INDIAN RAILWAYS
YEAR BOOK
2018 - 19

सत्यमेव जयते

Bharat Sarkar
Government of India
Rail Mantralaya
Ministry of Railways
(Railway Board)

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

Contents

Key Statistics

	Unit	2017-18	2018-19
PLANT & EQUIPMENT:			
Capital-at-Charge	₹ in crore	@3,24,725.64	**#3,48,601.77**
Total Investment	"	5,17,324.19	**5,73,641.66**
Route Length	Kms.	66,935*	**67,415**
Locomotives	Nos.	11,764	**12,147**
Passenger Service Vehicles	"	65,327	**67,597**
Other Coaching Vehicles	"	6,537*	**6,406**
Wagons	"	2,79,311*	**2,89,185**
Railway Stations	"	7,318*	**7,321**
OPERATION:			
Passenger: Train kms.	Millions	769.29	**779.24**
Vehicle kms.	"	26,195	**26,463**
Freight: Train kms.	"	396.48	**414.53**
Wagon kms.	"	18,457*	**19,364**
VOLUME OF TRAFFIC:			
Passengers Originating	Millions	8,286	**8,439**
Passenger kms.	"	11,77,699	**11,57,174**
Tonnes Originating:$			
Revenue Earning Traffic	"	1,159.55	**1,221.48**
Total Traffic (incl. non-revenue)	"	1,162.64	**1,225.29**
Net Tonne kms.$			
Revenue Earning Traffic	"	6,92,916	**7,38,523**
Total Traffic (incl. non-revenue)	"	6,93,281	**7,38,923**
EMPLOYMENT AND WAGES:			
Regular Employees	Thousands	1,270*	**1,227**
Wage Bill of Regular Employees	₹ in crore	1,28,714.74*	**1,34,364.18**
Average Annual Wage Per Regular Employee	₹ in units	10,18,501*	**10,97,370**
FINANCIAL RESULTS:			
Revenue	₹ in crore	1,78,725.31	**1,89,906.58**
Expenses	"	1,75,834.22	**1,84,780.30**
Miscellaneous Transactions	"	-1,225.48	**-1,352.42**
Net Revenue (before dividend)	"	1,665.61	**3,773.86**
Rate of Return on Capital	Percent	0.51	**1.08**
Dividend on Capital **	₹ in crore	0	**0**
Shortfall(-)/Excess(+)	"	1,665.61	**3,773.86**

@ Includes investment (₹ 53449.91 crore) from Capital Fund.
# Includes investment (₹ 53449.91 crore) from Capital Fund.
$ Excludes Konkan Railway.
* Revised
** No dividend was payble during 2018-19

Other Important Statistics

S.No.	Item	Unit	2017-18	2018-19
I	**Rail Network**			
1	Route Kilometres			
	(i) BG	Kms.	62,049*	**62,891**
	(ii) MG	"	3,201*	**2,839**
	(iii) NG	"	1,685*	**1,685**
	(iv) Total (all gauges)	"	66,935*	**67,415**
2	Running Track Kilometres (Total all gauges)	"	94,270*	**95,981**
3	Total Track Kilometres (Total all gauges)	"	1,22,873*	**1,23,542**
4	Electrified Route Kilometre (Total all gauges)	"	29,228*	**34,319**
II	**Rolling stock**			
1	Number of Locomotives	(in units)		
	(i) Steam	"	39	**39**
	(ii) Diesel	"	6,086	**6,049**
	(iii) Electric	"	5,639	**6,059**
	(iv) Total	"	11,764	**12,147**
2	Number of Wagons	"	279311*	**2,89,185**
3	Number of Coaches-	(in units)		
	(i) Passenger Carriages (including DEMU/ DHMU)	"	55,749	**57,134**
	(ii) Other Coaching Vehicles	"	6,537*	**6,406**
	(iii) EMU and MEMU Coaches	"	9,556	**10,439**
	(iv) Rail Cars	"	22	**24**
	(v) Total	"	71,864*	**74,003**
III	**Loco Utilisation**			
1	Tractive effort per loco			
	(i) BG	Kgs.	38,166	**39,413**
	(ii) MG	"	16,879	**16,226**
2	GTKMs (excl. wt. of engine & dept.) per kg. of tractive effort.			
	(i) BG	Kms.	4,062*	**3,989**
	(ii) MG	"	383	**401**
3	Engine kilometres per day per engine in use (Pass.) (B.G)			
	(i) Diesel	Kms.	594	**582**
	(ii) Electric	"	718	**678**

S.No.	Item	Unit	2017-18	2018-19
4	Engine kilometres per day per engine in use (Goods)(B.G)			
	(i) Diesel	Kms.	368	**351**
	(ii) Electric	"	393	**387**
5	NTKMs per engine hour (BG) All traction		17,474	**16,571**
6	Ineffective percentage of locomotives (B.G)	Percent		
	(i) Diesel	"	8.48	**8.53**
	(ii) Electric	"	6.80	**7.11**
IV	**Wagon Utilisation**			
1	Wagon KMs in terms of 8 wheelers	Million	18,457*	**19,364**
2	Total Carrying Capacity (All Gauges)	Million Tonnes	16.28	**16.95**
3	Average carrying capacity - wagon	Tonnes		
	BG	"	61.7	**61.6**
	MG	"	31.7	**31.6**
4	Wagon Turn Round (in days) (BG)	Days	5.21	**5.00**
5	Wagon Kms. per wagon per day (BG)	Kms	206.5	**203.9**
6	NTKMs per wagon per day (BG)	Kms	7405	**7,747**
7	Ineffective percentage of wagons (B.G)	%age	3.63	**3.61**
V	**Coach Utilisation**			
1	Vehicle Kms	Millions		
	(i) Suburban (EMU)	"	2,053*	**2,098**
	(ii) Non Suburban	"	24,140	**24,365**
	(iii) Total	"	26,195*	**26,463**
2	Vehicle Kms per vehicle day (B.G)	Kms.	555	**533**
3	Ineffective percentage of coaches(B.G) (Passenger Carriage)	Percent	5.89	**6.07**
VI	**Train Utilisation**			
a.	**Passenger Train Performance**			
1	Number of Passenger trains runs daily	Nos.	13,452	**13,523**
2	Passenger Train Kms	Millions	769.29	**779.24**
b.	**Goods Train Performance**			
1	Number of Goods trains runs daily	Nos.	9,141	**9,146**
2	Goods Train Kms.	Millions	396.48	**414.53**
3	Average Speed of All Goods Train (B.G.)			
	(i) Diesel	Kms./ Hour	22.7	**22.3**
	(ii) Electric	"	23.6	**23.8**
	(iii) All Traction	"	23.3	**23.2**
4	Average Net load of Goods train (B.G) (All traction)	Tonnes	1,763	**1,738**

S.No.	Item	Unit	2017-18	2018-19
5	Average Gross load of Goods train (B.G)(All traction)	Tonnes	3,025	**2,925**
VII	**Volume of traffic**			
a.	**Passenger Traffic (Suburban + Non-Suburban)**			
1	Passenger Originating	Millions	8,286	**8,439**
2	Passenger Kilometres	Millions	11,77,699	**11,57,174**
3	Average Lead	Kms.	142.21	**137.1**
4	Passenger Earnings	₹ in crores	48,643	**51,067**
5	Average rate per PKMs	Paise	41.30	**44.13**
	Number of Passenger carried per day	Millions	22.70	**23.12**
b.	**Freight Traffic (Revenue)**			
1	Tonnes originating	Millions	1,159.55	**1,221.48**
2	Lead (originating)	Kms.	598	**605**
3	Freight Earnings excl. Demurrarge/Wharfage	₹ in crores	1,13,523.53	**1,22,580.31**
4	Frieght NTKMs	Millions	6,92,916	**7,38,523**
5	Average rate per NTKMs	Paise	163.83	**165.98**
6	Earnings per million tonne	₹ in crores	97.90	**100.35**
7	Freight carried per day (including non-revenue)	Millions Tonnes	3.19	**3.36**
VIII	**Train Accidents (Excl. KRCL)**	Nos.	72	**59**
1	Collisions	”	3	**0**
2	Derailment	”	53	**46**
3	Level Crossing	”	13	**6**
4	Fire in trains	”	3	**6**
5	Miscellaneous	”	0	**1**
6	Accident per million train kms	”	0.06	**0.05**
IX	**Density**			
1	Net Tonne Kms per route Km. (BG)	Km.	11.17*	**11.75**
2	Passenger Kms per route Km. (BG)	”	18.89*	**18.34**
3	Gross Tonne Kms per route Km. (BG)	”	32.35*	**33.58**
X	**Comsumption of Fuel/Energy by Locomotive**			
	(i) Diesel	Million litres	2,778.43	**2749.01**
	(ii) Electric	Million KWH	16,634.17	**17681.79**
	* revised			

Some Selected Financial Ratio

S. NO.	Item	Unit	2017-18	2018-19
(A)	**Financial Ratios**			
1.	Operating ratio	%age	98.44	**97.29**
2.	Rate of return on Capital	%age	0.51	**1.08**
3.	Working ratio of IR	%age	92.5	**91.9**
4.	Operating ratio with subsidy (Cost recovery)	%age	80.0	**77.4**
5.	Operating ratio for Coaching (passenger) and Goods (Fright)			
	i. Goods	%age	58.83	**58.72**
	ii. Coaching	%age	181.20	**192.49**
6.	Debt Servicing as percentage of OWE and as a percentage of Gross receipts.			
	i. Debt servicing as percentage of OWE	%age	13.2	**13.6**
	ii. Debt servicing as percentage of Gross Receipts	%age	9.5	**10.0**
7.	Capex to Revenue ratio – Capex (from internal generation) /Revenue	%age	1.7	**2.5**
(B)	**Earning/ Yield Ratios (Based on Apportion Earning)**			
8.	Passenger yield/ PKMs	In Paise	41.30	**44.13**
9.	Freight yield/NTKMs	In Paise	163.83	**165.98**
	Productivity index			
	i. Employee Productivity		*611539	**669252**
	ii. Infrastructure Productivity		*6322773	**6646180**
(C).	**Asset Utilization**			
10.	Utilization of Assets			
	i. NTKMs per wagon per day -(BG)	KMs	7,405	**7747**
	ii. Wagon KMs per Wagon day -(BG)	KMs	206.5	**203.9**
	iii. Wagon turn around - BG	In days	5.21	**5.00**
	iv. Average Load per Wagon - BG	Tonnes	54.5	**60.8**
(D).	**Operating Indices**			
11.	Average speed of Goods Train – (BG) – All traction	KM/hour	23.3	**23.2**

S. NO.	Item	Unit	2017-18	2018-19
12.	Infective percentage of Rolling Stock – (BG)			
	i. Diesel Locos	%age	8.48	**8.53**
	ii. Electric Locos	%age	6.80	**7.11**
	iii. EMU Coaches	%age	12.2	**14.4**
	iv. Passenger Carriages	%age	5.89	**6.07**
	v. Other Coaching Vehicles	%age	6.44	**5.18**
	vi. Wagons	%age	3.63	**3.61**
13.	Specific Fuel Consumption (Consumption per 1000 GTKMs) – (BG)			
	i. Passenger service - Diesel	Litres	3.53	**3.74**
	ii. Goods services - Diesel	Litres	2.01*	**1.97**
14.	Specific Energy Consumption (Consumption per 1000 GTKMs) – (BG)			
	i. Passenger service- Electricity	K.Wt. Hrs.	19.4*	**18.9**
	ii. Goods services -Electricity	K.Wt. Hrs.	5.89	**5.83**
15.	Punctuality Index – Punctuality (M/Exp. Trains) –(BG)	%age	71.39	**69.23**
16.	Accident per Million train Kilometers		0.06	**0.05**

*Revised

Outside view of Rajendra Nagar Terminal of ECR

Economic Review

Macroeconomic outcome

According to National Statistical Office (NSO), India's real GDP (Gross Domestic Product) growth at 2011-12 prices for the year 2018-19 has been revised downwards to 6.8 percent, from 7.0 percent as per Second Advance Estimates of National Income released by NSO on 28th February 2019.

The year 2018-19 began on a robust note, but it was to be marked by unanticipated swings and turning points having direct bearing on India's macroeconomic performance. India's macroeconomic stability, however, provided a silver lining, with inflation remaining below target of 4 percent for the second financial year in succession under the Monetary Policy Committee (MPC); the current account deficit (CAD) settled below 1 percent of GDP in the fourth quarter of 2018-19; and (-) 2.1 percent of GDP in 2018-19(P). The fiscal deficit for the year as a whole was contained at 3.4 percent of GDP. External sector faced headwinds during 2018-19 as CAD exceeded net capital inflows, though reserve losses were partially recouped towards the close of the year. The Central Government's gross fiscal deficit was broadly in line with the Budget target of 2018-19 despite shortfalls in collections under GST and other indirect taxes, and also in income tax, which pulled down overall tax buoyancy.

According to International Monetary Fund's Global Economic Outlook, October 2019, global growth is forecast at 3.0 percent for 2019, (as against 3.8 percent global growth in 2017 and 3.6 percent growth in 2018) its lowest level since 2008–09 and a 0.3 percentage point downgrade from the April 2019 World Economic Outlook. Growth is projected to pick up to 3.4 percent in 2020 (a 0.2 percentage point downward revision compared with April), reflecting primarily a projected improvement in economic performance in a number of emerging markets in Latin America, the Middle East, and emerging and developing Europe that are under macroeconomic strain. In case of India, IMF has projected the growth rate at 6.1 percent in 2019 and 7.0 percent in 2020 and China at 6.1 percent and 5.8 percent in 2019 and 2020, respectively.

As per latest outlook of economy released by RBI in October 2019 Bulletin, GDP is expected to recover in second half of 2019-20, facilitated by favourable base effects and transmission of past monetary policy actions. A

slew of measures by the government impart an upside to growth prospects, such as release of funds for recapitalization of public sector banks, merger of public sector banks, reforms in the FDI regime, initiatives for exports and the real estate sector, reduction in the corporate income tax rate – and faster resolution of stressed assets may push growth above the baseline path. Intensification of global uncertainty around US-China trade tensions, a hard Brexit and geo-political tensions are key downside risks to the baseline growth path.

Further, RBI has projected real GDP growth to grow at 6.1 percent in 2019-20, from 5 percent in first quarter to 5.3 percent in second quarter, 6.6 percent in third quarter and 7.2 percent in the last quarter – with risks evenly balanced. For 2020-21, the RBI's structural model estimates indicates real GDP growth at 7.0 percent with quarterly growth rates in the range of 6.5-7.4 percent. Headline inflation is projected to remain below the medium-term target of 4 percent over the rest of 2019-20 and the early months of 2020-21. Volatility in international and domestic financial markets, as well as global crude oil prices, and domestic prices of perishable food items pose upside risks to the baseline inflation path. On the other hand, the softer outlook on global commodity prices and large buffer stocks could keep headline inflation below the baseline.

Gross Domestic Product (GDP) Growth

GDP at constant (2011-12) prices or real GDP in the year 2018-19 was estimated at ₹140.77 lakh crore (Provisional Estimate), as against the GDP of ₹131.79 lakh crore (First Revised Estimate) for the year 2017-18. The growth in real GDP during 2018-19 is estimated at 6.8 percent as compared to the growth rate of 7.2 percent in 2017-18. (Table 1)

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

	2014-15	2015-16 3rd RE	2016-17 2nd RE	2017-18 1st RE	2018-19 PE
GDP at constant	10527674 (7.4)	11369493 (8.0)	12298327 (8.2)	13179857 (7.2)	**14077586 (6.8)**
GVA at basic Price	9712133 (7.2)	10491870 (8.0)	11318972 (7.9)	12104165 (6.9)	**12906936 (6.6)**

Source: National Statistical Office (NSO), Press release dated 31st May 2019

PE: Provisional Estimate

RE: Revised Estimate

Growth rate over previous year indicated in brackets

Real Gross Value Added (GVA) at basic constant (2011-12) prices for the year 2018-19 which reflects the production or supply side method of calculating GDP is estimated at ₹129.06 lakh crore (Provisional Estimates) in comparison with ₹121.04 lakh crore (First Revised Estimate) for the year 2017-18, thus registering a year-on-year growth rate of 6.6 percent in 2018-19 as against 6.9 percent in the year 2017-18 (Table 2). The decrease in GVA in 2018-19 was mainly caused by subdued growth in Agriculture, Forestry and Fishing, Mining and Quarrying, Electricity, Gas, Water Supply and other utility services sectors, Trade, Hotel, Transport, Communication and Services as well as Public Administration, Defence and other services.

The sectors which registered a growth rate of over 6.0 percent in 2018-19(PE) in GVA at constant (2011-12) prices are Manufacturing (6.9%), Electricity, Gas, Water Supply & other utility services (7.0%), Construction (8.7%), Trade, Hotels, Transport, Communication and services related to broadcasting (6.9%), Financing, Real Estate & Professional Services(7.4%) and 'Public Administration, Defence and other services (8.6%). The growth in the 'Agriculture, Forestry and Fishing', 'Mining and Quarrying' is estimated to be 2.9 percent and 1.3 percent, respectively (Table 2).

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

	2016-17	2017-18	2018-19 (PE)
I. Agriculture, Forestry & Fishing	6.3	5.0	**2.9**
II. Industry			
Mining & Quarrying	13.0	5.1	**1.3**
Manufacturing	7.9	5.9	**6.9**
Electricity, Gas, Water Supply & other utility services	9.2	8.6	**7.0**
Construction	1.3	5.6	**8.7**
III. Services			
Trade, Hotels, Transport, Communication and services related to broadcasting	7.2	7.8	**6.9**
Financing, Real Estate & Professional Services	6.0	6.2	**7.4**
Public Administration, defence and other services	10.7	11.9	**8.6**
GVA at Basic Price	7.1	6.9	**6.6**

Source: National Statistical Office (NSO), Press release dated 31st May 2019.
PE: Provisional Estimates

Agriculture

Growth rate in Agriculture and allied sectors, after recovering to 6.3 percent in 2016-17, has shown a continuous dip thereafter (Table 2). In 2017-18, growth rate in Agriculture and allied sector declined to 5 percent and it declined further to 2.9 percent in 2018-19. As per the 4th Advanced Estimates, the foodgrains production in 2018-19 is 284.95 million tonnes. This is lower by 0.06 million tonnes as compared to 285.01 million tonnes in

the corresponding period of last year (Table 3). Except for Rice and Wheat, all other categories of foodgrains registered a decrease in production in 2018-19 over the previous year.

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

Items	2014-15	2015-16	2016-17	2017-18 Final Estimates	2018-19 4th AE
Food grains	252.02	251.54	275.11	285.01	**284.95**
Wheat	86.53	92.29	98.51	99.87	**102.19**
Rice	105.48	104.41	109.70	112.76	**116.42**
Coarse Cereals	42.86	38.52	43.77	46.97	**42.95**
Pulses	17.15	16.32	23.13	25.42	**23.40**

Source: Department of Agriculture, Cooperation and Farmers Welfare, 4th Advance Estimate of Production of Foodgrains for 2018-19.

Industry

As per the national accounts data of the NSO, Index of Industrial Production (IIP), which broadly comprises of Mining, Manufacturing and Electricity, was 3.6 percent in 2018-19 as compared to 4.4 percent in 2017-18 (Table 4). Manufacturing sector witnessed a decline in growth rate from 4.6 percent in 2017-18 to 3.6 percent in 2018-19. Growth rate in Mining sector increased from 2.3 percent in 2017-18 to 2.9 percent in 2018-19 and in Electricity sector, it declined from 5.4 percent in 2017-18 to 5.2 percent in 2018-19.

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

(Base: 2011-12 = 100)

	Weight	2014-15	2015-16	2016-17	2017-18	2018-19
Industry Group						
General Index	100.00	4.0	3.3	4.6	4.4	**3.6**
Mining	14.3725	-1.4	4.3	5.3	2.3	**2.9**
Manufacturing	77.6332	3.8	2.8	4.4	4.6	**3.6**
Electricity	7.9943	14.8	5.7	5.8	5.4	**5.2**

Source: National Statistical Office (NSO), Ministry of Statistics and Programme Implementation, Press release dated 12th June, 2019.

Note: Growth is over the corresponding period of previous year.

In terms of use-based classification, the growth rate of IIP for Primary goods declined from 3.7 percent in 2017-18 to 3.5 percent in 2018-19. Capital goods, witnessed a growth rate of 2.8 percent in the year 2018-19, as against 4.0 percent in 2017-18. Intermediate goods recorded a decline of 0.5 percent in 2018-19, as against 2.3 percent increase in 2017-18.

Infrastructure/Construction goods recorded a growth of 7.5 percent in 2018-19 as against 5.6 percent in 2017-18. Consumer durable goods recorded an increase of 5.5 percent in 2018-19 as compared to 0.8 percent in 2017-18. Consumer non-durables grew by 3.9 percent in 2018-19, as against the growth rate of 10.6 percent in 2017-18.

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) comprising weight of 40.27 percent in the items included in IIP, grew at same rate of 4.3 percent in 2018-19 also. Crude oil with a negative growth rate of 4.1 percent continued to be the worst performing infrastructure industry in 2018-19. Cement registered the maximum growth at 13.3 percent in the year 2018-19, followed by Coal at 7.4 percent, Electricity at 5.2 percent, Steel at 4.7 percent, Refinery products at 3.1 percent, Natural Gas at 0.8 percent and Fertilizers at 0.3 percent(Table 5).

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

Sectors	Weight	2014-15	2015-16	2016-17	2017-18	2018-19
Coal	10.3335	8.0	4.8	3.2	2.6	**7.4**
Crude oil	8.9833	-0.9	-1.4	-2.5	-0.9	**-4.1**
Natural Gas	6.8768	-5.3	-4.7	-1.0	2.9	**0.8**
Refinery Products	28.0376	0.2	4.9	4.9	4.6	**3.1**
Fertilizers	2.6276	1.3	7.0	0.2	0.03	**0.3**
Steel	17.9166	5.1	-1.3	10.7	5.6	**4.7**
Cement	5.3720	5.9	4.6	-1.2	6.3	**13.3**
Electricity	19.8530	14.8	5.7	5.8	5.3	**5.2**
Overall	100.0000	4.9	3.0	4.8	4.3	**4.3**

Source: Office of the Economic Adviser, D/o Industrial Policy & Promotion, April 2019

External Sector

Foreign Trade

The year 2018-19 registered a moderate export growth of 9.15 percent, as compared to 10.29 percent growth in 2017-18. Major boost was registered in oil exports in 2018-19, which recorded a growth of 23.84 percent as compared to non-oil exports which witnessed a growth rate of 6.42 percent. Imports also registered a growth of 10.20 percent in 2018-19, with oil imports and non-oil imports registering a growth of 29.66 percent and 4.28 percent, respectively (as per RBI bulletin dated 11.06.2019).

Trade deficit, accordingly, which was at US$ 160.04 billion in 2017-18 rose to US$ 180.28 billion in 2018-19.

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

Item	2017-18	Growth* (%)	2018-19	Growth* (%)
Exports	308.97	10.29	**337.24**	**9.15**
Imports	469.01	19.47	**517.52**	**10.34**
Trade Balance#	-160.04		**-180.28**	

Source: RBI Annual report, 29th August 2019.

Exports minus Imports ; *Over the previous year

Current Account Deficit (CAD)

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

Year	2014-15	2015-16	2016-17 PR	2017-18 (P)	2018-19 (P)
Trade Balance	-144.94	-130.08	-112.44	-160.04	**(-)180.28**
Net Invisibles	118.08	107.93	98.03	111.32	**123.03**
Current Account Balance	-26.86	-22.15	-14.42	-48.72	**(-)57.26**
Current Account Balance as a Ratio to GDP (%)	-1.3	-1.1	-0.6	-1.8	**(-)2.1**

Source: Annual data from 2014-15 to 2018-19 is from RBI Annual report dated 29th August 2019.

PR is partially revised

(P) : Provisional

Foreign Capital Inflows

Net Foreign Direct Investments (FDI) increased by 9.90 percent from US$ 30.29 billion in 2017-18 to US$ 33.29 billion in 2018-19. Net Portfolio Investment declined to US$ (-)1.98 billion in 2018-19, as compared to US$ 22.12 billion in the year 2017-18. (Table 8).

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	30.29	22.12
2018-19	**33.29**	**-1.98**

Source: RBI Bulletin dated 11th June 2019.

Foreign Exchange Reserves & Exchange rate

India's Foreign Exchange Reserves were at US$ 411.91 billion at the end of March 2019 as compared to US$ 424.36 billion at the end of March 2018. The Indian rupee was one of the least volatile Emerging Market (EM) currencies during 2017-18 and traded in the range of 63.63 to 65.08 per US$. During 2018-19, Indian rupee traded with a depreciating trend against US dollar and touched a historical low of 74.4 per US$ (reference rate) on October 11, 2018 before recovering by 4.1 percent to 69.2 per US$ on March 29, 2019. During H1 of 2018-19, rupee remained weak due to concerns related to widening of CAD owing to rising crude oil prices coupled with the tightening of financial conditions caused by increase in Federal Funds rate by the US Federal Reserve. Thereafter, softer monetary policy stance across major central banks and easing of crude oil prices coupled with return of risk-on sentiment triggered Foreign Portfolio Investments (FPIPs) inflows and helped rupee to recover in Q4 of 2018-19. Notwithstanding the overall depreciation of rupee against US dollar in 2018-19, as against 2017-18, it performed better than some of other major EME currencies, such as, Argentine peso, Turkish lira, Brazilian real, and Russian ruble, which depreciated by more than 10 percent vis-à-vis US dollar. Apart from rupee depreciating by 7.8 percent vis-à-vis US dollar in 2018-19, it depreciated against other major currencies also. It depreciated by 7.7 percent against Yen, and 6.8 percent against Euro and Pound Sterling each.2

Fiscal outcome

Major fiscal indicators of the Central Government indicated in the table 9 include improvement in the Central Government finances like tax to GDP ratio, significant consolidation of revenue expenditure and gradual increase in capital spending in 2018-19(Provisional Actual-PA). These have led to progressive reduction in primary and Fiscal Deficit. Comparison of Provisional Actuals with budget estimates for the year 2018-19 reveals that Government has been able to contain Fiscal Deficit at 3.4 percent of GDP through compression of Government expenditure. The entire reduction is in Revenue Expenditure. As percent of GDP, total Expenditure fell by 0.3 percentage points in 2018-19 (PA) over 2017-18, with 0.4 percentage points reduction in Revenue Expenditure and 0.1 percentage points increase in Capital Expenditure.

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

(as percent of GDP)

	2014-15	2015-16	2016-17	2017-18	2018-19 (BE)	2018-19 (PA)
Revenue Receipts	8.9	8.7	9.0	8.4	9.2	**8.2**
Gross Tax Revenue	10.0	10.6	11.2	11.2	12.1	**10.9**
Total Expenditure	13.4	13.1	12.9	13.5	13.0	**12.2**
Revenue Expenditure	11.8	11.2	11.1	11.0	11.4	**10.6**
Capital Expenditure	1.6	1.8	1.9	1.5	1.6	**1.6**
Interest payment	3.2	3.2	3.2	3.1	3.1	**3.1**
Major subsidies	2.1	1.9	1.3	1.1	1.4	**1.0**
Revenue Deficit	2.9	2.5	2.1	2.6	2.2	**2.3**
Fiscal Deficit	4.1	3.9	3.5	3.5	3.3	**3.4**
Primary Deficit	0.9	0.7	0.4	0.4	0.3	**0.3**

Source: Economic Survey 2018-19

BE- Budget Estimates

PA_Provisional Actuals

[2] Source: Economic Survey, 2018-19.

Inflation

Headline Wholesale Price Index (WPI) for all commodities averaged 2.96 percent in 2017-18 and accelerated to 4.26 percent in 2018-19. This was mainly on account of fuel inflation, which was 8.11 percent in 2017-18 and increased to 11.58 percent in 2018-19 due to strong global demand and subsequent rise in the global oil prices. Inflation in primary articles group increased from 1.32 percent in 2017-18 to 2.76 percent in 2018-19 whereas the Inflation in manufactured products firmed up from 2.80 percent in 2017-18 to 3.60 percent in 2018-19(Table 10).

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

Items/Groups	Weight (%)	April-March (Average)	
		2017-18	2018-19
All Commodities	100	2.96	**4.26**
1. Primary articles	22.6	1.32	**2.76**
2. Fuel and Power Group	13.1	8.11	**11.58**
3. Manufactured Products	64.2	2.80	**3.60**

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

Headline Inflation (Average of months April-March) measured in terms of Consumer Price Index (CPI)(Base 2012=100), rural and urban combined, eased from 3.6 percent in 2017-18 to 3.4 percent in 2018-19. In the year 2012-13, the CPI inflation 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 nine 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: Percentage of total production plus imports of select major commodities carried by the Indian Railways

	Coal	Iron Ore	Cement	Foodgrains	Fertilizers	Pol Products
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	62.77	69.05	36.66	15.95	87.01	15.16
2017-18 (R)	62.75	66.68	37.43	15.26	85.46	14.87
2018-19(P)	**62.74**	**62.64**	**34.66**	**13.78**	**85.91**	**14.59**

(P) Provisional (R) Revised

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

Table 12: SELECTED ECONOMIC INDICATORS

	ITEM		Unit / Base	2014-15	2015-16 3rd RE	2016-17 2nd RE	2017-18 1st RE	2018-19 PE
I.	(a)	**Net National Income**						
	(i)	At 2011-12 prices	₹ Crore	9224343	9963681	10772800	11531159	**12329646**
	(ii)	At current prices	₹ Crore	10978238	12162398	13595261	15128474	**16837219**
	(b)	**Per capita income**						
	(i)	At 2011-12 prices	(In Rupees)	72805	77659	82931	87623	**92565**
	(ii)	At current prices	(In Rupees)	86647	94797	104659	114958	**126406**

II. Gross Capital Formation

	Railways						
(i)	At 2011-12 prices	₹Crore	61372	60512	63810	63978	**NA**
(ii)	At current prices	₹Crore	71145	68631	73497	76115	**NA**

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

PE-Provisional Estimates

III. Foreign Trade:

(a)	Value of exports	₹Crore	1896445	1716384	1849434	1956515	**2307663**
	Value of imports	₹Crore	2737087	2490306	2577675	3001033	**3594373**
(b)	Value of exports	US $ Million	310352	262291	275852	303526	**330070**
	Value of imports	US $ Million	448033	381008	384357	465581	**514034**

Source: Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry for 2017-18 and 2018-19 as on 25.06.2019.

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

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

		Weight	2014-15	2015-16	2016-17	2017-18	2018-19
(a)	All Crops	(100.00)	124.0	120.8	132.8	139.4	**136.5**
(b)	Foodgrains	(50.7)	115.9	115.7	131.1	136.8	**135.3**
(c)	Non-foodgrains	(49.3)	132.3	126.1	134.7	142.1	**137.7**

Source: Handbook of Statistics (2018-19), Reserve Bank of India

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

		Weight	2014-15	2015-16	2016-17	2017-18	2018-19
(a)	General Index	(100.0)	111.0	114.7	120.0	125.3	**129.8**
(b)	Mining	(14.37)	93.3	97.3	102.5	104.9	**107.9**
(c)	Manufacturing	(77.63)	112.7	115.9	121.0	126.6	**131.1**
(d)	Electricity	(7.99)	126.6	133.8	141.6	149.2	**156.9**

Source: NSO, Ministry of Statistics and Programme Implementation, Press release dated 12th June,2019 for 2017-18 and 2018-19

SELECTED ECONOMIC INDICATORS (Contd.)

	ITEM	Unit/ Base	2014-15	2015-16	2016-17	2017-18	2018-19
VI.	Wholesale Price Index (Financial Year Average with weights) (Base 2011-12=100)	Weight					
(a)	All Commodities	(100.00)	113.9	109.7	111.6	114.9	**119.8**
(b)	Primary Articles	(22.62)	125.1	124.6	128.9	130.6	**134.2**
(c)	Fuel & Power	(13.15)	107.7	86.5	86.3	93.3	**104.1**
(d)	Manufactured Products	(64.23)	111.2	109.2	110.7	113.8	**117.9**
VII.	Wholesale Price Indices of Important Commodities used by Railways	Weight					
(a)	Non-coking coal	(1.40)	109.6	109.6	110.5	112.5	**119.0**
(b)	Minerals Oils	(7.95)	108.7	73.9	73.3	82.5	**96.7**
(c)	Electricity	(3.06)	105.7	105.3	104.2	103.7	**109.6**
(d)	Manufacture of Basic Metals	(9.65)	103.5	92.0	91.1	101.4	**112.2**
(i)	Inputs into Steel Making	(1.41)	104.6	85.4	82.9	98.2	**113.0**
(ii)	Ferrochrome	(0.11)	110.4	102.5	114.4	121.6	**121.1**
(iii)	Ferromanganese	(0.03)	114.3	95.2	104.4	121.5	**124.1**
(iv)	Ferrosilicon	(0.02)	115.2	99.3	88.4	94.6	**100.5**
(v)	Other Ferro alloys	(0.03)	111.8	96.2	100	118.2	**122.3**
(vi)	Manufacture of Non-Ferrous Metals	(1.69)	108.7	100.9	100.1	107.9	**112.2**
(e)	Manufacture of Electrical Equipment	(2.93)	109.5	109.0	108.2	109.6	**111.7**
(f)	Manufacture of Chemicals & Chemical Products	(6.47)	116.1	112.6	111.0	112.5	**119.1**
(g)	Manufacture of Non-metallic mineral products	(3.20)	111.3	110.5	109.8	112.7	**115.9**
(h)	Cotton dyed/printed Textile	(0.05)	113.5	114.9	118.0	124.0	**128.7**
(i)	Timber/wooden plank, sawn/re-sawn	(0.05)	120.0	121.5	122.6	116.2	**119.9**
(j)	Manufacture of Cement, Lime and plaster	(1.64)	110.9	109.9	110.6	113.8	**114.3**
(k)	Lube Oils	(0.29)	118.8	120.8	116.8	114.0	**124.8**
(l)	High Speed Diesel	(3.10)	114.8	73.4	74.4	84.4	**97.1**
VIII.	Consumer Price Index (Industrial Workers) (Base 2012=100) as on Sep 15, 2017		251	265	276	284	**300**

Source: WPI data from Office of Economic Advisor

CPI data from Handbook of Statistics (2018-19), RBI

Planning

In the year 2018-19 the following assets were acquired and task accomplished.

