



INDIAN RAILWAYS YEAR BOOK



2022-23



Sir M. Visvesvaraya Terminal, Bengaluru

INDIAN RAILWAYS



YEAR BOOK 2022-23



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

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Key Statistics

	Unit	2021-22	2022-23
PLANT & EQUIPMENT:			
Capital Investment (incl. capital Fund)	₹ in crore	@4,66,718.71	#5,72,920.19
Total Investment		8,09,918.59	9,72,734.18
Route Length	Kms.	68,043	68,584
Locomotives	Nos.	13,215	14,360
Passenger Service Vehicles	"	74,744	77,782
Other Coaching Vehicles	"	10,103	11,138
Wagons	"	3,18,883	3,15,791
Railway Stations	"	7,308	7,364
OPERATION:			
Passenger: Train Kms.	Millions	*617	751
Vehicle Kms.	"	*20,190	25,442
Freight: Train Kms.	"	481	554
Wagon Kms.	"	*22,112	25,459
VOLUME OF TRAFFIC:			
Passengers Originating	Millions	3,519	6,396
Passenger Kms.	"	5,90,217	9,58,919
Tonnes Originating:\$			
Revenue Earning Traffic	"	1,415.87	1,509.10
Total Traffic (incl. non-revenue)	"	1,418.84	1,510.76
Net Tonne Kms.\$			
Revenue Earning Traffic	"	8,71,816	9,59,566
Total Traffic (incl. non-revenue)	"	8,72,112	9,59,888
EMPLOYMENT AND WAGES:			
Regular Employees	Thousands	1,213	1,190
Wage Bill of Regular Employees	₹ in crore	*1,51,494.27	1,61,418.87
Average Annual Wage Per Regular Employee	₹ in units	*12,48,863	13,56,900
FINANCIAL RESULTS:			
Revenue	₹ in crore	1,91,206.48	2,39,982.56
Expenses	"	2,04,606.34	2,35,655.78
Miscellaneous Transactions	"	(-)1,624.72	(-)1,809.40
Net Revenue (before dividend)	"	(-)15,024.58	2,517.38
Rate of Return on Capital	Percent	(-)3.22	0.44
Dividend on Capital **	₹ in crore	0.00	0.00
Shortfall (-)/Excess (+)	"	(-)15,024.58	2,517.38

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

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

\$ Excludes Konkan Railway.

* revised

** No dividend was payable during 2021-22 & 2022-23.

Other Important Statistics

S.No.	Item	Unit	2021-22	2022-23
I	Rail Network			
1	Route Kilometres			
	(i) BG	Kms.	65,093	65,977
	(ii) MG	"	1,655	1,345
	(iii) NG	"	1,294	1,262
	Total (all gauges)	"	68,043	68,584
2	Running Track Kilometres (Total all gauges)	"	1,02,831	1,06,493
3	Total Track Kilometres (Total all gauges)	"	1,28,305	1,32,310
4	Electrified Route Kilometre (Total all gauges)	"	*51,804	58,074
II	Rolling stock			
1	Number of Locomotives	(in units)		
	(i) Steam	"	39	39
	(ii) Diesel	"	4,747	4,756
	(iii) Electric	"	8,429	9,565
	Total	"	13,215	14,360
2	Number of Wagons	"	*3,18,883	3,15,791
3	Number of Coaches-	(in units)		
	(i) Passenger Carriages (including DEMU/ DHMU)	"	*65,253	66,106
	(ii) Other Coaching Vehicles	"	*10,159	11,138
	(iii) EMU and MEMU Coaches	"	*11,984	11,664
	(iv) Rail Cars	"	*15	12
	Total	"	*87,411	88,920
III	Loco Utilisation			
1	Tractive effort per loco			
	(i) BG	Kgs.	40,553	41,171
	(ii) MG	"	16,053	15,978
2	GTKMs (excl. wt. of engine & dept.) per kg. of tractive effort.			
	(i) BG	Kms.	*3,710	3,873
	(ii) MG	"	*124	243
3	Engine kilometres per day per engine in use (Pass.) (B.G)			
	(i) Diesel	Kms.	703	577
	(ii) Electric	"	*760	829

S.No.	Item	Unit	2021-22	2022-23
4	Engine kilometres per day per engine in use (Goods) (B.G)			
	(i) Diesel	Kms.	484	345
	(ii) Electric	"	*492	389
5	NTKMs per engine hour (BG) All traction		*14,189	13,899
6	Ineffective percentage of locomotives (B.G)	Percent		
	(i) Diesel	"	9.79	10.40
	(ii) Electric	"	5.85	4.91
IV	Wagon Utilisation			
1	Wagon KMs in terms of 8 wheelers	Million	22,112	25,459
2	Total Carrying Capacity (All Gauges)	Million Tonnes	18.61	18.75
3	Average carrying capacity - wagon	Tonnes		
	BG	"	*62.20	62.9
	MG	"	32.44	32.3
4	Wagon Turn Round (in days) (BG)	Days	4.74	4.70
5	Wagon Kms. per wagon per day (BG)	Kms	211.00	223.00
6	NTKMs per wagon per day (BG)	Kms	*8,363	8,670
7	Ineffective percentage of wagons (B.G)	%age	*3.13	3.11
V	Coach Utilisation			
1	Vehicle Kms.(Excluding Deptt../Rail Car etc.)	Millions		
	(i) Suburban (EMU)	"	1,731	2,160
	(ii) Non Suburban	"	*18,459	23,281
	Total	"	*20,190	25,442
2	Vehicle Kms per vehicle day (B.G)	Kms.	*415	470
3	Ineffective percentage of coaches (B.G) (Passenger Carriage)	Percent	5.68	4.96
VI	Train Utilisation			
a.	Passenger Train Performance			
1	Number of Passenger trains runs daily	Nos.	10,250	12,541
2	Passenger Train Kms	Millions	*617	751
b.	Goods Train Performance			
1	Number of Goods trains runs daily	Nos.	9,164	10,388
2	Goods Train Kms.	Millions	481	554
3	Average Speed of All Goods Train (B.G.)			
	(i) Diesel	Kms/Hour	36.5	31.1
	(ii) Electric	"	38.1	30.1
	(iii) All Traction	"	37.8	30.3
4	Average Net load of Goods train (B.G) (All traction)	Tonnes	1,817	1,735
5	Average Gross load of Goods train (B.G.) (All traction)	Tonnes	*3,071	3,007

S.No.	Item	Unit	2021-22	2022-23
VII	Volume of traffic			
a.	Passenger Traffic (Suburban + Non-Suburban)			
1	Passenger Originating	Millions	3,519	6,396
2	Passenger Kilometres	Millions	5,90,217	9,58,919
3	Average Lead	Kms.	167.70	149.9
4	Passenger Earnings	₹ in crore	39,214.39	63,416.85
5	Average rate per PKMs	Paise	66.44	66.13
6	Number of Passenger carried per day	Millions	9.64	17.52
b.	Freight Traffic (Revenue)			
1	Tonnes originating	Millions	1,415.87	1,509.10
2	Lead (originating)	Kms.	616	636
3	Freight Earnings excl. Demurrage/Wharfage	₹ in crore	1,39,287.30	1,60,158.49
4	Freight NTKMs	Millions	8,71,816	9,59,566
5	Average rate per NTKMs	Paise	159.77	166.91
6	Earnings per million tonne	₹ in crore	98.37	106.13
7	Freight carried per day (including non-revenue)	Millions Tonnes	3.88	4.14
VIII	Train Accidents (Excl. KRCL)	Nos.	34	48
1	Collisions	"	2	6
2	Derailement	"	26	36
3	Level Crossing	"	1	1
4	Fire in trains	"	4	4
5	Miscellaneous		1	1
6	Accident per million train Kms		0.03	0.04
IX	Density			
1	Net Tonne Kms per route Km. (BG)	Km.	13.40	14.55
2	Passenger Kms per route Km. (BG)	"	9.60	14.53
3	Gross Tonne Kms per route Km. (BG)	"	*33.68	38.29
X	Consumption of Fuel/Energy by Locomotive			
(i)	Diesel	Million litres	*1,462.71	1,438.42
(ii)	Electric	Million KWH	17,756.60	21,823.73
	* revised			

Some Selected Financial Ratio

S. No.	Item	Unit	2021-22	2022-23
(A) Financial Ratios				
1.	Operating ratio	% age	107.39	98.10
2.	Rate of return on Capital	% age	(-) 3.22	0.44
3.	Working ratio of IR	% age	99.70	90.92
4.	Operating ratio with subsidy (Cost recovery)	% age	81.10	80.40
5.	Operating ratio for Coaching (passenger) and Goods (Freight)			
	i. Goods	% age	72.88	66.97
	ii. Coaching	% age	237.38	180.82
6.	Debt Servicing as percentage of OWE and as a percentage of Gross receipts.			
	i. Debt servicing as percentage of OWE	% age	18.20	18.90
	ii. Debt servicing as percentage of Gross receipts	% age	14.90	14.20
7.	Capex to Revenue ratio - Capex (from internal generation) /Revenue	% age	0.90	1.40
(B) Earning/Yield Ratios (Based on Apportion Earning)				
1.	Passenger yield/ PKMs	In Paise	66.44	66.13
2.	Freight yield/NTKMs	In Paise	159.77	166.91
(C) Productivity Index				
1.	Employee Productivity		7,59,187	8,73,523
2.	Infrastructure Productivity		71,76,680	78,53,951
(D) Asset Utilization				
1.	Utilization of Assets			
	i. NTKMs per wagon per day -(BG)	KMs	*8,363	8,670
	ii. Wagon KMs per Wagon day -(BG)	KMs	*211.00	223.00
	iii. Wagon turn around - BG	In days	4.74	4.70
	iv. Average Load per Wagon - BG	Tonnes	62.90	60.00

S. No.	Item	Unit	2021-22	2022-23
(E) Operating Indices				
1.	Average speed of Goods Train – (BG) – All traction	KM/hour	37.80	30.30
2.	Infective percentage of Rolling Stock – (BG)			
	i. Diesel Locos	% age	9.79	10.40
	ii. Electric Locos	% age	5.85	4.91
	iii. EMU Coaches	% age	10.40	7.31
	iv. Passenger Carriages	% age	5.68	4.96
	v. Other Coaching Vehicles	% age	5.55	7.38
	vi. Wagons	% age	3.13	3.11
3.	Specific Fuel Consumption (Consumption per 1000 GTKMs) – (BG)			
	i. Passenger service Diesel	Litress.	*3.97	3.59
	ii. Goods services Diesel	Litress.	*1.60	1.97
4.	Specific Energy Consumption (Consumption per 1000 GTKMs) – (BG)			
	i. Passenger service- Electricity	KWt. Hrs.	*19.3	18.70
	ii. Goods services -Electricity	KWt. Hrs.	*6.56	6.40
5.	Punctuality Index – Punctuality (M/Exp. Trains) – (BG)	% age	90.48	80.79
6.	Accident per Million Train Kilometers		0.03	0.04

*revised



Vistadome Coach

Economic Review

Macro-Economic Outcome

At the dawn of the year 2022-23 when the pandemic was rapidly on the wane, the global economic challenges arising from the Russia-Ukraine conflict led to a downward revision in growth forecast across countries as inflation played havoc and monetary tightening took over. Waves of global spillovers to merging market economies resulted in large currency depreciations, capital flight, investor risk aversion and debt concerns. Heightened risks of a global recession clouded the overall macro economic and financial outlook nevertheless, resilient India marched ahead, being projected as a fastest growing economy of the world. During the year, the Indian economy exhibited a robust growth of 7.2 percent after countering the turbulence of global headwinds. The growth momentum was principally led by significant private consumption and capex expansion on the domestic front, overcoming the adverse external demand conditions and the resultant larger deficit in net exports that acted as a drag on its growth. Agriculture and services sectors continued with their expansionary production trends, as in previous years indicating higher potential. The industrial sector growth moderate but stood at the cusp of revival facilitated by public investment and policies that have improved ease of doing business and improved viability. Thus it could be inferred that India is confidently poised on the vertex to ascend the pre-pandemic growth path after following a V-shaped recovery curve in the previous years.

According to the forecast of the International Monetary Fund (IMF)-World Economic Outlook of April 2023, global growth would fall from 3.4 percent in 2022 to 2.8 percent in 2023, before settling at 3.0 percent in 2024, the lowest medium-term forecast in decades. According to the IMF, Central banks were expected to be steadfast with their tighter anti-inflation stance and address financial stability concerns as developments demand. It viewed that fiscal policy makers should buttress monetary and financial policymakers' actions in getting inflation back to target while maintaining financial stability and that the measures to address structural factors impeding supply. could ameliorate medium-term growth.

Gross Domestic Product (GDP) Growth: India

GDP at constant (2011-12) prices or real GDP in the year 2022-23 was estimated at ₹160.06 lakh crore, as against the real GDP of ₹149.26 lakh crore for the year 2021-22. The year-on-year growth rate in real GDP was 7.2 percent during 2022-23 as against an expansion of 9.1 per cent in 2021- 22(Table 1).

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

	2018-19	2019-20 3rd RE	2020-21 2nd RE	2021-22 1st RE	2022-23 PE
GDP at constant price	13992914 (6.5)	14534641 (3.9)	13687118 (-5.8)	14925840 (9.1)	16006425 (7.2)
GVA at basic price	12733798 (5.8)	13236100 (3.9)	12681482 (-4.2)	13798025 (8.8)	14764840 (7.0)

Source: National Statistical Office (NSO), Ministry of Statistics and Programme Implementation, Press release dated 31st May 2023.

PE: Provisional Estimate

RE: Revised Estimate

Note: Growth rate over previous year indicated in brackets.

Real Gross Value Added (GVA), which reflects the production or supply side method of calculating GDP is estimated at ₹147.65 lakh crore (Provisional Estimates) for 2022-23, at basic constant (2011-12) prices, in comparison with ₹137.98 lakh crore (First Revised Estimate) for the year 2021-22, thus registering an year-on-year growth rate of 7.0 percent in 2022- 23 as against an expansion of 8.8 percent in the year 2021-22(Table1).

The momentum of growth was sustained in the various sectors compared to the high base effect of the previous year. Agriculture, Forestry & Fishing registered an expansion in the growth rate in GVA (4 per cent) in 2022-23 over the previous year proving its resilience despite uneven spatial and temporal distribution of rainfall. Mining & Quarrying was steady (4.6 percent), Manufacturing withstood global spillovers (1.3 percent), Electricity generation showed a robust growth(9.0 percent) and Construction showed a Sustainable growth (10 percent). The Services sector growth was led by Trade, Hotels, Transport, Communication and Services related to Broadcasting, a contact-intensive sub-sector as the pandemic effect ebbed (14 percent), followed by Public Administration, Defense and Other Services(7.2 per cent) and Financial, Real Estate & Professional Services (7.1 percent) (Table 2).

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

	2020-21 (2nd RE)	2021-22 (1st RE)	2022-23 (PE)
I. Agriculture, Forestry & Fishing	4.1	3.5	4.0
II. Industry			
Mining & Quarrying	-8.6	7.1	4.6
Manufacturing	2.9	11.1	1.3
Electricity, Gas, Water Supply & other utility services	-4.3	9.9	9.0
Construction	-5.7	14.8	10.0
III. Services			
Trade, Hotels, Transport, Communication and services related to broadcasting	-19.7	13.8	14.0
Financing, Real Estate & Professional Services	2.1	4.7	7.1
Public Administration, defence and other services	-7.6	9.7	7.2
GVA at Basic Price	-4.2	8.8	7.0

Source: National Statistical Office (NSO), Ministry of Statistics and Programme Implementation, Press release dated 31st May, 2023.

PE: Provisional Estimates. RE: Revised Estimates.

Agriculture

As per the Third Advance Estimates of Production of Food grains for 2022-23, the Food grain production in 2022-23 was 330.53 million tonnes. This was higher by 14.92 million tonnes as compared to 315.61 million tonnes during 2021-22. All the components of Food grains, including wheat, rice, coarse cereals and pulses registered an increase in production in 2022-23 over the previous year (Table 3).

Table3: Production of Selected Agricultural Commodities (million tonnes)

Items	2018-19	2019-20	2020-21	2021-22	2022-23
Food grains	285.21	297.50	310.74	315.61	330.53
Wheat	103.60	107.86	109.59	107.74	112.74
Rice	116.48	118.87	124.37	129.47	135.54
Coarse Cereals	43.06	47.75	51.32	51.10	54.75
Pulses	22.08	23.03	25.46	27.30	27.50

Source: Department of Agriculture and Farmers Welfare, Third Advance Estimates of Production of Food grains for 2022-23 as on 25.5.2023..

Industry

As per the national accounts data of the NSO, the Index of Industrial Production (IIP), which broadly comprises of mining, manufacturing and electricity, expanded by 5.2 percent in 2022-23 compared to the previous year's growth rate of 11.4 percent in 2021-22. This is attributed to a lower

growth rate witnessed in the components of the IIP including mining and manufacturing except for electricity. The growth rate of mining sector which was 12.2 percent in 2021-22 decreased to 5.8 percent in 2022-23 and that of manufacturing sector decreased from 11.8 percent in 2021-22 to 4.7 per cent in 2022-23. In the electricity group, the annual growth rate increased to 8.9 percent in 2022-23 compared to that of 7.9 percent in 2021-22 (Table 4).

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

(Base: 2011-12 = 100)

Industry Group	Weight	2018-19	2019-20	2020-21	2021-22	2022-23
General Index	100.00	3.8	-0.8	-8.4	11.4	5.2
Mining	14.3725	2.9	1.6	-7.8	12.2	5.8
Manufacturing	77.6332	3.9	-1.4	-9.6	11.8	4.7
Electricity	7.99432	5.2	1.0	-0.5	7.9	8.9

Source: National Statistical Office (NSO), Ministry of Statistics and Programme Implementation, Press release dated 12th June, 2023.

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

In terms of use-based classification, the annual growth rate of IIP for Primary goods decreased to 7.5 percent in 2022-23 from 9.7 percent in 2021-22. Annual Growth rate of IIP for Capital goods decreased from 16.9 percent in 2021-22 to 12.9 percent in the year 2022-23. Intermediate goods witnessed a lower growth rate of 3.8 percent in 2022-23 as against 15.4 percent in 2021-22. Growth rate of Infrastructure/construction goods was 8.4 percent in 2022-23 as against 18.8 percent in 2021-22. Growth rate of Consumer durable goods was 0.6 percent in 2022-23 as against 12.5 percent in 2021-22. For Consumer non-durables, growth rate was 0.5 percent in 2022-23 as against 3.2 percent in 2021-22.

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 weight of items included in IIP witnessed a growth rate of 7.7 percent in 2022-23 compared to 10.4 percent in 2021-22. Coal and Fertilizers which registered annual growth rates of 14.9 percent and 11.3 percent, respectively, were the best performing infrastructure industries in 2022-23. Steel and Electricity also improved performance with growth rates of 8.9 percent followed by Cement at 8.7 percent, Refinery products 4.8 percent, Natural gas 1.6 percent and Crude Oil -1.7 percent (Table 5).

Table 5: Growth in Index of Eight Core Industries (Base:2011-12=100)

Sectors	Weight	2018-19	2019-20	2020-21	2021-22	2022-23
Coal	10.3335	7.4	-0.4	-1.9	8.5	14.9
Crude oil	8.9833	-4.1	-5.9	-5.2	-2.6	-1.7
Natural Gas	6.8768	0.8	-5.6	-8.2	19.2	1.6
Refinery Products	28.0376	3.1	0.2	-11.2	8.9	4.8
Fertilizers	2.6276	0.3	2.7	1.7	0.7	11.3
Steel	17.9166	5.1	3.4	-8.7	16.9	8.9
Cement	5.3720	13.3	-0.9	-10.8	20.8	8.7
Electricity	19.8530	5.2	0.9	-0.5	8.0	8.9
Overall	100.0000	4.4	0.4	-6.4	10.4	7.7

Source: Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade, Press release dated 31st May 2023.

Fiscal Outcome

The major fiscal indicators of the Central Government are presented in Table 6. Comparison of Budget Estimates of expenditure in 2022-23(BE) over 2021-22(PA) suggests that gross fiscal deficit budgeted at 6.4 percent of GDP in 2022-23 is expected to be consolidated by 0.3 percentage point compared to the previous year with the winding up of the pandemic related support and the targeted fiscal measures undertaken to shield domestic consumers from high food and energy prices arising from Ukraine war. Central Government's total expenditure is expected to decrease by 0.7 percentage points to 15.3 percent of GDP in 2022-23 over the previous year, the revenue expenditure was budgeted to decline from 2021-22 level by 1.1 percentage point with capital spending increasing by 0.4 percentage point. Since 2018-19, the Centre's capex has increased steadily. The capex-led investment strategy with emphasis on infrastructure has large-scale implications for medium-term growth. Gross tax revenue is expected to continue to be robust with a target of 10.7 percent of GDP.

Table 6: Components of Revenue and Expenditure of the Central Government (as percent to GDP)

	2018-19	2019-20	2020-21	2021-22 (PA)	2022-23 (BE)
Revenue Receipts	8.2	8.4	8.3	9.2	8.5
Gross Tax Revenue	11.0	10.0	10.2	11.4	10.7
Total Expenditure	12.3	13.4	17.7	16.0	15.3
Revenue Expenditure	10.6	11.7	15.6	13.5	12.4
Capital Expenditure	1.6	1.7	2.2	2.5	2.9
Interest payment	3.1	3.0	3.4	3.4	3.6
Major subsidies	1.0	1.1	3.6	1.9	1.2
Revenue Deficit	2.4	3.3	7.3	4.4	3.8
Fiscal Deficit	3.4	4.7	9.2	6.7	6.4
Primary Deficit	0.4	1.6	5.7	3.3	2.8

Source: Economic Survey, 2022-23.

PA: Provisional Actuals, BE: Budget Estimates.

Inflation

Wholesale Price Index (WPI) for all commodities averaged 12.97 percent in 2021-22, improved to 9.40 percent in 2022-23. This was mainly on account of the Manufactured Products, which fell from 11.11 percent in 2021-22 to 5.63 percent in 2022-23 combined with decrease in the inflation for primary articles from 10.30 percent in 2021-22 to 10.02 percent in 2022-23 and that of Fuel and Power Group from 32.55 percent in 2021-22 to 28.01 percent in 2022-23 (Table 7).

Table 7: Annual Inflation rate (%) based on WPI (Base 2011-12=100)

Items/Groups	Weight (%)	April-March (Average)	
		2021-22	2022-23
All Commodities	100	12.97	9.40
Primary articles	22.61756	10.30	10.02
Fuel and Power Group	13.15190	32.55	28.01
Manufactured Products	64.23054	11.11	5.63

Source: Estimated from base data released by the Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade.

WPI rose sharply in the first half of 2022-23, reaching a peak of 16.6 percent in May 2022. The gap between WPI and Consumer Price Index (CPI) widened. The increase mirrored global trend of rising crude oil and other commodity prices following the war in Ukraine. Softening of global commodity prices, particularly in energy, food and metals in the latter half of the year alongwith proactive measures taken by the government led to consistent moderation in WPI inflation from its May 2022 peak to 1.3 per cent in March 2023. The wedge between both the indices closed by the end of the year.

Inflation measured in terms of CPI (Base 2012=100, rural and urban combined) averaged 6.7 percent in 2022-23, as against 5.5 percent in 2021-22 and 6.2 percent in 2020-21. CPI remained above the upper tolerance level of 6 percent for 10 successive months since January 2022, before moderating during November-December on seasonal easing in food prices. Inflation picked up again in January-February 2023 before easing to 5.7 percent in March 2023.

External Sector

Foreign Trade

Exports in the year 2022-23 contracted by (-)20.70 percent over the previous year, as compared to a growth rate of 44.84 percent in 2021-22. Imports contracted by (-)10.39 percent in 2022-23 as against a growth rate of 55.26 percent in 2021-22. The trade balance, accordingly, which was at US\$(-)189.46 billion in 2021-22 increased to US\$ (-)214.02 billion in 2022-23 (Table 8 and 9).

According to the data from RBI Bulletin, June 2023, the oil exports registered an annual growth rate of 44.45 percent in 2022-23 as against 163.71 percent in 2021-22 and (-)40.23 percent in 2020-21. The non-oil exports witnessed a growth rate of (-)0.24 percent during the year 2022-23 as against 33.62 percent in the previous year and (-)2.32 percent in 2020-21. The oil imports witnessed a growth rate of 29.62 percent in 2022-23 compared to the previous years' growth rate of 95.40 percent and (-)36.12 percent in 2020-21. The non-oil imports witnessed a growth rate of 12.03 percent in 2022-23 as against a growth rate of 44.88 percent in the previous year and a growth rate of (-)7.95 percent in 2020-21.

Table 8: Export, Import and Trade Deficit (in US \$ billion)

Item	2021-2022	Growth* (%)	2022-2023	Growth*(%)
Exports	429.16	44.84	340.32	-20.70
Imports	618.62	55.26	554.34	-10.39
Trade Balance#	-189.46		-214.02	

Source: RBI Annual report 2022-23 dated May 30th, 2023.

Exports minus Imports

*Over the previous year

Current Account Deficit (CAD)

Table 9: Current Account Balance (in US \$ billion)

Year	2018-19	2019-20	2020-21	2021-22	2022-23
Trade Balance	-180.28	-157.51	-102.15	-189.46	-214.02
Net Invisibles	123.03	132.85	126.07	150.69	146.94
Current Account Balance	(-)57.26	(-)24.66	23.91	-38.77	-67.08
Current Account Balance as a Ratio to GDP (%)	-2.1	-0.9	0.9	-1.2	-2.7

Source: RBI Annual Report dated 30th May 2023.

Foreign Capital Inflows

Net foreign direct investments(FDI), albeit strong, decreased from US\$ 38.59 billion in 2021-22 to US\$ 21.68 billion in 2022-23. Net Portfolio investment reflecting risk-off sentiments decreased to US\$ (-)3.49 billion in 2022-23 as compared to US\$ (-)16.78 billion in the previous year (Table10).

Sector wise composition indicates that the services sector, including financial services, computer services, communication services and business services, accounted for a major share of FDI equity in India during 2022-23, followed by manufacturing, retail and wholesale trade, electricity and other energy, and education, research and development.

FPI inflows in the equity market were primarily recorded in the financial services, automobile, consumer durables, chemicals and construction material sectors.

Table 10: Net Foreign Direct Investment (FDI) and Net Portfolio Investment
(In US\$ billion)

Years	Net FDI	Net Portfolio Investment
2018-19	30.71	-0.62
2019-20	43.01	1.4
2020-21	43.96	36.14
2021-22	38.59	-16.78
2022-23(P)	21.68	-3.49

Source: RBI Annual Report dated 30th May 2023.
(P): Provisional

Foreign Exchange Reserves & Exchange rate

Foreign exchange reserves at US\$ 578.4 billion as at end-March 2023, registered a decline of US\$ 28.9 billion since end-March 2022, of which US\$ 19.7 billion decline was due to valuation changes.

The Indian rupee remained under pressure during first quarter amid risk-off sentiments emanating from geopolitical tensions in the Eastern Europe and strengthening of US dollar with the Brent crude oil remaining elevated and volatile with an average of US \$112 per barrel. However, in the last quarter the Indian rupee gained 0.7 percent.

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
2018-19	62.84	62.63	34.55	13.65	86.05	14.55
2019-20	59.92	62.01	31.86	12.47	84.23	14.57
2020-21	58.18	78.57	39.83	20.05	84.44	15.35
2021-22 (R)	66.21	64.50	38.25	23.04	80.03	15.36
2022-23 (P)	64.31	61.66	37.27	21.27	83.73	15.50

(P): Provisional (R): Revised

Source: Production and import data received from various Central Ministries/ Departments and railway loading data received from Directorate of Statistics and Economics, Ministry of Railways.

Selected Economic Indicators

The trends for the last five years (2018-19 to 2022-23) in some of the economic indices like Net National Income, Per Capita Income, Capital Formation in Railways, Value of Foreign Trade, Indices of Agricultural Production, Wholesale Price Index (WPI) of commodities, WPI of important commodities used by Railways and Consumer Price Index for Industrial Workers are given below in Table 12.

Table 12: SELECTED ECONOMIC INDICATORS

ITEM	Unit / Base	2018-19	2019-20 3rd RE	2020-21 2nd RE	2021-22 1st RE	2022-23 (PE)
I. (a) Net National Income						
(i) At 2011-12 prices	₹ in Crore	12226019	12661722	11663958	12670834	13604058
(ii) At current prices	₹ in Crore	16713054	17746868	17222645	20326803	23823945
(b) Per capita income						
(i) At 2011-12 prices	(In ₹)	92133	94420	86054	92583	98374
(ii) At current prices	(In ₹)	125946	132341	127065	148524	172276
II. Gross Capital Formation						
Railways		2018-19	2019-20	2020-21	2021-22@	2022-23
(i) At 2011-12 prices	₹ in Crore	73028	75185	42332	90096	NA
(ii) At current prices	₹ in Crore	90369	97048	56121	128082	NA

Source: National Statistical Office (NSO), Ministry of Statistics and Programme Implementation, Press note dated 28th February 2023.

@First Revised Estimates.

III. Foreign Trade:

(a)	Value of exports	₹ in Crore	2307726	2219854	2159043	3147021	3620631
	Value of imports	₹ in Crore	3594675	3360954	2915958	4572775	5733959
(b)	Value of exports	US \$ Million	330078	313361	291808	422004	450958
	Value of imports	US \$ Million	514078	474709	394436	613052	714042

Source: Ministry of Commerce and Industry, Department of Commerce, Export Import Data Bank dated 27.06.2023.

