INDIAN RAILWAYS

YEAR BOOK
2017-18

सत्यमेव जयते

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

Contents

Key Statistics

	Unit	2016-17	2017-18
PLANT & EQUIPMENT:			
Capital-at-Charge	₹ in crore	@3,02,457.78	**#3,24,725.64**
Total Investment	"	4,71,776.39	**5,17,324.19**
Route Length	Kms.	67,368	**68,442**
Locomotives	Nos.	11,461	**11,764**
Passenger Service Vehicles	"	64,285	**65,326**
Other Coaching Vehicles	"	*6,699	**6,499**
Wagons	"	*2,77,992	**2,79,308**
Railway Stations	"	7,309	**7,318**
OPERATION:			
Passenger: Train kms.	Millions	788.45	**769.27**
Vehicle kms.	"	*26,334	**26,200**
Freight: Train kms.	"	391.09	**396.48**
Wagon kms.	"	18,403	**18,461**
VOLUME OF TRAFFIC:			
Passengers Originating	Millions	8,116	**8,286**
Passenger kms.	"	11,49,835	**11,77,699**
Tonnes Originating:$			
Revenue Earning Traffic	"	1,106.15	**1,159.55**
Total Traffic (incl. non-revenue)	"	1,110.95	**1,162.64**
Net Tonne kms.$			
Revenue Earning Traffic	"	6,20,175	**6,92,916**
Total Traffic (incl. non-revenue)	"	6,20,858	**6,93,281**
EMPLOYMENT AND WAGES:			
Regular Employees	Thousands	*1,309	**1,271**
Wage Bill of Regular Employees	₹ in crore	*1,18,501.74	**1,29,336.48**
Average Annual Wage Per Regular Employee	₹ in units	*908,263	**10,30,961**
FINANCIAL RESULTS:			
Revenues	₹ in crore	1,65,292.20	**1,78,725.31**
Expenses	"	1,59,029.61	**1,75,834.22**
Miscellaneous Transactions	"	-1,349.59	**-1,225.48**
Net Revenue (before dividend)	"	4,913.00	**1,665.61**
Rate of Return on Capital	Percent	1.62	**0.51**
Dividend on Capital	₹ in crore	0	****0**
Shortfall(-)/Excess(+)	"	4,913.00	**1,665.61**

\# Includes investment (₹ 53,449.91 crore) from Captial Fund.

@ Includes investment (₹ 53,449.91 crore) from Capital Fund.

$ Excludes Konkan Railway.

* Revised

** No dividend was payble during 2017-18

Other Important Statistics

S.No.	Item	Unit	2016-17	2017-18
I	**Rail Network**			
1	Route Kilometres			
	(i) BG	Kms.	61,680	**63,491**
	(ii) MG	"	3,479	**3,200**
	(iii) NG	"	2,209	**1,751**
	(iv) Total (all gauges)	"	67,368	**68,442**
2	Running Track Kilometres (Total all gauges)	"	93,902	**94,735**
3	Total Track Kilometres (Total all gauges)	"	1,21,407	**1,23,236**
4	Electrified Route Kilometre (Total all gauges)	"	25,367	**29,376**
II	**Rolling stock**			
1	Number of Locomotives	(in units)		
	(i) Steam	"	39	**39**
	(ii) Diesel	"	6,023	**6,086**
	(iii) Electric	"	5,399	**5,639**
	(iv) Total	"	11,461	**11,764**
2	Number of Wagons	"	*2,77,992	**2,79,308**
3	Number of Coaches-	(in units)		
	(i) Passenger Carriages (including DEMU/ DHMU)	"	*55,130	**55,749**
	(ii) Other Coaching Vehicles	"	*6,699	**6,499**
	(iii) EMU and MEMU Coaches	"	9,125	**9,556**
	(iv) Rail Cars	"	30	**21**
	(v) Total	"	*70,984	**71,825**
III	**Loco Utilisation**			
1	Tractive effort per loco			
	(i) BG	Kgs.	37,808	**38,166**
	(ii) MG	"	17,746	**16,879**
2	GTKMs (excl. wt. of engine & dept.) per kg. of tractive effort.			
	(i) BG	Kms.	*4,083	**4,064**
	(ii) MG	"	461	**383**
3	Engine kilometres per day per engine in use (Pass.) (B.G)			
	(i) Diesel	Kms.	598	**594**
	(ii) Electric	"	709	**718**

S.No.	Item	Unit	2016-17	2017-18
4	Engine kilometres per day per engine in use (Goods)(B.G)			
	(i) Diesel	Kms.	377	**368**
	(ii) Electric	"	390	**393**
5	NTKMs per engine hour (BG) All traction		16,337	**17,474**
6	Ineffective percentage of locomotives (B.G)	Percent		
	(i) Diesel	"	8.93	**8.48**
	(ii) Electric	"	7.43	**6.80**
IV	**Wagon Utilisation**			
1	Wagon KMs in terms of 8 wheelers	Million	18,403	**18,461**
2	Total Carrying Capacity (All Gauges)	Million Tonnes	15.99	**16.28**
3	Average carrying capacity - wagon	Tonnes		
	BG	"	60.9	**61.7**
	MG	"	*34.2	**31.7**
4	Wagon Turn Round (in days) (BG)	Days	5.32	**5.21**
5	Wagon Kms. per wagon per day (BG)	Kms	204.2	**206.5**
6	NTKMs per wagon per day (BG)	Kms	7,359	**7,405**
7	Ineffective percentage of wagons (B.G)	%age	3.63	**3.63**
V	**Coach Utilisation**			
1	Vehicle Kms	Millions		
	(i) Suburban (EMU)	"	*2,022	**2,051**
	(ii) Non Suburban	"	*24,310	**24,140**
	(iii) Total	"	*26,332	**26,191**
2	Vehicle Kms per vehicle day (B.G)	Kms.	564	**555**
3	Ineffective percentage of coaches(B.G) (Passenger Carriage)	Percent	5.95	**5.89**
VI	**Train Utilisation**			
a.	**Passenger Train Performance**			
1	Number of Passenger trains runs daily	Nos.	13,329	**13,452**
2	Passenger Train Kms	Millions	*788.45	**769.27**
b.	**Goods Train Performance**			
1	Number of Goods trains runs daily	Nos.	9,221	**9,141**
2	Goods Train Kms.	Millions	391.09	**396.48**
3	Average Speed of All Goods Train (B.G.)			
	(i) Diesel	Kms./ Hour	23.3	**22.7**
	(ii) Electric	"	24.0	**23.6**
	(iii) All Traction	"	23.7	**23.3**
4	Average Net load of Goods train (B.G) (All traction)	Tonnes	1,600	**1763**

S.No.	Item	Unit	2016-17	2017-18
5	Average Gross load of Goods train (B.G)(All traction)	Tonnes	2859	**3025**
VII	**Volume of traffic**			
a.	**Passenger Traffic (Suburban + Non-Suburban)**			
1	Passenger Originating	Millions	8,116	**8,286**
2	Passenger Kilometres	Millions	11,49,835	**11,77,699**
3	Average Lead	Kms.	141.70	**142.20**
4	Passenger Earnings	₹ in crores	46,280	**48.643**
5	Average rate per PKMs	Paise	40.25	**41.30**
	Number of Passenger carried per day	Millions	22.24	**22.70**
b.	**Freight Traffic (Revenue)**			
1	Tonnes originating	Millions	1,106.15	**1,159.55**
2	Lead (originating)	Kms.	561	**598**
3	Freight Earnings excl. Demurrarge/Wharfage	₹ in crores	1,02,027.82	**1,13,523.53**
4	Frieght NTKMs	Millions	6,20,175	**6,92,916**
5	Average rate per NTKMs	Paise	164.51	**163.83**
6	Earnings per million tonne	₹ in crores	*92.24	**97.90**
7	Freight carried per day (including non-revenue)	Millions Tonnes	3.04	**3.19**
VIII	**Train Accidents (Excl. KRCL)**	Nos.	103	**72**
1	Collisions	”	5	**3**
2	Derailment	”	77	**53**
3	Level Crossing	”	20	**13**
4	Fire in trains	”	1	**3**
5	Miscellaneous	”	0	**0**
6	Accident per million train kms	”	0.09	**0.06**
IX	**Density**			
1	Net Tonne Kms per route Km. (BG)	Km.	*10.07	**10.92**
2	Passenger Kms per route Km. (BG)	”	*18.50	**18.46**
3	Gross Tonne Kms per route Km. (BG)	”	31.38	**31.63**
X	**Comsumption of Fuel/Energy by Locomotive**			
	(i) Diesel	Million litres	*2792.96	**2,778.43**
	(ii) Electric	Million KWH	15,666.46	**16,632.17**
	* revised			

Some Selected Financial Ratio

S. NO.	Item	Unit	2016-17	2017-18
(A)	**Financial Ratios**			
1.	Operating ratio	%age	96.50	**98.44**
2.	Rate of return on Capital	%age	1.62	**.51**
3.	Working ratio of IR	%age	87.9	**92.5**
4.	Operating ration with subsidy (Cost recovery)	%age	79.9	**80.0**
5.	Operating ratio for Coaching (passenger) and Goods (Fright)			
	i. Goods	%age	59.05	**58.83**
	ii. Coaching	%age	168.83	**181.20**
6.	Debt Servicing as percentage of OWE and as a percentage of Gross receipts.			
	i. Debt servicing as percentage of OWE	%age	13.1	**13.2**
	ii. Debt servicing as percentage of Gross Receipts	%age	9.4	**9.5**
7.	Capex to Revenue ratio – Capex (from internal generation) /Revenue	%age	6.3	**1.7**
(B)	**Earning/ Yield Ratios (Based on Apportion Earning)**			
8.	Passenger yield/ PKMs	In Paise	40.25	**41.30**
9.	Fright yield/NTKMs	In Paise	164.51	**163.83**
	Productivity index			
	i. Employee Productivity		5,36,839	**6,11,386**
	ii. Infrastructure Productivity		57,86,288	**63,04,147**
(C).	**Asset Utilization**			
10.	Utilization of Assets			
	i. NTKMs per wagon per day -(BG)	KMs	7,359	**7,405**
	ii. Wagon KMs per Wagon day -(BG)	KMs	204.2	**206.5**
	iii. Wagon turn around - BG	In days	5.32	**5.21**
	iv. Average Load per Wagon - BG	Tonnes	52.0	**54.5**
(D).	**Operating Indices**			
11.	Average speed of Goods Train – (BG) – All traction	KM/hour	23.7	**23.3**

S. NO.	Item	Unit	2016-17	2017-18
12.	Infective percentage of Rolling Stock – (BG)			
	i. Diesel Locos	%age	8.93	**8.48**
	ii. Electric Locos	%age	7.43	**6.80**
	iii. EMU Coaches	%age	12.0	**12.2**
	iv. Passenger Carriages	%age	5.95	**5.89**
	v. Other Coaching Vehicles	%age	5.55	**6.44**
	vi. Wagons	%age	3.63	**3.63**
13.	Specific Fuel Consumption (Consumption per 1000 GTKMs) – (BG)			
	i. Passenger service Diesel	Litres	3.75	**3.53**
	ii. Goods services Diesel	Litres	1.98	**2.72**
14.	Specific Energy Consumption (Consumption per 1000 GTKMs) – (BG)			
	i. Passenger service- Electricity	K.Wt. Hrs.	18.9	**18.9**
	ii. Goods services -Electricity	K.Wt. Hrs.	6.46	**5.89**
15.	Punctuality Index – Punctuality (M/Exp. Trains) –(BG)	%age	76.69	**71.39**
16.	Accident per Million train Kilometers		0.09	**0.06**

Newly build Manduadih station equipped with modern facilites on North Eastern Railway

Economic Review

Macroeconomic outcome

Amidst a strengthening global economy and generally buoyant financial markets and world trade, Indian economy remains resilient relative to other major economies and is projected to grow at 7.6 percent in 2018-19 by the United Nations World Economic Situation and Prospects (WESP). As per the Central Statistical Office (CSO) estimates, real GDP grew by 6.5 percent in 2017-18 compared with 7.1 percent in the previous year. On the basis of data released by Central Statistical Office (CSO), GDP growth for the Indian economy has averaged 7.4 percent from 2014-15 to 2017-18, which is the highest among the major economies of the world. On Purchasing Power Parity (PPP) basis, Indian economy is already the third largest in the world. Exports registered a positive growth during 2016-17 and strengthened further in 2017-18. Foreign exchange reserves also witnessed a healthy growth measuring US $ 424.36 billion on March 30th 2018. According to Reserve Bank of India, the combination of a steady easing of inflation for the fifth year, a modest current account deficit of 1.9 percent of GDP, and public finances having sturdily weathered the implementation of a major structural reform – the Goods and Services Tax (GST), reinforces the prospects for 2018-19.

On the downside, the firming profile of international commodity prices especially of crude oil, spillovers from tightening global financial conditions, geo-political tensions, trade wars stirring up across borders, financial turbulence, and the overhang of impairment in domestic banking and corporate balance sheets, emerge as the key downside risks. Some of these factors could have dampening effect on GDP growth in the coming year. Moreover, widespread sustained recovery in private investment also remains a crucial challenge for the Indian economy. However, with world growth likely to witness moderate improvement in 2018, expectation of greater stability in GST, likely recovery in investment levels, and ongoing structural reforms, among others, should be supporting higher growth. On balance, country's economic performance should witness an improvement in 2018-19.

GDP Growth:

GDP at constant (2011-12) prices or real GDP in the year 2017-18 was estimated at ₹130.11 lakh crore (Provisional Estimate), as against the GDP of ₹121.96 lakh crore (First Revised Estimate) for the year 2016-17. The growth in real GDP during 2017-18 is estimated at 6.7 percent as compared to the growth rate of 7.1 percent in 2016-17. (Table-1)

Real Gross Value Added (GVA) i.e GVA at basic constant (2011-12) prices for the year 2017-18 which reflects the production or supply side method of calculating GDP is estimated at ₹119.76 lakh crore (Provisional Estimates) in comparison with ₹112.48 lakh crore (First Revised Estimate) for the year 2016-17, thus registering a year-on-year growth rate of 6.5 percent in 2017-18 as against 7.1 percent in the year 2016-17 (Table 1). The fall was mainly caused by subdued growth in Agriculture, Forestry and Fishing, mining and quarrying, manufacturing sector as well as Electricity, Gas, Water Supply and other utility services sectors and Public Administration, defence and other services. (Table 2).

The sectors which registered a growth rate of over 6.0 percent in GVA at constant prices are Electricity, Gas, Water Supply & other utility services (7.2 percent), Trade, hotels, transport, communication and services related to broadcasting (8.0 percent), Financing, Real Estate & Professional Services (6.6 percent) and 'Public administration, defence and other services' (10.0 percent). The growth in the 'Agriculture, forestry and fishing', 'Mining and quarrying' is estimated to be 3.4 percent and 2.9 percent respectively. Both manufacturing and 'construction' are estimated at 5.7 percent (Table 2).

Table 1: GDP and GVA at constant prices 2011-12 (In ₹ Crore)

	2014-15	2015-16	2016-17	2017-18 PE
GDP at constant	10527674 (7.4)	11386145 (8.2)	12196006 (7.1)	**13010843 (6.7)**
GVA at basic Price	9712133 (7.2)	10503348 (8.1)	11247629 (7.1)	**11976155 (6.5)**

Source: Central Statistics Office (CSO)

PE: Provisional Estimate

Growth rate over previous year indicated in brackets

Table 2: Sector-wise Growth in GVA at Basic Prices (%) at 2011-12 prices

	2015-16	2016-17	2017-18 (PE)
I. Agriculture, Forestry & Fishing	0.6	6.3	**3.4**
II. Industry			
Mining & Quarrying	13.8	13.0	**2.9**
Manufacturing	12.8	7.9	**5.7**
Electricity, Gas, Water Supply & other utility services	4.7	9.2	**7.2**
Construction	3.7	1.3	**5.7**
III. Services			
Trade, Hotels, Transport, Communication and services related to broadcasting	10.3	7.2	**8.0**
Financing, Real Estate & Professional Services	10.9	6.0	**6.6**
Public Administration, defence and other services	6.1	10.7	**10.0**
GVA at Basic Price	8.1	7.1	**6.5**

Source: CSO

PE: Provisional Estimates

Agriculture

Agriculture and allied sector has shown a recovery trend in growth rates after registering a low growth of 0.6 percent in 2015-16. The sector registered a high growth of 6.3 percent in 2016-17 and a slower but positive growth of 3.4 percent in 2017-18 as per provisional estimates for 2017-18. 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 in 2017-18 is 284.83 million tonnes. This is higher by 9.72 million tonnes as compared to 275.11 million tonnes in 2016-17 (Table 3). All the major categories of foodgrains registered an increase in production in 2017-18 over the previous year.

Table 3: Production of selected agricultural commodities (million tonnes)

Items	2013-14	2014-15	2015-16	2016-17 Final Estimates	2017-18 4th AE
Food grains	265.04	252.02	251.57	275.11	**284.83**
Wheat	95.85	86.53	92.29	98.51	**99.70**
Rice	106.65	105.48	104.41	109.70	**112.91**
Coarse Cereals	43.29	42.86	38.52	43.77	**46.99**
Pulses	19.25	17.15	16.35	23.13	**25.23**

Source: Dept. of Agriculture, Cooperation and Farmers Welfare

AE: Advanced Estimate

Industry

As per the national accounts data of the CSO, Index of Industrial Production (IIP), which broadly comprises of mining, manufacturing and electricity registered a positive growth of 4.4 percent in 2017-18 as compared to 4.6 percent in 2016-17 (Table 4). Manufacturing sector witnessed a growth of 4.6 percent in 2017-18 compared to 4.4 percent in 2016-17. However, growth rate in Mining sector declined from 5.3% in 2016-17 to 2.3% in 2017-18 and in Electricity sector, it declined from 5.8% in 2016-17 to 5.4% in 2017-18.

Table 4: Sectoral Growth Rates of Industrial Sector based on IIP (%)

(Base: 2011-12 = 100)

	Weight	2013-14	2014-15	2015-16	2016-17	2017-18
Industry Group						
General Index	100.00	3.3	4.0	3.3	4.6	**4.4**
Mining	14.4373	-0.1	-1.4	4.3	5.3	**2.3**
Manufacturing	77.633	3.6	3.8	2.8	4.4	**4.6**
Electricity	7.994	6.1	14.8	5.7	5.8	**5.4**

Source: CSO

Growth is over the corresponding period of previous year.

In terms of use-based classification, Primary goods and capital goods witnessed a growth rate of 3.7 percent and 3.9 percent respectively in the year 2017-18, as against 4.9 percent and 3.2 percent in 2016-17. Intermediate goods recorded an increase of 2.3 percent in 2017-18, as against 3.3 percent in 2016-17. Infrastructure/construction goods recorded a growth of 5.6 percent in 2017-18 as against 3.9 percent in 2016-17. Consumer durable goods recorded an increase of 0.7 percent in 2017-18 as compared to 2.9 percent in 2016-17. Consumer non-durables grew by 10.4 percent in 2017-18, as against the growth rate of 7.9 percent in 2016-17.

In the World Bank's latest 'Doing Business Report 2018' India stands at 100th rank in 2018. It has leapt 30 ranks over its previous rank of 130 in the year 2017. This achievement was the result of overall business environment in the country which improved significantly on account of several industries specific reform initiatives taken by the Government since 2014. Measures undertaken by the Government including implementation of the Goods and Services Tax, Insolvency and Bankruptcy Code, introduction of inflation targeting regime and announcement of bank recapitalization, have been instrumental in achieving this feat. Other measures to facilitate ease of doing business include initiation and simplification of online application for Industrial License and Industrial Entrepreneur Memorandum, integration

of twenty services with the eBiz portal which functions as a single window portal for obtaining clearances from various Government agencies, limiting the number of documents required for export and import.

Infrastructure Industries

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 40.27 percent in the IIP grew at 4.3 percent in 2017-18 compared to 4.8 percent in 2016-17 (Table 5). Crude oil with a negative growth rate of 0.9 percent continued to be the worst performing infrastructure industry in 2017-18 followed by fertilizers which registered a growth of 0.03 percent. Cement registered the maximum growth at 6.3 percent in the year 2017-18, followed by Steel at 5.6 percent, Electricity at 5.3 percent, Refinery products 4.6 percent, Natural Gas 2.9 percent and Coal 2.6 percent.

Table 5: Growth (%) in Core Industries (Base: 2011-12=100)

Sectors	Weight	2013-14	2014-15	2015-16	2016-17	2017-18
Coal	10.3335	1.0	8.0	4.8	3.2	**2.6**
Crude oil	8.9833	-0.2	-0.9	-1.4	-2.5	**-0.9**
Natural Gas	6.8768	-12.9	-5.3	-4.7	-1.0	**2.9**
Refinery Products	28.0376	1.4	0.2	4.9	4.9	**4.6**
Fertilizers	2.6276	1.5	1.3	7.0	0.2	**0.03**
Steel	17.9166	7.3	5.1	-1.3	10.7	**5.6**
Cement	5.3720	3.7	5.9	4.6	-1.2	**6.3**
Electricity	19.8530	6.1	14.8	5.7	5.8	**5.3**
Overall	100	2.6	4.9	3.0	4.8	**4.3**

Source: Office of the Economic Adviser, D/o Industrial Policy & Promotion

External Sector

Foreign Trade

The year 2017-18 registered a strong export growth of 10.29 percent, as compared to 5.17 percent growth in 2016-17. Major boost was registered in oil exports, which recorded a growth of 18.77 percent as compared to non-oil exports growth rate of 8.90 percent. Imports also registered a perceptible growth of 19.47 percent in 2017-18, with oil imports and non-oil imports registering a growth of 24.95 and 20.02 percent, respectively (as per RBI data dated 27.12.2018). Trade deficit, accordingly, which was at US$ 112.44 billion in 2016-17 rose to US$ 160.04 billion.

Table 6: Export, Import and Trade Deficit (in US $ billion)

Item	2016-17 (Partially revised)	Growth* (%)	2017-18	Growth* (%)
Exports	280.14	5.17	**308.97**	**10.29**
Imports	392.58	- 0.98	**469.01**	**19.47**
Trade Balance#	-112.44		**-160.04**	

Source: Reserve Bank of India Annual Report dated 29th August 2018.

#: Exports minus Imports

*Over the previous Year

Current Account Deficit (CAD)

India's current account deficit in 2017-18 was US $ 48.72 billion or (-) 1.9 percent of GDP, as compared to US $ 14.42 billion or (-) 0.6 percent of GDP in the previous year. It widened mainly on account of a negative trade balance of US $ 160 billion in 2017-18. However, the Net invisibles, the other component of current account deficit, increased from US $ 98.03 billion to US $ 111.31 billion in 2017-18 mainly on account of rise in net earnings from software services and private transfers/remittances (Table 7).

Table 7: Current Account Balance (in US $ billion)

Year	2013-14	2014-15	2015-16	2016-17 PR	2017-18 (P)
Trade Balance	-147.61	- 144.94	- 130.08	- 112.44	**- 160.04**
Net Invisibles	115.31	118.08	107.93	98.03	**111.32**
Current Account Balance	- 32.30	- 26.86	- 22.15	- 14.42	**- 48.72**
Current Account Balance as a Ratio to GDP (%)	- 1.7	- 1.3	- 1.1	- 0.6	**- 1.9**

Note: PR is partially revised and P is provisional

(Source: RBI Annual Report, 29th August, 2018)

Foreign Capital Inflows

Net foreign direct investments (FDI) decreased by 14.94 percent from US$ 35.61 billion in 2016-17 to $ 30.29 billion in 2017-18. Net Portfolio investment, which recorded a net inflow of US$ 7.61 billion in 2016-17, increased by 190.67 percent compared to US$ 22.12 billion in the year 2017-18. (Table 8). However, the country has 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.

It has been felt that the country has the potential to attract far more foreign investment, which can be achieved by further liberalizing and simplifying the FDI regime. Accordingly, in 2017-18, the Government permitted up to 100% FDI on the automatic route for Single Brand Retail Trading and construction development covering townships, housing, built-up structures and real estate broking services. Foreign Airlines have been allowed to invest up to 49% under approval route in Air India, and FIIs/FPIs have been allowed to invest in Power exchanges through primary market.

Table 8: Net Foreign Direct Investment (FDI) and Net Portfolio Investment

(In US$ billion)

	Net FDI	Net Portfolio Investment
2013-14	21.56	4.82
2014-15	31.25	42.20
2015-16	36.02	- 4.13
2016-17	35.61	7.61
2017-18 (P)	**30.29**	**22.12**

Source: Reserve Bank of India dated 29th August 2018.

(P): Provisional

Foreign Exchange Reserves & Exchange rate

India's foreign exchange reserves increased from US$ 369.95 billion at the end of March 2017 to $ 424.36 billion at the end of March 2018. Exchange rate of rupee depreciated from ₹ 64.84 per US dollar on March 31, 2017 to ₹65.04 per US dollar on March 28, 2018. The exchange rate of the Indian rupee vis-a-vis the US dollar has moved in both directions towards the end of the year 2017-18. It appreciated till the early part of January 2018 on buoyant capital inflows and weakening of the US dollar. It depreciated from early February, following the release of stronger than expected US non-farm payrolls and wages data that fuelled expectations of a faster pace of interest rate increases by the US Federal Reserve and over concerns of the impact of higher crude oil prices on India's trade deficit. By March, the exchange rate of the rupee was close to its October 2017 level. Changing market perceptions about the pace and timing of monetary policy normalisation in the US, along with domestic inflation, fiscal slippage and current account balance developments, have been important factors driving exchange rate movements in the recent period and are likely to remain so in the near-term.

Fiscal outcome

Sound public finance management has been one of the pillars of India's macro-economic stability in the last three years. There has been fiscal consolidation with reduction in Fiscal deficit as a percentage of GDP from 4.1 percent in 2014-15 to 3.9 percent in 2015-16 and 3.5 percent in 2016-17 and 2017-18. The fiscal deficit is budgeted to reduce further to 3.3 percent in 2018-19. Moreover, gross tax revenue is budgeted at 12.1 percent in 2018-19, which is the highest budgeted tax-GDP ratio so far, reflecting the formalization of GST and widening of the tax base.

Total liabilities of the Central government as a proportion of the GDP fell to 49.1 percent in 2017-18 (Revised Estimates) and are estimated to decline further to 47.8 percent in 2018-19 (Budget Estimates), with ultimate aim of reducing it to 40 percent by 2024-25 as per the recommendations of Fiscal Reform and Budget Management Committee.

Table 9: Components of Revenue and Expenditure of the Central Government

(as percent of GDP)

	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Revenue Receipts	9.0	8.9	8.7	9.0	9.0	**9.2**
Gross Tax Revenue	10.1	10.0	10.6	11.2	11.6	**12.1**
Total Expenditure	13.9	13.4	13.1	12.9	13.2	**13.0**
Revenue Expenditure	12.2	11.8	11.2	11.1	11.6	**11.4**
Capital Expenditure	1.7	1.6	1.8	1.9	1.6	**1.6**
Interest payment	3.3	3.2	3.2	3.2	3.2	**3.1**
Major subsidies	2.3	2.1	1.9	1.3	1.4	**1.4**
Revenue Deficit	3.2	2.9	2.5	2.1	2.6	**2.2**
Fiscal Deficit	4.5	4.1	3.9	3.5	3.5	**3.3**
Primary Deficit	1.1	0.9	0.7	0.4	0.4	**0.3**

Source: Union Budget documents and RBI Bulletin, April 2018

Figures for 2018-19 are Budget Estimate

Figures for 2017-18 are Revised Estimates

Inflation

Headline Wholesale Price Index (WPI) averaged 1.73 percent in 2016-17 and accelerated to 2.96 percent in 2017-18. This was mainly on account of fuel inflation, which was (-) 0.23 percent in 2016-17 and increased to 8.11 percent in 2017-18 due to strong global demand and subsequent rise in the global oil prices. Manufacturing inflation was at 1.37 percent in 2016-17 and firmed up to 2.80 percent in 2017-18 whereas the inflation in primary articles group declined from 3.45 percent to 1.32 percent in the year 2017-18.

Table 10: Annual Inflation rate (%) based on WPI (Base 2011-12=100)

Items/Groups	Weight (%)	April-March (Average)	
		2016-17	2017-18
All Commodities	100	1.73	**2.96**
1. Primary articles	22.6	3.45	**1.32**
2. Fuel and Power Group	13.2	-0.23	**8.11**
3. Manufactured Products	64.2	1.37	**2.80**

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 4.5 percent in 2016-17 to 3.6 percent in 2017-18. In the year 2012-13 the CPI inflation (average of months) was at 10.0 percent which reduced to 9.4 percent in 2013-14 and further to 5.8 percent in 2014-15. On the basis of CPI inflation data, it can be safely said that the Indian Economy witnessed a gradual transition from a period of high and variable inflation to more stable prices in the last four years.

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.

Table 11: Rail Coefficient: Select Major Commodities carried by the Indian Railways as a Percentage of total production plus imports.

	Coal	Iron Ore	Cement	Foodgrains	Fertilizers	Pol Products
2013-14	69.34	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	65.45	70.78	36.99	18.13	87.53	16.54
2016-17 (R)	62.77	69.93	36.66	15.95	87.01	15.16
2017-18 (P)	**62.75**	**66.63**	**37.84**	**15.38**	**85.49**	**14.85**

Source: Calculated on the basis of production and import data received from various Ministries.

Table 12: SELECTED ECONOMIC INDICATORS

	ITEM		Unit / Base	2013-14	2014-15	2015-16 2nd RE	2016-17 1st RE	2017-18 (PE)
I.	(a)	**Net National Income**						
	(i)	At 2011-12 prices	₹ Crore	8578417	9224343	9985060	10681594	**11405563**
	(ii)	At current prices	₹ Crore	9897663	10978238	12154034	13492657	**14849045**
	(b)	Per capital net national income						

(i)	At 2011-12 prices	(In Rupees)	68572	72805	77826	82229	**86668**
(ii)	At current prices	(In Rupees)	79118	86647	94731	103870	**112835**

II. Gross Capital Formation

	Railways						
(i)	At 2011-12 prices	₹Crore	42700	61372	60452	68503	**NA**
(ii)	At current prices	₹Crore	46117	71145	68566	79581	**NA**

Source: National Accounts Data, Ministry of Statistics and Programme Implementation

PE-Provisional Estimates

III. Foreign Trade:

(a)	Value of exports	₹Crore	1905011	1896445	1716384	1849434	**1955541**
	Value of imports	₹Crore	2715434	2737087	2490306	2577675	**3001016**
(b)	Value of exports	US $ Million	314416	310352	262291	275852	**303376**
	Value of imports	US $ Million	450214	448033	381008	384357	**465578**

Source: Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry.

Data for 2016-17 are revised and for 2017-18 are provisional.

IV. Index of Agricultural Production (Triennium ending 2007-08 =100)

		Weight	2013-14	2014-15	2015-16	2016-17	**2017-18**
(a)	All Crops	(100.00)	129.8	124.0	120.8	-	**135.2**
(b)	Foodgrains	(50.7)	123.3	115.9	115.7	-	**136.6**
(c)	Non-foodgrains	(49.3)	136.4	132.3	126.1	132.5	**133.7**

Source: Handbook of Statistics (2017-18), Reserve Bank of India

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

		Weight	2013-14	2014-15	2015-16	2016-17	**2017-18**
(a)	General Index	(100.0)	106.7	111.0	114.7	120.0	**125.3**
(b)	Mining & Quarrying	(14.37)	94.6	93.3	97.3	102.5	**104.9**
(c)	Manufacturing	(77.63)	108.6	112.7	115.9	121.0	**126.6**
(d)	Electricity	(7.99)	110.3	126.6	133.8	141.6	**149.2**

Source: CSO, Ministry of Statistics and Programme Implementation

SELECTED ECONOMIC INDICATORS (Contd.)

	ITEM	Unit/ Base	2013-14	2014-15	2015-16	2016-17	2017-18
VI.	Wholesale Price Index (Financial Year Average with weights) (Base 2011-12=100)	Weight					
(a)	All Commodities	(100.00)	112.5	113.9	109.7	111.6	**114.9**
(b)	Primary Articles	(22.62)	122.4	125.1	124.6	128.9	**130.6**
(c)	Fuel & Power	(13.15)	114.7	107.7	86.5	86.3	**93.3**
(d)	Manufactured Products	(64.23)	108.5	111.2	109.2	110.7	**113.8**
VII.	Wholesale Price Indices of Important Commodities used by Railways	Weight					
(a)	Non-coking coal	(1.40)	106.8	109.6	109.6	110.5	**112.5**
(b)	Minerals Oils	(7.95)	121.6	108.7	73.9	73.3	**82.5**
(c)	Electricity	(3.06)	103.6	105.7	105.3	104.2	**103.7**
(d)	Manufacture of Basic Metals	(9.65)	102.9	103.5	92.0	91.1	**101.4**
(i)	Inputs into Steel Making	(1.41)	103.5	104.6	85.4	82.9	**98.2**
(ii)	Ferrochrome	(0.11)	106.9	110.4	102.5	114.4	**121.6**
(iii)	Ferromanganese	(0.03)	110.7	114.3	95.2	104.4	**121.5**
(iv)	Ferrosilicon	(0.02)	111.9	115.2	99.3	88.4	**94.6**
(v)	Other Ferro alloys	(0.03)	106.9	111.8	96.2	100	**118.2**
(vi)	Manufacture of Non-Ferrous Metals	(1.69)	106.5	108.7	100.9	100.1	**107.9**
(e)	Manufacture of Electrical Equipment	(2.93)	104.8	109.5	109.0	108.2	**109.6**
(f)	Manufacture of Chemicals & Chemical Products	(6.47)	113.3	116.1	112.6	111.0	**112.5**
(g)	Manufacture of Non-metallic mineral products	(3.20)	107.5	111.3	110.5	109.8	**112.7**
(h)	Cotton dyed/printed Textile	(0.05)	104.9	113.5	114.9	118.0	**124.0**
(i)	Timber/wooden plank, sawn/re-sawn	(0.05)	114.4	120.0	121.5	122.6	**116.2**
(j)	Manufacture of Cement, Lime and plaster	(1.64)	106.4	110.9	109.9	110.6	**113.8**
(k)	Lube Oils	(0.29)	114.2	118.8	120.8	116.8	**114.0**
(l)	High Speed Diesel	(3.10)	126.3	114.8	73.4	74.4	**84.4**
VIII.	Consumer Price Index (Industrial Workers) (Base 2012=100)* as on Sep 15, 2017		236	251	265	276	**284**

Source: WPI data from Office of Economic Advisor

CPI data from Handbook of Statistics (2017-18), RBI

Planning

In the year 2017-18 the following assets were acquired and task accomplished.