	Heads		2018-19
1.	Locomotives	(Nos.)	**779**
2.	Wagons (BLC+ Private Wagons)	(”)	**9,535**
3.	Coaches including	(”)	**5,160**
	(i) EMUs	(”)	**708**
	(ii) MEMUs	(”)	**632**
	(iii) DMUs	(”)	**83**
4.	Route Kms of track electrified	(Kms.)	**5,276**
5.	New lines constructed	(Kms.)	**480**
6.	Double/Multiple lines provided	(Kms.)	**2,519**
7.	Track renewals (both primary & secondary renewal)	(Kms.)	**4,181**
8.	Gauge Conversion to BG from MG/NG	(Kms.)	**597**

The Plan allocation (Revised Estimates) and Actual Net Expenditure for 2018-19 compared with 2017-18, were as follows:

(₹in crore)

Plan Head		2017-18		2018-19	
		Allocation (R.E.)	Actual Net Expenditure	Allocation (R.E.)	Actual Net Expenditure
CIVIL ENGINEERING					
1	New Lines (Construction)	@22,157.90	8,195.19	**!!27,426.38**	**9,395.53**
2	Gauge Conversion	#2,803.65	2,880.11	**##4,171.10**	**4,055.00**
3	Doubling	$16,758.79	11,240.33	**$$17,315.26**	**15,168.33**
4	Traffic Facilities- Yard Remodeling and Others	%3,275.60	1,224.84	**^ ^2,857.10**	**1,146.70**
5	Road Safety Works - Level Crossings	674.95	536.79	**763.46**	**678.45**
6	Road Safety Works - Road Over/ Under Bridges	*6,028.73	3,175.77	**&&6,189.28**	**3,522.22**
7	Track Renewals	7,834.37	7,727.71	**8,631.68**	**8,241.66**
8	Bridge Works	700.50	448.73	**551.46**	**528.27**
9	Staff Quarters	223.03	250.67	**293.86**	**283.39**
10	Amenities for Staff	202.27	209.58	**268.04**	**223.24**
11	New Lines (const.)– Dividend free Projects	β1,000.00	988.63	****1,450.00**	**1,879.87**
	TOTAL	61,659.79	36,878.35	**69917.62**	**45,122.66**

MECHANICAL					
1	Rolling Stock	^29,567.18	20,139.29	**%%32037.04**	**28,108.17**
2	Leased Assets–Payment of Capital Component	8,000.00	7,979.82	**9112.92**	**9,111.51**
3	Machinery and Plant	460.40	367.91	**447.53**	**436.34**
4	Workshops including Production Units	£2,196.70	1,385.67	**<2,278.48**	**2,006.60**
	TOTAL	40,224.28	29,872.69	**43875.97**	**39,662.62**
ELECTRICAL ENGINEERING					
1	Electrification Projects	~5,031.65	3,769.99	**?7,016.50**	**5,931.32**
2	Other Electrical Works excl. TRD	!690.15	166.36	***1,261.08	**249.85**
3.	Traction Distribution Works	468.84	351.61	**435.66**	**351.00**
	TOTAL	6,190.64	4,287.96	**8713.24**	**6,532.17**
SIGNAL AND TELECOMMUNICATION					
1	S and T Works	2,030.70	1,255.63	**1,504.55**	**1,537.02**
	TOTAL	2,030.70	1,255.63	**1,504.55**	**1,537.02**
OTHERS					
1	Computerization	301.48	154.65	**226.67**	**174.37**
2	Railway Research	34.86	21.35	**18.76**	**23.68**
3	User's Amenities	Σ Σ 2,470.62	1,286.62	**>5,522.75**	**1,585.76**
4	Investment in PSUs	702.00	0.00	**2,904.00**	**2,904.00**
5	Investment in non-Government Undertakings including JVs/SPVs	5,227.10	4,887.99	**9,377.00**	**9,774.36**
6	Other Specified Works	&294.11	210.89	**314.97**	**288.16**
7	Training/HRD	116.43	62.09	**86.29**	**56.43**
8	Inventories	250.00	157.07	**333.93**	**270.32**
9	M.T.Ps.	598.00	794.18	**1074.98**	**1,163.97**
	TOTAL	9,994.60	7,574.84	**19859.35**	**16,241.05**
	GRAND TOTAL	®1,20,100.00	*79,869.47	**143870.73**	**+1,09,095.52**

Revised Estimates

@ 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 ₹3939.41 crore under EBR(IF) and ₹16930 crore under EBR(PPP).It also includes ₹3560 crore for National Project & Projects of National importance.

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

Includes ₹1945.90 crore under EBR (IF) and ₹310 crore for National Projects.

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

$$ Includes ₹1046 crore under EBR (Bond) and ₹15632.28 crore under EBR (IF).

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

^ ^ Includes ₹25.81 crore under EBR (IF) and ₹1570 crore under EBR (PPP).

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

&& Includes ₹2000 crore under EBR (PPP).

β Provision for Udhampur Srinagar- Baramulla New Line.

** Includes ₹1150 crore under EBR(IF) and Provision for Udhampur-Srinagar-Baramulla.

^	Includes ₹24,700.54 crore under EBR (IRFC) and ₹2,100 crore under EBR (PPP).
%%	Includes ₹26482.96 crore under EBR (Bond) and ₹2000 crore under EBR (PPP).
£	Includes ₹37.91 crore under EBR (IF) and 1,000 crore under EBR (PPP).
<	Includes ₹61.91 crore under EBR (IF).
~	Includes ₹5,032.83 crore under EBR (IF).
?	Includes ₹7026.44 crore under EBR (IF).
!	Includes ₹530 crore under EBR (PPP).
***	Includes ₹1,000 crore under EBR (PPP).
ΣΣ	Includes ₹1,000 crore under EBR (PPP).
&	Includes ₹1,00 crore for Nirbhaya Fund.
>	Includes ₹3500 crore under EBR (PPP).
®	RE 2017-18 includes gross outlays under DRF on account of outlay against higher CRRM targets.

Actual Net Expenditure (2017-18 and 2018-19)

*	Excluding actual expenditure of ₹22,116 crores under EBR(PPP) during 2017-18.
+	Excluding actual expenditure of ₹24,281.14 crores under EBR(PPP) during 2018-19.

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
2016-17	1,407	1,675	385	409	125	155	475
2017-18	1,571	1,715	393	413	125*	159*	494
2018-19	**1,675**	**1,685**	**409**	**422**	**126**	**162**	**528**

*Revised

Passenger Business

Indian Indian Railways is commonly used mode of public transportation in the country. During 2018-19, it carried 8,439 million passengers as against 8,286 million in 2017-18. Passenger kilometres, which is calculated by multiplying the number of journeys by mean kilometric distance in case of each class was 1,157 billion as against 1,178 billion in the previous year. Passenger earnings increased by 2,423.51 crore (4.98%) in comparison with 2017-18 .

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
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
2018-19	**4,784**	**179**	**1,499**	**1,977**	**3,476**	**3,655**	**8,439**

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

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
2018-19	**1,46,678**	**1,26,641**	**6,64,503**	**2,19,352**	**8,83,855**	**10,10,496**	**11,57,174**

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
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
2018-19	**30.7**	**707.3**	**443.3**	**111.0**	**254.3**	**276.5**	**137.1**

#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	2017-18	2018-19
Non-Suburban:								
Second Class Ordinary	50.38	42.82	37.14	31.70	30.20	31.95	25.00	**23.43**
Second Class Mail/Express#	6.02	6.38	7.20	9.26	9.77	13.67	16.78	**17.76**
Upper Class	0.94	0.66	0.30	0.49	0.83	1.30	1.92	**2.12**
Total	57.34	49.86	44.64	41.45	40.80	46.92	43.70	**43.31**
Suburban(all classes)	42.66	50.14	55.36	58.55	59.20	53.08	56.30	**56.69**
Grand Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

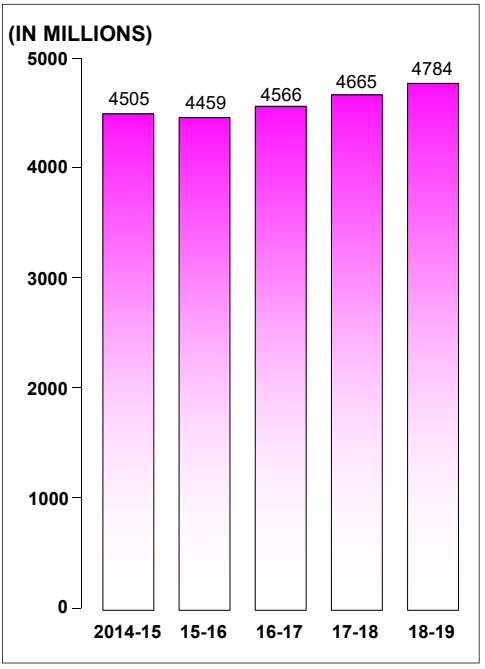
#Also includes Sleeper Class.

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

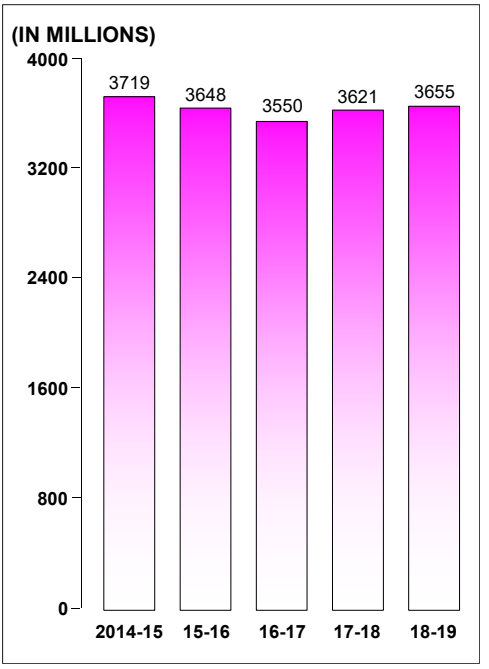
	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2017-18	2018-19
Non-Suburban:								
Second Class Ordinary	51.75	44.77	36.26	30.20	26.10	28.47	22.80	**18.96**
Second Class Mail/Express#	28.65	32.05	41.58	46.70	48.70	51.16	54.81	**57.42**
Upper Class	4.45	3.72	2.46	2.95	5.75	6.36	9.70	**10.94**
Total	84.85	80.54	80.30	79.85	80.55	85.99	87.31	**87.32**
Suburban (all classes)	15.15	19.46	19.70	20.15	19.45	14.01	12.69	**12.68**
Grand Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Also includes Sleeper Class.

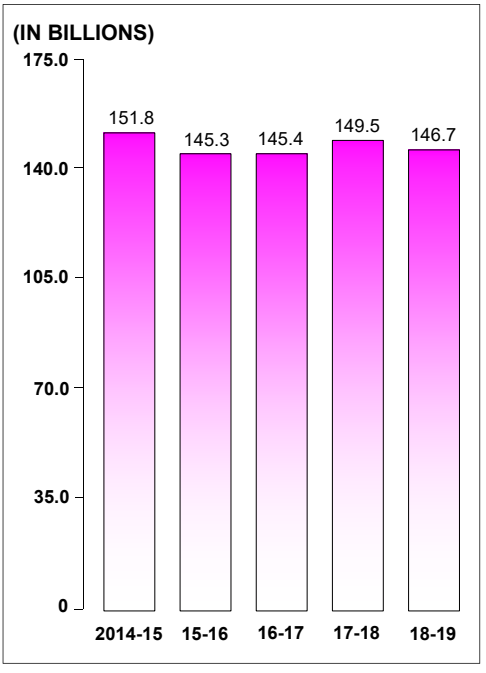
PASSENGERS ORIGINATING
SUBURBAN



PASSENGERS ORIGINATING
NON-SUBURBAN



PASSENGER KILOMETRES
SUBURBAN



PASSENGER KILOMETRES
NON-SUBURBAN

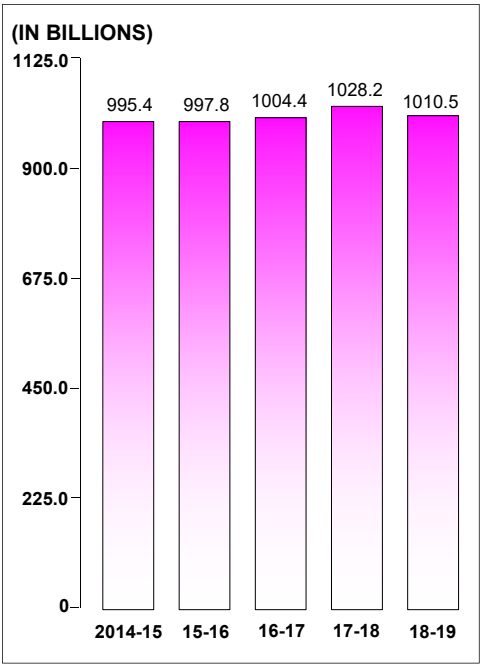


Table VI. Number of passenger trains run daily

Type of trains	Broad Gauge		Metre Gauge		Total (incl.NG)	
	2017-18	**2018-19**	2017-18	**2018-19**	2017-18	**2018-19**
EMU	5,507	**5,875**	-	**-**	5,507	**5,881**
Mail/Express	3,581	**3,695**	-	**-**	3,581	**3,695**
Ordinary Passenger Trains and Mixed Trains	4,287	**3,779**	77	**64**	4,364	**3,947**
Total	**13,375**	**13,349**	**77**	**64**	**13,452**	**13,523**

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

Type of trains	Broad Gauge	
	2017-18	**2018-19**
EMU	37.5	**37.5**
Mail/Express	50.3	**50.2**
Ordinary Passenger Trains (incl. mixed)	33.8	**33.5**

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

Passenger Revenue :

Passenger earnings in 2018-19 were ₹51,066.65 crore. This was ₹2,423.51 crore (4.98 %) higher than the earnings in 2017-18. Suburban traffic contributed 5.51 % to the total earnings. The remaining 94.49 % came from non-suburban passengers. Earnings from Second and Sleeper Class Mail/Express passengers comprised 50.69% of the total passenger earnings.

Passenger revenue in terms of earnings per passenger kilometre for different classes during 2017-18 and 2018-19 was as under:

		(In paise)
Segment	2017-18	**2018-19**
Non-suburban:		
Upper class	139.44	**139.78**
Second Class-Mail/Express (incl. sleeper class)	37.67	**38.95**
Second Class-Ordinary	20.83	**21.27**
Non-suburban (all classes)	44.58	**47.75**
Suburban(all classes)	18.76	**19.18**
Overall average	41.30	**44.13**

Passenger revenue in different classes with corresponding number of passengers and Passenger Kms. in 2018-19 is given below:

Segment	No. of passengers		Passenger kms.		Revenue	
	Million	Percentage	Million	Percentage	₹ in cr.	Percentage
Non-suburban:						
Upper Class	179	2.12	126641	10.94	17,702.52	34.66
Second Class Mail/ Express#	1,499	17.76	6,64,503	57.43	25,885.25	50.69
Second Class Ordinary	1,977	23.43	2,19,352	18.96	4,666.13	9.14
Total	3,655	43.31	10,10,496	87.33	48,253.90	94.49
Suburban (all classes)	4,784	56.69	1,46,678	12.67	2,812.75	5.51
Grand Total	**8,439**	**100**	**11,57,174**	**100**	**51,066.65**	**100**

#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
2016-17	87.16	2,022	700	24,307	50.2	21.5
2017-18	*87.74	*2,053	680	*24,140	*46.97	*20.9
2018-19	**90.10**	**2,098**	**688**	**24,364**	**47.96**	**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 2018-19, 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	212 trains	218 trains	40 trains	470
Suburban	54 trains	81 trains	-	135
Total	**266**	**299**	**40**	**605**

Ticketless Travel:

During 2018-19, 21.31 lakh checks were conducted against ticketless/ irregular travel (including carriage of unbooked luggage). About 330.61 lakh cases of ticketless/irregular travel/unbooked luggage were detected and ₹ 1,375.55 crore were realized on this account.

Passenger Amenities:

The allocation under the Plan Head "Passenger Amenities" in 2018-19 was ₹5,157.86 crore (Budget Estimate) and ₹5,910.71 crore (Revised Estimate).

1,253 stations have so far been identified for development under the Adarsh Station Scheme, out of which 1,148 stations have already been developed.

During the Year 2018-19, 222 stations were provided with water coolers, 75 stations were electrified and 130 passenger lifts and 165 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 70% 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 are also available for booking reserved tickets. Booking of e-tickets through International Credit/Debit Cards has also been enabled.

A new User Interface e-ticketing system has also been launched with user friendly features for easier navigation. This new online ticket booking system provides easy and fast way of booking rail tickets by automating the journey planning and purchase of tickets.

Mobile Application for train enquiry:

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

Paperless Unreserved Ticketing through Mobile Phones:

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

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

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

Currency Coin-cum Card Operated ATVMs was launched at New Delhi. About 460 such ATVMs are now functional over Indian Railway network. These machines issue unreserved tickets and accept Cash as well as Smart Cards for payment. In addition, about 3638 Smart Card based ATVMs have also been commissioned.

Parcel Management System (PMS):

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

Railway Users' Amenities

Railway Users' Consultative Committees, at different levels, provide opportunities for formal consultations between the management and the rail users with a view to improve services for rail users. National Railway Users' Consultative Council (NRUCC) , Zonal Railway Users' Consultative Committees (ZRUCCs), Divisional Railway Users' Consultative Committees

(DRUCCs), Konkan Railway Users' Consultative Committee (KRUCC), Metro Railway Users' Consultative Committee (MRUCC), Suburban 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 01.02.2019 to 31.01.2021. DRUCCs have been reconstituted for a two year term from 01.10.2017 to 30.09.2019 and ZRUCCs have been reconstituted for a two year term from 01-09-2018 to 31-08-2020.

I Manufacture of Train Sets

Semi High Speed Self Propelled Train-set was manufactured by Integral Coach Factory/Chennai with indigenous efforts, termed Train-18. First such rake was introduced between New Delhi and Varanasi. The Train-18 has contemporary features as per global standards.

II 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
2016-17	1,469
2017-18	2,480
2018-19	**4,429**

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

III 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.

21 Antyodaya rakes have been turned out by Production Units during 2016-17, 2017-18 and 2018-19.

(b) Deen Dayalu coaches :

General second class coaches for unreserved passengers with additional facilities like Cushioned luggage racks, Additional hand hold in doorway 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. 1342 Deen Dayalu coaches turned out by Production Units during 2016-17, 2017-18 and 2018-19.

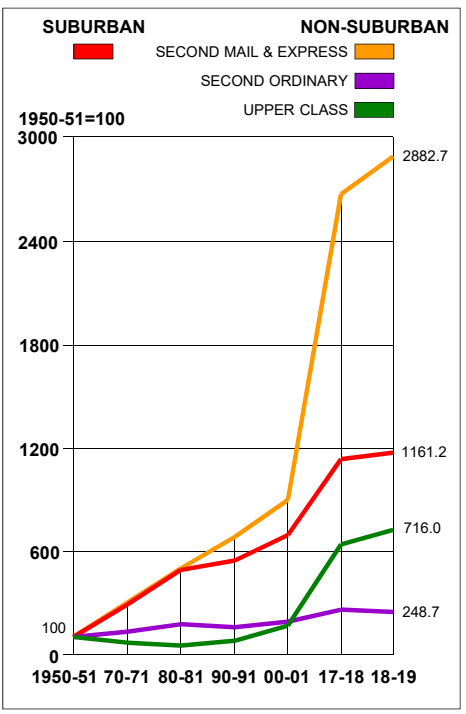
IV Focus on improving amenities for reserved passengers

(a) Humsafar Trains:

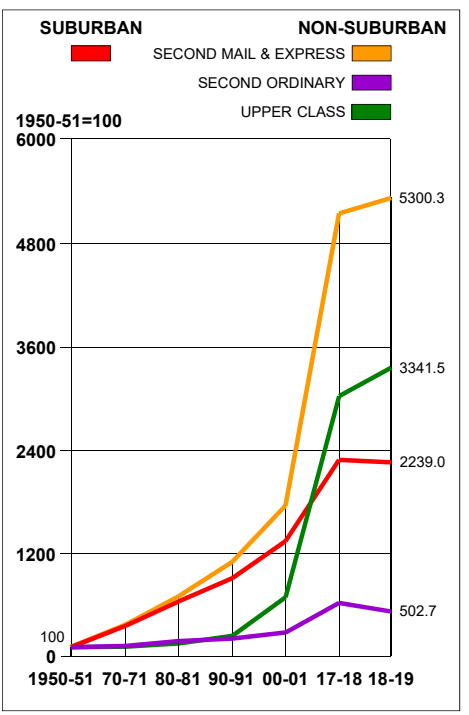
Humsafar trains having additional amenities in the coaches have been introduced for providing comfortable Air-Conditioned III Tier travel. Following major features have been introduced:-

GPS based Passenger information system, Passenger announcement system, Dust bins in each bay, 4 lane coffee vending machine, improved aesthetics and pleasing colour scheme, passenger announcement System, Closed-Circuit Television (CCTV) based surveillance system, Integrated Braille displays etc.

INDEX OF GROWTH OF ORIGINATING PASSENGERS



INDEX OF GROWTH OF PASSENGER KILOMETRES



32 Humsafar rakes (9 rakes in 2016-17, 10 rakes in 2017-18 and 13 rakes in 2018-19) 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.

5 Tejas rakes (1 rake in 2017-18 and 4 rakes in 2018-19) have been turned out by Production Units.

(C) Uday Trains:

Utkrisht Double Decker Air-conditioned Yatri (UDAY) trains have been conceptualized as double-decker rakes with improved amenities such as, a dedicated vending machine with dining facilities in each of the four coaches in the rake, Decorative vinyl wrapping on both exterior and interior of the coach, Water borne solar reflective coating on the roof and PU painting on the end walls, High quality and high aesthetic passenger friendly fittings in the toilets, Defused LED lighting, Powder coated seat frames and snack table, Aesthetically designed seat covers, All luggage racks are spray painted for aesthetic look, All foot steps are buffed and powder coated, Vinyl floor provided with clear coat, All stainless steel items like passage door, vestibule door, moldings etc., are buffed, PIS and infotainment system with Wifi, 7 dedicated LCD screens provided in coach and Dining table and chairs in middle deck etc.

One Uday rake was introduced in service between Bangalore City – Coimbatore(Train No. 22665/66) in June, 2018.

V Focus on improving safety in new manufactured coaches

Instructions have been issued 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 coaches.

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

VI Improving interiors of Coaches

(a) Project Swarn

Project Swarn was started to upgrade the condition of Rajdhani and Shatabdi Express Trains, with the objective of significantly improving the passenger experience across 9 dimensions which include coach interiors, toilets, onboard cleanliness, staff behavior, catering, linen, punctuality, security, on-board entertainment and Real time feedback is also a part of Project Swarn. Initially, 29 trains with 41 rakes was targeted to be upgraded, which was successfully completed in Oct., 2018. Later on, it was planned to cover all Rajdhani and Shatabdi Express trains under Project Swarn. Work in 55 rakes has already been completed. Work in remaining 12 rakes shall be completed in 2019-20.

(b) Upgradation of rakes of Mail/Express train (Project Utkrisht)

Project Utkrisht has been launched to improve condition of 66 important identified Mail/Express trains, consisting of 140 rakes in first phase. As a part of this project improvement in coach interior, coach exterior, toilets, lighting and passenger amenity items are carried out. Under Project Utkrisht, 90 rakes have already been refurbished in 2018-19. Phase II of Project Utkrisht has also been sanctioned in which 500 rakes of mail express trains will be covered.

VII Quick Watering Facilities

For effective enroute watering of trains within 10 minutes, 16 stations have been provided with Quick Watering Facilities in 2018-19 and work is in process to cover all important train watering stations with this facility.

VIII Automatic Coach Washing Plants

For better and quick exterior washing of trains, Automatic Coach Washing Plants have been provided at 12 locations and work is in process to cover more location in 2019-20.

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, 41 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 more than 1080 pairs of trains. 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 1050 pairs of trains till March 2019 for providing single window assistance to train passengers regarding cleanliness, linen, disinfestation, watering and petty repair.

5. 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, 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 910 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.
- 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 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 more than 2,00,000 bio-toilets in around 55,000 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 the end of 2019.
- All PUs and 42 major workshops are ISO 14000/IMS 50001 certified.
- A total of around 1591 water bodies are functional on Indian Railways. Indian Railways has currently around 52 water recycling plants already functioning. 28 more have been sanctioned and work is already in progress at 24 locations.

- Instructions have been issued 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.
- 166 Plastic bottle crushing machines have been installed at 126 stations.
- IR has planned plantation of 5 crore trees, out of which around 3.5 crore have already been planted.

Catering Services:

Indian Railways provide approximately 12 lakh meals/services per day to cater to the needs of about 2.3 crore travelling passengers every day. Provision of catering services on Indian Railways is ensured through Pantry Cars (in 403 pairs of trains), Train Side Vending (TSV) on 909 trains, E-catering available on 325 stations with an average of 12,000 meals per day, and Static Units at Stations. Static Catering Units include 643 Major Static Units (Food Plaza, Fast Food Units, Jan Ahaar, Cell Kitchen, Base Kitchens, Refreshment Rooms and Automatic Vending Machines) and 8607 Minor Static Units (all stalls, trolleys) on Indian Railways. In addition, there are 1892 Water Vending Machines, 438 Multi Purpose Stalls,1133 Bookstalls, 159 Miscellaneous Stalls and 14 Bookstalls cum Chemist Corners operational at stations to ensure availability of items of travelling needs of passengers.

In its endeavour to bring noticeable improvement in catering services on Indian Railways, a number of new initiatives have been taken during 2018-19 which include the following:

- 30 Base Kitchens/Kitchen Units have been upgraded during 2018-19 entailing civil works, electrical works and requisite kitchen equipments, reaching a total of 46 upgraded Kitchens.
- CCTV Cameras have been installed in the upgraded Base kitchens/ Kitchen Units to monitor Kitchen activities on real-time basis with live streaming available on the IRCTC website as well as Rail Drishti.
- QR codes on food packets- All food boxes served in mobile (post-paid) and static units to bear QR code or stickers giving details like MRP, name of contractor, weight, date of packing and symbol of veg/non-veg food item. Two Kitchens have started putting QR Codes (NDLS & MMCT).

- Hand held POS machines: To generate printed bill and invoice reflecting all details of transactions under taken at catering units, hand held POS machines are being provided. Currently, 5033 POS machines are in operation in 403 pairs of trains. In addition, 2132 POS machines are operational on 2018 Static Units.
- Awareness Campaigns for passengers like "No Bill- The food is for FREE", No Tips' stitched/displayed on uniforms etc. have been launched.

AC Metro Rake at Maidan Station, Kolkata

Freight Operation

Revenue earning freight traffic handled during 2018-19 was 1221.48 million tonnes. NTKMs earned during the year were 739 billion. Total loading and freight output inclusive of non-revenue traffic were 1225.29 million tonnes and 739 billion NTKMs respectively. Commodity wise loading of revenue earning traffic was as follows.

	Tonnes carried* (Millions)		Absolute Variation over last year	Percentage to total
	2017-18	2018-19		
Coal				
i) for steel plants	56.27	**59.05**	2.78	4.83
ii) for washeries	0.29	**0.09**	- 0.20	0.01
iii) for thermal power houses	243.92	**257.76**	13.84	21.10
iv) for other public users	254.72	**288.94**	34.22	23.65
Total	555.20	**605.84**	50.64	49.59
Raw material for steel plants except iron ore	23.77	**25.77**	2.00	2.11
Pig iron and finished steel				
i) from steel plants	35.47	**31.82**	-3.65	2.61
ii) from other points	18.89	**22.17**	3.28	1.82
Total	54.36	**53.99**	-0.37	4.43
Iron ore				
i) for export	8.19	**5.62**	-2.57	0.46
ii) for steel plants	86.60	**89.02**	2.42	7.29
iii) for other domestic users	45.01	**42.70**	-2.31	3.50
Total	139.80	**137.34**	-2.46	11.25
Cement	112.96	**117.34**	4.38	9.61
Foodgrains	43.79	**39.31**	-4.48	3.22
Fertilizers	48.53	**51.83**	3.30	4.24
Mineral Oil (POL)	43.11	**43.01**	-0.10	3.52
Container service				
i) Domestic containers	11.12	**11.91**	0.79	0.97
ii) EXIM containers	42.82	**48.26**	5.44	3.95
Total	53.94	**60.17**	6.23	4.92
Balance other goods	84.09	**86.88**	2.79	7.11
Total	1,159.55	**1221.48**	61.93	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
2016-17	1106.15	1511.13	620,175	1650.94	561	109.36
2017-18	1,159.55	1,584.08	6,92,916	1,844.58	598	116.57
2018-19	**1,221.48**	**1,668.69**	**7,38,523**	**1,965.99**	**605**	**117.93**

II. Movement of bulk commodities in the last four years

S. No.	Commodity group	2015-16		2016-17		2017-18		2018-19	
		Million Tonnes	Percent-age	Million Tonnes	Percent-age	Million Tonnes	Percent-age	Million Tonnes	Percent-age
1	Coal	551.83	50.10	532.83	48.17	555.20	47.88	605.84	49.60
2	Foodgrains	45.73	4.15	44.86	4.06	43.79	3.78	39.31	3.22
3	Iron & Steel	44.79	4.07	52.41	4.74	54.36	4.69	53.99	4.42
4	Iron ore	116.94	10.62	137.55	12.43	139.80	12.06	137.34	11.24
5	Cement	105.35	9.56	103.29	9.34	112.96	9.74	117.34	9.61
6	POL (Mineral oils)	43.24	3.93	42.42	3.83	43.11	3.72	43.01	3.52
7	Fertilizers (Chemical manures)	52.23	4.74	48.34	4.37	48.53	4.18	51.83	4.24
8	Limestone and Dolomite	23.53	2.14	25.53	2.31	27.70	2.39	30.35	2.48
9	Stones (including gypsum) other than marble	15.04	1.37	14.78	1.34	19.57	1.68	21.58	1.77
10	Salt	5.02	0.46	4.97	0.45	4.95	0.43	4.86	0.40
11	Sugar	3.39	0.31	2.35	0.21	2.47	0.21	3.02	0.25
	Total	**1007.09**	**91.43**	**1009.33**	**91.25**	**1052.44**	**90.76**	**1108.47**	**90.75**
12	Commodities other than above	94.42	8.57	96.82	8.75	107.11	9.24	113.01	9.25
	Grand Total	**1101.51**	**1000.00**	**1106.15**	**100.00**	**1159.55**	**100.00**	**1221.48**	**100.00**

III. Freight Train Kilometers and Wagon Kilometres

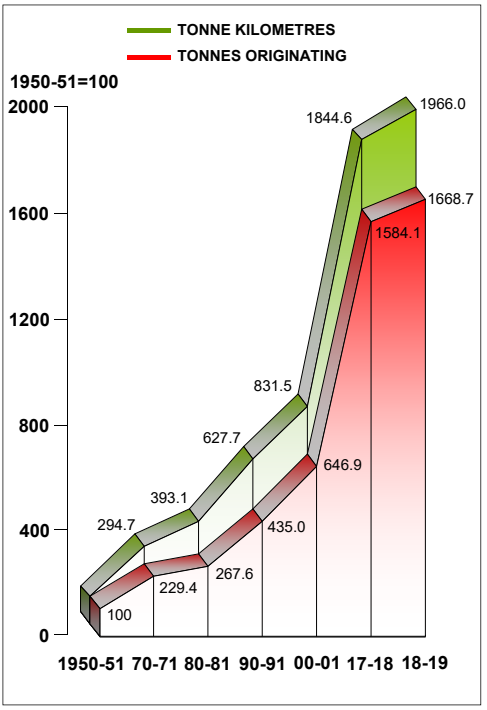
Year	Freight train kms.		Wagon kilometres@ (in terms of 4- wheelers)	
	Total(Million)	Per running track km per day	Total (Million)	Percentage of loaded to total
1950-51	112	5.2	4,370	70.7
1960-61	161	6.9	7,507	70.5
1970-71	202	7.7	10,999	69.7
1980-81	199	7.2	12,165	69.5
1990-91	245	8.5	19,230	65.5
2000-01	261	8.7	27,654	60.9
2010-11	368	11.6	17,749	66.5
2016-17	391	11.4	18,403	63.3
2017-18	396	11.5	18,457	64.3
2018-19	**415**	**11.8**	**19,364**	**64.9**

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

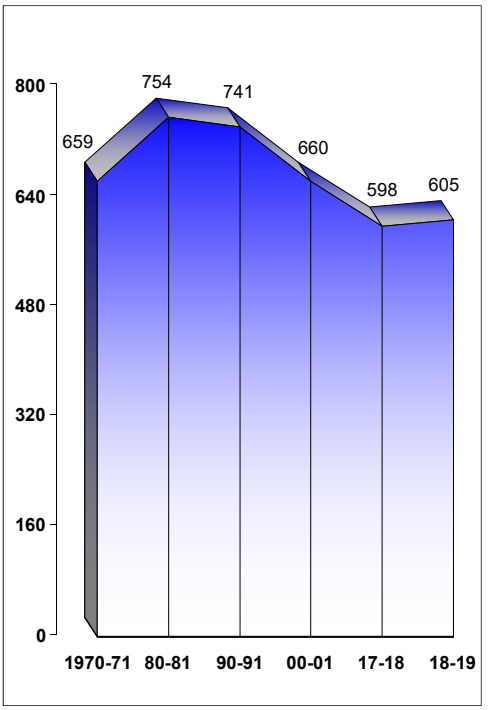
IV. Tonnes Originating, Net Tonne Kms. and Earnings from bulk commodities in 2018-19