IV. Index of Agricultural Production (Triennium ending 2007-08 =100)							
	Weight	2018-19	2019-20	2020-21	2021-22	2022-23	
(a) All Crops	(100.00)	138.1	145.5	154.1	156.7	163.7	
(b) Foodgrains	(50.7)	134.4	139.8	147.0	150.2	156.4	
(c) Non-foodgrains	(49.3)	142.0	151.3	161.3	163.3	171.2	

Source: Handbook of Statistics (2022-23), Reserve Bank of India dated September 15, 2023

V. Index of Industrial Production (2011-12=100)(Cumulative Index-April-March)							
	Weight	2018-19	2019-20	2020-21	2021-22	2022-23	
(a) General Index	(100.0)	130.1	129.0	118.1	131.6	138.4	
(b) Mining	(14.3725)	107.9	109.6	101.0	113.3	119.9	
(c) Manufacturing	(77.6332)	131.5	129.6	117.2	131.0	137.1	
(d) Electricity	(7.9943)	156.9	158.4	157.6	170.1	185.2	

Source: NSO, Ministry of Statistics and Programme Implementation, press release dated 12th June, 2023 for 2021-22 and 2022-23.

VI.	Wholesale Price Index (Financial Year Average with weights) (Base 2011-12=100)	Weight	2018-19	2019-20	2020-21	2021-22	2022-23
(a)	All Commodities	(100.00)	119.8	121.8	123.4	139.4	152.5
(b)	Primary Articles	(22.62)	134.2	143.3	145.7	160.7	176.8
(c)	Fuel & Power	(13.15)	104.1	102.2	94.0	124.6	159.5
(d)	Manufactured Products	(64.23)	117.9	118.3	121.5	135.0	142.6
VII.	Wholesale Price Indices of important Commodities used by Railways (with weights) (Base 2011-12=100)						
(a)	Non-coking coal	(1.40)	119.0	119.0	119.3	119.8	119.8
(b)	Minerals Oils	(7.95)	96.7	92.3	79.2	126.2	172.9
(c)	Electricity	(3.06)	109.6	111.8	109.6	117.4	143.3
(d)	Manufacture of Basic Metals	(9.65)	112.2	106.2	111.4	140.1	148.7
(i)	Inputs into Steel Making	(1.41)	113.0	100.6	109.2	150.8	159.7
(ii)	Ferrochrome	(0.11)	121.1	112.4	122.6	169.9	181.3
(iii)	Ferromanganese	(0.03)	124.1	117.7	116.3	153.7	141.3
(iv)	Ferrosilicon	(0.02)	100.5	94.9	98.8	127.9	144.5
(v)	Other Ferro alloys	(0.03)	122.3	117.5	117.7	141.7	131.5
(vi)	Manufacture of Non-Ferrous Metals	(1.69)	112.2	107.0	112.3	139.7	145.9
(e)	Manufacture of Electrical Equipment	(2.93)	111.7	111.3	113.6	122.3	128.8
(f)	Manufacture of Chemicals & Chemical Products	(6.47)	119.1	117.5	118.2	133.5	145.4
(g)	Manufacture of Non-Metallic Mineral products	(3.20)	115.9	116.7	117.6	123.7	133.7
(h)	Cotton dyed/printed Textile	(0.05)	128.7	128.3	128.8	133.9	150.3
(i)	Timber/wooden plank, sawn/ re-sawn	(0.05)	119.9	118.8	117.0	128.3	143.0
(j)	Manufacture of Cement, Lime and plaster	(1.64)	114.3	119.5	120.9	126.4	137.2
(k)	Lube Oils	(0.29)	124.8	131.7	137.2	162.0	180.0
(l)	High Speed Diesel	(3.10)	97.1	93.7	80.2	128.2	191.4
VIII.	Consumer Price Index (Industrial Workers) (Base 2012=100 from 2017-18 to 2019-20, Base 2016=100 for 2020-21 to 2021-22).		300	323	118	124	131

Source: : WPI data from Office of Economic Adviser, Department for Promotion of Industry and Internal Trade and CPI data from Hand book of Statistics, Reserve Bank of India dated September 15, 2023.

Planning

In the year 2022-23 the following assets were acquired:

S. No.	Heads	In Numbers
1.	Wagons (BLC+ Private Wagons)	22,790
2.	Locomotives including Trade	1,189
3.	Coaches including Trade	5,877
	(i) EMUs	120
	(ii) MEMUs	325

In addition, the following works were accomplished:

S. No.	Heads	In Kms.
1.	New lines	1,815.49
2.	Gauge Conversion to BG from MG/NG	242.20
3.	Double/Multiple lines	3,185.53
4.	Route Electrification	6,565
5.	Track renewals (both primary & secondary renewal)	5,227.26

The Plan allocation (Revised Estimates) and Actual Net Expenditure for 2022-23 compared with 2021-22, were as follows:

		(₹ in crore)			
S.No.	Plan Head	2021-22		2022-23	
		Allocation (R.E.)	Actual Net Expenditure	Allocation (R.E.)	Actual Net Expenditure
CIVIL ENGINEERING					
1	New Lines (Construction)	19,071.83	21,244.91	26,014.07	24,310.17
2	Gauge Conversion	3,038.09	2,836.87	3,870.00	2,833.79
3	Doubling	32,478.77	32,219.41	42,526.06	29,979.17
4	Traffic Facilities- Yard Remodeling and Others	4,273.44	2,675.13	4,740.00	4,456.36
5	Road Safety Works - Level Crossings	731.00	450.13	750.00	519.82
6	Road Safety Works - Road Over/ Under Bridges	3,862.13	4,222.06	6,000.00	4,825.25
7	Track Renewals	15,229.72	14,082.00	15,388.05	13,811.98
8	Bridge Works, Tunnel works & approaches	1,365.49	1,296.79	1,215.00	1,042.82
9	Staff Welfare	518.96	473.27	462.56	420.86
10	New Lines (const.)– Dividend free Projects	-	-	-	-
	TOTAL	80,569.43	79,500.57	91,240.07	79,500.57
MECHANICAL					
1	Rolling Stock	43,433.11	4,1406.17	60,198.86	43,878.98
2	Leased Assets–Payment of Capital Component	14,702.00	14,580.80	18,898.00	17,456.40
3	Machinery and Plant	866.59	887.07	537.91	519.49

4	Workshops including Production Units	2,513.34	2,668.39	2,671.46	2,478.67
	TOTAL	61,515.04	59,542.43	82,306.23	64,333.54
	ELECTRICAL ENGINEERING				
1	Electrification Projects	8,171.51	6,961.37	8030.22	6,641.61
2	Other Electrical Works including Traction Distribution Works.	662.81	626.84	676.17	731.28
	TOTAL	8,834.32	7,588.21	8,706.39	7,372.89
	SIGNAL AND TELECOMMUNICATION				
1	S and T Works	2,332.41	2,142.18	2,428.47	2,448.85
	TOTAL	2,332.41	2,142.18	2,428.47	2,448.85
	OTHERS				
1	Computerization	485.05	317.80	462.16	398.47
2	Railway Research	23.48	30.82	107.00	39.12
3	User's Amenities	2,351.42	1,995.41	3824.20	2,157.72
4	Investment in Non-Govt. undertaking including JVs/SPVs	32,244.41	25,750.57	28,980.87	27,532.93
5	Other Specified Works	862.24	542.55	856.82	556.21
6	Training/HRD	144.93	75.99	154.00	115.42
7	Inventories	250	-122.45	350.00	1,243.77
8	M.T.Ps.	2,000.00	2,514.58	3,536.00	4,497.91
9	EBR (Partnership)	25,000.00	-	14,700.00	-
10	Credits or recoveries	-1,612.73	-	-2,070.88	-
	TOTAL	61,748.80	31,105.27	50,893.17	36,541.55
	GRAND TOTAL	2,15,000.00	@1,79,878.66	2,45,300.00	#1,92,897.05

Actual Net Expenditure

@ Excluding actual expenditure of ₹10,388.41 crore under EBR(PPP) during 2021-22.

Excluding actual expenditure of ₹11,086.03 crore under EBR(PPP) during 2022-23.

Productivity:

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

Indices of Growth of Traffic Output and Input (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
2010-11	1,420	403	294	344	120	147	343
2020-21	1,632	335	430	448	127	170	561
2021-22	1,977	868	*450	*483	127	173	592
2022-23	2,176	1,599	453	490	128	180	654

*revised

Passenger Business

Indian Railways is commonly used mode of public transportation in the country. During 2022-23, it carried 6,396 million passengers as against 3,519 million in 2021-22. Passenger kilometres, which is calculated by multiplying the number of journeys by mean kilometric distance in case of each class was 959 billion as against 590 billion in the previous year. Passenger earnings increased by ₹24,202.45 crore (61.71%) in comparison with 2021-22.

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

Table I. Number of Passengers Originating

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
2020-21	917	49	224	60	284	333	1,250
2021-22	2,169	152	884	314	1,198	1,350	3,519
2022-23	3,792	268	1,695	640	2,336	2,604	6,396
# Also includes Sleeper Class.							

Also includes Sleeper Class.

Table II. Passenger Kilometres

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	1,18,120
1980-81	41,086	5,140	86,712	75,620	1,62,332	1,67,472	2,08,558
1990-91	59,578	8,712	1,38,054	89,300	2,27,354	2,36,066	2,95,644
2000-01	88,872	26,315	2,22,568	1,19,267	3,41,835	3,68,150	4,57,022
2010-11	1,37,127	62,203	5,00,631	2,78,547	7,79,178	8,41,381	9,78,508
2020-21	30,075	42,685	1,53,910	4,456	1,58,366	2,01,051	2,31,126
2021-22	69,798	1,17,568	3,84,496	18,355	4,02,851	5,20,419	5,90,217
2022-23	1,14,350	2,03,298	6,03,982	37,289	6,41,271	8,44,569	9,58,919
# Also includes Sleeper Class.							

Also includes Sleeper Class.

Table III. Average Lead							(in Kms.)
Year	Suburban (All classes)	Non suburban				Total Non-suburban	Grand Total
		Upper class	Second Class		Total		
			Mail/Exp.#	Ordinary			
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
2020-21	32.8	876.3	687.0	73.8	556.8	603.5	184.8
2021-22	32.2	772.9	435.1	58.4	336.3	385.5	167.7
2022-23	30.0	757.7	356.3	58.2	274.6	324.3	149.9
#Also includes Sleeper Class.							

#Also includes Sleeper Class.

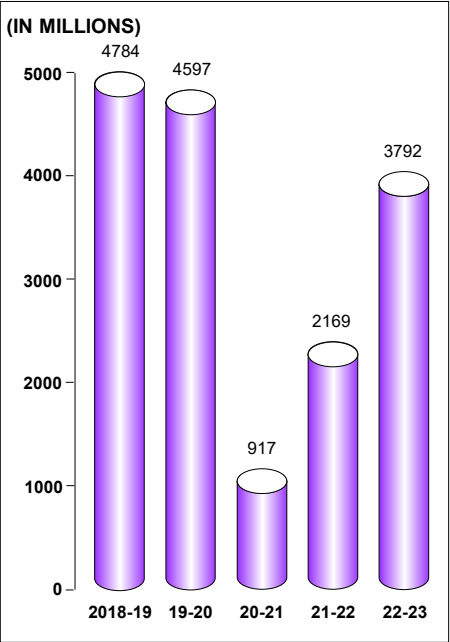
Table IV. Proportion to total traffic-No. of Passengers (Percentage)								
	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2021-22	2022-23
Non-Suburban:								
Second Class Ordinary	50.38	42.82	37.14	31.70	30.20	31.95	8.93	10.01
Second Class Mail/Express#	6.02	6.38	7.20	9.26	9.77	13.67	25.11	26.51
Upper Class	0.94	0.66	0.30	0.49	0.83	1.30	4.32	4.19
Total	57.34	49.86	44.64	41.45	40.80	46.92	38.37	40.71
Suburban(all classes)	42.66	50.14	55.36	58.55	59.20	53.08	61.63	59.29
Grand Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

#Also includes Sleeper Class.

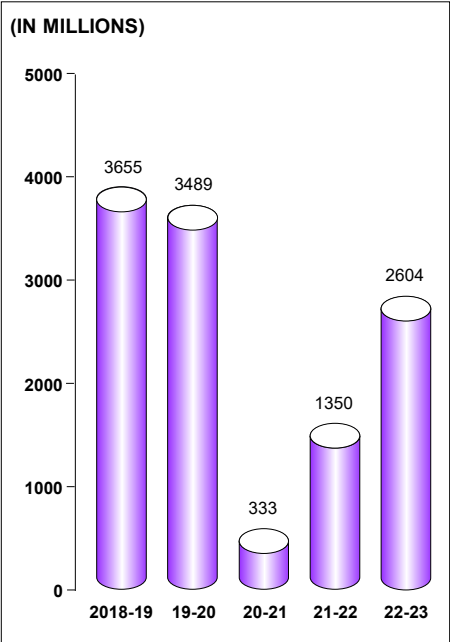
Table V. Proportion to total traffic – Passenger Kms. (Percentage)								
	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2021-22	2022-23
Non-Suburban:								
Second Class Ordinary	51.75	44.77	36.26	30.20	26.10	28.47	3.11	3.89
Second Class Mail/Express#	28.65	32.05	41.58	46.70	48.70	51.16	65.14	62.99
Upper Class	4.45	3.72	2.46	2.95	5.75	6.36	19.92	21.20
Total	84.85	80.54	80.30	79.85	80.55	85.99	88.17	88.08
Suburban(all classes)	15.15	19.46	19.70	20.15	19.45	14.01	11.83	11.92
Grand Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Also includes Sleeper Class.

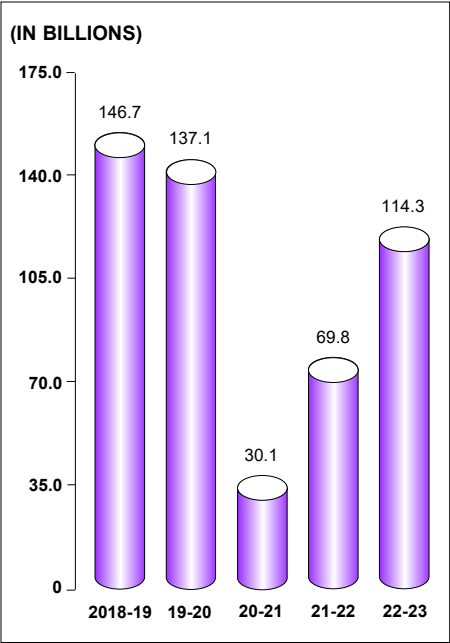
**PASSENGERS ORIGINATING
SUBURBAN**



**PASSENGERS ORIGINATING
NON-SUBURBAN**



**PASSENGER KILOMETRES
SUBURBAN**



**PASSENGER KILOMETRES
NON-SUBURBAN**

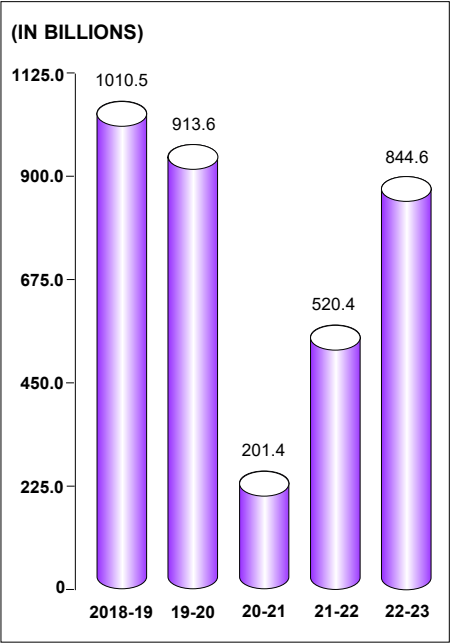


Table VI. Number of passenger trains run daily

Type of trains	Broad Gauge		Metre Gauge		Total (incl.NG)	
	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23
EMU	5,313	5,510	0	0	5,313	5,510
Mail/Express	2,999	4,036	0	0	2,999	4,036
Ordinary Passenger Trains and Mixed Trains	1,878	2,941	31	32	1,938	2,995
Total	10,190	12,485	31	32	10,250	12,541

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

Type of trains	Broad Gauge	
	2021-22	2022-23
EMU	39.1	37.42
Mail/Express	51.0	51.32
Ordinary Passenger Trains (incl. mixed)	37.7	37.40

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

Passenger Revenue :

Passenger earnings in 2022-23 were ₹63,416.85 crore. This was ₹24,202.45 crore (61.71%) higher than the earnings in 2021-22. Suburban traffic contributed 4.16% to the total earnings. The remaining 95.84% came from non-suburban passengers. Earnings from Second and Sleeper Class Mail/Express passengers comprised 46.47% of the total passenger earnings.

Passenger revenue in terms of earnings per passenger kilometre for different classes during 2021-22 and 2022-23 was as under:

Segment	(in paise)	
	2021-22	2022-23
Non-suburban:		
Upper class	148.20	151.23
Second Class-Mail/Express (incl. sleeper class)	52.07	48.79
Second Class-Ordinary	21.78	15.17
Non-suburban (all classes)	72.72	71.96
Suburban(all classes)	19.63	23.96
Overall average	66.44	66.13

Passenger revenue in different classes with corresponding number of passengers and Passenger Kms. in 2022-23 is given below:

Segment	No. of passengers		Passenger kms.		Revenue	
	Million	Percentage	Million	Percentage	₹ in cr.	Percentage
Non-suburban:						
Upper Class	268	4.19	2,03,298	21.20	30,744.60	48.48
Second Class Mail/Express#	1,695	26.51	6,03,982	62.90	29,467.41	46.47
Second Class Ordinary	641	10.01	37,289	3.89	556.69	0.89
Total	2,604	40.71	8,44,569	88.08	60,777.76	95.84
Suburban (all classes)	3,792	59.29	1,14,350	11.92	2,639.08	4.16
Grand Total	6,396	100.00	9,58,919	100.00	63,416.85	100.00
#Also includes Sleeper Class.						

Passenger Services:

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

Year	Suburban (EMU)		Non-suburban		Train kms. per running track km. per day	
	Train kms. (Million)	Vehicle kms. (Million)	Train kms. + (Million)	Vehicle kms.@ (Million)	Suburban (EMU)	Non-suburban +
1950-51	9.28	119.8	154	2,678	27.9	7.1
1960-61	14.05	196.8	190	3,594	28.7	8.2
1970-71	23.05	369.4	225	4,636	30.1	8.6
1980-81	35.55	601.5	258	5,582	36.6	9.7
1990-91	48.37	840.7	316	7,739	40.0	11.5
2000-01	56.04	1,029.5	397	11,035	47.1	13.8
2010-11	73.25	1,438.5	582	18,207	46.7	19.2
2020-21	37.90	880.0	207	7,178	20.1	5.9
2021-22	*71.04	1,731	*546	*18,459	*36.3	*15.3
2022-23	89.09	2,160	662	23,281	38.5	18.1
@ Includes Mainline EMUs, DEMUs, DHMUs and suburban services other than EMU but excluding Rail Cars/Bus and Departmental.						
+ Excludes Departmental but includes Rail Cars/Bus, MEMU, DEMU and DHMU services.						
* revised						

Passenger Service Improvements:

During the year 2022-23, Indian Railways introduced new trains, extended the runs and increased the frequency of existing trains, as given below:

	Trains introduced	Train Runs extended	Frequency of trains increased	Total
Non-suburban	145	147	30	322
Suburban	15	50	34	99
Total	160	197	64	421

(Trains in singles)

Ticketless Travel:

During 2022-23, 4.61 lakh checks were conducted against ticketless/irregular travel (including carriage of unbooked luggage). About 361.03 lakh cases of ticketless/irregular travel/ unbooked luggage were detected and ₹2,260.05 crore were realized on this account.

Customer Amenities:

The allocation under the Plan Head-53 “Customer Amenities” in 2022-23 was ₹2,700 crore (Budget Estimate) and the same was revised to ₹3,824 crore (Revised Estimate).

1,253 stations have so far been identified for development under the Adarsh Station Scheme, out of which 1,250 stations have already been developed.

During the Year 2022-23, 121 stations were provided with water coolers, 59 stations were electrified and 221 passenger lifts and 188 escalators were provided at stations.

Passenger Reservation System (PRS):

New Generation e-Ticketing System (NGeT):

The next Generation E-Ticketing (NGeT) system of IRCTC was commissioned in 2014 by CRIS, for facilitating seamless booking of reserved tickets online. The system has been continuously strengthened, which now has an upgraded capacity to book more than 28,000 tickets in a minute.

E-tickets can also be booked on IRCTC Rail connect Mobile Apps (Android & iOS platforms), which has been completely revamped in January 2021. On an average about 11.81 lakh tickets were booked daily in FY 2022-23 through IRCTC’s website, Mobile Apps and Authorized agents. More than 47% of online tickets were booked through IRCTC Rail connect Mobile App. The online ticket booking share is 80.96% of total served tickets.

IRCTC has a robust system of payment gateways with various payment options viz. Net Banking/credit & Debit card/Wallets/Bhim/UPI. Even foreign users can book tickets using international credit card.

Unreserved Ticketing through Mobile Phones:

Passengers can book unreserved tickets between any pair of stations over entire Indian Railways on Mobile-phones. Paperless tickets are generated on the Mobile Phone and are embedded with a QR code. Using this app, passengers can book Journey, Season or Platform tickets. Passenger can also book add-on Superfast surcharge ticket. Facility is also provided to scan station QR code & book paperless tickets (Journey/Platform) within station premises in the ticketing area. QR coded tickets are implemented at 3,106 stations over 15 Zonal Railways (including KRCL). An option of 'Next Trains' has also been provided in the UTS Mobile app, which displays train running in next 2 hours between selected pair of stations. Passenger can pay using e-Wallet (including R-Wallet), UPI, Credit Card, Debit Card, Net Banking.

Mobile UTS (M-UTS):

M-UTS is a portable ticketing solution for issuance of unreserved tickets. M-UTS devices (Android phone and Bluetooth printer) can easily be carried from one location to another. The battery on the phone and printer can last for 6 to 8 hours. The M-UTS application can work in either connected (GPRS or WiFi) or disconnected (i.e. offline) mode, synchronizing with the server when it senses a network.

Automatic Ticket vending Machines (ATVMs):

ATVMs are passenger operated ticket vending machines. These machines issue unreserved tickets and accept UPI payment as well as Smart Cards for payment. ATVMs provide features for issuance of journey and platform tickets, printing of Mobile paper tickets, renewal of season tickets, top-up of smart cards and check train availability within 2 hours between selected pair of stations. ATVMs also have the feature for fast booking of ticket for top 30 selling destinations in 2 clicks, thus queuing at the UTS counters at the stations, is reduced during the rush hours. Recently, booking of tickets & recharge of smart card is also enabled in ATVMS through Paytm & Free charge dynamic UPI QR code where passenger can scan QR code through any UPI enabled payment app & make payment.

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. 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 (SRUCCs), National Railway Users' Consultative Council (NRUCC) and Station Consultative Committees (SCCs) provide useful inputs to Railway Administration.

DRUCCs have been reconstituted for a two year term from 01.01.2022 to 31.12.2023. ZRUCCs, KRUCC & MRUCC have been reconstituted for a two year term from 01.02.2023 to 31.01.2025. NRUCC has been reconstituted for a two year term from 01-04-2022 to 31-03-2024. SRUCCs & SCCs are constituted by zonal Railways themselves.

1. Induction of semi-high speed Vande Bharat (Train-sets):

Integral Coach Factory/Chennai indigenously manufactured India's first Semi High Speed Self Propelled (Train-set) Vande Bharat trains in 2018-19. 2 Vande Bharat services were introduced between New Delhi -Varanasi and New Delhi - Shri Mata Vaishno Devi Katra in 2019-20.

These trains had many features as per global standards like quick acceleration, maximum speed of 160kmph, on board infotainment & GPS based passenger information system, automatic sliding doors, retractable footsteps and Zero discharge vacuum bio toilets etc.

A new and improved version of Vande Bharat trains with enhanced safety features, better ride index and passenger amenities were manufactured and introduced in 2022-23. As on 31.03.2023, 8 trains of the new version were running between Mumbai Central-Gandhi Nagar Capital, New Delhi-Amb Andaura, Chennai-Mysore, Bilaspur-Nagpur, Howrah Jn-New Jalpaiguri and Secundrabad-Vishakhapatnam, Mumbai Central-Sainagar Shirdi, and Mumbai Central-Solapur,

Further, Manufacturing of 744 Vande Bharat coaches is planned in Production Plan 2023-24.

2. Vistadome coaches:

Vistadome coaches provide panoramic view, through wider body side windows as well as through transparent sections in the roof, thus enabling the passengers to enjoy the scenic beauty of the places through which they travel. Total 88 Vistadome coaches are available over various sections of Indian Railways.

7 LHB type BG Vistadome in 2020-21, 15 in 2021-2022 and 17 in 2022-23 (till 31st March 2023) have been manufactured by ICF/Chennai. Further, Manufacturing of 54 Vistadome coach is included in Production Plan 2023-24.

3. CCTV cameras equipped with video analytics:

Provision of CCTV cameras in train coaches has been one of the priority items. Hon'ble MR under Para 31 of the Budget speech 2015-16 had also announced fitment of CCTV on pilot basis and IR has further planned for proliferation of CCTVs in its coaches. CCTV cameras have been fitted in more than 6,900 coaches so far,

4. Complete switchover to LHB:

Ministry of Railways has decided for large scale proliferation of LHB coaches which are technologically superior with features like Anti climbing arrangement, Air suspension (Secondary) with failure indication system and less corrosive shell, These coaches have better riding and aesthetics as compared to the conventional ICF coaches. The Production units of Indian Railways are producing only LHB coaches from April 2018 onwards. The production of LHB coaches are continually increased during the years and more than 34,400 LHB coaches has been turned out till 31st March 2023, (5,133 LHB coaches have been turnout in 2022-23).

1,060 no. of ICF Rakes (total 742 pair of trains) have been replaced with LHB coaches rakes. Around 1,228 rakes are running with LHB coaches.

The manufacturing of LHB coaches has increased from 2,209 coaches in year 2006-10 to 31,956 coaches in year 2014-23. Further, it is planned to manufacture 4,992 LHB coaches in Year 2023-24.

5. Smart Coaches:

In view of the latest development in rolling stock technology, its maintenance and increased level of passengers comfort. Indian railways has introduced around 100 Smart coaches with ultra modern features like Smart Public address and passenger information system, Smart HVAC (Heating, Ventilation and Air Conditioning system), Smart security and surveillance system etc. in train service.

6. Introduction of NMGH/ NMGHS coaches:

- a. There has been increase in demand of Automobile Carrying vehicles over Indian Railways. Accordingly, to capture traffic of automobile movement, there has been increased emphasis for manufacturing of NMG coaches from conversion of existing ICF coaches which are being phased out from train operation gradually.
- b. While NMG coaches have speed potential of 75 kmph, NMGH coaches were introduced with higher speed potential of 110 kmph which shall create more line capacity.

- c. Subsequently, NMGHS coaches with speed potential of 110 kmph and provision of side entry have been introduced.
- d. ICF coaches is planned to convert into 250 NMGH / 1750 NMGHS coaches. Consequently, 250 NMGH / 635 NMGHS coaches have been converted (as on 31.03.2023).

Further, work in around 1,115 NMGHS coaches (Automobile Carrying vehicles) is in progress.

7. Any other initiatives:

- a. Quick watering facilities are being provided for quick watering in trains within stipulated halt of the train. These facilities are essential to ensure availability of adequate water in coaches throughout the journey. At present nearly 156 locations have been identified for provision of this facility, out of which these systems are installed and functional at 110 locations. Work has been completed in 16 locations in 2022-23.
- b. Automatic Coach Washing Plants have been installed over Zonal Railways to clean exterior of coaches more effectively and efficiently. In addition to excellent cleaning the direct water consumption also gets reduced avoiding wastage and recycling the water through water recycling plant integrated with this plant. 139 locations have been identified for provision of ACWP. Instructions have already been issued to General Managers of Zonal Railways to provide automatic coach washing plants in all coaching depots. Now, Automatic Coach Washing Plants are available at 65 locations. Work has been completed in 16 locations in 2022-23.

8. Hydrogen For Heritage:

In a move to fulfill the Government's commitment to achieving zero carbon footprints by 2030, IR has planned to develop hydrogen fuel cell based trains in IR network. Accordingly, Northern Railway has awarded a contract for conversion of diesel power mode to Hydrogen Fuel as retro fitment of one DEMU rake on Sonipat-Jind section.

The retro fitment of diesel-powered DEMU and converting it into a hydrogen-fuel powered train set will not only save the expenditure but also save the carbon footprint and particulate matter. Field trial for this Hydrogen Fuel Based Train is expected to commence in 2023-24.

9. Production of Vande Metro:

Indian Railways have decided to introduce Vande Metro trains for Mainline as well as suburban system. These trains will have State-of-the-art IGBT based 3-phase propulsion system, air conditioning, automatic doors,

PA/PIS, Emergency Talk back system and CCTVs etc. in Budget 2023-24, provision of 3,600 coaches of Vande Metro has been made.

10. Bio Toilets in coaches:

As a part of “Swachh Bharat Mission” Indian Railway has completed the work of fitment/installation of Bio Toilets in all its coaches online. This has ensured that no human waste is discharged from coaches on track. With this effort, dumping of nearly 2,74,000 litres per day of wastewater and 3,980 tons per day of excreta on tracks is avoided.

The provision of Bio-toilets in coaches have been increased from 3,647 coaches in year 2006-2014 to 80,478 coaches in year 2014-2023. Further, all newly manufacture coaches, turning out of Production Units, are being provided with bio-toilets. With this effort, all coaches running on line are having provision of bio-toilets.

11. Focus on improving safety in new manufacture coaches:

Indian Railways is taking following steps to further strengthen the safety and reliability of railway passengers during manufacturing at Production Units

I. Fire detection and Suppression system in Pantry cars and Power cars:

Power Cars are more prone to fire due to presence of Diesel Alternator sets along with fuel tanks and other high voltage equipment. Pantry Cars are also more prone to fire due to cooking being carried out in these coaches. In this respect, Automatic Fire detection and suppression systems are being provided in Power cars and Pantry cars.

Instructions have already been issued to Production Units in April 2017 that all newly manufactured Power Cars and Pantry Cars are provided with Fire detection and Suppression system.

1,775 Power Cars and 806 Pantry Cars Coaches have been provided with Fire Detection and Suppression System upto 2022-23.

II. Fire and Smoke detection system in all newly manufactured AC coaches:

With a view to improve fire safety in running trains, Automatic Fire and Smoke Detection System are being provided in AC coaches. The specifications for Automatic Fire and Smoke Detection System have been upgraded integrating the air brake system in the coaches with Fire and Smoke detection system.