	Heads		2017-18
1.	Locomotives	(Nos.)	**673**
2.	Wagons (BLC+ Private Wagons)	(")	**12,000**
3.	Coaches including	(")	**5594**
	(i) EMUs	(")	**426**
	(ii) MEMUs	(")	**400**
	(iii) DMUs	(")	**278**
4.	Route Kms of track electrified	(Kms.)	**4,087**
5.	New lines constructed	(Kms.)	**409**
6.	Double/Multiple lines provided	(Kms.)	**999**
7.	Track renewals (both primary & secondary renewal)	(Kms.)	**4,023**
8.	Gauge Conversion to BG from MG/NG	(Kms.)	**454**

The Plan allocation (Revised Estimates) and Actual Net Expenditure for 2017-18 compared with 2016-17, were as follows:

(₹in crore)

Plan Head		2016-17		2017-18	
		Allocation (R.E.)	Actual Net Expenditure	Allocation (R.E.)	Actual Net Expenditure
CIVIL ENGINEERING					
1	New Lines (Construction)	**18,546.68	14,319.89	**@22,157.90**	**8,195.19**
2	Gauge Conversion	@@5,171.97	3,769.92	**#2,803.65**	**2,880.11**
3	Doubling	!!20,504.84	9,093.22	**$16,758.79**	**11,240.33**
4	Traffic Facilities- Yard Remodeling and Others	$$1,369.61	910.68	**%3,275.60**	**1,224.84**
5	Road Safety Works - Level Crossings	679.25	542.91	**674.95**	**536.79**
6	Road Safety Works - Road Over/Under Bridges	>9,654.37	3,196.23	***6,028.73**	**3,175.77**
7	Track Renewals	6,683.80	5,076.33	**7,834.37**	**7,727.71**
8	Bridge Works	591.91	474.52	**700.50**	**448.73**
9	Staff Quarters	371.45	308.45	**223.03**	**250.67**
10	Amenities for Staff	263.08	235.70	**202.27**	**209.58**
11	New Lines (const.)– Dividend free Projects	^ ^1,500.00	1,650.00	**β1,000.00**	**988.63**
	TOTAL	65,336.96	39,577.85	**61,659.79**	**36,878.35**

MECHANICAL					
1	Rolling Stock	&&26,181.62	19,610.99	**^29,567.18**	**20,139.29**
2	Leased Assets–Payment of Capital Component	7,000.00	6,999.99	**8,000.00**	**7,979.82**
3	Machinery and Plant	507.80	430.65	**460.40**	**367.91**
4	Workshops including Production Units	##3,326.96	1,534.35	**£2,196.70**	**1,385.67**
	TOTAL	37,016.38	28,575.98	**40,224.28**	**29,872.69**
ELECTRICAL ENGINEERING					
1	Electrification Projects	%%3,521.85	2,870.90	**~5,031.65**	**3,769.99**
2	Other Electrical Works excl. TRD	(c)664.38	139.82	**!690.15**	**166.36**
3.	Traction Distribution Works	253.28	220.11	**468.84**	**351.61**
	TOTAL	4,439.51	3,230.83	**6,190.64**	**4,287.96**
SIGNAL AND TELECOMMUNICATION					
1	S and T Works	952.53	951.56	**2,030.70**	**1,255.63**
	TOTAL	952.53	951.56	**2,030.70**	**1,255.63**
OTHERS					
1	Computerization	354.87	226.12	**301.48**	**154.65**
2	Railway Research	21.81	12.20	**34.86**	**21.35**
3	User's Amenities	1,920.66	981.18	**ΣΣ 2,470.62**	**1,286.62**
4	Investment in PSUs	513.53	46.33	**702.00**	**0.00**
5	Investment in non-Government Undertakings including JVs/SPVs	££ 8,264.80	7,137.80	**5,227.10**	**4,887.99**
6	Other Specified Works	555.57	304.86	**& 294.11**	**272.98**
7	Training/HRD	18.72	-	**116.43**	**0.00**
8	Inventories	70.57	(-)978.60	**250.00**	**157.07**
9	M.T.Ps.	1,534.09	1,389.94	**598.00**	**794.18**
	TOTAL	13,254.62	9,119.83	**9,994.60**	**7,574.84**
	GRAND TOTAL	**Σ** 1,21,000.00	'' 81,456.05	**®1,20,100.00**	**``79,869.47**

Revised Estimates

** Includes ₹5,610 crore for National Projects ₹101.48 crore under EBR (IF). It also includes ₹4,799.00 crore under EBR (P).

@ Includes ₹2,637 crore for National Projects ₹502 crore for Projects of National Importance. It also includes ₹223.86 crore under EBR (IF) and ₹14,174 crore under EBR (PPP).

@@ Includes provision of ₹843.00 crore for National Projects ₹1,182.28 crore under EBR (IF) and ₹321 crore under EBR(P).

Includes ₹350 crore for National Projects. It also includes ₹759.24 crore under EBR (IF).

!! Includes ₹2,907.00 crore under EBR(P) ₹16,141.74 crore for EBR(IF) and ₹37.13 crore for IRFC bonds.

$ Includes ₹85.46 crore under EBR (IRFC), ₹14,186.56 crore under EBR (IF) and ₹1,267 crore under EBR (PPP).

$$ Includes ₹180.25 crore under EBR (P) and ₹155.96 crore for EBR (IF).

% Includes ₹73.60 crore under EBR (IF) and ₹1,900.00 crore under EBR (PPP).

> Includes ₹6,592.26 crore under EBR (P).

* Includes ₹2,029 crore under EBR (PPP).

^ ^ Includes ₹1,500.00 crore for Udhampur-Srinagar-Baramulla New Line.

β Provision for Udhampur Srinagar- Baramulla New Line.

&& Includes ₹17,962.87 crore under IRFC (Bond) and ₹2,070.00 crore under EBR(P).

^ Includes ₹24,700.54 crore under EBR (IRFC) and ₹2,100 crore under EBR (PPP).

Includes ₹1,345.69 crore under EBR (PPP) and ₹12.55 crore under EBR (IF).

£ Includes ₹37.91 crore under EBR (IF) and ₹1,000 crore under EBR (PPP).

%% Includes ₹3,336.00 crore under EBR (IF) and ₹180 crore under EBR(P).

~ Includes ₹5,032.83 crore under EBR (IF).

(c) Includes ₹400.00 crore under EBR(P).

! Includes ₹530 crore under EBR (PPP).

& Includes ₹1,00 crore for Nirbhaya Fund.

Σ Σ Includes ₹1,000 crore under EBR (PPP).

ΣΣ Includes ₹1,202.00 crore under EBR(P).

Σ RE 2016-17 includes gross outlays under DRF on account of outlay against higher CRRM targets.

® RE 2017-18 includes gross outlays under DRF on account of outlay against higher CRRM targets.

Actual Net Expenditure (2016-17 and 2017-18)

'' Excluding actual expenditure of ₹26,834.09 crore under EBR (PPP).

`` Excluding actual expenditure of ₹22,116.00 crore under EBR (PPP).

Productivity:

The following table shows the indices of growth of traffic output vis-a-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	475
2017-18	**1,571**	**1,715**	**393**	**413**	**128**	**160**	**494**

Passenger Business

Indian Railways is commonly used mode of public transportation in the country. During 2017-18, it carried 8,286 million passengers as against 8,116 million in 2016-17. Passenger kilometres, which is calculated by multiplying the number of journeys by mean kilometric distance in case of each class was 1,178 billion as against 1,150 billion in the previous year. Passenger earnings increased by 2,362.68 crore (5.11%) in comparison with 2016-17.

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
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
2017-18	**4,665**	**159**	**1,390**	**2,072**	**3,462**	**3,621**	**8,286**

Also includes Sleeper Class

Table II. Passenger Kilometres

(in millions)

Year	Suburban (All classes)	Non suburban					Grand Total
		Upper class	Second Class			Total Non-suburban	
			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

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
2017-18	**1,49,465**	**1,14,248**	**6,45,462**	**2,68,524**	**9,13,986**	**10,28,234**	**11,77,699**

Also includes Sleeper Class.

Table III. Average Lead

(in millions)

Year	Suburban (All classes)	Non suburban				Grand Total
		Upper class	Second Class		Total Non-suburban	
			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
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
2017-18	**32.0**	**720.4**	**464.4**	**129.6**	**264.0**	**284.0**	**142.1**

#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	2016-17	2017-18
Non-Suburban:								
Second Class Ordinary	50.38	42.82	37.14	31.70	30.20	31.95	25.60	**25.00**
Second Class Mail/Express#	6.02	6.38	7.20	9.26	9.77	13.67	16.29	**16.78**
Upper Class	0.94	0.66	0.30	0.49	0.83	1.30	1.85	**1.92**
Total	57.34	49.86	44.64	41.45	40.80	46.92	43.74	**43.70**
Suburban(all classes)	42.66	50.14	55.36	58.55	59.20	53.08	56.26	**56.30**
Grand Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

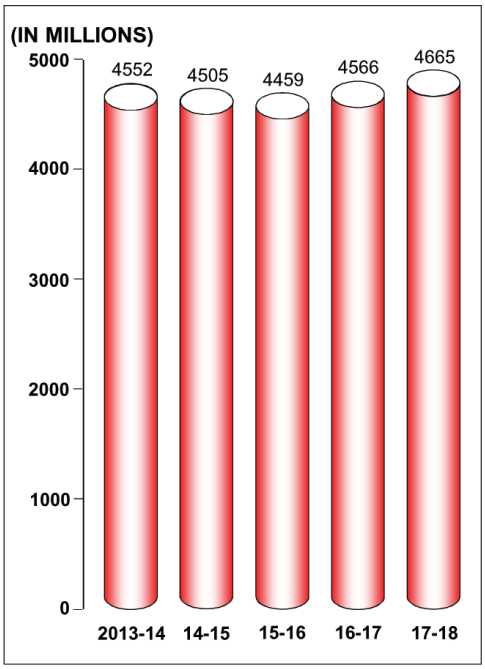
#Also includes Sleeper Class.

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

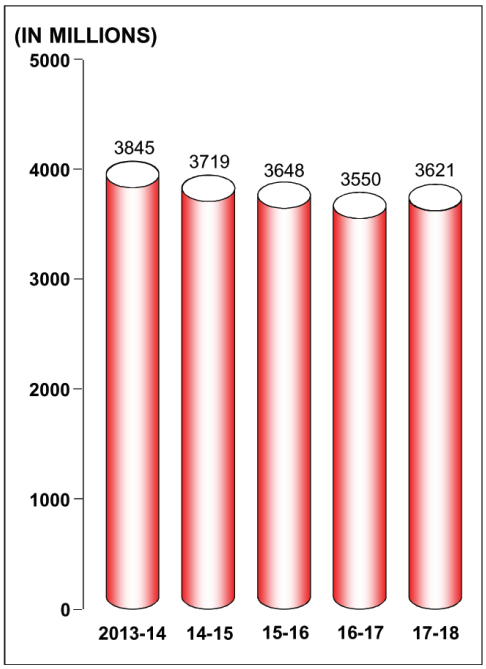
	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2016-17	2017-18
Non-Suburban:								
Second Class Ordinary	51.75	44.77	36.26	30.20	26.10	28.47	22.61	**22.80**
Second Class Mail/Express#	28.65	32.05	41.58	46.70	48.70	51.16	55.14	**54.81**
Upper Class	4.45	3.72	2.46	2.95	5.75	6.36	9.60	**9.70**
Total	84.85	80.54	80.30	79.85	80.55	85.99	87.35	**87.31**
Suburban (all classes)	15.15	19.46	19.70	20.15	19.45	14.01	12.65	**12.69**
Grand Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Also includes Sleeper Class.

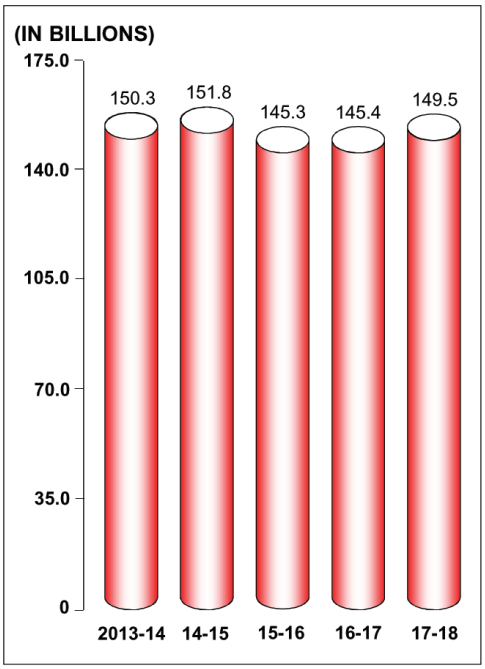
PASSENGERS ORIGINATING
SUBURBAN



PASSENGERS ORIGINATING
NON-SUBURBAN



PASSENGER KILOMETRES
SUBURBAN



PASSENGER KILOMETRES
NON-SUBURBAN

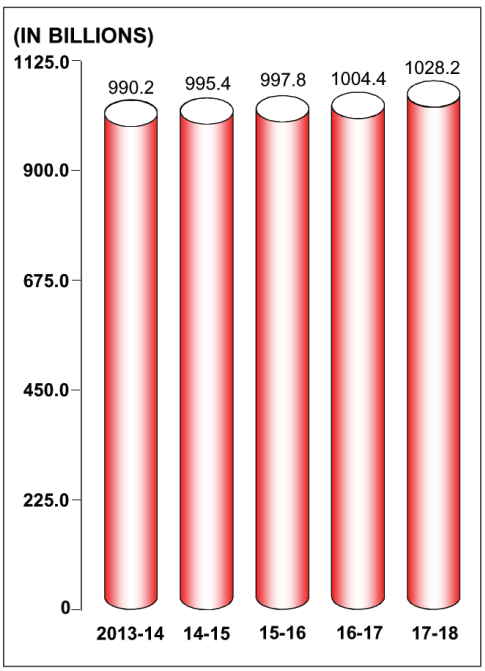


Table VI. Number of passenger trains run daily

Type of trains	Broad Gauge		Metre Gauge		Total (incl.NG)	
	2016-17	**2017-18**	2016-17	**2017-18**	2016-17	**2017-18**
EMU	5,148	**5,507**	0	**-**	5,148	**5,507**
Mail/Express	3,524	**3,581**	6	**-**	3,530	**3,581**
Ordinary Passenger Trains and Mixed Trains	4,387	**4,287**	158	**77**	4,651	**4,364**
Total	**13,059**	**13,375**	**164**	**77**	**13,329**	**13,452**

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

Type of trains	Broad Gauge	
	2016-17	**2017-18**
EMU	37.4	**37.5**
Mail/Express	50.6	**60.3**
Ordinary Passenger Trains (incl. mixed)	33.9	**33.8**

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

Passenger Revenue :

Passenger earnings in 2017-18 were ₹48,643.14 crore. This was ₹2,362.68 crore (5.11 %) higher than the earnings in 2016-17. Suburban traffic contributed 5.76 % to the total earnings. The remaining 94.24 % came from non-suburban passengers. Earnings from Second and Sleeper Class Mail/Express passengers comprised 49.99 % of the total passenger earnings.

Passenger revenue in terms of earnings per passenger kilometre for different classes during 2016-17 and 2017-18 was as under:

		(In paise)
Segment	2016-17	**2017-18**
Non-suburban:		
Upper class	135.60	**139.44**
Second Class-Mail/Express (incl. sleeper class)	36.64	**37.67**
Second Class-Ordinary	20.75	**20.83**
Non-suburban (all classes)	43.40	**44.58**
Suburban(all classes)	18.49	**18.76**
Overall average	40.25	**41.30**

Passenger revenue in different classes with corresponding number of passengers and Passenger Kms. in 2017-18 is given below:

Segment	No. of passengers		Passenger kms.		Revenue	
	Million	Percentage	Million	Percentage	₹ in cr.	Percentage
Non-suburban:						
Upper Class	159	1.92	1,14,248	9.70	15,930.69	32.75
Second Class Mail/ Express#	1,390	16.78	6,45,462	54.81	24,315.65	49.99
Second Class Ordinary	2,072	25.00	2,68,524	22.80	5,593.01	11.50
Total	3,621	43.70	10,28,234	87.31	45,839.35	94.24
Suburban (all classes)	4,665	56.30	1,49,465	12.69	2,803.79	5.76
Grand Total	**8,286**	**100.00**	**11,77,699**	**100.00**	**48,643.14**	**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
2015-16	86.39	1,970	684	23,356	50.0	21.6
2016-17	87.16*	2,022*	700	24,307*	50.2*	21.5
2017-18	**87.72**	**2,051**	**680**	**24,139**	**47.8**	**20.8**

*Revised

@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.

Passenger Service Improvements:

During the year 2017-18, 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	159 trains	118 trains	22 trains	299
Suburban	66 trains	33 trains	-	99
Total	**225**	**151**	**22**	**398**

Ticketless Travel:

During 2017-18, 23.23 lakh checks were conducted against ticketless/ irregular travel (including carriage of unbooked luggage). About 298.44 lakh cases of ticketless/irregular travel/unbooked luggage were detected and ₹1,184.08 crore were realized on this account.

Passenger Amenities:

The allocation under the Plan Head "Passenger Amenities" in 2017-18 was ₹2,470.79 crore (Budget Estimate) and ₹2,100.90 crore (Revised Estimate).

1,253 stations have so far been identified for development under the Adarsh Station Scheme up to May 2018, out of which 1065 stations have already been developed.

During the Year 2017-18, 189 stations were provided with water coolers, 152 stations were electrified and 161 passenger lifts and 126 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 20000 tickets per minute. E-ticketing website for reserved tickets now handles about 65% 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:

With a view to cut down queues at counters at Railway stations and to facilitate convenient booking of tickets by passengers, Indian Railways have introduced the facility of unreserved ticket booking through mobile phone by registering either through www.utsonmobile.inidanrail.gov.in or mobile app 'UTSONMOBILE'. Additional digital payment options have been added viz. net-banking, payment through credit/debit cards and e-wallets for purchase of unreserved tickets through mobile phone apart from the previous option of R-wallet of the Railways.

Mobile application- Rail Connect

Indian Railways E-ticketing System caters to over 1 million passengers daily who can book Railways reserved tickets without leaving their homes/ offices. An Android based mobile app for reserved booking "IRCTC Rail Connect" has been also been made to make ticketing easy.

Automatic Ticket Vending Machine (ATVM)

Automatic Ticket Vending Machines (ATVM) has been introduced by Indian Railways to reduce passengers queuing up at the ticket counters at Railway stations. ATVMs are touch screen based ticketing kiosks for dispensing unreserved tickets. The payment in these machines is made through smart card for purchasing the ticket. 5% of the value is added on the card as an incentive for purchasing ticket through ATVMs.

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 3350 Smart Card based ATVMs have also been commissioned.

Information on Status of Booking

First reservation chart is finalized automatically 4 hours before the scheduled departure of the train so that the waitlisted passenger can come to know about the final status of their bookings. Thereafter, the available accommodation, if any, can be booked across any computerised PRS counter or through internet. Second (final one) is prepared between 30 minutes to 10 minutes before the train departure. Remaining berth if any

are automatically utilized to confirm status of waitlisted passenger at the next station subject to certain conditions. The passenger gets SMS on his registered mobile indicating the coach and berth number allotted.

Alternate Train Accommodation Scheme – "Vikalp"

With a view to provide confirmed accommodation to waitlisted passengers and also to ensure optimal utilisation of available accommodation, a scheme called Alternate Train Accommodation Scheme – VIKALP has been implemented. Under this scheme, Waiting list passengers can give choice, at the time of booking ticket, to opt to travel on alternate train in case the berth is not confirmed after preparation of the chart.

Integrated Rail App : RAIL SARTHI

Integrated rail app for following service has been made available Seat Availability, Fare Enquiry, Train Running (NTES), PNR Enquiry etc.

Affiliated Services are also provided under this option:

Air Ticket Booking, Food on Track, Tour Booking, Booking Retiring Room, Onboard Cleaning request, Passenger can call the Helpline No. 138 for Complaints and Suggestions, Passenger can call the Helpline No. 182 for Security, Feedback, Complaint/Suggestions (COMS), Twitter link etc

Appointment of Station Ticket Booking Agent (STBA)

To facilitate ticket booking, 'Station Ticket Booking Agents' are engaged to issue unreserved tickets at 'E' category stations. The scheme of STBA has been very successful in achieving the target of 'Operation Five Minute' i.e. to make ticket available within 5 minutes.

Yatri Ticket Suvidha Kendra (YTSK)

With a view to expanding the facilities for issuing of tickets (both reserved and unreserved), public private partnership was allowed in establishment and operation of computerized PRS-cum-UTS terminals at centers called YTSK.

Sale of Platform Tickets through Ticket Vending Machines

The facility of purchasing of platform tickets through Ticket Vending Machines Platform Tickets can also be purchased on Mobile using the UTS-on-mobile app and a printout can be obtained from the ATVMs at all the stations provided with ATVMs.

Cancellation of Reserved Counter Tickets through IRCTC or through 139

The ease of cancellation Indian Railways introduced the facility of cancellation of the window ticket online or using 139 service. The permissible refundable amount can be collected on surrendering original PRS counter tickets at the Reservation Counters within the prescribed time limit.

Online concessional ticket booking facility to Divyangjan:

The scope of internet ticketing has been expanded to provide online concessional ticket booking facility to Divyangjan.

Automatic Refund in case of Cancellation of Train

In case of cancellation of trains, refund is granted automatically to e-Ticket holders to avoid inconvenience from lodging claim for refund.

Discount after first charting

To improve the utilization of the vacant berths after first charting, vacant berths are offered for current booking with 10% discount on last price plus other charges.

Booking of Foreign Tourists through Internet Upto 365 Days In Advance

With a view to provide confirmed reservation to foreign tourists through internet (e-ticketing) they are allow them to book accommodation in executive Class/1st AC/2nd AC Class in all trains upto 365 days in advance.

Facility of Online Change of Boarding Point Introduced for e-Tickets.

For the convenience of the passengers, the facility of changing boarding point online through IRCTC website has been provided wherein passengers can change their boarding point once by logging in through their user ID at least 24 hours before the scheduled departure of the train.

Option of Give Up Subsidy

Indian Railways offer two "slabs" of subsidy surrender — 50% and 100% of the subsidy amount. The 'Give-It-Up' option is available for tickets booked online or bought from counters.

Flexi Fare System in Rajdhani/Shatabdi/DurontoTrains

Under this scheme, the fare increases by 10% with every 10% of berths sold subject to maximum limit of 1.4 times in classes 2nd AC, 3rd AC, Sleeper, Second Sitting (reserved), AC Chair Car.

Travel Insurance Facility for Passengers

An Optional Travel Insurance Scheme, at a premium of Rs.0.92 (inclusive of taxes) per passenger, has been launched for the Railway passengers who book e-ticket through official website of Indian Railway Catering & Tourism Corporation (IRCTC).

The Sum Insured to be given to passengers are as follows:- (i) In case of Death- Rs.10 lakh, (ii) Permanent Total Disability – Rs. 10 Lakh, (iii) Permanent Partial Disability upto- Rs. 7.5 Lakh, (iv) Hospitalization Expenses for Injury – Rs 2 Lakh, (v) Transportation of mortal remains – Rs. 10 Thousand.

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 Railways Users' Consultative Committees and Station Consultative Committees at important stations provide useful inputs to Railway Administration.

NRUCC has been reconstituted for a two year term from 17.04.2017 to 16.04.2019. DRUCCs have been reconstituted for a two year term from 01.10.2017 to 30.09.2019.

Increasing production of LHB coaches:

The production of LHB coaches in Production Units has continuously increased over the years: Detail are as under :-

Year	LHB coaches
2013-14	543
2014-15	555
2015-16	1,044
2016-17	1,469
2017-18	**2,480**

The Production units of Indian Railways have started producing only LHB coaches from current financial year 2018-19.

(i) Focus on amenities for unreserved passengers

(a) Antyodaya Train Service:

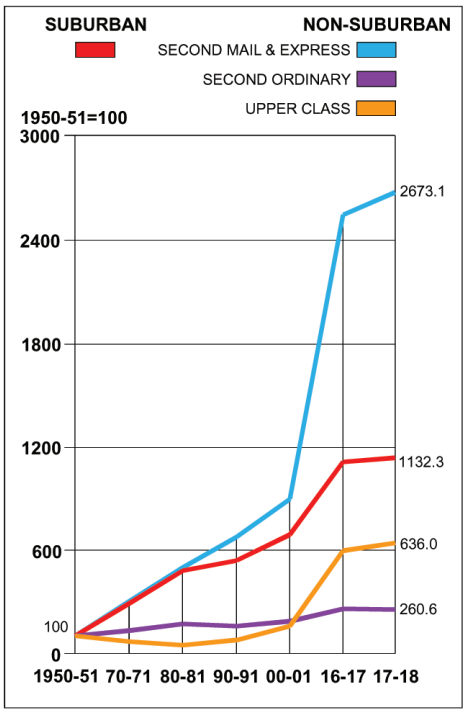
These are long distance fully unreserved train comprising of LHB general second class coaches with vestibules. These have additional facilities like cushioned luggage racks, additional hand hold in doorway area for the comfort of standing passengers, provision of J hooks near longitudinal luggage racks for hanging carry bags, enhanced number of mobile charging points, Fire extinguishers with anti-theft arrangement, more pleasing colour scheme for interior and exteriors, provision of MU cable in each coach for running train service with loco at both ends.

03 Antyodaya rakes turned out in 2016-17 and 10 Antyodaya rakes have been turned out by Production Units in the year 2017-18.

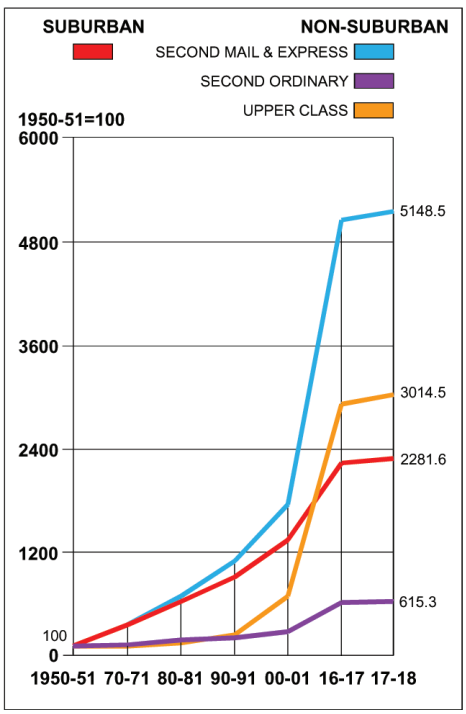
(b) Deen Dayalu coaches :

General second class coaches for unreserved passengers with additional facilities like Cushioned luggage racks, Additional hand hold in doorway

INDEX OF GROWTH OF ORIGINATING PASSENGERS



INDEX OF GROWTH OF PASSENGER KILOMETRES



area, provision of J hooks for hanging carry bags, Bio-toilets, Enhanced mobile charging facility, Water level indicator, Pleasing Interiors, Improved exterior colour scheme and polymerized floor coating in toilets. 316 Deen Dayalu coaches turned out in 2016-17 and 426 Deen Dayalu coaches have been turned out by Production Units in the year 2017-18.

(ii) Focus on improving amenities for reserved passengers

(a) Humsafar Trains:

Humsafar trains having additional amenities in the coaches have been introduced for providing comfortable Air-Conditioned III Tier travel. Following major features have been introduced:- GPS based Passenger information system, Passenger Announcement System, Dust bins in each bay, 4 lane coffee vending machine, improved aesthetics and pleasing colour scheme, Closed-Circuit Television (CCTV) based surveillance system, Integrated Braille displays etc.

19 Humsafar rakes (9 rakes in 2016-17 and 10 rakes in 2017-18) have been turned out by the Production Units.

(b) Tejas trains:

These ultra modern trains have following major distinguished features: Automatic entrance doors, Infotainment system (LCD Screens), Passengers Information display system (Electronic Reservation chart System), GPS based Passenger information system, Fire and Smoke detection system, Superior toilet fittings, Sealed vestibules, LED lights, CCTV, Aesthetically pleasing colour scheme etc.

One Mumbai CST-Karmali Tejas train plying between Mumbai CSTM to Karmali/Goa was started on 24.05.2017.

(iii) Focus on improving safety in new manufacture coaches

Instructions have been issued in 2017-18 for provision of following items in coaches during manufacturing at Production Units to improve the safety features of these coaches:

(1) Fire detection and suppression system in all newly manufactured Power Cars and Pantry Cars.

(2) Fire and Smoke detection system in all newly manufactured AC coaches.

(3) Double Acting AC compartment doors in all newly manufactured AC coaches.

(4) Fire extinguishers in all newly manufactured non-AC coaches.

(5) Automatic plug type doors in all newly manufactured Humsafar and Uday train coaches.

(iv) Improving interiors of Coaches

(a) Improving interiors of Coaches (Model rakes)

New interiors with more pleasing colours, aesthetically designed fittings, paneling, improved toilets, etc. have been provided in coaches during Mid-Life-Rehabilitation. About 140 Model rake coaches have already been turned out till March'2018 and are working as Mahamana trains.

(b) World class coach Interiors:

MCF has floated an EOI for developing coaches with world class interiors for newly manufactured LHB coaches. Better material for World class ambience will be used. RSP Sanction for upgradation of 5,000 LHB coaches has already been taken in Bulk RSP 2018-19.

(c) Project Swarn:

15 Shatabdi and 14 Rajdhani have been nominated for upgradation for the project Swarn. Work has already been completed in all except 5 trains.

(d) Upgradtion of 140 rakes of 66 Mail/ Express trains (Project Utkrishta).

Upgradation of rakes @ Rs. 60 lakh per rake is planned and RSP sanction for the same has been taken under Bulk RSP 2018-19. The work will be started from April 2018 onward and is targeted for completion within FY 2018-19. Under Project Utkrishta highly patronized trains will be targeted for upgradation.

(v) Green Train Corridor:

IR is proliferating bio-toilets on all its coaching stock so that no human waste is discharged from coaches on to the track as a part of "Swachh Bharat Mission". In order to demonstrate the advantage of fitment of Bio-toilets, certain sections have already been commissioned as Green Train Corridors which are free of human waste discharge trains. Additional sections have been nominated for commissioning as Green Corridors.

6 (six) 'Green Train Corridors' had been made functional during year 2016-17. 21 more 'Green Train Corridors', have been made functional in 2017-18.

(vi) Vacuum assisted toilets, which provide greater hygiene, planned:

Bio-vacuum toilets (less water consumption with better hygiene) have

also been provided in the coaches of Tejas rake running between Mumbai & Goa. Sanction is available for provision of vacuum assisted toilets discharge for bio-vachybrid toilets in 500 more coaches and work on the same would be taken up during 2018-19. Another sanction for 8,000 coaches has been taken in 2018-19.

Cleanliness and Hygiene

Cleanliness on Trains :

1. Intensive mechanized cleaning of coaches

Mechanised 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 (CTS) scheme

'Clean Train Station' Scheme is provided for limited mechanized cleaning attention to passing through trains during their halts at selected stations enroute. So far, 39 CTS have been made operational across Indian Railways.

3. On Board House Keeping Service (OBHS)

On Board House Keeping Service has been prescribed in all Rajdhani, Shatabdi, Duronto and other important long distance Mail/Express trains for cleaning of coach toilets, doorways, aisles & passenger compartments during the run of the trains. This scheme had been implemented in 1003 pairs of trains till end of the year 2017-18. 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 passengers and carries out the cleaning work as per demand. This service is available in 982 pairs of trains.

Scope of 'Clean My Coach' has been extended to provide 'Coach

Mitra' service in about 900 pairs of trains till March 2018 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 are setting up mechanized laundries at major coaching depots. 59 such laundries have been commissioned by the year 2017-18. Action is underway for setting up laundries at other identified locations.

Cleanliness at Stations :

- Provision of Integrated Housekeeping Contracts at major stations, award of rag picking / garbage disposal contracts at stations. Mechanized cleaning being done at 520 stations.
- Concrete washable aprons on platform tracks are provided to facilitate clearing of night soil on platform lines by washing with water jets.
- Provision of clean and hygienic toilets including pay and use toilets at stations.
- Third party survey to assess Cleanliness standards of 407 major railway stations is being done periodically.
- 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.
- 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).

Environment

- Indian Railways have installed around 1,37,934 bio-toilets in around 37,762 coaches to prevent open discharge of human waste on Railway Tracks from trains. It is proposed to install bio-toilets in all the coaches by March' 2019.