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	605.84	49.60	311487	42.18	56963.64	46.47
2	Foodgrains	39.31	3.22	57575	7.80	7615.98	6.21
3	Iron & steel	53.99	4.42	49926	6.76	8422.33	6.87
4	Iron ore	137.34	11.24	43323	5.87	9376.99	7.65
5	Cement	117.34	9.61	67818	9.18	10165.60	8.29
6	POL (Mineral oils)	43.01	3.52	29333	3.97	5631.62	4.59
7	Fertilizers (Chemical manures)	51.83	4.24	46834	6.34	6348.24	5.18
8	Limestone & dolomite	30.35	2.48	17400	2.36	2727.08	2.22
9	Stones (incl. gypsum) other than marble	21.58	1.77	10243	1.39	1570.45	1.28
10	Salt	4.86	0.40	8572	1.16	738.42	0.60
11	Sugar	3.02	0.25	4662	0.63	525.47	0.43
	Total	**1108.47**	**90.75**	**647173**	**87.64**	**110085.82**	**89.79**
12	Commodities other than above	113.01	9.25	91350	12.36	12494.49	10.21
	Grand Total	**1221.48**	**100.00**	**738523**	**100.00**	**122580.31**	**100.00**

INDEX OF GROWTH OF FREIGHT
(REVENUE TRAFFIC)

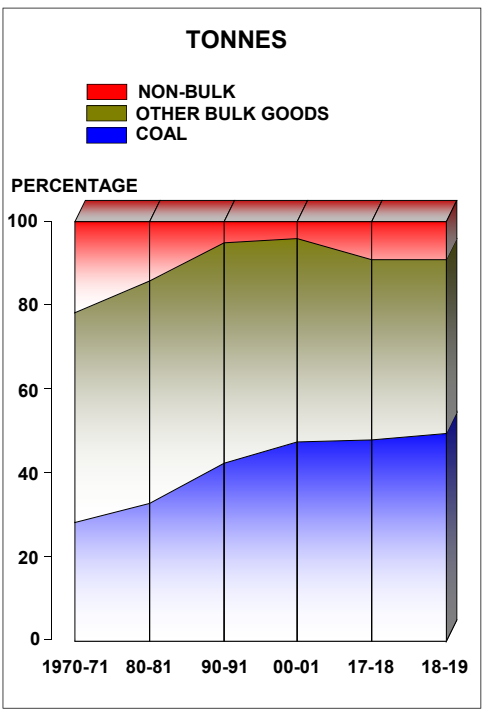


AVERAGE LEAD OF FREIGHT (KMS.)
(REVENUE TRAFFIC)

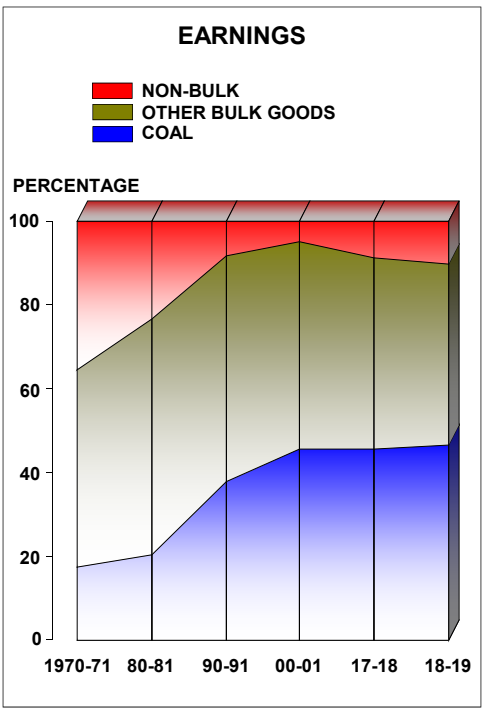


SHARE OF BULK COMMODITIES IN FREIGHT TRAFFIC

TONNES



EARNINGS



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

			2015-16	2016-17	2017-18	**2018-19**
Net tonne kilometres		BG	7,510	7,359	7,405	**7,747**
per wagon per day@		MG	365	-	-	**-**
Wagon kilometers		BG	21,4.50	204.20	206.5	**203.9**
per wagon per day@		MG	16	-	-	**-**
Net tonne kilometres	Diesel	BG	14,926	14,184	*14,426	**13,313**
per engine hour		MG	2,234	-	-	**-**
	Electric	BG	19,297	17,761	*19,227	**18,922**
Net tonne kilometres	Diesel	BG	2,42,570	2,36,241	2,45,908	**2,89,419**
per engine day on line		MG	3,083	-	-	**-**
	Electric	BG	3,34,273	3,28,105	3,58,454	**3,89,070**

*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 2018-19

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	605839	49.60	56963.63	46.47	311487	42.18
2	Iron ore	137338	11.24	9376.99	7.65	43322	5.87
3	Cement	117342	9.61	10165.59	8.29	67818	9.18
4	Iron & Steel	53983	4.42	8422.33	6.87	49926	6.76
5	Chemical Manures	51835	4.24	6348.23	5.18	46834	6.34
6	Total exim Container	48265	3.95	5473.80	4.47	42060	5.70
7	Mineral Oils	43010	3.52	5631.61	4.59	29333	3.97
8	Food grains	39308	3.22	7615.98	6.21	57575	7.80
9	Limestone & Dolomite	30348	2.48	2727.07	2.22	17400	2.36
10	RMC carried in General Service Wagons	18719	1.53	1009.20	0.82	3973	0.54
11	Stone other than Marble and gypsum	16698	1.37	1009.69	0.82	6262	0.85
12	Total Domestic container	11905	0.97	1895.39	1.55	15822	2.14
13	Ores other than manganese and iron	8458	0.69	530.00	0.43	2632	0.36
14	Non ferrous Metal	6530	0.53	721.42	0.59	3778	0.51

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	Gypsum	4878	0.40	560.75	0.46	3980	0.54
16	Salt	4859	0.40	738.41	0.60	8572	1.16
17	Jute manufactured	3465	0.28	355.09	0.29	2516	0.34
18	Sugar	3015	0.25	525.47	0.43	4662	0.63
19	Lime	2677	0.22	479.48	0.39	3570	0.48
20	De-Oiled Cakes in Pallet and Power form	1967	0.16	342.82	0.28	2660	0.36
21	Edible oils	1404	0.11	170.86	0.14	1685	0.23
22	Fruits & Vegetable fresh	1308	0.11	166.19	0.14	2398	0.32
23	Manganese ores	1155	0.09	129.82	0.11	772	0.10
24	Sand	1061	0.09	100.64	0.08	832	0.11
25	Caustic soda	863	0.07	68.16	0.06	464	0.06
26	Fodder Oil Cake	406	0.03	46.42	0.04	461	0.06
27	Cement manufactured	377	0.03	43.55	0.04	296	0.04
28	Opium & other narcotic drugs	276	0.02	55.01	0.04	459	0.06
29	Soda ash	211	0.02	51.46	0.04	422	0.06
30	Wood Unwrought (other than Firewood)	206	0.02	15.06	0.01	167	0.02

Freight Structure:

The freight was rationalized in November 2018 (w.e.f.01-11-2018) with the following features:

a. Increase in freight rate of coal, Raw material for steel plants (RMSP), Iron & Steel, Iron ore, other goods @ 8.75%

b. No increase in freight of foodgrains, fertilizers, POL, sugar, salt, edible oils and cement.

c. Increase in Haulage Charge per TEU of container traffic @ 5% (w.e.f. 01-12-2018)

Various initiatives were taken in 2018-19 which include 25% concession in movement of empty Container, movement of CP Coke in Container, Issue of multiple Railway Receipts (RRs) for container traffic, Revised Liberalized

Automatic Freight Rebate Scheme, Simplification of weighment policy to encourage customer satisfaction & Freight Advance scheme. All policies launched in 2018-19 have further been extended upto March, 2020.

Freight Marketing:

I. Procurement of rakes for freight traffic by inviting private investment

General Purpose Wagon Investment Scheme (GPWIS)

The scheme allows investment by End users, Public Sector Undertaking (PSUs), Port Owners, Logistics Providers and Mine Owners in General Purpose Wagons. The scheme permits eligible parties to invest in minimum of one rake of general purpose wagons for movement in any of the approved circuit(s) to carry any commodity.

During the year 2018-19, approval has been accorded for 77 rakes, out of which two rakes have been inducted and are in operation.

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, approval has been accorded for procurement of 84 rakes, out of which 51 rakes have been inducted under the scheme.

During the year 2018-19, approval has been given for two rakes and six rakes have been inducted.

Special Freight Train Operator (SFTO):

The scheme allows investment in procurement of Special Purpose Wagons (SPW) and High Capacity Wagons (HCW) for transportation of non-traditional commodities like molasses, fly ash, edible oil, caustic soda, chemical, petrochemicals, alumina & bulk cement etc. So far, approval has been accorded for procurement of 28 rakes, out of which 07 rakes have been inducted under the scheme.

During the year 2018-19, approval has been given for nine (9) rakes and one rake of BFNS has been inducted.

Automobiles Freight Train Operator Scheme (AFTO):

The scheme permits procurement and operation of special purpose rakes by private parties in transportation of automobile sector. So far,

approval has been accorded for procurement of 59 rakes, out of which 19 rakes have been inducted under the scheme.

During the year 2018-19, nineteen (19) rakes have been approved and six rakes for automobiles traffic have been inducted.

Wagon Leasing Scheme (WLS):

The Wagon Leasing Scheme (WLS) allows 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), General Purpose Wagons (GPW) and wagons for container movement. The leasing companies lease out rakes to end users, logistics service providers. So far, approval has been accorded for procurement of 137 rakes, out of which 40 rakes have been inducted under the scheme.

Development of private freight terminals through private investment

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, proposals for development of 109 PFTs have been received, out of which 60 PFTs have already been notified/ commissioned and these are operationalized.

During the year 2018-19, 3 PFTs have been commissioned.

Claims:

IR paid ₹46.38 crores as claim compensation for goods/parcel/luggage during the Financial Year 2018-19 as compared to ₹29.35 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)
2015-16	12,607	1,469	11.56
2016-17	8,533	1,747	43.45
2017-18	7,251	1,062	29.35*
2018-19	**5,777**	**874**	**46.38**

*Revised

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	-
2016-17	-	377	390	-	0	-
2017-18	-	368	393	-	-	-
2018-19	**-**	**351**	**387**	**-**	**-**	**-**

(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	-
2016-17	-	598	709	29	290	-
2017-18	-	594	718	30	232	-
2018-19	**-**	**582**	**678**	**33**	**285**	**-**

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
2016-17	4,083	461
2017-18	*4,062	383
2018-19	**3,989**	**401**

*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
2016-17	10.07	-	18.50	2.39	31.38	0.69
2017-18	*11.17	-	*18.89	1.50	*32.35	0.32
2018-19	**11.75**	**-**	**17.34**	**1.12**	**33.58**	**0.20**

*revised

(Millions)

Year	NTKMs Per Running Track Km.		Passenger Kms. Per Running Track Km.		Gross Tonne Kms. Per Running Track Km.	
	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.
1950-51	1.23	0.24	1.45	0.85	4.29	1.19
1960-61	2.19	0.54	1.61	0.87	6.59	2.15
1970-71	2.60	0.79	2.07	1.22	7.49	2.87
1980-81	3.06	0.76	3.63	1.64	8.84	2.63
1990-91	4.41	0.92	4.98	1.87	12.67	3.01
2000-01	4.93	0.24	6.73	2.03	15.55	1.75
2010-11	8.08	0.09	12.37	2.75	22.72	1.29
2016-17	7.14	-	12.97	2.24	22.00	0.65
2017-18	*7.78	-	*13.15	1.39	*22.52	0.30
2018-19	**8.09**	**-**	**12.62**	**1.09**	**23.11**	**0.20**

*revised

D. Coach Utilisation:

In 2018-19 the vehicle Kms. per vehicle day was 533 on BG and 115 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
2016-17	564	134
2017-18	555	125
2018-19	**533**	**115**

E. Average freight train load:

The average net load per train in 2018-19 was 1738 tonnes on BG The average gross load per train was 2,925 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
2016-17	1,600	-	2,859	-
2017-18	1,763	-	3,025	-
2018-19	**1,738**	**-**	**2,925**	**-**

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

2016-17	23.3	24.0	23.7	-
2017-18	22.7	23.6	23.3	-
2018-19	**22.3**	**23.8**	**23.2**	**-**

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

During 2018-19, NTKMs per engine hour stood at 16,571 for BG. NTKMs per goods train hour for BG was 40,722.

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
2016-17+	16,337	-	37,342	-
2017-18+	17,474	-	40,439	-
2018-19+	**16,571**	**-**	**40,722**	**-**

H. Wagon Utilisation:

On an average, a wagon moved 203.9 kms. per day on BG in 2018-19. NTKMs per wagon per day on BG was 7747. NTKMs per annum per tonne of wagon capacity on BG was 45,718. 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
2016-17	44.127	-	204.2	-	7,359	-
2017-18	43,778	-	206.5	-	7,405	-
2018-19	**45,718**	**-**	**203.9**	**-**	**7,747**	**-**

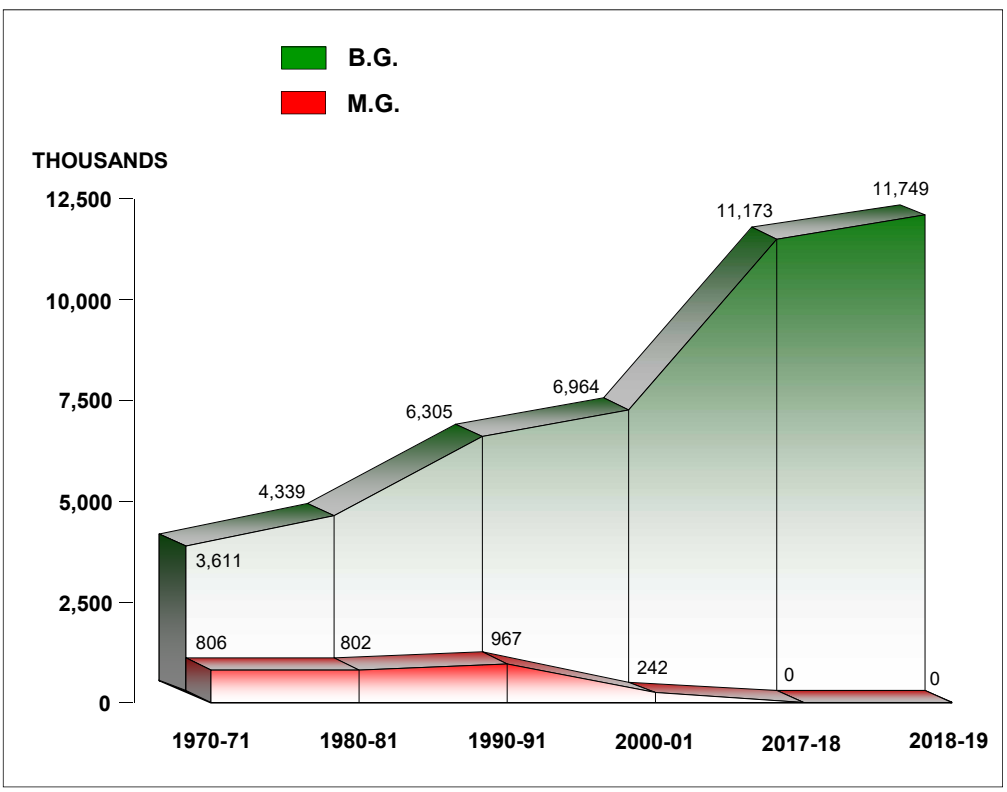
(+) in terms of 8 wheelers from 2010-11 onwards.

I. Wagon turn-round (in days):

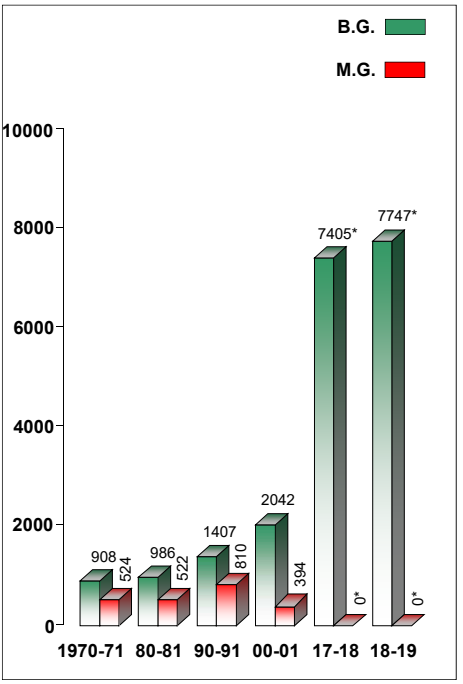
The turn-round time of wagons, representing operational cycle time is given in the following table:

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
2016-17	5.32	NA
2017-18	5.21	NA
2018-19	**5.00**	**NA**

NTKMS PER ANNUM PER ROUTE KM.

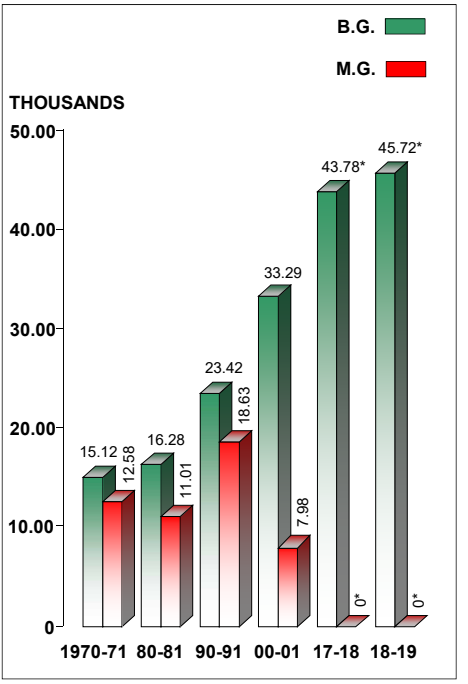


NET TONNE KILOMETRES PER WAGON PER DAY



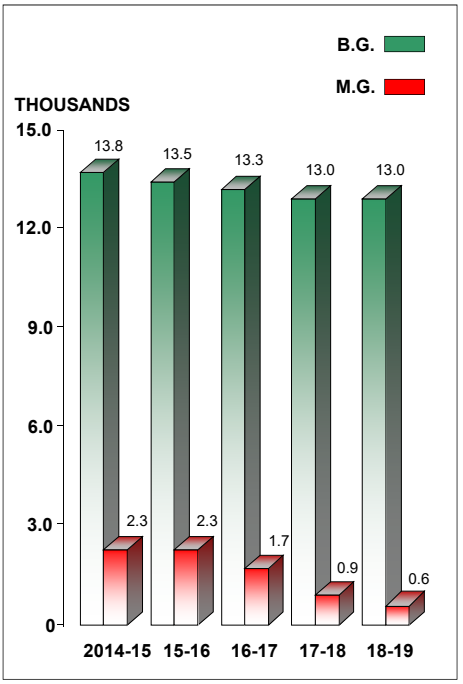
* In terms of eight wheelers

NET TONNE KILOMETRES PER ANNUM PER TONNE OF WAGON CAPACITY

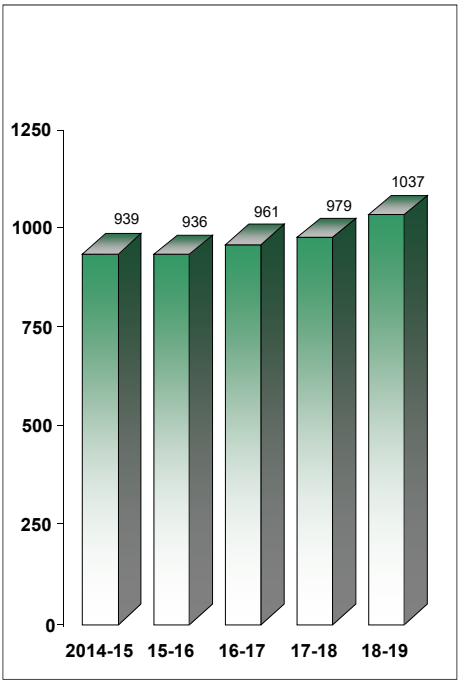


* In terms of eight wheelers

TRAIN KILOMETRES PER RUNNING TRACK KM



TRAIN KILOMETRES PER EMPLOYEE



Safety

There were 59 consequential train accidents in the year 2018-19 as compared to 72 accidents during 2017-18. Train accidents per million train Kms, an important index of safety, on IR dropped from 0.06 in the year 2017-18 to 0.05 in 2018-19.

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

Year *	Collision	Derailments	Level Crossing Accidents	Fire in trains	Misc. Accidents	Total	Accident Per Million Train Kms.
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
2018-19	**0**	**46**	**6**	**6**	**1**	**59**	**0.05**

*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		
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	28	182	0.03	188.51
2018-19	**16**	**90**	**0.04**	**641.15**

#Excludes KRCL.

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

Causes of Train Accidents:

Out of 59 consequential train accidents which occurred on IR during 2018-19, 51 were due to human failure. These include 42 accidents due to the failure of railway staff and 9 were due to persons other than Railway staff. There was two accident due to Equipment failure and another six accidents were due to Incidental 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 2017-18 and 2018-19 are as under:

Year#	Cost of Damage (in Lakh)		Interruption to through communication (Hours)
	Rolling Stock	Permanent Way	
2017-18	2243.20	702.16	698.53
2018-19	**2219.84**	**833.95**	**555.55**

#Excludes KRCL.

Rashtriya Rail Sanraksha Kosh (RRSK)

'Rashtriya Rail Sanraksha Kosh (RRSK)' has been introduced in 2017-18 for replacement/renewal/upgradation of critical safety assets, with a corpus of ₹1 lakh crore for five years, having annual outlay of ₹20,000 crore. In the first year of its inception, expenditure of ₹16,091 crore was made out of the Fund for safety works. In 2018-19 also, a provision of ₹20,000 crore was made, against which expenditure of approximately ₹18,000 crore has been incurred.

The Funds under RRSK are utilised for safety works relating to Traffic Facilities, 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, Training/ HRD, Passenger Amenities and Other Specified Works.

Ministry of Finance has issued 'Guidelines for Operation of Rashtriya Rail Sanraksha Kosh (RRSK)', which inter alia, includes Monitoring Framework for RRSK. It stipulates setting up of Monitoring Committee headed by CEO,NITI Ayog to examine performance. It is also laid down that the progress will be reviewed annually by 'Cabinet Committee on Economic Affairs (CCEA)' headed by 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:** 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 the year 2018-19, 83 Internal Safety Audits and 29 Inter-Railway Safety Inspections were carried out.
- **Training facilities:** Refresher training imparted to Non-Gazetted staff during 2018-19 is 1,55,337 (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 5,886 stations covering about 94 % of the interlocked Broad Gauge stations on Indian Railways, replacing the obsolete Multi Cabin Mechanical Signalling System, that involved a large amount of human intervention. Route Relay Interlocking (RRI) at 20 major stations namely, Bhusawal GYC, Igatpuri, Jamalpur, Sitarampur, Amritsar, Manduadih, Kasganj, Arrakkonam, Nimpura Departure Yard, Bondamunda E Cabin, Bondamunda J Cabin, Khanudih, Mohuda, Bhawaichandi, Sonnargar, Dehri-on Sone, Tori, Panki (UP), Lalgarh and Kota with Panel Interlocking at 96 stations and Electronic Interlocking at 277 stations, have been provided during the financial year 2018-19.

To avoid collisions, technological aids are briefly enumerated below:

- **Complete Track Circuiting:** Track Circuiting on 'A', 'B', 'C', 'D Special' and 'E Special' routes, where permissible speeds are more than 75 kilometers per hour on passenger lines has been completed at about 33,845 locations up to 31.03.2019. Total 6,060 stations have been provided with complete track circuiting.
- **Block Proving Axle Counter (BPAC):** To enhance safety, automatic verification of complete arrival of train at a station, Block Proving by Axle Counter (BPAC) is being provided at stations having centralized

operation of points and signals. As on 31.03.2019, Block Proving by Axle Counters (BPAC) have been provided on 5,363 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 operating manpower and amenities required while developing and operating a block station. As on 31.03.2019, Intermediate Block Signalling has been provided in 574 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 31.03.2019, Automatic Block Signalling has been provided on 3,039 Route Kilometers.

Automatic Train Protection (ATP) System

Automatic Train Protection (ATP) System: In order to enhance safety in Train operations, Indian Railways has decided to provide Automatic Train Protection (ATP) System using a mix of proven European Train Control System (ETCS) level 2 and an indigenously developed Train Collision Avoidance System (TCAS). The system will be an aid to Loco Pilot, which will help to eliminate accidents due to Signal Passing at Danger (SPAD) and over speeding, ensure visibility of signals in foggy weather in addition to increasing line capacity.

- Four projects of ETCS Level 2 of limited lengths on High Density Networks, have been taken up for extensive trials before going for large scale implementation.
- **Train Collision Avoidance System (TCAS):** Indigenous TCAS is under trials and once developed, it will be provided on low density routes. RDSO has taken up extended field trials of TCAS on a pilot section Lingampalli-Vikarabad-Wadi-Bidar pilot section (250 RKMs) on South Central Railway. Products of 3 manufacturers have been approved and safety certified for developmental orders for Absolute Block Section for speeds upto 110 KMPH.

Centralized Traffic Control (CTC) in Indian Railways: Centralized Traffic Control (CTC) is a computer based system which facilitates the control and management of multiple Signalling installations at various stations from a single location. It also provides a real time simulation of railway traffic in a section at a single location. Ghaziabad-Kanpur section of North Central Railway has been chosen for provision of first CTC of Indian Railways.

All signalling assets in Ghaziabad – Kanpur section (413 km double line section having 47 stations) can be controlled from a single location i.e. CTC Tundla, North Central Railway. This work is being done for the first time on Indian Railways having Centralized operation of points and associated signalling gears from the centralized place i.e. Tundla.

CTC System consists of Traffic Management Sub-System that controls wayside Station Interlocking and traffic flows in CTC territory. CTC enables the control of train movements directly, bypassing local operators/station masters and eliminating written train orders.

The CTC operator can directly see the train's locations on an electronic display panel and efficiently control the train's movements by operating signals and points centrally.

Train Management System (TMS): Train Management System, commissioned on Churchgate-Virar and Chatrapati Shivaji – Kalyan and Harbour line sections of Mumbai Suburban Section in 2003 and 2013 respectively, provides live train movements in the Control Centre. Eastern Railway also has commissioned TMS at Howrah divisional control office for managing its Howrah–Bandel suburban sections. This is an efficient tool to control train movements.

Announcements at stations are triggered automatically from the central servers. The advantages of online train information have been appreciated by the commuters.

Railway is planning to provide Train Management System at the suburban sections of metro cities. The work is sanctioned for provision of TMS on ECoR, suburban section of Chennai, Southern Railway, Howrah-Kharagpur Section, SER and Sealdah Division, Eastern Railway.

Interlocking of Level Crossing Gates: Indian Railways have provided interlocking with Signals at 11,375 Level Crossing Gates as on 31.03.2019, to enhance the safety at Level Crossings.

- **Sliding Boom at Level Crossing Gate:** 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. 4,293 Nos. of busy interlocked gates have been provided with Sliding Booms as on 31.03.2019 in addition to lifting barriers and further busy gates are also being progressively covered.

Self-Sufficiency: Signalling Workshop:- Railway signalling installations use a number of specialized equipment for smooth & safe running of trains. With the upgradation in technology and the 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, Ajmer on North Western Railway, Kharagpur on South Eastern Railway and Ghaziabad on Northern Railway have been manufacturing items like Electric Point Machines, Tokenless Block Instrument, Double Line Block Instruments, Axle Counters, various types of Relays, etc.

Measures to Reduce Derailments

- To improve safety, 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 considered to be functionally better than the 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.

COACHES

Increasing Production of LHB Coaches

There is large scale proliferation of technologically superior Linke Hofmann Busch (LHB) coaches, which have better riding, aesthetics and safety features as compared to conventional Integral Coaches Factory (ICF) coaches.

The Production of LHB coaches in production Units has continuously increased over the year:

1469 LHB coaches in 2016-17, 2480 LHB coaches in 2017-18 and 4429 LHB coaches in 2018-19.

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

Measures to Curb Accidents at Unmanned Level Crossings:

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

Level Crossing:

Indian Railway has decided to progressively eliminate the level crossings for the safety of Road users and train passengers. During the year 2018-19, 3,479 Nos. of unmanned level crossings and 631 Nos. of manned level crossings have been eliminated. All unmanned level crossings on Broad Gauge have been eliminated.

Road Over/Under Bridges: To improve safety of train operations 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 1,997 of sanctioned works of ROBs/RUBs appearing in Pink Book 2019-20 which contains 1,581 ROBs and 5,751 RUBs/Subways. These are at various stages of planning, estimation and execution.

During the year 2018-19, 172 ROBs and 1,305 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 01.04.2019, Indian Railway have 1,50,746 Bridges out of which 700 are important, 12,402 are major and 1,37,644 are minor Bridges. In the Year 2018-19, 1,013 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.

Aerial View of the Double Stack Freight Train during the trial run on WDFC's Ateli- Phulera sections on 15.08.2018.

The Network

Indian Railways (IR) is one of the world's largest rail networks with 67,415 Route Kilometres of route lengths as on 31.03.2019. Out of 67,415 RKMs, BG constitutes 62,891 RKMs (93.29%), MG 2,839 RKMs (4.21%) and NG 1,685 RKMs (2.50%). The growth of its Route length, Running and Track Kms since independence is as follows :-

Gauge	Route Kms.	Running Track Kms.	Total Track Kms.
1950-51	53,596	59,315	77,609
1960-61	56,247	63,602	83,706
1970-71	59,790	71,669	98,546
1980-81	61,240	75,860	1,04,480
1990-91	62,367	78,607	1,08,858
2000-01	63,028	81,865	1,08,706
2010-11	64,173	87,114	1,14,037
2015-16	66,252	92,084	1,19,630
2016-17	66,918	93,902	1,21,407
2017-18*	66,935	94,270	1,22,873
2018-19	**67,415**	**95,981**	**123,542**

*Revised after clarification/re-check of Route Kms by North Eastern Railway

Zones /Headquarters	Route Kms.	Running Track Kms.	Total track Kms.
Central, Mumbai	4,152	6,399	8,663
Eastern, Kolkata	2,817	5,104	7,151
East Central, Hajipur	4,148	5,915	9,715
East Coast, Bhubaneshwar	2,771	4,560	5,862
Northern, New Delhi	7,318	9,871	1,3405

North Central, Allahabad	3,522	5,197	6,366
North Eastern, Gorakhpur	3,477	4,225	4,593
Northeast Frontier, Maligaon, (Guwahati)	4,200	4,711	6,374
North Western, Jaipur	5,583	7,420	7,822
Southern, Chennai	5,081	7,343	9,022
South Central, Secunderabad	6,234	8,508	10,440
South Eastern, Kolkata	2,713	5,217	6,465
South East Central, Bilaspur	2,277	3,630	4,918
South Western, Hubli	3,566	4,515	5,680
Western, Mumbai	6,519	8,354	10,524
West Central, Jabalpur	3,010	4,957	6,447
Metro Railway, Kolkata	27	55	95
Total	**67,415**	**95,981**	**1,23,542**

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 2018-19.

State/Union Territory	Route Kms.	Running Track Kms.	Total Track Kms.
Andhra Pradesh	3,822	5,759	7,362
Arunachal Pradesh	12	12	26
Assam	2,519	2,668	3,619
Bihar	3,720	5,200	7,454
Chhatisgarh	1,212	2,195	2,961
Delhi	183	339	699
Goa	69	69	98
Gujarat	5,320	6,419	7,840
Haryana	1,703	2,543	3,218
Himachal Pradesh	312	317	376

Jammu & Kashmir	298	366	493
Jharkhand	2,571	4,199	6,114
Karnataka	3,540	4,690	5,898
Kerala	1,045	1,727	2,085
Madhya Pradesh	4,899	7,462	9,284
Maharashtra	5,819	8,514	11,399
Manipur	13	13	18
Meghalaya	9	9	13
Mizoram	2	2	6
Nagaland	11	11	22
Odisha	2,622	4,276	5,311
Punjab	2,265	2,759	3,622
Rajasthan	5,937	7,915	8,943
Tamil Nadu	4,031	5,479	6,766
Telangana	1,823	2,553	3,154
Tripura	226	226	288
Uttarakhand	341	445	527
Uttar Pradesh	8,823	12,207	15,593
West Bengal	4,230	7,566	10,244
Union Territory			
Chandigarh	16	18	83
Pondicherry	22	22	26
Total	**67,415**	**95,981**	**1,23,542**

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

With its more than 166 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 23.12 million passengers and 3.36 million tonnes of freight each day during 2018-19.

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, Member Staff, Member Material Management and Member Signal & Telecom 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.