10,844 AC coaches have been provided with Fire and Smoke Detection

System upto 2022-23. Instructions have already been issued to Production Units in June 2017 that all newly manufactured AC coaches be provided with Automatic Fire and Smoke Detection System.

III. Provision of Fire Extinguishers in Non AC coaches:

Dry chemical powder type fire extinguishers are provided in all Air-conditioned coaches, Second class- cum-guard and luggage van and Pantry cars. 34,705 Non-AC coaches are being provided with Dry chemical powder type fire extinguishers. Further, Instructions issued to Production Units to provide fire extinguishers in all newly manufactured non-AC coaches as well.

IV. Improving Fire Retardancy in Coaches:

Coaches are being provided with fire retardant furnishing materials such as Fire retardant curtains, partition paneling, roof ceiling, flooring, seat and berths along with cushioning material and seat covers, Windows and UIC Vestibules etc. The specifications of these items are being upgraded from time to time as a part of continual improvement. In the specification of major furnishing items, now anew parameter related to fire retardancy (i.e. heat release rate) has been introduced as per international norms.

12. Further Measure taken to strengthen the safety and reliability of Railway coaches:

Indian Railways had taken following steps to further strengthen the safety and reliability of Railway coaches

I. Progressive use of Air Springs:

For enhancing safety and reliability of passenger coaches, the suspension systems are being redesigned with air springs at secondary stage capable to maintain constant height at variable loads. Air springs have been developed and are being fitted on all the newly built EMUs & DMUs coaches for sub-urban trains. Air springs have now been developed for mainline coaches as well and have been fitted in large scale in newly manufactured coaches. Production Units have been advised to use Air springs in all newly manufactured LHB coaches.

II. Provision of Automatic door closure mechanism in coaches:

Provision of Automatic door closure mechanism has been planned on coaches to prevent accidental falling of passengers from running trains. Select variants of the main line coaches will be provided with Automatic door closure mechanism.

Automatic door closure mechanism has also been provided in the coaches of Vande Bharat Trains, TEJAS sleeper RAJDHANI, TEJAS Chair

car and Humsafer coaches.

14 air-conditioned EMU (Electric Multiple Unit) rake with Automatic doors has been manufactured at Integral Coach Factory, Chennai for Mumbai, Western Railway. Integral Coach Factory/Chennai has also turned out coaches for Kolkata Metro with Automatic door closure mechanism.

Further, instruction have been issued to Production Unit's to turn out all future Humsafar and Uday train coaches with Automatic Plug type doors (4 nos. per coach).

III. Provision of Double Acting doors in coaches:-

Double Acting door in coaches are two way swing AC compartment doors for easy evacuation of passengers. Such doors need to be provided in AT coaches so as to improve the fire worthiness and enable passengers to quickly evacuate from the coach in the event of fire.

Cleanliness on Trains:

1. Mechanised cleaning of coaches at both ends is being carried out through professional agencies in around 198 coaching depots. Machines like high pressure jet cleaners, floor scrubbers, wet and dry vacuum cleaners, hand held buffing etc. are deployed for the purpose.
2. On Board House Keeping Service (OBHS) has been provided in more 1,200 pairs of important long distance Mail/Express trains for cleaning of coach toilets, doorways, aisles & passenger compartments during the run of the trains.
3. 'Clean Train Station' (CTS) scheme has been prescribed for limited mechanized cleaning at 38 station.
4. Standard bid document (SBD) and General Condition of Contract for Services (GCCS) have been issued with enabling provision to improve handling and effectiveness of cleaning contracts.
5. 720 major station have been obtained consent to operate from concerned State Pollution Control Board.
6. 476 Goods Sheds, 42 Railway Owned Siding and 761 Private Siding have obtained consent to operate from concerned State Pollution Control Boards till March'2023.
7. Around 37 station have achieved Green Certification from CII till March'2023.

Catering Services:

Catering services are provided to the travelling passengers in trains and at stations. Catering Policy-2017 mandates the service of meals in trains

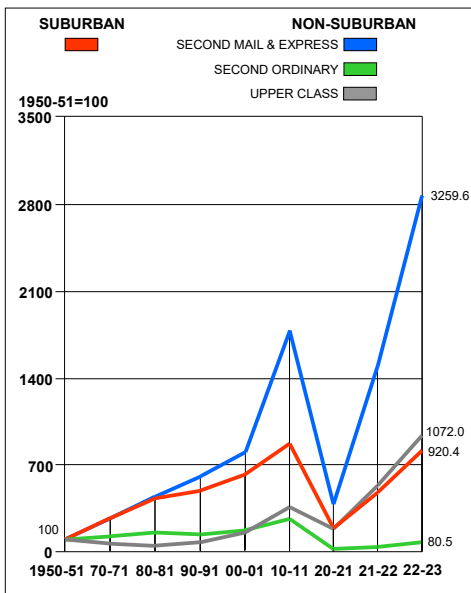
from the Base Kitchens owned, operated and managed by IRCTC. Catering services to the travelling passengers are provided through Pantry Cars (540 pairs of trains), Train Side Vending (728 pairs of trains) and Static Units at en-route stations. In addition, passengers travelling in trains may avail food of their choice through e-Catering services which are available at 368 stations with an average of 44,869 meals per day, Static Catering Units include 561 Major Static Units (Food Plaza, Fast Food Units, Jan Ahaar, Cell Kitchens, Base Kitchens, Refreshment Rooms and Automatic Vending Machines) and 9,318 Minor Static Units (all stalls, trolleys) on Indian Railways. In addition, there are 632 Water Vending Machines, 1201 Multi Purpose Stalls, 60 Bookstalls, 34 Miscellaneous/Curio Stalls and 03 exclusive Chemist Stalls 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 initiatives have been undertaken during 2022-23, which are as under:

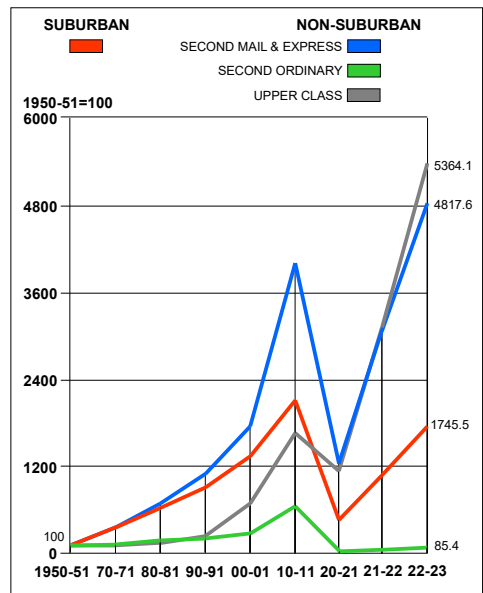
- Upgradation of Base Kitchen/Kitchen Units undertaken.
- CCTV Cameras have been installed in upgraded Base Kitchens /Kitchen Units for better monitoring of food preparation right at the source. Real time monitoring of the base kitchens through Artificial Intelligence and sharing of live streaming.
- Deployment of on board IRCTC supervisors on trains.
- QR codes have been introduced on food packets enabling display of details like name of kitchen, date of packaging, expiry date etc.
- Segregation of veg and non-veg food by means of stickers on food packets.
- Mandatory facility of cashless transaction, issue of printed bills and invoice reflecting all details of transactions undertaken at catering units.
- Awareness Campaigns launched:
 - MRP on all products - “No MRP, the licence get cancelled”
 - No Bill - The food is for FREE.
 - ‘No Tips’ is stitched/displayed on the uniforms of service providers.
- Third Party Audit is done to examine hygiene and cleanliness in Pantry Cars and Kitchen Units. Customer satisfaction survey is also conducted.
- To ensure compliance of Food Safety Norms, Food Safety and Standards Authority of India (FSSAI), certification from Designated Food Safety Officers of each catering unit has been made mandatory.

- Food Safety Supervisors have been deployed at Kitchen Units to monitor food safety and hygienic practices.
- Regular and surprise inspections are conducted by Railway/ IRCTC officials including Food Safety Officers.
- Further, as a measure to improve catering services on trains, IRCTC has been given flexibility to customise the menu within the same tariff so as to introduce the items of regional cuisines/preferences, seasonal delicacies, requirement during festivals, food items as per the preferences of different group of passengers such as diabetic food, baby food, health food options including millet based local products, etc
- There is also a robust mechanism in place for receiving passenger feedback, complaints through Rail Madad, Twitter handle @IR CATERING, CPGRAMS, E-Mails and SMS.

INDEX OF GROWTH OF ORIGINATING PASSENGERS



INDEX OF GROWTH OF PASSENGER KILOMETRES



Freight Operation

Revenue earning freight traffic handled during 2022-23 was 1,509.10 million tonnes. NTKMs earned during the year were 960 billion. Total loading and freight output inclusive of non-revenue traffic were 1,510.76 million tonnes and 960 billion NTKMs respectively. Commodity wise loading of revenue earning traffic was as follows.

Commodity Group	Tonnes carried* (Millions)		Absolute Variation over last year	Percentage to total
	2021-22	2022-23		
Coal				
i) for steel plants	56.70	59.23	2.53	3.92
ii) for washeries	0.07	0.01	-0.06	0.00
iii) for thermal power houses	485.23	568.62	83.59	37.68
iv) for other public users	110.80	99.38	-11.62	6.59
Total	652.80	727.24	74.44	48.19
Raw material for steel plants except iron ore	29.03	28.15	-0.88	1.87
Pig iron and finished steel				
i) from steel plants	36.15	33.70	-2.45	2.23
ii) from other points	32.35	36.17	3.82	2.40
Total	68.50	69.87	1.37	4.63
Iron ore				
i) for export	7.66	7.19	-0.47	0.48
ii) for steel plants	91.46	87.88	-3.58	5.82
iii) for other domestic users	69.24	65.07	-4.17	4.31
Total	168.36	160.14	-8.22	10.61
Cement	137.19	143.93	6.74	9.54
Foodgrains	73.38	70.92	-2.46	4.70
Fertilizers	49.18	56.34	7.16	3.73
Mineral Oil (POL)	44.46	48.22	3.76	3.20
Container service				
i) Domestic containers	17.64	19.83	2.19	1.31
ii) EXIM containers	56.62	59.39	2.77	3.94
Total	74.26	79.22	4.96	5.25
Balance other goods	118.71	125.07	6.36	8.29
Total	1,415.87	1,509.10	93.23	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		100.00	513	100.00
			37,565			
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
2010-11	921.73	1,259.20	625,723	1,665.71	679	132.4
2020-21	1,230.94	1,681.61	7,19,762	1,916.04	585	114.04
2021-22	1,415.87	1,934.25	8,71,816	2,320.82	616	120.08
2022-23	1,509.10	2,061.61	9,59,566	2,554.42	636	123.98

II. Movement of bulk commodities in the last four years:

S. No.	Commodity group	2019-20		2020-21		2021-22		2022-23	
		Million Tonnes	Percent- age	Million Tonnes	Percent- age	Million Tonnes	Percent- age	Million Tonnes	Percent- age
1	Coal	586.87	48.56	541.82	44.02	652.81	46.11	727.24	48.19
2	Foodgrains	37.53	3.10	62.82	5.10	73.38	5.18	70.92	4.70
3	Iron & Steel	53.13	4.40	60.06	4.88	68.50	4.84	69.87	4.63
4	Iron ore	153.37	12.69	159.13	12.93	168.36	11.89	160.14	10.61
5	Cement	110.10	9.11	120.40	9.78	137.19	9.69	143.93	9.54
6	POL (Mineral oils)	44.68	3.70	42.48	3.45	44.46	3.14	48.22	3.20
7	Fertilizers (Chemical manures)	51.39	4.25	53.79	4.37	49.18	3.47	56.34	3.73
8	Limestone and Dolomite	30.63	2.54	30.84	2.51	36.47	2.58	36.09	2.39
9	Stones (including gypsum) other than marble	18.24	1.51	27.30	2.22	24.20	1.71	28.53	1.89
10	Salt	4.30	0.36	5.88	0.48	8.03	0.57	8.84	0.59
11	Sugar	2.89	0.24	3.81	0.31	5.88	0.42	5.81	0.39
	Total	1,093.13	90.46	1,108.33	90.04	1,268.45	89.60	1355.93	89.85
12	Commodities other than above	115.28	9.54	122.61	9.96	147.42	10.40	153.17	10.15
	Grand Total	1,208.41	100.00	1,230.94	100.00	1,415.87	100.00	1509.10	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
2020-21	418	11.6	19,020	62.4
2021-22	481	12.8	*22,112	63.6
2022-23	554	14.25	25,459	63.2

*revised

IV. Tonnes Originating, Net Tonne Kms. and Earnings from bulk commodities in 2022-23

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	Total Coal	727.24	48.09	4,04,138	42.12	80,746.75	50.42
2	Food Grains	70.92	4.70	83,756	8.73	10,038.31	6.27
3	Iron & steel	69.87	4.63	66,495	6.93	10,529.33	6.57
4	Iron ore	160.14	10.61	57,979	6.04	12,314.07	7.69
5	Cement	143.93	9.54	86,009	8.96	12,196.83	7.62
6	Mineral oils	48.22	3.20	33,690	3.51	6,305.05	3.94
7	Chemical Manures	56.34	3.73	49,832	5.19	6,629.45	4.14
8	Limestone & Dolomite	36.09	2.39	20,297	2.12	3,257.37	2.03
9	Stones other than Marble & Gypsum	22.08	1.46	8,200	0.85	2,302.99	1.44
10	Salt	8.84	0.59	13,182	1.37	1,170.79	0.73
11	Sugar	5.81	0.39	9,163	0.95	974.04	0.61
	Total	1,349.48	89.33	8,32,741	86.77	1,46,464.96	91.45
12	Commodities other than above	159.62	10.67	1,26,825	13.23	13,693.53	8.55
	Grand Total	1,509.10	100.00	9,59,566	100.00	1,60,158.48	100.00

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

			2019-20	2020-21	2021-22	2022-23
Net tonne kilometres per wagon per day@	BG		7,057	6,861	*8,363	8,670
Wagon kilometers per wagon per day@	BG		188.7	181.5	*211.0	223.0
Net tonne kilometres per engine hour	Diesel	BG	11241	10,764	*10,561	9,969
	Electric	BG	16548	15,382	*15,869	15,484
Net tonne kilometres per engine day on line	Diesel	BG	2,40,027	4,92,526	2,61,932	2,54,603
	Electric	BG	2,93,461	3,67,735	3,81,507	7,38,358

*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 2022-23

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	7,27,237	48.19	80,746.75	50.42	4,04,138	42.12
2	Iron Ore	1,60,136	10.61	12,314.08	7.69	57,979	6.04
3	Cement	1,43,930	9.54	12,196.83	7.62	86,009	8.96
4	Food Grains	70,922	4.70	10,038.31	6.27	83,756	8.73
5	Iron & Steel	69,868	4.63	10,529.33	6.57	66,495	6.93
6	Total Exim Container	59,394	3.94	4,666.98	2.91	46,369	4.83
7	Chemical Manures	56,340	3.73	6,629.45	4.14	49,832	5.19
8	Mineral Oils	48,219	3.20	6,305.06	3.94	33,690	3.51
9	Limestone & Dolomite	36,090	2.39	3,257.37	2.03	20,298	2.12
10	Stone Other Than Marble And Gypsum	22,079	1.46	1,562.55	0.98	8,200	0.85
11	Rmc Carried In General Service Wagons	21,810	1.45	1,327.13	0.83	6,562	0.68
12	Total Domestic Container	19,827	1.31	2,414.99	1.51	26,082	2.72
13	Jute Manufactured	11,089	0.73	626.38	0.39	7,245	0.76
14	Ores Other Than Manganese And Iron	9,125	0.60	956.03	0.60	2,778	0.29
15	Salt	8,839	0.59	1,170.79	0.73	13,182	1.37
16	Non-Ferrous Metal	7,574	0.50	855.56	0.53	4,428	0.46
17	Gypsum	6,446	0.43	740.45	0.46	4,657	0.49

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
18	Sugar	5,813	0.39	974.04	0.61	9,163	0.95
19	Provisions	4,221	0.28	509.46	0.32	4,139	0.43
20	Lime	2,727	0.18	499.00	0.31	3,490	0.36
21	Cement Manufactured	2,646	0.18	191.20	0.12	1,413	0.15
22	Manganese Ores	1,549	0.10	160.15	0.10	933	0.10
23	Fruits & Vegetable Fresh	1,396	0.09	176.13	0.11	2,508	0.26
24	Sand	1,328	0.09	151.22	0.09	1,192	0.12
25	Edible Oils	1,281	0.08	157.52	0.10	1,984	0.21
26	Caustic Soda	839	0.06	97.15	0.06	670	0.07
27	Wood Unwrought (Other Than Firewood)	369	0.02	27.22	0.02	291	0.03
28	Opium & Other Narcotic Drugs	363	0.02	97.01	0.06	928	0.10
29	China Clay	347	0.02	42.65	0.03	355	0.04
30	Fodder Oil Cake	239	0.02	50.51	0.03	494	0.05

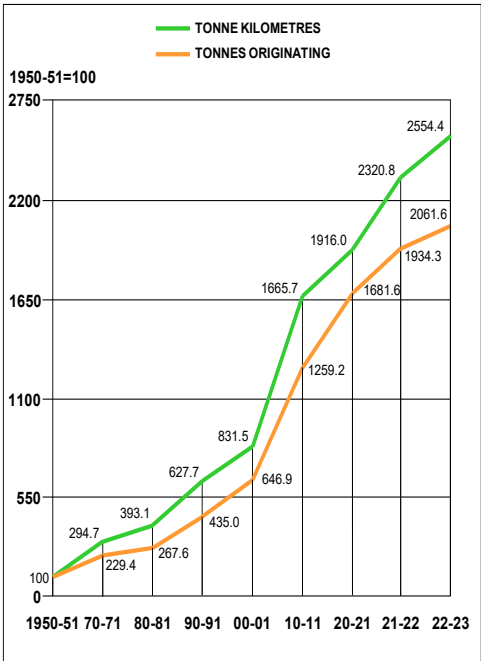
Freight Structure:

There was no increase in freight in 2022-23. However, various initiatives were implemented during this period which includes Liberalised Automatic Freight Rebate Scheme for traffic loaded in traditional empty flow direction, Short lead concession, Roll-on-Roll-off (RO-RO) service notified as a commodity in the Goods Traffic, Premium Indent Scheme, discount for transportation of fly ash, Round Trip Tariff policy, Roundtrip based charging for ultra short lead (<50 Km) Container traffic, reintroduction of Busy Season Charge w.e.f. 01.10.2022, mapping of goods tariff commodities with Harmonized System of Nomenclature (HSN) codes, Online goods balance sheet & electronic cash remittance note (e-CR Note) implemented from 01.03.2023 etc.

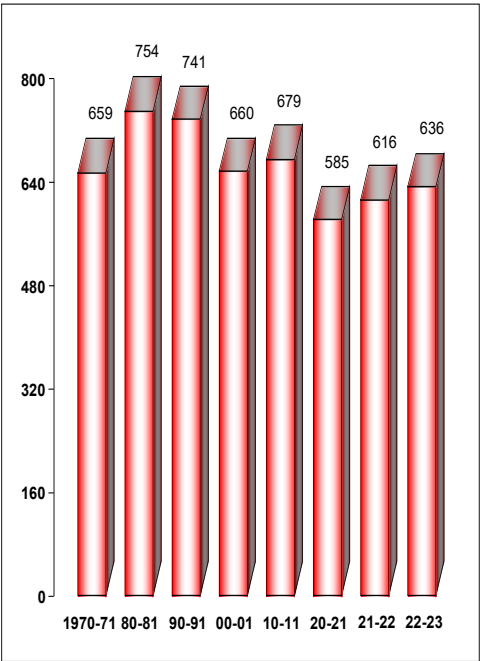
Freight Marketing:

- Gati Shakti Multi Modal Cargo Terminal (GCT):** Indian Railways has launched a new 'Gati Shakti Multi Modal Cargo Terminal (GCT)' policy on 15.12.2021. The objective of the policy is to boost investment from industry in development of additional terminals for handling rail cargo. These terminals will be constructed on non Railway land, as well as partially or fully on Railway land. All new upcoming terminals shall be commissioned as GCT.

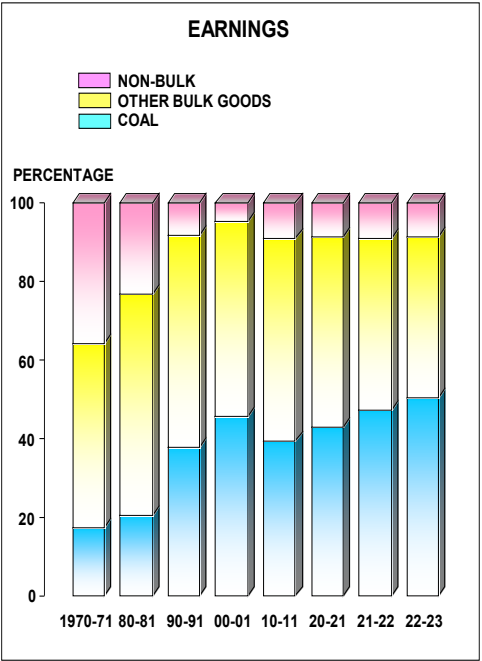
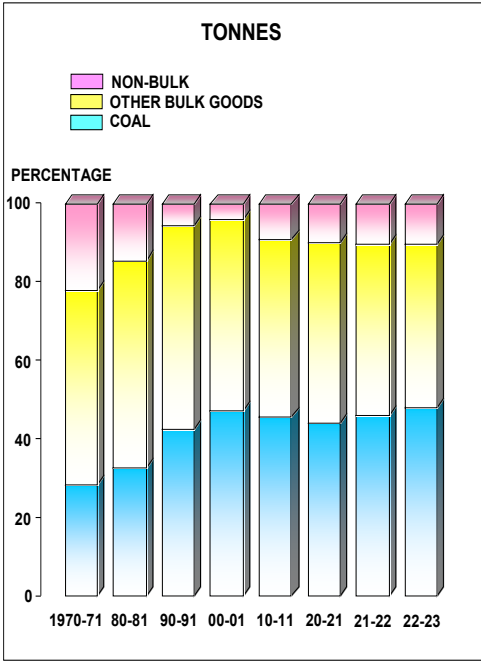
INDEX OF GROWTH OF FREIGHT (REVENUE TRAFFIC)



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



SHARE OF BULK COMMODITIES IN FREIGHT TRAFFIC



2. Joint Parcel Product – ‘JPP’ of India Post & Indian Railways:

As per the announcement made under the Gati Shakti segment of the Budget speech of Hon’ble Finance Minister, on 01.02.2022, Indian Railways have been mandated to ‘take the lead in integration of Postal and Railway networks to provide seamless solutions for movement of parcels’.

In conformance, a ‘Joint Parcel Product – JPP’ has been developed in collaboration with the India Post, wherein first-mile and last-mile connectivity is provided by the Department of Posts, and the middle-mile i.e. intermediate connectivity from station-to-station by Indian Railways. The ‘JPP’ aims to target business-to-business and business-to-customer market by providing complete parcel handling solution, i.e. picking up from the premises of the sender, booking and door-step delivery to the recipient.

Time-tabled JPP trains (in full rakes) were introduced w.e.f. 15.02.2023 on Indian Railways network, on identified routes. Presently, JPP trains are running, on 13 identified routes (on round trip basis), in collaboration with India Post.

3. e-Auction for Commercial Earning & Non-fare Revenue

contracts: The e-Auction policy for Commercial Earning & ‘Non-fare Revenue’ contracts has been issued on pan India basis on 13.06.2022. It covers contracts pertaining to parcel space in Brakevans/Parcel Vans attached to passenger-carrying trains, parking lots, pay-&-use toilets, cloak room, AC waiting hall, bottle crusher, space for commercial publicity, branding of stations, etc. Under the Policy, bidding is done through Railways E-Procurement System (IREPS).

The e-Auction process helps in (i) substantially reducing the time taken in finalization of tenders and in preventing revenue loss on this account, (ii) quick re-award of contract in case of failure of any contractor, and (iii) breaking the cartel among bidders. Besides, there is no geographical restriction on firms for registration/participation in any e-Auction throughout Indian Railways, which will increase competition among bidders.

4. Procurement of rakes for freight traffic by inviting private investments:

- i. General Purpose Wagon Investment Scheme (GPWIS) –** To allow investment for procurement of General Purpose Wagons by End users, Public Sector Undertaking (PSUs), Port Owner, Logistics Providers and Mines Owners. The scheme permits eligible investors to invest in minimum of one rake of general purpose wagon in any of the desired circuit(s) to carry any commodity in these rakes.

ii. Liberalized Special Freight Train Operators (LSFTO)

Scheme: Liberalized Special Freight Train Operators (LSFTO) Scheme has been started in the year 2020 by amalgamating erstwhile two schemes viz. Liberalized Wagon Investment Scheme (LWIS) and Special Freight Train Operator (SFTO) Scheme. The objective of the policy is to increase Railways share in transportation of non conventional traffic in high capacity and special purpose wagons to increase the commodity base of Rail Traffic. This policy provides an opportunity to logistics service providers or manufacturer to invest in wagons and use advantages of rail transport of selected commodity to create a win-win situation for railways and themselves.

In order to facilitate induction of wagons to transport trucks under Roll-on-Roll-off (RO-RO) concept, in the year 2022 'Roll-on-Roll-Off' (RO-RO) services' has been included in the list of commodities under LSFTO policy.

iii. Automobiles Freight Train Operator (AFTO) Scheme:

Automobile Freight Train Operator Scheme permits procurement and operation of special purpose rakes by private parties for transportation of automobiles sector.

iv. Wagon Leasing Scheme (WLS): The Scheme introduced the concept of leasing of railway wagons on Indian Railways. The scheme aims at induction of rakes of general purpose wagons, special purpose wagons and wagons for containers movements through PPP route. Wagon Leasing Companies can lease wagon under Automobiles Freight Train Operator (AFTO) scheme, General Purpose Wagon Investment Scheme (GPWIS), Liberalized Special Freight Train Operators (LSFTO) scheme, Automobiles Freight Train Operator (AFTO) scheme and also to Container Train Operators.

Claims:

IR paid ₹11.44 crore as claim compensation for goods/parcel/luggage during the Financial Year 2022-23 as compared to ₹28.63 crore 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 crore)
2018-19	5,799	873	46.38
2019-20	5,640	1,196	19.13
2020-21	3,845	266	84.01
2021-22	3,401	194	28.63
2022-23	3,584	104	11.44

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	-
2020-21	-	420	526	-	-	-
2021-22	-	484	*492	-	-	-
2022-23	-	345	389	-	-	-
*revised						

(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	-
2020-21	-	493	678	30	7	-
2021-22	-	703	*760	28	*167	-
2022-23	-	577	829	29	220	-
*revised						

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
2020-21	2,713	32
2021-22*	3,710	124
2022-23	3,873	243

*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.

Year	(Millions)					
	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
2020-21	11.18	-	3.59	0.07	23.17	0.02
2021-22	13.40	-	9.06	0.06	*33.68	0.10
2022-23	14.55	-	14.53	0.24	38.29	0.25

*revised

Year	(Millions)					
	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
2020-21	7.40	-	2.37	0.07	15.34	0.02
2021-22	8.73	-	5.90	0.06	*21.94	*0.11
2022-23	9.24	-	9.23	0.25	24.31	0.25

*revised

D. Coach Utilisation:

In 2022-23 the vehicle Kms. per vehicle day was 470 on BG and 28 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
2020-21	185	3
2021-22*	415	24
2022-23	470	28

*revised

E. Average freight train load:

The average net load per train in 2022-23 was 1,735 tonnes on BG. The average gross load per train was 3,007 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
2020-21	1,738	-	2,925	-
2021-22	1,817	-	*3,071	-
2022-23	1,735	-	3,007	-

*revised

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

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

Year	Broad Gauge		Metre Gauge All	
	Diesel	Electric	All traction	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
2020-21	40.6	45.8	43.2	-
2021-22	36.5	38.1	37.8	-
2022-23	31.1	30.1	30.3	-

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

During 2022-23, NTKMs per engine hour stood at 13,899 for BG. NTKMs per goods train hour for BG was 52,815.