- Twenty six sections on Indian Railways have been declared as Green Train Corridors. These sections have no human waste discharge from trains, as all trains passing to these Sections are fitted with 100% Bio toilets.
- 8 PUs and 42 major workshops are ISO 14000/IMS 50001 certified
- 54 Water bodies have been revived/restored and 44 no. of non-functional water bodies have been rejuvenated. At present 1559 water bodies are functional on Indian Railways. 43 water recycling plants have been set up in Railway premises in 2016-17 and 16 in 2017-18. 26 WRPs have been sanctioned and a target of commissioning 37 WRPS in 2018-19 has been set up.
- Instructions for placement of separate waste bins for bio-degradable and non-biodegradable waste at appropriate distance at stations/ platforms/foot over bridges and for disposal of the waste in an eco-friendly manner.
- Plastic bottle crushing machines have been installed at a number of stations.

Catering Services:

New Catering Policy 2017 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 has been mandated to set up new kitchens, upgrade existing ones and to manage catering service on all mobile units.

During the year 2017-18, the Catering and the allied services were provided through:

• Pairs of trains with pantry car/mini pantries	380
• Food Plazas/Fast Food Units	254
• Automatic Vending Machine	118
• Jan Aahar Units	49
• Milk Stalls	1028
• Other static catering units	7607

- Book Stalls 1112
- Curio Stalls 244
- Exclusive Chemist Stalls 19
- Bookstall cum Chemist Corners 12
- Multi Purpose Stalls (MPS) 74

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	2913.50	2010-11 & 2012-13	Not fixed**	Railway 100%
6	East-West Metro corridor, Kolkata from Howrah - Salt lake-Maidan	16.60	8574.98	2012-13	2019-20	74:26 (Rly. : MoUD)
Mumbai :						
1	Belapur-Seawood-Uran	27.50	1781.98	1996.97	Not fixed**	1:2 (Rly. : CIDCO)
2	Mumbai Urban Transport Project (MUTP) Ph.-II	63.89	8087.11	2008-09	2020-21	1:1 (Rly. : GoM)
3	Running of 12 car trains on Harbour lines	-	714.10	2012-13	2017-18	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.

Freight Operation

Revenue earning freight traffic handled during 2017-18 was 1159.55 million tonnes. NTKMs earned during the year were 693 billion. Total loading and freight output inclusive of non-revenue traffic were 1162.64 million tonnes and 693 billion NTKMs respectively. Commodity wise loading of revenue earning traffic was as follows.

	Tonnes carried* (Millions)		Absolute Variation over last year	Percentage to total
	2016-17	2017-18		
Coal				
i) for steel plants	54.51	**56.27**	1.76	4.85
ii) for washeries	0.20	**0.29**	0.09	0.02
iii) for thermal power houses	245.27	**243.92**	-1.35	21.04
iv) for other public users	232.85	**254.72**	21.87	21.97
Total	532.83	**555.20**	22.37	47.88
Raw material for steel plants except iron ore	22.75	**23.77**	1.02	2.05
Pig iron and finished steel				
i) from steel plants	38.43	**35.47**	-2.96	3.06
ii) from other points	13.98	**18.89**	4.91	1.63
Total	52.41	**54.36**	1.95	4.69
Iron ore				
i) for export	10.57	**8.19**	-2.38	0.71
ii) for steel plants	83.70	**86.60**	2.90	7.47
iii) for other domestic users	43.28	**45.01**	1.73	3.88
Total	137.55	**139.80**	2.25	12.06
Cement	103.29	**112.96**	9.67	9.74
Foodgrains	44.86	**43.79**	-1.07	3.78
Fertilizers	48.34	**48.53**	0.19	4.18
Mineral Oil (POL)	42.42	**43.11**	0.69	3.72
Container service				
i) Domestic containers	10.34	**11.12**	0.78	0.96
ii) EXIM containers	37.01	**42.82**	5.81	3.69
Total	47.35	**53.94**	6.59	4.65
Balance other goods	74.35	**84.09**	9.74	7.25
Total	1,106.15	**1,159.55**	53.40	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	73.20	100.00	37,565	100.00	513	100.00
1960-61	119.80	163.70	72,333	192.60	603	117.60
1970-71	167.90	229.40	110,696	294.70	659	128.50
1980-81	195.90	267.60	147,652	393.10	754	147.00
1990-91	318.40	435.00	235,785	627.70	741	144.40
2000-01	473.50	646.90	312,371	831.50	660	128.70
2014-15	1095.26	1496.30	681,696	1814.70	622	121.20
2015-16	1101.51	1504.80	654,481	1742.26	594	115.79
2016-17	1106.15	1511.13	620,175	1650.94	561	109.36
2017-18	**1159.55**	**1584.08**	**6,92,916**	**1844.58**	**598**	**116.57**

II. Movement of bulk commodities in the last four years

S. No.	Commodity group	2014-15		2015-16		2016-17		2017-18	
		Million Tonnes	Percent-age	Million Tonnes	Percent-age	Million Tonnes	Percent-age	Million Tonnes	Percent-age
1	Coal	545.81	49.83	551.83	50.10	532.83	48.17	555.20	47.88
2	Foodgrains	55.47	5.06	45.73	4.15	44.86	4.06	43.79	3.78
3	Iron & Steel	42.84	3.91	44.79	4.07	52.41	4.74	54.36	4.69
4	Iron ore	112.77	10.30	116.94	10.62	137.55	12.43	139.80	12.06
5	Cement	109.80	10.03	105.35	9.56	103.29	9.34	112.96	9.74
6	POL (Mineral oils)	41.10	3.75	43.24	3.93	42.42	3.83	43.11	3.72
7	Fertilizers (Chemical manures)	47.41	4.33	52.23	4.74	48.34	4.37	48.53	4.18
8	Limestone and Dolomite	21.20	1.94	23.53	2.14	25.53	2.31	27.70	2.39
9	Stones (including gypsum) other than marble	14.98	1.37	15.04	1.37	14.78	1.34	19.57	1.68
10	Salt	4.99	0.46	5.02	0.46	4.97	0.45	4.95	0.43
11	Sugar	2.69	0.25	3.39	0.31	2.35	0.21	2.47	0.21
	Total	**999.06**	**91.23**	**1007.09**	**91.43**	**1009.33**	**91.25**	**1052.44**	**90.76**
12	Commodities other than above	96.20	8.77	94.42	8.57	96.82	8.75	107.11	9.24
	Grand Total	**1095.26**	**100.00**	**1101.51**	**100.00**	**1106.15**	**100.00**	**1159.55**	**100.00**

III. Freight Train Kilometers and Wagon Kilometres

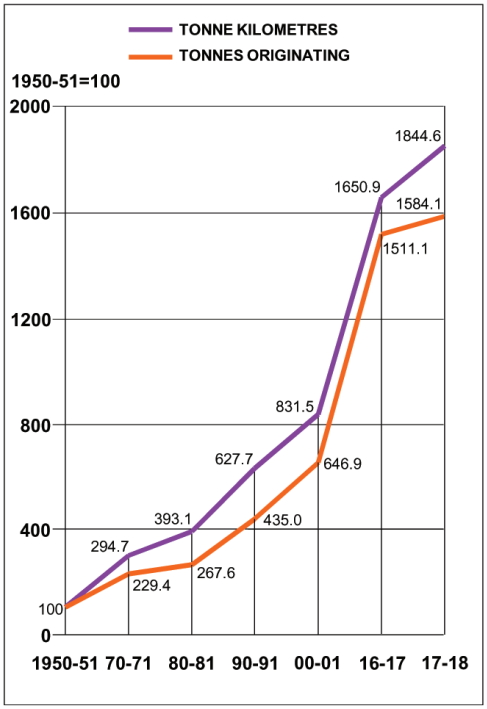
Year	Freight train kms.		Wagon kilometres@ (in terms of 4- wheelers)	
	Total(Million)	Per running track km per day	Total (Million)	Percentage of loaded to total
1950-51	112	5.2	4,370	70.7
1960-61	161	6.9	7,507	70.5
1970-71	202	7.7	10,999	69.7
1980-81	199	7.2	12,165	69.5
1990-91	245	8.5	19,230	65.5
2000-01	261	8.7	27,654	60.9
2010-11	368	11.6	17,749	66.5
2015-16	393	11.7	18,708	64.0
2016-17	391	11.4	18,403	63.3
2017-18	**396**	**11.5**	**18,461**	**64.4**

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

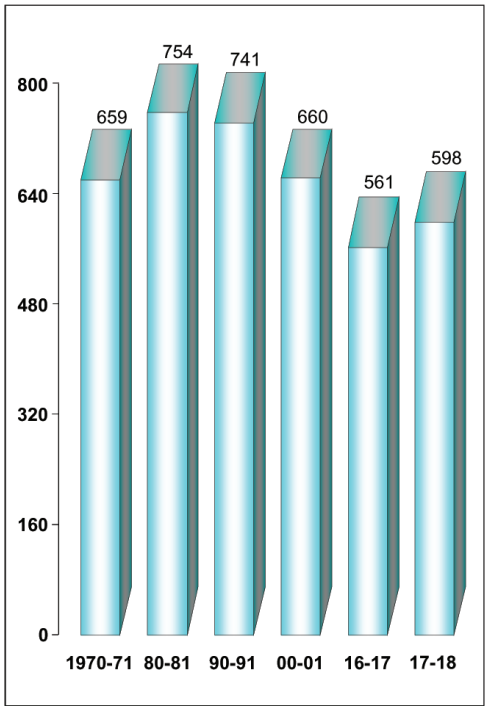
IV. Tonnes Originating, Net Tonne Kms. and Earnings from bulk commodities in 2017-18

S. No.	Commodity group	Tonnes originating		Net tonne kilometres		Earnings	
		In million	%age to total	In million	%age to total	₹ In crore	%age to total
1	Coal	555.20	47.88	2,76,692	39.93	52,042.21	45.84
2	Foodgrains	43.79	3.78	61,750	8.91	8,402.81	7.40
3	Iron & steel	54.36	4.69	49,048	7.08	8,182.11	7.21
4	Iron ore	139.80	12.06	43,807	6.33	8,801.71	7.76
5	Cement	112.96	9.74	63,954	9.23	9,613.34	8.47
6	POL (Mineral oils)	43.11	3.72	29,519	4.26	5,668.16	4.99
7	Fertilizers (Chemical manures)	48.53	4.18	42,035	6.07	5,744.11	5.06
8	Limestone & dolomite	27.70	2.39	16,292	2.35	2,523.19	2.22
9	Stones (incl. gypsum) other than marble	19.57	1.68	9,363	1.35	1,405.22	1.24
10	Salt	4.95	0.43	8,394	1.21	769.71	0.68
11	Sugar	2.47	0.21	4,028	0.58	458.26	0.40
	Total	**1,052.44**	**90.76**	**6,04,882**	**87.30**	**1,03,610.83**	**91.27**
12	Commodities other than above	107.11	9.24	88,034	12.70	9,912.70	8.73
	Grand Total	**1,159.55**	**100.00**	**6,92,916**	**100.00**	**1,13,523.53**	**100.00**

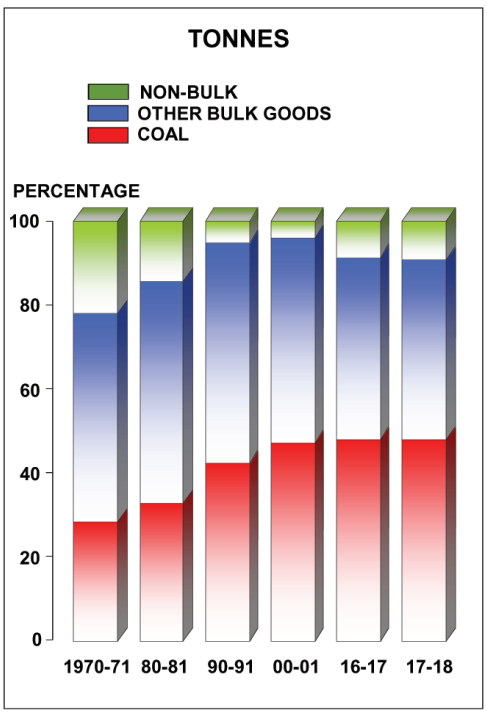
INDEX OF GROWTH OF FREIGHT
(REVENUE TRAFFIC)

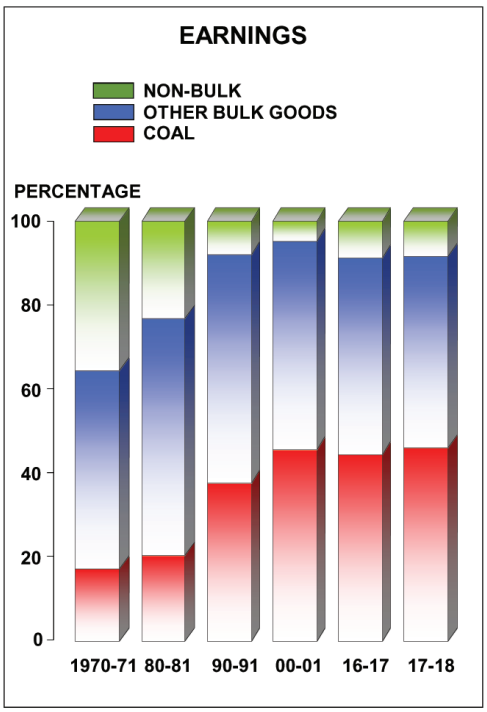


AVERAGE LEAD OF FREIGHT (KMS.)
(REVENUE TRAFFIC)



SHARE OF BULK COMMODITIES IN FREIGHT TRAFFIC





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

			2014-15	2015-16	2016-17	**2017-18**
Net tonne kilometres		BG	8,113	7,510	7,359	**7,405**
per wagon per day@		MG	1,029	365	-	**-**
Wagon kilometers		BG	220	214.50	204.20	**206.5**
per wagon per day@		MG	27	16	-	**-**
Net tonne kilometres	Diesel	BG	16,094	14,926	14,184*	**14,401**
per engine hour		MG	5,467	2,234	-	**-**
	Electric	BG	20,404	19,297	17,761*	**19,770**
Net tonne kilometres	Diesel	BG	2,60,364	2,42,570	2,36,241	**2,45,908**
per engine day on line		MG	36,207	3,083	-	**-**
	Electric	BG	3,34,934	3,34,273	3,28,105	**3,58,454**

*Revised @ From 2010-11 onward figures in terms of 8-wheelers

VI. Share of Tonnage, Earnings and Net tonne kms. of 30 selected commodities in 2017-18

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	555200	47.88	52042.21	45.84	276692.41	39.93
2	Iron ore	139799	12.06	8801.71	7.75	43806.77	6.32
3	Cement	112961	9.74	9613.34	8.47	63953.79	9.23
4	Iron & Steel	54359	4.69	8182.11	7.21	49047.84	7.08
5	Chemical Manures	48534	4.19	5744.11	5.06	42035.45	6.07
6	Food grains	43789	3.78	8402.8	7.40	61750.36	8.91
7	Mineral Oils	43108	3.72	5668.16	4.99	29518.74	4.26
8	Total exim Container	42821	3.69	3741.23	3.30	38064.35	5.49
9	Limestone & Dolomite	27704	2.39	2523.19	2.22	16292.00	2.35
10	RMC carried in General Service Wagons	17027	1.47	769.66	0.68	3723.63	0.54
11	Stone other than Marble and gypsum	14878	1.28	876.17	0.77	5567.15	0.80
12	Total Domestic container	11123	0.96	1451.08	1.28	15639.07	2.26
13	Ores other than manganese and iron	7881	0.68	471.81	0.42	2524.70	0.36
14	Non ferrous Metal	6809	0.59	747.95	0.66	4101.64	0.59

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
15	Salt	4946	0.43	769.71	0.68	8393.66	1.21
16	Gypsum	4693	0.4	529.05	0.47	3795.50	0.55
17	Jute manufactured	3412	0.29	403.91	0.36	2826.98	0.41
18	Sugar	2468	0.21	458.26	0.40	4028.19	0.58
19	De-Oiled Cakes in Pallet and Power form	2174	0.19	378.56	0.33	3128.80	0.45
20	Fruits & Vegetable fresh	1932	0.17	204.61	0.18	2857.35	0.41
21	Cement manufactured	1752	0.15	147.53	0.13	1023.98	0.15
22	Lime	1538	0.13	280.61	0.25	2048.75	0.30
23	Sand	1525	0.13	139.00	0.12	1055.21	0.15
24	Edible oils	1489	0.13	189.83	0.17	1691.91	0.24
25	Manganese ores	1053	0.09	102.46	0.09	646.62	0.09
26	Fodder Oil Cake	303	0.03	75.14	0.07	710.44	0.10
27	Caustic soda	997	0.09	65.07	0.06	458.53	0.07
28	Opium & other narcotic drugs	415	0.04	61.87	0.05	520.97	0.08
29	Wood Unwrought (other than Firewood)	382	0.03	27.84	0.02	341.19	0.05
30	Soda ash	367	0.03	83.03	0.07	661.63	0.10

Freight Structure:

There was no increase in Freight rates during 2017-18. However, to make the rail transportation attractive to its customers, various initiatives were taken in 2017-18 which include Coal tariff rationalization, classification of new commodities, expansion of freight basket through containerization, introduction of a new delivery model Double Stack Dwarf Container (DSDC), Long Term Tariff Contract (LTTC) with key freight customers using predetermined price escalation principle, rationalization and simplification of rate policies such as weighment policy, etc. All policies launched in 2017-18 have further been extended upto March, 2019.

Freight Marketing:

I. Procurement of rakes for freight traffic 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, 45 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, 7 rakes have been inducted under the scheme.

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)' was launched, which permits procurement and operation of special purpose rakes by private parties. So far, 17 rakes have been inducted under the scheme.

Wagon Leasing Scheme (WLS):

The Wagon Leasing Scheme (WLS) aims for induction of rakes on lease basis through PPP route. As per policy, 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 service providers. So far, 40 rakes have been inducted under the scheme.

General Purpose Wagon Investment Scheme (GPWIS):

With s view to allow investment for procurement of General Purpose Wagons by End users, Public Sector Undertaking (PSUs), Port Owner, Logistics Providers and Minis Owners, a new scheme namely General Purpose Wagon Investment Scheme (GPWIS) has been launched by Ministry of Railways. The scheme permits eligible investors to invest in minimum of one rake of general purpose wagon in any of the desired circuit(s) to carry any commodity. In lieu of making investment by the investor, a freight rebate of 10% will be granted for a period of 15 years which will be capped to Indian Railway Finance Corp. (IRFC) rate of return at the previous financial year with reference to the date of approval. The ownership will rest with the investor. These rakes will have a unique color code. The agreement will be done for the codal life of rake. In case there is no traffic in return direction, Indian Railways can load the rake on mutual agreement only.

Since inception the scheme, approval for procurement of 38 rakes has

been communicated to various firms.

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

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. So far, 59 Private Freight Terminals have been commissioned & functioning.

Claims:

IR paid ₹29.30 crores as claim compensation for goods/parcel/luggage during the Financial Year 2017-18 as compared to ₹43.45 crores paid in the corresponding period of the last year. The trend of claims settlement in the preceding five periods is given below:-

Year	Number of Claims received	Number of Claims paid	Gross amount of compensation paid (₹ in crores)
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
2017-18	**7,251**	**1,062**	**29.30**

Iron Ore Loading in ChakradharpurDivision, SER

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	-
2015-16	-	367	380	-	65	-
2016-17	-	377	390	-	-	-
2017-18	**-**	**368**	**393**	**-**	**-**	**-**

(ii) 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	-
2015-16	-	607	662	29	364	-
2016-17	-	598	709	29	290	-
2017-18	**-**	**594**	**718**	**30**	**232**	**-**

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.

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
2015-16	4,314	1,292
2016-17	*4,083	461
2017-18	**4,064**	**383**

*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
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
2017-18	**10.92**	**-**	**18.46**	**1.50**	**31.63**	**0.32**

(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
2015-16	7.66	0.01	13.19	3.16	22.86	1.14
2016-17	7.14	-	*12.97	2.24	*22.00	0.65
2017-18	**7.74**	**-**	**13.09**	**1.39**	**22.43**	**0.30**

*revised

D. Coach Utilisation:

In 2017-18 the vehicle Kms. per vehicle day was 555 on BG and 125 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
2015-16	569	154
2016-17	564	134
2017-18	**555**	**125**

E. Average freight train load:

The average net load per train in 2017-18 was 1763 tonnes on BG. The average gross load per train was 3,025 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
2015-16	1,728	601	3,072	1,037
2016-17	1,600	-	2,859	-
2017-18	**1,763**	**-**	**3,025**	**-**

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

2015-16	23.0	23.7	23.4	19.9
2016-17	23.3	24.0	23.7	-
2017-18	**22.7**	**23.6**	**23.3**	**-**

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

During 2017-18, NTKMs per engine hour stood at 17,474 for BG. NTKMs per goods train hour for BG was 40,439.

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
2015-16	17,506	2,177	38,681	9,880
2016-17	16,337	-	37,342	-
2017-18	**17,474**	**-**	**40,439**	**-**

H. Wagon Utilisation:

On an average, a wagon moved 206.5 kms. per day on BG in 2017-18. NTKMs per wagon per day on BG was 7405. NTKMs per annum per tonne of wagon capacity on BG was 43,778. These indices of wagon utilization are given below:

Year	Net tonne kms. per tonne of wagon capacity per annum		Wagon kms. per wagon per day		(in terms of 4-wheelers) 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
2015-16	45,193	6,120	212.3	13	7,510	551
2016-17	44,127	-	204.2	-	7,359	-
2017-18	**43,778**	**-**	**206.5**	**-**	**7,405**	**-**

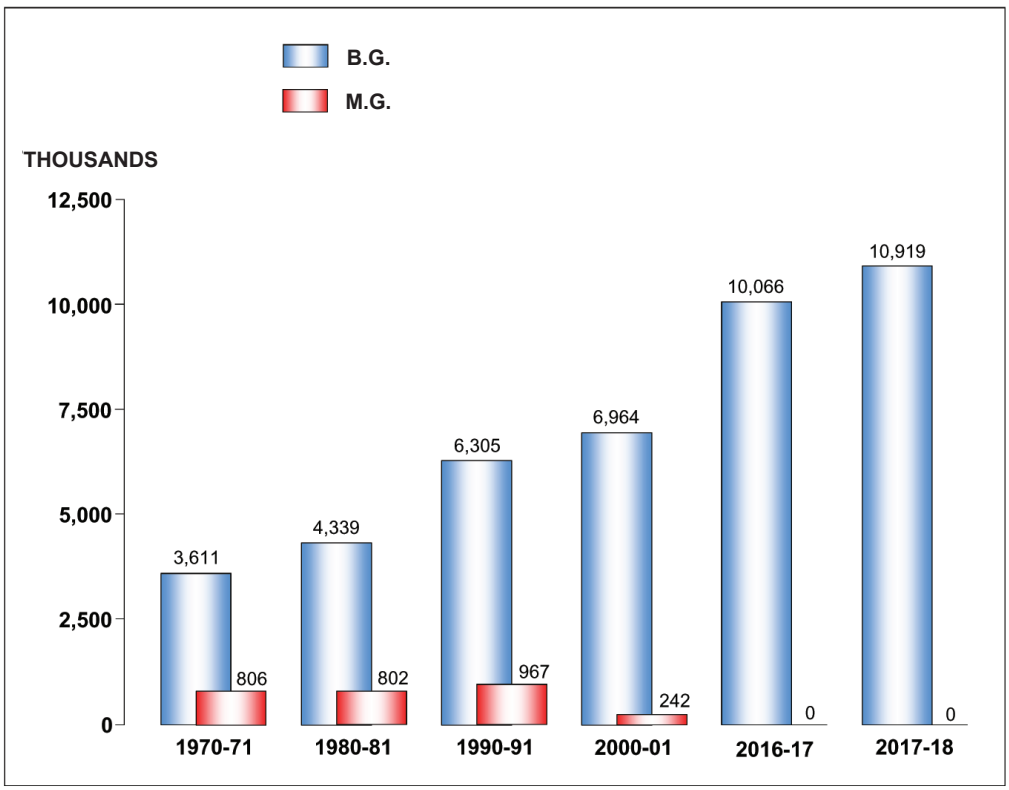
(+) in terms of 8 wheelers from 2010-11 onwards.

I. Wagon turn-round (in days):

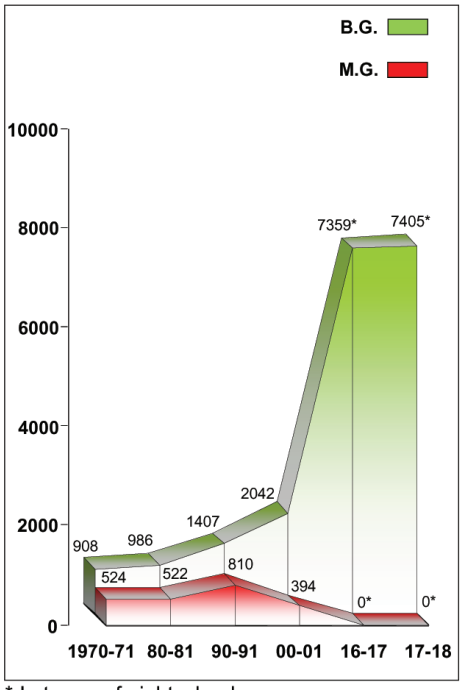
The turn-round time of wagons, representing operational cycle time is given in the following table:

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
2015-16	5.18	NA
2016-17	5.32	NA
2017-18	**5.21**	**NA**

NTKMS PER ANNUM PER ROUTE KM.

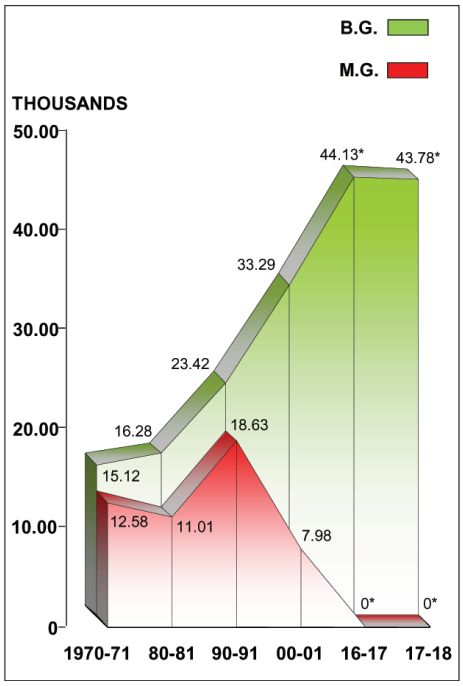


NET TONNE KILOMETRES PER WAGON PER DAY



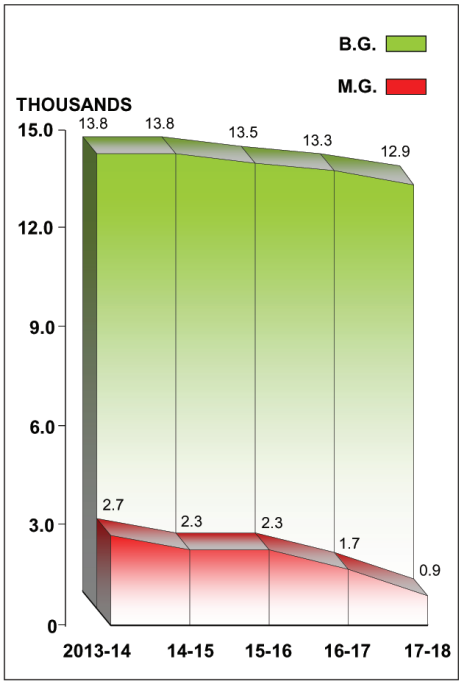
* In terms of eight wheelers

NET TONNE KILOMETRES PER ANNUM PER TONNE OF WAGON CAPACITY

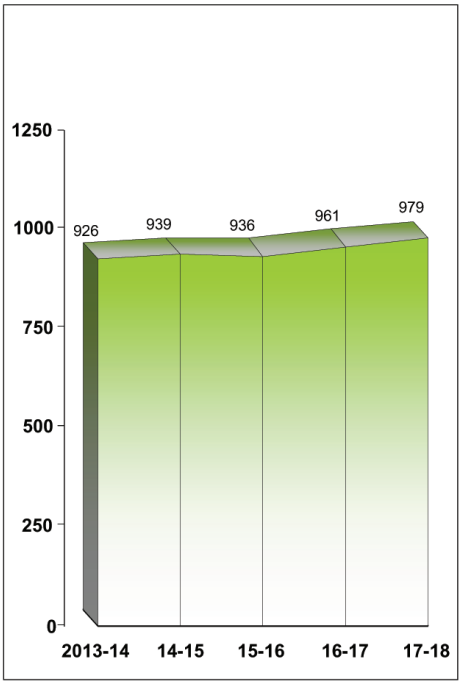


* In terms of eight wheelers

TRAIN KILOMETRES PER RUNNING TRACK KM



TRAIN KILOMETRES PER EMPLOYEE



Safety

There were 72 consequential train accidents in the year 2017-18 as compared to 103 accidents during 2016-17. Train accidents per million train Kms, an important index of safety, on IR dropped from 0.09 in the year 2016-17 to 0.06 in 2017-18.

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..
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
2017-18*	**3**	**53**	**13**	**3**	**0**	**72**	**0.06**

*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		
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
2017-18#	**29**	**182**	**0.03**	**188.51 (Approx)**

#Excludes KRCL.

@The compensation paid during a year relates to cases settled and not necessarily to the number of accidents/casualties during that year.

Causes of Train Accidents:

Out of 72 consequential train accidents which occurred on IR during 2017-18, 60 (83.33%) were due to human failure. These include 43

accidents (59.72%) due to the failure of railway staff and 17 (23.61%) due to persons other than Railway staff. Equipment failure was the cause of 3 (4.17%) of the accidents. 5 (6.94%) accidents on Incidental factors, 2 (2.78%) accidents were due to Sabotage and 2 (2.78%) accidents were on account of combination of factors.

Damage to Railway Property:

The cost of damage to railway property and duration of interruption to through communication caused by consequential train accidents during 2016-17 and 2017-18 are as under:

Year#	Cost of Damage (in Lakh)		Interruption to through communication (Hours)
	Rolling Stock	Permanent Way	
2016-17#	*5458.48	7230.18	*988.09
2017-18#	**2243.20**	**702.16**	**698.53**

#Excludes KRCL.

*Revised

Rashtriya Rail Sanraksha Kosh (RRSK)

As announced by Hon'ble Minister of Finance in his Budget Speech for 2017-18, a Fund namely 'Rashtriya Rail Sanraksha Kosh (RRSK)' has been created with a corpus of ₹1 lakh crore over a period of five years for critical safety related works. Accordingly, a provision of ₹20,000 crore has been made in Budget Estimate (BE) 2017-18 out of RRSK to fund essential works for ensuring safety.

The Fund under RRSK shall be deployed to finance works under plan heads Rolling Stock, Level Crossings, Road Over/Under Bridges, Track Renewal, Bridge Works, Signal and Telecommunication Works, other Electrical Works, TRD Works, Machinery and Plant, Workshops and Training/HRD.

An independent 'RRSK Monitoring Committee' has been created headed by CEO, NITI Ayog to regularly examine the RRSK performance. The RRSK progress/performance shall also be reviewed annually by the 'Cabinet Committee on Economic Affairs (CCEA)' headed by the Hon'ble Prime Minister.

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 2017-18, 89 Internal Safety Audits and 32 Inter-Railway Safety Inspections were carried out.
- **Training facilities:** Refresher training imparted to Non-Gazetted staff during 2017-18 is 1,29,274 (Provisional).

Measures to avoid collision

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 5,770 stations covering about 92 % 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 7 major stations namely, Jalgaon, Khanalampura, New Coochbehar, Mettur Thermal Plant Yard, Kharagpur, Cuttack and Dadri with Panel Interlocking at 208 Stations have been provided during the year 2017-18.

To avoid collisions, technological aids are briefly enumerated below:

- **Complete Track Circuiting:** Complete Track Circuiting has been done upto 100%, 99.8%, 100% and 98.6% 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 31.03.2018 Block Proving Axle Counter (BPAC) have been provided on 5,058 block sections.
- **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 31.03.2018, Intermediate Block Signalling have been provided 532 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 31.03.2018, Automatic Block Signalling has been provided on 2,901 Route Kms.

Automatic Train Protection (ATP)

- **Automatic Train Protection (ATP):** System based on proven European Train control System (ETCS-L1) Technology has been implemented on 342 RKMs (200 RKMs Delhi Agra section, 117 RKMs Chennai /suburban section and 25 RKMs of Metro Railway Kolkata).
- **ATP called Auxiliary Warning System (AWS):** ATP called Auxiliary Warning System (AWS) is presently functional on 364 RKMs in the Mumbai suburban section of Central Railway (240 RKMs) and Western Railway (124 RKMs).
- The work of modernization of signalling system on Indian Railway, which includes works of ETCS L-2, has been included in the Works Programme 2018-19 for complete 60,000 Route kilometres on Broad Gauge network of Indian Railways subject to expenditure on this project will be made only after following due processes, mandatory approvals and sanctions.
- **Train Collision Avoidance System (TCAS):** TCAS is a pilot project for indigenous technology development of train protection system called Train Collision Avoidance System (TCAS) has been launched on IR. This indigenous technology is aimed at providing capability to prevent train accidents caused due to Signal Passing at Danger (SPAD) or non-observance of speed restrictions by train drivers.
- RDSO has taken up extended field trials of TCAS on pilot section Lingampalli- Vikarabad-Wadi-Bidar pilot section (250 RKMs) on South Central Railways. Product of M/s Medha has been approved and safely certified for developmental orders for Absolute block section with speed upto 110 Kmph.
- **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 410 km long double line electrified route dealing with 200 trains per day. Its Central Control Centre is established at Tundla station.