Panoramic View of Newly built track

Track and Bridges

As on 31.3.2019, the Indian Railways had		(in Kms.)
(i) Route length	-	67415
(ii) Running Track length	-	95981
(iii) Total Trackage	-	123542
The following works were carried out during 2018-19		
(i) Track renewal	-	4181
(ii) Construction of New Line	-	480
(iii) Gauge conversion from MG/NG to BG	-	597
(iv) Track conversion from single to double line	-	2519

New Lines:

During 2018-19, 479.54 Kms. of new lines have been completed on the following sections:-

Railway	Section	Km.
Central	Belapur – Khar Kopar	25
	Narayandoh-Solapur Wadi	23
East Coast	Balangir-Bhainsapalli	18.203
East Central	Balumath-Shivpur	25
	Biraul-Harnagar	8
	Kanwar-Maheshmunda	25.3
North Eastern	Maharaj Ganj-Masrakh	36
Northeast Frontier	Tetelia-Kamalajari	10
	Bogibeel Bridge and North & South Bank	48.60
	Santir Bazar-Belonia	10
	Bathnaha - Nepal Custom Yard	8
	Haldibari - International Border	3
	Alamganj-Bilasipara	28
Northern	Amb Andaura-Daulatpur	16
South Central	Obulavaripalli-Venkatachalam	80
	Telapur-Ramachandrapuram (MMTS)	5.337
	Nandyal Jn Cabin-Nandyal	2.1
South Eastern	Dhutra connection (3 Km)	3
South East Central	Bhanupartappur-Keoti	8
South Western	Chikkabenakal-Gangavathi	13
Western	Moti Sadli-Airajpur	26

	Patan-Bhildi	51
West Central	Jhalawar-Jhalarapatan	7
	Total	**479.54**

Gauge Conversion:

During 2018-19, 597.2 Kms of track was converted from MG/NG to BG as detailed below:

Railway	Section	Km.
East Central	Raxaul-Sikta-Narkatiaganj	42
	Jaynagar-Janakpur-Kurtha	34
	Saharsa-Garhbaruwri	16
	Banmankhi-Barhara Kothi	16
	Sakri-Mandan Mishra	11
North Eastern	Gonda-Bahraich	60
	Aishbagh-Sitapur	88.6
	Mandhana-Brahmavart	7.2
	Sitapur-Lakhimpur	46
North Western	Palsana-Ringus	23
South East Central	Kelod-Patansaongi-Itwari	47
	Bhimal Gondi-Kelod	45
Southern	Pattukkottai-Tiruturaipundi-Thiruvarur	76
Western	Asarva-Rakhiyal	42
	Rakhiyal-Himat Nagar	43.4
	Total	**597.2**

Doubling:

During 2018-19, 2519.44 Kms of double/multiple lines track were completed as detailed below:

Railway	Section	Km
Central	Vakav-Madha (7.2) Madha-Wadsinge (7.68)	14.88
	Akalkot Road-Nagansur	5.12
	Nagansur-Boroti	8.98
	Bhudli-Bhusaval	12.62
East Coast	Jagdalpur-Amagura	14.3
	Naranpur-Basantapur	8.59
	Chilik Dara-Sagadapata	12.47
	Barpali-Dungripali	14.27
	Bamur-Rairakhol	15.65
	Kottavalasa-Mallividu	8.9

	Arand-Komakhan	32.76
	Silak Jhori-Kumar Sadra	9.23
	Balangir-Deogaon Rd.	17.3
	Lakkavarapukota –Shrungavarapukota	9.61
	Dungripali-Khaliapali	12.77
	Ambagaon-Amagura	10
	Sitabinj-Basantapur	13.95
	Ambagaon-Kotpar Road	7.53
	Kotpar Rd.-Charumala Kusumi	11.73
East Central	Ramdayalu Nagar-Kurhani	14
	Bakhtiyarpur Surface triangle line	4.7
	Dehri on Sone- Sonnagar	5.76
	Bandhua Palmar surface line	13.7
	Tori-Shivpur	44
	Jogeswar Bihar-Karmahat	11
	Kurhani-Bhagwanpur	14.08
Eastern	Tarapith-Rampurhat	6.52
	Dankuni-Bally	6.15
	Sainthia-Gadadharpur	7.19
	Manigram-Jangipur	14.8
	Bainchi-Debipur	4.92
	Bainchi-Pandooah-Khanyan	14.6
	Naihati Bye Pass Line	2.92
	Bhagalpur-Lailakh Mamalkha	14.31
	Tenya-Ganga Tikuri	13.25
	Azimganj-Khagra Ghat	7.2
North Central	Jhansi-Paricha Thermal	23.64
	Panki-Bhaupur	11.69
	Bhadan-Khurja	388
	Rundhi - Sholaka 4th line	10.47
	Parauna-Ait-Bhua	27.05
	Hodal-Sholaka	10.34
North Eastern	Varanasi city-Manduadih	7
North Frontier	Hojai-Dhalpukhuri-Habaipur	19.87
	New Domohani-New Maynaguri Yleg connection	5.86
	New Maynaguri-Betgara	4.6
Northern	Suriawan - Janghai	15.7
	Sewapuri - Parsipur	14
	Parsipur-Bhadohi	8
	Cabin C Bathinda	2

	Utraitia- Shrirajnagar	29.26
North Western	Marwar-Bhinwaliya	24
	Haripur-Guriya	9
	Ateli-Phulera	380
	Bangurgram-Mangaliyawas	21
	Karjoda-Palanpur	5.93
	Jharli-Manheru	28.03
	Madar-Kishangarh (Exclu Ateli-Phulera)	232
	Alwar-Dhigawara	29.80
	Rani-Bhinwaliya	27.80
	Maval-Shri Amirgadh -Sarotra Road	13.61
	Sarotra Road-Iqbalgadh-Jethi	13.59
South Central	Manchiryal-Peddampet	9.02
	Khadarpet-Gulapalayamu	23.63
	Mudkhed-Mugat	10.37
	Limbgaon-Nanded	15.79
	Medchal-Bolarum (MMTS)	13.88
	Guntur-Tenali	25.47
South East Central	Kirodimal Nagar-Raigarh, Raigarh-Jamga	27
	Champa-Saragaon (9 km) 3rd & 4th Line	18
	Khodri-Pendra Road	13.7
South Eastern	Hijli-Narayangarh	20
	Jhinkpani-Kendposi	18
	Monaharpur-Jaraikela 3rd line	11.2
	Sonua-Goilkera	12.7
	Goilkera-Posoita	17.37
	Rajkharswan-Chakradharpur	18
	Kendposi-Maluka	10.2
	Basulya Sutahata-Durga Chak	5.25
	Patasahi-Champajharan	13
Southern	Changanaseri-Chingavanam Section	10
	Tiruvottiyur-Korukkupet 4th line	5
	Jokatte-Kulasekhara	8.2
	Chennai-Korukkupet 3rd & 4th line	8.2
	Kuruppantara-Ettumanur	8
	Takkolam-Arakkonam byepass	10
South Western	Devarayi-Shivathan	8.07
	Kardi-Arsikere	36.4
	Chikjajur-Tolahunse	37
	Hosapete-Munirabad-Ginigera Koppal	22.75

	Binkadakatti-Hulkoti-Annigeri	17.59
	Munirabad-Koppal	4.98
	Minchnal-Jumnal	32
	Makalidurga-Devarapalle	37
	Jumnal-Wandal	26
West Central	Bhopal-Nishatpura	2.12
	Baran-Chhajawa-Piplod-Atru-Salpura	42
	Turki-Baghai Road	10
	Katangi Khurd-Salhana	15
	Itarsi-Budni 3rd line	17
Western	Nandurbar - Dondaicha	34
	Surbari-Kataria-Samakhiyali	23.45
	Surendranagar-Chamaraj	7
	Chittaurgarh-Shambhupura	13.1
	TOTAL	**2519.44**

Gauge-wise Details:

Broad gauge, though forming 93.42% of the route, generated 100% of the freight output (NTKms) and 99.66% of the passenger output (Pkms).

Route length as on 31.03.2019 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)	12,174.43	26,305.07	38,479.50	22,144.21	2,267.02	24,411.23	62,890.73
Metre (1000 mm)	—	2,838.79	2,838.79	—	—	—	2,838.79
Narrow (762mm/610 mm)	—	1,685.60	1,685.60	—	—	—	1,685.60
Total	**12,174.43**	**30,829.46**	**43,003.89**	**22,144.21**	**2,267.02**	**24,411.23**	**67,415.12**
%age to total RKMs	**—**	—	63.79	—	—	36.21	100.00

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 2018-19, traffic density (million GTKms. per running track km.) increased from 4.29 to 23.11 on BG.

Track Renewal and Maintenance:

During 2018-19, 4181 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	5586.03	2794
2016-17	6397.97	2487
2017-18	8884.16	4023
2018-19	**9690.05**	**4181**

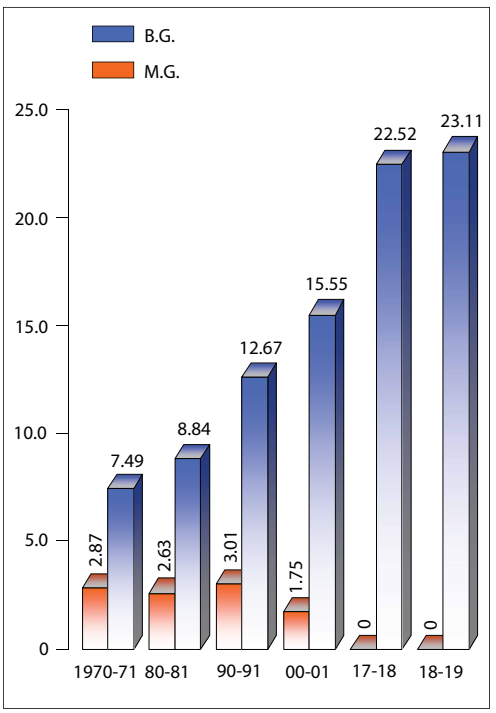
One Complete Track Renewal (CTR) units comprises of one km of Through Rail Renewal (0.5 CTR units) and one km of Through Sleeper Renewal (0.5 CTR units).

Track Upgradation:

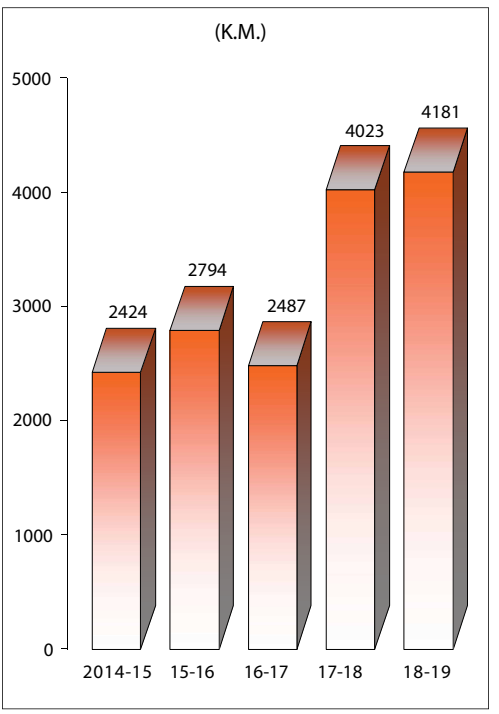
The track constitutes the basis infrastructure of a railway system and bears the burden of coping with ever increasing traffic. Higher speed and heavy axle load operation of IR has necessitated up-gradation of the track structure. Several policy initiatives have been taken in order to modernize the track.

Track structure is upgraded at the time of renewals. Sleepers are being upgraded from wooden, steel and CST-9 to PSC sleepers. Heavier section

TRAFFIC DENSITY
MILLION GTKMS
PER RUNNING TRACK KM



TRACK RENEWALS
PER ANNUM



and high tensile strength 52kg/60kg 90UTS rails are used in place of 90R/52kg 72UTS rails. Similarly, long rail panels or welded rails are predominantly used in place of earlier fish plated joints. The sturdier turnouts using thick web switches is gradually introduced on trunk routes and high density routes. As on 31.03.2019, BG main lines of IR, about 89.42% of the length is covered by long welded rails, 99.19% with PSC sleepers and 96.97% with 52kg/60kg 90 or higher UTS rails.

Welded Rails:

On most of BG track, rails have been converted into long welded rails. Short-welded rails of 39m length and single rails are limited to locations, where welded rails are not permitted on technical grounds. As on 31.03.2019, 79682 Km length of track on main lines of Indian Railways was with long welded rails and 8960 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 functionally & technically better design (wider & heavier sleeper) has been developed and adopted for future use. The wider and heavier offers higher frame resistance, less stress on ballast and rail pad improving reliability and maintainability of track.

Bridges:

As on 01.04.2019, IR has 1,50,746 Bridges out of which 700 are important, 12,402 are major and 1,37,644 are minor Bridges. In the year 2018-19, 1,013 Bridges are Strengthened/Rehabilitated/Rebuilt to enhance safety of train operation.

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 01.04.2019 is as under:

Total number of level crossings	:	22,388
Number of manned level crossings	:	21,340 (95%)
Number of unmanned level crossings	:	1,048 (5%)

Indian Railway has decided to progressively eliminate the level crossings

for the safety of road users and train passengers. During the year 2018-19, 3,479 Nos. of unmanned level crossings and 631 Nos. of manned level crossings have been eliminated. All unmanned level crossings on Board Gauge 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 1997 of sanctioned works of ROBs/RUBs appearing in Pink Book 2019-20 which contains 1581 ROBs and 5751 RUBs/Subways. These are at various stages of planning, estimation and execution.

During the year 2018-19, 172 ROBs and 1305 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 31.03.2019 Indian Railways (IR) owns about 4.78 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	0.43
'Grow More Food' scheme	0.03
Commercial Licensing	0.04
Other uses like pisiculture	0.10
Encroachment	0.01
Vacant land	0.51
Total	**4.78**

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 2018-19, Railway did mass plantation of 110.09 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 Sansathan to open the Kendriya Vidyalayas. Apart from this, land is also leased to Central/State Governments/Public Sector Undertakings on long term basis for public utility purpose like ROB/RUB, construction/widening of roads etc.

Railways have also taken up commercial use of such land which may not be required by the Railways for its immediate future use. Through an amendment to Railways Act, 1989, Rail Land Development Authority (RLDA), under the Ministry of Railways has been constituted on 1st November 2006 to undertake all tasks related to commercial development on railway land/ air-space under the control of Ministry of Railways. At present, 61 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).

EDFC -Drone view of construction of bridge on river Yamuna at Prayagraj (Allahabad).

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'2019, electrification on Indian Railways has been extended to 34,319 RKMs out of the total rail network of 67,415 RKMs. This constitutes 50.91% of the total Railway Network. On this electrified route, 65.4% of freight traffic & 56.2% of Passenger traffic is hauled with fuel cost on electric traction being merely 33.2% 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 Bhigvan-Gulbarga, on which electrification work is in progress and targeted for completion by end of 2019-20.

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	*29,228
2019	**34,319**

*Revised

(b) During year **2018-19** alone, **5,276** RKM has been commissioned; which is highest ever electrification in a single year and 29% higher than the previous year.

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

III Sections Opened for Electric Traction after Statutory Inspection of Commissioner of Railway Safety in 2018-19.

S. No.	Section	Railway	State	RKM
1.	Chalisgaon - Dhule	CR	Maharashtra	56
2.	Daund - Baramati	CR	Maharashtra	44
3.	Panvel - Pen	CR	Maharashtra	37
4.	Pen - Thal	CR	Maharashtra	27
5.	Jasai - Uran	CR	Maharashtra	8
6.	Nerul - Kharkopar & Belapur - Kile chord	CR	Maharashtra	12
7.	Pen - Roha	CR	Maharashtra	39
8.	Kiul - Bhagalpur	ER	Bihar	98
9.	Pakur - Tildanga	ER	Jharkhand	30
10.	Katwa - Azimganj	ER	West Bengal	73
11.	Tildanga - Malda	ER	West Bengal	40
12.	Azimganj - Manigram	ER	West Bengal	22
13.	Warisaliganj - Kiul	ECR	Bihar	49
14.	Jiwdhara – Sugauli - Bettiah	ECR	Bihar	51
15.	Sugauli - Raxaul	ECR	Bihar	30
16.	Fatuha – Islampur	ECR	Bihar	43
17.	Biharsharif - Daniawan	ECR	Bihar	37
18.	Bettiah - Valmikinagar	ECR	Bihar	93
19.	Ara - Sasaram	ECR	Bihar	96
20.	Bandhua - Paimar	ECR	Bihar	13
21.	Karnauti - Bakhtiyarpur	ECR	Bihar	6
22.	Koderma - Kurhagada	ECR	Jharkhand	40
23.	Kurhagada - Hazaribagh	ECR	Jharkhand	44
24.	Hazaribagh - Barkakana	ECR	Jharkhand	52
25.	Koderma - Maheshpur	ECR	Jharkhand	20
26.	Balumath - Bukru	ECR	Jharkhand	8
27.	Biratoli - Balumath	ECR	Jharkhand	12
28.	Bobbili - Salur	ECoR	Andhra Pradesh	17
29.	Khariar Road - Lakholi	ECoR	Chhattisgarh	75
30.	Balangir - Titlagarh	ECoR	Odisha	61
31.	Kakiriguma - Sikarpai	ECoR	Odisha	91
32.	Haridaspur - Kendrapara	ECoR	Odisha	44

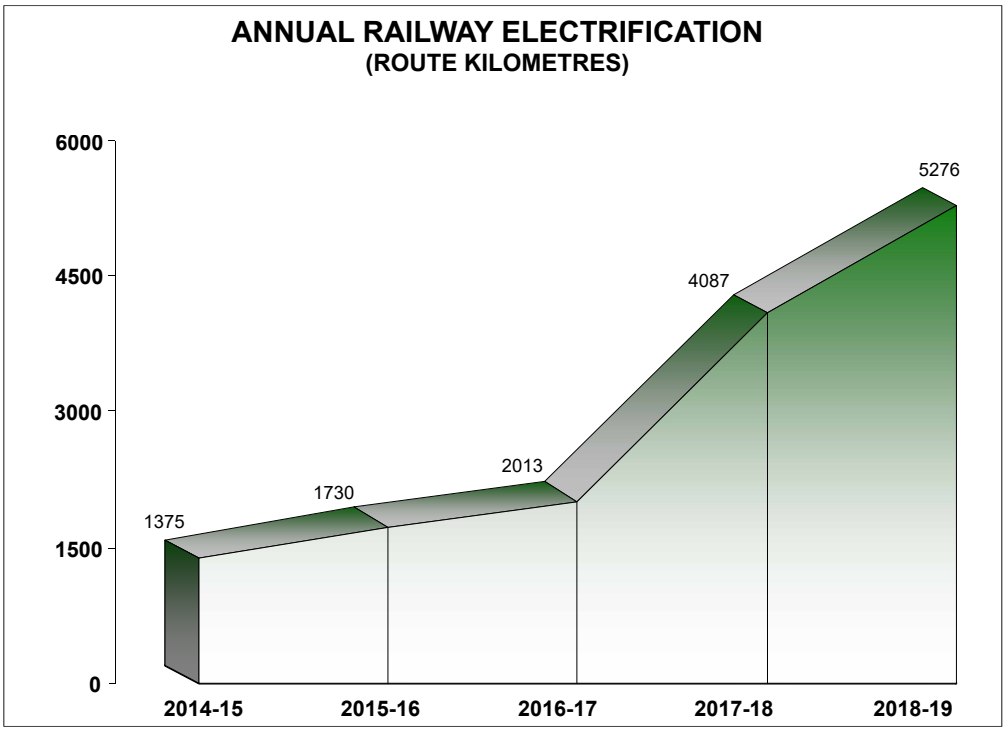
33.	Turekela - Khariar	ECoR	Odisha	53
34.	Bamur - Sambalpur	ECoR	Odisha	84
35.	Delhi Sarai Rohilla - Bijwasan	NR	Delhi	25
36.	Bijwasan - Rewari	NR	Haryana	53
37.	Kurukshetra - Narwana	NR	Haryana	84
38.	Jind - Panipat	NR	Haryana	70
39.	Rohtak - Panipat	NR	Haryana	66
40.	Rewari - Rohtak	NR	Haryana	73
41.	Amritsar - Batala	NR	Punjab	38
42.	Dhuri - Ludhiana	NR	Punjab	59
43.	Rajpura - Patiala	NR	Punjab	30
44.	Khetasarai - Akbarpur -Tanda	NR	Uttar Pradesh	72
45.	Gajroula - Muazzampur Narain	NR	Uttar Pradesh	95
46.	Srirajnagar- Gauri Ganj	NR	Uttar Pradesh	83
47.	Gauri Ganj - Janghai	NR	Uttar Pradesh	99
48.	Raja ka Sahaspur - Moradabad	NR	Uttar Pradesh	24
49.	Najibabad - Saneh Rd	NR	Uttar Pradesh	15
50.	Raiwala - Rishikesh	NR	Uttarakhand	12
51.	Saneh Road - Kotdwara	NR	Uttarakhand	9
52.	Chikasana -Bharatpur	NCR	Rajasthan	18
53.	Bharatpur – Mandawar	NCR	Rajasthan	65
54.	Idgah - Chikasana	NCR	Uttar Pradesh	33
55.	Achhnera - Mathura	NCR	Uttar Pradesh	37
56.	Harpalpur – Hamirpur - Khairar	NCR	Uttar Pradesh	165
57.	Khairar - Dingwai	NCR	Uttar Pradesh	20
58.	Chhapra - Bakulha	NER	Bihar	22
59.	Tinpheria - Jalalpur	NER	Bihar	4
60.	Kaptan Ganj – Valmiki Nagar	NER	Uttar Pradesh	53
61.	Aunrihar - Jaunpur	NER	Uttar Pradesh	57
62.	Kaptan Ganj – Kathkuiyan	NER	Uttar Pradesh	39
63.	Kathkuiyan -Tinpheria	NER	Uttar Pradesh	36
64.	Mathura - Mendu	NER	Uttar Pradesh	50
65.	Sarnath -Varanasi	NER	Uttar Pradesh	8
66.	Bakulha - Ballia	NER	Uttar Pradesh	40
67.	Allahabad - Varanasi	NER	Uttar Pradesh	122
68.	Block Hut A – Dali Ganj	NER	Uttar Pradesh	7
69.	Katihar – Mukuria - Kumedpur	NFR	Bihar	57
70.	Mukuria Dalkhola	NFR	Bihar	34
71.	Dalkhola - Gunjaria	NFR	West Bengal	48
72.	Palanpur - Shri Amirgadh	NWR	Gujarat	32

73.	Hisar - Sirsa	NWR	Haryana	83
74.	Sirsa - Raman	NWR	Haryana	47
75.	Mandi – Dabwali - Birang Khera	NWR	Haryana	10
76.	Kosli - Manheru	NWR	Haryana	43
77.	Raman - Bathinda	NWR	Punjab	27
78.	Bathinda - Mandi Dabwali	NWR	Punjab	33
79.	Det - Debari	NWR	Rajasthan	97
80.	Birang Khera - Hanumangarh	NWR	Rajasthan	49
81.	Debari -UDZ incl. AII Yard	NWR	Rajasthan	18
82.	Phulera - Madar	NWR	Rajasthan	69
83.	Guriya - Bhinwaliya	NWR	Rajasthan	68
84.	Hanumangarh – Surat Garh	NWR	Rajasthan	47
85.	Shri Amirgadh - Maval	NWR	Rajasthan	8
86.	Karur - Salem	SR	Tamil Nadu	83
87.	Tiruchchirappalli -Thanjavur	SR	Tamil Nadu	48
88.	Villupuram - Cuddalore Port	SR	Tamil Nadu	50
89.	Arakkonam - Takkolam	SR	Tamil Nadu	15
90.	Siripuram - Tummalacheruvu	SCR	Andhra Pradesh	61
91.	Pondugula -Tummalacheruvu	SCR	Andhra Pradesh	21
92.	Guntakal - Kalluru	SCR	Andhra Pradesh	38
93.	Obulavaripalli - Venkatachalam	SCR	Andhra Pradesh	88
94.	Guntakal - Virapur	SCR	Andhra Pradesh	24
95.	Virapur - Haddinagundu	SCR	Karnataka	21
96.	Pagidipalli - Nalgonda	SCR	Telangana	74
97.	Vishnupuram - Pondugula	SCR	Telangana	9
98.	Vishnupuram - Janpahad	SCR	Telangana	8
99.	Peddapalli - Gangadhara	SCR	Telangana	56
100.	Nalgonda - Kukkadam	SCR	Telangana	28
101.	Telapur-Ramchandrapuram	SCR	Telangana	5
102.	Medchal - Bolarum	SCR	Telangana	12
103.	Lohardaga - Tori	SER	Jharkhand	42
104.	Birsola - Balaghat – Samnapur	SECR	Madhya Pradesh	41
105.	Shikara - Nainpur	SECR	Madhya Pradesh	56
106.	Nainpur - Chiraidongri	SECR	Madhya Pradesh	19
107.	Gondia - Birsola	SECR	Maharashtra	17
108.	Itwari - Kelod	SECR	Maharashtra	48
109.	Ballari - Toranagallu	SWR	Karnataka	35
110.	Palanpur Yard	WR	Gujarat	6
111.	Chandlodiya - Sanand	WR	Gujarat	20
112.	Barnagar - Fatehabad	WR	Madhya Pradesh	36

113.	Ratlam - Dhosawas	WR	Madhya Pradesh	3
114.	Ratlam - Barnagar	WR	Madhya Pradesh	46
115.	Chittaurgarh - Chanderia	WR	Rajasthan	13
116.	Jabalpur - Katni	WCR	Madhya Pradesh	91
117.	Majhgawan - Sagma	WCR	Madhya Pradesh	37
118.	Katni – Khanna Banjari	WCR	Madhya Pradesh	46
119.	Vijaypur - Chachura Binaganj	WCR	Madhya Pradesh	39
120.	Guna - Badarwas	WCR	Madhya Pradesh	48
121.	Manikpur - Majhgawan	WCR	Uttar Pradesh	34
	Total			**5,276**

IV Important Electrification Projects Completed during 2018-19: Chhapra-Ballia-Ghazipur-Varanasi-Allahabad rail line.

In the year 2018-19, Railway electrification of Chhapra-Ballia-Ghazipur-Varanasi-Allahabad rail line of North Eastern Railway covering 330 route kilometers and passing through the States of Uttar Pradesh & Bihar has been completed. This has resulted in smooth and seamless flow of electric trains in the section as traction changes/detentions at Chhapra, Varanasi and Allahabad have been eliminated.



Angul-Sambalpur rail line.

In the year 2018-19, Railway Electrification of Angul-Sambalpur rail line of East Coast Railway, covering 156 route kilometers and passing through the State of Odisha has been completed. This has resulted in smooth and seamless flow of electric trains in the section.

Valmiki Nagar-Narkatiaganj-Sugauli-Muzaffarpur incl Sugauli - Raxaul rail line.

In the year 2018-19, Railway Electrification of Valmiki Nagar-Narkatiaganj-Sugauli-Muzaffarpur incl Sugauli –Raxaul of East Central Railway, covering 240 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.

Gorakhpur Cantt. – Kaptan Ganj- Valmiki Nagar.

In the year 2018-19, Railway Electrification of Gorakhpur Cantt - Kaptan Ganj-Valmiki Nagar rail line of North Eastern Railway, covering 96 route kilometers and passing through the State of Uttar Pradesh has been completed. This has resulted in smooth and seamless flow of electric trains in the section.

Idgah-Achhnera-Mathura & Achhnera-Bharatpur rail line.

In the year 2018-19, Railway Electrification of Idgah-Achhnera-Mathura & Achhnera-Bharatpur rail line of North Central Railway, covering 87 route kilometers and passing through the State of Uttar Pradesh has been completed. This has resulted in seamless movement of electric trains in this section.

Rohtak-Panipat rail line.

In the year 2018-19, Railway electrification of Rohtak - Panipat rail line of Northern Railway covering 71 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 Panipat have been eliminated.

Kiul-Tilaiya rail line.

In the year 2018-19, Railway electrification of Kiul-Tilaiya rail line of East Central Railway covering 87 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 Kiul and Tilaiya have been eliminated.

V Major New Electrification Works sanctioned in 2018-19, under plan Head- "Railway Electrification"

S.No.	Section	Railway	State	RKM
1.	Lonand - Phaltan	CR	Maharashtra	26
2.	Katwa - Ahmadpur	ER	West Bengal	52
3.	Rampurhat(excl.) – Dumka - Bhagalpur(excl.) & Jasidih - Deoghar - Dumka(excl.) incl. Barahat - Banka(excl.) - Chandan - Deoghar and Madhupur - Giridih	ER	Jharkhand & Odisha	361
4.	Dauram Madhepura - Purnia	ECR	Bihar	77.3
5.	Muzaffarpur - Sitamarhi	ECR	Bihar	64.52
6.	Dildarnagar -Tarighat	ECR	Bihar	18.67
7.	Khurda Road - Balangir	ECoR	Odisha	301
8.	Lanjigarh Road - Junagarh Road	ECoR	Odisha	56
9.	Naupada - Gunupur	ECoR	Odisha & Andhra Pradesh	90
10.	Prayag - Prayag ghat	NR	Uttar Pradesh	2.46
11.	Raebareli - Unchahar incl. Dalmau -Daryapur	NR	Uttar Pradesh	63
12.	Phaphamau - Partapgarh	NR	Uttar Pradesh	46
13.	Akbarpur - Faizabad - Barabanki	NR	Uttar Pradesh	161
14.	2nd Line Utratia-Raebareli - Amethi	NR	Uttar Pradesh	126
15.	Raja Ka Sahaspur - Sambhal Hatam Sarai	NR	Uttar Pradesh	23
16.	Faizabad - Sultanpur-Chilbila	NR	Uttar Pradesh	94.4
17.	Janghai - Zafrabad	NR	Uttar Pradesh	47
18.	Amb Andaura -Talwara	NR	Himachal Pradesh	40
19.	Bhatinda – Firozpur - Jalandhar City Incl. Lohian Khas – Nakodar - Phillaur & Nakodar - Jalandhar	NR	Punjab	301
20.	Ludhiana - Firozpur City - Husainiwala including Firozpur City – Fazilka - Abohar & Kotkapura - Fazilka	NR	Punjab	339
21.	Phagwara Jn. - Nawanshahar Doaba -Jaijon Doaba incl. Nawanshahar-Rahon	NR	Punjab	74
22.	Jalandhar City - Hoshiarpur	NR	Punjab	38.4
23.	Verka Jn. - Dera Baba Nanak	NR	Punjab	45
24.	Taran Taran - Patti - Khemkaran	NR	Punjab	54.4
25.	Batala Jn. - Qadian	NR	Punjab	19
26.	Bathinda Jn. - Abohar-Sri Ganganagar	NR	Punjab & Rajasthan	125

27.	Sonipat - Gohana - Jind	NR	Haryana	86
28.	Mahoba - Udaipura	NCR	Madhya Pradesh	196
29.	Barhan - Etah	NCR	Uttar Pradesh	59
30.	Salempur - Barhaj Bazar exisiting BG line	NER	Uttar Pradesh	20.25
31.	Mandhana Jn-Brahmavart	NER	Uttar Pradesh	8
32.	Gorakhpur - Anand Nagar-Gonda & Anand Nagar - Nautanwa	NER	Uttar Pradesh	261.6
33.	Gonda - Bahraich	NER	Uttar Pradesh	59.84
34.	Paniahwa - Chhitauni - Tamkuhi Road	NER	Uttar Pradesh	67.69
35.	Shahjahanpur - Pilibhit, Pilibhit -Tanakpur	NER	Uttar Pradesh & Uttrakhand	145.5
36.	Hathua - Bathua Bazar - Bhatni New line	NER	Bihar	79.6
37.	Duraundha - Maharajganj-Masrakh	NER	Bihar	41.53
38.	Moradabad - Kashipur-Ramnagar, Rampur - Lalkua-Kathgodam incl. Lalkua - Kashipur and Bareilly-Lalkua	NER	Uttrakhand & Uttar Pradesh	309
39.	Chaparmukh - Silghat Town incl. Senchoa Jn-Mairabari single line	NFR	Assam	130
40.	Lumding - Badarpur single line	NFR	Assam	172
41.	Badarpur - Jiribam, Katakhal - Bhairabi & Badarpur - Karimganj-Sabroom incl. Karimganj - Maishashan, Agartala - Akhaura & Baraigram - Dullabcherra	NFR	Assam , Tirpura & Mizoram	590
42.	Rangiya Jn.- Rangapara- Harmuty - Naharlagun including branch lines	NFR	Assam & Arunachal Pradesh	339
43.	Mariani-Jorhat town - Furkating & Tinsukia Jn - Makum-Tirap & Makum-Dangiri single line	NFR	Assam	174
44.	Harmuty - Murkongselek including branch line	NFR	Assam	230
45.	Katihar - Jogbani single line	NFR	Bihar	109
46.	Raninagar– Haldibari single line	NFR	West Bengal	34
47.	New Jalpaiguri - New Mal Jn-Alipurduar-Samuktala and Alipurduar-New Coochbehar incl. New Mal Jn- Changrabandha, New Changrabandha- New Coochbehar, New Coochbehar - Bamanhat, New Coochbehar – Fakiragram-Dhubri	NFR	West Bengal & Assam	506
48.	Katihar-Teznarayanpur, Barsoi-Radhikapur & Eklakhi-Balurghat single line	NFR	Bihar & West Bengal	176
49.	Aluabari - Siliguri via Baghdogra	NFR	Bihar & West Bengal	76.23
50.	Luni - Marwar	NWR	Rajasthan	71.71

51.	Bikaner - Merta-Jodhpur and Merta -Phulera	NWR	Rajasthan	424
52.	Degana - Ratangarh	NWR	Rajasthan	142.9
53.	Hanumangarh – Sriganganagar - Sarupsar - Suratgarh incl Sarupsar -Anupgarh	NWR	Rajasthan	281
54.	Samdari - Barmer-Munabao	NWR	Rajasthan	250.3
55.	Sikar - Loharu	NWR	Rajasthan	122
56.	Mavli - Bari Sadri	NWR	Rajasthan	82
57.	Dausa - Gangapur city	NWR	Rajasthan	93
58.	Madar - Pushkar	NWR	Rajasthan	25.7
59.	Ringas – Sikar - Churu	NWR	Rajasthan	140
60.	Thaiyat Hamira - Sanu incl. Pipar Road -Bilara,Makrana - Parbatsar and Merta Rd - Merta city	NWR	Rajasthan	135.7
61.	Hisar - Suratpura	NWR	Haryana & Rajasthan	64.6
62.	Udaipur City - Himmatnagar	NWR	Rajasthan & Gujarat	209.7
63.	Suratgarh – Phalodi - Bhildi incl. Phalodi -Jaisalmer	NWR	Rajasthan & Gujarat	902
64.	Dindigul - Palakkad	SR	Tamil Nadu & Kerala	179
65.	Tiruchchirappalli – Manamadurai –Virudunagar	SR	Tamil Nadu	217
66.	Salem - Vriddhachalam - Cuddalore Port	SR	Tamil Nadu	196
67.	Shoranur - Nilambur	SR	Kerala	66
68.	Kollam - Punalur	SR	Kerala	44
69.	Virudunagar - Tenkasi Jn	SR	Tamil Nadu	122
70.	Sengottai- Tenkasi Jn. - Tirunelveli-Tiruchendur	SR	Tamil Nadu	141
71.	Madurai - Manamadurai Jn.-Rameswaram	SR	Tamil Nadu	161
72.	Pollachi - Podanur	SR	Tamil Nadu	40
73.	Parli Vaijnath - Vikarabad	SCR	Maharashtra, Karnataka & Telangana	269
74.	Pimpalkutti - Mudkhed & Parbhani - Parli Vaijnath	SCR	Maharashtra & Telangana	246
75.	Tenali - Repalle	SCR	Andhra Pradesh	34
76.	Nandyal - Yerraguntla	SCR	Andhra Pradesh	123
77.	Purna - Akola	SCR	Maharashtra	209
78.	Lingampet Jagityal - Nizamabad	SCR	Telangana	95
79.	Dharmavaram - Pakala	SCR	Andhra Pradesh	228

80.	Gadwal - Raichur	SCR	Telangana	57
81.	Rupsa - Bangriposi	SER	Odisha	89
82.	Bankura - Mashagram	SER	West Bengal	118
83.	Tata - Badampahar	SER	Jharkhand & Odisha	89
84.	Tirodi - Katangi	SECR	Madhya Pradesh	15
85.	Wadsa - Gadchiroli	SECR	Maharashtra	49.2
86.	Tumsar Road - Tirodi	SECR	Maharashtra & Madhya Pradesh	46.8
87.	Balaghat - Katangi	SECR	Madhya Pradesh	46.8
88.	Marauda - Dallirajhara	SECR	Chhattisgarh	76
89.	Hosapete - Swamihalli	SWR	Karnataka	59
90.	Birur-Talguppa	SWR	Karnataka	161
91.	Mysuru - Hassan-Mangalure incl. Arsikere - Hassan	SWR	Karnataka	347
92.	Mysuru - Chamarajanagar	SWR	Karnataka	61
93.	Kadur - Chikkamagaluru	SWR	Karnataka	46
94.	Chikbanavar - Hassan	SWR	Karnataka	166
95.	Bangarapet - Yelehanka	SWR	Karnataka	149
96.	Kanalus – Wansjaliya - Porbandar	WR	Gujarat	103.3
97.	Rajkot - Jetalsar - Viraval - Somnath with Jetalsar - Wansjaliya	WR	Gujarat	277.5
98.	Mhow - Khandwa	WR	Gujarat	138
99.	Vasad - Kathana	WR	Gujarat	43
100.	Anand - Khambhat	WR	Gujarat	51.79
101.	Vishvamitri - Pratap Nagar -Chota Udepur	WR	Gujarat	102
102.	Kanjari Boriyavi - Vadtal	WR	Gujarat	6.4
103.	Nadiad - Modasa	WR	Gujarat	104.8
104.	Ankleshwar - Rajpipla	WR	Gujarat	62.84
105.	Jhund - Kharaghoda	WR	Gujarat	23.3
106.	Adipur - New Bhuj	WR	Gujarat	48.94
107.	Mahesana – Patan - Bhildi	WR	Gujarat	90.61
108.	Dhola - Bhavnagar with Sihor Jn.- Palitana & Rajula Road Jn- Mahuva	WR	Gujarat	119.2
	Total			**14,577**

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 5,886 stations covering about 94% of the interlocked Broad Gauge stations on Indian Railways, replacing the obsolete Multi Cabin Mechanical Signalling System, involving a large number of human intervention. Route Relay Interlocking (RRI) at 20 major stations namely, Bhusawal GYC, Igatpuri, Jamalpur, Sitarampur, Amritsar, Manduadih, Kasganj, Arrakkonam, Nimpura Departure Yard, Bondamunda E Cabin, Bondamunda J Cabin, Khanudih, Mohuda, Bhawaichandi, Sonnargar, Dehri-on Sone, Tori, Panki (UP), Lalgarh and Kota with Panel Interlocking at 96 Stations and Electronic Interlocking at 277 stations, have been provided during the year 2018-19.