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
2020-21	13,693	-	74,021	-
2021-22	*14,189	-	*75,494	-
2022-23	13,899	-	52,815	-

*revised

H. Wagon Utilisation:

On an average, a wagon moved 223 Kms. per day on BG in 2022-23. NTKms. per wagon per day on BG was 8,670. NTKms. per annum per tonne of wagon capacity on BG was 42,643. These indices of wagon utilization are given below:

Year	(in terms of 4-wheelers)					
	Net tonne kms. per tonne of wagon capacity per annum		Wagon kms. per wagon per day		Net tonne kms. per wagon per day	
	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.
1950-51	11,833	9,021	62.3	50.2	710	304
1960-61	16,558	10,125	76.9	51.6	998	405
1970-71	15,117	12,583	73.4	58.4	908	524
1980-81	16,285	11,013	73.4	47.3	986	522
1990-91	23,418	18,629	110.5	69.7	1,407	810
2000-01	33,289	7,981	179.0	43.8	2,042	394
2010-11 +	57,953	7,300	262.1	31.6	9,247	663
2020-21	40,216	-	170.1	-	6,861	-
2021-22	40,555	-	*211.0	-	*8,363	-
2022-23	42,643	-	223.0	-	8,670	-

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

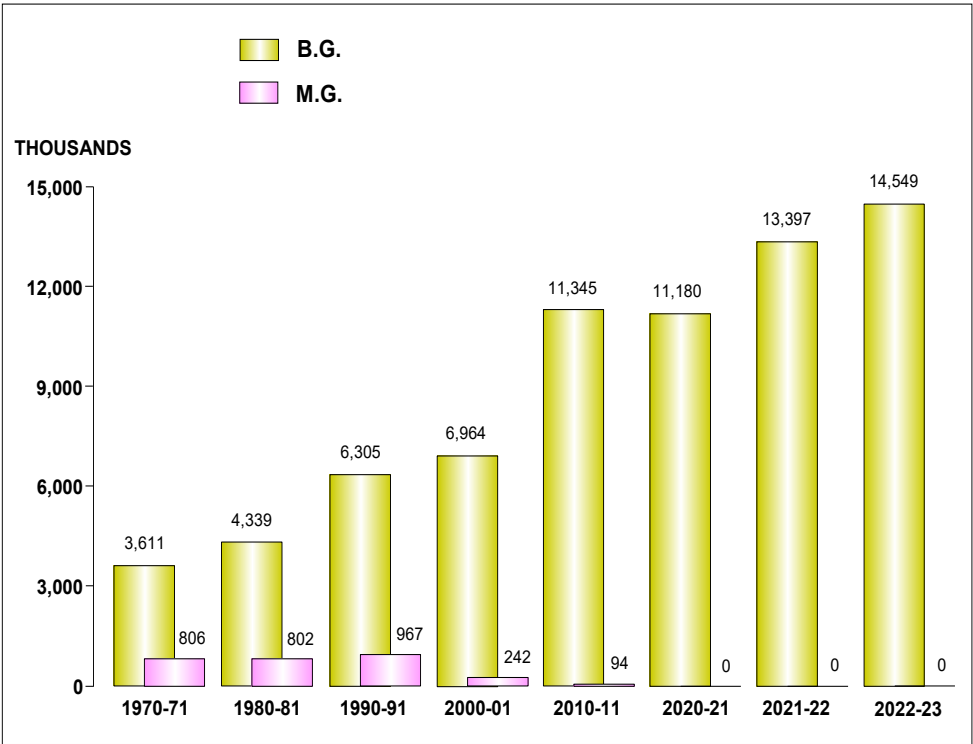
* revised

I. Wagon turn-round (in days):

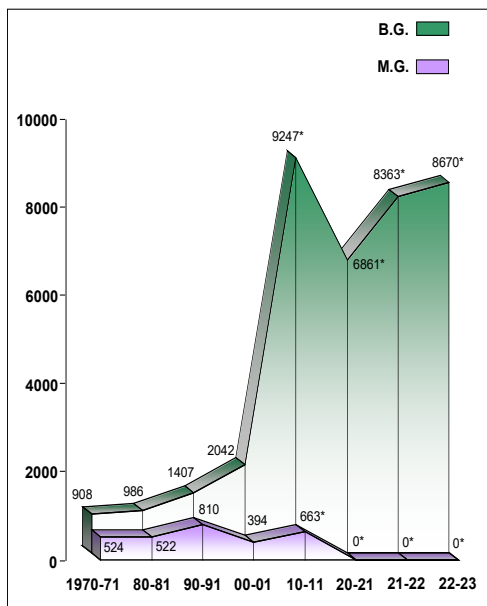
The turn-round time of wagons, representing operational cycle time is given in the following table:

Year	B.G.
1950-51	11.0
1960-61	11.2
1970-71	13.3
1980-81	15.2
1990-91	11.5
2000-01	7.5
2010-11	4.97
2020-21	5.43
2021-22	4.74
2022-23	4.70

NTKMS PER ANNUM PER ROUTE KM.

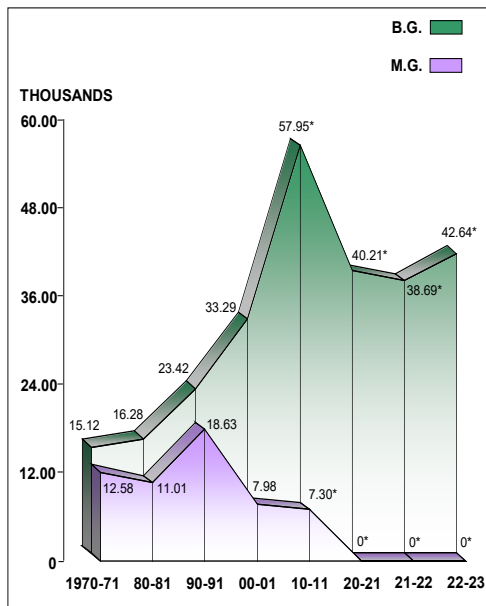


NET TONNE KILOMETRES PER WAGON PER DAY



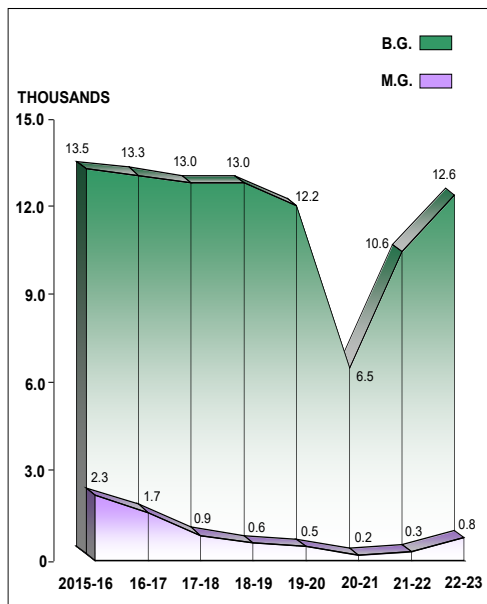
* In terms of eight wheelers

NET TONNE KILOMETRES PER ANNUM PER TONNE OF WAGON CAPACITY

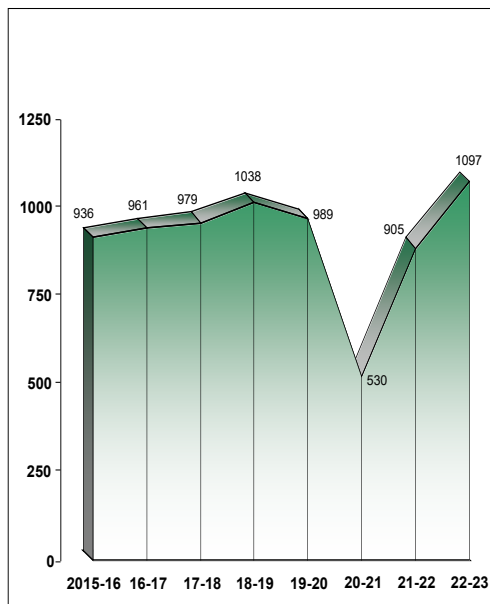


* In terms of eight wheelers

TRAIN KILOMETRES PER RUNNING TRACK KM



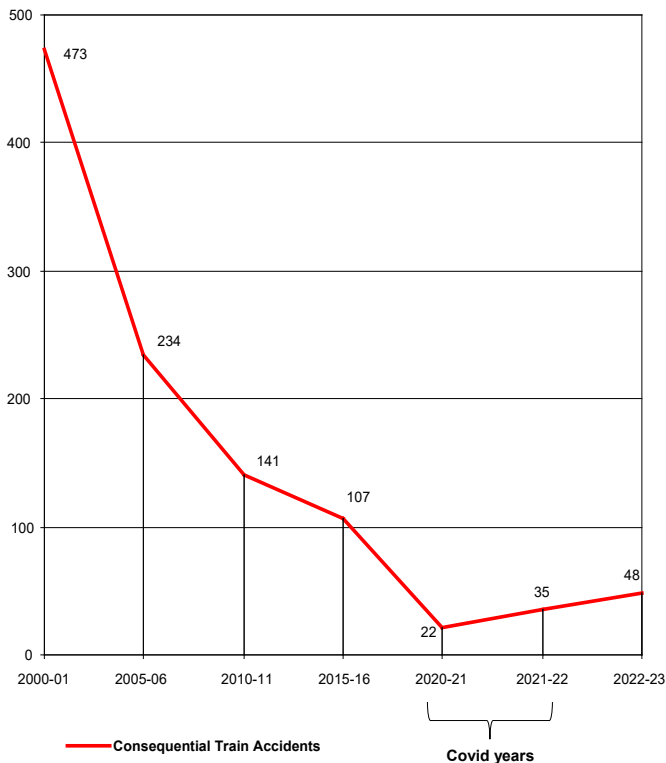
TRAIN KILOMETRES PER EMPLOYEE



Safety

Accidents:

As a result of continuous improvement in quality of assets, maintenance practices and various technological improvements done over the years, consequential train accidents have declined as shown by the graph below:



Compensation:

A sum of ₹126.84* lakh (approx.) was paid as compensation under section 124 of Indian Railways Act, 1989 for death/injury of passengers in train accidents to the next of kin/victims during 2022-23 as compared to ₹85.88* lakh (approx.) paid in 2021-22. The amount of compensation paid during the year relates to the number of cases settled and payment made during the year and not necessarily to the accidents that occurred during the year.

(*Excluding Konkan Railway and Metro Railway, Kolkata.)

Damage to Railway Property:

The cost of damage to railway property and duration of interruption to through communication caused by consequential train accidents during the years 2021-22 and 2022-23 are as under:

Year	Rolling stock (In lakh)	Permanent Way (In lakh)	Interruption to through communication (In Hours)
2021-22	3,915.15	472.01	568.05
2022-23*	5,570.21	385.74	728.02
*Provisional			

Rashtriya Rail Sanraksha Kosh (RRSK)

RRSK, as part of Capex, was introduced in 2017-18 with a corpus of ₹1 lakh crore and an annual outlay of ₹20,000 crore. The projects taken up under this Fund relate to Track Renewal, Bridges, Signalling, Rolling Stock and Training & Amenities for safety critical staff. Bulk of expenditure from RRSK has been on Engineering & Signalling works and safety critical Passenger Amenities items. With continuous and assured funding from Gross Budgetary Support (GBS), Internal Generation and EBR, safety works have been prioritised and adequate funding has ensured that these works are executed as per priority. During the period, 2017-18 to 2021-22, gross expenditure of ₹1.08 lakh crore was incurred on RRSK works.

NITI Aayog has appreciated Railways' progress on safety and implementation of RRSK and held that safety indicators have shown improvement after implementation of RRSK. On the recommendation of NITI Aayog, the currency of RRSK has been extended for another five year term beyond 2021-22 with contribution of ₹45,000 crore from GBS. Expenditure of ₹13,894.84 crore was incurred under RRSK in 2022-23 and a provision of ₹12,309.12 crore has been made for 2023-24.

Measures to Improve Safety:

- **Safety Focus:** In order 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, along with upgrading the skills of 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 Audits were conducted on regular basis. During the year 2022-23, 94 Internal Safety Audits (INTRA) and 33 Inter-Railway Safety Audits were carried out.

- **Training facilities:** Refresher training was imparted to 1,69,047 Non-Gazetted employees during the year 2022-23. (Provisional figure).

Measures to Avoid Collision

In order to enhance safety in train operations and make it efficient, Modern Signaling Systems, comprising Panel Interlocking/Route Relay interlocking/Electronic Interlocking (PI/RRI/EI) with Multi Aspect Colour Light Signals (MACLS) are being progressively provided. So far 6,396 stations (covering about 98.31% of interlocked Broad Gauge stations) on Indian Railways have been provided with such systems, replacing the obsolete Multi Cabin Mechanical Signaling System, thus optimizing operational cost involved in its operation as well as enhancing safety by reducing human intervention.

Indian Railways have in principle taken a decision in 2016 to provide Electronic Interlocking in future at all installations. Out of 6,396 interlocked stations, 3,045 stations have been provided with Electronic Interlocking System as on 31.03.2023.

The new Electronic Interlocking System at Bandel Junction of Eastern Railway having provision of 1,002 routes is Asia's largest Electronic Interlocking System commissioned on 30.05.2022.

Complete Track Circuiting: In order to ensure track occupation verification, Track Circuiting has been completed at 34,984 locations up to 31.03.2023 covering A, B, C, D Special and E Special routes. Total 6,375 stations (98%) have been provided with complete track circuiting over Indian Railways.

Block Proving by Axle Counter (BPAC): In order to enhance safety and improve mobility, 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 31.03.2023, Block Proving by Axle Counters (BPAC) has been provided on 6,364 block sections.

Intermediate Block Signaling: Provision of Intermediate Block Signaling (IBS) has proved very useful in enhancing line capacity without extra recurring revenue expenditure, in the form of operating manpower and amenities required while developing and operating a block station. As on 31.03.2023, Intermediate Block Signaling has been provided in 727 block sections on Indian Railways.

Automatic Block Signaling: For augmenting Line Capacity and reducing headway on existing High Density Routes on Indian Railways, Signaling provides a low cost solution by provision of Automatic Block Signaling. As on 31.03.2023, Automatic Block Signaling has been provided on 3,908 Route Km.

Automatic Train Protection System: Kavach is an indigenously developed Automatic Train Protection (ATP) system. Kavach aids the loco pilot in train running within specified speed limits by automatic application of brakes in case Loco Pilot fails to do so and also help the train safely run during inclement weather. Kavach is a highly technology intensive system, which requires safety certification of the highest order. Kavach was adopted as a National ATP system in July 2020. As on 31.03.2023, Kavach has been deployed on 1,465 Route km. and 111 locomotives (including Electric Multiple Unit rakes) on South Central Railway.

Kavach tenders have been awarded for Delhi–Mumbai & Delhi–Howrah corridors (approx. 3,000 Route km.) and work is in progress on these routes of Eastern, East Central, North Central, Northern, West Central and Western Railway zones. Indian Railways is preparing Detailed Project Report (DPR) and detailed estimate for another 6,000 Rkm.

Centralized Traffic Control (CTC): It is a computer based system which facilitates control and management of multiple Signalling installations covering a number of stations from a single location. It also provides a real time simulation of railway traffic centrally helping in real time traffic planning for punctual train operations. Controllers can manage train movements directly from CTC centre on real time basis.

Centralized Traffic Control System at Tundla, North Central Railway: Centralized Traffic Control (CTC), covering 264.16 Rkm. of Double line section with 31 stations on Aligarh-Kanpur Route, has been operationalized.

Train Management System: TMS provides real-time status of train positions, all train movements and a complete view of the section covered on a giant screen provided in the divisional control centre. Punctuality reports, rake and crew links, train graphs and unusual occurrence reports are generated in the control office.

Train Management System at Khurda Road of East Coast Railway: The overall display panel, known as the ‘Mimic Indication Panel’, is designed to present detailed status of the system at a glance. It is expected that with commissioning of TMS/CTC projects, our controllers shall be able to efficiently manage train operations. Besides providing real time train running information in the control offices, passengers shall also be provided

with accurate arrival/departure information at stations through automatic working of the Passenger Information System at Stations. This system has been provided on Suburban sections of Mumbai on Western & Central Railways and Howrah of Eastern Railway. Similar system is being provided at Khurda Road in East Coast Railway and Sealdah division in Eastern Railway.

Growth of deployment of Signaling on Indian Railways (As on 31.03.2023).

Item	Mar'14	Mar'15	Mar'16	Mar'17	Mar'18	Mar'19	Mar'20	Mar'21	Mar'22	Mar'23
Panel Interlocking (Stations)	4,200	4,195	4,107	4,155	4,130	4,052	3,863	3,747	3,438	3,134
Route Relay Interlocking (Stations)	276	280	281	281	282	228	228	247	226	217
Electronic Interlocking (Stations)	735	842	1,005	1,148	1,358	1,606	1,927	2,206	2,572	3,045
PI/RR/I/El (Stations)	5,211	5,317	5,393	5,584	5,770	5,886	6,018	6,200	6,236	6,396
Block Proving by Axle Counter (Block sections)	4,175	4,585	4,640	4,976	5,058	5,363	5,663	5,805	6,003	6,364
Automatic Signaling (Route Km)	2,623	2,715	2,752	2,866	2,901	3,039	3,309	3,447	3,549	3,908
Intermediate Block Signaling (Block sections)	449	475	489	501	532	574	602	628	666	727
Interlocked level Crossing Gates (Nos.)	10,493	10,513	10,776	10,826	11,006	11,375	11,639	11,710	10,854	11,079

Measures to Reduce Derailments:

- Track Renewal and Maintenance:**

During 2022-23, 5,227 Kms. in Complete Track Renewal (CTR) units of track renewal was carried out. The year wise details of track renewal done and expenditure incurred thereon are as under:

Year	Gross expenditure (₹ in Cr.)	Track Renewal done (CTR units)
2019-20	9,390.55	4,500
2020-21	13,522.65	4,363
2021-22	16,557.87	4,275
2022-23	*16,325.72	5,227
*provisional		

One Complete Track Renewal (CTR) units comprises 01 Km. of Through Rail Renewal (0.5 CTR units) and 01 km. of Through Sleeper Renewal (0.5 CTR units).

Track Upgradation:

The track constitutes the basic infrastructure of a railway system and bears the burden of coping with ever increasing traffic. Higher speed and heavy axle load operation of Indian Railways have 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 (Normal/Wider Base) sleepers. Heavier section and high tensile strength 60kg 90UTS/R260 rails are being used in place of 90R/52kg, 72/90UTS rails. Similarly, long rail panels or welded rails are predominantly used in place of earlier fish plated joints. Sturdier turnouts using thick web switches are being provided on trunk routes and high density routes. As on 31.03.2023, on BG main lines of Indian Railways, about 90.06% of the length has been covered by long welded rails, 99.50% with PSC sleepers and 99.27% with 52kg/60kg 90 or higher UTS rails.

Welded Rails:

On most of BG tracks, 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 31.03.2023, 90,427.2 km length of track on main lines of Indian Railway was with long welded rails and 9,300.8 km length of track on main lines was with short-welded rails.

Bridges:

As on 01.04.2023, Indian Railway has 1,58,064 bridges, out of which 711 bridges are important, 12,610 bridges are major and 1,44,743 bridges are minor bridges. During the year 2022-23, 1,732 bridges were strengthened/rehabilitated/rebuilt to enhance safety of train operation.

Bridges Inspection and Management System:

As far as maintaining safety in train operations is concerned, there is a well-established system of inspection of Railway bridges in Indian Railways. All the Railway bridges are inspected twice a year, once before the onset of monsoon and once after the monsoons, by the designated officials. Repair/Strengthening/Rehabilitation/Rebuilding of bridges is a continuous process

and is undertaken whenever so warranted by their condition as ascertained during these inspections.

Measures Taken to Strengthen Safety and Reliability of Railway Coaches:

- 1) Indian Railways has taken the following steps to further strengthen the safety and reliability of railway coaches::

i) Complete switchover to LHB:

Ministry of Railways has decided for large scale proliferation of LHB coaches which are technologically superior with features like Anti climbing arrangement, Air suspension (Secondary) with failure indication system and less corrosive shell. These coaches have better riding and aesthetics as compared to the conventional ICF coaches. The Production units of Indian Railways are producing only LHB coaches from April 2018 onwards. The production of LHB coaches has continually increased during the years and more than 34,400 LHB coaches have been turned out till 31st March 2023. (5,133 LHB coaches have been turned out in 2022-23).

1,060 Nos. of ICF Rakes (total 742 pair of trains) have been replaced with LHB coaches rakes. Around 1,228 rakes are running with LHB coaches.

The manufacturing of LHB coaches has increased from 2,209 coaches in the years 2006-2014 to 31,956 coaches in the years 2014-2023. Further, it is planned to manufacture 4,992 LHB coaches in the year 2023-24.

- ii. **CCTV cameras equipped with video analytics:** Provision of CCTV cameras in train coaches has been one of the priority items. Hon'ble MR under Para 31 of the Budget speech 2015-16 had also announced fitment of CCTV on pilot basis and Indian Railways has further planned for proliferation of CCTVs in its coaches. CCTV cameras have been fitted in more than 6,900 coaches so far.

- iii. **Smart Coaches:** In view of the latest development in rolling stock technology, its maintenance and increased level of passengers comfort. Indian Railways has introduced around 100 Smart coaches with ultra modern features like Smart Public Address and Passenger Information System, Smart HVAC (Heating, Ventilation and Air Conditioning System), Smart security and surveillance system etc. in train service.

- iv. **Induction of semi-high speed Vande Bharat (Train-sets):** Integral Coach Factory/Chennai indigenously manufactured India's

first Semi High Speed Self Propelled (Train-set) Vande Bharat trains in 2018-19. Two Vande Bharat services were introduced between New Delhi-Varanasi and New Delhi-Shri Mata Vaishno Devi Katra in 2019-20.

These trains had many features as per global standards, like quick acceleration, maximum speed of 160kmph, on board infotainment & GPS based passenger information system, automatic sliding doors, retractable footsteps, Zero discharge vacuum bio toilets etc.

A new and improved version of Vande Bharat trains with enhanced safety features, better ride index and passenger amenities was manufactured and introduced in 2022-23. As on 31.03.2023, 8 trains of the new version were running between Mumbai Central-Gandhi Nagar Capital, New Delhi-Amb Andaura, Chennai-Mysore, Bilaspur-Nagpur, Howrah Jn-New Jalpaiguri and Secunderabad-Vishakhapatnam, Mumbai Central-Sainagar Shirdi and Mumbai Central-Solapur.

Further, manufacturing of 744 Vande Bharat coaches is planned in Production Plan 2023-24.

- v. Production of Vande Metro:** Indian Railways have decided to introduce Vande Metro trains for mainline as well as suburban system. These trains will have State-of-the-art IGBT based 3-phase propulsion system, air conditioning, automatic doors, PA/PIS, Emergency Talkback system and CCTVs etc. In Budget 2023-24, provision of 3,600 coaches of Vande Metro has been made.

vi. Introduction of NMGH / NMGHS coaches:

- a. There has been increase in demand of Automobile Carrying vehicles over Indian Railways. Accordingly, to capture traffic of automobile movement, there has been increased emphasis for manufacturing of NMG coaches from conversion of existing ICF coaches which are being phased out from train operation gradually.
- b. While NMG coaches have speed potential of 75kmph, NMGH coaches were introduced with higher speed potential of 110kmph which shall create more line capacity.
- c. Subsequently, NMGHS coaches with speed potential of 110kmph and provision of side entry have been introduced.
- d. ICF coaches are planned to be converted into 250 NMGH/1750 NMGHS coaches. Consequently, 250 NMGH/635 NMGHS coaches have been converted (as on 31.03.2023).

Further, work in around 1,115 NMGHS coaches (Automobile Carrying vehicles) is in progress

Measures Taken to Strengthen the Safety and Reliability of Railway Coaches to Prevent Fire in Coaches:

2) Indian Railways is taking the following steps to further strengthen the safety and reliability of Railway passenger coaches during manufacturing at Production Units:

i) Fire detection and Suppression system in Pantry cars and Power cars:

Power Cars are more prone to fire due to presence of Diesel Alternator sets along with fuel tanks and other high voltage equipment. Pantry Cars are also more prone to fire due to cooking being carried out in these coaches. 1,775 Power Cars and 806 Pantry Cars Coaches have been provided with Fire Detection and Suppression System upto 2022-23.

ii) Fire and Smoke detection system in all newly manufactured AC coaches:

With a view to improve fire safety in running trains, Automatic Fire and Smoke Detection System are being provided in AC coaches. The specifications for Automatic Fire and Smoke Detection System have been upgraded integrating the air brake system in the coaches with Fire and Smoke detection system. 10,844 AC coaches have been provided with Fire and Smoke Detection System upto 2022-23.

iii) Provision of Fire Extinguishers in Non AC coaches:

Dry chemical powder type fire extinguishers are provided in all Air-conditioned coaches, Second class-cum-guard and luggage van and Pantry cars. 34,705 Non-AC coaches are being provided with Dry chemical powder type fire extinguishers. Further, Instructions have been issued to Production Units to provide fire extinguishers in all newly manufactured non-AC coaches as well.

iv) Improving Fire Retardancy in Coaches:

Coaches are being provided with fire retardant furnishing materials such as Fire retardant curtains, partition paneling, roof ceiling, flooring, seat and berths along with cushioning material and seat covers, Windows and UIC Vestibules etc. In the specification of major furnishing items, now a new parameter related to fire retardancy (i.e. heat release rate) has been introduced as per international norms.

v) Provision of Automatic Smoke/Fire detection with Alarm system in EMU, MEMU and Kolkata Metro:

During 2022-23, Automatic Smoke/Fire detection & Alarm system has been provided in 37 MEMU rakes. Kolkata Metro has introduced 11 rakes equipped with Automatic Smoke/Fire detection & Alarm system.

3. Further Measures Taken to Strengthen Safety and Reliability of Railway Coaches:

i) Progressive use of Air Springs:

For enhancing safety and reliability of passenger coaches, the suspension systems are being redesigned with air springs at secondary stage capable to maintain constant height at variable loads. Air springs have been developed and are being fitted on all the newly built EMU & DMU coaches for sub-urban trains. Production Units have been advised to use Air springs in all newly manufactured LHB coaches.

ii) Provision of Automatic door closure mechanism in coaches:

Provision of Automatic door closure mechanism has been planned on coaches to prevent accidental falling of passengers from running trains. Automatic door closure mechanism has also been provided in the coaches of Vande Bharat Trains, TEJAS sleeper RAJDHANI, TEJAS Chair car and Humsafer coaches.

iii) Provision of Double Acting doors in coaches:

Double Acting door in coaches are two way swing AC compartment doors for easy evacuation of passengers. Such doors need to be provided in AC coaches so as to improve fire worthiness and enable passengers to quickly evacuate from the coach in the event of fire.

iv) Provision of Aerosol based fire suppression system in electric panel of coaches:

With a view to improve fire safety in running trains, instructions have been issued to production units & Zonal Railways in June'2022. So far LHB (AC-1320, Non AC-80), ICF (AC-8), power cars LHB-44 & pantry cars 21 & LSLRD-861 coaches have been provided with Aerosol Fire suppression system in Electric panel of coaches.

Measures to Curb Accidents at Level Crossings:

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

Level Crossings: Level crossings are meant to facilitate the smooth running of traffic in a regulated manner governed by specific rules & conditions. Status of level crossings on IR as on 01.04.2023 is as under:

Total number of level crossings	: 18,477
Number of manned level crossings	: 17,918 (97%)
Number of unmanned level crossings	: 559 (3%)
(only on NG Heritage Section)	

Road Over/ Under Bridges: During the year 2022-23, 234 ROB's and 833 RUB's/Subways have been constructed under cost sharing, railway cost/accommodation works, Deposit/BOT terms and by NHAI over Indian Railways.

Interlocking of Level Crossing Gates: Indian Railways have provided interlocking with Signals at 11,079 Level Crossing Gates as on 31.03.2023, to enhance safety at Level Crossings.

Sliding Boom at LC Gate: 7,031 Nos. of busy interlocked gates have been provided with Sliding Booms as on 31.03.2023, in addition to lifting barriers, and further busy gates are also being progressively covered.

Other Administrative Measures:

The following measures have been taken by the Government to enhance safety in train operations :

- **Concept of Rolling Block -** This has been introduced in Indian Railways (Open Lines) General Rules vide Gazette notification dated 30.11.2023, wherein work of maintenance/repair/replacement is planned up to 52 weeks in advance on rolling basis and executed as per plan.
- **Constant Review of Safety Performance at Board's apex level -** Safety performance is invariably reviewed as the first item on the 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 & CEO and Board Members have been conducting Safety Review Meetings with General Managers and Principal Heads of Departments of Zonal Railways during their visits as well as through regular monthly video conference.
- **Intensive Footplate Night Inspections -** Intensive Footplate Inspections, including night inspections, have been conducted at the level of 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.
- **Disaster Management Plan and Standard Operating Procedures (SOPs)** - As per the provision of Disaster Management Act, 2005, Ministry of Railways has prepared Disaster Management Plan. All Zonal Railways and divisions have also prepared their Disaster Management Plans. The Disaster Management Plan provides a framework covering all aspects of disaster management. It encompasses disaster risk reduction, mitigation, preparedness, response, recovery and building back better. It also provides a framework with role clarity for rapid mobilization of resources for effective disaster management by the concerned stakeholders. In addition, detailed Standard Operating Procedure (SOP) has been made for preventing and handling fire in railway coaches to minimize loss of life and railway property. Also, detailed protocol for handling train accidents has been prepared.
- **Mock Drills/Exercises** - In the financial year 2022-23, Indian Railways have conducted full scale disaster management exercise with NDRF at 51 locations in 46 divisions, covering all Zonal Railways. In addition, Zonal Railways conduct quarterly Mock drills in each division, involving resources of Railways like Accident Relief Trains (ARTs), Accident Relief Medical Vans (ARMVs), Breakdown Cranes etc.
- **Indian Railways Institute of Disaster Management (IRIDM)**, Bengaluru in November, 2022 organized a five-day Advance Training Programme for officers in association with the National Institute of Disaster Management (NIDM), New Delhi. This exercise has helped to assess the post disaster needs assessment and to understand coordination needs among different agencies involved in rescue and relief exercise after an accident.

The Network

Indian Railways (IR) is one of the world's largest rail networks with 68,584 Route Kilometres of route lengths as on 31.03.2023. Out of 68,584 RKMs., BG constitutes 65,977 RKMs. (96.20%), MG 1,345 RKMs. (1.96%) and NG 1,262 RKMs. (1.84%). The growth of its Route length, Running and Track Kms. since independence is as follows :-

Year	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
2020-21	68,103	1,00,866	1,26,611
2021-22	68,043	1,02,831	1,28,305
2022-23	68,584	1,06,493	1,32,310

Zones /Headquarters	Route Kms.	Running Track Kms.	Total Track Kms.
Central, Mumbai	4,203	7,125	9,392
Eastern, Kolkata	2,823	5,813	7,548
East Central, Hajipur	4,297	6,574	9,000
East Coast, Bhubaneswar	3,017	5,389	6,751
Northern, New Delhi	7,363	10,489	13,742
North Central, Prayagraj	3,523	5,653	6,952
North Eastern, Gorakhpur	3,470	5,210	5,431
Northeast Frontier, Maligaon, (Guwahati)	4,348	5,160	6,920
North Western, Jaipur	5,706	8,062	8,488

Southern, Chennai	5,092	7,715	9,446
South Central, Secunderabad	6,560	9,863	11,817
South Eastern, Kolkata	2,759	5,615	6,531
South East Central, Bilaspur	2,506	4,246	5,603
South Western, Hubli	3,662	5,288	6,515
Western, Mumbai	6,157	8,619	10,914
West Central, Jabalpur	3,060	5,596	7,142
Metro Railway, Kolkata	38	76	118
Total	68,584	1,06,493	1,32,310

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 2022-23.