Salient sectional features are:

1.	No. of stations	47 Stations
2.	No. of block section	47 Sections
3.	Total length of section	413 KMs
4.	Way side stations	38 Station
5.	Major big yards	6 Yards
6.	Medium yards	3 Yards

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 (Hirangaon, Firozabad, Makhanpur, Shikohabad, Kaurara, Bhadan, Balarai) 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 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 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 11,006 Level Crossing Gates as on 31.03.2018, to enhance the safety at Level Crossings.

- **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 especially in suburban areas. With provision of Sliding Boom Interlocking, Signalling System continues to function normally with minimum effect on train operation. 3,527 Nos. of busy interlocked gates have been provided with Sliding booms as on 31.03.2018 in addition to lifting barrier and further busy gates are also being progressively covered.

Measures to Reduce Derailments

- To improve safety aspect, Indian Railways (IR) has been using Pre-stressed Concrete sleepers which 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 PSC sleepers are being used for all renewals, new lines, doubling, gauge conversion, etc.
- A new design of wider sleeper has been developed and adopted. The new design is functionally considered to be better than present design. The wider and heavier sleeper offers higher frame resistance, less stress on ballast and rail pad, improving reliability and maintainability of track.
- Upgradation of Track Structure consisting of pre-stressed Concrete (PSC) sleepers, 52 Kg/60 Kg high strength (90 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. Progressively use of flash Butt Welds is being increased and AT welding is being kept to bare minimum. 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 :**
  - Flash Butt Welding of rails on IR is carried out by using Stationary

plants and Mobile machines.

- FBW is done using electrical current and enough heat is generated by using the resistance of rails. No external material is used and Welding takes place by fusion of parent rail metal.
- Approval of Quality Assurance Plan and Welding Parameters are Standardized by RDSO for both Stationary and mobile plants before execution of Work.
- FB Welding is carried out as per Indian Railways Manual for flash Butt Welding of Rails, 2012 (FBWM).

Measures taken to prevent Fire in Trains

- **Focus on improving safety in new manufacture coaches:** Instructions have been issued in 2017-18 for provision of following items in coaches during manufacturing at Production Units to improve the safety features of these coaches:
  - Fire detection and suppression system in all newly manufactured Power Cars and Pantry Cars.
  - Fire and Smoke detection system in all newly manufactured AC coaches.
  - Double Acting AC compartment doors in all newly manufactured AC coaches.
  - Fire extinguishers in all newly manufactured non-AC coaches.
  - Automatic plug type doors in all newly manufactured Humsafar and Uday train coaches.

Measures to Curb Accidents at Unmanned Level Crossings:

Indian Railway has decided to progressively eliminate the level crossings for the safety of Road users and train passengers. During the year 2017-18, 1,565 Nos. of unmanned level crossings and 470 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 2,163 of sanctioned works of ROBs/RUBs appearing in Pink Book 2018-19 which contains 1,716 ROBs and 6,092 RUBs/Subways. These are at various stages of planning, estimation and execution.

During the year 2017-18, 195 ROBs and 1,200 RUBs/Subways have been constructed under cost sharing, railway cost/accommodation works, Deposit/BOT term and by NHAI over Indian Railway.

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 01.04.2018, Indian Railway have 1,47,523 Bridges out of which 700 are important, 12,085 are major and 1,34,738 are minor Bridges. In the Year 2017-18, 889 Bridges were Strengthened/Rehabilitated/Rebuild 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.

Other 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 meeting with Zonal Railways:** Chairman and Board Members have conducted Safety Review Meetings with General Managers and PHODs of Zonal Railways during their visits as well as through video conference.
- **Intensive Footplate Night Inspections:** Intensive Footplate Inspections including night inspections have been conducted at the level of SAG Branch officers and supervisors in the field.
- **Regular Safety Drives & Awareness Campaigns:** Safety drives and awareness campaigns 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 68,442 route kilometres of route lengths. The size of the network - gauge-wise and zone-wise as on 31 March, 2018 is as follows:

Gauge	Route Kms.	Running Track Kms.	Total Track Kms.
Broad Gauge (1676 mm)	63,491	89,521	1,17,560
Metre Gauge (1000 mm)	3,200	3,462	3,775
Narrow Gauge (762 mm and 610 mm)	1,751	1,752	1,901
Total	**68,442**	**94,735**	**1,23,236**

Zones /Headquarters	Route Kms.	Running Track Kms.	Total track Kms.
Central, Mumbai	4,115	6,337	8,598
Eastern, Kolkata	2,723	4,917	7,454
East Central, Hajipur	4,107	5,859	9,723
East Coast, Bhubaneshwar	2,757	4,360	5,802
Northern, New Delhi	7,301	9,788	13,302
North Central, Allahabad	3,523	5,128	6,285
North Eastern, Gorakhpur	4,947	4,674	4,953
Northeast Frontier, Maligaon, (Guwahati)	4,136	4,600	6,227
North Western, Jaipur	5,586	7,273	7,680
Southern, Chennai	5,081	7,311	8,972
South Central, Secunderabad	6,229	8,453	10,384
South Eastern, Kolkata	2,740	5,173	6,816
South East Central, Bilaspur	2,177	3,483	4,859
South Western, Hubli	3,524	4,192	5,332
Western, Mumbai	6,465	8,225	10,373
West Central, Jabalpur	3,004	4,907	6,381
Metro Railway, Kolkata	27	55	95
Total	**68,442**	**94,735**	**1,23,236**

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 2017-18.

State/Union Territory	Route Kms.	Running Track Kms.	Total Track Kms.
Andhra Pradesh	3,817	5,708	7,311
Arunachal Pradesh	12	12	26
Assam	2,465	2,577	3,503
Bihar	3,653	5,532	7,611
Chhatisgarh	1,211	2,119	2,897
Delhi	183	339	788
Goa	69	69	98
Gujarat	5,285	6,359	7,728
Haryana	1,710	2,499	3,175
Himachal Pradesh	296	300	358
Jammu & Kashmir	298	366	494
Jharkhand	2,585	4,107	6,432
Karnataka	3,499	4,361	5,543
Kerala	1,045	1,709	2,071
Madhya Pradesh	4,829	7,390	9,261
Maharashtra	5,733	8,348	11,220
Manipur	13	13	18
Meghalaya	9	9	13
Mizoram	2	2	6
Nagaland	11	11	22
Odisha	2,608	4,123	5,325
Punjab	2,269	2,765	3,631
Rajasthan	5,929	7,734	8,793
Tamil Nadu	4,030	5,472	6,739
Telangana	1,823	2,553	3,154
Tripura	216	216	273
Uttarakhand	341	402	189
Uttar Pradesh	10,324	12,169	15,904
West Bengal	4,139	7,431	10,558
Union Territory			
Chandigarh	16	18	69
Pondicherry	22	22	26
Total	**68,442**	**94,735**	**1,23,236**

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
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
2017-18	**29,376**	**68,442**	**52,926**	**94,735**	**69,297**	**1,23,236**

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

With its more than 165 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 22.70 million passengers and 3.19 million tonnes of freight each day during 2017-18.

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 31.3.2018, the Indian Railways had		(in Kms.)
(i) Route length	-	68,442
(ii) Running Track length	-	94,735
(iii) Total Trackage	-	1,23,236
The following works were carried out during 2017-18		
(i) Track renewal	-	4,023
(ii) Construction of New Line	-	409
(iii) Gauge conversion from MG/NG to BG	-	454
(iv) Track conversion from single to double line	-	999

New Lines:

During 2017-18, passenger train services were introduced on 409.42 Kms. of new lines on the following projects/sections:-

Railway	Section	Km.
East Central	Barkakana-Sidhwar	7
	Tatisilway-Mesra-Shanki	31
	Tilaiya-Laundh-Kheraundh	25
East Coast	Bolagarh-Nayagarh	12.08
	Tori-Biratoli-Balumath	20
North Eastern	Bathua Bazar-Panch Deori	11
Northeast Frontier	Udaipur-Garjee	10
	Karimganj Byepass	3.5
	Gauripur-Alamganj	10
	Garjee-Santirbazar	13
North Western	Dausa-Deedwana	35.44
South Central	Mattampally-Revur Ramapuram-Janpahad	19
	Kadapa-Pendlimarri	21
	Gulbarga-Kamalapur	42
	Humnabad-Kamalapur	30.4
South Eastern	Jharsuguda-Barpali	41
	Barpali-Sardega	9
South East Central	Gudum-Bhanupratapur	17
South Western	Bagalkot-Khajjdoni	30
Western	Chota Udepur-Motisadli	22
	Total	**409.42**

Gauge Conversion:

During 2017-18, 453.52 Kms of track was converted from MG/NG to BG and passenger train services were introduced as detailed below:-

Railway	Section	Km.
Eastern	Balgona-Shri Khanda	20.6
	Shri Khanda-Katwa	6.6
	Ahmadpur-Katwa	51.92
North Eastern	Majhola Pakariya-Tanakpur	36
North Western	Fatehpur-Churu	43.4
	Sikar-Palsana	27
Southern	Pollachi-Podanur	40
	Karaikkudi –Pattukkottai	73
	Sengottai-Punalur	21
South East Central	Chhindwara-Bhandarkund	35
	Ghonsore-Nainpur	35
	Balaghat-Samnapur	16
	Nainpur-Chiraidongri	18
Western	New Bhuj-Deshalpur	30
	Total	**453.52**

Doubling:

During 2017-18, 998.88 Kms of double/multiple lines track were completed and passenger train services were introduced as detailed below:-

Railway	Section	Km
Central	Tilati-Akalkot Road	13.88
Eastern	Gadadharpur-Tarapith 3rd Line	14.1
	Azimganj cabin-Azimganj Jn.	1.98
	Dankuni-Bhattanagar	6.5
	Pirpainti-Shivanarayanpur-Kahalgaon	20.3
East Coast	Sitabinj-Chilik Dara	32.09
	Tokapal-Badearapur	5.6
	Hirakud-Godbhaga	9.52
	Dilmili-Silak Jhori	11.4
	Naranpur-Keonjhar-Porjanpur	25.83
	Titlagarh-Kantabanji	31.67
	Badearapur Dilmili	11.2
	Chudang Garh-Bhubaneswar New 3rd Line	6.04
	Bhubaneswar New-Mancheswar 3rd Line	6.63
	Boinda-Jarapada	15.15

	Godbhaga-Suktapalli	15.22
	Belsonda-Arand	18
	Gidam-Dantewara	7.32
	Bamur-Saragipali	9.47
Northern	Lambhua-Koiripur	17
	Koiripur-Sri Krishana Nagar	19
	Meerut-Daurala	16
	Chhandrauli- Trivediganj-Haidergarh	16
	Haidergarh-Chaubisi-Akbarganj	17
	Mirthal-Bhangala Beas River	2.5
	Daurala-Khatauli	17
	Akbarganj-Adhinpur	25
	Dhapper-Chandigarh	22
North Eastern	Sarnath-Varanasi City	6.5
Northeast Frontier	Raninagar Jalpaiguri-Jalpaiguri Road	7.15
	New Coochbehar-New Baneswar- New Alipurduar	18.41
	New Coochbehar-Pundibari-Sajerpar-Ghoksadanga	21.6
North Western	Sojat-Chandawal	14.5
	Swarupganj-Bhimana	8.6
	Chandawal-Guriya	9.5
	Kishangarh By Pass	11.8
	Kosli-Jharli	14.5
	Mori Bera-Khimel	40.16
North Central	Dadri Yard	5
	Palwal-Rundhi	9.31
Southern	Valadi-GOC (Tiruchhirappalli Jn.)	20.55
	Kalpattichatram-Manaparai	22.47
	Ponmalai Golden Rock-Solagampatti	18
	Panambur-Jokatte	6.3
	Chennai Central -Basin Bridge 5th & 6th Line	4.44
	Solagampatti-Thanjavur	29
	Tamaraipadi-Kalpattichatram	25
South Central	Parbhani-Mirkhal	17
South Eastern	Dangoaposi-Maluka 3rd Line	10
	Gamharia-Adityapur	6.5
South East Central	Durg-Rasmara 3rd Line	8
	Kharsia-Robertson 3rd Line	9
	Kalumna-Nagpur	5
	Tenganmada-Khongsara	8.3
	Rasmara-Murhipar-Rajnandgaon 3rd Line	23

South Western	Minchnal-Lachyan	42.5
	Hebsur-Navalgund-Annigeri	16.57
	ShivathanTinaighat	16.45
	Bhanapur-Koppal	12.23
West Central	Vidisha-Sanchi 3rd Line	9.14
Western	Dhrangadhra-Chuli	15
	Amalner-Nardana	34
	Dondaicha-Sindkheda-Nardana	28
	Paldhi-Jalgaon	11
	Udhna-Chalthan	11
	Andheri-Goregaon 5th & 6th Line	10
	Total	**998.88**

Gauge-wise Details:

Broad gauge, though forming 92.77% of the route, generated 100% of the freight output (NTKms) and 99.53% of the passenger output (Pkms).

Route length as on 31.03.2018 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)	9,625.64	30,969.50	40,595.14	19,750.05	3,212.84	22,962.89	63,558.03
Metre (1000 mm)	-	3,199.72	3,199.72	-	-	-	3,199.72
Narrow (762mm/610 mm)	-	1,684.60	1,684.60	-	-	-	1,684.60
Total	**9,625.64**	**35,853.52**	**45,479.46**	**19,750.05**	**3,212.84**	**22,962.89**	**68,442.35**

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 2017-18, traffic density (million GTKms. per running track km.) increased from 4.29 to 22.43 on BG.

Track Renewal and Maintenance:

During 2017-18, 4,023 kms in Complete Track Renewal (CTR) units of track renewal was carried out. The year wise details of Track Renewal done and expenditures incurred thereon are as under:

Year	*Gross expenditure (₹ in cr.)	Track Renewal done (kms)
2015-16	5,586.03	2,794
2016-17	6,397.97	2,487
2017-18	**8,884.16**	**4,023**

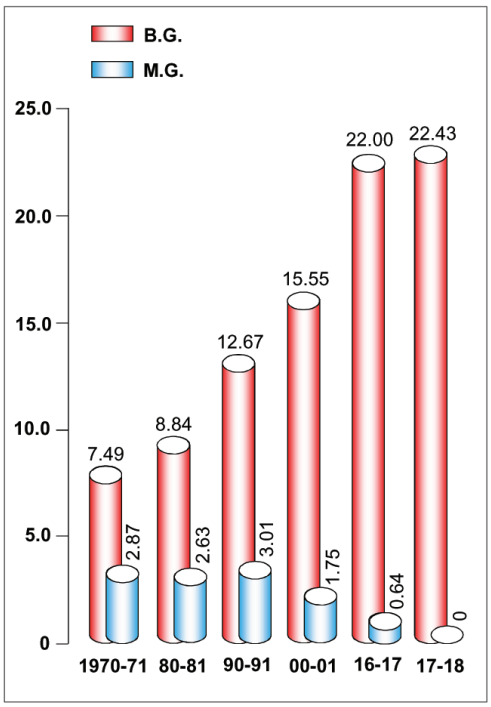
One Complete Track Renewal (CTR) units comprises of one km of Through Rail Renewal (0.5 CTR units) and one km of Through Sleeper Renewal (0.5 CTR units).

Track Upgradation:

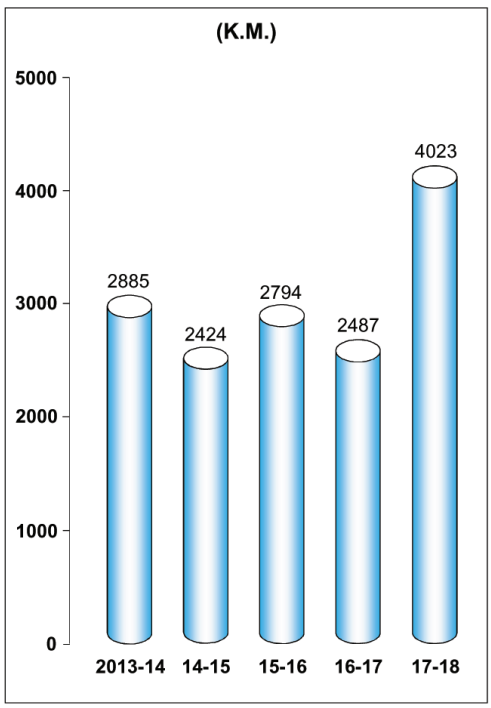
The track constitutes the basic infrastructure of a railway system and bears the burden of coping with ever increasing traffic. Higher speed and heavy axle load operation of IR has necessitated up-gradation of the track structure. Several policy initiatives have been taken in order to modernize the track.

Track structure is upgraded at the time of renewals. Sleepers are being upgraded from wooden, steel and CST- 9 to 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 other high density routes. As on 31.03.2018, on BG main lines of IR, about 88.63% of the length is covered by long welded rails, 99.18% with PSC sleepers and 96.46% with 52kg/60kg 90 or higher UTS rails.

TRAFFIC DENSITY
MILLION GTKMS
PER RUNNING TRACK KM



TRACK RENEWALS
PER ANNUM



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 31.03.2018, 77,112 Km length of track on main lines of Indian railways was with long welded rails and 10,058 Km length of track on main lines was with short-welded rails.

Concrete Sleepers:

Pre-stressed concrete (PSC) 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 PSC sleepers are being used for all renewals, new lines, doubling, gauge conversion, etc.

A new design of wider sleeper has developed which is functionally considered to be better than present design. As the wider and heavier sleeper offers higher frame resistance, less stress on ballast and rail pad, improving reliability and maintainability of track, it is proposed to use this improved design of sleeper only in future works.

Bridges:

As on 01.04.2018, IR has 1,47,523 bridges out of which 700 are important, 12,085 are major and 1,34,738 are minor bridges. In the year 2017-18, 889 bridges were strengthened/ rehabilitated/rebuilt.

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 01.04.2018 is as under:

Total number of level crossings	:	25,299	
Number of manned level crossings	:	19,507	(77%)
Number of unmanned level crossings	:	5,792	(23%)

Indian Railway has decided to progressively eliminate the level crossings for the safety of road users and train passengers. During the year 2017-18, 1565 Nos. of unmanned level crossings and 470 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 2163 of sanctioned works of ROBs/RUBs appearing in Pink Book 2018-19 which contains 1716 ROBs and 6092 RUBs/Subways. These are at various stages of planning, estimation and execution.

During the year 2017-18, 195 ROBs and 1200 RUBs/subways have been constructed under cost sharing, railway cost/accommodation works, Deposit/BOT term and by NHAI over Indian Railway.

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.

Land Management:

As on 31.03.2018 Indian Railways (IR) owns about 4.77 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	0.42
Grow More Food scheme	0.03
Commercial Licensing	0.04
Other uses like pisiculture	0.09
Encroachment	0.01
Vacant land	0.52
Total	**4.77**

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 2017-18, Railway did mass plantation of 88.96 lakh 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. Plantation will further improve in coming years. 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. As such, Railway is making all efforts to plant more and more trees.

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. Though 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, 54 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 Railways land, RLDA has also been assigned the task of development of Multi Functional Complexes (MFCs).

Inspection of Track by maintenance officials

Electrification

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. Since then, there has been no looking back and the Indian Railways have slowly but steadily electrified its routes.

By March'2018, electrification on Indian Railways has been extended to 29,376 RKMs out of the total rail network of 68,442 RKMs. This constitutes 42.92% of the total Railway Network. On this electrified route, 64.50% of freight traffic & 56.50% of Passenger traffic is hauled with fuel cost on electric traction being merely 36.39% of the total traction fuel cost on Indian Railways. Further, Indian Railways has planned to electrify balance BG rail routes by 2021-22 to achieve 100% electrification of BG rail routes.

With the progressive electrification, metro cities of **Delhi, Mumbai, Kolkata** and **Chennai** have already been interconnected with electric traction. **Mumbai-Chennai** route is also electrified except Pune-Wadi, on which electrification work is in progress which when completed will bridge the remaining gap.

II Progress of Railway Electrification

(a) The progress of Electrification since independence is tabulated below:

Year	Cumulative Electrified (RKM)
1951	388
1961	748
1971	3,706
1981	5,345
1991	9,968
2001	14,856
2011	19,607
2018	**29,376**

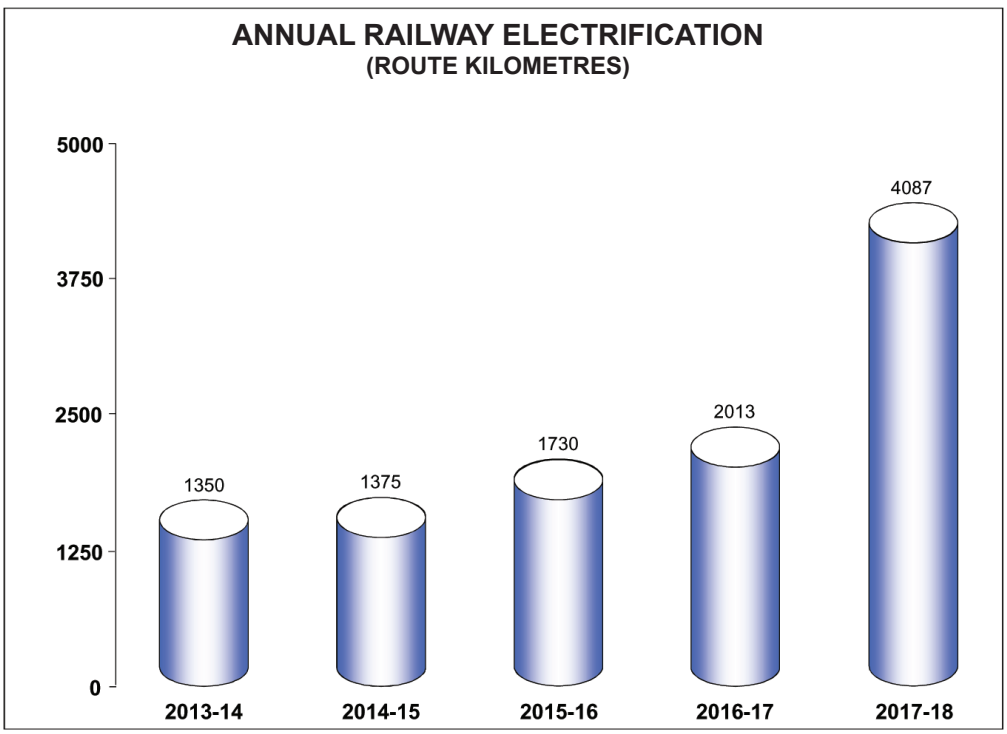
(b) During year **2017-18** alone, **4,087 RKM** has been commissioned against target of **4,000 RKM**.

(c) Progress of Railway Electrification in last few years is as under:

III Sections Opened for Electric Traction After Inspection of Commissioner of Railway Safety in 2017-18.

S. No.	Section	Railway	State	RKM
1	Gulbarga-Wadi	CR	Karnataka	36
2	Parasia-Chhindwara	CR	Madhya Pradesh	30
3	Chandurbazar-Walgaon & Narkher -Morshi	CR	Maharashta	86
4	Walgaon- Narkher	CR	Maharashta	29
5	Katwa-Balgona	ER	West Bengal	27
6	Nalhati-Azimganj	ER	West Bengal	45
7	Bakhtiyarpur-Rajgir-Tilaiya-Manpur	ECR	Bihar	139
8	Muzaffarpur-Jiwdhara	ECR	Bihar	71
9	Mansi-Saharsa-Dauram-Madhepura	ECR	Bihar	63
10	Tilaiya- Warisaliganj	ECR	Bihar	37
11	Punrath-NTPC siding	ECR	Bihar	9
12	Tori-Biratoli	ECR	Bihar	9
13	Meral Gram-Wyndhamganj	ECR	Jharkhand	35
14	Wyndhamganj-Renukut-Chopan	ECR	Uttar Pradesh	86
15	Lanjigarh-Titlagarh	ECoR	Odisha	47
16	Lapanga-Sambalpur	ECoR	Odisha	32
17	Boinda-Bamur	ECoR	Odisha	31
18	Singapur Road-Sikripai	ECoR	Odisha	25
19	Damanjodi-Kakiriguma	ECoR	Odisha	27
20	Titlagarh-Turekela	ECoR	Odisha	45
21	Sambalpur –Balangir Road	ECoR	Odisha	119
22	Hisar-Jakhal	NR	Haryana	79
23	Una Himachal-Amb Andaura	NR	Himachal Pradesh	25
24	Kahangarh-Katarsinghwala	NR	Punjab	87
25	Katarsinghwala-LHM-Bathinda	NR	Punjab	38
26	Jind-Narwana-Kahangarh	NR	Haryana	76
27	Zafrabad-Khetasarai	NR	Uttar Pradesh	28
28	Lalitpur-Udaipura	NCR	Uttar Pradesh	32
29	Shankargarh-Manikpur	NCR	Uttar Pradesh	53
30	Jhansi-Harpalpur	NCR	Uttar Pradesh	83
31	Bhimsen-Hamirpur	NCR	Uttar Pradesh	48
32	Ballia -Varanasi City	NER	Uttar Pradesh	131
33	Gorakhpur-Kaptanganj	NER	Uttar Pradesh	35
34	Kumedpur -Malda court-Singhabad	NFR	West Bengal	83
35	Katihar-Kumedpur	NFR	Bihar	30
36	Rewari-Dabla	NWR	Haryana	78
37	Rewari-Kosli	NWR	Haryana	27
38	Rohtak-Bhiwani	NWR	Haryana	48

39	Manheru-Hisar	NWR	Haryana	74
40	Dabla-Jhilo-Ringas	NWR	Rajasthan	73
41	Ringas -Phulera	NWR	Rajasthan	63
42	Ajmer-Det	NWR	Rajasthan	167
43	Erode-Karur-Tiruchchirappalli	SR	Tamil Nadu	141
44	Karur-Dindigul	SR	Tamil Nadu	72
45	Nallapadu-Guntakal & Gooty-Pendekallu	SCR	Andhra Pradesh	421
46	Manthralayam Road-Guntakal	SCR	Andhra Pradesh	92
47	Nallapadu-Siripuram	SCR	Andhra Pradesh	18
48	Mattampally-Janpahad	SCR	Telangana	20
49	Malakajgiri-Bolarum	SCR	Telangana	13
50	Chiksugur-Manthralayam road	SCR	Karnataka	45
51	Ranchi-Lohardaga	SER	Jharkhand	68
52	Jharsuguda-Sardega MCL siding	SER	Odisha	50
53	Chhindwara-Bhandarkurd	SECR	Madhya Pradesh	36
54	Kachhpura-Shikara	SECR	Madhya Pradesh	59
55	Gondia-Nagbhir	SECR	Maharashtra	132
56	Nagbhir-Mulmarora-Ballharshah	SECR	Maharashtra	116
57	Ramanagaram-Yeliyur-Mysuru	SWR	Karanataka	96
58	Sabarmati-Khodiyar	WR	Gujarat	10
59	Gandhinagar-Kalol	WR	Gujarat	21
60	Kalol-Mahesana -Palanpur	WR	Gujarat	114
61	Pipariya-Jabalpur	WCR	Madhya Pradesh	177
	Total			**4,087**



IV Completion of Electrification of Nallapadu (Guntur)-Guntakal rail line.

In the year 2017-18, railway electrification of **Nallapadu (Guntur)-Guntakal** rail line of South Central Railway covering 426 route kilometers and passing through the state of Andhra Pradesh has been completed. This has resulted in smooth and seamless flow of electric trains in the section as traction changes/detentions at Guntur and Guntakal have been eliminated.

V Completion of Electrification of Balharshah-Gondia rail line.

In the year 2017-18, Railway Electrification of Balharshah-Gondia rail line of South East Central Railway, covering 250 route kilometers and passing through the State of Maharashtra has been completed. This has resulted in smooth and seamless flow of electric trains in the section as traction changes/detentions at Balharshah and Gondia have been eliminated.

VI Completion of Electrification of Manpur-Tilaiya - Bakhtiyarpur rail line.

In the year 2017-18, Railway Electrification of Manpur-Tilaiya-Bakhtiyarpur of East Central Railway, covering 132 route kilometers and passing through the State of Bihar has been completed. This has resulted in smooth and seamless flow of electric trains in the section as traction changes/detentions at Manpur and Bakhtiyarpur have been eliminated.

VII Completion of Electrification of Bengaluru-Mysuru rail line.

In the year 2017-18, Railway Electrification of Bengaluru - Mysuru rail line of Southern Railway, covering 125 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 Mysuru to North 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.

VIII Completion of Electrification of Erode-Karur-Tiruchchirappalli.

In the year 2017-18, Railway Electrification of Erode-Karur-Tiruchchirappalli rail line of Southern Railway, covering 141 route kilometers and passing through the State of Tamil Nadu has been completed. This has resulted in smooth and seamless flow of electric trains in the section as traction changes/detentions at Erode and Tiruchchirappalli have been eliminated.

IX Completion of Electrification of Rohtak-Bhiwani rail line.

In the year 2017-18, railway electrification of Rohtak- Bhiwani rail line of North Western Railway covering 48 route kilometers and passing through the state of Haryana has been completed. This has resulted in smooth and seamless flow of electric trains in the section as traction changes/detentions at Rohtak and Bhiwani have been eliminated.

X Completion of Electrification of Amravati-Narkher rail line.

In the year 2017-18, railway electrification of Amravati-Narkher rail line of Central Railway covering 138 route kilometers and passing through the state of Maharashtra has been completed. This has resulted in seamless movement of electric trains in this section with providing alternate route for already electrified Badnera-Wardha-Nagpur-Narkher rail line route.

XI Completion of Electrification of Mansi-Saharsa-Dauram Madhepura rail line.

In the year 2017-18, railway electrification of **Mansi-Saharsa-Dauram Madhepura** rail line of East Central Railway covering 63 route kilometers and passing through the state of Bihar has been completed. This has extended seamless flow of electric trains from Mansi to Dauram Madhepura.

XII Major New Electrification Works sanctioned in 2017-18, under plan Head- "Railway Electrification"

S.No.	Section	Railway	State	RKM
1	Daund-Baramati	CR	Maharashtra	44
2	Wani-Pimpalkhutti	CR	Maharashtra	66
3	Miraj-Kurduwadi-Latur	CR	Maharashtra	377
4	Biharsharif-Daniawan	ECR	Bihar	38
5	Ara – Sasaram	ECR	Bihar	97
6	Fatuha – Islampur	ECR	Bihar	43
7	Darbhanga-Jaynagar	ECR	Bihar	69
8	Giridih-Nawadih-Koderma	ECR	Jharkhand	114
9	Raxaul-Sitamarhi-Darbhanga-Samastipur	ECR	Bihar	231
10	Samastipur-Khagaria	ECR	Bihar	85
11	Unnao-Balamau-Sitapur	NR	Uttar Pradesh	162
12	Narwana – Kurukshetra	NR	Haryana	86
13	Bareilly-Chandausi-Harduaganj incl. Chandausi-Moradabad	NR	Uttar Pradesh	199
14	Gajroula-Muazzampur Narain	NR	Uttar Pradesh	95
15	Panipat-Jind	NR	Haryana	70
16	Rohtak –Panipat	NR	Haryana	71
17	Raiwala-Rishikesh	NR	Uttarakhand	12

18	Garhi Harsaru-Farukhnagar	NR	Haryana	12
19	Amritsar-Batala-Bharoli	NR	Punjab	104
20	Rewari-Rohtak	NR	Haryana	74
21	Unnao-Unchahar	NR	Uttar Pradesh	113
22	Najibabad-Kotdwara	NR	Uttar Pradesh & Uttarakhand	24
23	Bandikui-Bharatpur	NCR	Rajasthan	97
24	Birlanagar-Etawah	NCR	Madhya Pradesh & Uttar Pradesh	115
25	Bhandai-Udi	NCR	Uttar Pradesh	113
26	Shikohabad-Farrukhabad	NCR	Uttar Pradesh	158
27	Kaptanganj-Thawe-Khairah-Chhapra Kacheri	NER	Bihar & Uttar Pradesh	206
28	Mankapur-Katra-Ayodhya	NER	Uttar Pradesh	38
29	Kasganj-Bareilly, Bhojipura-Daliganj	NER	Uttar Pradesh	401
30	Guwahati-Dibrugarh via Tinsukia and Simaluguri-Dibrugarh	NFR	Assam	656
32	New Bongaigaon-Agthori via Rangiya	NFR	Assam	143
32	Raninagar Jalpaiguri-Samuktala Road	NFR	West Bengal	129
33	New Bongaigaon-Goalpara-Kamakhya	NFR	Assam	175
34	2nd line Alwar-Bandikui	NWR	Rajasthan	60
35	Rewari-Sadulpur-Hanumangarh	NWR	Haryana & Rajasthan	320
36	Sadulpur-Ratangarh-Bikaner Lalgarh incl. Ratangarh Sardar Shahar	NWR	Rajasthan	286
37	Villupuram-Cuddalore Port-Mayiladuturai-Thanjavur & Mayiladuturai-Thiruvarur	SR	Tamil Nadu	228
38	Bengaluru-Omalur via Hosur	SWR	Tamil Nadu & Karnataka	196
39	Chikjajur-Ballari	SWR	Karnataka &Andhra Pradesh	184
40	Gadag-Hotgi	SWR	Karnataka & Maharashtra	284
41	Chikbanavar-Hubballi	SWR	Karnataka	456
42	Rajkot-Sikka-Okha	WR	Gujarat	271
43	Ratlam-Fatehabad-Laxmibainagar	WR	Madhya Pradesh	115
44	Wankaner-Dahinsara-Maliya Miyana & Surendranagar-Dhrangadhra	WR	Gujarat	132
45	Guna-Gwalior	WCR	Madhya Pradesh	227
	Total			**7,176**

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 5770 stations covering about 92% 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 7 major stations namely, Jalgaon, Khanalampura, New Coochbehar, Mettur Thermal Plant Yard, Kharagpur, Cuttack, Dadri with Panel Interlocking at 114 Stations and Electronic Interlocking at 208 stations have been provided during the year 2017-18.