Complete Track Circuiting: Track Circuiting on 'A', 'B', 'C', 'D Special' and 'E Special' routes, where permissible speeds are more than 75 kilometers per hour on passenger lines has been completed at about 33,845 locations up to 31.03.2019. Total 6,060 stations have been provided with complete track circuiting.

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 31.03.2019, Block Proving Axle Counters (BPAC) have been provided on 5,363 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 31.03.2019, Intermediate Block Signalling has been provided in 574 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 31.03.2019, Automatic Block Signalling has been provided on 3,039 Route kms

Automatic Train Protection (ATP) System:

In order to enhance safety in Train operations, Indian Railway has decided to provide Automatic Train Protection (ATP) System using a mix of proven European Train Control System (ETCS) level 2 and indigenously developed Train Collision Avoidance System (TCAS). The system will be an aid to Loco Pilot, which will help to eliminate accidents due to Signal Passing at Danger (SPAD) and over speeding, ensure visibility of signals in foggy weather in addition to increasing line capacity.

Four projects of ETCS Level 2 of limited lengths on High Density Networks, have been taken up for extensive trials before going for large scale implementation.

Indigenous TCAS is under trials and once developed, it will be provided on low density routes. 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. Products of 3 manufacturers have been approved and safety certified for developmental orders for Absolute block section with speeds upto 110 Kmph.

Centralized Traffic Control (CTC) in Indian Railways:

Centralized Traffic Control is a computer based system which facilitates the control and management of multiple Signalling installations at various stations from a single location. It also provides a real time simulation of railway traffic in a section at a single location. Ghaziabad-Kanpur section of North Central Railway has been chosen for provision of first CTC of Indian Railways. All signalling assets in Ghaziabad – Kanpur section (413 km double line section having 47 stations) can be controlled from a single location i.e. CTC Tundla, North Central Railway. This work is being done for the first time on Indian Railways having Centralized operation of points and associated signalling gears from the centralized place i.e. Tundla.

CTC System consists of Traffic Management Sub-System that controls wayside Station Interlocking and traffic flows in CTC territory. CTC enables the control of train movements directly, bypassing local operators/station masters and eliminating written train orders.

The CTC operator can directly see the train's locations on an electronic display panel and efficiently control the train's movements by operating signals and points centrally.

Train Management System (TMS): TMS, commissioned on Churchgate-Virar and Chatrapati Shivaji – Kalyan and Harbour line sections of Mumbai Suburban Section in 2003 and 2013 respectively, provides live train movements in the Control Centre. Eastern Railway also has commissioned TMS at Howrah divisional control office for managing its Howrah–Bandel suburban sections. This is an efficient tool to control train movements.

Announcements at stations are triggered automatically from the central servers. The advantages of online train information have been appreciated by the commuters.

Railway is planning to provide Train Management System at the suburban sections of metro cities. The work is sanctioned for provision of TMS on ECoR, suburban section of Chennai, Southern Railway, Howrah-Kharagpur Section, South Eastern Railway and Sealdah Division, Eastern Railway.

Interlocking of Level Crossing Gates:

Indian Railways have provided interlocking with Signals at 11,375 Level Crossing Gates as on 31.03.2019, 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 function normally with minimum effect on train operation. 4,293 Nos. of busy interlocked gates have been provided with Sliding Booms as on 31.03.2019 in addition to lifting barriers and further busy gates are also being progressively covered.

Growth of deployment of Signalling on Indian Railways:					**As on 31.03.2019**
Item	March,15	March,16	March,17	March,18	**March,19**
Panel Interlocking (Stations)	4,195	4,107	4,155	4,130	**4,052**
Route Relay Interlocking (Stations)	2,80	281	281	282	**228**
Electronic Interlocking (Stations)	842	1,005	1,148	1,358	**1,606**
PI/RRI/EI (Stations)	5,317	5,393	5,584	5,770	**5,886**
Block Proving Axle Counter (Block sections)	4,585	4,640	4,976	5,058	**5,363**
Automatic Signalling (Route Kms)	2,715	2,752	2,866	2,901	**3,039**
Intermediate Block Signalling (Block sections)	475	489	501	532	**574**
Interlocked level Crossing Gates (Nos.)	10,513	10,776	10,826	11,006	**11,375**

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, Ajmer on North Western Railway, Kharagpur on South Eastern Railway and Ghaziabad on Northern Railway have been manufacturing items like Electric Point Machines, Tokenless Block Instrument, Double Line Block Instruments, Axle Counters, various types of Relays, etc. The out turn achieved by these S&T workshops during 2014-15, 2015-16, 2016-17, 2017-18 and 2018-19 are as under:-

Year Wise out Turn Signal and Telecommunication Workshop:

Year	Out Turn in Lakhs
2014-15	20732.01
2015-16	22098.30
2016-17	22513.21
2017-18	25749.21
2018-19	**29690.10**

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 2019, Indian Railways has about 55,835 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. 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 all stations excluding Halt Stations for internet facility to passengers which will aid in

"Digital India" initiatives of Govt. of India. Wi-Fi internet facility at 1,606 stations has been provided as on date. Work is in progress at remaining stations by M/s Tata Trust without incurring any expenditure by Ministry of Railways .

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. RFP for these stations has already been floated & due to open on 22.07.2019. In addition to these 6,124 stations, Video Surveillance System at 202 more stations has been sanctioned under ISS works, out of which 130 stations have been commissioned so far i.e. upto 31.03.2019 .

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.

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 16,840 data circuits that power its various data and voice networks across the country.

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 5,206 stations and Coach Guidance System at 583.

RailTel has installed a SIP server & commissioned 1,389 SIP Phones on PAN India basis across Indian Railways.

Important Telecom assets are tabulated below:

S.No.	Installation	Units	As on 31.03.2018	As on 31.03.2019
1.	Optical Fibre Cable	Rkms	53,476	**55,835**
2.	Quad Cable	Rkms	61,849	**62,571**
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	**1,178**
7.	Public Address System	Nos. of STNs	5,096	**5,206**
8.	Train Display Boards	Nos. of STNs	1,090	**1,090**
9.	Coach Guidance System	Nos. of STNs	576	**583**
10.	VHF Sets			
	a. 5 Watt sets (Hand held)	Nos.	1,49,787	**1,49,787**
	b. 25 Watt sets (At Stations)	Nos.	9,465	**9,465**
11.	V SAT	Nos.	881	**635**
12.	Railnet Connections	Nos.	1,31,213	**1,31,502**
13.	UTS/PRS Circuits	Nos.	10,883	**11,044**
14.	FOIS Circuits	Nos.	2,277	**2,454**
15.	NGN & Exchange Circuits	Nos.	2,536	**2,536**
16.	Wi-Fi at Stations	Nos. of STNs	523	**1,606**
17.	CCTV at Stations	Nos. of STNs	436	**453**

Signal & Safety Devices at NF Railway

Rolling Stock

Locomotives:

The size of IR's fleet of locomotive stock as on 31st March, 2019 consisted of 39 steam, 6049 diesel and 6059 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
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
2018-19	**39**	**6,049**	**6,059**	**12,147**	**39,413**	**16,226**

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

Year	Broad Gauge		Metre Gauge	
	Diesel	Electric	Diesel	Electric
2015-16	37,186	37,801	18,896	-
2016-17	37,633	37,995	18,948	-
2017-18	38,244	38,086	18,960	-
2018-19	**40,400**	**38,455**	**18,967**	**-**

Coach upkeep:

1,029 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
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	*54,081	*39,57,328	1,690	1,67,185	*6,537
2018-19	**10,439**	**18,85,610**	**55,282**	**40,39,652**	**1,876**	**1,64,976**	**6,406**

$ Includes standing accommodation.

@ Includes Rail Cars.

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

* Revised

Wagons:

As on 31st March, 2019, the size of IR's wagon fleet consisted of 2,89,185 units 67,566 covered, 1,65,254 open high-sided, 17,049 open low-sided, 24,663 other types and 14,653 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
2016-17	2,77,992	24.0	56.1	5.4	9.3	5.2	100
2017-18	*2,79,311	23.7	56.8	5.7	8.4	5.4	100
2018-19	**2,89,185**	**23.4**	**57.1**	**5.9**	**8.5**	**5.1**	**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
2016-17	264	15.99	262	60.9	1.9	34.2
2017-18	264	16.28	263	61.7	1.1	31.7
2018-19	**275**	**16.95**	**274**	**61.6**	**1.0**	**31.6**

$ Excludes departmental service wagons and brake vans

Some of the major types of wagons plying on IR as on 31.03.2019 are shown below:

Types of Wagons fleet (BG)		
Types of Wagon	**Units available**	**Brief description**
BOXNHS	19258	Bogie open wagon, air brake, high speed.
BOXNS	3170	Bogie open wagon, air brake, high speed.
BOXNLW	2181	Bogie open wagon, air brake, light weight.
BOXNCR	362	Bogie open wagon, air brake, made of corrosion resistant IRS M : 44 steel.
BOXNHA	842	Bogie open, air brake wagon of 22 t axle load with high side walls (higher than BOXN), designed for transportation of coal.
BOXNHL	59626	Bogie open air brake, stainless steel wagon
BOX' N'	39188	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	1199	Standard Gondola wagon, air brake, to carry minerals / iron ore with an axle load of 22.9 t.
BCN/BCNA	41867	Bogie covered wagon, air brake fully riveted / welded construction for transportation of bagged cement, food grains, fertilizers, etc.
BCNAHS/BCNHS	10189	Bogie covered air brake, all welded & riveted construction with High Speed bogie CASNUB – 22 HS BOGIE.

BCNHL	18561	Bogie covered, air brake, micro – alloy (stainless steel wagon)
BRN	1533	Bogie Rail wagon Heavy, air brake.
BRNA /HS	5471	Bogie Rail wagon Heavy, air brake, High Speed bogie, riveted cum welded construction.
BRHNEHS	1562	Bogie Rail wagon, air brake, high speed CASNUB BOGIE for engineering department.
BFNS	1027	Bogie Flat, air brake wagon, high speed for transportation of H.R. coils, plates, sheets & billets loading.
BOST / HS	9451	Longer BOXNHS, air brake, wagon for finished steel products.
BOBR / N / HS	18450	Bogie open rapid discharge air brake wagon for coal.
BOBYN	6067	Bogie Hopper, air brake, bottom discharge wagon
BOBSN	1923	Bogie open air brake, side discharge wagon for iron ore.
BTPN	11677	Bogie Tank wagon, air brake, for liquid consignments like petrol, naptha, ATF and other petroleum products.
BTPFLN	943	Bogie Tank wagon, air brake, with frameless body.
BTPGLN	145	Bogie Tank wagon, air brake, for or carrying Liquified Petroleum Gas.
BLCA/BLCB/ BLCAM	21093	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 (Group)	1515	Container Flat wagon, same as BLCA / BLCB, but with a Longer Platform of 45ft.(privately owned).

Repairs and Maintenance:

42 Loco sheds and 214 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	
	2017-18	**2018-19**
Diesel Locos	474	**440**
Electric Locos	443	**465**
Coaches	30,037	**30,649**
Wagons	50,956	**53,903**

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 ₹6,223.72 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 capacity on PU's workshops as well specialise technical projects allotted by Ministry of Railways.

Key Milestones:

S. No.	Year	Fund Utilization (in crores of Rupees)	Contracts Awarded
1	2017-18	436.53	679.67
2	**2018-19**	**448.61**	**1096.38 (Best Ever)**

Composite Turnkey projects involving machines:

Completed

- Composite Works contract for Augmentation of production capacity for manufacturing of advanced LHB coaches at Integral Coach Factory/ Chennai (₹127 crore).
- Coil Spring manufacturing facility at Integral Coach Factory/Chennai (₹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/CR (₹ 62.3 crore).
- Creation of BG Coach POH facilities at Moti bagh/NGP (₹81.89 crore).
- Modernisation and Augmentation of Wagon POH capacity at Dahod (₹92.92 crore).
- Augmentation of BG coaches POH capacity from 50 coaches to 100, Bhavnagar (₹48.71 crore).
- Augmentation of Wagon POH capacity from 400 to 500 wagons per month, Raipur (₹113.20 crore).
- Setting up of Axle Forging Line, Rail Wheel Factory/Bengaluru (₹303.21 crore).

Other Projects in Pipeline

- 3rd Axle Machine Line for Rail Wheel Factory (₹221.42 crore).

- Setting up of wheel shop at New Katni Junction, WCR (₹66.94 crore).

Special Projects in new technology areas in hand:

- Procurement of Simulator in motion type for training of Loco Pilots (₹350 crore).
- Procurement of Trolley Mounted Sewage Evacuation Machines (₹58.44 crore).
- Fitment of RFID in Wagons (₹52 crore).
- Fitment of Bio Vacuum Hybrid Toilet System in 500 LHB Coaches (₹ 55 crore).
- Smart Yard facilities in Tughlakabad & Mughal Sarai (₹64 crore).
- Procurement of Hot Axle Box Hot Wheel Detector (₹56 crore).

New Projects expected

- Procurement of 200 Ton Telescopic Breakdown Cranes

Rate Contract

- Procurement of Coach Washing Plant (₹80.5 crore).

WAP7 Locomotive produced by DMW, Patiala

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
2016-17	-	45.9	40.0	14.1	-	38.3	61.7
2017-18	-	*47.2	*41.3	*11.5	-	38.7	61.3
2018-19	**-**	**46.3**	**42.1**	**11.6**	**-**	**37.1**	**62.9**

@ 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
2016-17	-	46.3	46.3	7.4	-	35.5	64.5
2017-18	-	*45.3	48.8	*5.9	-	*35.6	*64.4
2018-19	**-**	**43.8**	**50.4**	**5.8**	**-**	**34.6**	**65.4**

@ Includes DHMU & DEMU

* Revised

Electric Traction:

Highest-ever Electric loco production:

CLW has turned out 402 three-phase electric loco in year 2018-19 which is the rarest feat achieved by CLW and this performance has been unprecedented in the history of CLW. A cumulative production of 605 electric locomotives has been achieved during 2018-19 utilizing the capacity of CLW, DLW & DMW.

Operation of trains with WAP-5/WAP-7 locomotive in push-pull mode:

In order to increase average speed of passenger trains, IR has successfully introduced Push-pull operation (one locomotive in front of rake and one rake in rear of rake with all controls from front locomotive) in train no. 22221/22 between Mumbai - Delhi (CSMT-NZM) over Central railway Route. With the Push-Pull arrangement in this train, attaching / detaching of banker locomotive at ghat section between Kasara - Igatpuri is no more required. Average speed of train has also been enhanced and journey time has been curtailed by 95 minutes in CSMT - NZM direction. One more train no. 12127/28 Mumbai-Pune Intercity has also been switched over on Push-Pull mode and average saving of about 37 minutes journey time is achieved. Considering the significant reduction in journey time and better passenger comfort as compared to single loco hauled train, it is decided to proliferate the Push-Pull operation on more trains.

Manufacturing of High Horse Power (9000 hp) Freight locomotives:

Enhancement of average speed of freight trains is one of the Mission of Indian Railways. At present Horse Power to Trailing Load ratio of freight trains is less than one which is just adequate. Thus average speed of freight trains on IR is only 23.3 kmph (ASS 2017-18) even after deployment of multi locomotives in heavy freighters. To the solution, IR has taken initiative and developed High Horse Power Freight electric locomotives (9000 HP) in-house successfully. The upgradation is 'Make in India' initiative and only with the incremental increase in initial cost of locomotive. This is a vital initiative in the direction of right powering of freight trains over IR which will help in to enhance average speed of freight trains leading to capacity enhancement.

Upgradation of speed of WAP-7 locomotives up to 160 kmph:

In order to enhance speed of coaching trains up to 160 kmph (semi high speed), it is necessary to have a electric locomotive which can haul 24 – 26 coach trains at a speed of 160 kmph. Presently, IR has only WAP-7

coaching locomotive capable to haul such trains at 140 kmph. To cope up with the requirement of 160 kmph locomotive, IR has successfully upgraded the speed of existing WAP7 locomotive from 140 kmph to 160 kmph indigenously. This indigenous cost effective solution will not only enhance the speed of coaching trains but also helps into enhances the average speed IR's rail network.

Development of Passenger locomotives with speed of 200 kmph:

In compliance to the decision for introduction of high speed train operation (up to 200 kmph), CLW has redesigned the cab of existing WAP-5 locomotive for aerodynamic profile and upgraded for achieving the speed potential of 200 kmph. First High Speed WAP-5 electric passenger locomotive with speed potential of 200 kmph and aerodynamic cab has been turned out from CLW and is under field trials. This upgraded locomotive will play pivotal role in high speed train operation in India.

Diesel Traction:

Indian Railways has a fleet of about 5550 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 in to Electric loco:** Consequent upon rapid electrification of IR, Electric locomotives are required in large number. IR has conceived a plan to convert Diesel Locomotives in to Electric locomotive. Conversions of 200 diesel locos (100 HHP & 100 ALCO locomotives) in to electric loco have been sanctioned in Pink Book 2018-19. Two ALCO type WDG3A Diesel Engines have been converted in to Electric loco WAGC3.The loco has completed it oscillation trial and presently under operation over IR. Further, another set of two ALCO locomotives is under conversion at DMW/PTA.

  Another set of two HHP locomotives have been converted in to Electric loco WAG-11 by DLW. The loco is under speed and oscillation trial with RDSO.

- **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, improve their efficiency and alertness. Till May'2019, ACs have been fitted in 916 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, 76 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 also 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 3606 Diesel Locomotives.

- **CNG/LNG DEMU:** Indian Railways 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 - 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 26 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 realized with use of CNG engines in dual fuel mode.

- **Auxiliary Power Unit (APU):** APU is a self-contained unit with 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 liters of diesel per hour in comparison to 25 liters 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 986 Diesel Locomotives.

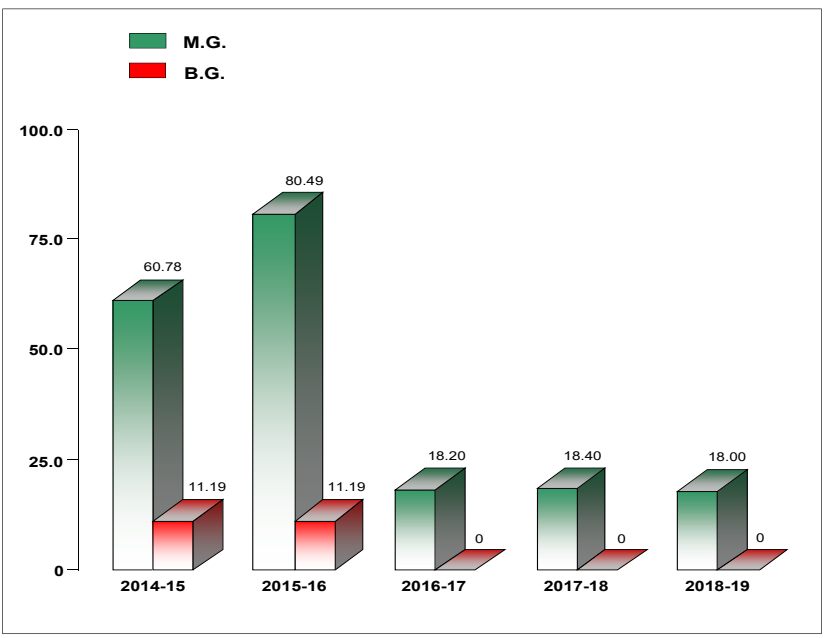
- **Common Rail electronic Direct Injection (CReDI):** Use of CReDI as fuel injection system leads to reduction in fuel consumption, reduction in emissions and reduction of engine combustion generated noise, in addition to the increased life of engine due to controlled injection and combustion of fuel. 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. There have been sanctions of 180 units of CReDI. Out of these, DMW has fitted CReDI in 15 ALCO diesel locos. Further procurement of 65 units of CReDI is 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

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



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 International 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 Functional Requirements Specification (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. IIT/KGP has carried out remaining acoustic insulation work at Kazipet shed. Sound pressure level measurement has been done by IIT/KGP in consultation with RDSO on 26-28th Dec.'2018. IIT/KGP submitted Final report in May'2019 to RDSO for scrutiny.
- **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 by Hon'ble Minister of Railways 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 First1600 HP DEMU rake with solar powered Panel hotel load system on 14 July 2017 at Safdurjung railway station, New Delhi. Total 6 such trailer coaches are fitted by IROAF at ICF, Chennai. In addition to above, fitment of Solar panel over 14 nos. Trailer Coaches of DEMU are under process. Furhter 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 addition to above, flexible solar panels have also been retrofitted on 13 coaches of Sitapur-Rewari passenger. 50 nos. of Guard vans have been retrofitted with solar panel. Further RSP sanctions are available for provision of Solar panels on 750 Nos. Guard Brake vans.The work of retrofitment of solar panels will be done in different workshops and DEMU sheds on Indian Railways.

Steam Locomotives:

Steam Locomotives are the icons of Indian Railways 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 & Farcuhnagar (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 140th year and a UNESCO World Heritage Site.

iv. Meter Gauge Steam services over Nilgiri Mountain Railway (NMR), now in its 112th year and a UNESCO World Heritage Site.

v. Narrow Gauge steam services over Kalka-Simla Railway (KSR) now in its 117th year and UNESCO World Heritage Site.

vi. Narrow Gauge steam services over Neral-Matheran on Matheran Light Railway (MLR), now in its 113th year.

vii. Narrouw Gauge steam services over Kangra Valley Railway (KVR), now in its 91th 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. Weekend summer special train service with steam locos has been introduced between 'Mettupalayam' and 'Coonoor' from 31.03.2018. 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 in iconic "Fairy Queen" (1855), placed in the Guinness Book of Record as being the oldest working locomotive in the World and "Akbar" (WP-7161), 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.

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)**	
	2017-18	**2018-19**	2017-18	**2018-19**
Electricity (Million KWH)	16634.17	**17681.79**	2386.85	**2264.45**
HSD Oil (Million litres)	2778.431	**2749.01**	*69.651	**72.120**
Coal (Million tonnes)	0.000578	**0.000898**	0.000327	**0.000155**

*Revised

Personnel

The number of regular employees on Indian Railways as on 31.3.2019 stood at 12,70,399.

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

Year	Number@ of staff as on 31st March (in thousands) Groups A&B	Group C	Group D	Total	Expenditure@ on staff (₹ in crore)
1950-51	2.3	223.5	687.8	913.6	113.8
1960-61	4.4	463.1	689.5	1,157.0	205.2
1970-71	8.1	583.2	782.9	1,374.2	459.9
1980-81	11.2	721.1	839.9	1,572.2	1,316.7
1990-91	14.3	891.4	746.1	1,651.8	5,166.3
2000-01	14.8	900.3	630.2	1,545.3	18,841.4
2010-11	16.9	1,079.2	235.9	1,332.0	51,776.6
2017-18	*16.6	1,133.5	120.3	*1,270.4	*1,28,714.74
2018-19	**16.6**	**1,075.8**	**134.5**	**1,226.9**	**1,34,364.18**

*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 87.7% and 11.0% respectively. Of the employees in Group C and D, 3.21 lakhs (26.5%) are workshop employees and artisans and 8.89 lakhs (73.5%) from other categories including running staff. Railway Protection Force/RPSF personnel totalled 62,451.

In the non-gazetted cadres, the ratio of Group C to D changed from 25:75 in 1950-51 to 89:11 in 2018-19, 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 31.03.2018	As on 31.03.2019	As on 31.03.2018	As on 31-3-2019
Group A	1,405 (13.77%)	**1462 (14.62%)**	744 (7.29%)	**748 (7.48%)**
Group B	1,236 (19.28%)	**1262 (19.22%)**	494 (7.70%)	**543 (8.27%)**
Group C #	2,11,575 (16.87%)	**2,04,939 (16.93%)**	95,575 (7.62%)	**95,918 (7.93%)**
Grand Total	2,14216 (16.86%)	**2,07,663 (16.93%)**	96,813 (7.62%)	**97,209 (7.92%)**

Including erstwhile Group 'D'

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

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

Wage Bill:

Wage bill including pension etc. during 2018-19 was ₹1,34,364.18 crore registering an increase of ₹5,649 crore over the previous year. The average wage per employee was up by 7.74% from ₹10,18,501 per annum in 2017-18 to ₹10,97,370 per annum in 2018-19. 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 59%.

The average annual wage (excluding fringe benefits) per employee paid under various categories in 2018-19 is given below:

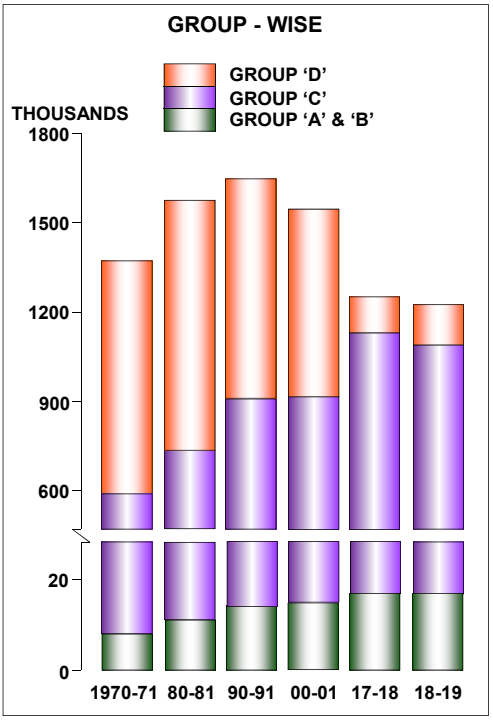
Category	Groups A & B (₹)	Group C (₹)	Group D (₹)	Total (₹)
Workshop and artisan	-	8,56,362	6,53,923	8,33,866
Running*	-	14,19,432	-	14,19,432
Others	-	11,90,729	5,79,883	11,13,511
Total	**30,24,373**	**11,29,669**	**5,99,048**	**10,97,370**

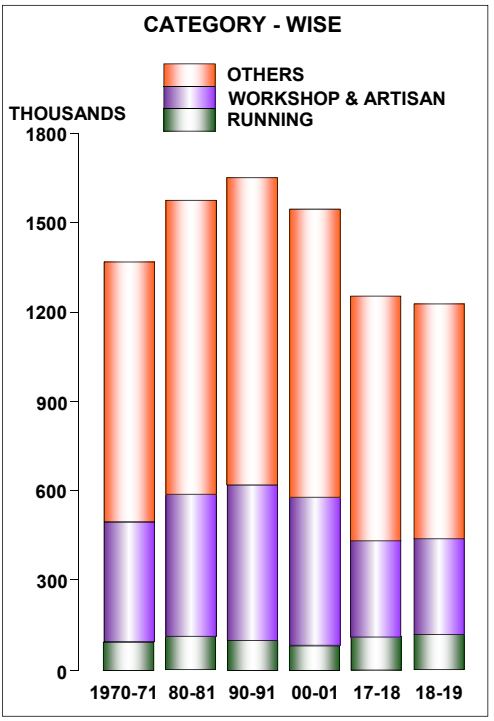
*Emoluments include running allowance.

Productivity Linked Bonus:

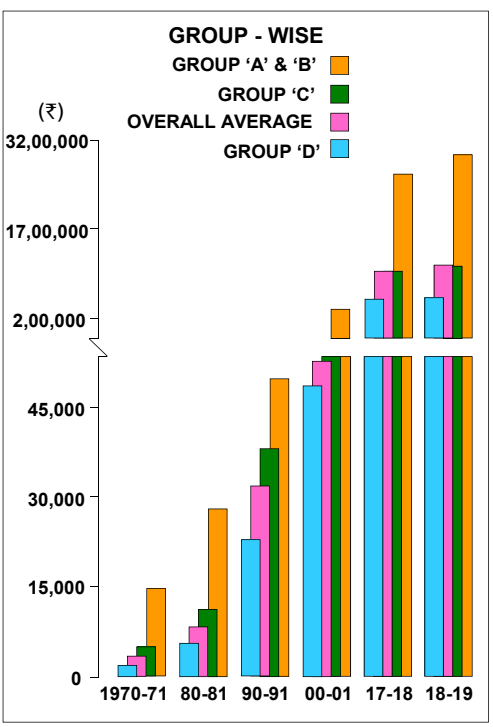
In 2018-19, all non-gazetted Railway employees (excluding RPF/RPSF personnel), were sanctioned Productivity Linked Bonus (PLB) for 78 days. This benefitted an estimated 11,52,308 lakh Railway employees. Further, Group 'C' and 'D' RPF/RPSF personnel have been sanctioned ad-hoc bonus equivalent to 30 (thirty) days' emoluments for the year 2018-19. The PLB and ad-hoc bonus both have been paid on an enhanced calculation ceiling of ₹7,000/-p.m. Financial implication for PLB and ad-hoc bonus was approximately ₹2,024.40 crore and ₹43.81 crore respectively.