State/Union Territory	Route Kms.	Running Track Kms.	Total Track Kms.
Andhra Pradesh	3,983	6,721	8,329
Arunachal Pradesh	12	12	27
Assam	2,571	2,968	3,975
Bihar	3,888	5,776	7,101
Chhatisgarh	1,188	2,379	3,155
Goa	69	83	103
Gujarat	4,939	6,468	8,077
Haryana	1,744	2,673	3,221
Himachal Pradesh	313	317	376
Jharkhand	2,648	4,738	6,054
Karnataka	3,617	5,409	6,710
Kerala	1,048	1,766	2,126
Madhya Pradesh	5,196	8,470	10,445
Maharashtra	5,875	9,392	12,361
Manipur	56	56	70
Meghalaya	9	9	13
Mizoram	1	1	6
Nagaland	25	25	41
Odisha	2,935	5,308	6,388

Punjab	2,265	2,869	3,734
Rajasthan	6,100	8,784	9,819
Tamil Nadu	4,038	5,805	7,130
Telangana	1,999	2,951	3,490
Tripura	265	265	337
Uttarakhand	346	442	516
Uttar Pradesh	8,798	13,967	16,986
West Bengal	4,135	8,076	10,427
Union Territory			
Chandigarh	16	18	79
Delhi	184	346	686
Jammu & Kashmir	298	372	499
Pondicherry	23	25	29
Total	68,584	1,06,492	1,32,310

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

With its more than 170 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 17.52 million passengers and 4.14 million tonnes of freight each day during 2022-23.

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 & Chief Executive Officer (CEO), Railway Board. Members of the Railway Board include Member (Finance), Member (Infrastructure), Member (Traction & Rolling Stock) and Member (Operations & Business Development) who represent their respective functional domains. For administrative purposes, IR is divided into 17 Zones, each headed by a General Manager. Zonal Railways are further divided into smaller operating units called Divisions. There are 68 Operating Divisions in IR at present, each under a Divisional Railway Manager. In addition, there are a number of Production Units, Training Establishments, Public Sector Enterprises and other Offices working under the control of Railway Board.

Track and Bridges

As on 31.3.2023, the Indian Railways had			(in Kms.)
(i)	Route length	-	68,584
(ii)	Running Track length	-	1,06,493
(iii)	Total Trackage	-	1,32,310
The following works were carried out during 2022-23`			
(i)	Track renewal	-	5,227.26
(ii)	Construction of New Line	-	1,815.49
(iii)	Gauge conversion from MG/NG to BG	-	242.20
(iv)	Track conversion from single to double line	-	3,185.53

New Lines:

During 2022-23, 1,815.49 Kms. of new lines have been completed on the following sections:-

Railway	Project	Section	Km.
Central	Belapur-Seawood-Uran	Kharkopar-Uran	29.20
Eastern	Pirpainthi-Jasidih new line	Mohanpur-Harlantnr	16.00
	Pirpainthi-Jasidih new line	Harlatanr-Hansdiha	22.13
East Central	Khagaria-Kusheshwarsthan	Khagaria-Alauli	19.00
	Koderma Ranchi new line	Sidhwar-Shannki	26.70
	Koderma-Tilaiya new line	Koderma-Jharahi	17.30
	Sakri-Hasanpur New Line	Hasanpur-Bithan	10.00
East Coast	Khurda-Bolangir	Bichhupalli-Jharatarba	10.65
	Angul-Balaram	Angul-Balaram	14.00
	Angul Sukinda New line	Baghuapal-Budhapank	95.00
Northern	Rohtak-Meham-Hansi	Rohtak-Meham	32.00
North Western	Dausa-Gangapurcity new line	Piplai-Lalsot	26.00
South Central	Manoharabad-Kotapalli	Kodakandla-Duddeda	21.68
	Muneerabad-Mehbubnagar	Krishna to Magnur	13.20
	Bhadrachalam-Sattupalli	Betampudi Chord line	1.73
	Bhadrachalam-Sattupalli	Bhavanapalem-Sattupalli	14.00

South East Central	Kharsia-Korichapar new line	Chaal feeder line	8.50
	Mandir Hsaud-New Raipur-Kendri	Mandir Hsaud-New Raipur-Kendri	20.50
	Kharsia-Dharamjaigarh lines	Korichapar-Baroud	4.50
South Western	Tumkur-Rayadurga	Kadiridevarapalli- Doddahalli	20.00
	Gadag-Wadi	Sanganal-Hanumapur	13.10
Western	Dahod Indore new line	Dahod-Katwara	11.30
West Central	Ramganjmandi-Bhopal	Junakheda-Akhlera	27.00
Metro	Joka-Binay Badal	Joka-BBD Bagh via Majerhat	13.00
	New Garia-Hemanta Mukherjee	Dumdum-New Garia via Rajerhat	11.00
DFCCIL	WDFC	Rewari-Madar (306 km double line)	612.00
	WDFC	Madar-Palanpur (353 km double line)	706.00
	Total		1,815.49

Gauge Conversion:

During 2022-23, 242.2 Kms of track was converted from MG/NG to BG as detailed below:

Railway	Project	Section	Kms.
East Central	Saharsa-Forbesganj GC	Narpatganj-Forbesganj	17.00
	Jaynagar-Darbhanga- Narkatiaganj	Narkatiaganj-Amolwa	12.74
	Sakri-Nirmali & Saharsa-Forbisganj	Jhanjharpur-Mahrail	8.00
	Saharsa-Forbesganj	Lalitgram-Narpatganj	12.00
North Eastern	Indara-Dohrighat	Indara-Dohrighat	34.70
North Western	Ahmedabad-Udaipur via Himmatnagar	Kharwachanda - Jaisamand	37.00
Southern	Maylitrurai - Thaugavur	Tiruuraipundi- Agastiyampalli	37.00
	Madurai -Bodinayakannur	Teni-Bodinaykannur	15.00
Western	Ahmedabad-Mehsana	Dangarwa-Jagudan	16.00
	Ahmedabad Mehsana GC	Jagudan- Mehsana	10.80
	Miyagaon-Dabhoi	Miyagaon-Karjan-Dabohi GC	8.56
	Katosan Rd.-Chanasma-Ranuj GC	Katosan Road-Bechraji	29.00
	Akola-Khandwa GC	Khandwa Cabin-Khandwa	4.40
	Total		242.20

Doubling:

During 2022-23, 3,185.53 Kms. of double/multiple lines track were completed as detailed below:

Railway	Project	Section	Kms.
Central	Itarsi-Nagpur 3rd line	Narkher-Kalambha	15.00
	Daund-Gulbarga doubling	Bhigwan-Washimbe	28.48
	Wardha-Chitoda chord line	Wardha Chitoda dn chord line	4.25
	Jalgaon-Manmad 3rd line	Jalgaon-Pachora	48.00
	Daund-Manmad doubling	Kashti-Balvandi	24.88
	Pune-Miraj doubling	Walha-Nira	10.20
	Pune-Miraj doubling	Bhilwadi-Nandre	6.94
	Jalgaon-Bhusawal 4th line	Jalgaon-Badli	11.50
	Pune-Miraj doubling	Palsi-Jarandeshwar	9.00
	Pune-Miraj doubling	Satara-Koregaon	10.90
	Daund-Manmad doubling	Belapur-Puntamba	20.00
	Jalgaon-Bhusawal 4th line	Bhusawal-Badli	12.6
	Daund-Manmad doubling	Ankai Killa-Manmad	8.63
	Pune-Miraj doubling	Rajewadi-Daundaj	20.10
	Nagpur Itarsi 3rd line	Katol Kalamba	10.00
	Daund-Manmad doubling	Kanhegaon-Kopargaon	15.37
	Sagardighi-Malda Town (Nimtita-New Farakka)	Dhulianganga-New Farakka	15.50
Eastern	Raebareli-Amethi Doubling	Jais-Fursat Ganj-Rupamau	19.78
	Rosa-Sitapur-Burhwal DL	Jangbahadur Ganj-Neri	24.00
	Bandel-Boinchi	Bandel-Magara	7.00
	Utraitia-Raebareli doubling	Raebareli-Gangaganj	8.50
	Katwa-Bazarsau doubling	Tenya-Bazarsau	6.98
	Laksar-Haridwar (left over patch)	Laksar-Yard remodelling	1.90
	Boinchi-Shaktigarh 3rd line	Rasulpur-Shaktigarh	7.00
	Alamnagar-Utraitia Doubling	Alamnagar-Transport Nagar	10.00
	Rajpura-Bathinda doubling	Kaulseri-Sekha	28.40
	Dankuni-Chandanpur	Baruipara-Chandanpur	14.00
	Jhansi-Bina 3rd line	Jhansi-Babina	25.00
	Bazarsau-Azimganj	Bazarsau-Chaurigacha	7.40
	Jhansi-Bhimsen doubling	Nandkhas-Parauna	34.50
	Manigram-Nimtitta doubling	Jangipur-Ahiran	6.35
	Mathura Jhansi 3rd line	Bhandai-Dhaulpur	42.70
	Jhansi-Bina 3rd line	Bijrotha-Matatila	16.00
	Naihati-Ranaghat 3rd line	Naihati-Kalyani	10.40
	Aunrihar-Jaunpur	Aunrihar-Dobhi	22.80
	Sondalia-Champapukur	Sondalia-Lebutala	5.95
	Varanasi-Prayagraj doubling via Madho Singh	Gyanpur Road-Handia Khas	25.20

East Central	Ramna Singrauli	Magardaha-Mirchadhuri	17.00
	Narkatiaganj-Valmikinagar	Chamua-Harinagar	8.00
	New Bongaigaon-Kamakhyia via Goalpara	Nar Narayana Setu (Jogighopa Bridge)	2.29
	Samastipur-Darbhanga doubling	Kishanpur-Thalwara	12.00
	New Maynaguri - Gumanihat	Betgara - Kolaigram	23.00
	Ranchi Rd- Patratu doubling	Barkakhana -Arigada-Barkakhana link	4.80
	Digaru - Hojai Doubling	Dharamtul - Kampur	32.50
	Digaru - Hojai Doubling	Jagiroad - Dharamtul	18.80
	Kiul-Gaya doubling	Wazirgang to Tilaiya	18.00
	Phulera Degana doubling	Degana - Borawar	38.00
	Hajipur-Bachwara	Akshaywatrai Nagar Sahdai Buzurg	14.50
	Degana - Raika Bag doubling	Merta Road - Kharia Khangar	26.00
	Phulera Degana doubling	Borawar - Kuchaman City	20.00
	Kairala Rd- Shaktinagar	Krishnashila-Shatinagar	11.00
	Madurai - Vanchi Maniyachchi -Tuticorin Doubling	Tattaparai - Milavittan	7.47
	Sagauli-Valmiki nagar doubling	Sagauli-Majhowlia	12.80
	Madurai - Vanchi Maniyachchi -Tuticorin Doubling	Tulukapatti - Kovilpatti	33.00
	Patratu-Sonnagar 3rd line	Sigsigi-Rajhura	21.50
	Vijayawada - bye - pass	CR bulb line at Vijayawada	1.50
	Ramna-Singrauli doubling	Mirchadhuri-Karaila Road	9.00
	Vijayawada - Gudivada - Bhimavaram DL	Vijayawada - Uppaluru	17.00
	Kairalaroad-Shaktinagar doubling	Kairala Road- Anpara	11.70
	Guntur - Guntakal	Donakonda - Kurichedu	12.53
	Kiul Gaya doubling	Lakhisarai-Sheikhpura	25.3
	Kazipet - Balharshah 3rd line	Manikgarh - Wirur	19.00
	Ramna-Singrauli doubling	Billi-Obra-Salaibanva	11.20
	Vijayawada-Gudur 3rd line	Talamanchi-Srivenkateswarpalem	24.80
	Patratu Sonnagar 3rd line	Ankhora-Nabinagar	14.00
	Vijayawada - Gudivada - Bhimavaram DL	Bhimavaram - Narasapur	30.00
	Muzaffarpur-Sagauli	Chakia-Pipar-Jivdhara	24.00
	Guntur - Guntakal	Kurichedu - Gundlakamma	11.50
	Patratu-Sonnagar third line	Baghabishunpur yard	3.00
	Secunderabad - Mahbubnagar DL	Gollapalli - Divitipalli	16.00
	Jaranghih-Danea doubling	Bokaro Thermal-Gomia	5.60
	Bondamunda - Ranchi	Lodhma - Balsiring	9.90
	Muzaffarpur-Sugauli doubling	Mahwal-Mehsi-Chakia	15.00
	Rourkela - Jharsuguda 3rd line	Rajgangpur - Kalunga	16.50

East Coast	Salegaon-Rajatgarh	Nargundi-Talcher	45.50
	Bondamunda - Ranchi	Lodhma - Karra	13.10
	Jarapada-Budhapank 3rd and 4th line	Budhapank-NTPC 3rd line	8.94
	Anuppur - Katni 3rd line	Jhalwara - Rupaund	13.50
	Jarapada-Budhapank 3rd and 4th line	Budhapank- Talcher Road 4th line	6.87
	Kottavalasa - Koraput	Padua-Bheja-Machkund Road	21.40
	Rajnandgaon - Nagpur 3rd line	Dongargarh - Paniajob	8.00
	Sambalpur-Titlagarh doubling	Sikir-Titlagarh	10.15
	Rajnandgaon - Nagpur 3rd line	Darekasa - Bortalao	8.00
	Hosapete - Hubballi - Vasco da-gama	Sanvordem - Madgaon	14.80
	Vizianagram-Sambalpur 3rd line	Titlagarh-Kesinga	12.96
	Yelahanka - Penukonda	Devarapalle - Hindupur	10.70
	Sambalpur-Talcher doubling	Maneshwar-Jujumara	24.00
	Hotagi - Kudgi - Gadag DL	Gadag - Hombal	12.70
	Kirandul-Jagdapur	Kaklur-Dabpal	21.13
	Hubballi - Chikjajur	Haveri - Saunshi	50.00
	Sambalpur-Titlagarh doubling	Deobahal-Bargarh-Barpali	31.00
	Katni - Bina 3rd line	Hardua - Rithi	15.13
	Sambalpur-Titlagarh	Badmal-Sikir	10.00
	Bina - Kota doubling	Bina - Kanjiya	20.47
	Vizianagram- Sambalpur- Titlagarh 3rd line	Rupra Rd - Lanjigarh	18.10
	Katni - Singrauli Doubling	Salhana - Pipariyakalan - Khanna Banjari	21.40
	Bhadrak-Nergundi 3rd line	Kapilas Rd- Nergundi 3rd line	3.20
	Katni - Singrauli Doubling	New Katni Jn - Katangikhurd	7.80
	Bina - Kota doubling	Bijora - Baran	13.00
	Sambalpur-Talcher doubling	Angul-Talcher	12.00
	Bina - Kota doubling	Bhonra - Bijora	25.70
	Bina - Kota doubling	Ashok Nagar - Orr	13.05
	Koraput-Singapur	Dumuriput-Damanjodi	8.18
	Ratlam - Khandwa - Akola	Nimarkheri yard	2.00
	Doubling of KK line	Koraput-Manabar	6.83
	Palanpur - Samakhiyali doubling	Palanpur - Chandisar	11.90
	Koraput-Singapur	Koraput -Dumuriput	10.70
	Surendranagar - Rajkot Doubling	Daladi - Wankaner	12.16
	Bansapni-Daitari-Tomka-Jakhpura Doubling	Sagdapata-Tangripal	17.80
	Jagdapur-Koraput	Chatripur-Maligura	6.95
Northern	Rosa-Sitapur-Burhwal doubling	Neri-Sitapur	32.00
	Janghai- Pratapgarh- Amethi	Amethi-Antu	16.00
	Jaunpur - Akbarpur doubling	Meghawan-Khetasari	18.40
	Akbarpur-Barabanki doubling	Akbarpur-Goshaiganj	24.70

North Central	Rajpura-Bhatinda doubling	Bhatinda Cantt-Bhatinda	9.70
	Rajpura-Bhatinda doubling	Nabha-Kaulseri	20.82
	Jaunpur-Akbarpur	Shahganj-Khetasarai	10.30
	Janghai-Pratapgarh doubling	Antu-Pratapgarh	21.00
	Jaunpur-Akbarpur doubling	Jaunpur-Maghawan	6.00
	Rajpura-Bhatinda doubling	Lehra Mohabbat-Bhatinda Cant	16.60
	Akbarpur-Barabanki doubling	Goshainganj-Darshan Nagar	27.00
	Bhaupur Panki 4th line	Bhaupur Panki 4th line	11.00
	Mathura - Jhansi 3rd line	Gwalior- Banmore	19.00
	Jhansi-Bina 3rd line	Lalitpur-Bijrotha	29.00
	Bhimsen-Jhansi doubling	Pamaan-Bhimsen	15.28
	Mathura-Jhansi 3rd line	Dabra-Anandpeth-Antri	19.90
	Kanpur-Kanpur coaching complex	Kanpur-Kanpur coaching complex	2.00
	Jhansi Bina third line	Lalitpur-Jakhlaun	17.00
	Mathura-Jhansi 3rd line	Banmor-Sank-Morena	19.20
	Jhansi-Bhimsen doubling	Usargaon-Kalpi-Chunrah	14.00
	Bhimsen-Jhansi doubling	Malasa-Lalpur-Paman	19.43
	Jhansi-Bina 3rd line	Babina-Bijrotha	36.00
	Dadri-Chipiyana 4th line	Dadri-Maripat	7.60
	Mathura-Jhansi 3rd line	Kitham Baad	20.20
North Eastern	Bhatni-Aunrihar doubling	Kidiharapur-Indara	12.98
	Aunrihar-Jaunpur doubling	Muftiganj-Jaunpur	14.20
	Chapra-Ballia doubling	Bakulha-Sahatwar	25.70
	Aunrihar-Jaunpur doubling	Dobhi-Muftiganj	21.00
	Rosa-Sitapur-Burhwal doubling	Sitapur-Parsendi	18.20
	Varanasi-Allahabad doubling	Handiakhas-Ramnathpur	18.40
	Ballia-Ghazipur doubling	Karimuddinpur-Yusufpur	14.20
	Phephna Indara doubling	Phephna-Rasra	22.41
	Roza-Burhwal-Sitapur doubling	Biswan-Sarayan	14.00
	Chapra-Ballia doubling	Gautamsthan-Manjhi	8.00
	Daliganj-Malhaur doubling	Daliganj-Malhaur doubling	13.00
	Varanasi-Prayagraj doubling	Ramnathpur-Jhusi	10.70
	Mau-Shahganj doubling	Sathion-Azamgarh-Phariah	29.80
	Ghazipur-Ballia doubling	Yusufpur-Ghazipur	18.00
Northeast Frontier	NBQ-Goalpara-Kamakhya DL	Abhaypuri -Panchratna	26.43
	New Bongaigaon-Agthori via Rangiya doubling	Bongaigaon-Bijni	17.53
	New Bongaigaon- Kamakhya via Goalpara	Dudhnoi-Dhupdhara	29.70
North Western	Degana-Rai Ka Bagh doubling	Kharia Khangar-Pipar Road	31.00
	Sadalpur bye-pass line	Sadalpur bye-pass	3.36
	Degana-Rai ka Bagh	Pipar ka Road - Rai ka Bagh	45.50
Southern	Maniyachi-Nagarcoil doubling	Aralvaymozhi-Valliyur	18.20
	Kuruppanthara - Chingavanam	Etmanur-Chingavanam	17.90
	Nangunari-Valliyur doubling	Maniyachi-Nagercoil doubling	14.00
	Madurai-Tuticorin doubling	Kovilpatti-Kadambur	22.30

South Central	Salem Omalur doubling	Salem Omalur	12.50
	Madurai-Maniyachi-Tuticorin	Madurai-Tirumangalam	17.30
	Maniyachi-Nagercoil doubling	Melappalaiyam-Nangunari	24.50
	Vijaywada - Gudivada -	Aravalli - Nedadavolu Jn.	39.56
	Bhimavaram - Narsapur DL		
	Kazipet-Ballarshah 3rd line	Bisugirsharif-Uppal	20.00
	Gooty-Dharmavaram doubling	Zangalapalle-Taticherla	18.80
	Vijaywada-Kajipet 3rd line	Kondapalli-New west block hut	10.30
	Vijaywada-Gudur 3rd line	Nellore-Talmanchi	16.00
	Guntur-Guntakal doubling	Gajjalkonda-Tarlupadu	25.42
	Kazipet Vijaywada 3rd line	Kondapalli- Cherumadhvaram	7.90
	Vijaywada-Gudur 3rd line	Karavadi-Chinnaganjam	22.70
	Gooty bye pass	Gooty bye pass	3.20
	Guntur Guntakal doubling	Cheekatigalapalem-Gundalkamma	6.80
South Eastern	Kazipet-Ballarshah 3rd line	Potkapalli-Bigusharif	10.40
	Gooty-Dharmavaram	Chigicherla-Dharmavaram	10.55
	Kazipet-Ballarshah	Wirur-Makudi	15.80
	Guntur-Guntakal	Munumaka-Sayaliyapuram	21.60
	Vijaywada-Gudur 3rd line	Nellore-Manubolu	29.40
	Kazipet-Vijaywada 3rd line	Chirumandhavaram- Vijaywada	16.70
	Guntur-Guntakal doubling	Malkapuram-Betamcherala	25.30
	Vijaywada-Gudur 3rd line	Singrayakonda-Ulvapadu	9.60
	Vijaywada-Gudur 3rd line	Chirala-Chinnaganjam	21.90
	Ranchi - Bondamunda doubling	Hatia-Balsiring	6.00
	Kharagpur-Narayangarh	Kharagpur-Hijli	3.50
	Rourkela-Jharsuguda	Kalunga-Rourkela	13.50
	Ranchi-Bondamunda doubling	Bangurkela-Bondamunda Link B	2.50
	Ranchi-Bondamunda doubling	Govindpur-Bakaspur	13.10
South East Central	Kharagpur-Adityapur 3rd line	Chakuliya-Ghatshila	30.60
	Rourkela Jharsuguda 3rd line	Rajgangpur-Tangarmunda	26.40
	Jharsugudega-Sardega doubling	Jharsuguda-Kechobahal	19.30
	Talgaria-Bokaro	Talgaria-Chass	13.30
	Damodar-Mohisila doubling	Damodar-Mohisila	8.20
	Ranchi Bondamunda doubling	Bakaspur-Pakra	13.70
	Dharamjaigarh-Kharsia	Kharsia-Korichappar	44.00
	Rajnandgaon-Nagpur 3rd line	Kachewani-Tumsar	27.00
	Bilaspur-Jharsuguda 4th line		11.50
	Rajnandgaon-Kalumna 3rd	Bhandara-Tharsa	24.70
	Annuppur-Katni 3rd line	Jhalwara-Katni	8.00
	Rajnandgaon-Kalumna 3rd line	Tharsa-Salwa	13.00
	Jharsuguda-Bilaspur 4th line	Gatora-Latia	18.00
	Rajnandgaon-Kalumna 3rd line	Gangajhari-Kachewani	8.00
	Annuppur-Katni 3rd line	Amlai-Singhpur	22.40
	Bilaspur-Jharsuguda 4th line	Himgir-Belpahar	14.00
	Raipur-Titlagarh	RVH-Mandirhassaund-Lakholi	25.00

South Western	Pune-Miraj-Londa	Desur-Belgavi	10.80
	Pune-Miraj-Londa	Belagavi-Suldhal	27.00
	Londa-Miraj doubling	Khanapur-Desur doubling	16.00
	Miraj-Londa doubling	Khanapur-Gunji doubling	12.00
	Hotgi-Kudgi doubling	Hole Alur - Badami	19.00
	Hubli-Chickjajur doubling	Devaragudda-Haveri	25.00
	Miraj-Londa doubling	Suldhal-Ghataprabha	30.00
	Gadag-Hotgi doubling	Badami-Guledagudda	13.00
	Miraj-Londa	Londa-Gunji	13.00
	Hubli-Chickjajur doubling	Hubli-Sanushi	20.00
West Central	Satna Rewa Doubling	Kaima-Sakariya	6.00
	Bina Katni 3rd line	Sagar-Makronia	7.00
	Kota-Bina doubling	Chhabra Gugor-Motipura	21.60
	Satna-Rewa doubling	Sakaria-Hinautaramban	8.00
	Katni-Singrauli doubling	Marwasgram- Niwas Road	17.00
	Katni-Bina 3rd line	Narioli-Isarwara	9.00
	Katni Singrauli doubling	Saraigram-Deoragram	20.70
	Mahadevkhedi Malkhedi chord	Mahadevkhedi Malkhedi	5.60
	Bina - Kota doubling	Salpura-Chhabragugor	16.20
	Ramganjmandi-Bhopal new line	Bioara-Rajgarh-Panchor Road	6.40
	Katni Bina 3rd line	Rithi-Saliya	18.50
	Kota-Bina doubling	Kanjia-Pipraigaon	27.44
	Katni-Singrauli	Khannabanjari- Mehroi	11.90
	Kota-Bina doubling	Kota-Sagoria	2.70
	Katni-Bina 3rd line	Khurai-Sumreri	8.50
	Katni-Singrauli doubling	Niwas Road-Saraigram	29.00
Western	Surendranagar-Rajkot doubling	Digsar-Muli	7.70
	Surendranagar-Rajkot	Wakaner-Sidhavadar	14.40
	Palanpur-Samakhiali doubling	Diodar-Radhanpur	38.80
	Palanpur-Samakhiali	Varahi-Chhansara	16.22
	Vatwa - Ahmadabad 3rd line	Vatwa - Ahmadabad 3rd line	2.47
	Mehsana-taranga Hill extension	Mehsana-Jagudan	12.00
	Nimach-Chittaurgarh	Bisalwaskalan-Nimach	9.40
	Surendranagar-Rajkot doubling	Sindhavadar-Bhileshwar	19.50
	Surendranagar-Rajkot	Muli Road-Vagadiya	16.70
	Palanpur-Samakhiali	Adesar-Kidiyanagar	25.19
	Palanpur-Samakhiali	Piprala-Adesar	17.00
	Surendranagar-Rajkot	Wagadia-Daldi	24.10
	Surendranagar-Rajkot	Bileshwar-Rajkot	9.20
	Indore-Devas-Ujjain doubling	Karchana-Barlai	36.40
	Palanpur-Samakhiali	Chhansara-Piprala	25.60
	Viramgam-Samakhiali doubling	Maliya Miyana A Cabin to B Cabin	8.40
Total			3,185.53

Gauge-wise Details:

Broad gauge, though forming 96.20% of the route, generated 100% of the freight output (NTKms) and 99.96% of the passenger output (Pkms).

Route length as on 31.03.2023 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)	28,580	7,678	36,258	29,494	225	29,719	65,978
Metre (1000 mm)		1,345	1,345	-	-	-	1,345
Narrow (762 mm/ 610 mm)		1,262	1,262	-	-	-	1,262
Total	28,580	10,225	38,865	29,494	225	29,719	68,584
%age to total RKM	-	-	56.67	-	-	43.33	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 2022-23, traffic density (million GTKms. per running track km.) increased from 4.29 to 24.32 on BG.

Track Renewal and Maintenance:

During 2022-23, 5,227.26 kms of Complete Track Renewal (CTR) units of track renewal was carried out. The year wise details of Track Renewal done and expenditure incurred thereon are as under:

Year	Gross expenditure (₹ in cr.)	Track Renewal carried out (Kms.)
2019-20	9,390.55	4,500
2020-21	13,522.65	4,363
2021-22	16,557.87	4,275
2022-23	16,325.72	5,227.26

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

Track Upgradation:

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

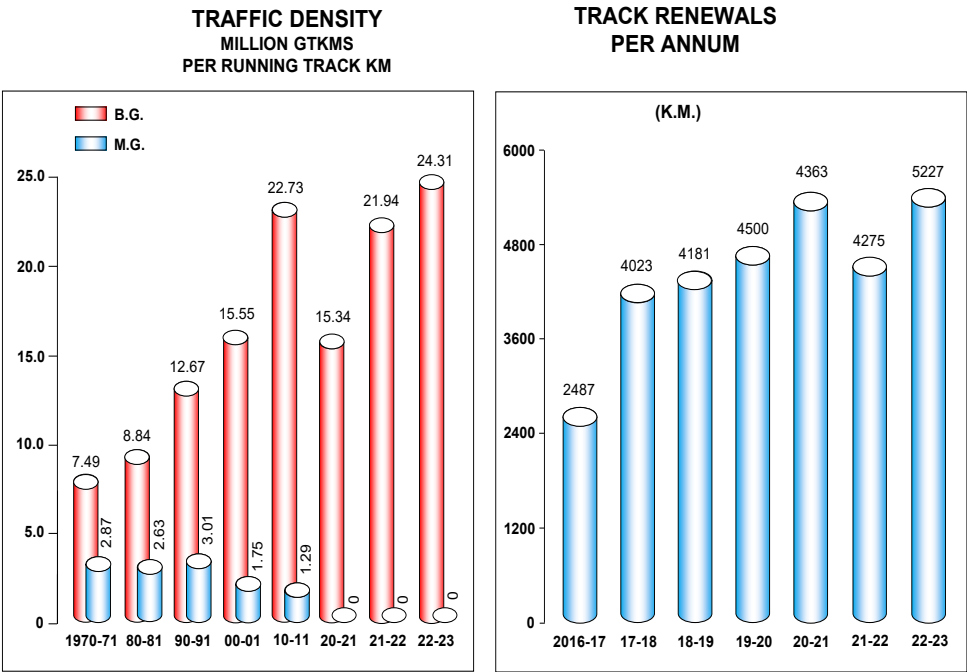
Track structure is upgraded at the time of renewals. Sleepers are being upgraded from wooden, steel and CST-9 to PSC (Normal/Wider Base) sleepers. Heavier section and high tensile strength 60kg 90UTS R260 rails are being used in place of 90R/52kg 72/90UTS rails. Similarly, long rail panels or welded rails are predominantly used in place of earlier fish plated joints. The sturdier turnouts using thick web switches are being provided on trunk routes and high density routes. As on 31.03.2023, on BG main lines of IR, about 90.06% of the length is covered by long welded rails, 99% with PSC sleepers and 99.27% 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 31.03.2023, total length of track on main lines of Indian Railways was 1,02,121.9 km out of which 90,427.2 km was with long welded rails and 9,300 km was with short-welded rails.