Complete Track Circuiting: Track Circuiting has been done upto 100%, 99.8%, 100% and 98.6% 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 31.03.2018 Block Proving Axle Counter (BPAC) have been provided on 5058 block sections.

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 31.03.2018, Intermediate Block Signalling has been provided at 532 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 31.03.2018, Automatic Block Signalling has been provided on 2,901 Route Kms.

Automatic Train Protection (ATP) System:

1. Automatic Train Protection (ATP) System based on proven European Train Control System (ETCS-L1) Technology has been implemented on 342 RKMs (200 RKMs Delhi-Agra Section, 117 RKMs Chennai Suburban section and 25 RKMs of Metro Railway Kolkata).
2. ATP called Auxiliary Warning System (AWS) is presently functional on 364 RKMs in the Mumbai suburban section of Central Railway (240 RKMs) and Western Railway (124 RKMs).
3. The work of modernization of signalling system on Indian Railway, which includes works of ETCS L-2, has been included in the Works Programme 2018-19 for complete 60,000 Route kilometres on Broad Gauge network of Indian Railways subject to expenditure on this project will be made only after following due processes, mandatory approvals and sanctions.
4. Train Collision Avoidance System (TCAS): A pilot project for indigenous technology development of train protection system called Train Collision Avoidance System (TCAS) has been launched on IR. This indigenous technology is aimed at providing capability to prevent train accidents caused due to Signal Passing at Danger (SPAD) or non-observance of speed restrictions by train drivers.

   RDSO has taken up extended field trials of TCAS on a pilot section Lingampalli-Vikarabad-Wadi-Bidar pilot section (250 Rkm) on South Central Railway. Product of M/s Medha has been approved and safely certified for developmental orders for Absolute block section with speed upto 110 Kmph.

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 double line electrified route dealing with nearly 200 trains per day. Its Central Control Centre is established at Tundla station.

Salient sectional features are:

1.	No. of stations	47
2.	No. of block section	47
3.	Total length of section	413 KMs
4.	Way side stations	38
5.	Major big yards	6
6.	Medium yards	3

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 (Hirangaon, Firozabad, Makhanpur, Shikohabad, Kaurara, Bhadan, Balarai) 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 suburban section from CST Mumbai to Kalyan extending over 54 km covering 26 stations. TMS works 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 11,006 Level Crossing Gates as on 31.03.2018, to enhance the safety at Level Crossings.

Sliding Boom: Provision of Interlocked Sliding Boom has become very effective in minimising disruption to train services when Level Crossing Gates gets damaged by road vehicles especially in suburban areas. With provision of Sliding Boom Interlocking, Signalling System continues function normally with minimum effect on train operation. 3,527 Nos. of busy interlocked gates have been provided with Sliding booms as on 31.03.2018 in addition to lifting barriers and further busy gates are also being progressively covered.

Growth of deployment of Signalling on Indian Railways: **As on 31.03.2018**

Item	March,14	March,15	March,16	March,17	**March,18**
Panel Interlocking (Stations)	4,200	4,195	4,107	4,155	**4,130**
Route Relay Interlocking (Stations)	276	280	281	281	**282**
Electronic Interlocking (Stations)	735	842	1,005	1,148	**1,358**
PI/RRI/EI (Stations)	5,211	5,317	5,393	5,584	**5,770**
Block Proving Axle Counter (Block sections)	4,175	4,585	4,640	4,976	**5,058**

Automatic Signalling (Route Kms)	2,623	2,715	2,752	2,866	**2,901**
Intermediate Block Signalling (Block sections)	449	475	489	501	**532**
Interlocked level Crossing Gates (Nos.)	10,493	10,513	10,776	10,826	**11,006**

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 equipments has gone up. To attain self-sufficiency in meeting this increased demand, IR's Signal Workshops at Podanur on Southern Railway, Mettuguda 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 2013-14, 2014-15, 2015-16, 2016-17 and 2017-18 are as under:

Year Wise out Turn Signal and Telecommunication Workshop:

Year	Out Turn in Lakhs
2013-14	20478.68
2014-15	20732.01
2015-16	22098.3
2016-17	22513.21
2017-18	**25749.21**

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 2018, Indian Railways has about 53,476 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 51,002 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 712 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 439 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 6,124 (A1, A, B, C, D & E category) stations on Indian Railways. In addition to these 6,124 stations, Video Surveillance System at 202 more stations has been sanctioned under ISS works, out of which 108 stations have been commissioned so far i.e. upto 31.08.2018 .

Implementation of Upgradation of Security helpline: In phase-I the trial for provision of Security Helpline at Five Locations i.e. New Delhi, Allahabad, Jaipur, Bhopal & Pune have been successfully upgraded with required facilities. Automatic Call Distribution (ACD System) provided at security control of these divisions has been successfully integrated with CRM applications, developed by CRIS, for reading call related information. In phase-II, Security Helpline at remaining 65 locations is required to be upgraded and work has been in progress.

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 16,451 data circuits that power its various data and voice networks across the country.

Railways have also established their 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 move to enhance safety, reliability and productivity. IR is also using 1.49 lakh VHF walkie-talkies sets to ensure safety and enhance reliability.

Internet has changed the way organizations work today. It is impacting

almost all the activities of daily life today. Broadband penetration is also taken as an indication of growth. Indian Railways has also embraced this technology and is using it effectively. It has recently provided broadband 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 5,096 stations and Coach Guidance System at 576.

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:

S. No.	Installation	Units	As on 31.03.2017	As on 31.03.2018
1.	Optical Fibre Cable	Rkms	51,247	**53,476**
2.	Quad Cable	Rkms	60,458	**61,849**
3.	Railway Telephone Subscribers Lines	Nos.	3,95,816	**3,95,816**
4.	No. of Control Sections provided with Dual Tone Multiple Frequency (DTMF) control equipment	Nos.	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	1,812	**1,812**
7.	Public Address System	No. of STNs	4,893	**5,096**
8.	Train Display Boards	No. of STNs	1,090	**1,090**
9.	Coach Guidance System	No. of STNs	556	**576**
10.	VHF Sets			
	a. 5 Watt sets (Hand held)	Nos.	1,44,040	**1,49,787**
	b. 25 Watt sets (At Stations)	Nos.	9,425	**9,465**
11.	V SAT	Nos.	881	**881**
12.	Railnet Connections	Nos.	1,30,185	**1,31,213**
13.	UTS/PRS Circuits	Nos.	10,839	**10,883**
14.	FOIS Circuits	Nos.	2,219	**2,277**
15.	NGN & Exchange Circuits	Nos.	2,536	**2,536**
16.	Wi-Fi at Stations	No. of STNs	115	**523**
17.	CCTV at Stations	No. of STNs	383	**436**

Rolling Stock

Locomotives:

The size of IR's fleet of locomotive stock as on 31st March, 2018 consisted of 39 steam, 6,086 diesel and 5,639 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
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
2017-18	**39**	**6,086**	**5,639**	**11,764**	**38,166**	**16,879**

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

Year	Broad Gauge		Metre Gauge	
	Diesel	Electric	Diesel	Electric
2014-15	36,520	37,420	18,974	-
2015-16	37,186	37,801	18,896	-
2016-17	37,633	37,995	18,948	-
2017-18	**38,244**	**38,086**	**18,960**	**-**

Coach upkeep:

926 old coaches were given mid-life rehabilitation 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
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	*53,668	*39,69,607	*1,492	*1,43,395	*6,699
2017-18	**9,556**	**17,48,490**	**54,080**	**39,57,263**	**1,690**	**1,67,185**	**6,499**

$ Includes standing accommodation.

@ Includes Rail Cars.

+ Includes luggage vans, mail vans, parcel vans, etc.

* Revised

Wagons:

As on 31st March, 2018, the size of IR's wagon fleet consisted of 2,79,308 units 66,167 covered, 1,58,795 open high-sided, 15,799 open low-sided, 23,602 other types and 14,945 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
2015-16	2,51,295	24.9	55.0	5.5	9.3	5.3	100
2016-17	*2,77,992	24.0	56.1	5.4	9.3	5.2	100
2017-18	**2,79,308**	**23.7**	**56.8**	**5.7**	**8.4**	**5.4**	**100**

* Revised

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
2015-16	237	14.39	235	60.8	2	33.7
2016-17	*264	*15.99	*262	60.9	1.9	34.2
2017-18	**264**	**16.28**	**263**	**61.7**	**1.1**	**31.7**

$ Excludes departmental service wagons and brake vans

* Revised

Some of the major types of wagons plying on IR as on 31.3.2018 are shown below:-

Types of Wagons fleet (BG)

Types of Wagon	Units available	Brief description
BOXNHS	19117	Bogie open wagon, air brake, high speed.
BOXNS	643	Bogie open wagon, air brake, high speed.
BOXNLW	2182	Bogie open wagon, air brake, light weight.
BOXNCR	322	Bogie open wagon, air brake, made of corrosion resistant IRS M : 44 steel.
BOXNHA	776	Bogie open , air brake wagon of 22 t axle load with high side walls (higher than BOXN),designed for transportation of coal.
BOXNHL	56433	Bogie open air brake, stainless steel wagon
BOX' N'	45274	High - sided bogie open wagon 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.
BOY	1207	Standard Gondola wagon, air brake, to carry minerals / iron ore with an axle load of 22.9 t.
BCN / BCNA	41597	Bogie covered wagon, air brake fully riveted / welded construction for transportation of bagged cement, food grains, fertilizers, etc.
BCNAHS/BCNHS	8902	Bogie covered, air brake, all welded & riveted construction with High Speed bogie CASNUB – 22 HS BOGIE.

BCNHL	18543	Bogie covered , air brake, micro – alloy (stainless steel wagon)
BRN	1364	Bogie Rail wagon Heavy, air brake.
BRNA / HS	5434	Bogie Rail wagon Heavy, air brake, High Speed bogie, riveted cum welded construction.
BRHNEHS	1559	Bogie Rail wagon, air brake, high speed CASNUB BOGIE for engineering department.
BFNS	729	Bogie Flat, air brake wagon, high speed for transportation of H.R. coils, plates, sheets & billets loading.
BOST / HS	8418	Longer BOXNHS, air brake, wagon for finished steel products.
BOBR / N / HS	14154	Bogie open rapid discharge air brake wagon for coal.
BOBYN	3777	Bogie Hopper, air brake, bottom discharge wagon
BOBSN	1685	Bogie open air brake, side discharge wagon for iron ore.
BTPN	11021	Bogie Tank wagon, air brake, for liquid consignments like petrol, naptha, ATF and other petroleum products.
BTPFLN	427	Bogie Tank wagon, air brake, with frameless body.
BTPGLN	117	Bogie Tank wagon, air brake, for carrying Liquified Petroleum Gas.
BLCA/BLCB	13237	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).

Repairs and Maintenance:

63 Loco sheds and 211 Carriage and Wagons sick lines and central repair depots provide repair and maintenance facilities for the entire fleet of rolling stock.46 workshops undertake maintenance 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	
	2016-17	2017-18
Diesel Locos	486	**474**
Electric Locos	436	**443**
Coaches	30,649	**30,037**
Wagons	49,663	**50,956**

COFMOW

Central Organisation for Modernisation of Workshops (COFMOW) was established under the Ministry of Railways by the Government of India for modernizing Indian Railways Workshops. Since its establishment in 1979 COFMOW has been assisting in modernizing Indian Railways Production Units and maintenance Workshops. So far COFMOW has been involved in purchasing over 22,020 machines valued at ₹6223.72 crores. COFMOW continues its

endeavour to provide crucial technical support to the various manufacturing and maintenance units of Indian Railways. COFMOW is now taking up composite turnkey projects of setting up workshop/expansion of workshops as well specialise technical projects allotted by Ministry of Railways.

COFMOW is in a position to offer its services to those needing modernization or upgradation of their manufacturing /maintenance activities with enhanced productivity. Over the time, COFMOW has emerged as a leading specialised organisation with the advantage of technical core group in handling variety of machinery and plant with enhanced productivity. Further, COFMOW provides professional advice and assists Zonal Railways & PUs in preparing and upgrading technical specification of M&P for procurement of machine tools and allied equipment.

Salient features:

- Bringing in state of the art technologies available worldwide in the field of M&P.
- Preparing, Upgrading and Compilation of specifications of machines used in workshops, maintenance sheds and production units.
- Successive efforts for indigenisation have led to a vibrant machine tool industry in India.
- Undertake turnkey works/ projects associated with M&P, New Manufacturing lines and composite modernization projects.
- 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 for their M&P requirements.
- E-tendering all M&P items.
- Executing Specialised technical projects involving upgradation of Railways rolling stock & yards.

Key Milestones:

S. No.	Year	Fund Utilization (in crores of Rupees)	Contracts Awarded
1	2016-17	481	526.71 crores 179.6 crores (works)
2	**2017-18**	**435.82**	**305.35 crores 410 crores (Works + Special projects)**

Composite Turnkey projects involving machines:

Completed

- Coil Spring manufacturing facility for Integral Coach Factory (₹83.88 crore).
- New Wheel and Axle assembly line at Rail Wheel Factory, Bengaluru (₹ 49.42 crore).
- Wheel Shop at Sanpada (₹33.64 crore).

Under progress

- Augmentation of Wheel shop capacity at Matunga (₹62.3 crore).
- Modernisation and Augmentation of Wagon POH capacity at Dahod (₹92.42 crore).
- Coach POH facility at Motibagh workshop Nagpur (₹78.56 crore).
- Augmentation of coaches POH capacity at Bhavnagar (₹48.08 crore).

Other Projects in Pipeline

- Augmentation of wagon POH capacity at Raipur.
- Axle forging line at RWF, Bengaluru.
- Axle machining line at RWF, Bengaluru.

Special Projects in new technology areas in hand:

- CBC Retro Fitment in ICF Coaches (₹212 crore).
- Fitment of RFID in Wagons (₹52 crore).
- Fitment of Vacuum Bio-Toilets in 500 LHB Coaches (₹55 crore).
- Smart Yard facilities in Tughlakabad & Mughal Sarai (₹64 crore).

WAP7 Electric Locomotive Manufactured by DMW

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
2015-16	-	48.0	37.9	14.1	-	37.5	62.5
2016-17	-	45.9	*40.0	14.1	-	38.3	61.7
2017-18	**-**	**44.2**	**41.4**	**14.4**	**-**	**38.7**	**61.3**

@ 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
2015-16	-	48.3	44.3	7.4	-	34.9	65.1
2016-17	-	46.3	46.3	7.4	-	35.5	64.5
2017-18	**-**	**43.5**	**48.8**	**7.7**	**-**	**35.5**	**64.5**

@ Includes DHMU & DEMU

Electric Traction:

Highest-ever Electric loco production:

CLW has turned out 350 three-phase electric loco in year 2017-18 which is the rarest feat achieved by CLW and this performance has been unprecedented in the history of CLW. A cumulative production of 377 electric locomotives has been achieved during 2017-18 utilizing the capacity of CLW, DLW & DMW.

First-ever electric locomotive manufactured at Diesel Modernization Works, Patiala:

In order to cater to the enhanced requirement of electric locomotives commensurate with 100% electrification and to utilize the infrastructure & manpower of DMW, mainly a Diesel loco rehabilitation workshop, was entrusted with the responsibility to manufacture Three Phase IGBT based electric locomotives and a target for production of two WAP-7 electric locomotives was assigned for year 2017-18. With enormous efforts put in by officers and staff, DMW has turned out first-ever electric locomotive in March 2018 and successfully fulfilled the assigned target of two locos.

Conversion of Diesel locomotives to Electric locomotives:

A WAGC3-class diesel locomotive which was due for a mid-life rehabilitation has been converted to electric and the new indigenous 'Make in India' Electric locomotive delivers 5,000 HP which is 92% more than the rail horse power of 2,600 HP of the older version of the locomotive.

High Speed Operation - WAP-5 loco in MU with single panto & 20 coaches at 160 kmph:

WAP5 is the only locomotive available with IR which is having a speed potential of 160 kmph. Haulage power of this locomotive has been increased by making MU of two WAP5 locomotives, thereby making total Traction power of 11000 Horse Power is available and can haul 22-24 coach train upto 160 kmph speed. Three pair of WAP-5 locomotives provided with 25 kV jumper, high speed cattle guard and H-type couple have been commissioned for operation of trains at 160 Kmph. Successful trials have been carried out at 150/130 kmph between Hazrat Nizamuddin - Bandra Terminus.

Provision of Air Conditioning (AC) system in electric locomotive cabs: Loco Pilots are working in locomotive under extreme weather conditions of heat, humidity and dust prevalent across the country. Improvement in the working conditions of loco crew is a level on run and will make working environment of crew better and improve priority area for IR. Provision of Air-conditioning system in loco cab will reduce fatigue their

efficiency. Better working condition will also improve the alertness level of the loco pilots. Regular fitment of cab ACs has been started by CLW in year 2017-18.

Indigenous Development of Technology - Open Control TCN Compliant Vehicle Control Unit for IGBT based three phase electric locomotives: In order to minimize dependency on imported items of electric locomotives, IR has taken an initiative for indigenize development of imported equipments. Accordingly, with indigenous efforts in collaboration with Centre for Development of Advanced Computing (C-DAC) , R&D organization under the Ministry of Electronics and Information Technology has developed indigenized Vehicle Control Unit (VCU) for three phase electric locomotives. This VCU conforms to IEC-61375 standards. A typical vehicle control system comprises of microprocessor based vehicle control, associated sensors, distribution boxes, contactors, and display unit with keypad. Based on the application, the hardware and configuration of the system varies.

Diesel Traction:

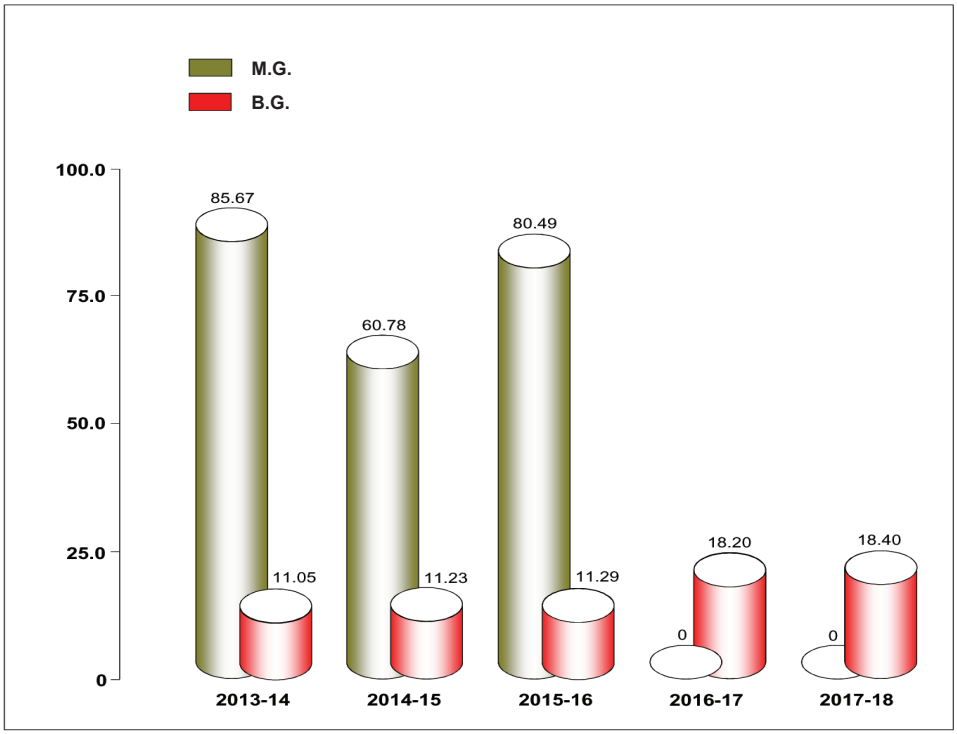
Indian Railways has a fleet of about 5541 mainline BG diesel locos based in 42 Sheds. Following initiatives have been taken by Mech. Engineering (Traction) Directorate for improving availability & reliability and enhancing the safety concerning to diesel locomotives and train operation.

- **Conversion of Diesel Locos into Electric loco:** Consequent upon rapid electrification of IR, Electric locomotives are required in large number. IR has conceived a plan to convert Diesel Locomotives into Electric locomotive. Conversions of 200 diesel locos (100 HHP & 100 ALCO locomotives) into electric loco have been sanctioned in Pink Book 2018-19. Two WAGC3 Electric locos converted from WDG3A locos has been released from DLW and the oscillation trial has been completed. Further two WDG4 locomotives are under conversion at DLW.
- **Air Conditioning (AC) of locomotive cabs:** Loco Pilots are working in extreme weather conditions of heat, humidity and dust prevalent across the country. The need for making locomotive cab crew friendly to ensure long hours of fatigue free driving has been recognized world over. Improvement in the working conditions of loco crew is a priority area for IR also. Provision of AC in loco cab has been a step in this direction. This 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 871 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, 63 locations on all Zonal Railways have started using the blended oil. Bio-Diesel plants at Tondiarpet/ Chennai and Raipur are under construction. 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.
- **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. 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 working in 3643 locomotives.

ENERGY CONSUMPTION (IN COAL EQUIVALENT)
GOODS SERVICES

(KGS. OF COAL/1000 GTKMS.)



- **CNG/LNG DEMU:** IR's has already embarked on its journey to use alternate source of energy like CNG in its fleet of Diesel Electric Multiple Units (DEMUs). 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 RSP. Work has been completed on 23 DPCs for CNG and work of conversion on two more DPCs is under progress.

  CNG is not only cheaper fuel than diesel but is also more environment-friendly. In comparison to diesel engine, a saving in fuel cost of 6% has been realised with use of CNG engines in dual fuel mode.

- **Auxiliary Power Unit (APU):** APU is a self-contained unit containing a small diesel engine coupled with compressor and alternator for battery charging. It has its own set of controls, accessories and is integrated to the existing control system of locomotive. In APU System, Main Engine shuts down and small 25 HP Engine starts and charges batteries and air brake 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 units have been fitted in 865 Diesel Locomotives.

- **Common Rail electronic Direct Injection (CReDI):** Use of CReDI as fuel injection system leads to reduction in fuel consumption, reduction in emissions to very low levels and reduction of engine combustion generated noise, in addition to the increased life of engine due to controlled injection and combustion of fuel. Railway Locomotive manufacturers like EMD, GETS, etc. also have ongoing advanced CReDI development programs for their railway traction engines.

  The performance envisaged with implementation of a CReDI system is reduction in fuel consumption by 4-6% over the duty cycle with added benefits of reduced key emissions. The ALCo version has already been validated in the field at MLY shed and DMW has fitted 15 systems of CReDI on ALCo locos. Further procurement of 65 nos. of units are in advance stage at DMW.

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 diesel until the normalcy is established.

A dual mode loco design has been developed by RDSO. Prototype Dual mode locomotive is under production 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. Trial results are encouraging. Noise reduction in 6 loco Cabs, in which trials were conducted, has been achieved as per feedback obtained from Sr.DME/DSLs. DLW is coordinating with RDSO to develop fresh FRS for reduction of noise. RDSO has awarded a consultancy contract for Noise source identification and control in HHP Locomotives to IIT/KGP. IIT/KGP has prepared Acoustic insulation scheme and fitted in cabs of Loco No.70800/ WDG4D, which reached Kazipet shed on 24.02.2018. IIT/KGP is to carry out remaining work and sound pressure level measurement in consultation with RDSO. RDSO has asked Kazipet shed on 12.06.18 to issue road permit to M/s L&L Products/ Pune so that required acoustic material could be sent to the shed for completing remaining acoustic insulation work on cab floor.
- **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 No. WDG4D-70486 fitted with vacuum based toilet and bio-digester system has been flagged off on 06th May 2016. DLW has fitted Water Closets in five Diesel locomotives. Sanction for additional five toilets to be fitted in freight locomotives has also been accorded. Further, provision of toilets will be done based on performance of the above modification on these locomotives.

DEMU with Solar Power panel: Hon'ble Minister of Railways dedicated First 1600 HP DEMU rake with solar powered Panel hotel load system on 14th July 2017 at Safdurjung railway station, New Delhi. Total 6 such trailer coaches are fitted by IROAF at ICF, Chennai. Further RSP sanction is available for provision of Solar Panels on 530 Nos. trailing Cars of DEMUs

Solar Panels on trains: Solar Panels have been installed on 10 Nos Exhibition Coaches of Swachhata Express in March 2018. In addition, flexible solar panels have also been retrofitted on 11 coaches of Sitapur- Rewari passenger in the month of July 2018 to augment the battery charging.

50 nos. of Guard vans have been retrofitted with solar panel in 2017-18. RSP sanction is available for provision of Solar Panels on 750 Nos Guard Brake vans.

Steam Locomotives:

Steam Locomotives are the icons of IR's century old rich industrial heritage. The sound and smells of the gallant stalwarts of bygone era are major tourist attraction. For offering mesmerizing experiences of old ages, the following routes have currently been earmarked for running of steam locomotive hauled tourist trains:

i. Broad Gauge Steam service on demand between Delhi Cantt. & Rewari and Garhi Hasru & Farukhnagar (Delhi Division)

ii. Broad gauge Steam Tourist specials over selected routes of Southern Railway.

iii. Narrow Gauge steam services over Darjeeling Himalayan Railway (DHR), now in its 139th year and a UNESCO World Heritage Site.

iv. Meter Gauge Steam services over Nilgiri Mountain Railway (NMR), now in its 111th year and a UNESCO World Heritage Site.

v. Narrow Gauge steam services over Kalka-Simla Railway (KSR) now in its 116th year and UNESCO World Heritage Site.

vi. Narrow Gauge steam services over Neral-Matheran on Matheran Light Railway (MLR), now in its 112th year.

vii. Narrow Gauge steam services over Kangra Valley Railway (KVR), now in its 90th year.

Besides 20 steam locomotives that are in regular operations over Darjeeling Himalayan Railway and Nilgiri Mountain Railway, Indian Railways have also preserved about 17 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 seven 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. Southern Railway has also revived Express (1855), twin of Fairy Queen, for operating tourist specials in Southern India.

Railways have also sanctioned projects for manufacture of two new MG steam locomotives for Nilgiri Mountain Railway and reviving other vintage Steam Locomotives.

In addition, about 223 steam locomotives, many of them are more than 100 years old, have been preserved at the National Rail Museum, Regional Rail Museums, Railway stations, heritage parks and other public places for display and bringing back memories of old glory to the mind of the visitors.

Consumption of Fuel/Energy

	Quantity Consumed			
	For Traction		**For other than traction Purposes (including manufacturing units)**	
	2016-17	**2017-18**	2016-17	**2017-18**
Electricity (Million KWH)	15666.46	**16634.17**	2394.56	**2386.85**
HSD Oil (Million litres)	*2792.963	**2778.431**	*51.803	**55.614**
Coal (Million tonnes)	*0.000981	**0.000578**	*0.000275	**0.000327**

*Revised

Personnel

The number of regular employees on Indian Railways as on 31.3.2018 stood at 12,70,715.

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

	Number@ of staff as on 31st March (in thousands)				Expenditure@ on staff
Year	Groups A&B	Group C	Group D	Total	(₹ 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
2015-16	16.7	1,229.3	84.3	1,330.3	93,001.24
2016-17	*16.4	*1,211.8	*80.4	*1,308.6	*1,18,501.74
2017-18	**16.9**	**1,133.5**	**120.3**	**1,270.7**	**1,29,336.48**

*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 1.3% of the total strength, while Group C and D account for 89.2% and 9.5% respectively. Of the employees in Group C and D, 3.26 lakhs (25.6%) are workshop employees and artisans and 9.45 lakhs (74.4%) from other categories including running staff. Railway Protection Force/RPSF personnel totaled 65,416.

In the non-gazetted cadres, the ratio of Group C to D changed from 25:75 in 1950-51 to 90:10 in 2017-18, 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 2017-18 as compared to the previous

year is given below:

	Number of SC Employees		Number of ST Employees	
	As on 31.03.2017	As on 31.03.2018	As on 31.03.2017	As on 31-3-2018
Group A	1,314 (13.48%)	**1,405 (13.57%)**	716 (7.34%)	**744 (7.19%)**
Group B	1,155 (17.49%)	**1,236 (18.81%)**	490 (7.42%)	**494 (7.52%)**
Group C #	2,26,636 (17.54%)	**2,11,575 (16.87%)**	1,03,901 (8.04%)	**95,575 (7.62%)**
Grand Total	2,29,105 (17.51%)	**2,14,216 (16.86%)**	1,05,107 (8.03%)	**96,813 (7.62%)**

Group 'C' Including erstwhile Group 'D' & Group 'D' Safaiwala, now level - 1 as per 7th CPC

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 2017-18 was ₹1,29,336.48 crore registering an increase of ₹10,835 crore over the previous year. The average wage per employee was up by 13.51% from ₹9,08,263 per annum in 2016-17 to ₹10,30,961 per annum in 2017-18. 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 61 %.

The average annual wage (excluding fringe benefits) per employee paid under various categories in 2017-18 is given below:

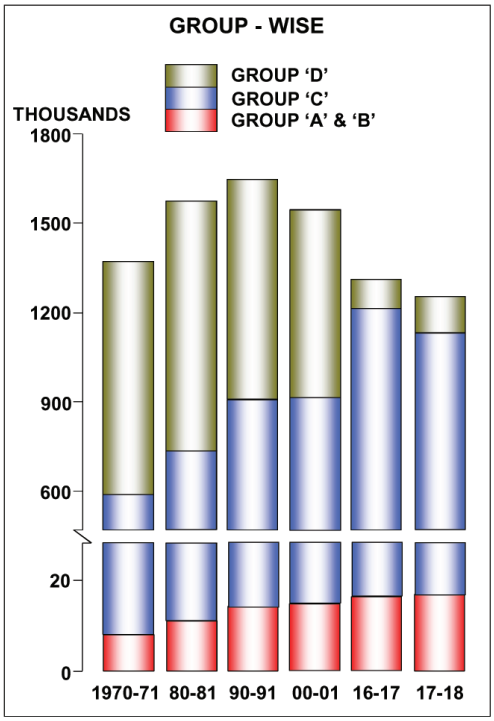
Category	Groups A & B (₹)	Group C (₹)	Group D (₹)	Total (₹)
Workshop and artisan	-	8,20,423	6,15,167	7,99,390
Running*	-	14,73,389	-	14,73,389
Others	-	10,63,671	6,23,277	10,15,848
Total	**31,84,233**	**10,42,500**	**6,21,066**	**10,30,961**

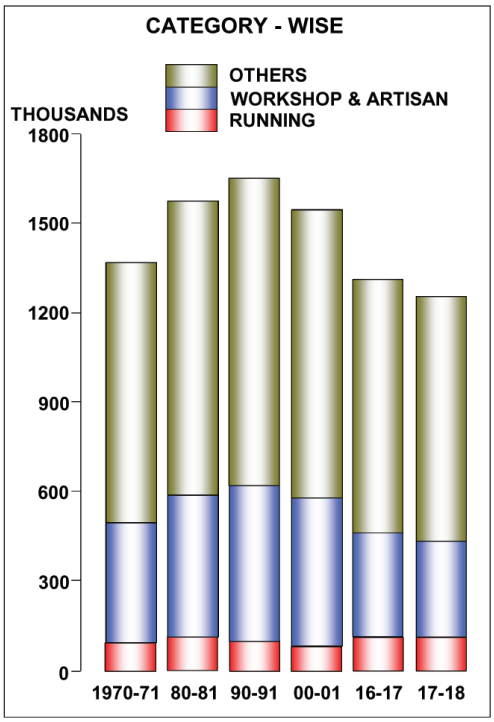
*Emoluments include running allowance.

Productivity Linked Bonus:

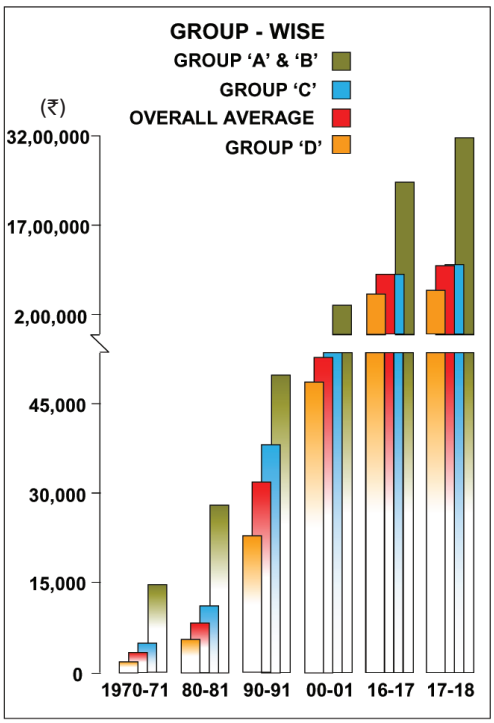
In 2017-18, all non-gazetted Railway employees (excluding RPF/RPSF personnel were sanctioned Productivity Linked Bonus (PLB) for 78 days. This benefitted about 11,91,304 Railway employees. Further, Group 'C' and 'D' RPF/RPSF personnel have been sanctioned ad-hoc bonus equivalent to 30 (thirty) days' emoluments for the year 2017-18. PLB and ad-hoc bonus both have been paid on an enhanced calculation ceiling of ₹7,000/-

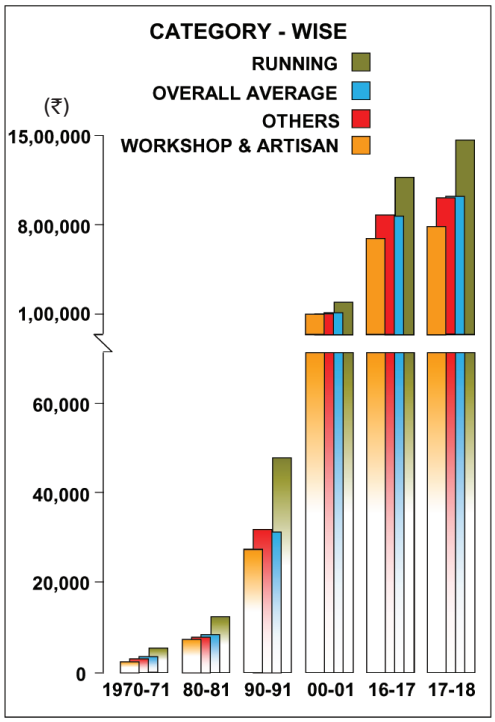
NUMBER OF PERSONNEL





AVERAGE ANNUAL WAGE PER EMPLOYEE





p.m. Financial implication for PLB and ad-hoc bonus was approximately ₹2,044.31 crore and ₹44.97 crore respectively.