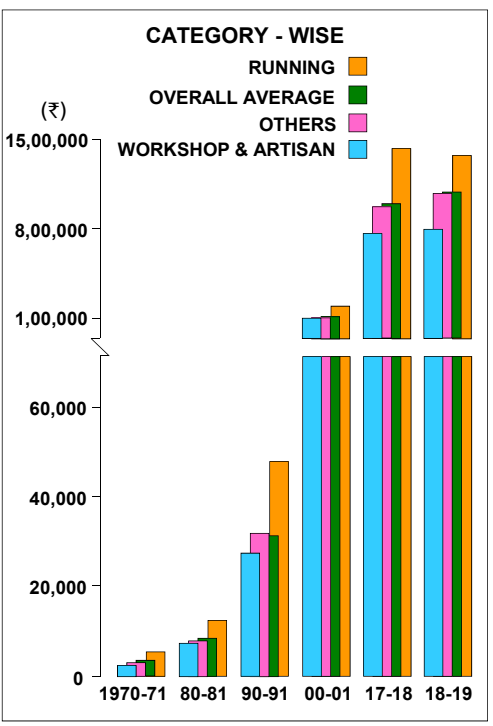
NUMBER OF PERSONNEL





AVERAGE ANNUAL WAGE PER EMPLOYEE





Human Resource Development (HRD) and Manpower Planning:

Training

Railways have historically been a labour intensive organization. The size of Indian Railways' workforce is approximately 1.3 million with more than 500 job categories. Over the years major technological advancements have taken place on Indian Railways and the need for training is continuous and essential. Some of the disciplines/job categories are totally unique to the Railways and there is no exposure provided as part of the general education scheme in the country. Further, maintenance and operation of sophisticated equipments on Indian Railways involves a fairly high level of knowledge and skills in order to ensure safe and reliable running of trains, since the knowledge and skills required in the Railways are not specifically imparted by any college or vocational institution, it is imperative that the Railways organize their own need-based system of training and develop their manpower. To make this possible, elaborate infrastructure has been developed by the Indian Railways. Keeping in view the safety considerations and the diverse categories of manpower variety, training on the railways is given highest priority and the need for continuous training to up-grade the skill and technical knowhow of the workforce with introduction of new technologies from time to time.

There are different sets of Training Centres for Gazetted and Non-Gazetted Staff. These Training Centres located all over Indian Railways imparts various type of trainings i.e Probationary/Initial training (i.e before taking up a working post), Promotional training (i.e on promotion), Refresher training (i.e mid-career/on introduction new developments in technology) and Specialized training (for Specialized courses).

All frontline staff who are involved in Train Operation are given training on Threat perception, 'Emergency response, Fire fighting, Use of Fire extinguisher, First Aid' and Gender Sensitization. Training not only covers Hard skill but Soft Skill Training/Customer Care training also. Soft Skill training/Customer care training is stress involved in the job. These trainings help to optimize output from workforce. Apart from in-house training, railway employees are also sent to foreign training under transfer of technology and are also provided training in leading training institutes within India.

It has been constant endeavor of Railways to develop Human Resources. In this direction, a 5-days on-job training or classroom training was given to all 13 lakh employees of Indian Railways under 'Project Saksham' in the year 2018 to enhance the skilling abilities. In view of the success and positive outcome of "Project Saksham, 2018", "Project Saksham-II, 2019"

has been launched w.e.f. 01.04.2019 to 31.12.2019. "Project Saksham-II, 2019" like 'Project Saksham-2018' will be a five day on the job training at workplace or as classroom training in Railway Training Center depending on the nature of training.

Apprenticeship Training

Since long Indian Railways has been developing the skills of youth by way of training under the Apprentices Act, 1961 in trades such as Fitter, Turner, Machinist, Welder, Painter, Carpenter, Electrician, Refrigerator and AC Mechanic etc. has been going on in the established Basic and Systems Technical Schools in the zonal railways and production units since long. The Apprentices Act 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. Ministry of Skill Development and Entrepreneurship is the administrative ministry responsible for implementation of the Act. Initially, the Act envisaged the Apprenticeship Training of "trade apprentices" (ITI pass outs and School leavers). The Act was amended in 1973 and 1986 to include training of graduates and technicians and technician (vocational) apprentices respectively under its purview. Various sections of the Act amended in 1997, 2008 and 2014 to amend the definition of 'establishment', 'worker', 'stipend' and reservation for candidates belonging to Other Backward Classes etc.

Apprenticeship training is one of the most effective ways to develop skilled manpower for industry by using training facilities available in the establishments without putting any extra burden on exchequer to set up training infrastructure. Persons after undergoing apprenticeship training can easily adapt to industrial environment at the time of regular employment. The other advantages of apprenticeship training are as follows:

- Improved quality of training, experiential learning and enhanced employability.
- Providing apprentices a real chance to put skills into practice and helps them to gain confidence in working environment.

Apprentices Training consists of Basic Training and On-the-Job Training/Practical Training at workplace in the industry. The basic training is an essential component of apprenticeship training for those who have not undergone any institutional training/skill before taking up on-the-job training/practical training. It counts for 20-30% of overall duration of Apprenticeship Training. Apart from basic training, there is a component of on-the-job training which is performed in the establishment and under taken by the establishment itself.

Zonal Railways, Production Units and Railway Public Sector Undertakings engage Apprentices for Apprenticeship training at a minimum of 2.5% to 10 % of the strength of the establishment and Production Units engage a minimum of 5%.

Railway Recruitment Boards:

During the financial year 2018-19, the following activities/initiatives have been undertaken by RRBs:

- Arising and filling up of vacancies is a continuous process. The requirement for various Group 'C' posts under Direct Recruitment Quota (DR-Quota) is assessed by Zonal Railway(s)/Production Unit(s), which accordingly place indents on concerned Railway Recruitment Boards (RRBs). RRBs, in turn, make recruitment on the basis of these indents.
- Accordingly, during 2018-19, 05 recruitment notifications for a total of 1,56,138 vacancies of various Group 'C' including Level-1 (erstwhile Group 'D') posts, have been published by RRBs. The details are mentioned below-

S. No	CEN No.	Post(s)	Date of Notification	Vacancies (notified/ modified)
1	03/2018	Jr. Engineer, Depot Material Superintendent & Chief Metallurgical Assistant	29.12.2018	13,561
2	01/2019	Non Technical Popular Categories (NTPC)- Graduate & Under Graduate level	28.02.2019	35,208
3	02/2019	Para-medical categories	04.03.2019	1,937
4	03/2019	Isolated & Ministerial categories	08.03.2019	1,663
5	RRC-01/2019	Level-1 (erstwhile Group 'D')	12.03.2019	1,03,769
		TOTAL		**1,56,138**

During 2018-19, panels of 1,727 candidates have been supplied to the Indenting Railway(s)/Production Unit(s) by 21 RRBs across India. Further, the Computer Based Tests against CENs No. 01/2018 & 02/2018 were completed during 2018-19 and panels of 1,27,573 candidates, for ALP/ Technicians and Level-1 posts, are likely to be supplied by July/August-2019.

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 45.12% staff have been provided with railway quarters, 4,807 staff quarters were electrified during 2018-19.

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 45 Thrift and Credit Societies, 144 Railway men's Consumer Co-operative Societies, 25 Labour Co-operative Societies and 4 Railway men's Housing Societies functioning on Indian Railways during 2018-19.

INDIAN RAILWAY MEDICAL SERVICE:

The philosophy of Health Directorate in the Indian Railways is based on the idea that the output of a contented and healthy worker who is relieved of mental and financial worries on account of his own or some family member's sickness, will be better and more conducive to the efficient running of Railways.

MISSION STATEMENT

"Total Patient Satisfaction Through Humane Approach & Shared Commitment Of Every Single Doctor and Paramedic To Provide Quality Health Care Using Modern & Cost effective treatment".

SERVICES PROVIDED BY HEALTH DIRECTORATE:

Promotive, preventive, primary secondary & tertiary health care is provided to all beneficiaries. Under Industrial Health - Medical Examination

of UPSC / RRB / RRC candidates, Periodical Medical Examination of Staff and Medical Facility as per Workshop Act. Attendance at Railway accidents and attending passengers who take ill on journey. Carrying out all programmes of Ministry of Health & Family Welfare. Beside the above it is also involved in carrying out testing of food and water samples under Food Safety & Standard Act.

RESOURCES AVAILABLE:

• No of Hospitals	125
• No of Beds	12,935
• No of Health Units	586

BENEFICIARIES

66 lakhs (Approx)

PERFORMANCE STATISTICS 2018-19

• Total OPD patient treated	2,01,64,464
• Total Indoor patient treated	5,08,831
• Major/special surgeries (including cardiac / Joint replacement / Cochler implant /Onco Surgeries)	1,02,432
• Medical examination candidates	37,460
• PME of employees	1,13,585
• Water and food samples (under FSSA Act)	12,51,093
• No of passenger call attended	60,806

MAJOR ACHIEVEMENTS:

- All eligible Railway Hospitals (91) have been registered with National Health Agency and providing treatment to beneficiaries under PM JAY Ayushman Bharat Scheme.
- MoU with Ministry of Health & Family Welfare for playing active role in achieving goal of eradication of Tuberculosis
- AYUSH facility has already been started in 5 Railway Hospitals of NR,ER,NFR,SR, WR.
- Decentralization of powers upto Divisional & Health unit Level for procurement , empanelling of hospital, consultant, reimbursement etc.
- Health wellness camp once a year for all Railway employees and for RPF twice a year.

- Various new facilities and infrastructure commissioned: - New Dialysis Centre and renovated OPD Complex started in Central Hospital Lalaguda and in Pune. A 50 bedded Sub Divisional Hospital commissioned in Tirupati. New OPD Complex, Modular OT, Vitrectomy Machine and Auto Tracking Digital X-ray commissioned in NRCH. OPD Complex and Pharmacy along with Hospital Auditorium has been renovated on Central Hospital, NFR. Opening of New Surgical and Casuality Block of B R Singh Hospital.
- Our hospitals are recognised by National Board of Examination for carrying out Post Graduate teaching and many of our doctors are examiners in this Course

Pension Adalats:

In accordance with the directives of Department of Pension and Pensioners' welfare (DOP&PW), All India Pension Adalat (AIPA) was held on 18.09.18 on all Indian Railways. In the aforesaid Pension Adalat, a number of 5951 cases were taken up to settle grievances of pensioners on the spot. Next Pension Adalat will be held on 15th December, 2019.

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 112 Railway 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, 87 Kendriya Vidyalayas are also functional on Railway land, to cater 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, 2019 the total number of notified Railway offices is 3587. In the year 2018-19, a total number of 1047 inspections have been carried out by these officers and the second Sub-Committee of Parliamentary Committee on Official Language has inspected 19 railway offices and has appreciated the use of Hindi in

these offices during inspections by Parliamentary Committee. In addition Grih-Patrika 'Rail Rajbhasha' in Hindi is also regularly published by Railway Board office. Till now 124 editions of the patrika have been published and circulated to all the Railway Offices. E-Rajbhasha web magazine is also being brought out regularly in every quarter. Till now 24 editions of this patrika have been brought out. About 87 Hindi Grih-Patrika are also being published by Zonal Railways/Divisions etc.at their level.

Training in Typewriting, Stenography and Hindi Language

In addition to the Training Centres set up by the Ministry of Home Affairs, arrangement are also made by IR to provide in-service training in Hindi language, Hindi typing and Hindi stenography. The number of employees trained at the end of 2018-19 as compared to 2017-18 as follows:

Activity	As on March 31,2018	As on March 31,2019
Working knowledge/ Proficient in Hindi	8,73,280	**8,87,806**
Hindi Typewriting	6,891	**7,414**
Hindi Stenography	3,222	**3,065**

Other activities

The existing policy of purchasing bilingual electronic equipments, like computers etc. is being followed. During 2018-19, 46,870 bilingual personal computers were available in various offices of Indian Railways. Websites of the Zonal Railways including Railway Board are also bi-lingual. In order to promote usage of Hindi in Railway offices, 874 Codes/Manual and 6548 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. Presently, about 17 lacs books in Hindi are available in 942 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 968 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 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 under the Chairmanship of Hon'ble Minister for Railways in order to propagate the use of Hindi in Ministry of Railways and Zonal Railways wherein honourable members of the Samiti give valuable suggestions to propagate the use of Hindi.

Incentive Schemes for the use of Hindi

Various incentive schemes have been implemented to encourage Railway personnel to work in Hindi. Prominent among them are the Individual Rajbhasha Cash Awards Scheme, Railway Minister Rajbhasha Shield/Trophy Scheme, Lal Bhadur Shastri Takniki Molik Lekhen Scheme, Premchand and Maithili Sharan Gupt Award Scheme, Rail Yatra Vritant Scheme, Hindi Essay competition and other schemes for Elocution/Noting/ Drafting in Hindi. For the year,2018 GM, Central Railway was awarded 'Kamlapati Tripathi Rajbhasha Swarn Padak Scheme', 30 silver medals under 'Rail Mantri Rajbhasha Rajat Padak Scheme' were given to officers working in Zonal Railways for the outstanding work in Hindi.

In order to promote usage of Hindi 'Rajbhasha Fortnight' was organised from 04 to 14 September, 2018 in the Ministry of Railways. During this period Essay Writing Competition, Elocution, Noting & Drafting Competition, Sulekhan Competition, Antakshari, Kavi Sammelan and Hindi Workshop were organised.

Special Achievement:

On 14 September, 2018 Ministry of Railways was awarded the first prize under 'Rajbhasha Kirti Puraskar' from the Honourable Vice President of India for the outstanding usage of Hindi.

Outstanding Achievements in Sports:

1. At International Level:

I. In XXI Commonwealth Games 2018 held at Gold Coast, Queensland, Australia from 4th to 15th April, 2018, out of total 66 medals won by India, Railway bagged 15 medals (10 Gold, 01 Silver and 04 Bronze). The performance of Railway weightlifters and wrestlers in particular has been remarkable.

II. Indian Hockey Women team won Silver Medal in the Donghae Women's Asian Champions Trophy 2018 held at Donghae City, South Korea from 13.05.2018 to 20.05.2018. Indian Hockey Women team had 12 players from Indian Railways in the team of 18 players and 02 coaches.

III. Indian Railway Power lifting players represented country in the Asian Power lifting Championship held at Udaipur (Rajasthan), India from 1st to 6th May, 2018. The Gold Medals Winners are Ms. Anjali, Ms. Sonali, Sh. Vimal, Sh. J. Krishna and Silver Medal Winner is Sh. P. Suresh.

IV. Shri P. Karthikeyan (ICF) received Grant Master title in 2018-19 and also won Commonwealth Chess Championship held in July, 2018.

V. Women International Master Ms. Mahalakshmi (ICF) was declared Runners-Up in Commonwealth Chess Championship in July, 2018.

VI. Indian Railway Men Football team participated in the USIC World Railway Football qualifying rounds (Group – A) held at Lalandia, Roadby, Denmark from 20.06.2018 to 24.06.2018 and the team won all the matches & became topper in the group.

VII. Ms. Trisha Deb, Archer (Compound) of SER has won Silver Medal in Compound team Championship event in the World Cup 2018, Stage – IV held at Berlin, Germany from 15th to 23rd July, 2018.

VIII. In XVIII Asian Games 2018 held at Jakarta, Palembang (Indonesia) from 18th August, 2018 to 2nd September, 2018. India has won 69 medals. Out of total 69 medals won by India, Railway bagged 09 medals (02 Gold, 04 Silver and 03 Bronze). The performance of Railway Wrestlers has been remarkable.

IX. Shri Malkeet Singh (CR) has won Silver Medal in the 6th ACBS Asian Team Snooker Championship held at Doha, Qater from 19th to 21st September, 2018.

X. Indian Railway Body Building players represent Indian team in the 52nd Asian Body Building & Physique Sports & Championship held at Pune from 2nd to 8th October, 2018.

XI. Indian Railway Marathon players participated in the 7th USIC Men and 2nd USIC Women World Railway Marathon Championship held at Prague (Czech Republic) from 11.10.2018 to 14.10.2018 and IR team Won Runners-up in the team Championship. Their names are Ms./Sh. Subhankar Ghosh, Arvind Kr. Yadav, Yogendra Kumar, Pram Singh, Manju Yadav, Monika Raut and Preenu Yadav.

XII. Indian Railways Wrestler, Shri Bajrang Poonia (NR) became World number one in 65 kg. Weight category in the united World Wrestling (UWW) ranking.

XIII. Indian Railway Cycling players participated in the 13th USIC World Railway Cycling Championship held at Bikaner (Rajasthan) from 12th to 16th November, 2018 and IR cyclist won the medal in 20 Km. Individual Time Trial event & 40 KM Team Time Trial Event. Their names are S/Sh.-Arvind Panwar, Manohar Lal, Shreedhar, Sandesh Uppar and Devkishan Saran.

XIV. Indian Railway Boxer, Ms. Sonia (NR) won Silver Medal in the Women World Boxing Championship held at New Delhi from 15th to 24th November, 2018.

XV. Indian Railway Body Building players represent Indian team in the 10th World Body Building and Physique Sports Championship held at Thaliand from 11th to 17th December, 2018.

2. At National Level:

During 1st April, 2018 to 31st March, 2019, Indian Railway team won National titles in 20 disciplines and stood runners-up in 13 disciplines and podium third in 02 disciplines.

3. Following Railway players have been honored with National Sports Awards during 2018-19:

S. No.	Name	Game	Award	Rly.
i)	Ms. Mirabai Chanu	Weightlifting	Padmashree Award	NFR
ii)	Sh. Bajrang	Wrestling	Padmashree Award	NR
iii)	Ms. Bombayla Devi Laishram	Archery	Padmashree Award	ER
iv)	Ms. Mirabai Chanu	Weightlifting	Rajiv Gandhi Khel Ratna Award	NFR
v)	Shri Sumit	Wresting	Arjuna Award	NR
vi)	Shri Vijay Sharma	Weightlifting	Dronacharya Award	NR

Finance

Indian Railways financial results for 2018-19 compared with the previous year are tabulated below:

		(₹ in crore)
	2017-18	**2018-19**
Capital-at-charge	**2,71,275.73	***2,95,151.86**
Investment from Capital Fund	53,449.91	**53,449.91**
Total	3,24,725.64	**3,48,601.77**
Passenger Earnings	48,643.14	**51,066.65**
Other Coaching Earnings	4,314.43	**4,474.46**
Goods Earnings	1,17,055.40	**1,27,432.72**
Sundry Earnings	8,688.18	**6,996.23**
Gross Earnings	1,78,701.15	**1,89,970.06**
Suspense	24.16	**-63.48**
Gross Traffic Receipts	1,78,725.31	**1,89,906.58**
Ordinary Working Expenses	1,28,496.51	**1,40,200.30**
Appropriation to Depreciation Reserve Fund	1,540.00	**300.00**
Appropriation to Pension Fund	45,797.71	**44,280.00**
Total Working Expenses	1,75,834.22	**1,84,780.30**
Net Traffic Receipts	2,891.09	**5,126.28**
Miscellaneous Transactions	-1,225.48	**-1,352.42**
Net Revenue Receipts	1,665.61	**3,773.86**
Dividend payable to Genl Revenues $	0.00	**0.00**
Excess (+)/Shorfall (-)	1,665.61	**3,773.86**
Percentage of Net Revenue to Capital-at-charge including investment from Capital Fund	0.51	**1.08**
Operating Ratio (%)	98.44	**97.29**
Capital-at-charge (including investment from Capital Fund) per NTKM (in paise)	418	**425**

* Excludes ₹15,143.21 crore of MTPs, ₹1026.98 crore of Circular Railways, ₹16,026.70 crore of Udhampur-Srinagar-Baramulla Project (National Project), ₹1,1954.00 crores of appropriation to SRSF and ₹24,062.87 crore investment in DFCCIL. ₹30,000 crore investment in RRSK and ₹15107.03 crore investment in RSF. Includes ₹16,562.26 crore of Production Units.

** 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 ₹15,873.41 crore of Production Units.

Revenue:

Revenue from Freight accounted for 67.08% of Gross Earnings. Passenger Earnings constituted 26.88% of the Gross Earnings, of which

5.51% was from Suburban Services, 85.35% from Express Long distance and 9.14 % 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 86.39% of the total goods earnings, while commodities other than the above accounted for 9.80%. Miscellaneous realization like demurrage, wharfage, shunting and siding charges etc. made up the remaining 3.81%.

Balance Sheet:

A brief summary of Balance Sheet as on 31st March, 2019 compared with the previous year is given below:

(₹ in crore)

	As on 31.03.2018	As on 31.03.2019	Variation
Assets			
Block Assets	5,17,324.19	**5,73,641.66**	56,317.47
Fund with Central Government			
(i) Reserve Fund	3,978.06	**1,905.94**	-2,072.12
(ii) Banking Accounts	62,758.78	**61,620.47**	-1,138.31
Sundry Debtors	4,075.32	**4,007.03**	-68.29
Cash in hand	786.96	**1,377.04**	590.08
Total	5,88,923.31	**6,42,552.14**	53,628.83
Liabilities			
Represented by:			
Capital-at-charge	**3,01,590.94	***3,35,241.43**	33,650.49
Investment financed from internal resources etc.	2,15,733.25	**2,38,400.23**	22,666.98
Total (i)	5,17,324.19	**5,73,641.66**	56,317.47
Reserve Fund	3,978.06	**1,905.94**	-2,072.12
Total (ii)	3,978.06	**1,905.94**	-2,072.12
Banking Accounts			
(i) Provident Fund	36,737.67	**38,115.46**	1,377.79
(ii) Miscellaneous Deposits etc.	25,956.22	**23,450.36**	-2,505.86
(iii) Loans and Advances	64.89	**54.65**	-10.24
Total (iii)	62,758.78	**61,620.47**	-1,138.31
Sundry Creditors etc. **(iv)**	4,862.28	**5,384.07**	521.79
Total (i) to (iv)	5,88,923.31	**6,42,552.14**	53,628.83

* Excludes ₹15,143.21 crore of MTPs, ₹1026.98 crore of Circular Railways, ₹11,954 crore appropriation to SRSF, ₹30,000 appropriation to RRSK and ₹15,107.03 crore appropriation to RSF. Includes ₹24,062.87 crore investment in DFCCIL ₹16,026.70 crore Udhampur-Srinagar-Baramulla Project (National Project).

** 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.

Cash Flow:	2018-19	(₹ 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	56,271.00	**56,539.28**
By replacement of assets	268.28	
Payments of interest on loans, repayment of loans and increase/decrease in Reserve Funds		
Payments of interest on loan for Development Fund	0.00	**-2,071.93**
Repayment of loan for Development Fund	0.00	
Increase (+)/ Decrease (-) in Funds balances	-2,071.93	
Payment for Accident Compensation	0.00	
	Total	**54,467.35**
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.	-1,182.61	**30,591.25**
Development Fund financed from Surplus	750.00	
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	0.00	
Debt Service Fund financed from Surplus	0.00	
Railway Safety Fund financed from General Revenues(from Central Road Safety Fund)	13,000.00	
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 Surplus	3,023.86	
OLWR	0.00	
Cash Surplus - Working Results		**3,773.86**
Appropriation to Development Fund		**-750.00**
Appropriation to Capital Fund		**0.00**
Appropriation to Debt service fund		**0.00**
Appropriation to Railway Safety Fund		**0.00**
Appropriation to RRSK		**-3,023.86**
Borrowing from General Revenues (excluding MTPs)*		**23,876.10**
	Total:	**54,467.35**

* Excludes ₹ 1186.87 crore (MTP), ₹ 0.34 crore (Circular Railways), ₹ 0.00 crore (Udhampur – Srinagar- Baramulla) and ₹ 9774.36 crore DFCCIL. Includes ₹643.01 crore of PUs.

Composite Input Cost Index

Base 2011-12=100

	2017-18		**2018-19****	
	Revenue Index	Cost Index	**Revenue Index**	**Cost Index**
Unit Revenue				
Average receipt per pkm	151.98		**162.28**	
Average receipt per ntkm	166.48		**170.05**	
Cost Indices of Inputs				
Labour: Average annual wage per employee @		225.9		**240.5**
High Speed Diesel(H.S.D.)		84.4		**97.1**
Electricity (Railway traction)		103.7		**109.6**
Transport equipment and parts		110.7		**112.8**
Non-Ferrous Metals		107.9		**112.2**
Electrical machinery, equipment & battery		109.6		**111.7**
Lubricants		114.0		**124.8**
Manufactured products		113.8		**117.9**
Ferrous Metals		101.4		**112.2**
Composite weighted index of inputs		*174.2		**187.0**

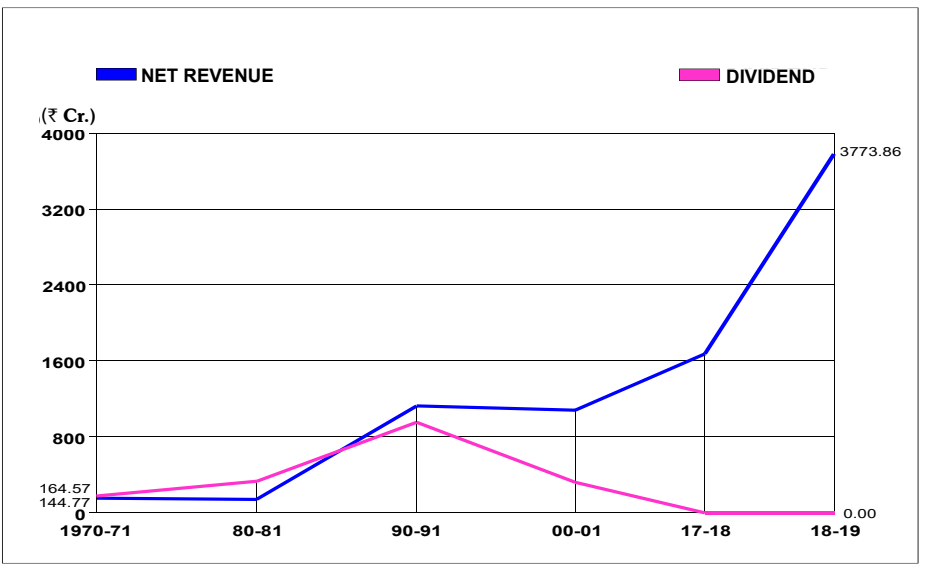
* Revised

** Provisional

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

S.no. 2-9 based on information received from Office of Economic Adviser, Department for Promotion of Industry and Internal Trade.

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 2018-19 is assessed at Rs.38,313.59 crore excluding staff welfare cost (Rs.7,227.99 crore) and law and order cost (Rs 5,097.56 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, Salt, charcoal, bamboos etc. are carried below cost of operation in order to contain their market prices. The total losses on the movement of these commodities in 2018-19 amounted to Rs.59.95 crore.

Commodities	Losses(in Crore of Rs.)
Fruit and Vegetables	41.93
Salt	9.62
Charcoal	5.04

Bamboos	2.86
Cotton Manufactured other than piece goods	0.17
Electric Goods	0.16
Wool Raw and Waste	0.07
Hide and Skins	0.06
Paper	0.04
Total	**59.95**

These commodities constituted 1.60% of the total revenue NTKMs and 0.79% of freight earnings in the year 2018-19.

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 2018-19 amounted to Rs. 1,994.83 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 2018-19 has revealed an overall loss of Rs.6,753.56 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 99 uneconomic branch lines for the year

2018-19 shows that, on an original investment on these lines of the order of ₹3,992.90 crore, loss during the year 2018-19 amounted to ₹ 2,342.32 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 15 lines examined in 2018-19, 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 2018-19

S. No.	Name of the branch line	Date of opening	Cost (₹ in crore)	Expected return on investment	Actual return on investment		
				(%)	2016-17 (%)	2017-18 (%)	**2018-19 (%)**
1	Abohar-Fazilka (BG) 34 Kms.	16.07.2012	232.51	-7.44	-13	-14	**-15**
2	Taran Trn-Govindwal (BG) 21.416 Kms.	06.08.2011	81.44	NA	-23	-24	**-28**
3	Ludhiana-Sahnewal (BG) 15.11 Kms.	17.11.2012	289.40	-2.26	-4	-5	**-6**
4	Udhampur-SVDK (BG) 25 Kms	04.07.2014	1231.09	NA	-2	-2	**-2**
5	Jammu Tawi-Udhampur (BG) 53 Kms.	2004	521.00	0.50	-8	-9	**-10**
6	Banihal-Baramula (BG) 13.7 Kms.	26.06.2013	4917.00	-1.30	-2	-3	**-3**
7	Chuararu Takrala-Amb Andaura (BG) 11.17 Kms.	2011-12	273.25	0.18	-5	-5	**-11**
8	New Morinda-Sahnewal (BG) 52.18 Kms.	2013-14	717.08	-2.26	-8	-8	**-8**
9	Chandigarh-Morinda (BG) 43.89 Kms.	2006-07	403.24	-2.26	-16	-12	**-13**
10	Una Himachal-Chuararu Takrala (BG) 16.5 Kms.	2005-06	385.59	0.18	-5	-4	**-5**
11	Rewari-Jhajjar-Rohtak (BG) 81.257 Kms.	08.01.2013	383.93	-4.78	-2	-2	**-2**
12	Jind-Sonipat (BG-81 Kms)	26.06.16	417.18	NA	0	0	**0**
13	Kolayat-Phalodi (BG) 112 Kms.	16.07.2007	170.78	-3.06	-27.56	-11.13	**-15.56**
14	Madar-Pushkar (BG) 25.7 Kms.	23.01.2012	132.12	-4.06	-1.54	-1.57	**-1.76**
15	Koderma-Giridhi (BG) 86.50 Kms.	13.05.2005	699.95	NA	NA	NA	**-4.6**

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 (Northeast 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 2018-19 amounted to Rs. 1,815.45 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 2018-19 amounted to Rs. 37,673.03 crore.

The Net Social Service Obligation borne by IR in 2018-19 assessed at Rs. 38,313.59 crore, constitutes 20.17% of the total revenue earnings and 20.06% 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

Trial of Ultrasonic Broken Rail Detection (UBRD) Systems: Trial of Ultrasonic Broken Rail Detection (UBRD) Systems installed by M/s. Armaments Corporation of South Africa SOC limited (ARMSCOR) on 22 km UP line of ALD-CNB section of NCR (60 kg Rail) has been completed on 31.03.2019. Results show 100% positive detection of clean rail breakage; however, the system is also showing a large number of false alarms. Trial Report is being prepared at RDSO.

Change-over to UIC-518 Method for Rolling Stock Testing: RDSO currently uses the peak based criteria, developed over years of experience, for assessment of the safety and comfort levels of Rolling Stock before clearing for regular operations over IR. The European method follows

the statistical approach prescribed in UIC-518 pamphlet and EN-14363 standard for dynamic assessment of rail vehicles. RDSO has started the process of switchover to UIC-518 and for this consultants are being engaged. The work is expected to complete very soon.

Dedicated Test Track for Testing of Rolling Stock: For speedy oscillation trials of new/upgraded rolling stock and various trials of track components, OHE, S&T equipments etc. provision of Dedicated Test Track is necessary on IR. Now a 25 km unutilised railway stretch has been identified on Jodhpur Division of NWR and a work of ₹353 crore has been sanctioned in Pink Book of year 2018-19 for the construction of dedicated test track. North Western railway has awarded major tenders for construction work. There is a provision for RDSO of ₹11.16 crores for consultancy work which is under finalisation.

Ultrasonic Testing of Rails by Vehicular System: In order to increase coverage of Ultrasonic testing of Rails (presently done manually by pedestrian SRT/DRT system), vehicle based USFD system is being introduced. First such system, purchased by Northern Rly., has been run and benchmarked by RDSO at testing speed of 40 kmph. The vehicular system has been put on service in March 2019.

Reliability

Development of 2x130 kVA Static Inverters: In order to make 180kVA Static Inverters (SIV) more reliable, an IGBT based Inverter with redundancy feature has been developed. Field trial of prototype has been successfully completed. Railway Board has directed Zonal Railways to provide new design SIV as per RDSO specification. This SIV with redundancy feature will improve the reliability of loco.

Passenger Amenities

Induction of Vande Bharat Express, the first Train Set "Train-18" in commercial service: RDSO has played a pivotal role in introduction of Vande Bharat Express (Train 18) which was inaugurated by Hon'ble PM on 15th Feb 2019. The testing and performance trials of the first "Train-18" were carried out by RDSO in a record time and after evaluation, the Rolling Stock was certified by RDSO for operation.

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 CO2 concentration inside coaches so as to limit CO2 concentration under SDCL conditions to 700 ppm as per ASHARE stipulations.

Operational Efficiency

Up-gradation of power of existing WAP5 loco to 6000HP: By suitable software modification in WAP5 locomotives, it has been possible to deliver more power from converters to traction motors up from existing 5400 HP to 6000 HP. This enhanced power capacity was also tested by actual field trials in 24 coach passenger trains. Now WAP5 loco are being used like WAP7 loco with a speed potential of 160 kmph.

Design & Development of Wider sleeper for 25 T axle load: RDSO has developed wider sleeper with more concrete and less steel. It provides higher frame resistance in lateral and longitudinal direction against buckling because of increase in width and weight and the same has been verified after trials by RDSO. A heavier track structure would result in enhanced life of track components including rail. Railway Board has approved its regular use on IR tracks.

Design Development of 25T Container Flat Wagon: RDSO has developed the design of container flat type wagons BLCS (A-car & B-car) fit for 25 ton axle load operations and featuring low height platform for increased payload. Prototype has been manufactured and is under RDSO tests.

New High capacity Parcel Van: RDSO has recently developed a parcel Van with increased volumetric capacity designed to operate as dedicated freight vehicle / freight trains. The wagon, manufactured by M/s. Texmaco, has been cleared at test speed of 110 kmph (Operational speed of 100 kmph).

Push-Pull operation of trains: RDSO has completed the trials for push-pull mode of operation of trains in push-pull mode, in which one locomotive in the front pull the train while one locomotive in the rear pushes it in synchronized operation. This increases the train acceleration, reduces journey times, while at the same time, reducing the jerks and terminal detention. Final speed certificate has been issued by RDSO such push pull operation. 22222 CSMT-HZM Rajdhani is being operated through push-pull mode.

Increase in Speed at Turnouts: After detailed studies, RDSO has finalised the infrastructure required for increasing speeds over turnouts and loops to 50 kmph with certain additions / modifications. RDSO recommendations sent to Railway Board have been approved by Board (MT, MRS, MTR, ME) and the joint guidelines have been circulated to Zonal railways and PSUs.

Indigenous Development

Train Collision Avoidance System (TCAS): RDSO has indigenously

developed Train Collision Avoidance System (TCAS) which would enhance train safety on Indian Railways. TCAS provides display of signal aspects on locomotives and prevents trains from passing Signals at danger through continuous speed supervision and application of brake as required. Field trials of the indigenously developed system over 250 km section (Lingampalli-Vikarabad-Wadi-Bidar) of SC Railway have been completed and works to the tune of 1200 kms have also been sanctioned by Railway Board for execution in South Central Railway. Three firms have been approved by RDSO for developmental orders for speed upto 110 kmph in Absolute Block Section. Further, trials for higher speeds upto 160 kmph and automatic Block Section are under advanced stage.