Bridges:

As on 01-04-2023, IR has 1,58,064 bridges out of which 711 bridge are important, 12,610 are major and 1,44,743 are minor bridges. During the year 2022-23, 1,732 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 01.04.2023 is as under:

Total number of level crossings	:	18,477
Number of manned level crossings	:	17,918 (97%)
Number of unmanned level crossings	:	559 (3%)
(only on NG Heritage Section)		

During the year 2022-23, 880 Nos. of manned level crossings have been eliminated. All unmanned level crossings on Board Gauge have already been eliminated on 31.01.2019.

Road Over/ Under Bridges:

During the year 2022-23, 234 ROBs and 833 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:

Maintaining the safety in the operation is concerned, there is a well-established system of inspection of Railway Bridges in Indian Railways. All the Railway Bridges are inspected twice a year.

Land Management:

As on 31.03.2023, Indian Railways (IR) owns about 4.88 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:

S. No.	Description	Area (in lakh hectares)
1.	Track and structures including Stations, colonies, etc.	3.62
2.	Afforestation	0.43
3.	'Grow More Food' scheme	0.019
4.	Commercial licensing	0.04
5.	Other uses like pisciculture	0.13
6.	Encroachment	0.008
7.	Vacant land	0.63
Total		4.88

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's land-use policy.

During 2022-23, Railway did mass plantation of 81.43 lakh trees. Railways have already finalized a model agreement with Ministry of Environment & Forests to be entered by Zonal Railways with State Forest Departments. 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, Railways are 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.

The extant policies for leasing, licensing and Right of Way (ROW) of railway land have been simplified to enable integrated development of infrastructure aligned with PM Gati Shakti framework and to attract more cargo traffic to railways. Accordingly, a master circular on "Policy for Management of Railway land" has been issued on 04.10.2022, which also include provisions for leasing of railway land for activities connected with railway working, public infrastructure, Government Departments, Hospitals, Kendriya Vidyalaya, projects related to renewable source of energy, water treatment/recycling, sewage treatment plants etc. for exclusive use of the railways, by transparent methods of competitive bidding.

Licensing of railway land is permitted for purposes directly connected with railway working. Plots of railway land at stations, goods sheds and sidings are licensed to other parties for stacking/storing of goods either received or to be dispatched by rail. Railway land is also leased to Kendriya Vidyalaya Sangathan to open Kendriya Vidyalayas. A part of 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 was 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. 126 sites measuring 997.83 hectares (approx.) were entrusted to RLDA for commercial development upto 31.03.2023. Necessary action for development of these sites is under process by RLDA.

Besides commercial development of vacant Railway land, RLDA has also been assigned the task of development of Multi Functional Complexes (MFCs). As on 31.03.2023, a total number of 123 sites have been entrusted to the RLDS, out of which 15 have already been successfully completed and commissioned. In addition to this, IRCON is currently managing 24 MFCs.

Electrification

Indian Railways' Mission 100% Electrification policy is seen as pivotal for the country's entire energy sector. The government initially stepped up the rate of railway electrification in order to reduce crude oil imports and save foreign exchange payments. However, there has been growing recognition that it will deliver significant environmental benefits. In performance terms, electric traction provides users with a better quality of service. The higher power of electric locomotives increases the average speeds and loadings for both freight and passenger trains, which in turn offers a tremendous opportunity to modernize railways and support economic development. Electrification will meet the aspirations of its citizens to provide clean transport, by reduce carbon footprint & provide the country with an environmentally friendly, green and clean mode of transport.

For a long time, the railway was largely fueled by coal and diesel, but electrification has been growing steadily since independence in 1947, but the past seven years have seen some remarkable transformation. Since then the focus has been on delivery, with the rate of commissioning ramped up to complete network one by one.

By March' 2023, electrification on Indian Railways has been extended to 58,074 RKMs excluding Konkan Railway. This constitutes 88% of the total BG Railway Network.

II. Progress of Railway Electrification

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

Year	Cumulative Electrified (Rkms)
1951	388
1961	748
1971	3,706
1981	5,345
1991	9,968
2001	14,856
2011	19,607
2020	*39,866
2021	*45,772
2022	*51,804
2023	58,074
*revised	

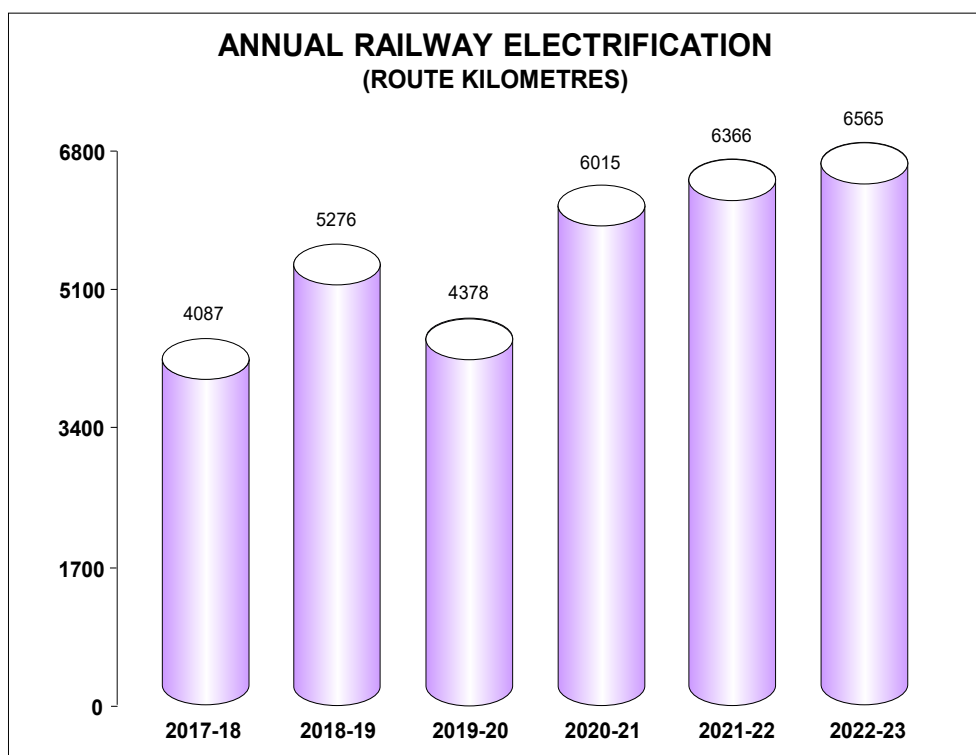
(b) During year 2022-23, record 6,565 Rkm. has been electrified.

III. Sections Electrified in (2022-23):

S.No.	Section	Railway	State	Rkms.
1.	Jasai-JNPT	CR	Maharashtra	9
2.	Pangari-Latur	CR	Maharashtra	130
3.	Kharkopar-Uran	CR	Maharashtra	29
4.	Hansdiha-Godda	ER	Jharkhand	32
5.	Mohanpur-Harlatanr	ER	Jharkhand	16
6.	Banmankhi-Purnea-Bihariganj	ECR	Bihar	60
7.	Shanki-Barkakana	ECR	Jharkhand	31
8.	Narkatiaganj-Amolwa	ECR	Bihar	13
9.	Sakri-Tamuria	ECR	Bihar	29
10.	Hasanpur-Bithan	ECR	Bihar	15
11.	Bichhupali-Jhartarbha	ECOR	Odisha	12
12.	Angul-Balaram	ECOR	Odisha	15
13.	Sukinda-Talcher	ECOR	Odisha	92
14.	Banihal-Badgam	NR	J&K	88
15.	Abohar-Bhatinda-Kot Kapura	NR	Punjab	115
16.	Jalandhar -Lohian Khas	NR	Punjab	49
17.	Ludhiana-Jagraon	NR	Punjab	38
18.	Verka-Dera Baba Nanak	NR	Punjab	45
19.	Atari-Chheharta	NR	Punjab	18
20.	Taran Taran-Khemkaran	NR	Punjab	54
21.	Phagwara Jn. - Nawanshahar	NR	Punjab	35
22.	Jagraon-Moga-Firozpur	NR	Punjab	83
23.	Ishanagar-Udaipura	NCR	Madhya Pradesh	75
24.	Bankey Ganj-Mailani-Kurraiya	NER	Uttar Pradesh	29
25.	Shohrat garh-Pachperwa-Subhagpur	NER	Uttar Pradesh	118
26.	Kashipur-Lalkuao-Kathgodam	NER	Uttarakhand	79
27.	Moradabad-Ramnagar	NER	Uttar Pradesh & Uttarakhand	72
28.	Hathua-Panch Deori	NER	Bihar	32
29.	Indara-Dohrighat	NER	Uttar Pradesh	33
30.	Mirza-Azara	NFR	Assam	11
31.	Jagi Road-Senchoa-Mairabari & Senchoa-Silghat Town	NFR	West Bengal & Assam	165
32.	Aluabari-Siliguri-Sivok-New Mal-Dalgaon	NFR	West Bengal & Bihar	179
33.	Purnea-Jogbani	NFR	Bihar	79
34.	Dudhnoi-Mendipathar	NFR	Meghalaya & Assam	20
35.	Chaparmukh-Lumding	NFR	Assam	91
36.	Barsoi-Radhikapur	NFR	West Bengal & Bihar	54
37.	Eklakhi-Balurghat	NFR	West Bengal	87
38.	Luni-Barmer	NWR	Rajasthan	180

S.No.	Section	Railway	State	Rkms.
39.	Mavli-Bari Sadri	NWR	Rajasthan	82
40.	Udaipur-Kharwa Chanda	NWR	Rajasthan	25
41.	Biradhwai-Lalgarh	NWR	Rajasthan	154
42.	Sikar-Churu	NWR	Rajasthan	88
43.	Banisar-Bikaner-Merta-Parbatsar	NWR	Rajasthan	344
44.	Hanumangarh-Sriganganagar	NWR	Rajasthan	67
45.	Degana-Ratangarh	NWR	Rajasthan	87
46.	Bhikamkor- Jodhpur	NWR	Rajasthan	81
47.	Nagappattinam - Velanganni	SR	Tamil Nadu	10
48.	Palani-Dindigul	SR	Tamil Nadu	56
49.	Karaikudi-Manamadurai	SR	Tamil Nadu	61
50.	Virudunagar-Tenkasi	SR	Tamil Nadu	122
51.	Bhagavathipuram-Sengottai-Tenkasi-Tirunelveli -Tiruchendur	SR	Tamil Nadu	147
52.	Edamann-Punalur	SR	Kerala	8
53.	Washim-Hingoli-Purna	SCR	Maharashtra	125
54.	Kalikiri-Tummanamgunta	SCR	Andhra Pradesh	50
55.	Bavannapalem-Sattupalli	SCR	Telangana	14
56.	Khanapur-Latur Road-Parli Vaijnath-Parbhani	SCR	Karnataka & Maharashtra	225
57.	Aravalli-Nidadavolu	SCR	Andhra Pradesh	33
58.	Gadwal-Mahbubnagar	SCR	Telangana	73
59.	New Piduguralla-Savalyapuram	SCR	Andhra Pradesh	46
60.	Kosai-Mudkhed	SCR	Telangana	138
61.	Rotegaon- Aurangabad	SCR	Maharashtra	60
62.	Bethampudi Chord line	SCR	Telangana	3
63.	Nizamabad-Manoharabad	SCR	Telangana	117
64.	Jankampet-Basar	SCR	Telangana	23
65.	Kurnool - Gadwal	SCR	Telangana	54
66.	Aurangabad-Badnapur	SCR	Maharashtra	56
67.	Palari-Chourai	SECR	Madhya Pradesh	69
68.	Mandir Hasaud-Naya Raipur- Kendri	SECR	Chhattisgarh	15
69.	Gharghoda-Bhalumuda	SECR	Chhattisgarh	14
70.	Nittur-Birur-Hosdurga	SWR	Karnataka	151
71.	Kulem-Madgaon&Tinaighat-Castle Rock	SWR	Goa	44
72.	Chikjajur-Hubballi	SWR	Karnataka	191
73.	Mysuru-Chamarajanagar	SWR	Karnataka	61
74.	Chikballapur-Bangarapet	SWR	Karnataka	103
75.	Chikbanavar-Solur-Kunigal	SWR	Karnataka	60
76.	Birur-Kumsi	SWR	Karnataka	88
77.	Hosapete-Vyasa Colony	SWR	Karnataka	19
78.	Hassan-Arsikere	SWR	Karnataka	45
79.	Kadur - Sakharayapatna	SWR	Karnataka	17
80.	Holealur- Navanagar	SWR	Karnataka	41
81.	Londa-Belagavi	SWR	Karnataka	52
82.	Mahesana-Dangarwa	WR	Gujarat	29

S.No.	Section	Railway	State	Rkms.
83.	Sihor-Bhavnagar conc. Jetty	WR	Gujarat	31
84.	Muli Rd-Vagadiya- Wankaner-Dahinsara-Navlakhi&Dahinsara-Maliya Miyana	WR	Gujarat	158
85.	Varahi-Lakhpat	WR	Gujarat	42
86.	Nadiad - Modasa	WR	Gujarat	106
87.	Rajkot-Jetalsar-Lushala	WR	Gujarat	127
88.	Rajula-Mahuva	WR	Gujarat	31
89.	Samakhiyali-Adipur- New Bhuj	WR	Gujarat	114
90.	Amarsar- Bileshwar	WR	Gujarat	27
91.	Wansjaliya-Porbandar	WR	Gujarat	32
92.	Surbari-Samakhiyali	WR	Gujarat	24
93.	Miyagam-Dabhoi	WR	Gujarat	32
94.	Chota Udepur -Alirajpur	WR	Madhya Pradesh	49
95.	Katosan Road-Bechraji	WR	Gujarat	29
96.	Dhasa-Lunidhar	WR	Gujarat	47
97.	Chuli-Halvad	WR	Gujarat	17
98.	Junakhera-Aklera	WCR	Rajasthan	27
99.	Joka-Taratala	Kolkata Metro	West Bengal	7
100.	Kavi Subhash-Hemanta	Kolkata Metro	West Bengal	5
Total				6,565



IV. Important Railway Electrification Projects Completed during 2022-23:

S.No.	Section	Railway	State	Rkms.
1.	Jasai - Jawaharlal Nehru Port Trust	CR	Maharashtra	9
2.	Koderma - Hazaribagh - Barkakana - Ranchi	ECR	Jharkhand	203
3.	Dauramadhepura-Purnia	ECR	Bihar	77
4.	Taran Taran - Patti - Khem Karan	NR	Punjab	54
5.	Verka Jn. - Dera Baba Nanak	NR	Punjab	45
6.	Mahoba-Udaipura	NCR	Madhya Pradesh	196
7.	Gorakhpur-Anand Nagar-Gonda & Anand Nagar-Nautanwa	NER	Uttar Pradesh	262
8.	Moradabad-Kashipur-Ram Nagar, Rampur-Lalkua-Kathgodam incl. Lalkua-Kashipur and Bareilly-Lalkua	NER	Uttar Pradesh, Uttarakhand	309
9.	Katihar-Jogbani	NFR	Bihar	109
10.	Chaparmukh-Silghat Town incl. Senchoa Jn-Mairabari	NFR	Assam	130
11.	Aluabari-Siliguri via Baghdogra	NFR	Bihar & West Bengal	76
12.	Sadulpur-Ratangarh-Bikaner Lalgahar incl. Ratangarh Sardar shahar	NWR	Rajasthan	286
13.	Mavli – Bari Sadri	NWR	Rajasthan	82
14.	Ringas-Sikar-Churu	NWR	Rajasthan	140
15.	Virudunagar - Tenkasi Jn	SR	Tamil Nadu	122
16.	Tiruchchirappalli-Manamadurai-Virudunagar	SR	Tamil Nadu	217
17.	Dindigul-Palakkad	SR	Tamil Nadu & Kerala	179
18.	Tiruchchirappalli-Nagappattinam-Karaikal Port	SR	Tamil Nadu	153
19.	Pimpalkutti-Mudkhed & Parbhani -Parli Vajinath	SCR	Maharashtra & Telangana	246
20.	Purna-Akola	SCR	Maharashtra	209
21.	Parli Vajinath – Vikarabad	SCR	Telangana & Karnataka	269
22.	Dharmavaram-Pakala	SCR	Andhra Pradesh	228
23.	Chhindwara-Nainpur-Mandla Fort	SECR	Madhya Pradesh	183
24.	Chikbanavar-Hubballi	SWR	Karnataka	456
25.	Bangarapet-Yelahanka	SWR	Karnataka	149
26.	Mysuru-Chamaraja nagar	SWR	Karnataka	61
27.	Adipur- New Bhuj	WR	Gujarat	49
28.	Kanalus-Wansjaliya-Porbandar	WR	Gujarat	103
29.	Nadiad- Modasa	WR	Gujarat	105

Signal and Telecom

Signalling

To enhance safety in train operations and make it efficient, Modern Signalling Systems comprising of Panel Interlocking/Route Relay interlocking/Electronic Interlocking (PI/RRI/EI) with Multi Aspect Colour Light Signals (MACLS) are being progressively provided. So far 6,396 stations (covering about 98.31% of interlocked Broad Gauge stations) on Indian Railways have been provided with such systems, replacing the obsolete Multi Cabin Mechanical Signaling System, thus optimizing operational cost involved in its operation as well as enhancing safety by reducing human intervention. Indian Railways have in principle taken decision in 2016 to provide Electronic Interlocking in future at all installations. Out of 6,396 interlocked stations, 3,045 stations have been provided with Electronic Interlocking System as on 31.03.2023.

The new Electronic Interlocking System at Bandel Junction of Eastern Railway having provision of 1,002 routes is Asia's largest Electronic Interlocking System commissioned on 30.05.2022.

Complete Track Circuiting: To ensure track occupation verification, Track Circuiting has been completed at about 34,984 locations up to 31.03.2023 covering A, B, C, D Special and E Special route. Total 6,375 stations (98%) have been provided with complete track circuiting over Indian Railways.

Block Proving by Axle Counter (BPAC): To enhance safety and improved mobility 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 31.03.2023, Block Proving by Axle Counters (BPAC) has been provided on 6,364 block sections.

Intermediate Block Signaling: 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 31.03.2023, Intermediate Block Signalling has been provided in 727 block sections on Indian Railways.

Automatic Block Signaling: For augmenting Line Capacity and reducing headway on existing High Density Routes on Indian Railways, Signaling provides a low cost solution by provision of Automatic Block Signaling. As on 31.03.2023, Automatic Block Signaling has been provided on 3,908 Route Km.

Automatic Train Protection System: Kavach is indigenously developed Automatic Train Protection (ATP) system. Kavach aids the loco pilot in train running within specified speed limits by automatic application of brakes in case Loco Pilot fails to do so and also help the train safely run during inclement weather. Kavach is a highly technology intensive system, which requires safety certification of highest order. Subsequently Kavach was adopted as a National ATP system in July 2020. As on 31.03.2023, Kavach has been deployed on 1,465 Route km and 111 locomotives (including Electric Multiple Unit rakes) on South Central Railway.

Kavach tenders have been awarded for Delhi-Mumbai & Delhi-Howrah corridors (approximately 3,000 Route km) and work is in progress on these routes of Eastern, East Central, North Central, Northern, West Central and Western Railway zones. Indian Railways is preparing Detailed Project Report (DPR) and detailed estimate for another 6,000 Rkm. Further, KAVACH works have been sanctioned covering High Density Network (HDN) and other than HDN routes of Indian Railways.

Centralized Traffic Control (CTC):

It is a computer based system which facilitates control and management of multiple Signalling installations covering a number of stations from a single location. It also provides a real time simulation of railway traffic centrally helping in real time traffic planning for punctual train operations. Controllers can manage train movements directly from CTC centre on real time basis.

Centralized Traffic Control (CTC) covering 264.16 Route km of Double line section with 31 stations on Aligarh - Kanpur Route has been operationalized.

Further works of CTCs on about 14,660 Route Km including all entire HDN Routes have been approved.

Train Management System (TMS): TMS provides real-time status of train positions, all train movements and a complete view of the section covered on a giant screen provided in the divisional control centre. Punctuality reports, rake and crew links, train graphs, and unusual occurrence reports are generated in the control office.

The overall display panel, known as the 'Mimic Indication Panel', is designed to present detailed status of the system at a glance. It is expected that with commissioning of TMS/CTC projects, our controllers shall be able to efficiently manage train operations. Besides providing real time train running information in the control offices, passengers shall also be provided with accurate arrival/departure information at stations through automatic working of the Passenger information System at Stations. This system has been provided on Suburban sections of Mumbai on Western & Central Railways and Howrah of Eastern Railway. Similar System is being provided at Khurda Road in East Coast Railway and Sealdah division in Eastern Railway.

Interlocking of Level Crossing Gates:

Indian Railways have provided interlocking with Signals at 11,079 Level Crossing Gates as on 31.03.2023, to enhance the safety at Level Crossings. The numbers of interlocked level crossing gates have gone down due to closure of level crossing gates.

Sliding Boom at LC Gate:

Provision of Interlocked Sliding Boom has become very effective in minimizing 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. 7,031 Nos. of busy interlocked gates have been provided with Sliding Booms as on 31.03.2023 in addition to lifting barriers and further busy gates are also being progressively covered.

Growth of deployment of Signalling on Indian Railways:

Item	As on 31.03.2023				
	March,19	March,20	March,21	March,22	March,23
Panel Interlocking (Stations)	4,052	383	3,747	3,438	3,134
Route Relay Interlocking (Stations)	228	228	247	226	217
Electronic Interlocking (Stations)	1,606	1,927	2,206	2,572	3,045
PI/RR/I/EI (Stations)	5,886	6,018	6,200	6,236	6,396
Block Proving by Axle Counter (Block sections)	5,363	5,663	5,805	6,003	6,364
Automatic Signaling (Route Kms)	3,039	3,309	3,447	3,549	3,908
Intermediate Block Signaling (Block sections)	574	602	628	666	727
Interlocked level Crossing Gates (Nos.)	11,375	11,639	11,710	10,854	11,079

Self-Sufficiency

Signalling Workshop: Railway Signaling installations use a number of specialized equipment for smooth & safe running of trains. With upgradation of technology and shift towards electrical/electronic system of Signaling, 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, 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. Year wise out-turn achieved by these S&T workshops are as under:

Year wise Out-Turn of Signal and Telecommunication Workshop:

Year	Out Turn in ₹ Lakhs
2018-19	29,669.70
2019-20	32,385.90
2020-21	25,041.89
2021-22	31,300.00
2022-23	34,033.42

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 is successfully exploiting surplus capacity of IR Telecom network commercially.

As on March 2023, Indian Railways has about 64,141 Route Kilometers of Optical Fibre Cable (OFC) that is carrying Gigabits of traffic. Railways Control Communication which is quintessential for train operation is also being transferred to OFC system. This OFC network is also contributing significantly in building National Knowledge Network through RailTel. RailTel also provides RailWire Broadband services.

In line with “Digital India” initiative of Government of India, Railways have provided Wi-Fi Internet facility at 6,108 stations. Indian Railways is also using 1.34 lakh VHF sets to ensure safety and enhance reliability in train operations.

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. Railway has planned to provide Video Surveillance System at all stations (All category except halt stations) of Indian Railways. Video Surveillance (CCTV) System has been provided at 866 stations till 31.03.2023. In addition, CCTV also provided at Railway Offices & at all Divisional & Zonal Hospitals over Indian Railways.

Indian Railways have also rolled out Global System of Mobile Communication – Railways (GSM-R) based Mobile Train Radio Communication (MTRC). MTRC has already been provided on 2,756.6 Route Kms. Now Railways have decided to go for Long Term Evolution (LTE) System based MTRC to fulfill the data and voice needs.

Railways have also established their Multi-Protocol Level Switching (MPLS) based Next Generation Network (NGN) for voice traffic. This Next Generation Network (NGN) has been used to interconnect more than 100 exchanges of Railways carrying the administrative voice traffic. Common User Group (CUG) mobile phones have also been hired to enable communication while on move to enhance safety, reliability and productivity. Further Railways have decided to extend the CUG facility to all its employees.

Railways have been allocated dedicated 5 MHz Bandwidth in 700 MHz spectrum for captive Mobile Train Radio Communication Telecom (MTRC). Telecom also plays a major role in ensuring passenger comfort. For the convenience of passengers, Train Information Boards have been provided at 1,208 Stations, Public Address (PA) Systems at 5,516 stations and Coach Guidance System at 705.

As part of digital initiative of Government of India and to bridge digital divide, Wi-Fi facility has been provided at 6,108 stations as on 31.03.2023. Indian Railways have progressively been implementing e-office application for paperless working in the office besides improving transparency and efficiency in the system. Till 31.03.2023, 236 locations including all zonal & divisional headquarters have been connected through e-Office & approx. 1.47 lakh user accounts have also been created over Indian Railways.

Important Telecom assets are tabulated below:

S.No.	Installation	Units	As on	As on
			31.03.2022	31.03.2023
1.	Optical Fibre Cable	Rkms	62,652	64,141
2.	Quad Cable	Rkms	63,844	64,956
3.	Railway Telephone Subscribers Lines	Nos.	3,45,374	3,45,374

4.	No. of Control Sections provided with Dual Tone Multiple Frequency (DTMF) control equipment	Nos.	325	325
5.	Mobile Train Radio communication System (Route kms.):			
a.	GSM (R) based	Rkms	2,728	2,756.6
b.	TETRA based	Rkms	53	75.38
6.	Public Address System	Nos. of STNs	5,159	5,516
7.	Train Display Boards	Nos. of STNs	1,190	1,208
8.	Coach Guidance System	Nos. of STNs	697	705
9.	VHF Sets			
a.	5 Watt sets (Hand held)	Nos.	1,52,050	1,34,210
b.	25 Watt sets (At Stations)	Nos.	8,283	8,772
10.	V SAT	Nos.	396	327
11.	Railnet Connections	Nos.	1,54,175	1,54,175
12.	UTS/PRS Circuits	Nos.	11,091	10,507
13.	FOIS Circuits	Nos.	2,790	2,962
14.	Exchange Circuits	Nos.	1,819	1,637
15.	Wi-Fi at Stations	Nos. of STNs	6,100	6,108
16.	CCTV at Stations	Nos. of STNs	853	866
17.	E-Office (No. of Locations)	Nos. of Locations	216	236



Auto singalling commissioned in 170 KMs.

Rolling Stock

Locomotives:

The size of IR's fleet of locomotive stock as on 31st March, 2023 consisted of 39 steam, 4,750 diesel and 9,565 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
2020-21	39	5,108	7,587	12,734	39,911	16,439
2021-22	39	4,747	8,429	13,215	40,553	*16,031
2022-23	39	4,756	9,565	14,360	41,171	15,978
*revised						

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

Year	Broad Gauge		Metre Gauge	
	Diesel	Electric	Diesel	Electric
2019-20	38,777	39,257	18,963	-
2020-21	40,246	39,691	19,080	-
2021-22	39,899	40,912	*18,964	-
2022-23	40,912	41,296	18,964	-
*revised				

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
2020-21	10,991	19,51,169	58,778	43,00,547	1,965	1,75,534	7,949
2021-22	*11,984	*17,64,857	*63,299	*46,85,098	1,969	*1,74,020	*10,159
2022-23	11,664	17,74,546	64,204	47,22,460	1,914	1,69,141	11,138
\$ Includes standing accommodation.							
+ Includes luggage vans, mail vans, parcel vans etc.							
@ Includes Rail Cars.							
* revised							

Wagons:

As on 31st March, 2023, the size of IR’s wagon fleet consisted of 3,15,791 units 71,986 covered, 1,76,756 open high-sided, 24,510 open low-sided, 25,412 other types and 17,127 brake vans/departmental wagons:

Year	Total wagons on line (In units)	Percentage of total number of wagons					Total
		Covered	Open high sided	Open low sided	Other types	Depart-mental	
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
2020-21	3,02,663	22.3	56.1	8.2	8.1	5.3	100
2021-22	3,18,896	22.1	55.4	8.6	*8.1	5.7	100
2022-23	3,15,791	22.8	56.0	7.8	8.0	5.4	100

* revised

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

Year	All Gauges		Broad Gauge		Metre Gauge	
	Total number of wagons\$ (000)	Total capacity (Million tonnes)	Number\$ (000)	Average capacity (Tonnes)	Number\$ (000)	Average capacity (Tonnes)
1950-51	195	4.14	149	22.6	43	17.1
1960-61	295	6.30	207	23.1	83	18.0
1970-71	368	9.35	271	27.8	91	19.1
1980-81	387	11.14	299	30.6	83	23.0
1990-91	335	11.50	276	36.9	55	22.9
2000-01	214	10.19	199	48.7	14	34.4
2010-11	217	12.18	213	56.6	4	33.0
2020-21	287	17.82	286	62.3	0.9	32.2
2021-22	*300	*18.61	300	61.7	*0.9	32.4
2022-23	300	18.75	299	62.9	0.8	32.3

\$ Excludes departmental service wagons and brake vans
 * revised

Some of the major types of wagons plying on IR as on 31.3.2023 are shown below:

Types of Wagons fleet (BG)			
Types of Wagon	Units available	Tare weight (t)	Brief description
BOXNHL	87,035	20.6	Bogie open air brake, stainless steel wagon.
BOX' N'/M1	18,325	23.2	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.
BOXNHS/M1	15,946	23.2	Bogie open wagon, air brake, high speed.
BOXNS	4,593	19.85	Bogie open wagon, air brake, high speed.
BOXNLW	2,271	20.41	Bogie open wagon, air brake, light weight.
BOXNCR	428	23.1	Bogie open wagon, air brake, made of corrosion resistant IRS M : 44 steel.
BOXNHA	267	23.17	Bogie open, air brake wagon of 22 t axle load with high side walls (higher than BOXN), designed for transportation of coal.
BOY	07	20.71	Standard Gondola wagon, air brake, to carry minerals/ iron ore with an axle load of 22.9 t.
BCN/M1 / BCNA /M1	39,536	27.20/ 24.55	Bogie covered wagon, air brake fully riveted / welded construction for transportation of bagged cement, food grains, fertilizers, etc.