Human Resource Development (HRD) and Manpower Planning:

Human Resource Development strategies on Indian Railways have been reoriented towards enhancing competitiveness in the context of internal and external changes. In addition to in house training facilities, railway men are provided specialized training in other institutions in India and abroad. Indian 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 financial incentives. Efforts to improve the basic infrastructure for training are a continuous process. Manpower Planning system has been redesigned to regulate manpower intake with reference to emerging operational and business needs.

A Mission Satyanishtha was launched on 27th July, 2018 at National Rail Museum, New Delhi to sensitize all Railway officers and supervisors about the need to adhere to ethics and maintain high standards of probity in public life. The programme was webcast to all Zonal Railways/PUs simultaneously through Railnet and IR website. The programme was further organized by the Zonal Railways at their headquarters to cover all officers and supervisors of IRs.

A massive training programme for giving 5 days on the job training of classroom training to all 13-lakh employees of Indian Railways has been launched under 'Project Saksham'. A web-based portal for monitoring of "Project Saksham" was also developed by Indian Railways. It is located in the public domain on internet on URL saksham.indianrailways.cloud. The project has been successfully completed due to online monitoring of the programme of Training. To make available such vast resource of training to future Railway employees, and also to have a ready refresher material for participants a massive exercise has been initiated to consolidate all the training material, experiences, feedback, suggestion for improvements etc at one place. The information will be available in a booklet form as well as on a portal for easy access to employees posted even in remote areas.

An Academic Council on Indian Railways has been constituted consisting of all Heads of Indian Railway Seven Centralized Training Institutes and ED(T&MPP), Railway Board to strengthen and streamline the decision-making processes and review all training courses and course contents. DG/NAIR is the Convener of the Academic council.

Following Seven Centralized Training Institutes 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 Sig. Engg. & Telecommunication, Secunderabad.
- Indian Railways Institute of Mechanical & Electrical Engineering, Jamalpur.
- Indian Railways Institute of Electrical Engineering,Nasik.
- Indian Railways Institute of Transport Management, Lucknow.
- Jagivan Ram Railway Protection Force Academy, Lucknow.

These Centralized Training Institutes, apart from imparting probationary training also cater to the various specialized training needs of Indian Railway Offices. National Academy of Indian Railways provides inputs in General Management, Strategic Management and function related areas for serving Railway Officers. Other CTIs conduct specialized technical training courses in respective functional areas including Training Programmes on Information Technology. The need based special courses conducted by CTIs and their facilities for 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.

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

During 2017-18, a total 9,440 Gazetted 3,73,829 Non-gazetted Staff underwent different types of training programmes.

Railway Recruitment Boards:

During the financial year 2017-18 & April-September (2018), the following activities/initiatives have been launched and implemented-

- First time in history of Indian Railways Aptitude (Psycho) Exam through Computer Based Test (CBT)

  For the first time in the history of Indian Railways, Aptitude Test for the post of Assistant Station Master and Traffic Assistant for 43282 candidates across India was conducted on 30th June 2017 against CEN 03/2015 through Computer Based Mode.

- World's largest CBT for various NTPC Graduate level posts against CEN No. 03/2015 for a staggering number of about 92 lakh candidates, concluded and panels of total of 13739 candidates have been provided.

- RRBs have recently invited online applications against Centralized Employment Notification (CEN) No. 01/2018 on 03.02.2018 for a total 64,371 (enhanced) vacancies of Asst. Loco Pilots & Technicians. A total of 47,55,920 online applications were received and 1st stage CBTs have been successfully conducted on 10 days from 09.08.2018 to 04.09.2018 in multiple shifts with record attendance of nearly 77%. 2nd stage CBTs are tentatively scheduled in December-2018.
- RRBs have also been entrusted to conduct direct recruitment for Level-1 (erstwhile Group 'D') staff, earlier conducted by Railway Recruitment Cells (RRCs), in CBT mode. Accordingly, Centralized Employment Notification (CEN) No. 02/2018 was published by RRBs on 10.02.2018 for a total 62,907 vacancies. Record number of 1,89,78,913 online applications have been received. 1st stage CBTs have started from 17.09.2018 and are scheduled to be completed on 17th December-2018.
- To address the problem of inaccuracies and deficiencies in the assessment of vacancies on Indian Railways and their linkages to RRBs, Online Indenting and Recruitment Management System (OIRMS) has been implemented in recruitment processes against latest Centralized Employment Notifications (CENs) No. 01/2018 for the posts of ALP & Technicians and 02/2018 for Level-I (erstwhile Group 'D') posts issued by RRBs. Complete process of vacancy assessment by Railways/PSUs, and online indenting of the same have been carried out with the help of OIRMS software.

Further, during 2017-18, panels of 19,100 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 45.61% staff have been provided with railway quarters, 1,619 staff quarters were electrified during 2017-18.

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

Co-operative societies of various types are functioning on Indian Railways. These Cooperative Societies are registered under the Multi-State Cooperative Societies Act, 2002 and are under overall supervision of the Central Registrar of Cooperative Societies, Deptt. of Agriculture & Coop. Krishi Bhawan, New Delhi. Railway Administration has no jurisdiction over the administrative, financial, managerial, appointment & service matter of the employees of the society. Railways only provide certain facilities & concessions to these Cooperative Societies as per the provisions of Chapter XXIII of IREM Vol.II. There are 41 Thrift and Credit Societies, 137 Railway men's Consumer Co-operative Societies, 26 Labour Co-operative Societies and 5 Railway men's Housing Societies functioning on Indian Railways during 2017-18.

INDIAN RAILWAY MEDICAL SERVICE:

Indian Railway Medical Service provides Comprehensive Health Care to Railway Beneficiaries. Comprehensive Health Care includes Preventive, Promotive, Occupational, Industrial & Public Health services besides Curative services.

Indian Railway Medical Service also plays a significant role in monitoring Health status of employees through 9,025 Health Camps as well as conducting Medical Examination of 44,628 candidates and Periodical Medical Examination of 1,33,883 employees. It also plays a significant role in monitoring the quality of water & food within Railway premises.

It has taken great strides to become a modern well organized three tier Comprehensive Health Care System. With a sanctioned strength of 2,540 Medical Officers it is the largest industrial health services in the world. It is running 24x7 round the year, 125 hospitals & 586 health units spread throughout the length & breadth of country. Indian Railway Medical Service also employees 35,158 paramedical staff for the 12,935 indoor beds. It attends to roughly 65.5 lakhs beneficiaries.

Pan India 21121066 crore people attended Railway OPD facilities and 6,045 special, 39960 major operations were performed including joint replacement, 5,188 invasive cardiac intervention and 946 cardiac surgery.

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. Railway Medical Officers are regular contributors to international journals & conferences in the field of Medical Science.

(A) Resources available

No. of Hospitals	125
No. of Indoor beds	12,935
No. Health Units/Polyclinic	586
No. of Lock Up Dispensaries	92
No. of Pvt. Hospitals recognized for Medical treatment	684 (Up to June 2018)

(B) Beneficiaries

No. of RELHS Card Holders	6,91,465
No. of Beneficiaries	65,47,486

(C) Performance Statistics 2017-18

Total OPD cases attended	2,11,21,066
Total Indoor cases admitted	5,01,914
Total no. of Surgeries performed	1,38,935
Percentage of man days lost due to sickness (RMC)	1.34
No. of New Candidates examined for fitness	44,628
No. of Engineering Services candidates examined	548
No. of Medical Services candidates examined	353
No. of employee who under went PME	1,33,883
No. of food samples collected/	
Samples found faulty/action taken	2,325 124 / 16
Water sample for residual chlorine tested/fit	11,62,651/ 10,16,615
Water sample for bacteriological test/fit	71,651/ 69,510
No. of sick Passengers attended by Railway Doctors	63,965
No. of Children immunized	12,685
No. of multipurpose health drives conducted	9,025
Total No. of persons examined in the multipurpose health drives above.	4,58,127

Pension Adalats:

In accordance with the directives of Department of Pension and Pensioners welfare (DOP&PW), instructions have been issued to Zonal Railways and Productions Units to conduct Pension Adalat annually on Zonal level and quarterly at Divisional level to examine and settle the grievances of Pensioners. Every efforts are made to settle these cases on the spot. A No of 5951 cases were taken up in the All India Pension Adalat held on 18.09.2018.

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.

Railway Schools:

IR runs and manages one Degree College and 116 Railway Schools which include 85 Senior/Secondary/High Schools. These schools are being operated purely as a measure of staff welfare and they 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 students residing in the vicinity of these schools.

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, 2018 the total number of notified Railway offices is 3575. 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 2017-18,a total number of 1037inspections have been carried out.

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 2017-18 as compared to 2016-17 as follows:

Activity	As on March 31,2017	As on March 31,2018
Working knowledge/		
Proficient in Hindi	8, 69,954	**8,73,280**
Hindi Typewriting	6,881	**6,891**
Hindi Stenography	3,165	**3,222**

Other activities

The existing policy of purchasing bilingual electronic equipments, like computers etc. is being followed. During 2017-18, 45,811 bilingual personal computers were available in various offices of Indian Railways. Websites of the Zonal Railways including Railway Board are also billingual. In order to promote usage of Hindi in Railway offices, 914 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 litterateurs of Hindi.

Official Language Implementation Committees

To review the progress of the use of Hindi, total 1039 Official Language Implementation Committees are functioning on the Zonal Railways and in Production Units etc and meetings of these committees are being organized regularly in every quarter. Besides this, Railway Board Official Language Implementation Committee have 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 Hindi Salahkar Samiti are also invited in these meetings as observer member.

Railway Hindi Salahakar Samiti

The meeting of Railway Hindi Salahakar Samiti was organized on 30.05.2017 under the Chairmanship of Hon'ble Minister of State for Railways in order to propagate the use of Hindi in Ministry of Railways and Zonal Railways wherein honourable members of the Samiti gave valuable suggestions to propagate the use of Hindi. Besides this, Rajbhasha exhibition was also organized.

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 in Hindi. Under Rail Yatra Vritant Scheme Cash awards and Certificates were given to first three essayist. Further under 'Kamlapati

Tripathi Rajbhasha Swarn Padak Scheme', GM was awarded one Gold Medal and Cash award. 30 silver medals under 'Rail Mantri Rajbhasha Rajat Padak Scheme' were given to officers working in Zonal Railways.

In order to promote usage of Hindi 'Rajbhasha Fortnight' was orgainsed from 14 to 27 September, 2017 in the Ministry of Railways. During this period Essay Writing Competition, Elocution, Noting & Drafting Competition, Antakshari. Hindi Prashan Manch, Kavi Sammelan, Hindi Workshop, Seminar and Hindi Typing Competition were organized. During this period Assistant Directors of Official Language Directorate imparted Table Training to officials/employees of various branches of Boards office.

Outstanding Achievements in Sports:

1. At International Level :-

i) Shri Ajay Saroj and Ms. Sudha Singh won gold medal in Asian Athletics Championship held at Bhubaneshwar from 6th to 9th July, 2018.

ii) Ms. Trisha Deb won Silver Medal in World Archery Championship held at Mexico from 15.10.2017 to 22.10.2017.

iii) Shri Gaurav Bidhuri won Bronze medal in World Boxing Championship held at Hamburg (Germany) from 25th August to 3th September, 2017.

iv) Shri V. Vignesh Kumar and Aranya Gogai won Gold Medal and Ms. Mamta Rana won Silver Medal in Commonwealth Powerlifting Championship held at South Korea from 10.07.2017 to 17.07.2017.

v) Shri Siddharth Parikh won Bronze Medal in World Billards Championship held at Leeds (United Kingdom) from 23.10.2017 to 27.10.2017.

vi) Shri S. Satish Kumar, Shri R.V. Rahul and Pardeep Singh won Gold Medal in Commonwealth Weightlifting Championship held at Gold Coast City (Australia) from 02.07.2017 to 09.07.2017.

vii) Mirabai Chanu won Gold Medal in World Weightlifting Championship held at Anaheim(USA) from 27.11.2017 to 05.12.2017.

viii) Indian Railway Hockey (Men) players - Shri Chinglensana Singhand and Shri Amit Rohidas were awarded Gold Medal for representating Indian Hockey Men team in 10th Men Hockey Asia cup held at Dhaka (Bangladesh) from 08.10.2017 to 23.10.2017.

ix) Indian Railway Hockey (Women) players – Ms. Monika, Ms. R. Rajani, Ms. Navneet Kaur, Ms. Gurjeet Kaur Ms. Nikki Pradhan, Ms. Vandana Katariya, Ms. Namita Toppo, Ms. Lilima Minz, Ms. Sushila Chanu and Ms. Deep Grace Ekka were awarded Gold Medal for representating Indian Hockey Women team in 9th Women Hockey Asia cup held at Gifu (Japan) from 28.10.2017 to 05.11.2017.

x) Shri Utkarsh Kale, Shri Bajrang, Shri Sushil Kumar, Shri Jitendra, Shri Deepak, Shri Sumit, Ms. Seema, Shri Vinesh, Ms. Sakshi Malik, Ms. Ritu Malik, Ms. Kiran won Gold Medal and Shri Rahul Aware, Shri Praveen Rana, Shri Pawan Kumar, Shri Hitender and Ms. Gargi Yadav won Silver Medal Commonwealth Wrestling Championship held at Johanesburg (South Africa) from 15.12.2017 to 17.12.2017.

xi) Indian Women Cricket Team were Runners Up in ICC Cricket (W) World Cup held at England from 24.06.2017 to 23.07.2017.

xii) Shri A Baby Singh won Gold Medal in 51st Asian Body Building Championship held at Seoul (South Korea) from 20.08.2017 to 26.08.2017.

2. At National Level :-

During 1st April, 2017 to 31st March, 2018, Indian Railway team won National titles in 24 disciplines and stood runners-up in 10 disciplines and podium third in 06 disciplines.

3. Following Railway players have been honored with National Sports Awards during 2017-18:-

S. No.	Name	Game	Award	Rly.
(i)	Ms. Harmanpreet Kaur	Cricket	Arjuna Award	WR
(ii)	Shri Satyawart Kadian	Wrestling	Arjuna Award	NR
(iii)	Shri Roshan Lal	Wrestling	Dronacharya Award	NR-(After Retirement)
(iv)	Ms. Sumarai Tete	Hockey	Dhyan Chand Award	SER
(v)	Ms. Sakshi Mailk	Wrestling	Rajiv Gandhi Khel Ratna Award	NR

Finance

Indian Railways financial results for 2017-18 compared with the previous year are tabulated below:

		(₹ in crore)
	2016-17	**2017-18**
Capital-at-charge	**2,49,007.87	***2,71,275.73**
Investment from Capital Fund	53,449.91	**53,449.91**
Total	3,02,457.78	**3,24,725.64**
Passenger Earnings	46,280.46	**48,643.14**
Other Coaching Earnings	4,312.00	**4,314.43**
Goods Earnings	1,04,338.54	**1,17,055.40**
Sundry Earnings	10,368.04	**8,688.18**
Gross Earnings	1,65,299.04	**1,78,701.15**
Suspense	-6.84	**24.16**
Gross Traffic Receipts	1,65,292.20	**1,78,725.31**
Ordinary Working Expenses	1,18,829.61	**1,28,496.51**
Appropriation to Depreciation Reserve Fund	5,200.00	**1,540.00**
Appropriation to Pension Fund	35,000.00	**45,797.71**
Total Working Expenses	1,59,029.61	**1,75,834.22**
Net Traffic Receipts	6,262.59	**2,891.09**
Miscellaneous Transactions	-1,349.59	**-1,225.48**
Net Revenue Receipts	4,913.00	**1,665.61**
Dividend payable to Genl Revenues $	0.00	**0.00**
Excess (+)/Shorfall (-)	4,913.00	**1,665.61**
Percentage of Net Revenue to Capital-at-charge including investment from Capital Fund	1.62	**0.51**
Operating Ratio (%)	96.50	**98.44**
Capital-at-charge (including investment from Capital Fund) per NTKM (in paise)	431	**418**

* Excludes ₹13,956.34 crore of MTPs, ₹1,026.64 crore of Circular Railways, ₹16,026.70 crore of Udhampur-Srinagar-Baramulla Project (National Project), ₹11,954.00 crore of appropriation to SRSF, ₹14,288.51 crore investment in DFCCIL, ₹15,000.00 crore investment in RRSK and ₹12,107.03 crore investment in RSF. Includes ₹15873.41 crore of Production Units.

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

$ No Dividend was payable

Revenue:

Revenue from Freight accounted for 65.50% of Gross Earnings. Passenger Earnings constituted 27.22% of the Gross Earnings, of which

5.76% was from Suburban Services, 82.74% from Express Long distance and 11.50% 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 90.41% of the total goods earnings, while commodities other than the above accounted for 6.57%. Miscellaneous realization like demurrage, wharfage, shunting and siding charges etc. made up the remaining 3.02%.

Balance Sheet:

A brief summary of Balance Sheet as on 31st March, 2018 compared with the previous year is given below:

(₹ in crore)

	As on 31.03.2017	As on 31.03.2018	Variation
Assets			
Block Assets	4,71,776.39	**5,17,324.19**	45,547.80
Fund with Central Government			
(i) Reserve Fund	2,577.04	**3,978.09**	1,401.05
(ii) Banking Accounts	58,784.12	**62,758.78**	3,974.66
Sundry Debtors	3,856.37	**4,075.32**	218.95
Cash in hand	675.96	**786.96**	111.00
Total	5,37,669.88	**5,88,923.34**	51,253.46
Liabilities			
Represented by:			
Capital-at-charge	**2,75,584.46	***3,01,590.94**	26,006.48
Investment financed from internal resources etc.	1,96,191.93	**2,15,733.25**	19,541.32
Total (i)	4,71,776.39	**5,17,324.19**	45,547.80
Reserve Fund	2,577.04	**3,978.09**	1,401.05
Total (ii)	2,577.04	**3,978.09**	1,401.05
Banking Accounts			
(i) Provident Fund	35,003.54	**36,737.67**	1,734.13
(ii) Miscellaneous Deposits etc.	23,699.98	**25,956.22**	2,256.24
(iii) Loans and Advances	80.60	**64.89**	-15.71
Total (iii)	58,784.12	**62,758.78**	3,974.66
Sundry Creditors etc. **(iv)**	4,532.33	**4,862.28**	329.95
Total (i) to (iv)	5,37,669.88	**5,88,923.34**	51,253.46

* Excludes ₹13,956.34 crore of MTPs, ₹1,026.64 crore of Circular Railways, ₹11,954 crore of appropriation to SRSF, ₹15,000.00 crore appropriation to RRSK and ₹12,107.03 crore appropriation to RSF. Includes ₹16,026.70 crore of Udhampur-Srinagar-Baramulla Project (National Project) and ₹14,288.51 crore investment in DFCCIL.

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

Cash Flow:	2017-18	(₹ 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	52,134.25	**53,442.35**
By replacement of assets	1,308.10	
Payments of interest on loans, repayment of loans and increase/decrease in Reserve Funds		
Payments of interest on loan for Development Fund	0.00	**876.21**
Repayment of loan for Development Fund	0.00	
Increase (+)/ Decrease (-) in Funds balances	876.21	
Payment for Accident Compensation	0.00	
	Total	**54,318.56**
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.	3,051.40	**32,192.01**
Development Fund financed from Surplus	1,505.61	
Development Fund financed from General Revenue	0.00	
Capital Fund financed from surplus	0.00	
Capital Fund financed from Railway Revenue (for capital component of IRFC lease charges)	0.00	
Railway Safety Fund financed from surplus	160.00	
Debt Service Fund financed from Surplus	0.00	
Railway Safety Fund financed from General Revenues from (Central Road Safety Fund)	11,375.00	
Spl. Railway Safety Fund financed from Surplus	0.00	
Spl. Railway Safety Fund financed from Genl. Revenues	0.00	
RRSK Finance from General Revenue (Capital)	5,000.00	
RRSK Finance from RSF	10,000.00	
RRSK Finance from DRF	1,100.00	
OLWR	0.00	
Cash Surplus - Working Results		**1,665.61**
Appropriation to Development Fund		**-1505.61**
Appropriation to Capital Fund		**0.00**
Appropriation to Debt service fund		**0.00**
Appropriation to Railway Safety Fund		**-160.00**
Borrowing from General Revenues (excluding MTPs)*		**22,126.55**
	Total:	**54,318.56**

* Excludes ₹757.75 crore (MTP), ₹419.62 crore (Circular Railways), ₹988.62 crore (Udhampur –Srinagar- Baramulla) and ₹2,750.00 crore DFCCIL. Includes ₹644.54 crore of PUs.

Composite Input Cost Index

Base 2011-12=100

	2016-17		**2017-18****	
	Revenue Index	Cost Index	**Revenue Index**	**Cost Index**
Unit Revenue:				
Average receipt per pkm	148.70*		**151.98**	
Average receipt per ntkm	165.80*		**166.48**	
Cost Indices of Inputs				
Labour: Average annual wage per employee @		199.0		**225.9**
High Speed Diesel(H.S.D.)		74.4		**84.4**
Electricity (Railway traction)#		104.2		**103.7**
Transport equipment and parts#		110.4		**110.7**
Non-Ferrous Metals #		100.1		**107.9**
Electrical machinery, equipment & battery#		108.2		**109.6**
Lubricants#		116.8		**114.0**
Manufactured products		110.7		**113.8**
Ferrous Metals#		91.1		**101.4**
Composite weighted index of inputs		158.4		**175.8**

* Revised

** Provisional

@ Based on information received from Directorate of Statistics and Economics.

S.No. 2-9 based on information received from Office of Economic Adviser, DIPP

From the WPI new base series of 2011-12, following items have been taken as proxy for items in 2004-05 series:

Electricity for Electricity (Railway traction)

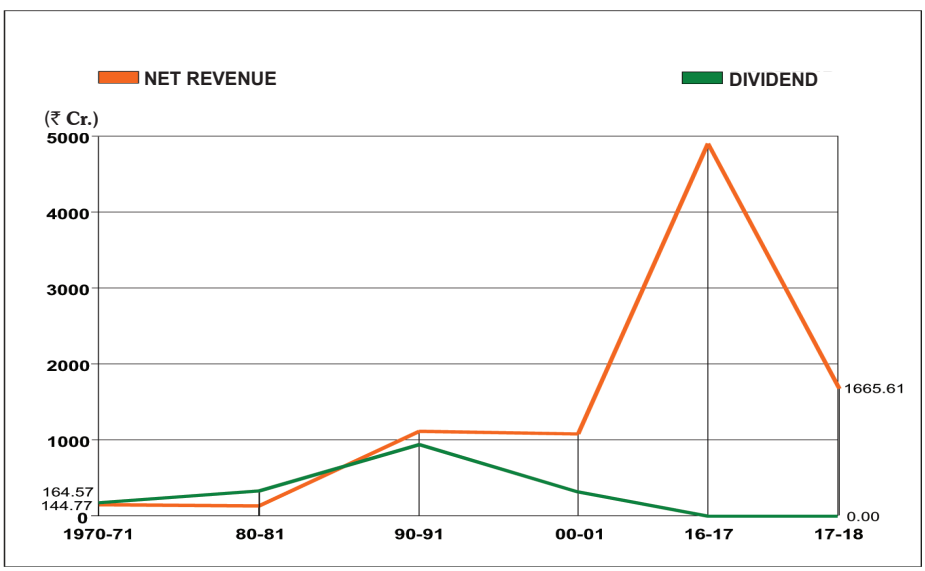
Manufacture of non-ferrous metals incl. precious metals' for 'Non-ferrous metals'

Manufacture of electrical equipment for 'Electrical machinery, equipment and battery'

Lube oils' for 'Lubricants'

Manufacture of basic metals' for Ferrous metals'

NET REVENUE AND DIVIDEND



Social Service Obligation

Indian Railways (IR), in the larger social and national interest, undertakes certain uneconomic operations in transportation to provide affordable transport facilities to poorer sections of society and to facilitate the movement of essential commodities meant for mass consumption. Losses incurred on this account fall under Social Service Obligation of IR.

Net Social Service Obligation borne by IR in 2017-18 is assessed at ₹32,358.19 crore excluding staff welfare cost (₹6,067.23 crore) and law and order cost (₹4,596.70 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;

Concession in passenger fares;

Losses on EMU Suburban Services;

Operation of Uneconomic Branch & New Lines opened for Traffic during the last 15 years;

Operation of Strategic Lines;

Pricing of passenger fares below cost;

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 2017-18 amounted to ₹60.19 crore.

Commodities	Losses(in Crore of ₹)
Fruit &Vegetables	46.01
Charcoal	6.18
Bamboos	4.30
Jute Raw Unpressed	1.35
Other Wood	1.20

Glass Wares	0.46
Cotton Manufactured other than piece goods	0.42
Paper	0.12
Cotton Raw pressed	0.11
Wool Raw and Waste	0.02
Rubber Crude & Raw	0.01
Total	**60.19**

These commodities constituted 0.61% of the total revenue NTKMs and 0.26% of freight earnings in the year 2017-18.

Concession in passenger fares:

As a welfare measure, Indian Railway extend concessions in passenger fares to more than 50 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. Revenue foregone due to concession in passenger fares during the year 2017-18 amounted to ₹1,809.64 crore.

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.

Losses on EMU Suburban Services :

Analysis of the profitability of EMU Suburban Services in Chennai, Kolkata, Mumbai and Secunderabad during the year 2017-18 has revealed an overall loss of ₹6,184.45 crore. Lag in the rise of passenger fares with respect to inflationary pressures prevalent in the economy has contributed to EMU Suburban losses.

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 105 uneconomic branch lines for the year 2017-18 shows that, on an original investment

on these lines of the order of ₹4,238.41 crore, loss during the year 2017-18 amounted to ₹2,042.38 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 16 lines examined in 2017-18, 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 2017-18

S. No.	Name of the branch line	Date of opening	Cost (₹ in crore)	Expected return on investment	Actual return on investment		
				(%)	2015-16 (%)	2016-17 (%)	**2017-18 (%)**
	Developmental Lines						
1	Lanjigarh-Bhawanipatna-Junagarh (BG) 54.30 Kms.	11.08.2012	295.11	2	-4.2	-3.5	**-1.5**
2	Abohar-Fazilka (BG) 34 Kms.	16.07.2012	232.50	-7.44	-11	-13	**-14**
3	Taran Trn-Govindwal (BG) 21.416 Kms.	06.08.2011	81.44	NA	-20	-23	**-24**
4	Ludhiana-Sahnewal (BG) 15.11 Kms.	17.11.2012	289.40	-2.26	-4	-4	**-5**
5	Udhampur-SVDK (BG) 25 Kms	04.07.2014	1231.09	NA	-2	-2	**-2**
6	Jammu Tawi-Udhampur (BG) 53 Kms.	2004	521.00	0.50	-6	-8	**-9**
7	Banihal-Baramula (BG) 13.7 Kms.	26.06.2013	4917.00	-1.30	-2	-2	**-3**
8	Chuaru Takrala-Amb Andaura (BG) 11.17 Kms.	2011-12	257.64	0.18	-4	-5	**-5**
9	New Morinda-Sahnewal (BG) 52.18 Kms.	2013-14	716.67	-2.26	-7	-8	**-8**
10	Chandigarh-Morinda (BG) 43.89 Kms.	2006-07	402.89	-2.26	-14	-16	**-12**
11	Una Himachal-Chuaru Takrala (BG) 16.5 Kms.	2005-06	385.59	0.18	-4	-5	**-4**
12	Rewari-Jhajjar-Rohtak (BG) 81.257 Kms.	08.01.2013	341.65	-4.78	-2	-2	**-2**
13	Kolayat-Phalodi (BG)112 Kms.	2006-07	170.78	-3.06	-19.76	-27.56	**-11.13**

14	Madar-Pushkar (BG) 25.7 Kms.	23.01.2012	132.12	-4.06	-1.26	-1.54	**-1.57**
15	Kakinada-Kotipalli (BG) 44.7 Kms.	13.05.2005	153.58	19.87	-6	-7	**-4**
16	Jind-Sonipat (BG-81 Kms)	26.06.16	399.21	NA	NA	0	**0**

Operation of Strategic Lines:

At present, following six operational lines only have been categorized as strategic railway lines on Indian Railways:-

(i) Pathankot-Mukerian (Northern Railway)

(ii) Rangapara North Lakhimpur-Murkongselek (Northeat Frontier Railway)

(iii) Siliguri-Jogighopa including BG conversion of Siliguri-Haldibari (Northeast Frontier Railway)

(iv) Jaisalmer-Pokaran (North-Western Railway)

(v) Bhatinda-Suratgarh (North-Western Railway)

(vi) Bhuj-Naliya (Western Railway)

Apart from the above, there are other lines which are located in the border areas and serving the strategic needs of Defence and Paramilitary forces. Some of the projects have been taken up as National Projects from strategic point of view in the northeast region. Indian Railways is maintaining these services essentially for strategic reasons despite steep operating losses. The losses accruing to IR on account of operation of Strategic lines during the year 2017-18 amounted to ₹1,797.34 crore.

Pricing of passenger fares below cost:

IR being the major transport carrier of the country bears a Social Service Obligation owing to the nature of the services it is committed to offer affordable transportation solution to the poorest section of the society. This essential feature of IR contributes not only to promoting economic and industrial growth but also in providing certain services below their cost of operation in the interest of common men. Railways therefore have to fine tune between the need to maintain its financial viability and its commitments to society at large. This places certain curbs on the commercial freedom of IR in the matter of pricing and elimination of uneconomic operation and services. The resultant losses accruing to IR on account of fares below cost of operation during the year 2017-18 amounted to ₹31,128.12 crore.

The Net Social Service Obligation borne by IR in 2017-18 assessed at ₹32,358.19 crore, constitutes 18.11% of the total revenue earnings and 18.39% of the total working expenditure.

Research and Development

RDSO under Ministry of Railways is the sole R&D organisation of Indian Railways and functions as the technical advisor to Railway Board, Zonal Railways and Production Units. RDSO's major functions involve:

- Development, adoption, absorption of new technology for use on Indian Railways.
- Development of new and improved designs of equipment and systems.
- Setting standards for adoption on Indian Railways.
- Development of specifications for materials and products needed for Indian Railways.
- Technical investigation, statutory clearances, testing and providing consultancy services.
- Inspection of critical and safety items of Rolling Stock (including Metro Stock), Locomotives, Signalling & Telecommunication equipment and Track components.
- Vendor development for safety and critical items controlled by RDSO.

RDSO also offers international consultancy services in matters pertaining to design, testing and inspection of railway equipments as well as survey for construction of new lines. RDSO attracts worldwide attention in the area of Research & Development in Railway equipment and systems.

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

Safety

CBT (Computer Based Testing): RDSO has switched over from paper pencil to Computer Based Testing for Testing for the Post of ASMs to speed up the process of recruitments, a total of 34118 ASM candidates were tested in CBT mode in 13 different cities across the country in three shifts in a single day on 30.06.2017.

Revision of Measurement Proforma for Accident Investigation: As directed by CCRS, the existing accident proforma has been revised and a draft made. Which is being reviewed at RDSO.

Introduction of USFD Testing of Rails in Track using B-Scan Machines: On Indian Railways, rails are manually scanned through Ultrasonic Single/Double Rail Tester using A-Scan method, in which the operator manually detects any rail defects by viewing Ultra Sonic image on the screen. Now RDSO has developed an improved B-Scan method of Ultra Sonic in which, the scan is continuously recorded (along with precise GPS location & time data) and kept safe for future viewing. RDSO has issued equipment specification to Zonal Railways.

Trial of Ultrasonic Broken Rail Detection (UBRD) Systems: Based on RDSO specification, the UBRD system has been installed on 20km UP line of RK-SRE section on NR and on 25 km UP line of ALD-CNB section of NCR. The equipment has potential to detecting rail fractures in real time. The system is under trial and improvements.

Reliability

Specification of Condition Based Monitoring System for Diesel Loco: Condition Monitoring is the process of monitoring of condition (temperature, pressure, vibration, current, etc) in machinery to identify any significant change indicative of a developing fault. It is considered an important tool for improving the reliability and availability of Diesel loco.

Railway Board advised RDSO to develop the specification on Condition Based Monitoring System (CBMS) for procurement for 10 ALCO Locomotives and 10 HHP Locomotives. RDSO has issued specification and advised DLW/DMW for procurement of CBMS as per RDSO Specification.

Passenger Amenities

Introduction of First Ever Indigenous Air-Conditioned EMU Rake with 3 Phase Propulsion System: With active control and supervision by RDSO, India's first indigenous Air-conditioned EMU rake manufactured by ICF, Chennai was inducted in commercial service on Western Railway on 25th Dec. 2017. It has Vestibule coaches with Automatic, Electric operated sliding plug doors.

Development of LED based Head Code, GPS based Passenger Information System (PIS) for EMU & MEMU Coaches: System displays name of next halting station, name of destination, direction of the platform etc. for the benefit of passengers.