Conversion of Diesel Loco to Electric Loco Under Mission 100% Electrification: RDSO, CLW & DLW has jointly worked on conversion of WDG3A Alco type Diesel Loco to twin Co-Co electric loco classified as WAGC3. The conversion is one of a kind in world. RDSO has done weight calculation and FEA of under frame of converted loco in the assigned time frame. Prototype locomotive was turned out of DLW and after oscillation trials held in the month of Aug 2018, certified by RDSO for regular operation.

Indigenous development of Distributed Power Wireless Control System (DPWCS): OEMs of DPWCS are using different sets of Radio Equipment with uncommon communication protocol, leading to problem in Interoperability. RDSO initiated the development of indigenous radio equipment with M/s BEL for Electric Locomotives. Testing & Proof of Concept trials has been successfully done. Field trial has also been done in KZJ-RDM section of SCR and results were found in order.

Regenerative braking in WAG7 locomotive: The advanced feature of regenerative braking available in three phase drive electric locomotives is not there in existing conventional locomotives. RDSO has reviewed the existing design and after Railway Board approval provided regenerative braking in WAG7 class of conventional locomotive. The first such locomotive was flagged off by Member Traction Railway Board on 08.02.2019 at BHEL Jhansi.

Inspection and Quality Audit

In RDSO, all the product inspection modules have been made online. Inspection calls are placed online and after inspection, Inspection Certificates are issued online.

Quality Assurance /Civil directorate is the inspecting agency for GRSP/ CGRSP, GFN Liners, CMS Crossings and AT Weld portions and in 2018-19, a total of ₹593.57 crore worth of these items was inspected.

RDSO's stellar contribution in Bogibeel Bridge Project

Bogibeel Bridge is the longest Rail-cum-road Bridge in India with length of 4.94 km. RDSO has been associated with this iconic project since its inception to its completion including being a part of the Technical Advisory Group (TAG) and the design and construction. With RDSO's active involvement, the bridge has been put in operation.

Tests & Trials

IR Rolling Stock Trials: RDSO has conducted a very large number of tests of Rolling stock last year in very short amounts of time. Particularly noteworthy was trials of Train 18 which all trials were completed in a record of less than a month against the normal duration of 5-6 months. A total of 29 Oscillation Trials, 11 Coupler Force, Controllability & EBD Trials, 06 COCRS, 09 Squeeze tests and several others trials were done in the period April – December 2018.

Metro Trials: Further, after conducting Oscillation, EBD and other trails, Interim Speed Certificates for four Metros (Noida, Kolkata, Nagpur & Gujrat Metros) were issued by RDSO in year 2018-19.

Track Recording

The total liability of track recording on Indian Railway as per IRPWM comes out to be approx. 1,95,000 track kms. During the year 2018-19, a total of 1,02,461 track km have been recorded with 05 operational TRCs, which is 14% higher than last year's.

Research and Collaboration

International Exhibition InnoRail – 2018: 3rd edition of the International Exhibition cum Conference "InnoRail-2018" was organised at RDSO from 22nd to 24th Nov 2018. More than 120 exhibitors from India and abroad participated in the event. Concurrent seminars on relevant topics were also held alongside the exhibition. Eminent speakers from Industry, Railway and Metro segment addressed the gathering.

Export

Design & Development of standard gauge bogie for export locomotive: Based on requirements of RITES/DLW, RDSO developed complete Bogie (MTA) for standard Gauge 4500 HP Diesel locomotive for export. The dynamic simulation and strength of the design have been validated by RDSO using simulation and found OK. All bogie drawings have been approved and issued to DLW. This will enhance export capability of Standard Gauge 4500 HP locomotives and earn foreign exchange.

Undertakings and other Organizations

As many as 14 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	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 Government of India Enterprise was established in 1974, under the aegis of Indian Railways. RITES Ltd., Miniratna (Category-I), Schedule 'A' Central Public Sector enterprise, an ISO 9001:2015 company.

RITES success story spans over a period of 45 years covering over 55 countries across Asia, Africa, Latin America, South America and Middle East regions. The Company is the only export arm of Indian Railways for exporting rolling stock (other than Thailand, Malaysia and Indonesia).

Capabilities

The major services provided by the Company include Engineering and Project Management Consultancy, third party inspection, quality assurance, construction supervision & project management, operation & maintenance, leasing and export of rolling stock, Signalling & Telecommunication, Rolling Stock Design, Workshops, Technical Services, Airport/Bridge/ Highways / Marine/Environmental Engineering, Urban Planning, Urban Transport, Transport Planning & Economics, Privatization & Concession. Company has also ventured into projects relating to construction of railway infrastructure, electrification works and modernization of railway workshop on turnkey basis. The Company has diversified through its subsidiary into the field of renewable energy such as solar and wind energy.

Overseas Business

Two sets of DEMU (26 coaches) and two locomotives have been exported to Sri Lanka Railways against contracts secured last year for supply 6 sets

of DEMUs and 10 Broad Gauge AC Diesel Electric Locomotives. Further, RITES secured new business for supply of 160 Broad Gauge passenger coaches from Sri Lanka and Locomotive spares to Myanmar Railways.

Presently, RITES is providing consultancy services for implementing light rail project in Mauritius. It has successfully completed the prestigious consultancy project of preparation of DPR for project Trident Port for Govt. of Mauritius. RITES also secured Construction Supervision and Project Management Consultancy (PMC) services for development of National Coast Guard Headquarters in Mauritius from Government of Mauritius.

RITES has completed one integrated check-post at Birgunj and the second checkpost at Biratnagar in Nepal is under progress.

RITES is also conducting construction supervision services consultancy services for the work of construction of Tshesebe to Masunga Road in Botswana through its Subsidiary, RITES (AFRICA).

RITES undertook detailed Design Consultancy for a Standard Gauge Railway line between Tema and Akosombo, in Ghana. Feasibility Study of a diversion on proposed Tema-Akosombo Standard Gauge Railway line in Ghana.

Project Management Consultancy for East Bank – East Coast road linkage project in Guyana (South America).

Domestic Business

RITES continues to provide its services for the various projects on turnkey construction basis to Indian Railways viz. construction of doubling of track between Gooty and Dharmavaram section, Annupur-Pendra Road third line, railway electrification of Sawaimadhopur-Jaipur-Ringas, Railway electrification of Vijaypur-Maksi section. RITES is also carrying out a very prestigious project on turnkey basis for shifting of existing railway infrastructure and other utilities at Sabarmati and Ahmedabad in connection with High Speed Rail Project from Ahmedabad to Mumbai for NHSRCL.

RITES has introduced new economical design with high degree of skews (upto 46 degrees) for ROBs for EDFC. IR has awarded project on preparation of National Railway Plan. RITES, as consultant, is also working on 8 Station Development project assigned by IRSDC located in North East, NCR, MP and Maharashtra.

The State-of-the-art 4.94 km long fully welded steel Warren Type Truss with double decker (2-tier) Rail-cum-Road Bogibeel Bridge arrangement supporting double track railway line at the lower deck and 3 lane road on

the composite upper deck over river Brahmaputra near Dibrugarh, Assam has been successfully commissioned.

During the year, SAIL RITES joint venture on 50:50 basis (SRBWIPL) has achieved the milestone of manufacturing 100 wagons per month by producing 101 new BOXNHL wagons in January 2019; cumulatively, SRBWIPL manufactured 696 new BOXNHL wagons and rehabilitated 313 BOXNR wagons during current financial year.

RITES currently undertaking projects in renewable energy, power procurement through its subsidiary Railway Energy Management Company Limited (REMCL) - a Joint Venture Company of RITES and Indian Railways. REMCL has successfully implemented open access supply for Railways in 12 entities across the country, covering 65% of energy requirement resulting in the annual saving of about Rs. 4000 crore to Indian Railways.

Financial Performance:

The financial performance of the Company for the last two years is given below:

(₹ in crore)

Particulars	Standalone		Consolidated	
	2018-19	2017-18	**2018-19**	2017-18
Financial Results:				
Total Income	**2164**	1587	**2240**	1651
Operating Turnover	**1969**	1434	**2048**	1497
Profit After Tax (PAT)	**445**	332	**490**	357
Net Worth	**2384**	2199		

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 Indian Railways' expertise. The company diversified in other areas and considering its major share of business from projects abroad, its name was changed to "Ircon International Limited" w.e.f. 17th October 1995.

Since inception, IRCON has been a consistent Foreign Exchange earner for the country. The company takes pride in being actively engaged in Nation Building projects since its incorporation. It has successfully completed more than 380 projects in India and 127 projects abroad across 24 countries.

Building Infrastructure, Building Tomorrow

IRCON's role in building infrastructure across the country and abroad has left an imprint on the society and also on the company's march to success. The Company's vision has helped in the diversification of its area of work to Highways, Tunnels, Bridges, Flyovers, ROBs, Airport Hangar & Runways, Metro rail and Buildings, Workshops & Production Units, EHV Transmission Line & Grid Sub-stations, Industrial Electrification, Signalling and Telecom Systems, etc.

Overseas Projects

IRCON is actively engaged in infrastructure development in several Asian and African countries.

- The Company's expertise coupled with experience helped it successfully execute a turnkey project valuing over USD 1 billion in Malaysia, the largest ever Transportation project completed by any Indian company abroad.
- IRCON has completed projects of upgradation of Coastal Railway line in Southern Sri Lanka and reconstruction of Railway line in Northern Province of Sri Lanka valuing a total of USD 730 Million.
- Successfully commissioned the prestigious project of 2ndBhairab Railway Bridge (1 Km long) across river Meghna with approach rail lines in Bangladesh.
- The construction of embankment, track, all civil works, major and minor bridges & culverts and implementation of EMP of Khulna-Mongla Port new Rail Line is also carrying out in Bangladesh.
- The company is executing a double line Railway project between Oued Sly and Yellel (93 km) at a value of about US$ 409.69 million. The work involves the construction of the second line and upgradation of the existing line in Algeria.The work is likely to be completed by December 2019.
- IRCON has recently secured a new project for "Upgradation of Railway Line from Maho to Omanthai under Indian Line of Credit, Track rehabilitation and Ancillary works" in Sri Lanka.

Projects of National Importance

After commissioning the most challenging section of Jammu & Kashmir Railway network, involving the Pir Panjal Railway Tunnel, IRCON is working to connect the remaining sections of the project to connect Katra with Banihal.

IRCON has recently commissioned the BOT project of Four Laning of Shivpuri-Guna section of NH-3 in the State of Madhya Pradesh, well in advance of the targeted completion date and collection of toll for the section has commenced. Similarly, another important road project in the state of Rajasthan (Bikaner-Phalodi) was also completed by IRCON during the financial year 2018-19.

A world-class Rail Coach Factory providing manufacturing/production of "State of the Art" Railway Coaches has been set up by IRCON on turnkey basis for the Indian Railways at Raebareli.

Rail Connectivity Projects

Taking the bilateral relationship to new heights, IRCON is executing Rail connectivity projects to its neighboring countries i.e. Nepal and Bangladesh. These projects are New Broad Gauge Railway Line between Jogbani (India) and Biratnagar (Nepal), costing ₹374 Crore, Jayanagar (India) and Bardibas (Nepal), costing ₹548 Crore and the work of design and construction of Akhaura (Bangladesh)-Agartala (India) rail link, at a cost of ₹570 Crore.

IRCON has promoted the development of various Coal and Mineral Rail Corridors by leveraging its financial strength and forming JV Companies with the Coal and Mineral companies and the State Governments, with equity participation of 26% in the JVCs. There are Five Coal and Mineral Connectivity Rail Corridor Projects under the JV model, comprising of approximately 1,059 TKm length with an estimated cost of around ₹15,800 crores in the states of Chhattisgarh, Jharkhand, and Odisha.

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. Together with a team of IT professionals with rich practical experience, CRIS has successfully positioned itself at the vanguard of Indian Railways' digital transformation.

Achievements and Developments

CRIS is developing and managing IT applications in almost all areas of Railway working. The applications taken up by CRIS are as given below:

Ticketing and Passenger Services

PRS(Passenger Reservation System); NGeT (Next-Gen *e*-Ticketing System); UTS (Unreserved Ticketing System), Paperless UTS, ATVMs (Automatic Ticket Vending Machines); NTES (National Train Enquiry System); RBS (Rates Branch System); IR Web Applications & Complaint Management System; Kolkata Metro Ticketing System; Hand-held terminals for TTEs (HHT); PRS Modernization; Webclaims (Claims and refunds); PMIS (Parcel Management Information System); TTE lobbies system.

Freight and Operations

FOIS (Freight Operations Information System), *e*-Registration of demand, and *e*-payment Gateway; Pipeline Management System for FOIS; ICMS (Integrated Coaching Management System); COA (Control Office Application); TSR (Train Signal Registers); CMS (Crew Management System); SATSaNG (Software aided Train Scheduling System); SIMS (Safety Information Management System); RTIS (Real-time Train Information System); *e*-CRM (Customer Relationship Modelling); Route Optimization modelling using OR tools; Auto-generation of optimized Loco Links.

Resource Management - Finance

AIMS / I-PAS (Accounting Information Management System); IR Budget management System; GST implementation on all production systems; TAMS (Traffic Accounts Management System); WAMS (Workshop Management Information System); ARMS (Accounting Reforms Management System); Data Warehouse for I-PAS.

Resource Management - Material and others

EPS (*e*-Procurement System);IMMS (Integrated Material Management System); VIMS (Vendors Interface Management System);*e*-Drishti and other RB Applications; RSMS (Railway Security Management System); HRMS (Human Resource Management System); HMIS (Health Management Information System).

Fixed Asset Management

TMS (Track Management System); RORACS (ROB/RUB General Arrgt. Drawing System); Land Management System; IR GIS System; BMS (Bridge Management System); TMMMS (Track Machines Maintenance Management System); CRS Sanctions Management System; IRPSM (Projects and Sanctions Management System); BSIS (Building & Structures Information Systems; Field Sensor Data, Drone Recording and CC live feed; TDMS (Traction Distribution Management System); EEMS (Electrical

Energy Management System); SMMS (Signalling Maintenance Management System).

Rolling Asset Management

LAMS / SLAM / LMS (Locomotive Asset Management System); CMM (Coaching Maintenance Management System); WISE (Workshop Management System); FMM (Freight-Wagon Maintenance Management System); Fuel Management System; Automatic Identification of Rolling Stock using RFID; COFMOW system; PU Information Systems (DLW, MCF/ RBL, RWP/Bela); Centralized Design Knowledge resource.

Integration & Infrastructure

Rail Cloud; Communication Network Projects; IR Information Security Management project; DAU (Data Analytics Unit); ESB (Enterprise Service Bus); IR-MDMS (IR Master Data Management System); IREA (Indian Railways Enterprise Architecture); CRIS Datacentre; IT Incubator Darjeeling; Enterprise Project Management / Test Case Management.

Business Continuity

PRS-DR (Disaster Management System for PRS); DR and BC for UTS; DR system for EPS; DR system for Track Management System; DR system for ICMS; DR system for CMS; DR system for AIMS; Near Site DR site for FOIS.

New Applications taken up in the year

Enterprise Service Bus (ESB)

Indian Railways has several IT applications with large amount of Business Logic & Transactional data available in various IT systems managing the different aspects of railway working viz. Passenger and Freight, Train Operations, Material Management, Permanent Way Maintenance, Accounting, Finance, Coaching Management etc. These applications have separate Database, which results in Data duplication and mismatches. Enterprise Service Bus (ESB) is an IT tool which facilitates data exchange among various Applications.

The Enterprise Service Bus project is helping in Integration of various Applications resulting in single point of entry for primary data that is available to all applications requiring that data through ESB; Consistency of data across systems; Consolidated data availability in real time; Eliminating the need of creating same data by different applications. Data once created in an application is shared with other applications through ESB.

Modernization of PRS

The existing PRS system is based on a legacy platform, and very few third party products are supported on this platform. Further, there is a requirement of higher scalability to handle ever increasing demand. It is proposed to modernise PRS through an open standards based system i.e. vendor neutral and easily integrable with other systems/devices.

Modernization of PRS will provide a system which has capability to handle 2-3 times higher inventory (seat/berth) and 6 times higher number of transactions per second (TPS). Enhancements in the functional capabilities such as Enablement of multiple payment modes, support for integrating with smart cards, Seamless integration with business analytics and decision support system for trend analysis etc. will become possible.

Rail Cloud - Cloud Computing Technology

Use of Cloud Computing Technology provides a solution to the application group to access a shared pool of computing resources (such as: servers, storage, network, software platforms and services) that can be rapidly provisioned and released with minimal management effort.

Benefits of Cloud computing technology are Consolidation of Infrastructure from currently siloed project based infrastructure; Agile and quick provision of infrastructure; Optimum Resource (Infra & Human) utilization; Self-Service portal for provisioning / de-provisioning and monitoring of resource; and Need based infra provision using scaling features.

Master Data Management (MDM)

To integrate all source and subscriber CRIS applications as well as all Railway Departments using the relevant Asset masters holding common master entities to maintain the single version of true master data across Indian Railways. Its deliverables are Clean data with de-duplication for all subscribers to MDMS.

The new system will have microservice base architecture and will be designed to be cloud native. It will adhere to the basic requirements of high capacity OLTP (Online Transaction Processing) systems i.e. high scalability, high performance, high availability, high level of security, ease of operations and high agility.

Data Analytics and Artificial intelligence (AI)

The objective and key deliverables of the project is to help to build up capabilities to take up analysis of available data, and providing the required

infrastructure in terms of hardware, software, skilled manpower, and interfaces for analytics / AI in existing and future IT applications. Various analytics / AI based reports and information are expected using analytics/ AI, enabling IR to streamline its planning and operations.

Data analysis use cases are identified in reserved segment of passenger ticketing. In addition, use cases have been identified in Power and Energy Demand Prediction Based on Availability Based Tariff Regime, Locomotive Link Optimisation, Coaching Crew Link Optimisation, and Route Optimisation Modeling.

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 ₹1,95,626 crore to the Railways upto 31st March, 2019. Rolling Stock assets worth about ₹25,637 crore were financed during 2018-19. 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 ₹58,715 crore till 31st March, 2019. Besides, IRFC has funded National Projects worth ₹5,079 crore.

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 11.208% p.a. in 2018-19 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 ₹4,327.43 crore to Rail Vikas Nigam Ltd. (RVNL) till the end of fiscal year 2018-19 for development of Railway Projects.

IRFC has consistent profit earning track record. It has so far paid ₹3,324 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 (ISO-9001: 2015) manages with Eight Regional Offices and Corporate Office and owns total 15498 wagons, 25682 –owned & leased containers, 82 Reach Stackers & 16 Gantry Cranes which interconnect a vast spread network of its 83 terminals (14-exim; 24-domestic & 37-combined) catering to both domestic and international containerized cargo.

In terms of performance, CONCOR achieved a gross operating turnover of ₹ 6881.91 crore while handling a total of 3.83 million TEU's. In terms of tonnage, the company carried a total tonnage of 43.50 million tons in FY-2018-19.

During 2018-19 one CFS & two MMLPS namely Bodhjungnagar, Krishnapatnam & Barhi (Haryana) was commissioned. One centre for Distribution Logistics as part of new initiatives has been opened in Chennai. CONCOR has commenced Coastal Shipping operations w.e.f. 10.1.2019 (Kandla port to Tuticorin via Mangalore.

Latest Developments & Future plans:

CONCOR is effectively running Double Container trains from Khatuwas terminal (Rajasthan) to Mumbai port.

Recently CONCOR has started the domestic movement through Coastal Shipping providing services from Kandla Port to Tuticorin via Mangalore & Kochi.

As far as future outlook is concerned CONCOR aims to achieve by the year 2020 :

Throughput capacity of 7 million TEU's

Market Share of 80 % in Rail container freight market

Turnover of ₹12000 crore & Net worth of ₹10000 crore

Further commissioning of Terminals enhanced totalling to 100

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 ₹2899 crore during the year 2018-19 from ₹2483 crore of the previous year. The Corporation has earned a net profit (Profit after Tax) of ₹102 crore during the year under review as compared to the profit of ₹126 crore in the financial year 2017-18.

Key Financial Highlights:

		(₹ In crore)
Particulars	2017-18	**2018-19**
Total Income	2483.00	**2898.68**
Operating Margin	309.00	**293.03**
Profit After Tax	126.00	**101.87**
Net Worth	1812.68	**2056.33**

TRAIN OPERATING PERFORMANCE:

On an average, 52 Passenger Trains per day were running during the year 2018-19. The coaching earnings has reached to ₹687 crore in 2018-19 compared to ₹646 crore in 2017-18. Unreserved Ticketing System (UTS) has been implemented at all 59 stations of KRCL on 25-01-2019.

On the freight front, during 2018-19, the freight earning registered is ₹569 crore as compared to ₹523 crore in FY 2017-18 showing a growth of 9%.

Rail Tel Corporation of India Limited (RailTel)

RailTel Corporation of India Ltd., was formed on 26th September 2000 for modernizing the Telecommunication system of Indian Railway through an internal entity. Formed with an authorized capital of ₹1000 crore and an exclusive Right of way (ROW) of the 65000 RKM of Indian railway network, the PSU started functioning with a hand full of talented, experienced and motivated Signalling & Telecommunication engineers of Indian Railway.

RailTel is creating Point of Presence at every Railway station enroute which are spaced at 8-10 Kms. At all the stations enroute STM-1/4 equipment offering bandwidth upto (155/622 Mbps) is deployed primarily to meet Railways requirement and serve the unserved and the underserved. The distribution layer network of STM-64/16 (10G/2.5G) spaced at 40-60 KMs is deployed to connect important towns/cities of the country. Presently this

network is available at more than 600 cities in multiple rings of STM-64/16.

RailTel has PAN India Telecom Network with capability of Service delivery from 2mbps to 100 Gbps links. RailTel Network comprises of various technologies viz. Next Generation Network (NGN), Synchronous Digital Hierarchy (SDH), Packet Transport Network (PTN), Dense Wavelength Division Multiplexing (DWDM), Internet Protocol- Multi Protocol Label Switching (IP-MPLS) which are maintained by round the clock Network Operation Centres and trained field manpower. All the equipments provided on the network are of State-of-the-Art Technology and are as per International Telecom Standards.

Performance during last three years.

a. In the last 3 years, the Company has consistently earned every year more than ₹150 crore profit before tax.

b. The company has paid dividend in excess of ₹ 50 crore to Ministry of Railways during the year under report.

c. 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)
	2017-18	**2018-19***
Revenue share to Railways	27.64	28
Revenue share to DoT	45.01	46
* Provisional Figures		

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

Financial Performance

			(₹ In crore)
	Particulars	2017-18	**2018-19***
1	Share Capital	321	**321**
2	Gross Income	1025	**1014**
3	Gross Operating Margin	313	**291**
4	Net Profit after Tax	156	**113**
5	Net Worth	1249	**1297**
6	Dividend paid to Ministry of Railways	62.47	****65**

* Provisional Figures

** Includes proposed dividend for the FY 2018-19 is ₹47 Crore

Focus Areas:

Station Wi-Fi

Contributing towards fulfillment of Hon'ble Prime Minister Sh. Narendra Modi Ji's Digital India dream and with a vision of Hon'ble Minister of Railway Sh Piyush Goyal of turning Railway stations into platforms for Digital inclusion, RailTel is transforming Railway stations into Digital hubs by providing public Wi-Fi in major railway stations. As on 31st March-2019 1235 stations were live with RailTel's RailWire Wi-Fi with 9 million unique users per month. This is one of the largest and fastest public Wi-Fi networks of the world.

Video Surveillance System (VSS)

RailTel is also executing provision of IP camera-based Video Surveillance System at 6124 railway stations and 7020 premium train coaches and EMU coaches. This will go a long way in enhancing the safety and security of the passengers travelling over the IR network.

E-office in Indian Railways

RailTel has also started implementation of e-office over IR to bring transparency and efficiency in working. Implementation was first taken up at the South-Central Railway zonal head quarter along with Guntur division and was completed in March, 2019 and other Zonal headquarters and one division in each zone will be completed by September, 2019.

Modern Train Control System (MTCS)

RailTel Enterprises Limited (REL), a wholly owned subsidiary company of RailTel Corporation of India Ltd., has been entrusted with the work of Modern Train Control System project for modernizing railway signalling system at 4 railway sections.

The Modern Train control system will be implemented for 165 Route KM (RKM) on Chennai Central- Mumbai section of South Central Railway, 145 RKM on Howrah-Chennai Central section of East Coast Railway, 155 RKM on New Delhi- Chennai central Section of North central Railway and 175 RKM on Mumbai- Howrah section of Central Railway.

Modernization of Signalling System

RailTel Enterprises Ltd, a wholly owned subsidiary of RailTel Corporation of India Ltd., has been awarded the work of replacement of old mechanical signalling equipment with state-of the-art electronic interlocking system at 13 stations of Northern Railway.

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.

Telepresence as a Service (TPaaS)

RailTel's TPaaS an end-to-end, high-definition video conferencing service that gives users a virtual, face-to-face meeting experience was launched in January-2015. Before adoption of TPaaS Indian Railways were spending huge amount of money and man hours for meetings and events. Post adoption of TPaaS the number of travels for meetings and events has dropped drastically saving man hour, travel and lodging expenses.

The RailTel Telepresence Services have often served events for the Hon'ble Prime Minister of India, Minister of Railways, Minister of Industry & Commerce reaching out to places where making available even OB Vans would have been difficult at short notice. The services are offered on a monthly subscription basis requiring no investment into CAPEX by the customer while obviating the recurring need for investment due to technology obsolescence.

Indian Railway Catering and Tourism Corporation Limited (IRCTC)

Indian Railway Catering and Tourism Corporation Limited (IRCTC), was incorporated on 27th September 1999 under the Companies Act, 1956 as an extended arm of the Indian Railways to upgrade, professionalize and manage the catering and hospitality services at stations, on trains and other locations and to promote domestic and international tourism through development of budget hotels, special tour packages, information & commercial publicity and global reservation systems. The authorized share capital of the company is ₹250 crore and paid up share capital is ₹160 crore, fully subscribed by Ministry of Railways, Government of India.

Financial Performance Highlights

During the financial year 2018-19, the Company achieved a total income of ₹1957.01 crore, as compared to ₹1544.75 crore in the previous year. The Company earned Profit before tax of ₹ 475.93 crore in 2018-19 as compared to ₹338.98 crore in 2017-18 and Profit after tax of ₹305.93 crore in 2018-19 as compared to ₹219.52 crore in 2017-18.

The Board of Directors has recommended a total dividend of ₹122.37 cores (including interim dividend of ₹ 60 crore already paid to Government of India) for the financial year 2018-19 as against ₹ 88.81 crore paid in the previous year.

The financial highlights of the year 2018-19 as compared with the year 2017-18 are as below:

(₹in Crores)

S. NO.	PARTICULARS	2017-18	2018-19
1	Total Income	1,544.75	**1,957.01**
2	Total Expenditure	1,181.45	**1,487.49**
3	Gross Margin	360.30	**469.52**
4	Profit Before Taxes	338.98	**475.93**
5	Provision for Taxes	119.46	**170.00**
6	Profit After Tax	219.52	**305.93**
7.	Dividend	88.81	**122.37**
8	Net worth	945.37	**1,067.02**
9.	Number of Employees	1,464	**1,509**
10.	RATIO		
(i)	Total expenditure/total income	76.48%	**76.00%**

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

Catering & Hospitality:

During the year, IRCTC managed on-board catering services in 19 Rajdhanis, 2 Tejas, 1 Gatiman, 1 Vande Bharat, 22 Shatabdis, 19 Durontos and 296 Mail/Express trains. During 2018-19, Ministry of Railways introduced 1 Tejas, 1 Vande Bharat, 1 Rajdhani and 13 Mail/express trains.

During the year, IRCTC managed 11 Base Kitchens, located at New Delhi, Howrah, Ahmedabad, Patna, Mumbai Central, Mumbai CST, Ballarshah, Nagpur, Balasore, Sealdah and Kharagpur Jn. In view of Catering Policy 2017, 30 base kitchens were also up-graded in FY 2019.

During the year, company commissioned 16 Food Plazas and 49 Fast Food Units, thereby managing 290 operational units.

E-catering service is expanding and available at 325 stations. The average daily bookings under E-Catering for FY – 2018-19 stood at 11,859 meals.

IRCTC has commissioned 8 Executive Lounges at Visakhapatnam, New Delhi, Vijayawada, Agra Cantt, Jaipur, Ahmedabad, Madurai & Sealdah.

The Company is presently operating two Rail Yatri Niwas at Ginger Rail Yatri Niwas, New Delhi and Sampath Rail Yatri Niwas Howrah and two BNR Hotels from Puri and Ranchi.

Travel & Tourism:

IRCTC has become one of the leading travel and tourism companies in the market. The various tourism products of IRCTC includes Luxury Train Tours Maharajas' Express, Buddhist Circuit Special Train, Bharat Darshan Special Tourist Trains, Rail Tour Packages, International and Domestic Air packages, Land Tour Packages, Hotel booking, Car Rental, Customised and LTC tours and Event Management etc.. IRCTC have its exclusive tourism portal, www.irctctourism.com for showcasing and booking of various tourism products in a single space.

Internet Ticketing:

E-ticketing accounts for 70% of reserved tickets in 2018-19 on Indian Railways booked online. On an average, more than 7.78 lakh tickets were sold daily through IRCTC's website during the 2018-19. The site offers round the clock ticket booking services except for 35 minutes from 2345 hrs to 0020 hrs.

Year	2017-18	**2018-19**
No. of E-Tickets Booked (in Lakhs)	2,466	**2,841**
No. of Passengers Booked E-tickets (in Lakhs)	4,340	**4,949**
E-ticketing Revenue Collection (₹ in Crores)	28,475	**32,069**

Packaged Drinking Water (Rail Neer) :

In addition to present operational plants located at Delhi, Patna, Palur, Ambernath, Amethi, Parassala and Bilaspur, the Company has set up four new plants at Hapur, Sanand, Nagpur and Bhopal in FY 2018-19.

The total production of Rail Neer at Nangloi, Danapur, Palur, Ambernath, Amethi, Parassala & Bilaspur plants was 21.50 crore bottles in FY 2018-19 against total production of 20.20 crore bottles in previous year. The capacity utilization of all plants was 83% as on 31st March, 2019.

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.

During 2018-19, 5,518 trains including 4,455 container trains have moved on PRCL section which included 2,117 double stack container trains and traffic of 8.24 million tonnes on PRCL section. The total apportioned earning is ₹227.65 crore from freight operations during 2018-19 and a net profit of ₹85.61 crore.

18 pairs of passenger trains run on SUNR – Botad section of Project Railway. The comparative figures of 2017- 2018 and 2018 - 2019 are:-

	2017- 18	**2018-19**
Number of single stack Container trains	2,623	**2,338**
Number of Double Stack containers trains	1,627	**2,117**
Number of Bulk trains	481	**575**
Number of empty trains run	390	**488**
Total number of trains run	5,121	**5,518**
Traffic volume (in Million Tonnes)	7.31	**8.24**
TEU's loading	2,79,789	**3,26,690**
Gross Apportioned freight earning (₹ in crore)	201.01	**227.65**
Net Profit (₹ in crore)	75.12	**85.61**
Net Worth as per audited financial statements (₹ in crore)	497.38	**571.18**
Number of passenger trains (in SUNR – Botad)	15 pairs**	**18 pairs****

** includes 9 mail / express trains, which are running weekly and 9 mail / express / passenger trains run daily

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 31.03.2019, RVNL has completed 8879.65 km of project length consisting of 360.01 km of New Lines, 2,932.35 km of Doubling, 1,783.22 km of Gauge Conversion and 3,762.07 km of Railway Electrification, 42.0 km Metropolitan Transport Project (MTP), 7 Railway Workshops and 1 Cable Stayed Bridge at Bardhhaman and 4 other specific Works. 76 projects assigned to RVNL have been fully completed. During 2018-19, RVNL completed 999.943 km of project length including 129.19 km of New line, 263.83 km doubling, 106.92 km of Gauge Conversion, and 500 km of pure Railway Electrification works and an additional 120.41 km of electrification as part of doubling and other projects.

During 2018-19, the turnover of the Company reached a figure of ₹10060.07 crore as compared to ₹7556.55 crore in 2017-18, i.e. an increase of 33.13%. The Gross Profit of the Company increased from ₹564.15 crore in 2017-18 to ₹758.31 crore in 2018-19.

The Profit after Tax (PAT) of the Company for the year was ₹606.59 crore as on 31st March, 2019 as compared to ₹469.66 crore in previous year i.e. an increase of 29.15%. In view of the improved financial performance in 2018-19, RVNL has paid a Dividend of ₹186.94 crore as compared to ₹167.57 crore in the previous year. The cumulative dividend paid to Ministry of Railways by RVNL is ₹595.24 crore.

In addition to borrowings from IRFC for implementation of projects, comprising of ₹4,327.43 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 ₹7,369 crore against which the equity contribution of RVNL is ₹919 crore, i.e. approximately 12.5%. Balance funds of ₹6,450 crore will be provided by the equity share of stakeholders and through debt raised from Financial Institutions.

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 2018-19, total earning of ₹ 82.81 crore have been realized by RLDA. The number of sites for commercial development with RLDA is 59 in 2018-19.
- **Construction of Multi Functional Complexes (MFCs):** Land for MFCs are leased to PSUs on 30 to 45 years lease on revenue sharing model. However RLDA adopted combination model (upfront Lease Premium and fixed Annual Lease Rent model) for development through private developers for which bidders are selected through open competitive and transparent bidding process. In all, 40 MFCs

were assigned to PSU for development [IRCON (24), RITES (14), and RVNL (2)], out of these 38 MFCs have been completed by them and 20 MFCs have been commissioned by IRCON. However, as per the directions of the Railway Board, 14 MFC Buildings Commissioned by RITES have been handed over back to Railways without any cost. RLDA has been entrusted 123 MFCs for development through private developers. Out of these 53 MFCs have been awarded and 31 MFC have been recommended for de-entrustment, due to non feasibility or being commercially unviable or requested by Railway to drop them.