BCNAHS/M1	19,271	24.6	Bogie covered, air brake, all welded & riveted construction with High Speed bogie CASNUB – 22 HS BOGIE.
BCNHL	18,861	20.8	Bogie covered, air brake, micro – alloy (stainless steel wagon)
BOBR/N/ HS/M1	17,782	26.40/ 25.6/ 25.61	Bogie open rapid discharge air brake wagon for coal.
BRNA / HS	6,109	23.54	Bogie Rail wagon Heavy, air brake, High Speed bogie, riveted cum welded construction.
BOST / HS	4,792	25.5	Longer BOXNHS, air brake, wagon for finished steel products.
BRHNEHS	1,476	26.15	Bogie Rail wagon, air brake, high speed CASNUB BOGIE for engineering department.
BFNS	1,188	26.71	Bogie Flat, air brake wagon, high speed for transportation of H.R. coils, plates, sheets & billets loading.
BRN	748	24.393	Bogie Rail wagon Heavy, air brake.
BOBYN/M1	6,497	27.78	Bogie Hopper, air brake, bottom discharge wagon.
BOBSN/M1	2,609	30.00	Bogie open air brake, side discharge wagon for iron ore.
BTPN	12,991	27.00	Bogie Tank wagon, air brake, for liquid consignments like petrol, naphtha, ATF and other petroleum products.
BTPGLN	1,078	41.6	Bogie Tank wagon, air brake, for carrying Liquified Petroleum Gas.
BTFLN	777	23.58	Bogie Tank wagon, air brake, with frameless body.
BLCA/ BLCB/ BLCAM	22,458	19.1/ 18.00/ 18.00	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	1,638	19.1/ 19.00	Container Flat wagon, same as BLCA / BLCB, but with a Longer Platform of 45ft. (privately owned).

Repairs and Maintenance:

44 Loco sheds and 256 BG Carriage and Wagons sick lines and central repair depots provide repair and maintenance facilities for the entire fleet of rolling stock.

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	
	2021-22	2022-23
Diesel Locos	47	53
Electric Locos	373	399
Coaches	27,224	30,006
Wagons	56,135	65,142

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:

Year	Percentage of Train Kms. by types of traction						
	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
2020-21	-	18.9	63.7	17.36	-	27.0	73.0
2021-22	-	*34.4	*51.5	*13.7	-	24.4	75.6
2022-23	-	25.3	62.8	11.8	-	20.5	79.5

@ 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
2020-21	-	21.2	69.1	9.7	-	25.5	74.5
2021-22*	-	23.5	70.6	5.8	-	22.7	77.3
2022-23	-	19.1	75.0	5.9	-	20.3	79.7

@ includes DHMU & DEMU
* revised

Electric Traction:

Electric loco production:

During the year 2022-23, a total of 1,086 electric locomotives have been inducted in the Indian Railway system. During the year, CLW, BLW & PLW have turned out 436, 343 & 198 three-phase energy efficient electric locomotives respectively. In addition, MELPL & BHEL have manufactured 100 & 9 electric locomotives respectively. As on 31st March 2023, IR has a fleet of 9,411 electric locomotives.

New Era of Green Technology-HOG power supply:

As on 31st March 2023, 1,309 electric locomotives have been provided with Hotel Load Converter for deployment in Head on Generation (HOG) enabled coaching rakes/trains. The main benefits of this system are supply of pollution free and cheaper power from OHE as compared to End on Generation (EOG) system besides other advantages like reduction of carbon emission, noise level and consumption of fossil fuels helping in protecting the environment.

Software for Loco Asset Management (SLAM):

A computer application 'Software for Loco Asset Management (SLAM)' has been successfully developed by CRIS for monitoring of electric locomotive performance and reliability. The SLAM is now rolled out on pan India basis covering all the Electric & Diesel sheds, trip sheds, Production units, RDSO, workshops etc. for ease of locomotive fleet management & monitoring at each level from anywhere.

Diesel Traction

Auxiliary Power Unit (APU) - APU is a self-contained unit fitted in diesel locomotives for fuel saving, with a small diesel engine coupled with compressor 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 locomotive 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 ₹20 lakh/year on account of savings in fuel oil only. This unit has also fitted in all the new diesel locomotives being manufactured at Marhowra plant.

Transferred 20 WDM3D Board Gauge Diesel Locomotives to Bangladesh Railway – Ministry of Railways (MOR) have been transferred 20 nos. WDM3D Board Gauge serviceable Diesel Locomotives through Ministry of External Affairs (MEA) to Bangladesh Railway (BR) on Grant Basis. These locomotives have been flagged off by Hon'ble Minister of Railways on 23rd May 2023.

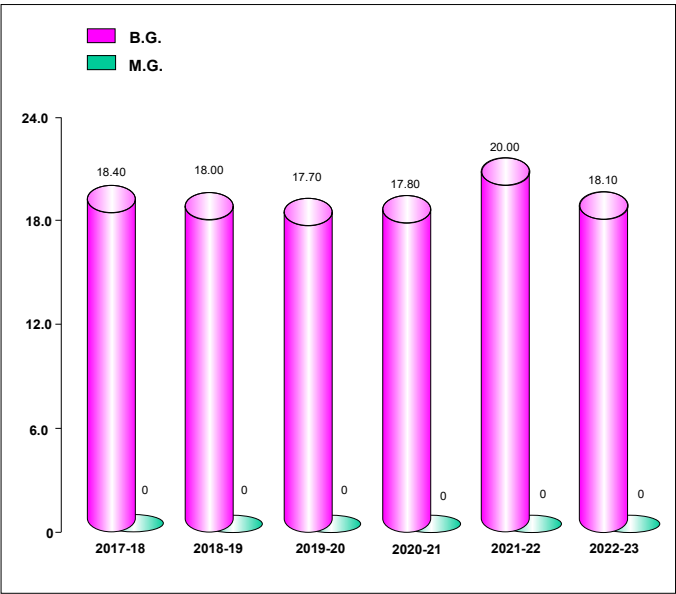
Steam Locomotive

Steam Locomotives are the icons of Indian Railways rich industrial heritage. The sound and smells of the gallant stalwarts of a bygone era are major tourist attractions. 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 Harsaru & Farukhnagar (Delhi Division)
- (ii) Broad Gauge Steam Tourist specials over selected routes of Southern Railway.
- (iii) Narrow Gauge Steam services over Darjeeling Himalayan Railway (DHR), now in its 144th year and a UNESCO World Heritage Site.
- (iv) Meter Gauge Steam services over Nilgiri Mountain Railway (NMR), now in its 116th year and a UNESCO World Heritage Site.
- (v) Narrow Gauge Steam services over Kalka-Simla Railway (KSR) now in its 121st year and UNESCO World Heritage Site.
- (vi) Narrow Gauge Steam services over Neral-Matheran on Matheran Light Railway (MLR), now in its 117th year.
- (vii) Narrow Gauge Steam Services over Kangra Valley Railway (KVR), now in its 95th year.

WG Class Steam Locomotive No. 10,253 has been revived at Rewari Steam Shed. It was steam up and moved on its wheel and resurrected on 24.09.2023 after 32 years. 105 year old Steam loco 794-B was flagged off at Neral Station of Nilgiri Mountain Railway to attract the tourists.

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



Personnel

The number of regular employees on Indian Railways as on 31.3.2023 stood at 11,89,615.

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

Number@ of staff as on 31st March (in thousands)					Expenditure@ on staff (₹ in crore)
Year	Groups A&B	Group C	Group D	Total	
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
2020-21	18.6	1,224.2	#	1,242.7	1,39,818.25
2021-22	18.3	1,194.6	#	1,212.9	*1,51,494.27
2022-23	17.8	1,171.80	#	1,189.6	1,61,418.87
*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.					
# erstwhile Group D merged in Group C from 2019-20.					

Number of personnel (Groups A & B) constitute 1.50% of the total strength, while Group C (including Group D merged in Group C) account for 98.50%. Of the employees in Group C 1.20 lakh (10.27%) are workshop employees and artisans and 10.51 lakh (89.73%) from other categories including running staff. Railway Protection Force/RPSF personnel totaled 65,624.

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 2022-23 as compared to the previous year is given below:

	Number of SC Employees		Number of ST Employees	
	As on 31.03.2022	As on 31.03.2023	As on 31.03.2022	As on 31.03.2023
Group A	1,468 (13.61%)	1,448 (13.94%)	780 (7.23%)	772 (7.43%)
Group B	1,175 (15.60%)	1,225 (16.50%)	497 (6.60%)	517 (6.96%)
Group C #	1,96,647 (16.46%)	1,97,830 (16.88%)	92,294 (7.73%)	91,468 (7.81%)
Grand Total	1,99,290 (16.43%)	2,00,503 (16.85%)	93,871 (7.74%)	92,757 (7.80%)
# Group 'C' 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 2022-23 was ₹1,61,418.87 crore registering an increase of ₹9,924.60 crore over the previous year. The average wage per employee was up by 8.7% from ₹12,48,863 per annum in 2021-22 to ₹13,56,900 per annum in 2022-23. 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 57%.

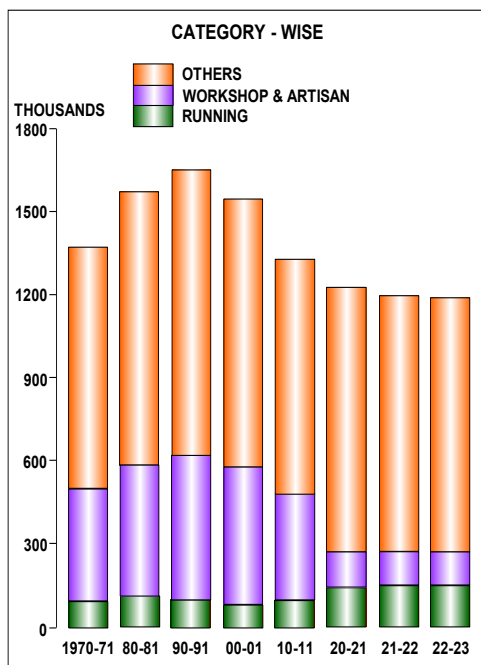
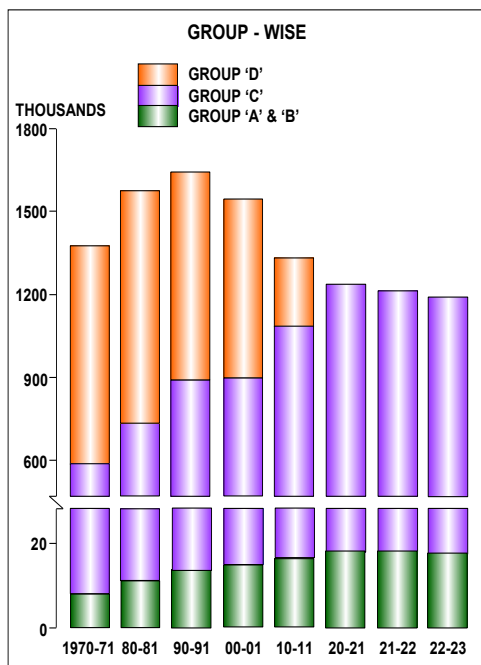
The average annual wage (excluding fringe benefits) per employee paid under various categories in 2022-23 is given below:

Category	Groups A & B (₹)	Group C (₹)	Group D (₹)	Total (₹)
Workshop and artisan	-	14,18,556	-	14,18,556
Running*	-	17,55,603	-	17,55,603
Others	-	12,37,777	-	12,37,777
Total	36,39,459	13,22,198	-	13,56,900
*Emoluments include running allowance.				

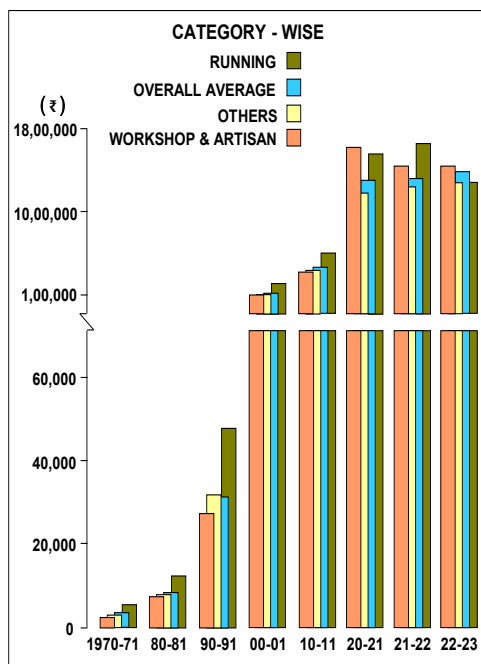
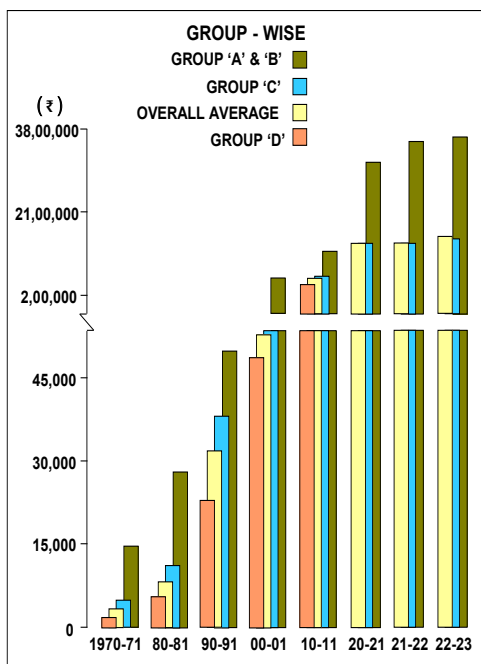
Productivity Linked Bonus:

In 2022-23, all eligible non-gazetted Railway employees (excluding RPF/RPSF personnel) were sanctioned Productivity Linked Bonus (PLB) for 78 days. This benefitted an estimated 11,07,346 Railway employees. Further, Group 'C' and RPF/RPSF personnel have been sanctioned ad-hoc bonus equivalent to 30 (thirty) days' emoluments for the year 2022-23. 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 ₹1,968.87 crore and ₹44.27 crore respectively.

NUMBER OF PERSONNEL



AVERAGE ANNUAL WAGE PER EMPLOYEE



Human Resource Development (HRD) and Manpower Planning:

Training

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 of new developments in technology) and Specialized training (for Specialized courses). During 2022-23, around 4,35,514 non-gazetted employees have been provided different types of training i. e. initial, promotional, refresher and specialized.

To meet the challenges posed by changes/advancement in technology, quality of services and safety of operations, significant initiatives have been taken to train the human resources.

All safety category railway employees are given structured training at various stages of their career. Detailed training modules as per prescribed periodicity are available for each category at initial/promotional stages along with refresher courses and specialized training courses laying emphasis on more practical aspects which helps them in assimilating technology transferred and skill upgradation. These modules are updated keeping in view the technological changes in working practice. Safety Category staff like loco staff also undergo simulation training. Online training materials have also being made available to the trainees.

All frontline staff involved in train operations are imparted a special one day capsule training on Threat Perception & Emergency Response. Training module has also been formulated for running staff to include training Course on Fire Fighting & use of fire extinguishers, in initial and periodic refresher courses for Assistant Loco Pilots, AC Attendants and other running staff. Safety staff are given exclusive training on First Aid and on Disaster Management with the emphasis on Relief, Rescue and Rehabilitation (three 'R's). Yoga and Meditation lessons have been introduced in training centres with an aim to help railway men in coping with the stresses involved with their jobs. Some of the other Specialized Courses run by the Training Centres include Management Development Programme for Supervisors, Safety Oriented Course for Permanent Way supervisors, Air brake Operations Training for Guards and Drivers, Inspection and Rehabilitation of Bridges for Junior Engineers/Senior Section Engineers (Permanent Way)/ Bridge/ Works.

Apart from in-house training, railway employees are also sent for foreign trainings under transfer of technology and are also provided inputs through leading training institutes within India.

Apprenticeship Training

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.

Indian Railways have also been awarded “CERTIFICATE OF APPRECIATION” for outstanding contribution towards engagement of apprentices.

Training Modules

In view of technological upgradation and changed job requirements, there was a need to review the existing training modules of all the departments. Therefore, the existing training modules of all the departments viz. Traffic, Commercial, Electrical, Civil, Mechanical, Personnel, Signal & Tele and Finance were reviewed, updated & uploaded on Railway's website. These Training modules have been converted into online mode and the same have been uploaded.

Online Training

The training material for different categories of staff has also been converted in online mode in the form of power point presentations, pdf documents and videos of lectures etc. These training materials can now be accessed by Railway employees even from his remotest place of posting. Most of the trainings are now being conducted in online/blended mode.

Railway Recruitment Boards:

During the financial year 2022-2023, the following activities/initiatives have been undertaken by RRBs:

- IInd Stage Computer based test (CBT) for about 08 Lakh candidates and in Computer Based Skill Test for NTPC categories posts under CEN no. 01/2019 has been conducted during May 2022 to August 2022.
- Single Stage Computer Based Test (CBT) for 1.11 crore candidates

applied for 1,03,769 vacancies under CEN No. RRC 01/2019 Level 1 posts (erstwhile Group 'D' posts) has been concluded from 17.08.2022 to 11.10.2022 in 5 phases.

Aadhar Authentication: After several meetings, interactions and exchanges with UIDAI officials, UIDAI approved the scheme to use biometric attendance with Aadhar Data of candidates appearing in RRB exam and a Gazette Notification amending General Rules of sub-section (ii) clause (b) subsection (4) of section 4 of Aadhar Act, 2016 (18 of 2016) read with rule 5 of Aadhar Authentication for Good Governance (Social Welfare, Innovation, Knowledge) Rules, 2009 have been notified by Government of India Press and published under G.S.R 507 (E) dated 04.07.2022. This has been implemented in CBT for CEN RRC 01/2019 (Level 1) for 1,03,769 vacancies held in 33 days in 99 shifts for 1,11,57,996 candidates scheduled from 17th August 2022 to 11th October 2022 in five phases across 33 states, 191 cities and 551 test centers which is summarized below. Examination centers were set up all across the country including the remotest areas of the country viz. North East sister states, Islands of Andaman & Nicobar as well as Lakshadweep and Kashmir valley in north.

Rozgar Mela: Since, October 2022 Pradhan Mantri Mission Rozgar Mela is being organized by DoP&T every month.

Further, during 2022-23, panels of 43,832 candidates have been supplied to the Indenting Railway(s)/Production Unit(s) by 21 RRBs across India.

Staff Welfare

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

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

Approximately 41.88% staff have been provided with railway quarters, 2,659 staff quarters were electrified during 2022-23.

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

Cooperative societies of various types are functioning on Indian Railways. These Cooperative Societies are either registered with Central Registrar of Cooperative Societies, then Ministry of Agriculture, Department

of Agriculture and Cooperation. Now Ministry of Cooperation or Registrar of Cooperative Societies of the State concerned in which they are operating. The affairs of such societies are governed by Multi State Cooperative Societies Act 2002.

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 53 Thrift and Credit Societies, 101 Railway men's Consumer Cooperative Societies, 11 Labour Cooperative Societies and 4 Railway men's Housing Societies functioning on Indian Railways during 2022-23.

Indian Railway Medical Service:

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

With a sanctioned strength of 2,572 Medical Officers and 37,087 paramedical staff it is the largest industrial health services in the world. It is running 24x7 round the year, with 129 hospitals & 586 health units having a total of 14,000 indoor beds spread throughout the length & breadth of country. It attends to roughly one crore beneficiaries.

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

Ayushman Bharat Pradhan Mantri- Jan Arogya Yojana has been implemented the Railway Hospitals. As on date, 91 hospitals have been opened for AB PM-JAY beneficiaries.

Thirteen of our zonal hospitals are functioning as institutions for training for the very prestigious DNB program in most of the specialties and some super specialties.

Other activities carried out by IRHS are providing first aid to travelling passengers, attending Railway accidents, colony sanitation, and implementation of Food Safety Standards Act (FSSA), various National Health Programmes and providing post-graduation training & study program. Our health services inspire great confidence amongst the beneficiaries.

Covid treatment and vaccination is being done in Railway hospital, 98 PSA Oxygen generation plants have been installed and commissioned in Railway hospital. More than 21 lakh beneficiaries have been given first dose of Covid vaccination and more than 19 lakh their second dose.

Performance Statistics (2022-23)

Total OPD cases attended	1,77,40,128
Total Indoor cases admitted	4,89,019
Total no. of surgeries performed	1,28,625
Percentage of man days lost due to sickness	1.72
No. of New Candidates examined for fitness	1,42,273
No. of employee examined under Periodical medical Examination (PME)	1,19,570
No. of food samples collected/found faulty	3,882
Water sample for residual chlorine tested/fit	12,13,606/11,03,624
Water sample for bacteriological tested/fit	78,756/75,096
No. of sick passengers attended by Railway Doctors	67,643
No. of Children immunized	8,484
Wellness assurance camp	10,394
Total no. of persons examined in the multipurpose health drives above	2,00,885

Pension Adalats

Instructions have been issued to Zonal Railways & Production Units to conduct Pension Adalat annually on Zonal level and quarterly at Divisional level to examine & settle the grievances of pensioners. In accordance with the directive of Department of Pension & Pensioners Welfare (DoP&PW). All out efforts are being made to settle these cases on the spot. A total number of 4,087 cases were taken up during the Pension Adalat held in the month December, 2022.

Railway Minister's Welfare and Relief Fund

The Fund is aimed at providing financial assistance and relief to Railway employees and their families in distress. Voluntary contributions from the employees and Railway Women's Organizations constitute the primary source of the Fund.

Railway Schools

IR runs and manages one Degree College and 69 Railway Schools. These schools are being operated purely as a measure of Staff Welfare and

they provide quality education at subsidized cost to the wards of Railway employees as well as non-Railway wards. In addition to this, 93 Kendriya Vidyalay are also being run on Railway land, thus catering to the needs of children 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 Indian Railways. Till the end of 31st March, 2023, the total number of notified Railway Offices is 3,637. In these Railway offices, employees proficient in Hindi have already been given directions to transact cent-percent work in Hindi in the subjects specified under Official Language Rules. Besides this, Official Language officers of Railway Board office and Zonal Railways regularly inspect the Railway Offices to monitor the implementation of Hindi. In the year 2022-23 a total number of 71 inspections have been carried out by the second Sub-Committee of Parliamentary Committee on Official Language and has appreciated the use of Hindi in these Offices during inspections by Parliamentary Committee. In addition to this Grih-Patrika ‘Rail Rajbhasha’ in Hindi is also published by Railway Board Office. Till now 132 editions of the patrika have been published and circulated to all the Railway offices. About 156 Hindi Grih-Patrika are also being published by Zonal Railways/Divisions etc. at their level.

Training in Hindi Typewriting, Hindi Stenography and Hindi Language

In addition to the Training Centres set up by the Ministry of Home Affairs, arrangement are also made by Indian Railways to provide in-service training in Hindi language, Hindi typing and Hindi stenography. The number of employees trained at the end of 2022-23 as compared to 2021-22 as follows:-

Activity	As on March 31st 2022	As on March 31st 2023
Working knowledge/ Proficient in Hindi	8,79,262	8,56,740
Hindi Typing	7,672	7,882
Hindi Stenography	2,597	3,005

Other activities

The existing policy of purchasing bilingual electronic equipments, like computers etc. is being followed. During 2022-23, 71,863 bilingual personal computers are available in various offices of Indian Railways. Websites of

the Zonal Railways including Railway Board are also available in bilingual form. In order to promote usage of Hindi in Railway Offices, 967 Codes/Manual and 6,653 Station-Working Rules have been published bilingually. Presently, more than 17 lakh books in Hindi are available in 986 Hindi libraries on Indian Railways.

Official Language Implementation Committees

To review the progress of the use of Hindi, total 979 Official Language Implementation Committees are constituted on the Zonal Railways, Production Units etc and meetings of these committees are being organized regularly. Besides this, Railway Board Official Language Implementation Committee has also been constituted at Railway Board level and its meetings were conducted regularly.

Railway Hindi Salahakar Samiti

In order to propagate the usage of Hindi in Ministry of Railways and Zonal Railways, Railway Hindi Salahakar Samiti is constituted under the Chairmanship of Hon'ble Minister of Railways, whose main objective is to give valuable suggestions to increase the use of Hindi. The 61st meeting of the Railway Hindi Salahakar Samiti was conducted under the chairmanship of the Hon'ble Minister of Railways on 05.05.2022 wherein Hon'ble members of Hindi Salahakar Samiti also gave their valuable suggestions for implementation and propagation 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 Kamalapati Tripathi Rajbhasha Swarna Padak Puraskar Yojna, Rail Mantri Rajbhasha Rajat Padak Puraskar Yojna, Rail Mantri Rajbhasha Shield/Trophy and other Running Shield Puraskar Yojna, Individual Cash Award Scheme, Rail Mantri Hindi Nibandh Puraskar Yojna, Premchand Puraskar Yojna, Maithilisharan Gupta Puraskar Yojna, Lal Bahadur Shastri Takniki Maulik Lekhan Puraskar Yojna, Rail Yatra Vritant Puraskar Yojna, Zonal Railway/All India Level Hindi Essay, Hindi Elocution and Hindi Noting & Drafting Competition and Akhil Rail Hindi Natyotsav Competition.

All Indian Railway Hindi Essay, Hindi Elocution and Hindi Noting and Drafting competitions were successfully organized at Zonal Railway Training Institute, Udaipur, North Western Railway from 25th to 27th May, 2022.

On the occasion of Amrit Mahotsav, Akhil Bharatiya Rajbhasha Sammelan was organized by the Department of Official Language, Ministry of Home Affairs in Surat on 14th and 15th September, 2022 in which

Ministry of Railways was awarded 3rd prize of 'Rajbhasha Kirti Puraskar' for best implementation of Official Language Policy during the year 2021-22.

In order to promote Rajbhasha, 'Hindi Pakhwara' was organized from 14th to 29th September, 2022 in the Ministry of Railways. In inaugural function, message of Hon'ble Home Minister and Hon'ble Railway Minister was read. During this period, Hindi Essay Competition, Hindi Elocution Competition, Hindi Noting and Drafting Competition, Antakshari Competition, Rajbhasha Seminar, Sangeet Sandhya (Rangoli) were organised. Birth anniversary of Hindi poet Ramdhari Singh Dinkar was celebrated on 29.09.2022 and subsequently, Prize distribution ceremony took place at the end of Hindi Pakhwara.

On 21st November, 2022, 'Kavi Sammelan' was organized in the Conference Hall of Rail Bhawan. Besides this, All Indian Railways Hindi Natyotsav-2022 was also organized at Railway Coach Factory, Kapurthala from 11th to 14th March, 2023.

Outstanding Achievements in Sports:

I. At International Level:

- In XXII Commonwealth Games 2022 held at Birmingham (United Kingdom) from 28th July, 2022 to 8th August, 2022 the contribution of Railway sportspersons in the Country's medal tally in the Commonwealth Games 2022 has been significant. Out of total 61 medals won by India, Railway bagged 12 medals. They have contributed 03 Gold, 04 Silver and 05 Bronze Medals. The performance of Railway players has been remarkable.
- Indian Railway Wrestling (Men & Women) players Shri Bajrang and Shri Gourav Baliyan won Silver and Shri Sunil Kumar, Ms. Sarita & Shri Satyavrat Kadiyan won Bronze Medals in the Senior Asian Free Style, Greco Roman Style and Women Wrestling Championship held at Ulaanbaatar (Magnolia) from 19.04.2022 to 24.04.2022.
- Indian Railway Shooting player, Shri Kusale Swapnil won Silver Medal in the event of Men's 50m Rifle Event in the ISSF World Cup 2022 held at Baku (Azerbaijan) from 27th May, 2022 to 7th June, 2022.
- Gymnastic player, Ms. Pranati Nayak (CLW) won Bronze Medal in the 9th Asian Gymnastics & Artistic Championship held at Doha (Qatar) from 15th to 18th June, 2022.

- Indian Railway Cross Country (Men & Women) teams won Gold Medal in USIC (World Railway) Cross Country (Men & Woman) Championship held at Berlin (Germany) from 13th to 16th July, 2022.
- Indian Railway Wrestler, Shri Nitesh (WR) won Bronze in the U-23 World Wrestling Championship 2022 held at Pontevedra, Spain from 17th to 23rd October, 2023.
- Indian Railway Shooter, Shri Swapnil Kusale (CR) Won Bronze Medal in World Championship at Cairo, Egypt from 12th Oct to 25th Oct 2022.
- Indian Railway Senior Women Cricket team won the Senior Women T20 trophy held at Bengaluru on 05.11.22. Out of 15 players of Indian Team, 06 players from Indian Railways.
- Indian Railway Shooter, Ms. Meghana Sajjanar (SWR) won Gold medal in the 15th Asian Air Gun Shooting Championship held at Daegu, Korea from 9th to 19th Nov. 2022.
- Indian Railway Chess player, Shri. P Shyaam Nikhil (ICF) won Gold medal in the Commonwealth Chess Championship held at Srilanka from 13th to 22nd Nov. 2022.
- Indian Railway Table Tennis (Men & Women) teams won Gold Medals in the USIC (World Railway) Table Tennis held at Jaipur (India) from 21st to 26th November, 2022.
- Three Indian Railway Kho-Kho (Men) players represented the country in the 4th Asian Kho Kho Championship held at Tamulpur (Assam) from 20th to 23rd March, 2023 and won Gold Medal.

II. At National Level:

During 1st April, 2022 to 31st March, 2023, Indian Railways teams participated in total 53 National Championships. Out of which IR was semi-finalist in 01 Championships, 3rd Position in 04 Championships, Runners-up in 10 Championships and Winners in 22 Championships.