Roof Mounted Ventilation Units (RMVUs) for 3 Phase AC EMU of MRVC Phase- II Project: 3 Phase EMU coaches under MUTP-II have been equipped with two Roof Mounted Ventilation Units (RMVUs) each to provide forced ventilation to induct requisite fresh air into the coaches to contain CO_2concentration inside coaches.

Operational Efficiency

Development of Brake Van with CASNUB Bogie: New design with CASNUB bogie has been developed for Brake van with 100 kmph potential to replace the BVZI brake van with ICF bogie. Series production has been started.

Development of FOG Vision System: To enhance the visibility to the crew during the foggy weather conditions, RDSO prepared a specification and placed trial order on M/s BEL & M/s Tata (2 nos each) during the month of Nov. 2017. It is planned to conduct the functional trails with proto type Fog Vision equipment of these firms during the current year. The successful implementation of Fog vision System is expected to improve speed of the trains during the foggy weather conditions.

RDSO Designs / Drawings of Steel Bridges: Plate Girders drawings for 25t Loading and DFC Loading (32.5t axle load) for 12.2m, 18.3m & 24.4m steel plate girder were issued. Open Web & Open Web Under slung Girder drawings for 25t loading for 30.5m, 45.7m, 61.0m & 76.2m, 91.44m and Under slung Girder of 30.5 m issued. Open Web Girder drawing for DFC Loading (32.5t Axle Load)for 30.5m, 45.7m,61.0m & 76.2m issued.

Infrastructure

Induction of New Technology- Nuclear Moisture Density Gauge: Approval for use of Nuclear Moisture Density Gauge in Iqbalgarh-Vadodra section of DFCCIL has been issued. It will accelerate the progress of construction of new embankment.

Indigenous Development

Indigenization of High capacity Draft Gear to RDSO specification No. WD-71-BD-15: For import substitution, two indigenous vendors for high capacity Draft Gear have been registered during 2017-18.

Inspection and Quality Audit

A system of Quality Audit at Railway Units is followed to have interaction with Railway units & to ensure conformance to the requirement of laid down work instructions & maintenance practices.

To bring in total transparency in vendor registration at RDSO, a system of on line vendor registration was up-graded on 08.11.2017. The up-graded portal has inbuilt application processing & monitoring system to ensure quick finalization of cases. The potential vendor can now apply on-line for approval. Drawings, specification & STRs are uploaded on website.

40643t of fabricated steel work of triangulated and welded plate girder bridges was inspected in 2017-18 as against target of 18000t. This is exclusive of the two national important bridges i.e. Bogibeel and Chenab. Eight girders of 125m span Rail cum Road bridge over Brahmputra at Bogibeel (a national importance project) have been inspected and cleared for launching in 2017-18, making the cumulative total of 39 spans.

RDSO is carrying out fabrication inspection of the Chenab Bridge and has done the prefabrication requirement like approval of QAP, scrutiny of WPSS and then qualifying the welders to take up the welding works. Till now 650 welding qualification records have been approved and 30 segments of Kauri end viaduct have been inspected by M&C directorate of RDSO.

Consultancy

Major Consultancies were provided to Zonal Railways by Geo-Technical Directorate

Consultancy	Section	Railway
Rehabilitation of Weak Formation	Mughalsarai - Patna	Danapur Division, ECR
Investigation of embankment failure site	Andul - Baltikuri	KGP Division, SER
Rehabilitation of Weak Formation	Bhopal - Bina	Bhopal Division, WCR
Remedial measures to prevent Boulder/Rock mass falling on the track	Kottavalsa - Kirandul	Waltair Division, ECoR
Remedial measures to prevent boulder/rock mass falling on the track	Karjat & Lonavala	Mumbai Division, CR
Slope Stability Analysis of High Bank Location on 3rd New BG Railway Line	Durg - Nagpur	SECR
Stabilisation of Slopes of Unstable Cuttings	Koderma - Ranchi New Line Project	Dhanbad Division, ECR
Formation Treatment	Hubballi - Hospet and Hubballi - Tumkur	SWR

IRS Code for Earthquake Resistant Design of Railway Bridges (Seismic Code) has been prepared and issued on 27.10.2017 for adoption on Indian Railways.

Tests & Trials

- 6 important Oscillation Trials involving EMU, Metro, coaches and wagons etc were conducted for improvement in passenger services and improving throughputs on Indian Railways.
- 6 important Emergency Braking Distance, Controllability and Coupler Force Trials involving EMU and coaching train rakes were conducted to improve safety.

- Speed Certificate was issued for Nagpur Metro Rail Corporation Ltd. (NMRCL)
- Speed Certificate was issued for Hyderabad Metro Rail Limited (HMRL)

Track Recording

At present total liability of track recording on Indian Railway as per IRPWM comes out to be approx. 1,95,000 track kms. During the year 2016-17, a total of 85,112 track Km have been recorded with 04 operational TRCs. In the current year, total 90193 km has been recorded with 05 operational TRCs.

Research and Collaboration

Global Technology Conference (GTC): RDSO organized a two-day Global Technology Conference on 3rd & 4th May 2017 in New Delhi. Several experts from rail transportation development and allied technological industries, academia and research fraternity across the world have been delivered over 50 presentations and interacted with experts of Indian Railways (IR) for identification of appropriate cutting edge technologies and systems available worldwide for adaptation and deployment on IR and Public Sector Units of the IR. The broad themes of the Conference were:

- Enhanced Safety
- Reduced In-service failures and automated Health monitoring & Inspection
- Capacity Enhancement and Congestion reduction
- Enhanced Customer Service

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 Limited, a Mini Ratna Schedule 'A' Public Sector Enterprise under the Ministry of Railways, is a leading player in the transport consultancy and engineering sector in India. The major business engagements as consultants, engineers and project managers are in Railways, highways, airports, ports, ropeways, urban transport and inland waterways in India and abroad. RITES is the export arm of Indian Railways for locomotives, rolling stock, equipment and spares (other than Malaysia, Indonesia & Thailand) RITES has operational experience of 44 years in over 55 countries of SAARC, ASEAN, Africa, Latin America and Middle East regions.

Capabilities

Feasibility studies, 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 has recognition by multi-lateral funding agencies- the World Bank, Asian Development Bank, UNDP (United Nations Development Programme) and AFDB (African Development Bank).

Overseas Projects

Mauritius - Construction supervision consultancy for the Metro Express

Project and detailed project report for Trident Port

Myanmar - Supply of 18 MG (Metre Gauge) diesel electric locomotives of 1,350 horse power along with spares to the Government of Myanmar.

Gabon - feasibility studies and preparation of the detailed project report for the new standard gauge railway line

Nepal - Procurement assistance and bid management services for the Integrated Check Posts at Biratnagar, Nepal through the Ministry of External Affairs, Government of India.

Bhutan - Design consultancy services for construction of cargo complex, parallel taxi way and modification of old terminals in Paro International Airport

Botswana - Consultancy services for the construction supervision of Tseshebe – Masunga Road

Sri Lanka - Supply of 6 sets BG (Broad Gauge) diesel electric multiple units and 10 BG diesel electric locomotives to Sri Lanka.

Guyana (South America) - Project Management Consultancy for East Bank - East Coast road linkage project

Bangladesh - Supply of 120 BG stainless steel passenger coaches and 26 new BG diesel locomotives.

Domestic Projects:

- Doubling of railway line from Gooty to Dharmavaram for South Central Railway and third line between Pendra Road and Anuppur for South East Central Railway in India on EPC (Engineering Procurement Construction) basis
- Railway electrification works for the Ringas – Jaipur – Sawaimadhopur section for North Western Railway and for the Vijaypur – Maksi section for West Central Railway in India.
- Conduct of the preliminary engineering – cum – traffic survey for the Dedicated Freight Corridor Projects between Kolkata – Mumbai, Delhi – Chennai, Kharagpur – Vijaywada and Chennai – Goa for the Dedicated Freight Corridor Corporation of India.
- Conduct of the project management services for the Western Dedicated Freight Corridor Project for the Dedicated Freight Corridor Corporation of India.
- Conduct of Final Location Survey and Geo – Technical investigation for the Mumbai – Ahmedabad High Speed Rail Corridor.

- Conduct of Final Location Survey and Geo – Technical investigation for the feasibility studies of the new BG railway link for the Bhanupalli – Bilaspur – Manali – Leh Railway Project in India.
- General engineering and design consultancy services for Nagpur Metro Project, Delhi Metro Project, Pune Metro Project and Ahmedabad Metro Project.
- Conduct of feasibility studies and preparation of the detailed project report for the Metro Projects in Varanasi, Thane, Kochi, Kanpur, Agra, Meerut, Allahabad and Chennai in India.
- REMCL, a Joint Venture Company of RITES and Indian Railways has successfully implemented open access supply of electricity for Railways in 10 States, covering 55% of energy requirement resulting in the annual saving of over ₹2,000 crores to Indian Railways.

Financial Performance:

The comparative financial performance of RITES during the last 2 years is as follows:

		(₹ in crore)
	2016-17	**2017-18**
Total Income	*1,507	**1,603**
Net profit after tax	331	**337**
Net worth	*2,035	**2,192**
*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, Signalling 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 42 years of its operations. It has so far completed about 380 infrastructure

projects in India and 127 Projects across the globe in more than 24 countries. As per 2018 edition of Engineering News Record (ENR) of USA, IRCON is the only Indian PSU and one of the only six 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 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 "Design, Supply, Installation, Testing and Commissioning of Computer based Interblocking Colour Light Signalling System on turnkey basis at 11 stations between Ishurdi-Darsana section." Some other Key Railway Projects are also under execution in Algeria, Bangladesh and South Africa.

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 BG 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 BG railway line from Sivok in North Bengal to Rangpo in Sikkim to provider a rail connectivity to Sikkim.

During 2017-18 major projects completed include,

- Construction of Road Over Bridge (ROB) in Bihar through its funds on 1st Km at Manpur by-pass in Gaya District.
- Construction of New Indoor Sports Complex at Gholsapur (Behala) on Sealdah Division of Eastern Railway.
- Carrying out Topographical and Geotechnical survey; Preparation of

Master Plan, Planning, Designing and Construction of Boundary Wall and allied Preparatory works for the National Institute of Technology, Mizoram.

Some of the ongoing 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 estimate cost of ₹4,500 crore in Chhattisgarh.
- Construction of Modern Coach Factory at Rai Bareilly
- Construction of RoBs in the states of Rajasthan and Bihar
- Supply, Installation, Testing and Commissioning of Ballastless Track of Standard Gauge and sub-station works for Delhi Metro under phase-III
- Four laning of Bikaner- Phalodi section in Rajasthan
- Four laning of Shivpuri Guna section in Madhya Pradesh
- Six- Laning of Davanagere- Haveri from (km. 260) to Km. 338+923) of NH-48 in the state of Karnataka to be executed on Hybrid Annuity Project on DBOT Annuity Under NHDP Phase-V
- Eight-lane Vadodara-Kim Expressway from 323.000 to 355.000 (sanap to Padra section of Vadodara Mumbai Expressway) in the state of Gujarat under NHDP Phase-VI (Phase IA – Package-II)

The Company is also engaged in construction of rural Roads under Pradhan Mantri Gram Sadak Yojana (PMGSY) and has contributed significantly in the road sector by completing about 5,000 km of roads and about 112 nos. of Road over Rail Bridges.

Financial Performance

In the Year 2017-18 the Company has registered total income of ₹4,123 crore however the Company's Average Annual Turnover for the past five years stands at ₹3,783 crore. The profit before tax achieved by the company is ₹533 crore and the Profit after Tax achieved is ₹391 crore. The Net Worth of the company stood at ₹3,751.95 crore at the end of the financial year.

Centre for Railway Information Systems (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 Railway's 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; and a Comprehensive financial management system. Mobile apps based on these domains provide information at the passengers' fingertips.

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.

Unreserved Ticketing System (UTS) provides cluster-to-anywhere booking of unreserved tickets at all stations and through mobile phones.

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

Real-time Train Information System (RTIS) captures the Train running Information automatically through GPS and is under development.

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

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

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

Automatic Fare Collection System for Kolkata Metro is a Smart Card & Token based system for use in the Kolkata Metro.

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

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

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.

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.

Control Office Application (COA) is a division-oriented application which assists the 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, creating a Master Chart, and providing a tool for path management.

Computerization of Train Signal Registers (TSR) enables station masters to record the timings of receipt and dispatch. It will interface with the Control Office Application to ease the work of the section controllers.

Crew Management System (CMS) is a browser-based application. It 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 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 (Webclaims) 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.

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.

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.

Radio frequency identification (RFID) is being used to provide an automated wagon identification system.

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

Traction Distribution Management system (TDMS) will manage the OHE assets of Indian Railways.

GIS Map & Geospatial Database for Indian Railway assets is being used for accurate location of Indian Railways assets.

Pilot Signaling maintenance management system (SMMS) will be implemented on five divisions.

CRS Sanction Management System is for managing CRS sanctions.

Fuel Management System will bring transparency in fuel consumption.

Materials Management; Financial Management; Resource management

E-Procurement System (IREPS) enables fully secured 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.

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

Centralized Material Management Information system (MMIS) includes all Purchase and Depot functions.

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

Traffic Accounts Management System is accountal system for earnings from all segments: Goods, Passenger (reserved and unreserved sector) including Parcel and Sundries; and Internal check of earnings and raising of bills against State/Central Government.

Workshop Accounts Management System is a web based interface for accountal of all activities of workshop and raising of necessary costs to relevant Heads and Internal Check Module.

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.

Network Security Infrastructure Management System has been implemented at 5 PRS / UTS data centres and CRIS data centre for provision of IPSec (Internet Protocol Security) over the Unified Ticketing Network.

Indian Railway Information Security Group Project involves setting up an Information security group in CRIS and obtaining security certification for the IR data center located in CRIS Headquarters.

Health Management Information System (HMIS) is a centralized solution for hospitals and health units of IR.

Call & Appointment Management System (CAMS) is designed, developed and implemented for managing appointments, invitations and calls.

IR-Master Data Management Project ensures the uniformity, accuracy, stewardship, semantic consistency and accountability of the enterprise's official, shared Master Data assets.

Highlights of the year 2017-18

1. IMMIS

The E-Procurement System (EPS) has been redesigned to migrate it from its obsolete software platform to standard Java EE. The NIT and Bidding module of the redesigned application was launched on 01.08.2017. Publication of all IMMS tenders through the new software was started on 23.08.2017. Online tender decision module was launched in September 2017.

2. IPAS/GST

GST was implemented successfully on target in all Indian Railway applications with effect from 01/07/2017.For manual recoveries, CRIS developed a utility for capturing required data and made it available to all Zonal Railways. The target for implementing GST in Indian Railways was met by CRIS after a concerted effort by all concerned.

3. SMS Alerts

Provisions have been made in the PRS system to send SMS to passengers of Duronto, Jan Shatabdi, Suvidha and Garib Rath trains (same as given for Rajdhani, Shatabdi, Tejas & Gatimaan train) if train is delayed more than 59 minutes. Changes have been made in the Passenger Reservation Systems (PRS) to allow DP quota booking in Suvidha & Tatkal special trains and to allow circular booking in Duronto/Rajdhani trains against disabled passenger concessions.

4. Mobile Apps

a. Hon'ble MR had announced integration of all existing ticketing digital solutions under one App in his Budget Speech 2016-17. Accordingly, Integrated Mobile Application 'Saarathi' was

developed, incorporating features of Ticketing (reserved and unreserved), Enquiry, Affiliated Services, Onboard Cleaning, and Feedback. The app was inaugurated by MR on 14/07/2017.

b. A mobile app for IR freight customers has been designed to bring ease of doing business for individuals and corporates. This app provides enhanced GIS views, dashboards and data views on multiple freight related aspects such as Track and Trace of Consignments, Private Freight Terminal / Container Rail Terminal locations over IR, Loading / Unloading Terminals, Terminal-wise pending / fulfilled Indents, Freight Rates, Route Information, along with expected freight to be charged by Railways for any movement of consignment through the Freight Calculator option.

5. PRS, UTS

a Unreserved Ticketing System software was updated to enable printing of Kannada language on the UTS ticket.

b Provision to book Paperless Mobile ticket using QR Code placed at source station was made in the UTS Android app for suburban commuters in Mumbai. This provision enables the commuter to book his journey ticket without involvement of a booking window using United Payment Interface (UPI).

c A provision was made for booking of Airconditioned tickets for local services in Mumbai in the UTS on Mobile App.

Conclusion

Information Technology has been very beneficial for the Indian Railways by providing it with ways to better connect with its passengers and freight customers. Improved access to information encourages disintermediation in all transactions between the Railways and its customers. This speeds up Railway work and greatly reduces transaction costs. In fact, implementation of effective IT systems is 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, making Railway services even better

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, 54 EC Capital Gain Bonds, Term loans from banks/financial institutions and through external commercial borrowings/export credit etc. The Department of Public Enterprises has consistently rated the Company as "Excellent" for its performance vis-à-vis the parameters set cut in the MOU.

The Company has leased rolling stock assets worth ₹1,69,989 crore to the Railways upto 31st March, 2018. Rolling Stock assets worth about ₹18,669.86 crore were financed during 2017-18. 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 `37,360 crore till 31st March, 2018.

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 11.15% p.a. in 2017-18 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 ₹3,281.43 crore to Rail Vikas Nigam Ltd. (RVNL) till the end of fiscal year 2017-18 for development of Railway Projects.

IRFC has consistent profit earning track record. It has so far paid ₹3,124 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 per with 'Sovereign' from four major International Credit Rating Agencies.

Container Corporation of India Limited (CONCOR)

Container Corporation of India Ltd. (CONCOR), a Navratna CPSE of Govt. of India, Ministry of Railways was incorporated in March 1988. CONCOR's operations commenced from Nov 1989. The Company was set up with the prime objective of developing multimodal transport and logistics infrastructure to support country's growing international trade as well as for the transport of domestic cargo in containers by adopting the latest Technology and practices. The company commenced operations on 1st November 1989. It manages the largest dry port network of India and acts as a Carrier, Terminal Operator & Warehouse/CFS Operator. CONCOR continued to be the market leader (75% share) in this sector.

The company (ISO-9001: 2015) manages with Eight Regional Offices and Corporate Office and owns total **14,534 wagons, 20695 –owned &**

leased containers, 78 Reach Stackers & 16 Gantry Cranes which interconnect a vast spread network of its 72 terminals (14-exim; 22-domestic & 36-combined) catering to both domestic and international containerized cargo. CONCOR having all these in its own kitty which all private players combined together do not even get anywhere close to it.

In terms of performance, CONCOR achieved a gross operating turnover of ₹6167.12 crore while handling a total of 3.53 million TEU's. In terms of tonnage, the company carried a total tonnage of **39.97 million tons** in FY-2017-18.

Over 26 years, the company has grown to be a major multi-modal logistics solution provider company, providing inland handling and transportation of containers predominantly by rail. It operates through two segments namely, EXIM and domestic which is engaged in handling, transportation and warehousing activities. The company has also made forays into management of ports, air cargo complexes and cold chains.

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. CONCOR has attempted to diversify its business by venturing into Air Cargo and port terminal operations through JV's with private corporate. Huge investments have been made towards creation of state of art infrastructure facilities called Multi Modal Logistics Parks which in future shall be the answer to all transportation, warehousing, clearance needs of the trader. With the upcoming Dedicated Freight Corridor and export favoring policy being adopted by the government, coupled with the fact that India is set to become favorite 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 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.

FINANCIAL PERFORMANCE:

Total revenue increased to ₹2483 crore during the year 2017-18 from

₹2153 crore of the previous year. The Corporation has earned a net profit (Profit after Tax) of ₹126 crore during the year under review as compared to the profit of ₹62 crore in the financial year 2016-17.

TRAIN OPERATING PERFORMANCE:

On an average, 52 Passenger Trains per day were run during the year 2017-18. One new train, Tejas Express was introduced during the year. The passenger earnings during the year was ₹637 crore registering an increase of 5% over the corresponding earning of ₹606 crore of last year.

On the freight front, on an average, 16 freight trains were run per day including Roll on - Roll off (RORO) services, during the year 2017-18. The freight earnings during the year was at an all-time high of ₹515 crore, as compared to last year's freight earnings of ₹440 crore, which is 17 % more than that of previous year.

PROJECT PERFORMANCE:

Udhampur-Srinagar-Baramula Rail Link (USBRL PROJECT, J&K) - So far, the Corporation has completed 27.31 km tunnel excavation, out of a total of 41 km of the construction of Katra-Dharam Section of USBRL Project, J&K. 3.506 km of tunnel excavation and 4.821 km of Tunnel Lining have been completed during the year. A turnover of ₹1076 crore in USBRL Project alone was achieved in the year which is the highest ever and 33% higher than ₹808 crore of 2016-17.

JAIGAD DIGNI RAIL CONNECTIVITY PROJECT – The project is being executed by the JV (Joint Venture) Company "Jaigad Digni Rail Limited". Work is in progress and likely to be completed in 2020.

TRACK DOUBLING - ROHA-VEER SECTION (47 KM): Track doubling of this section is expected to increase the line capacity of the Corporation. During the year, the project has achieved cumulative financial progress of ₹80.06 crore out of ₹410 crore and physical progress of 44%.

ROUTE ELECTRIFICATION OF KONKAN RAILWAY ROUTE: With complete electrification, the Corporation is expected to save approx. ₹100 crore per annum on fuel cost. For expeditious execution of the railway electrification on KR route, work has been initiated from both the ends simultaneously. Field work of casting foundations for OHE masts and other civil works are in progress.

Rail Tel Corporation of India Limited (RailTel)

RailTel was formed on 26th September 2000 with the objective of creating National Broadband Telecom and Multimedia Network in all

parts of the country, to facilitate Railways in 'expeditious' modernization of their operation and safety system and network by providing state-of-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 also developed state of art STM-16/64/DWDM network on 46,090 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 10,782 grampanchayats (under Ph-I) in 10 States/UTs of country for providing minimum 100 Mbps broadband to panchayats.

The Company is a Mini Ratna Category-I company since May, 2012 and has earned four "Excellent" rating during last five years. 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)
	2016-17	**2017-18**
Revenue share to Railways	26.88	**27.64**
License fee to DoT	41.17	**45.01**

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

Financial Performance

			(₹ In crore)
	Particulars	2016-17	**2017-18**
1	Share Capital	321	**321**
2	Gross Income	899	**1,025**
3	Gross Operating Margin	309	**317**
4	Net Profit after Tax	129	**156**
5	Net Worth	1,157	**1,249**
6	Dividend paid to Ministry of Railways	51.53	**18**

Focus Areas:

Station Wi-Fi

RailTel has partnered with Google and provided fast Wi-Fi across 400 A1 & A category railway stations bringing internet access to millions of Rail commuters thereby bridging the digital divide. This project is the biggest public Wi-Fi network in the world catering to over 7.5 million Monthly unique users and approx. 25000 first time internet users per day.

Nirbhaya Project

RailTel has been entrusted with the execution of 'Nirbhaya project' – Indian Railways' endeavour to set up high-tech Video surveillance system with Video analytics across 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 optical fiber cable and providing central view console at Zonal/Divisional HQs for use by RPF and senior management.

Rural Station Wi-Fi project

RailTel had provided RailWire Wi-Fi at 298 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 center 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.

Signalling Business

RailTel made its foray into Signalling business with its subsidiary M/s RailTel Enterprise Limited signing an MOU with M/s TVM Signalling & Transportation Systems India Pvt. Ltd. (a group company of M/s KYOSAN) for hosting a cloud based Signaling Application in RailTel Data Center. This will change the way the Indian Railways handles Signaling Design, Alterations, Proof Checking and Certification. This Design Automation Tool for KYOSAN EI will be used by Railways/PSUs/System Integrators initially for a period of 2 years. At present, there are more than 150 KYOSAN/TSTS

make Electronic Interlocking works in progress at stations over different Zones of Indian Railways.

Tele-presence as a Service (TPaaS)

RailTel in partnership with OEM has started providing Tele-presence services 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 is utilizing this infrastructure effectively for over two years with RailTel enabling over 70 functions in current financial year of Railways for various passengers services and train inaugurations and presently connecting all Zonal, Divisional Headquarters and Production Units. This service is also being used by other government organizations such as Airport Authority of India, Directorate of Logistics, Central Warehousing Corporation, Andhra Pradesh Sarva Shiksha Abhiyan, Central Mine Planning & Design Institute, Andhra Pradesh Water Resource Department, IRCON, RITES to name a few.

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. As on 31st March, 2018, the authorised share capital of the company stood at ₹50 crores and paid up share capital was ₹40 crores, fully subscribed by Ministry of Railways, Government of India.

Financial Performance Highlights

During the financial year 2017-18, the Company achieved a total income of ₹1,549.40 crore, as compared to ₹1,598.71 crore in the previous year. The Company earned Profit before tax of ₹341.48 crore in 2017-18 as compared to ₹331.45 crore in 2016-17 and Profit after tax of ₹222.02 crore in 2017-18 as compared to ₹214.69 crore in 2016-17.

The Board of Directors has recommended a Final dividend of `106.89 crore (including Dividend Distribution Tax) for F.Y. 2017-18 as against ₹101.92 crore paid in the previous year.

The financial highlights of the year 2017-18 as compared with the year 2016-17 are as below:

S. NO.	PARTICULARS	2016-17	(₹in Crores) 2017-18
1	Total Income	1,598.71	**1,549.40**
2	Total Expenditure	1,242.31	**1,181.35**
3	Gross Margin	356.40	**368.05**
4	Profit Before Taxes	331.45	**341.48**
5	Provision for Taxes	116.76	**119.46**
6	Profit After Tax	214.69	**222.02**
7.	Dividend	84.68	**88.81**
8	Net worth	778.34	**947.71**
9.	Number of Employees	1,494	**1,464**
10.	RATIO		
(i)	Total expenditure/total income	77.71%	**76.25**

The activities of company can be broadly grouped under following four segments:

1. Catering & Hospitality
2. Travel & Tourism
3. Internet Ticketing
4. Packaged Drinking Water(Rail Neer)

Catering & Hospitality:

During the year, IRCTC had 335 mobile units including 1 Tejas and Gatiman each, 17 Rajdhanis, 24 Shatabdis, 19 Durontos, 12 Hamsafars, 15 Janshatabdis and 246 Mail/Express trains. IRCTC managed 247 Static Units including 167 Refreshment Rooms, 53 Jan Ahaars and 27 Cell Kitchens.

During the year, 16 kitchen units(Refreshment Rooms, Cell Kitchens and Base kitchens) were upgraded with installation of equipments like tilting boiling kettle, tilting braising pan, vegetable process and chapatti making machine.

During the year, company commissioned 25 Food Plazas and 29 Fast Food Units thereby managing 254 operational units in all.

E-catering is expanding and around 250 stations have already been made live. The average daily bookings under E-catering for financial year 2017-18 stood at 5188 meals.

IRCTC has commissioned 5 Executive Lounges at Vijayavada and Agra Cantt. in the year 2017-18 making the total of five operational executive lounges including New Delhi, Visakhapatnam and Jaipur. The company also operates two Rail Yatri Niwas (New Delhi, Howrah) and two Budget Hotels (Puri, Ranchi)

Travel &Tourism Activities

Travel and Tourism Activities is the one of the largest businesses of IRCTC clocking a revenue of ₹406.54 crores in the FY 2017-18 and accounting for 26.18% of the total revenue of the company.

IRCTC, today, has become one of the leading travel and tourism companies in the market catering to the needs of diverse tourist segments. With the strength of being a Railway PSU, IRCTC specialises in rail tourism and at present, is the market leader in this segment.

Besides rail tourism, IRCTC has also diversified into various other tourism businesses for sustaining in the immensely competitive tourism market. The various tourism business segments of IRCTC include Maharajas' Express, Buddhist Circuit Special Train, Bharat Darshan Special Tourist Trains, State Special Tourist Trains, Rail Tour Packages, Airline ticketing, International and Domestic Air packages, Land Tour Packages, Hotel booking, Car Rental, Customised and LTC tours, Event Management.

IRCTC's online tourism portal www.irctctourism.com for booking of various tourism products is functional and available to tap the potential of business using internet. Besides IRCTC also has dedicated websites for airline ticket booking, Maharajas' Express and Buddhist Special Tourist Train.

Internet Ticketing:

E-ticketing now accounts for 65.83% of reserved tickets on Indian Railways booked online. On an average, more than 6.75 lakh tickets were sold daily through IRCTC's website during the 2017-18. The site offers round the clock ticket booking except for 35 minutes from 23:45 hrs to 00:20 hrs.

Year	2016-17	**2017-18**
No. of E-Tickets Booked (in Lakhs)	2,092.95	**2,466.47**
No. of Passengers Booked E-tickets (in Lakhs)	3,730.87	**4,340**
E-ticketing Revenue Collection (` in Crores)	24,485.21	**28,475.48**

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

- UPI/BHIM payment option made available to users.
- Aadhar Linkage to user ID to allow 12 tickets in a month
- Cab booking facility provided.
- International users can book tickets under Foreign Tourist Quota online.

Packaged Drinking Water (Rail Neer) :

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 20.20 crore bottles against total production of 18.70 crore bottles in the previous year. The capacity utilization of all plants was 82% as on 31st March, 2018.

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) 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 non-Government 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 2017-18, 5121 trains including 4250 container trains have moved on PRCL section which included 1627 double stack container trains and, traffic of 7.31 million tonnes of cargo have generated. The total apportioned earning is ₹201.01 crore from freight operations during 2017-18 and a net profit of ₹75.12 crore.

17 pairs of passenger trains are running on different sections of Project Railway. The comparative figures of 2016 - 2017 and 2017 - 2018 are:-

	2016 - 2017	**2017 - 2018**
Number of Container trains	3422	**2623**
Number of Double Stack containers trains	1390	**1627**
Number of Bulk trains	546	**481**
Number of empty trains run	451	**390**
Total number of trains run	5809	**5121**
Cargo (in Million Tonnes)	7.57	**7.31**
Gross Apportioned revenue (Rs. in crore)	217.45	**201.01**
Net Profit (Rs. in crore)	78.56	**75.12**
Net Worth (Rs. in crore) as per audited financial for the FY 2017-18)	422.26	**497.38**
Number of passenger trains	**15 pairs	****15 pairs**
** includes 4 mail / express trains, which are running weekly and 11 mail / express / passenger trains run daily		

Apart from container transportation, bulk traffic from fertilizers, food-grain, onion, salt, soda ash and cement have moved on PRCL section during the year.

PRCL will also get the benefit (being one of the primary feeder routes) of the proposed dedicated freight corridor and derive benefits of double stack container trains, which have been introduced between APM Terminals, Pipavav and various destinations

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 31.03.2018, RVNL has completed 7879.71 km of project length consisting of 230.82 km of New Lines, 2,668.52 km of Doubling, 1,676.30 km of Gauge Conversion and 3,262.07 km of Railway Electrification, 42.0 km Metropolitan Transport Project (MTP), 6 Railway Workshops and 1 Cable Stayed Bridge at Bardhhaman. 65 projects assigned to RVNL have been fully completed. During 2017-18, RVNL completed 885.5 km of project length including 315.2 km of Doubling and 425 km of Railway Electrification works,86.3 km Gauge Conversion, 42.0 km MTP, 17 km New Line and an additional 153.87 km of electrification as part of doubling and other projects. For the past six years, RVNL has been contributing more than 1/3rd of total project length completed on Indian Railways under Doubling & Railway Electrification Plan Heads.

During 2017-18, the turnover of the Company reached a figure of ₹7,556.56 crore as compared to ₹5,919.62 crore in 2016-17, i.e. an increase of 27.65%. The Gross Profit of the Company increased from ₹484.79 crore in 2016-17 to ₹564.15 crore in 2017-18.

The Profit after Tax (PAT) of the Company for the year was ₹469.66 crore as on 31st March, 2018 as compared to ₹385.02 crore in previous year i.e. an increase of 21.98%. In view of the improved financial performance in 2017-18, RVNL has paid a Dividend of ₹167.57 crore as compared to ₹154.50 crore in the previous year. The cumulative dividend paid to Ministry of Railways by RVNL is ₹575.87crore.

In addition to borrowings from IRFC for implementation of projects, comprising of ₹3,281.43 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 ₹6,703 crore against which the equity contribution of RVNL is ₹649 crore, i.e. approximately 10%. Balance funds of ₹6,054 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 Roha Rail 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 is also 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.

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. The Rules for functioning of RLDA have also been notified in the Extraordinary Gazette dated 04-01-2007.

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 2017-18, total earning of ₹42.93 crore have been realized by RLDA through small commercial sites and MFC. ₹2,580.64 crore have been received from M/s IRCON for commercial development of Bandra (E) site.

  In 2017-18, RLDA had been entrusted with 54 Sites for commercial developement During 2017-18.

- **Construction of Multi Functional Complexes (MFCs):** From 2009-10 onwards, RLDA was assigned the additional responsibility of developing Multi Functional Complexes (MFCs) 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. RLDA has been entrusted 123 MFCs for development through private developers. Out of these 49 MFCs have been awarded and 31 MFCs have been recommended for de-entrustment, due to non feasibility or being commercially unviable or requested by Railway to drop them.

- **Redevelopment of Stations:** For redeveloping railway stations, Indian Railway Stations Development Corporation Ltd. (IRSDC) was created as a Special Purpose Vehicle (SPV), a Joint Venture of IRCON & RLDA, with an authorized share capital of ₹100 crore and initial paid up share capital is ₹40 crore, which has now enhanced to ₹80 crore. Further, an MOU has been signed between RLDA & NBCC (India) Ltd. on 30-06-2017 for redevelopment of 10 stations. These stations are Ernakulam (SR) Gomtinagar (NER) Kota (WCR), Lucknow (NR), Delhi Sarai Rohilla (NR), Madgaon (Konkan Railway), Punducherry(SR), Nellore (NCR), Tirupati (SCR) and Thane New (CR) on Indian Railways. MOU has also been signed between RLDA & IRCON on 03-08-2017 for redevelopment of Safdarjung Railway Station on Northern Railway.