LOAs for 9 MFC sites namely Hazur Sahib/Nanded, Neemuch, Bharatpur, Sasaram, Hajipur, Deoghar, Durgapur, Sikar & Raja-Ki- Mandi issued during 2018-19.

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 (1318 route km) and Western DFC (1504 route km) spanning a total length of 2822 route km are being constructed. The Eastern Dedicated Freight Corridor starts from Ludhiana and terminates at Sonnagar, traversing the states of Punjab, Haryana, Uttar Pradesh, Bihar. The Sonnagar – Dankuni section will be built on a PPP mode. It will largely serve coal and steel traffic to northern parts of India. The Western Dedicated Freight Corridor originates from Dadri (Uttar Pradesh) and terminates at Jawaharlal Nehru Port Trust (Mumbai) passing through Uttar Pradesh, Haryana, Rajasthan, Gujarat and Maharashtra. This corridor will mainly meet requirements of container traffic.

Project in Brief:

The total length of the Eastern & Western DFC is 2,822 km which is targeted for completion in the period 2018-21 (in phases). Total Expenditure upto 31.03.2019 (approx.) is ₹ 46,970 crore (including the cost of land). The Overall Financial progress is 58% (including land) and the overall Physical progress is - 60%.

The activities of the Dedicated Freight Corridor registered a quantum jump during the year 2018-19. DFCCIL achieved the following milestones during the period:

A) Achievements during the year 2018-19

1. Trial runs in Western & Eastern DFC: The project has witnessed a major leap in the progress of Civil, Electrical and S&T construction works with successful trial runs of Freight trains in both Eastern and Western Corridor after completion of Civil works.
    - Trial run of a freight train in Madar-Kishangarh Balawas section (306 km) of WDFC was conducted on 30.12.2018. The section has 9 newly built freight stations and contains 1 important Bridge, 17 Major Bridges, 269 Minor Bridges, 3 RFOs & 143 Major/Minor RUBs.
    - Successful trial run of Goods train in Bhadan to Khurja section (194 kms) of EDFC-1 was conducted on 30.11.2018. The section has 6 newly built freight stations and contains 17 Major Bridges, 137 Minor Bridges, 3 RFOs & 92 Major/Minor RUBs.
2. Track linking with Mechanized track laying machine is in progress at 7 locations. Track linking of 774 km has been done in the year taking the cumulative linking to 1,898 km.
3. OHE wiring by Mechanized wiring train has been started for the first time in India in both EDFC & WDFC. In this process, stringing of contact & category wire is being done simultaneously that too under tension. This facilitates the droppering activity which can follow on immediately thereafter. Each machine is capable of undertaking wiring of 3 km per shift. At present, there are 4 wiring trains in EDFC-1 & WDFC. Total 774 km laying of catenary and contact wire has been completed upto 31.03.2019.
4. CAPEX: DFCCIL achieved record CAPEX of ₹2,036 crore during March 2019, highest ever CAPEX in any month. With this the cumulative CAPEX for 2018-19 is likely to be approximately ₹10,000 crores, which is also the highest ever.

B) Overall Progress of major items: 1477 km of Earthwork (upto H) have been completed, 186 major bridges have been completed and 125 are in progress and 8 RFOs have been completed and 20 are in progress.

C) Procurement: Total contracts worth ₹52,387 crore (97.8%) have already been awarded till date. All civil contracts have been awarded.

D) Land Acquisition: There has been a tremendous improvement in the cooperation by State Governments. Numerous hurdles/ impediments have been removed and considerable progress in the land acquisition has been achieved. The total award for 11,363 hectares of land (WDFC: 5,967 ha out of 6,000 ha and EDFC: 5,396 ha out of 5,830 ha) with compensation amounting to ₹13,727 crore. (WDFC: ₹6,088 crore, EDFC: ₹7,639 crore.) has been issued. Progress of land acquisition is approximately 98.52% excluding Sonnagar-Dankuni section and above 96% on an overall basis. 2,080 Arbitration cases & 244 Court cases pertaining to land were disposed of during the year taking the cumulative figure of disposal to 10,682 Arbitration cases & 1,700 Court cases till date.

E) Environmental Issues: DFCCIL has planned approximately 37,000 trees along the corridor (approx. 26,000 no. of trees under EDFC-1, 7,000 no. of trees under EDFC-2 and 4,000 no. of trees under EDFC-3) under "Green Belt Development Plan".

MUMBAI RAILWAY VIKAS CORPORATION LTD. (MRVC)

1.1 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.

1.2 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. The cost of the rail component of MUTP was ₹4452 crore out of which loan of ₹1613 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 has been closed in March 2012.

1.3 Mumbai Urban Transport Project - II

MUTP II has been sanctioned by the Parliament in the budget of 2008-09 at total cost of ₹ 5300 cr. which is likely to be revised to ₹ 8087 crore (approx.) at the time of completion of all Projects. The work includes network expansion & capacity enhancement of Mumbai Suburban on Western & Central Railway.

1.4.1 Progress of MUTP II

A) MUTP 2A – Completed:

B) MUTP 2B – In progress:

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	March 2021
2	5th & 6th line between Thane-Diva	MRVC	March 2020
3	Extension of Harbour Line between Andheri-Goregaon	MRVC	Completed in December 2017
4	6th Line between Mumbai Central-Borivali	WR	March 2021
5	Resettlement and Rehabilitation	MMRDA	Along with project

1.4.2 Overall Amenities at various Stations by MRVC under MUTP II works in Mumbai -

30 New FOBs

27 Booking offices,

6 Elevated Decks,

31 Platform extensions

01 New Station (Ram Mandir Rd)

12 New platforms

02 New home platforms

44 Escalators

25 Elevators.

06 Skywalk/Highwalk

1.5 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 was entirely funded by Government of Maharashtra & Ministry of Railways on 50:50 basis.

1.6 Mumbai Urban Transport Project III:

To further strengthen and augment the suburban railway infrastructure in MMR, MUTP 3 was sanctioned by Union Cabinet on 30.11.2016 at the

total cost of ₹10947 crrore. The cost of MUTP III will be shared by Ministry of Railways and Govt. of Maharashtra. ₹ 6129 crore is the loan component balance ₹4818 crore will be shared between Ministry of Railways and Govt. of Maharashtra.

1.6.1 Salient Features of EMU Rakes to be procured under MUTP III:

Railway Board has approved that all the rakes under MUTP III will be Air-conditioned and they will be provided with following advance features -

- Austenitic stainless-steel car body
- Automatic door closing system
- Gangways
- Aerodynamic Cab Design
- Stainless Steel seating arrangement
- Fully suspended Traction Motors
- Under-slung electrics
- LED lighting
- CCTV camera in all coaches

1.7 Mumbai Urban Transport Project – 3 (A)

As MMR region is rapidly expanding in Northern and Eastern part including the New Airport in Navi Mumbai, upgrading the suburban transport in Island City and expansion of the Network in Northern Part are essential. MRVC had conceptualized all rail projects for Sustainable Urban Transport in the City of Mumbai and put it in a single basket, named MUTP 3A at the total cost of ₹54,777 crore the cost of which was to be shared equally between Ministry of Railways and Govt. of Maharashtra. On 7th March 2019 MUTP 3A costing ₹33,690 crore was approved by CCEA and approval conveyed to Railway Board.

S. N.	MUTP 3A corridors
1	Extension of Harbour Line between Goregaon-Borivali
2	5th & 6th line between Borivali-Virar
3	4th line between Kalyan-Asangaon
4	3rd & 4th line between Kalyan-Badlapur
5	Kalyan Yard - Segregation of Long distance and Suburban Traffic
6	a) CBTC on CSMT-Panvel on Harbour Line

b) CBTC on CSMT-Kalyan on Central Railway

c) CBTC on CCG-VR on Western Railway

7 Station Improvement

8 Procurement of Rolling Stock (191/12 car)

9 Maintenance facilities for Rolling Stock

10 Stabling Lines

11 Augmentation of Power Supply Arrangement

12 Technical Assistance

1.7.1 Benefits of MUTP 3A

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

- 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.

1.8 Construction of FOBs on Central & Western Railway:

The work of execution of 58 FOBs on Central and Western Railway stations of Mumbai Suburban Section was entrusted to MRVC. Work of 8 FOBs have already been completed.

Braithwaite & Co. Ltd

Braithwaite & Co. Ltd (BCL) is a leading Heavy Engineering Company in India, under Ministry of Railways has its three manufacturing units located in West Bengal. BCL is a dominant player in Wagon Manufacturing Industry and its major product includes manufacturing of Newly Built Wagons, Repairing of Wagons, Structural Steelwork, manufacture and maintenance service for Cranes and Steel Castings (Bogie & Coupler). The Company has got accredited with ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 and EN ISO 3834-2:2005.

During the financial year 2018-19, BCL has surpassed all of its physical and financial parameters, as can be seen from the tabulated details of its performance, highlighted below.

Particulars	FY 2018-19	FY 2017-18	% increase
Newly Built Wagon (No.)	869	530	64%
Repair Wagon (No.)	4590	919	400%
Bogie (No.)	1371	970	41%
Revenue from Operations	₹317.03 Cr.	₹30.89 Cr.	142%
Profit (PBT)	₹9.41 Cr.	₹2.60 Cr.	262%
Net Worth	₹63.68 Cr.	₹5.81 Cr.	996% *

* Note: An Equity of ₹50 Cr. has been infused in the Company, thereby enhancing its Net Worth.

View of Railway Station Kathgodam

Self – Sufficiency

Stores imported by IR constitute 1.70% of the total stores purchased. The cost of stores imported in the last three years are as under:

			(₹ in crore)
Item	2016-17	2017-18	**2018-19**
Diesel loco parts and fittings	932.09	508.72	**426.93**
Electric loco parts and fittings	176.77	120.57	**180.47**
Carriage, Wagon and EMU parts and fittings	278.65	228.36	**286.05**
Electrical stores	6.93	17.48	**2.31**
Engineering stores	4.31	14.26	**17.72**
Ball and Roller Bearings	0	0.54	**0.24**
General stores covering acids, chemicals, drugs, etc.	67.03	43.92	**30.71**
Other items including metal ferrous, complete units of rolling stock i.e. bogies, wheel -sets, couplers, etc.	27.87	56.26	**111.45**
Grand Total	1,493.65	990.11	**1,055.88**

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 2018-19 is furnished below:

	LOCOMOTIVES/COACHES	2017-18	**2018-19**
DLW	WDG-4D	7.07	**8.84**
	WDP-4D	8.24	**7.65**
	WDG-5	73.24	**40.75**
	WAP-7	-	**0.91**

	WAG-9	-	**1.36**
	WAG-11	-	**5.25**
	WDG-4D (represents NRC loco)	7.07	**-**
	YDM-4 (represents NRC loco)	0.37	**-**
	WDG-3A (represents NRC loco)	-	**2.96**
	WDS-6 (represents NRC loco)	-	**2.94**
	Sri Lanka Loco (represents NRC loco)	-	**0.45**
RCF	LGS	1.74	**2.17**
	LWACCN	1.32	**1.70**
	LWACCW	1.32	**1.74**
	LWCBAC	1.38	**1.67**
	LWFAC	1.36	**1.73**
	LWFCWAC	1.40	**1.75**
	LWFCZAC	1.16	**1.75**
	LWFCZAC	1.16	**1.40**
	LWFCZACHS	1.04	**1.40**
	LWLCBRRM	0.96	**1.22**
	LWLRRMHS	1.04	**1.24**
	LWS	1.74	**2.34**
	LWSCN	1.88	**2.22**
	LWSCZ	1.72	**2.23**
	LWSCZAC	1.45	**1.73**
	LWSCZACHS	1.44	**1.73**
CLW	WAG-9	3.09	**2.65**
	WAP-7	2.82	**2.35**
	WAP-5	3.97	**3.92**
MCF	LWACCW	4.81	**3.62**
	LWACCN	4.67	**3.62**
	LWSCN	6.44	**4.71**
	HUMSAFAR		
	TURNKEY	-	**3.37**
	HUMSAFAR	4.04	**-**
	DEEN DAYALU	5.07	**3.61**
	TRC	-	**3.68**
	TRSC	-	**3.58**
	LWSCN(G)	-	**4.68**

	LWLRRM	-	**2.95**
	LDSLR	-	**2.24**
	LWSCZ	-	**5.06**
	LWLBAC	-	**4.04**
	LS-5	5.77	**-**
	ANTYODYA	5.46	**-**
ICF	LWLRRM	1.51	**1.81**
	LWLRRM TEJAS	-	**1.85**
	AC EMU B	-	**0.39**
	LSCN	1.99	**2.39**
	LS Antyodaya	0.71	**-**
	LS	0.71	**-**
	LACCW	1.83	**2.65**
	LACCN	2.00	**2.87**
	LFCZAC (Anubhuthi)	1.34	**-**
	LFCZAC	-	**2.37**
	LSCZAC	1.91	**2.58**
	LGS	-	**2.00**
	LSCZ	-	**2.08**
	LOMS	-	**1.16**
	MEMU DMC US	-	**0.29**
	MEMU TC US	-	**1.06**
	TRAIN 18 DTC	-	**0.55**
	TRAIN 18 MC	-	**0.26**
	TRAIN 18 MC EC	-	**0.56**
	TRAIN 18 TC	-	**0.52**
	TRAIN 18 NDTC	-	**0.53**
	TRAIN 18 NDTC EC	-	**0.53**
	AC EMU NDMC US	-	**0.50**
	AC EMU TC US	-	**0.86**

Locomotives:

Locomotives are manufactured by Chittaranjan Locomotive Works (CLW), Chittaranjan, Diesel Locomotive Works (DLW), Varanasi and Diesel Loco Modernisation Works, Patiala. During 2018-19, CLW manufactured 402 state-of-the-art 3 phase HP BG electric locomotives. DLW manufactured 274 BG locomotives including 102 HHP Diesel Locomotives, 27 Diesel

Locomotives for NRC/Export and 145 BG High Horse Power Electric Locomotives in the year 2018-19. DLW also converted two WDG4 old diesel locomotives to WAG11 electric locomotive. DMW manufactures 58 nos 3-phase (WAP-7) HP BG electric locomotives.

Diesel Loco Modernisation Works:

DMW, Patiala rebuilt & upgraded 45 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 DETC inspection cars and 01 Multigenset locomotive for Indian Railways.

Passenger Service Vehicles:

During the year, Integral Coach Factory (ICF), Chennai manufactured 3,240 coaches including 708 EMUs, 83 DEMUs and 21 high speed Self Propelled Accident Relief Trains (SPART), 16 coaches for Kolkata Metro, 2222 LHB coaches, 72 three phase MEMU, 16 Train set coaches, 59 nos (DETC) inspection coaches and 39 coaches for Sri Lankan Railways. Rail Coach Factory (RCF), Kapurthala manufactured 1350 coaches including 782 LHB coaches, 560 MEMU and 8 coaches for NRC customers. Modern Coach Factory at Raebareli manufactured 1425 LHB coaches during 2018-19.

Wheels and Axles:

RWF, Bangalore produced 40,136 wheel-sets during 2018-19. It also manufactured 1,31,131 wheels and 71,001 axles including Wheels and Axles for wheel sets. Rail Wheel Plant Bela produced 23,500 wheels during 2018-19.

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 2018-19, 12,649 wagons were inducted in Indian Railway System. Out of these, 1,001 wagons (including 480 BLC wagons) were manufactured by Railway Workshops and the remaining 11,648 wagons (including 1,269 BLC wagons) were manufactured by wagon industry.

Signalling:

Railway signaling 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, Ajmer on North Western Railway, Kharagpur on South Eastern 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 last three years are as under:

Year Wise out Turn Signal and Telecommunication Workshop

Year	Out Turn in Lakhs
2016-17	22513.21
2017-18	25749.21
2018-19	**29690.10**

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	
	2017-18	**2018-19**
Rewinding		
TAO 659 TM armature	155	***137**
HS15250A TM armature	533	***531**
EMU TM armature	684	***607**
3-Phase TM stator	74	***63**
3-Phase TM rotor	154	**213**
Re-shafting		
TAO 659/HS15250A TM armature	603	***218**
3-Phase TM rotor repairs	89	***14**
EMU TM armature	346	***237**

*Due to reduction in arisings.

Materials Management

Materials Management Department deals with planning, organising, communicating, directing and controlling of all the activities concerned with the flow of materials into an organization and its further movement to various users. Indian Railways is one of the largest organizations in the country dealing with public procurement.

Expenditure on Purchases

Expenditure by Indian Railways on procurement of goods to meet the requirements of operation, maintenance and production of assets (excluding track related items and goods supplied as part of works) during 2018-19 was ₹62,133.74 crore.

A broad classification of procurement of such goods is given below:-

(₹ in Crore)

	2017-18	**2018-19**
Stores for operation, repairs and maintenance	10,284	**13,424**
Stores for construction	4,263	**2,956**
Fuel	14,925	**16,565**
Stores for manufacture of Rolling Stock and purchase of Complete units	20,012	**29,189**
Total	49,484	**62,134**

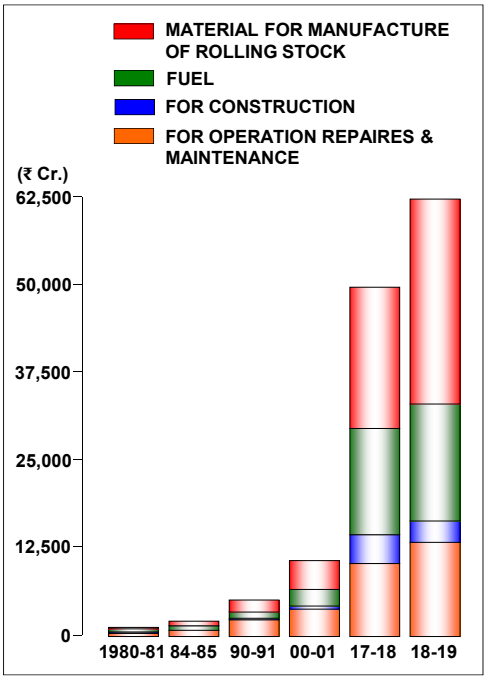
Stocking Depots

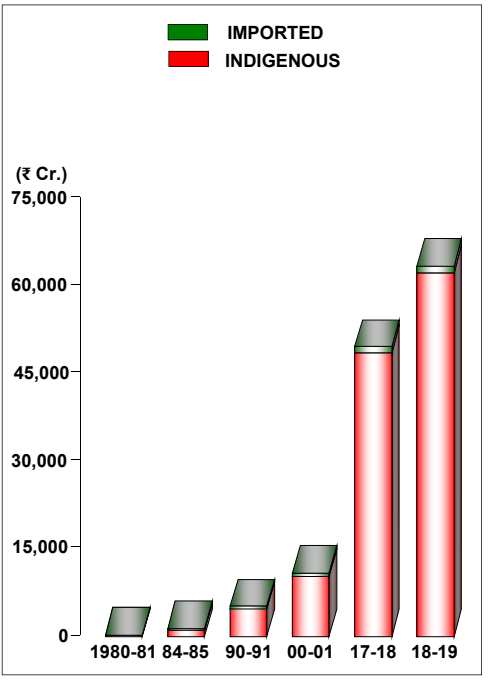
Warehouse management is an important aspect of materials management. Indian Railways has extensive warehouse network dedicated to provide the required material as close to the point of consumption as efficiently possible. To meet this requirement Zonal Railways and Production Units have 262 stocking depots spread all over the Railway Network. These depots stock over 1.3 lakh items consisting of raw materials, components, spares, consumables etc .

Disposal of unserviceable Items

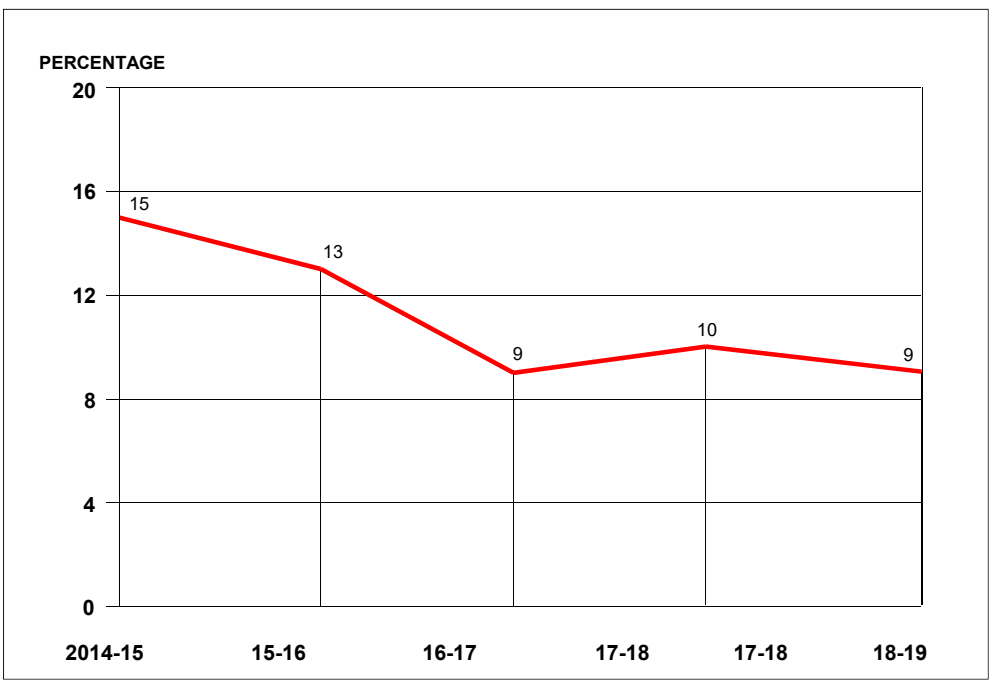
Efficient Materials Management also involves timely and efficient disposal of scarp generated during maintenance and production activities. Safe disposal of industrial waste and hazardous scrap is a legal obligation which is meticulously ensured by Indian Railways. Disposal of obsolete items is essential to free the locked up capital in such assets. Disposal of scrap is an important source of revenue for Railways. Total revenue generated through disposal of scrap, during 2018-19, was ₹4,192.07 crore, as against ₹3143.20 crore during 2017-18.

VALUE OF STORES PURCHASED





INVENTORY TURNOVER RATIO (EXCLUDING FUEL)



Digitisation

Transparency and efficiency in public procurement and enhancing the Ease of Doing Business is an endeavour which is directly in line with 'Digital India' initiative of the Government. Digital journey of Materials Management on Indian Railways that started with roll out of e-procurement system in FY:2011-12 with limited scope of e-tendering has now extended to encompass the complete Materials Management cycle which includes demand generation, tendering, purchase decision, contracting, inspection, material receipt and payment. All types of tenders for Goods, Services, Works, Earning/Leasing and sale of scrap are issued on a single web-portal i.e. www.ireps.gov.in. An Android app "IREPS –आपूर्ति " has been launched which enables access to useful information related to Railways procurement and disposal, "on the go."

System of Lot Publishing, instead of traditional catalogue publishing, has been rolled out for re-Auction in January, 2019. This has made paradigm shift in the method of disseminating information pertaining to the available scrap for sale to prospective bidders in a transparent manner.

Agency of Procurement

Zonal Railways and Production Units mostly procure the materials required by them in a decentralised system, but for purchase of a few items which are centralised for procurement at Railway Board's level. Common use Goods and Services available on GeM are reserved for procurement through GeM portal. Out of ₹62,133.74 crore worth of stores procured in 2018-19, 63% was done by Zonal Railways and Production Units, 36% by Railway Board and the balance 1% through other sources.

Stores worth ₹6,269.56 crore were bought from Small Scale Sector and Khadi and Village Industries in 2018-19.

Public Sector Undertakings contributed 20% and other industries contributed 80% towards supplies.

Indigenous Vendor Development

Indian Railways has fully implemented Public Procurement (Preference to Make in India) Order. The value of Indigenous stores at ₹61,078.07 crore during 2018-19 constituted almost 98% of the total purchases by Indian Railways. Indian Railway has to depend on imports for high technology components for its locomotives, coaches, signal & telecom equipments etc. which are not available in adequate quantity with required quality within the country.

Inventories

Maintaining inventories at an optimum level is the key to successful materials management. Turn Over Ratio for the year 2018-19 was 9%

(without fuel) and 6% (with fuel), as against 10% (without fuel) and 8% (with fuel) during 2017-18.

Wagons and Steel Procurement

During the year 2018-19, 12,649 wagons were inducted in Indian Railway System, out of these, 1,001 wagons were manufactured by Railway Workshops.

Procurement of iron and steel, during 2018-19, was 1.56 lakh MT (₹712.7 crore) as against 1.09 lakh MT (₹471.5 crore) during 2017-18.

Passenger Amenities

Contracts for supply and installation of 1,00,000 steel benches across 2,000 stations throughout Indian Railways have been concluded during the year. Installations have already commenced and are expected to be completed during 2019-20.

Swatch Bharat

To achieve this objective, Indian Railways placed purchase orders for 1,03,116 Bio-toilets upto March 2019, out of which 1,01,376 Bio-toilets i.e. more than 98% have been supplied by March, 19.

Printing and Stationery:

Eight General Printing Presses, Three Ticket Printing Presses, Three General-cum-Ticket Printing Presses and attached 'Book and Forms Depots' on Indian Railways, met the entire requirements of passengers for Card Tickets, Blank Computer Stationery, SPT Rolls, PRS, UTS & Thermal Ticket Rolls and money Value Books/Forms upto 31.07.2018. Out of 14 Printing Presses, 09 Printing Presses (06 General Printing Presses and 03 Ticket Printing Presses) have been closed by 31.07.2018. Thereafter, only 05 Printing Presses meets the above requirements.

General Printing Presses produced an out-turn of 28.59 crore A-2 standard size impressions in 2018-19. 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 Receipt, 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 10.47 crore Card Tickets in 2018-19 by maintaining "outstanding load" on printing presses well below one month's level. The Book and Forms Depots stocked 4627 different items. Transactions of receipts and issues at these depots were worth of ₹ 6132 crore and ₹6660 crore respectively, in 2018-19.

Security

The Railway Protection Force (RPF) has been constituted under the RPF Act, 1957 (as amended in the year 1985 and 2003) for better protection and security of railway property, passenger area, passengers and matters connected therewith. RPF functions under the Ministry of Railways.

RPF is empowered under the Railway Property (Unlawful Possession) Act, 1966 to deal with cases of theft, dishonest misappropriation and unlawful possession of railway property. RPF is also empowered under the Railways Act, 1989 to deal with offences related to roof traveling, touting, unauthorized entry into coaches earmarked for ladies, unauthorized vending, trespassing etc.

The sanctioned strength of RPF is 74,523. 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 organized 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. 50% of the expenditure on GRPs is shared by the Railways with respective states.

Round the clock security related assistance to passengers by RPF:

- **All India Security Help-Line:** 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, computerized registration of complaints, voice recording, dashboard and its integration with an App.

- **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 2018 and 2019 (upto July):

Year	No. of children rescued by RPF
2018	13091
2019 (Upto June)	**5682**

- **Surveillance through CCTV Cameras:** Indian Railways have decided to provide CCTV cameras at all stations (excluding halt stations) as well as in trains to enhance the safety of passengers. So far, CCTV cameras have been provided at 473 railway stations and the balance stations are targeted by 2020-21. Similarly, CCTV cameras have been provided at 1,300 coaches and the rest of the passenger carrying coaches are targeted by 2021-22.

Measures initiated by the RPF for security of passengers and passenger area:

- Escorting of about 2500 important Mail/Express trains daily by RPF 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 473 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 2017-2018 and 2018-2019 are as under-

Year	No. of persons prosecuted (in lakh)	No. of persons convicted (in lakh)	Amount of fine realized (₹in crore)
2017-18*	13.92	12.42	39.01
2018-19	**10.84**	**10.19**	**35.67**

*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:

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.

146 and 27 criminals involved in crime against women passengers were arrested by RPF and handed over to GRP in 2018 and 2019 (upto May) respectively. Besides, 1.39 lakh and 36437 offenders were prosecuted by the RPF u/s 162 of Railways Act during the year 2018 and 2019 (upto May) respectively. 967 and 271 women in distress were rescued by RPF in the year 2018 and 2019 (upto May) respectively.

Operational measures for women security:

i) 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.

ii) All ladies special trains, running in metropolitan cities, are being escorted by lady RPF personnel.

iii) 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.

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

v) Seminars on gender sensitization/Public awareness programmes are being organized with the assistance of NGOs for sensitization of RPF personnel, Railway staff and passengers.

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 from the year 2017-18 and 2018-19 are as under-

Year	No. of cases detected under the RP(UP) Act	Value of property recovered (₹ in crore)	No. of persons arrested
2017-18	4,577	2.92	6,518
2018-19	**4,641**	**3.24**	**7,114**

Training

At present 13 RPF Training Centres, including one Centralized Training Institute (CTI) are catering to the training needs of RPF personnel. Initial as well as on the job refresher courses are conducted for RPF personnel to enhance capability and skill development. Training curriculum includes Outdoor drill, PT, Parade, weapons training, field craft etc. and indoor training includes Law, Railway working, Passenger interface, Soft skill, Yoga, Gender sensitization, Human-rights, computers etc. Specialized training/courses are also conducted for RPF Officers and staff at training institutes of other CPOs, CBI etc. RPF personnel are also undergoing training as per the training schedule chalked out by BPR&D for Police/ Central Armed Police Force.

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 2018, 03 RPF personnel have been awarded with 'Railway Ministers Medal for Best Investigation' and 03 RPF personnel have been awarded with 'Railway Ministers Medal for Bravery'.

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 2018-19 were:

- A total of 19,637 preventive checks were conducted throughout the Railways.
- A total of 27 Vigilance bulletins, including "Chetna Ahwan" by the Railway Board, were released for circulation. These bulletins contain case studies, dos & don't etc. related to various departments.
- Print and electronic media was extensively utilized by all Zonal Railways, Production Units and Public Sector for conducting extensive public campaigns during Vigilance Awareness Week, 2018.

Participative Vigilance:

- **24 Hours Vigilance Helpline:** There is 24 hour 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 29th October to 03rd November in the year 2018.

- **Counselling:** As many as 251 workshops/seminars/interactive sessions were conducted on topical issues by Vigilance in 2018-19 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 88 personnel participated in two schedules from 04th - 08th June, 2018 and 11th -15th June, 2018.

Punitive Vigilance:

A statement showing number of officials against whom disciplinary action in vigilance-investigated cases was initiated/finalized during April 2018 to March 2019 is given below:

Vigilance investigated cases	April 2018 - March 2019
Number of officials against whom disciplinary proceedings were initiated	**5,003**
Number of officials against whom disciplinary proceedings resulted in imposition of major penalty	**900**
Number of officials against whom disciplinary proceedings resulted in imposition of minor penalty	**3,828**

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 2018, these measures resulted in realization of revenues to the tune of ₹76.93 crores.
- Scrutinizing of more than 2,968 Annual Property Returns filed by Officers during 2018.

Preserving Indian Railways' Heritage

The chronicled narrative of the industrial heritage of a nation is as much a historical record of its move to modernity. In that light, the Railway Heritage of India includes world famous 'built' railway heritage, like the UNESCO recognized iconic landmark CSMT building in Mumbai (erstwhile Victoria terminus), and the picturesque Mountain Railways of India in Darjeeling, Ooty and Matheran.

The 'intangible' heritage of the Indian Railways is also showcased in the National Rail Museum in Chanakyapuri, New Delhi, a constant source of delight to railway enthusiasts. The Regional Rail Museums in four major cities of Howrah, Chennai, Mysore & Nagpur are equally popular with visitors. Several prestigious and well-acclaimed Railway Heritage galleries across the national railway network stand testimony to the value attached to over 166 years of railway heritage experienced by railway persons & citizens alike.

With a new initiative towards digital content, narratives of Indian Railways' mesmerizing journeys have been retold through the new "Google Arts & Culture" platform in 2018. Panoramic station views, Charming personal anecdotes and a fourfold exploration – People, Journeys, Heritage and Engineering – bring the stories right into the handheld device or personal computer screen of viewers as well. Virtual tours, Iconic bridges, the Railways impact on Art, Literature, Sports, Films & Songs… they all link railway transportation to the retelling of touching, human stories.

Railway technology evolves quickly. So the Steam Locomotives, Meter Gauge Locomotives & Wooden body coaches, Old Machinery & Equipment are no longer in regular operation. With their phasing out, lots of maintenance practices are in danger of being gradually forgotten. At times, it becomes really impossible to locate an artisan who can do the valve setting of a steam locomotive or a carpenter who can precisely fix the door of a wooden body saloon. Equipment like block instruments, their tokens, token pickup devices, quadrant signaling devices, stationary vacuum exhausters, which were very common even three decades ago, are now completely phased out.

The industriousness and skill of a railway worker is not forgotten, however, when our museums showcase this railway industrial heritage in a memorable way. Visitor centers and Heritage parks at ICF, Chennai and Tindharia Workshop on the Darjeeling Himalayan Railway are but a few examples of this effort.

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 a working Steam Shed, a feat un-parallel in the World. The Rewari Steam Centre now maintains six Broad Gauge and four Meter Gauge working steam locomotives, including 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.

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 recreate the romance of a by-gone era. A "Heritage Train" has been introduced by the Western Railways in December 2018 which runs on the picturesque Patalpani - Kalakund section in Ratlam Division (Madhya Pradesh). This train rides through 4 tunnels, 24 sharp turns and 41 bridges covering a distance of 9.5 kms.

Indian Railways maintain a large repository of built heritage like buildings, bridges, via ducts etc. As of now, about 37 bridges and 73 buildings are designated as Heritage Assets by Indian Railways. Notable among them are Jubilee Bridge near Kolkata, Yamuna bridge near Naini, Sonenagar Bridge,

Pamban via duct, Bandra suburban station, Pratap Vilas Palace, Vadodara, Glenogle Bungalow, 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.

Nilgiri Mountain Rail, passing through forest

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