- **Colony Redevelopment-** 23 colonies at different locations have been entrusted to RLDA for redevelopment. The Work is in progress in these colonies.

  Non-tariff Revenue generated by RLDA and its administrative

expenditure for the last two years is given in the table below:

(₹ in crores)

S. NO.	Year	Expenditure	Earnings
1	2016-17	15.58	18.23
2	**2017-18**	**18.63**	**42.93**

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 the 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, Gujrat 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 the adoption of improved technologies leading to significant reduction in carbon footprints. The difference in volumes of freight transported by rail over the freight by road can easily be judged by the fact that one DFC train will be able to take as many as 1300 trucks off the road.

DFC will come up with several distinct features for the first time in Indian Railways. Freight carrying capacity will go up to 13,000 tonnes from the current 5000 tonnes. The maximum speed of goods trains will be 100 kmph as against the current maximum speed of 75 kmph on Indian Railways. Similarly, the average speed of freight trains will also increase from the current speed of 26 kmph to 70 kmph. The length of a Goods trains will

be increased from 700 meters to 1500 meters. Double stack containers trains well be operated on the Western DFC. DFC will use GPS based radio communication system for operating trains. DFCCIL is designed to be a very lean organization and maintenance cost is expected to be substantially low as compared to the present Railway system.

Achievements during the year 2017-18

The activities of the Dedicated Freight Corridor registered a quantum jump during the year 2017-18. DFCCIL achieved following milestones during the period:

Award of Contracts

The year 2017-18 witnessed awarding of all civil contracts of EDFC & WDFC. Upto 31.03.2018, contracts have been finalized amounting to ₹51,906 crore (97.2%) out of total contracts of ₹53,430 crore.

Finance

During the year, there was a significant increase in capital expenditure. Capex on contract, utilities, etc. amounted to ₹6,703 crore (on an accrual basis) as compared to ₹5,488 crore in 2016-17 witnessing an increase of 22%.

Progress of Work

All civil contracts for Eastern & Western DFC have been awarded and the project has witnessed a major leap in civil, electrical and S&T construction work in both the corridors.

Civil works in Ateli-phulera section (190km) have been completed and a trial ruin successfully conducted at a speed of 100 kmph on 27th march, 2018.

During the year, a total track linking of 547 km has been done, taking the cumulative track linking to 1124 km. In the same period, 61 major bridges have been completed and 45 are in progress while cumulatively 107 Major bridges have been completed. Minor Bridges above shown headway with 318 being completed and 49 in various stages of construction in 2017-18, while cumulatively, a massive 1,241 Minor bridges have been completed. Likewise, 166 Rail Under Bridges (RUBs) have reached completion and 79 are in progress while cumulatively 440 RUBs have attained completion. Similarly, one Rail fly Over (RFO) has been completed and 13 are in progress. The State Governments have agreed to share the cost of Rail Over Bridges (ROBs) on 50:50 basis. This has resulted in approximate savings of ₹2,400 crores to Ministry of Railways.

Land Acquisition

The project is spread over a length of 3,360 kms passing through 9 states and encompassing more than 60 districts involving 11,764 hectares of land with more than 3 lakh project affected persons (PAPs) DFCCIL has been abel to acquire 98.2% of the land.

Future Corridors

Four more freight corridors are to be developed. They include the East-West Corridor (Kolkata to Mumbai) spanning 2,328 kms, the North-South Corridor (Delhi-Chennai) covering 2,327 kms, the East Coast Corridor (Kharagpur-Vijayawada) of 1,114 kms and the Southern Corridor (Chennai-Goa) of a length of 829 kms. The freight Corridors, when completed will given a quantum leap to the freight and logistics sector and become a force multiplier to the Indian Economy.

MUMBAI RAILWAY VIKAS CORPORATION LTD. (MRVC)

Mumbai Railway Vikas Corporation Ltd (MRVC Ltd), a PSU of Govt. 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

The cost of the rail component of MUTP I was ₹4,452 crore out of which loan of ₹1,613 crore was taken from the World Bank. The balance expenditure had been shared equally between Government of Maharashtra & Ministry of Railways. All works have been completed and MUTP I has been closed in March 2012.

Major Infrastructural Inputs in MUTP 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 extending the length of all platforms
- 1500 V DC to 25 kV AC traction conversion on Central & Western Railway – traction conversion was completed on entire Western Railway.

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

- 559 additional services introduced on Central & Western Railway
- 1216 services 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 has been sanctioned by the Parliament in the budget of 2008-09 at 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. The work includes network expansion & capacity enhancement of Mumbai Suburban on Western & Central Railways.

Progress of MUTP II

Mumbai Urban Transport Project 2A – Completed :

The total present cost of MUTP 2A is ₹4,803 crore out of which the loan of ₹1,727 crore has been taken from World Bank. The loan is also equally shared between Government of Maharashtra & Ministry of Railways.

The works under MUTP 2A are :

S. N.	Name of Work	Agency of Execution	Completion Target
1	EMU Procurement/Manufacture (ICF) – 72/12 car rakes	MRVC/RDSO/ICF	Completed
2	1500v DC to 25kV AC Conversion (172 tkm)	CR, MRVC	Completed
3	EMU Maintenance Facilities & Stabling Lines	CR, WR, MRVC	Completed
4	Trespass Control measures	MRVC	Completed
5	Technical Assistance & Institutional Strengthening	MRVC	Completed

The World Bank loan is closed on 31.12.2016. All the works under MUTP 2A have already been completed.

Mumbai Urban Transport Project 2B– In progress :

The works under MUTP 2B are entirely funded by both Government Maharashtra and Ministry of Railways on 50:50 basis. The major works under MUTP 2B are :

S. N.	Name of Work	Agency of Execution	Completion Target
1	5th & 6th line between CSTM-Kurla	CR	Phase I- Parel Terminus – March 2019 Phase II-Parel- Kurla - March 2021
2	5th & 6th line between Thane-Diva	MRVC	March 2019
3	Extension of Harbour Line	MRVC	Completed
4	6th Line between Mumbai Central-Borivali	WR	Phase I-Bandra Terminus-Borivali-March 2019 Phase II-Mumbai Central-Bandra Terminus –March 2021
5	Resettlement and Rehabilitation	MMRDA	Along with project

Expected benefits of Mumbai Urban Transport Project – II :

- Additional 88 track kms.
- 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 (MUTP 2C):

This work was sanctioned separately during the rail budget 2012-13 at the cost of ₹714.10 crore. This work is named as MUTP 2C. The project is entirely funded by Government of Maharashtra & Ministry of Railways on 50:50 basis. The project involves infrastructure works for extending the platforms at 16 stations on CR and 5 stations on WR, and procurement of 153 coaches. The project was completed in April 2016 and all the services presently running on Harbour line with 12 coach EMU with capacity increase by 33%.

Mumbai Urban Transport Project III

To further strengthen and augment the suburban railway infrastructure in MMR, MUTP 3 has been sanctioned by Union Cabinet on 30.11.2016 at the total cost of ₹10,947 crore The cost of MUTP III will be shared equally by Ministry of Railways and Government of Maharashtra. All the activities under MUTP 3 will be implemented and executed by MRVC.

The works under MUTP III are as follows :

S. N.	Name of the work
1	New Suburban Railway corridor between Panvel-Karjat on Central Railway (Double Line)
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- 12 Car Air-Conditioned EMU Rakes
5	Trespass Control on mid-section on Central & Western Railway

Benefits of Mumbai Urban Transport Project - III

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

- Introduction of 300 additional suburban train services.
- Improved safety and security of passengers due to trespass control measures.
- Decongestion of Thane station due to Airoli-Kalva elevated link which will provide seamless connectivity of Kalyan/Dombivli to Navi Mumbai bypassing Thane station.
- Saving of travel time of about half an hour from Mumbai CST to Karjat due to availability of new route.
- Enabling of faster economic development of the area being served by the project such as Boisar, Palghar, NAINA, etc

Project under Process-

MRVC have closely interacted with GoM, Western & Central Railways and other stakeholders and conceptualized all rail projects for Sustainable Urban Transport in the City of Mumbai for the horizon of 2031. The works so identified for sustainable Urban Transport are put in a single basket which has been named as MUTP 3A:-

S. N.	MUTP 3A corridors
1	Fast elevated corridor between CSMT-Panvel on Harbour Line
2	New Suburban corridor between Panvel-Virar
3	Extension of Harbour Line between Goregaon-Borivali
4	5th & 6th line between Borivali-Virar
5	4th line between Kalyan-Asangaon
6	3rd & 4th line between Kalyan-Badlapur
7	Kalyan Yard - Segregation of Long distance and Suburban Traffic
8	a) CBTC on CSMT-Panvel on Harbour Line
	b) CBTC on CSMT-Kalyan on Central Railway
	c) CBTC on CCG-VR on Western Railway
9	Station Improvement
10	Procurement of Rolling Stock (210/12 car)
11	Maintenance facilities for Rolling Stock
12	Stabling Lines
13	Augmentation of Power Supply Arrangement
14	Technical Assistance

Benefits of Mumbai Urban Transport Project - 3A

The following benefits are expected to accrue after completion of MUTP 3A –

- Creation of additional capacity by introducing new suburban corridors, which leads to development of new CBDs & connectivity to New Airport.
- Introduction of Air-conditioned coaches with Automatic door operation to improve comfort level & safety of commuters.
- Seamless travel for long distance suburban passengers by extending and creating corridors.
- Improvement in passenger amenities, improved passenger movement at stations.
- Decongestion of entry/exit at the stations.
- Increase in safety, capacity & efficiency of suburban network by

introduction of Communication Based Train Control System.

- Segregation of suburban rail operation on Central & Western Railway.

Construction of FoBs on Central & Western Railway

Railway Board has entrusted MRVC the work of execution of FoBs on Central Railway (14) and Western Railway (16) stations of Mumbai Suburban Section. The work is targeted to be completed by December 2019.

Burn Standard Company Ltd (BSCL)

The Heritage company Burn & Co. (established in the year 1781) and Indian Standard Wagon Company Ltd (established in the year 1918) were nationalized in 1976 after amalgamation and renamed "BURN STANDARD COMPANY LIMITED". The Company came under the administrative control of Ministry of Railways (MOR) from Ministry of Heavy Industries on 15.09.2010. Against total Authorized Capital of ₹185 crore, total issued and subscribed Capital Shares of ₹184.63 crore are owned by Government of India through Ministry of Railways @ ₹1000/- per share.

The company has integrated facilities for wagon manufacturing with engineering Units at Howrah & Burnpur and Steel Foundry at Howrah. Facilities are also available for ship building / barge manufacturing at HW and Burn Standard Shipyard, Jhellingum. Total 487 employees are on roll of the company as on 31.03.18.

BSCL is a dominant player in the Wagon manufacturing and allied Foundry Components and commands around 17% to 18% of the total market share for Wagons, Bogies, Couplers etc.

Major Areas of Operations:

- Manufacturing and supply of all types of wagons.
- Manufacturing and supply of Steel Castings.
- Heavy Steel Fabrications like Steel Bridge Girder, Structural
- Barges, Ship and Marine Applications
- Heavy repairs / rehabilitation of Railway wagons.

Highlights

The company operation is concentrated in three major segments; wagon fabrication, foundry items and heavy repairing of Railway Wagons.

- During the year 2017-18, the Company achieved total revenue of ₹275.84 crore showing an increase of 41.18% over the last years total revenue of ₹195.38 crore.

- The Company incurred gross loss of ₹22.85 crore during the year 2017-18 as compared to gross loss of ₹33.51 crore during the year 2016-17.
- The Company manufactured 908 wagons against Railway Board Order during the year 2017-18 as compared to 545 wagons during the year 2016-17. The production showed an increase of 66.60%.
- The Company produced 4204.550 MT Liquid Metal and supplied 1386 bogies, 1933 Couplers and 1022 Draft Gears in the financial year 2017-18 as compared to production of 5970 MT of Molten Metal during the year 2016-17. The production of Foundry Division was tapered during the last six months of 2017-18 to reduce deployment of manpower against Contract Labour keeping in view the closure initiative taken in view of recommendation of NITI Aayog.
- During the year 2017 -18, heavy repairing of 4927 Railway wagons done as compared to 4042 Railway wagons repairing during the previous year 2016 -17.

Braithwaite & Co. Ltd (BCL)

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 9001:2015, ISO 14001:2015, OHSAS 18001:2007 and EN ISO 3834-2: 2005.

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 ₹230 Cr (Approx). The Company is also pioneer of manufacturing of various types of Cranes and supplied the sane in major Ports and Steel / Power Plants etc The Company also undertakes the job of up gradation/revamping/ AMC of different types of cranes. Major performance highlights are as follows:

Particulars	2016-17	2017-18
Production of Newly Built Wagons (No.)	777	**530**
Production of Repair Wagon (No.)	915	**919**
Sales (` Lakhs)	15,418.54	**13,088.72**
Net Profit (after tax) (` Lakhs)	(895.50)	**260.17**

Self – Sufficiency

Stores imported by IR constitute 2% of the total stores purchased. The cost of stores imported in the last three years are as under:

			(₹ in crore)
Item	2015-16	2016-17	**2017-18**
Diesel loco parts and fittings	900.53	932.09	**508.72**
Electric loco parts and fittings	42.70	176.77	**120.57**
Carriage, Wagon and EMU parts and fittings	205.65	278.65	**228.36**
Electrical stores	46.87	6.93	**17.48**
Engineering stores	2.38	4.31	**14.26**
Ball and Roller Bearings	0.37	0	**0.54**
General stores covering acids, chemicals, drugs, etc.	99.19	67.03	**43.92**
Other items including metal ferrous, complete units of rolling stock i.e. bogies, wheel -sets, couplers, etc.	32.80	27.87	**56.26**
Grand Total	1,330.49	1,493.65	**990.11**

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 2017-18 is furnished below:

	LOCOMOTIVES/COACHES	2016-17	**2017-18**
DLW	WDG-4D	12.39	**7.07**
	WDP-4D	12.63	**8.24**
	WDG-5	74.19	**73.24**
	WDG-4D (represents NRC loco)	12.63	**7.07**
	YDM-4 (represents NRC loco)	-	**0.37**
	WDG-3A (represents NRC loco)	1.44	**-**
RCF	LGS	2.05	**1.74**
	LWACCN	1.99	**1.32**
	ACCN/LHB (3 Tier AC LHB)(HUMSAFAR)	1.95	**-**
	LWACCW	2.05	**1.32**

	LWCBAC	2.12	**1.38**
	LWFAC	2.03	**1.36**
	LWFCWAC	-	**1.40**
	FACWAC	2.06	**-**
	LWFCZAC	2.08	**1.16**
	LWFCZACHS	1.63	**1.04**
	LWLCBRRM	-	**0.96**
	WLRRM/LHB	1.59	**-**
	LWLRRMHS	1.55	**1.04**
	LWS	-	**1.74**
	LWSCN	2.86	**1.88**
	LWSCZ	2.62	**1.72**
	LWSCZAC	2.07	**1.45**
	LWSCZACHS	1.40	**1.44**
CLW	WAG-9	3.66	**3.09**
	WAP-7	3.53	**2.82**
	WAP-5	4.20	**3.97**
MCF	LWACCW	3.30	**4.81**
	LWACCN	3.31	**4.67**
	HUMSAFAR	3.00	**4.04**
	LWSCN	6.96	**6.44**
	LS(GEN)	7.20	**-**
	DEEN DAYALU	-	**5.07**
	LS-5	4.39	**5.77**
	ANTYODYA	5.75	**5.46**
ICF	LWLRRM	3.20	**1.51**
	LSCN	4.01	**1.99**
	LS Antyodaya	2.81	**0.71**
	LS	-	**0.71**
	LACCW	3.75	**1.83**
	LACCN	4.33	**2.00**
	LFCZAC (Anubhuthi)	-	**1.34**
	LSCZAC	-	**1.91**

Locomotives:

Locomotives are manufactured by Chittaranjan Locomotive Works (CLW), Chittaranjan, Diesel Locomotive Works (DLW), Varanasi and Diesel Loco Modernisation Works ,Patiala. During 2017-18, CLW manufactured 350 state-of-the-art 3 phase HP BG electric locomotives. DLW manufactured 296 BG locomotives including 36 Diesel Locomotives for Non Railway Customers and 25 BG High Horse Power Electric Locomotives in the

year 2017-18. DLW also converted two WDG3A old diesel locomotives to WAGC3 electric locomotive.

Diesel Loco Modernisation Works:

DMW, Patiala rebuilt & upgraded 118 diesel electric locomotives from 2600 HP to 3100/3300 HP along with fitment of Microprocessor Based AC-DC Power Transmission system resulting improved fuel efficiency and enhanced reliability. DMW also manufactured 02 nos 3-phase (WAP-7) HP BG electric locomotives for Indian Railways.

Passenger Service Vehicles:

During the year, Integral Coach Factory (ICF), Chennai manufactured 2,397 coaches including 408 EMUs, 193 DEMUs and 24 high speed Self Propelled Accident Relief Trains (SPART), 24 coaches for Kolkata Metro, 1110 LHB, 567 conventional coaches, 36 inspection coaches and 35 coaches for Non Railway Customers. Rail Coach Factory (RCF), Kapurthala manufactured 1251 coaches including 659 LHB coaches, 194 conventional, 368 MEMU and 30 coaches for NRC customers. Modern Coach Factory at Raebareli manufactured 711 LHB coaches during 2017-18.

Wheels and Axles:

RWF, Bangalore produced 30,159 wheel-sets during 2017-18. It also manufactured 1,21,121 wheels and 72,027 axles including Wheels and Axles for wheel sets. Rail Wheel Plant Bela produced 13,880 wheels during 2017-18.

Wagons:

Indian Railways' bulk requirement of wagons is met by wagon manufacturing units both in public and private sectors as well as PSUs under the administrative control of Ministry of Railways.

During the year 2017-18, 8,015 wagons were inducted in Indian Railway System. Out of these, 1,129 wagons (including 478 BLC wagons) were manufactured by Railway Workshops and the remaining 6,886 wagons (including 395 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 2015-16, 2016-17 and 2017-18 are as under:

Year Wise out Turn Signal and Telecommunication Workshop

Year	Out Turn in Lakhs
2015-16	22098.3
2016-17	22513.21
2017-18	**25749.21**

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 these shops is as under:

Item No.	No. of jobs undertaken	
	2016-17	**2017-18**
Rewinding		
TAO 659 TM armature	127	**155**
HS15250A TM armature	525	**533**
EMU TM armature	659	**684**
3-Phase TM stator	67	**74**
3-Phase TM rotor	106	**154**
Re-shafting		
TAO 659/HS15250A TM armature	578	**603**
3-Phase TM rotor repairs	154	**89***
EMU TM armature	233	**346**
*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 ₹3,143.20 crores during 2017-18.

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 ₹49,484.70 crores in 2017-18.

A broad analysis of purchases made is given below:-

		(₹ in Crores)
	2016-17	**2017-18**
Stores for operation, repairs and maintenance	11,403	**10,284**
Stores for construction	1,264	**4,263**
Fuel	11,949	**14,925**
Stores for manufacture of Rolling Stock and purchase of Complete units	18,731	**20,012**
Total	43,347	**49,484**

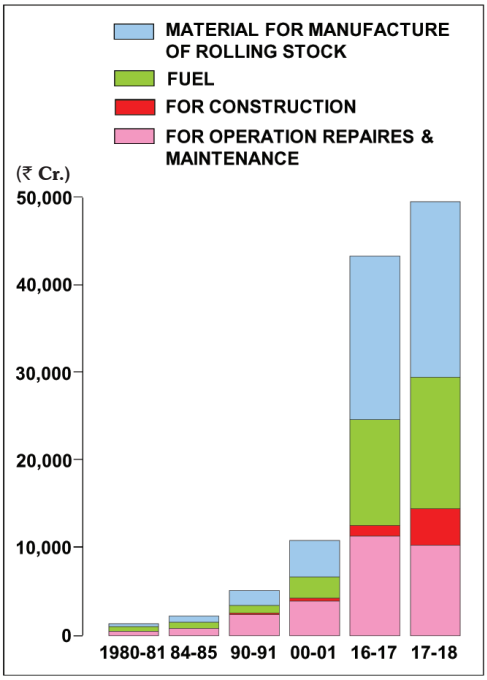
Modernisation:

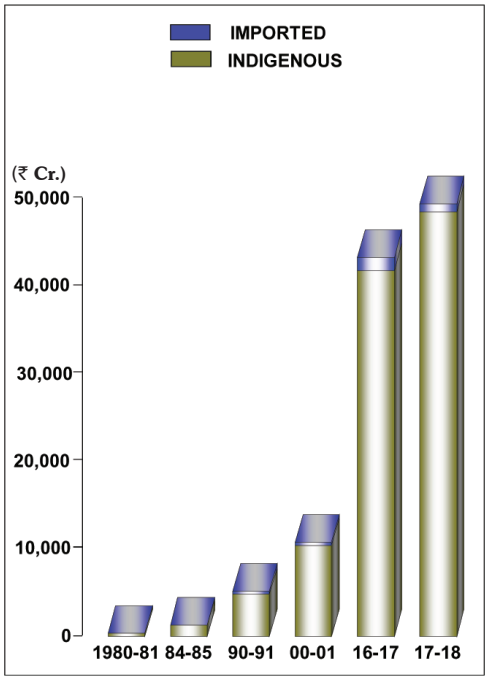
IR started e-auction during 2012-13. During 2017-18, 100% scrap sale was through e-auction. E-procurement was expanded to all the Zonal Railways and Production Units. In line with government directive all procurement by Stores Directorate (except cash purchase) is now done by e-procurement. E-procurement 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. Out of

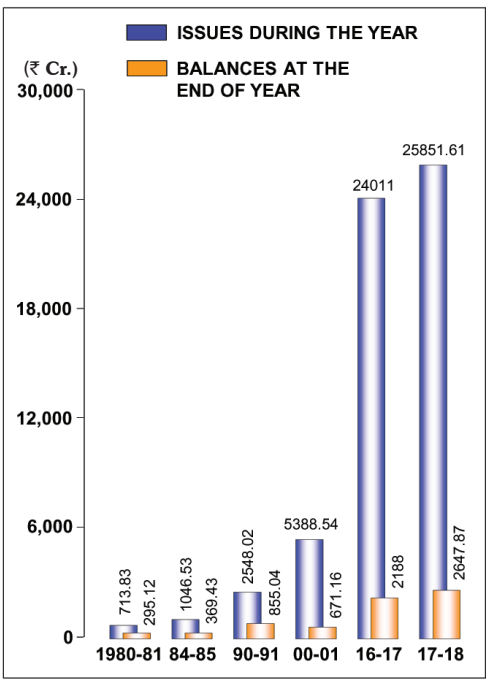
VALUE OF STORES PURCHASED



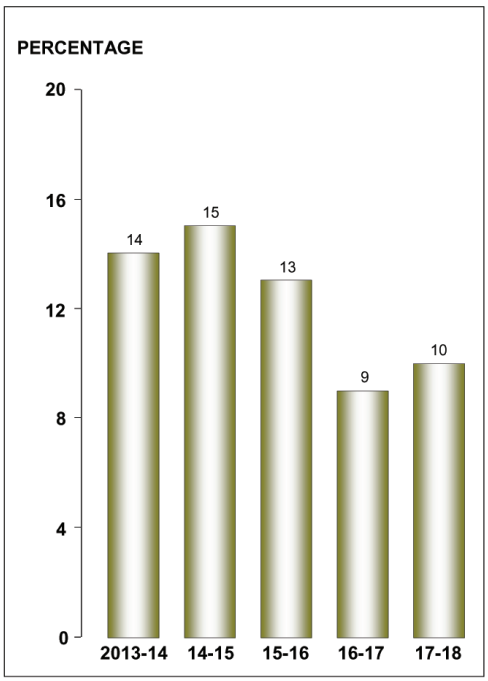


STORES-BALANCES & ISSUES (TOTAL WITHOUT FUEL)

(ZONAL RAILWAYS AND PRODUCTION UNITS)



INVENTORY TURNOVER RATIO (EXCLUDING FUEL)



₹49,484.70 crores worth of stores procured in 2017-18, 62% was done by Zonal Railways and Production Units, 35% by Railway Board and the balance 3% through other sources.

Stores worth ₹5,657.80 crores were bought from Small Scale Sector and Khadi and Village Industries in 2017-18. Public Sector Undertakings contributed 19% and other industries contributed 81% towards supplies.

Indigenous Vendor Development

The value of Indigenous stores (₹48,494.46 crores) in 2017-18 constituted almost 98% of the total purchases. However, Indian Railway has to depend on imports for certain high technology components for 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 2017-18, the Turn Over Ratio (TOR)-the main efficiency indicator for Inventory Management-was 10% (without fuel) and 8% (with fuel).

Inventory as on 31.03.2018, (without fuel) held by the Stores Departments on Indian Railways as a whole was ₹2,647.87 crores (₹3,119.71 crores with fuel) during the period against total issues of ₹25,851.61 crores (₹39,720.76 crores with fuel).

Printing and Stationery:

Eight General Printing Presses, Three Ticket Printing Presses, Three General-cum-Ticket Printing Presses and attached 'Books and Forms Depots' on Indian Railways, meets the entire requirements of passengers for Card Tickets, Blank Computer Stationery, SPT Rolls, PRS, UTS & Thermal Ticket Rolls and Money Value Books and Forms.

General Printing Presses produced an out-turn of ₹43.57 crore A-2 standard size impressions in 2017-18. Considerable progress was made in implementing Government's directives 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 2017-18 by maintaining "outstanding load" on printing presses well below one month's level.The Book and Form Depots stocked 5234 different items. Transactions of receipts and issues at these Depots were worth ₹114.18 crore and ₹111.10 crore, respectively, in 2017-18.

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 travelling, touting, unauthorized entry into coaches earmarked for ladies, unauthorized vending, trespass etc.

The Sanctioned strength of RPF is 74527. 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, including one Mahila Battalion.

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.

Registration of FIRs, their investigation and maintenance of law & order in Railway Station premises as well as in running trains are the statutory responsibility of State Governments, which they discharge through the Government Railway Police (GRP). RPF supplement the efforts of the GRPs of different States by deploying its staff for strengthening of security over Railways.

Round the clock security related assistance to passengers by RPF:

- **All India Security Help-Line:** A 24x7 security helpline has been made functional through Security Control Rooms of RPF to provide round the clock security related assistance to passengers. This Helpline is functioning through a three digit no. 182. Security helpline system is

being upgraded to include features like automated phone call distribution system, auto generated SMS, computerised registration of complaints, voice recording, dashboard and its integration with an App. Proof of concept has been completed at Bhopal, Pune, Delhi, Allahabad and Jaipur and remaining 65 locations will be upgraded soon.

- **Twitter:** Complaints/suggestions, relating to Security, received through MR Twitter handle @RailMinIndia 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 jointly prepared by the Ministry of Railways and the Ministry of Women and Child Development (MOWCD). Under the SOP, Railways provided space for setting up of Child Help Desk/Kiosk (CHD) at the nominated stations. The scheme has been implemented at 88 railway stations.

Details of children rescued by RPF in the year 2017 and 2018 (upto July):

Year	No. of children rescued by RPF
2017	11,178
2018	**7,628**

- **Surveillance through CCTV Cameras:** CCTV cameras have been provided at about 436 railway stations for round the clock surveillance to check incidents of crime against passengers. It has been further decided to provide CCTV cameras to cover all the stations to strengthen surveillance mechanism over entire network of Indian Railways.

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 2016-17 and 2017-18 is as under-

Year	No. of persons prosecuted (in lakh)	No. of persons convicted (in lakh)	Amount of fine realized (₹in crore)
2016-17	23.85	22.78	69.40
***2017-18**	**13.92**	**12.42**	**39.01**

*excluding cases under sections 137, 138 and 167 sections of the Railways Act, 1989.

- 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/Co-ordination has been maintained with GRP/State Police/ Central Intelligence Agencies to strengthen Railway security.

Special measures for women security:

Action Plan for Women Security: The year 2018 has been declared as the year of women passengers' Security over Railways. An Action Plan has been chalked out for security of women passengers over Indian Railways which include provision of CCTV cameras in ladies coaches of sub-urban trains and on platforms to cover ladies coaches during halt, initiation of proposal for amendment in the Railways Act, deployment of women police personnel in sub-urban trains during night hours, recruitment of women in RPF, special drives under the Railways Act against offenders, etc. A three member committee at Railway Board level has been constituted to supervise and monitor implementation of Action Plan. Constitution of similar committees has been done at Zonal and Divisional levels.

Operational measures for women security:

- Special Lady Squads like **'Bhairvi', 'Virangana', 'Shakti'** have been formed by Northern, Central and North Central Railways respectively to ensure safety & security of women passengers.
- All ladies special trains, running in metropolitan cities, are being escorted by lady RPF personnel.
- The Ladies compartments in local trains are being escorted by RPF and GRP during peak/non-peak hours. Staff deployment is made during late night and early morning local trains to ensure proper security to lady passengers.

- Action is taken against offenders travelling in ladies coaches by conducting intensive drives under section 162 of the Railways Act.

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 2016-17 and 2017-18 is as under-

Year	No. of cases detected under the RP(UP) Act	Value of property recovered (₹ in crore)	No. of persons arrested
2016-17	4,730	3.10	6,015
2017-18	**4,577**	**2.92**	**6,518**

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.

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 2017 and 2018. During the year 2017, 01 RPF personnel have been awarded with 'Railway Minister's Medal for Best Investigation' and 03 RPF personnel have been awarded with 'Railway Minister's Medal for Bravery'.

Alert on duty by Security personnel at Howrah Station

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 2017-18 were:

- A total of 18,272 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'ts 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, 2017.

Participative Vigilance:

- **24 Hours Vigilance Helpline:** There is 24 hours Vigilance Helpline (Helpline No.155210) of the Railways. 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 30th October to 4th November in the year 2017.

- **Counselling:** As many as 245 workshops/seminars/interactive sessions were conducted on topical issues by Vigilance in 2017-18 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 89 personnel participated in two schedules from 22nd-26th May, 2017 and 29th-02nd June, 2017.

Punitive Vigilance:

A statement showing number of officials against whom disciplinary action in vigilance-investigated cases was initiated/finalized during April 2017 to March 2018 is given below:

Vigilance investigated cases	April 2017 – March 2018
Number of officials against whom disciplinary proceedings were initiated	**5,377**
Number of officials against whom disciplinary proceedings resulted in imposition of major penalty	**1,022**
Number of officials against whom disciplinary proceedings resulted in imposition of minor penalty	**4,751**

Proactive Vigilance:

- Conducting 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 2017, these measures resulted in realization of revenue to the tune of ₹301.57 crores.
- Scrutinizing of more than 3,577 Annual Property Returns filed by Officers during 2017.

Preserving Indian Railways' Heritage

Indian Railways with more than 165 years of rich history; presents a wide spectrum of both tangible and intangible heritage. Indian Railways is proud owner of five UNESCO accorded World Heritage Sites namely Darjeeling Himalayan Railway (1999), Nilgiri Mountain Railway (2005) & Kalka Shimla Railway (2008) (together as Mountain Railways of India), Chhatrapati Shivaji Maharaj Terminus, Mumbai (2004) and Churchgate Building, Mumbai (As a part of Mumbai's Victorian and Art Deco Ensembles, 2018). There are two more in waiting or in the tentative list namely Matheran Light Railway (MLR) and Kangra Valley Railway(KVR).

However, the repository of heritage of Indian Railway is not limited to its world heritage inscriptions. Like any other industry, Railway technology evolves at a fast pace, for example, Steam Locomotives, Meter Gauge rolling stocks, Wooden body coaches, various machinery & equipment are no longer in regular operation now. With their phasing out, lots of maintenance practices have also been gradually forgotten. At times, it becomes really impossible to locate an artesian who can do valve setting of a steam locomotive or a carpenter who can precisely fix the door of wooden body saloon. Beside rolling stocks, even equipment like block instruments, their tokens, token pickup devices, quadrant signalling devices, stationary vacuum exhausters, which were very common three decades ago, are now completely phased out.

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 casting moulds, 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 buildings at Mumbai (CSMT, Bandra Suburban & Churchgate), Howrah, Chennai (Central, Egmore & Royapuram), Lucknow, Kanpur, Delhi Junction, etc. bear identities of their respective cities.

These 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 33 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 destination in their region. In addition, digital screens are being made operational at 22 stations depicting heritage and history of Indian Railways.

Indian Railways have also preserved about 223 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 17 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 Records as being the oldest working locomotive in the World and "Akbar", that featured in many Bollywood movies like Sultan, Gadar etc.

Southern Railway (SR) has also restored Express (1855), which is currently deployed to haul Steam Tourist Specials at various places over Southern Railway. South Eastern Railway (SER) is also reviving the Broad Gauge Garratt Locomotive at Kharagpur Workshop, once restored, this will become the longest and heaviest Broad Gauge Working Locomotive in the World.

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 locomotives holding of thirteen and seven respectively, attract steam lovers from India and abroad. The sight and sound of Steam Locomotives recreated smells and romance of a by-gone era.

Indian Railways maintain a large repository of built heritage like buildings, bridges, via ducts etc. As of now, about 35 bridges and 72 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 Bunglow 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 have 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 virtual tour of museums, special delegations to Divisional Railway Managers for promoting hill railways and steam tourism, capacity building of railway officers and introducing modules for training courses etc.

Narrow Gauge Train at Batasia loop on Darjeeling Himalayan Railway