III. Following Railway players have been honored with National Sports Awards during 2022-23:-

S.No.	Name	Game	Award	Railway
I	Ms. Sarita	Wrestling	Arjuna Award	NWR
II	Ms. Deep Grace Ekka	Hockey	Arjuna Award	ECoR
III	Shri Sujit Mann	Wrestling	Dronacharya Award	NR
IV	Md. Ali Qamar	Boxing	Dronacharya Award	ER

Finance

Indian Railways financial results for 2022-23 compared with the previous year are tabulated below:

		(₹ in crore)
	2021-22	2022-23
Capital Investment	*4,13,268.80	**5,19,470.28
Investment from Capital Fund	53,449.91	53,449.91
Total	4,66,718.71	5,72,920.19
Passenger Earnings	39,214.39	63,416.85
Other Coaching Earnings	4,899.56	5,958.32
Goods Earnings	1,41,096.39	1,62,262.90
Sundry Earnings	6,067.96	8,498.60
Gross Earnings	1,91,278.30	2,40,136.67
Suspense	(-)71.83	(-)154.11
Gross Traffic Receipts	1,91,206.48	2,39,982.56
Ordinary Working Expenses	1,56,506.34	1,80,255.78
Appropriation to Depreciation Reserve Fund	-	700.00
Appropriation to Pension Fund	48,100.00	54,700.00
Total Working Expenses	2,04,606.34	2,35,655.78
Net Traffic Receipts	(-)13,399.86	4,326.78
Miscellaneous Transactions	(-)1,624.72	(-)1,809.40
Net Revenue Receipts	(-)15,024.58	2,517.38
Dividend payable to Genl Revenues \$	-	-
Excess (+)/Shorfall (-)	(-)15,024.58	2,517.38
Percentage of Net Revenue to Capital at charge including Investment from Capital Fund	(-)3.22	0.44
Operating Ratio (%)	107.39	98.10
Capital-at-charge (including investment from Capital Fund) per NTKM (in paise)	507	551
* Excludes ₹19,527.63 crore of MTPs, ₹1,911.20 crore of Circular Railways, ₹11,954.00 crore of Appropriation to SRSF, ₹56,617.40 crore Investment in DFCCIL and others, ₹16,026.70 crore of Investment in Udhampur-Srinagar-Baramulla, ₹70,000.00 crore investment in RRSK and ₹32,957.03 crore investment in RSF. Includes ₹17,717.06 crore of Production Units.		
** Excludes ₹22,328.31 crore of MTPs, ₹1,916.20 crore of Circular Railways, ₹11,954.00 crore of Appropriation to SRSF, ₹56,617.40 crore Investment in DFCCIL and others, ₹16,026.70 crore of Investment in Udhampur-Srinagar-Baramulla, ₹80,000.00 crore investment in RRSK, ₹62,957.03 crore investment in RSF and ₹10,239.00 crore Investment in SGF. Includes ₹19,937.11 crore of Production Units.		

Revenue:

Revenue from Freight accounted for 67.57% of Gross Earnings. Passenger Earnings constituted 26.41% of the Gross Earnings, of which

4.16% was from Suburban Services, 94.96% from Express Long distance and 0.88% from Ordinary Short Distance traffic. Bulk freight like coal, ores, iron & steel, cement, foodgrains, fertilizers, POL products, limestone, dolomite, stones other than marble, salt and sugar contributed 90.09% of the total goods earnings, while commodities other than the above accounted for 8.44%. Miscellaneous realization like demurrage, wharfage, shunting and siding charges etc. made up the remaining 1.30%.

Balance Sheet:

A brief summary of Balance Sheet as on 31st March, 2023 compared with the previous year is given below:

	As on 31.03.2022	As on 31.03.2023	(₹ in crore) Variation
Assets			
Block Assets	8,09,918.59	9,72,734.18	1,62,815.59
Fund with Central Government			
(i) Reserve Fund	2,033.26	2,352.14	318.88
(ii) Banking Accounts	66,931.54	70,616.70	3,685.16
Sundry Debtors	5,836.55	5,946.58	110.03
Cash in hand	623.17	446.47	(-)176.70
Total	8,85,343.11	10,52,096.07	1,66,752.96
Liabilities			
Represented by:			
Capital Investment	*5,08,599.65	**6,17,614.79	1,09,015.14
Investment financed from internal resources etc.	3,01,318.94	3,55,119.39	53,800.46
Total (i)	8,09,918.59	9,72,734.18	1,62,815.60
Reserve Fund	2,033.26	2,352.14	318.88
Total (ii)	2,033.26	2,352.14	318.88
Banking Accounts			
(i) Provident Fund	40,226.99	39,570.32	(-)656.67
(ii) Miscellaneous Deposits etc.	26,639.02	30,974.90	4,335.88
(iii) Loans and Advances	65.53	71.48	5.95
Total (iii)	66,931.54	70,616.70	3,685.16
Sundry Creditors etc.	(iv) 6,459.71	6,393.05	(-)66.66
Total (i) to (iv)	8,85,343.11	10,52,096.07	1,66,752.98
* Excludes ₹11,954.00 crore of appropriation to SRSF, ₹70,000.00 crore appropriation to RRSK and ₹32,957.03 crore appropriation to RSF.			
** Excludes ₹11,954.00 crore appropriation to SRSF, ₹80,000.00 crore appropriation to RRSK, ₹62,957.03 crore appropriation to RSF and ₹10,239.00 crore appropriation to SGF.			

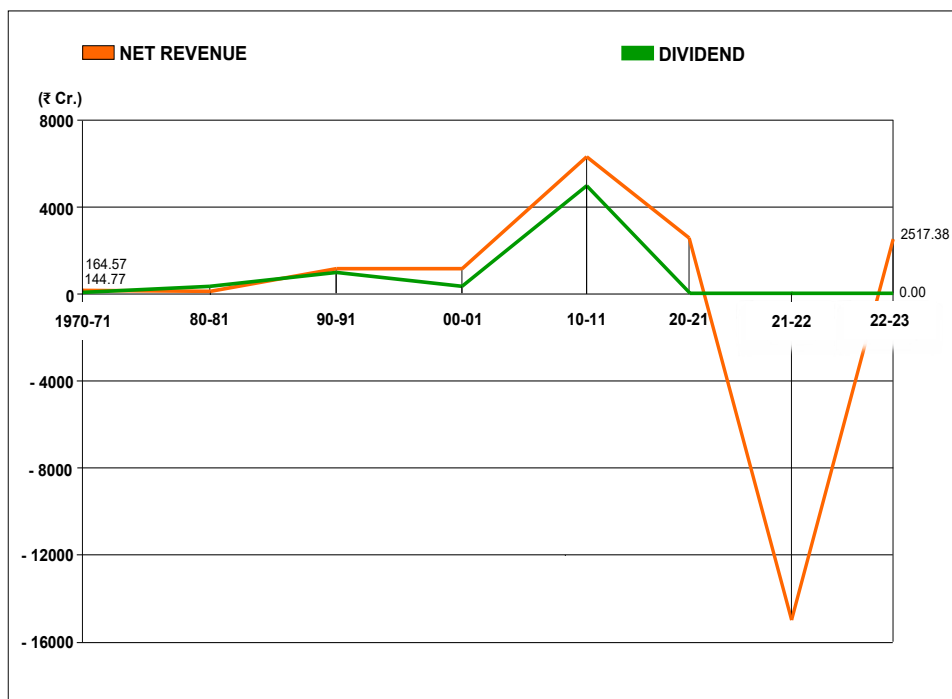
Cash Flow:	2022-23	(₹ in crore)
Acquisition of new assets and replacement of existing assets:		
Acquisition of new assets and improvement element in replacement of assets like replacement of assets	1,62,539.56	} 1,62,657.63
Like by like replacement of assets	118.06	
Payments of interest on loans, repayment of loans and increase/decrease in Reserve Funds		
Payments of interest on loan for Development Fund	0.00	} 320.87
Repayment of loan for Development Fund	0.00	
Increase (+)/ Decrease (-) in Funds balances	320.87	
Payment for Accident Compensation	0.00	
Total	1,62,978.50	
Finance from 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.	1,204.97	} 53,961.35
Development Fund financed from Surplus	1,000.00	
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 finance from surplus	0.00	
Railway Safety Fund finance from Genl Revenues (from Central Road Safety Fund)	30,000.00	
Debt Service Fund finance from Surplus	0.00	
Spl. Railway Safety Fund financed from Genl. Revenues	0.00	
RRSK Finance from General Revenue (Capital)	10,000.00	
RRSK Finance from RSF	0.00	
RRSK Finance from Surplus	1,517.38	
SGF Finance from General Revenue (Capital)	10,239.00	
OLWR	0.00	
Cash Surplus - Working Results		2,517.38
Appropriation to Development Fund		(-)1,000.00
Appropriation to Capital Fund		0.00
Appropriation to Railway Safety Fund		0.00
Appropriation to RRSK		(-)1,517.38
Appropriation to Debt service fund		0.00
Investment from Capital		1,09,017.15
Total	1,62,978.50	

Composite Input Cost Index

Base 2011-12=100

S.N.		2021-2022		2022-23	
		Revenue Index	Cost Index	Revenue Index	Cost Index
I	Unit Revenue				
i	Average receipt per pkm	*252.59		244.51	
ii	Average receipt per ntkm	159.50		166.65	
II	Cost Indices of Inputs				
i	Labour: Average annual wage per employee @		273.7		297.3
ii	High Speed Diesel(H.S.D.)		128.2		191.4
iii	Electricity (Railway traction)		117.4		143.3
iv	Transport equipment and parts		122.7		127.6
v	Non-Ferrous Metals		139.7		145.9
vi	Electrical machinery, equipment & battery		122.3		128.8
vii	Lubricants		162.0		180.0
viii	Manufactured products		135.0		142.6
ix	Ferrous Metals		140.1		148.7
	Composite weighted index of inputs		213.8		238.0
	*revised				

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 2022-23 is assessed at ₹40,190.12 crore excluding staff welfare cost (₹8,517.34 crore) and law and order cost (₹6,367.95 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 2022-23 amounted to ₹780.67 crore.

S.No.	Commodities	Losses (₹ in crore)
1	Fly Ash	308.66
2	Salt	205.78
3	Fruits & vegetables	78.56
4	L.P.G.	71.84
5	Total edible oil	48.44
6	Charcoal	9.23

S.No.	Commodities	Losses (₹ in crore)
7	Milk and Milk Products	5.27
8	Cotton Manufactured other than Piece Goods	4.36
9	Bamboos	3.54
10	Other Wood	3.41
11	Paper	2.15
12	Others	39.43
	Total	780.67

These commodities constituted 3.23% of the total revenue NTKMs and 1.80% of freight earnings in the year 2022-23.

Concession in passenger fares:

Revenue foregone due to concession in passenger fares during the year 2022-23 amounted to ₹235.85 crore.

Losses on EMU Suburban Services:

Analysis of the profitability of EMU Suburban Services in Chennai, Kolkata, Mumbai and Secunderabad during the year 2022-23 has revealed an overall loss of ₹7,841.95 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 88 uneconomic branch lines for the year 2022-23 shows that, on an original investment on these lines of the order of ₹5,292.64 crore, loss during the year 2022-23 amounted to ₹2,379.06 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 13 lines examined in 2022-23 as part of social service obligation on the railways for development of backward areas, most lines are showing either negative or unremunerative returns.

Financial Results of New Lines for the Year 2022-23

S.No	Name of the branch line	Date of opening	Cost (₹ in crore)	Expected return on investment (%)	Actual return on investment (%)		
					2020-21	2021-22	2022-23
1	Abohar-Fazilka (BG) 34 Kms.	16.07.2012	232.50	(-)7.44	(-)12	(-)15	(-)17
2	Taran Trn-Govindwal (BG) 21.416 Kms.	06.08.2011	81.44	NA	(-)22	(-)27	(-)31
3	Ludhiana-Sahnewal (BG) 15.11 Kms.	17.11.2012	291.12	(-)2.26	(-)4	(-)5	(-)6
4	Udhampur-SVDK (BG) 25 Kms.	04.07.2014	1,231.09	NA	(-)2	(-)2	(-)2
5	Banihal-Baramula (BG) 13.7 Kms.	26.06.2013	4,917.00	(-)1.30	(-)2	(-)3	(-)3
6	Churaru Takrala-Amb Andaura (BG) 11.17 Kms.	2011-12	514.23	0.18	(-)8	(-)8	(-)9
7	New Morinda- Sahnewal (BG) 52.18 Kms.	2013-14	725.81	(-)2.26	(-)8	(-)10	(-)12
8	Rewari-Jhajjar-Rohtak (BG) 81.257 Kms.	08.01.2013	491.73	(-)4.78	(-)2	(-)2	(-)2
9	Jind-Sonipat (BG) 81 Kms.	26.06.2016	493.09	NA	0	0	0
10	Madar-Pushkar (BG) 25.7 Kms.	23.01.2012	132.12	(-)4.06	(-)1.60	(-)1.92	(-)2.17
11	Koderma-Giridhi (BG) 106.89 Kms.	08.08.2015	699.95	NA	(-)2.13	(-)2.76	(-)2.21
12	Rainagar-Masagram (BG) 20.9 Kms.	16.04.2013	46.26	NA	0.00	0.00	(-)11.59
13	MYS-CMNR (BG) 60.78 Kms.	11.11.2008	280.93	NA	(-)0.64	(-)4.58	(-)14.38

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 2022-23 is ₹2,412.79 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 passenger fares below cost of operation (excluding EMU Suburban Services) during the year 2022-23 amounted to ₹41,425.09 crore.

The Net Social Service Obligation borne by IR in 2022-23 assessed at ₹40,190.12 crore, constitutes 16.74% of the total revenue earnings and 16.38% of the total working expenditure.

Research and Development

RDSDO 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 and assimilation of new technology for use on Indian Railways.
- Development of new and improved designs of equipment and systems.
- Development and Setting standards for adoption on Indian Railways.
- Development of specifications for materials and products for Indian Railways.
- Inspection of critical and safety items of Rolling Stock (including Metro Stock), Locomotives, Signalling & Telecommunication equipment and Track components
- Technical investigations to improve safety & reliability, statutory clearances, testing and providing consultancy services.

RDSO have collaborations with various R&D Institute such as IITs, IISc, NID, CSIR & DRDO etc. RDSO also associated with International Institutes/Universities like UIC, Korean Railway Research Institute, BRICS Railway Research Network & Russian Railways etc. through Memorandum of Understanding in emerging technology Railway Domains. RDSO attracts worldwide attention in the area of Research & Development in Railway equipment and systems.

Important activities during the year are given as:-

1. Integrated Track Monitoring System

Three state of the art track recording cars - Integrated Track Monitoring System (ITMS) have been introduced on IR with the following advanced features:

- Track parameters recording systems
- Full rail profile and wear measurement system
- Acceleration measurement at axle box and coach floor level
- System for measurement of infringement of MMD envelop with LIDAR technology
- System for video inspection of track components with the help of line scan camera and analysis for reporting condition of track components
- System for Rear Window Video Recording of IR track

This enhances the maintenance practices for safe train operation. To ensure safety of traffic, periodic track monitoring of Indian Railway track is being done. Track recording of 2,21,175 Km has been completed during this year, which is the highest ever track recording done in IR.

- Mahoba-Khajuraho section of North Central Railway and Sahnewal-New Morinda Section of Northern Railway is being maintained by tweaking of track for oscillation trials of rolling stock.
- Revised limits (TL-90 etc.) for Indian railway track based upon prevailing track parameters have been finalized after analysis of approx. 47,000 track km data.

2. Development of R350 HT Rail

At present, Indian Railways network primarily comprises 880 grade 90 UTS rails. In an exclusively passenger train only environment, these rails have potential to permit speed up to 200 kmph. However, in a mixed traffic regime, low yield strength of these rails and corresponding ultimate tensile strength and hardness starts becoming a bottleneck on higher axle loads. To overcome the problem of low yield strength, RDSO along with industry partners developed R350 HT, which is capable of carrying 25 ton axle load at 100 kmph.

The features of R350 rail are as follows:

- Capable for 25/22.9 ton axle load @ 100 kmph. and Fit for both Tangent and curve track
- Wear of Rail is reduced by a factor of 3 to 5
- RCF resistance increased by a factor of 2 to 5 which leads Lower probability of fracture due to rolling contact fatigue
- Higher Fracture Toughness,
- Results in a lower probability of rail and track components fracture
- AT/FB welds of R350HT rail higher strength → less probability of failure
- Better reliability
- Lesser life cycle cost
- Cost 12.75% high whereas the life 50% higher
- Reduced track maintenance possession time
- In line with International practice such as Sweden, Brazil, USA & NNOTRACK, National Guidelines for European Railways etc.

3. KAVACH (Train Collision Avoidance System TCAS)

Development of Train Collision Avoidance System (TCAS) Train Collision

Avoidance System (TCAS) is meant to provide protection by preventing trains to pass signal at Danger (Red), excessive speed over turnouts / Speed restrictions and to avoid the situation in which more than one trains are on the same track to cause collision, in case operations are not able to control so. It also provides assistance to Loco Pilots by means of real-time display of signal aspects in Loco Pilot's cab. It is based on the determination of location of Trains through distance traversed from RFID tags installed on track and transmission of signalling related information from Stationary Unit such as Station Interlocking. Kavach (Train Collision Avoidance System, TCAS) is an indigenously developed Automatic Train Protection (ATP) system to prevent unusual incidences due to SPAD, collision between two Locos and supervise Loco Speed. KAVACH phase- Two works are undertaken to make this system at par with other Train protection system being used internationally. Functional Requirement Specification for KAVACH (The Indian Railway Automatic Train Protection System) SPN No RDSO/SPN/196/2020Version 4.0 issued in May'22 and various trials are in progress.

4. SigDATE: Signaling Design Automation Tool for EI

Project regarding “modelling and validation of interlocking for railway signaling systems” is being under taken by RDSO with IIT Kharagpur. Under this project, IIT Kharagpur has developed SigDATE (Signaling Design Automation Tool for EIs) automated tool for following activities:

1. Generation of RCC from SIP
2. Generation of application logic circuits for EI from RCC.

SigDATE reduces the time required for preparing the RCC as compare with manual signaling design work. SigDATE automates this entire process to save time and expedite the commissioning of EI works. With the help of this tool, the Route Control Chart (RCC) for commissioning of Electronic Interlocking (EI) systems can be automatically generated by capturing the Signal Interlocking Plan (SIP) of station yards. This tool provides a graphical user interface for capturing the signal interlocking plan in electronic form and uses internal data structure to store the geometric data of the yard for further processing.

SigDATE has been rolled out on 23.08.2022 for generation of RCC for station yards having up to 100 routes. Based on the feedbacks received from Zonal Railways, automation tool SigDATE has been improvised and its version 2.0 and version 3.0 have been released on 31.10.2022 and 18.07.2023 respectively.

Automation tool SigDATE can also generate application logic circuits for EI but this part of automation tool needs further development and improvement. Feedback on application logic circuit part has been received from Zonal Railways and IIT Kharagpur is working on the received feedbacks for improving the application logic part of SigDATE

5. Drone Inspection of Bridges

There are many areas in important/major bridges like bottom of girder, sites of PSC girders, tall piers etc. where manual inspection is generally not possible. With the help of Drone inspection even these inaccessible areas can be efficiently covered. Detailed Guidelines for conducting such Drone inspection for Indian Railway Bridges using 3D Bridge Information Model and Unmanned Aerial System (Drone) have been issued in the form of BS-129 (R1) by RDSO. The details collected can eventually be dovetailed with web enabled IT Application Bridge Management System (BMS) enabling Indian Railways to retain all Bridge Information and exception reports in digital format which can be accessed by all stakeholders.

6. Development of thermal Vision Camera System

This is Autonomous detection and alarm generation system which is capable of detection of elephant/ big wild animals at 500- 600 m using Thermal vision camera and Artificial Intelligence during day/night on railway track. The project has been successfully completed in Apr 2023. One set of the system has been fitted on SGUJ based loco WDP4D 40436. Total no of 15 incidents of possible collisions with elephant/wild animals averted so far as per record provided by NFR.

Specifications for Thermal Vision Camera has been prepared for ATLAS (Autonomous Thermal Vision Camera based Loco Pilot Assistance System) and uploaded on RDSO website. Railway Board & Zonal Railways have been informed about the development of specification for further fitment in other locos as per requirement.

7. Development of Specification of HAHW and indigenous WILD System

Hot Axle box Hot Wheel Detector (HAHW) System is an automated wayside detection system for detecting hot axle boxes & locked wheels by monitoring temperature of the axle box bearings, wheel rim/discs and brake discs. Procurement of 106 Nos. HAHW system has been initiated by Northern Railway.

The Wheel Impact Load Detector (WILD) is a wayside detection system, which is used to identify the wheels with potential tread defects such as flat spots, out-of-rounds, built-up treads, Shell tread as well as defects in suspension (springs, shock absorbers etc.) that result in high impact loads, which cause damage to the vehicle and bogie components and to the track structure. Specification No. RDSO-SPN-RE-WILD-2023 of indigenous WILD system issued on 06.07.2023.

8. New Wagons Designs developed

• BOBSNS wagon

This wagon is capable to carry 25t axle load with side discharge and with

the use of these wagons 11% in rake throughput has been increased over existing BOBSN wagon. Oscillation trials have been successfully conducted at 100/100 kmph at 22.9t axle load. Railway Board sanction for operation over IR at 100/75 kmph has been received. 600 wagons are under manufacturing.

- **BLSS wagon**

This 25t axle load flat wagon can carry containers in which number of wagons increased to 48 from 45 per rake by rearranging unit composition (04 nos. A-Car & 44 nos. B-Car). The under-frame is spine type enabling reduction in tare weight from existing 25t container wagons. Presently these wagons are under Testing.

- **FMP (RORO) Wagon**

It is a Multi-model low floor height flat wagon which has been designed for carrying Road vehicles, containers, steel products and similar commodities. The Floor height has been reduced to 975 mm. Five design variants are available to allow loading of all types of road vehicles with different lengths. Railway Board sanction has been received.

- **ACT1 wagon**

Taller height Auto car wagon with 4875 mm height & uniform floor height can carry SUVs in both decks with easy loading & unloading facility. On rake 330 nos. of small cars and 264nos of SUV's can be carried. Development of Prototype and Oscillation trials have been completed. RB Sanction has been received and five rakes are under manufacturing.

9. Passenger Transport improvements

A non-AC version of push-pull train has been conceptualized similar to existing LHB push-pull Rajdhani Express. 02 rakes of non-AC are being manufactured with LHB Non-AC (LWSCN, LWS and LSLRD) Coaches and two WAG-5 locomotives in Push- Pull mode. The salient features of this type of formation are as follows:

- ✓ Passenger capacity same as existing LHB non-AC coaches
- ✓ Wider dust-sealed gangway with semi-permanent coupler
- ✓ Horizontal sliding wider windows
- ✓ HOG compliant slimmer Switch Board Cabinet
- ✓ Modern upgraded amenities like CCTV, GPS based Papis, LED lights etc.

Final generic speed certificate has been issued by RDSO after completion of all performance trials including controllability, coupler force, COCR on 21.11.2023 for operation over IR.

- **Vande Bharat Express (Ver-2.0)**

Vande Bharat Express has started running in various routes of Indian

Railways after successful oscillation and performance trials.

The salient features are:

- ✓ Speed potential of 160 km/h
- ✓ All coaches are AC chair cars and provision of 180 Degree C rotation of Executive Class Chair car.
- ✓ All coaches are equipped with fully automatic plug type sliding doors.
- ✓ Provision of KAVACH integrated with propulsion system to enhance safety in operation.
- ✓ Provision of four electrically operated push button and emergency talk back unit.
- ✓ Provision of Fire safety as per EN 45545.
- ✓ Dedicated control room with CCMS (Centralized coach monitoring system) and tip up seat for technical crew, pantry crew & housekeeping staff have been provided.
- ✓ Bogie has been designed as a light weight, high speed & energy efficient bogie of 17t axle load capacity with superior riding for long-distance main line trains.
- ✓ Others amenities are LED light fittings (diffused lighting), Flushed LED destination board, GPS based passenger information system, CCTV monitoring system, onboard information system, speaker in driver cab, door indication lamp, Wi Fi Router, Disaster management light in all coaches.

- **AC EMU with M/s MEDHA Electric**

RDSO has provided necessary technical assistance to M/s Medha Electric in design and development of Air Conditioned EMU coaches fitted with 3-phase on board propulsion system of 12 car rake with 33% powering. The AC EMU has stainless steel body with straight side walls & fluted roof. Statutory CCRS inspection has been completed on June-2023 at Mumbai. Railway Board sanction has been received.

- **3-Phase underslung MEMU**

The design and development work of 3-Phase underslung MEMU with indigenous 3-phase propulsion system has also been done. This MEMU has provision of Train-18 type bogie with air spring, EP brake with wheel mounted brake disc system and air- conditioned driver cabs. Railway Board sanction (for speed 110 kmph) has been received.

- **LHB AC Vista-dome Dining Car (LWCTDAC)**

In view to capture the tourism market on IR Traffic system, LHB AC Vista-dome coaches for tourist has already been developed and running successfully on IR. In continuation to this, LHB AC Vista-dome dining car a new variant has been conceptualized to facilitate a separate dining arrangement with

appealing aesthetic interior for tourist passengers travelling in adjacent LHB Vista-dome tourist car in a rake during journey.

The salient features of LHB AC Vista-dome dining car are as under:

- ✓ Speed potential of 160 km/h.
- ✓ This coach is equipped with dining arrangement having cushioned seats and table for 24 tourist passengers with 04 nos. of corner sofa
- ✓ Transparent larger windows on sidewall and roof have been provided to facilitate panoramic view of scenic beauty to tourist passengers during journey similar to Vista-dome coaches.
- ✓ Roof glasses glazed for opalescence through electric controls, for making opaque has also been provided.

10. Development of Parcel Services

Development of NMGHS With Ball Transfer Unit (BTU) Floor

- Pursuant to Para 21, the Budget Announcement of FY: 2022-23, Railway Board authorized for a Proof of Concept (PoC) model of – “Rail Post Gati Shakti – joint parcel product (JPP) Service”, on Western Railway at Surat for OD between Surat-Varanasi.
- Under mission “Rail Post Gati Shakti - a joint parcel product service”, Railway Board advised RDSO to develop the design of NMGHS coach provided with additional attachment of Ball Transfer Unit (BTU) and locking arrangement for easy handling of Cargo Boxes & India Post Cargo arrangement.
- RDSO has standardized design/drawings for conversion of dedicated NMGHS coaches with BTU flooring. The salient features are as under:
 - ✓ Dedicated NMGHS coaches with BTU flooring converted from aged ICF coaches.
 - ✓ Operational speed 110 km/h.
 - ✓ Provision of Ball Transfer Units on floor for easy movements of palletized Cargo Boxes during loading / unloading.
 - ✓ Provision of recessed D-shackle rings on floor to facilitate securing of palletized Cargo Box by sling belts and to prevent movement of consignments during run.
 - ✓ Carrying capacity 18t (Maximum).

LHB Parcel Van with Rear Opening (LVPHR)

Recently, IR has felt the impetus for increasing the nos. of automobile carrier to cater the requirements of traffic regarding transport of vehicles on IR. In this connection, LVPHR has been conceptualized as a common universal stock to cater the mobility requirements of parcel as well as automobile vehicles on

IR by providing the rear end for speedier delivery of consignment. Railway Board sanction has been obtained for introduction on IR.

The salient features of LHB Parcel van with rear opening are as under:

- ✓ Upgraded version of existing LVPH with highest payload of any coaching stock on IR.
- ✓ Speed potential of 130 km/h.
- ✓ Wider rear end opening with wider side loading doors of as compared to existing LVPH.
- ✓ Foldable fall plates for inter-coach motor vehicle movement, which will be retracted before closing the shutter doors.
- ✓ Interior floor area of 23040 mm x 2580 mm for transport of motor cars/SUVs.

11. Development of 12000 HP Electric Locomotive – WAG12B

The locomotive has been produced under Make in India programme. The locomotive is manufactured by Madhepura Electric Locomotive Pvt. Ltd. (MELPL) in collaboration with M/s Alstom. These WAG 12B e-Locos are hauling a wide range of commodities across the country. The features of this electric locomotive are as follows:

- ✓ This is country's most powerful freight locomotive that can run at 120 kmph
- ✓ Twin Bo-Bo with 22.5 t axle load, upgradable up to 25 t
- ✓ Starting TE 706 kN for 22.5T and 785 kN for 25T axle load
- ✓ Achieves balancing speed of 75 Kmph on ruling gradient of 1:200 with 6000T load
- ✓ Hauls 6000T load at 60 kmph on feeder routes with ruling gradient of 1:150

12. Hydrogen fuel cell based 1600 HP DEMU Train

RDSO has prepared technical specification for 'Development of Hydrogen Fuel cell based DPRS 1200 kW DEMU'. This is a new technology and initially retro fitment of 1200 kW DEMU operating between Sonapat-Jind section of Northern Railways with hydrogen fuel cell based system has been considered for this project. Hydrogen is high energy fuel (120 MJ/Kg) in comparison to diesel (43 MJ/Kg) with low maintenance and manageable Carbon footprint. In the proposed hybrid power system, the primary energy source is Proton Exchange Membrane Fuel Cell (PEMFC) and secondary energy source will be battery bank to meet the peak and average power requirement. Type test of 5 subsystems have been completed by RDSO and a Third Party Safety Auditor has been appointed for safety assessment of

the fuelling infrastructure and Hydrogen based Propulsion and Onboard Storage Systems.

13. Development of Fire Testing Facilities

Indian Railways is switching over to EN 45545 standards for fire protection in a phased manner. EN 45545 is a comprehensive set of standards which specifies fire protection for railways vehicles and verification methods for these measures. Vande Bharat trains and future rolling stocks under process for procurement are EN 45545 compliant.

For testing of furnishing material of IR coaches as per fire properties of EN 45545 standards, RDSO has set up fire testing lab in M&C directorate for this objective. Following 04 fire testing machines have been procured for this lab:

- ✓ ISO 5660-1 Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)
- ✓ ISO 11925-2:2010 Reaction to fire tests – Ignitability of products subjected to direct impingement of flame – Part 2: Single- flame source test.
- ✓ ISO 5658-2: Reaction to fire tests - Spread of flame - Part 2: Lateral spread on building and transport products in vertical configuration
- ✓ ISO 9239-1 Reaction to fire tests for floorings - Part 1: Determination of the burning behaviour using a radiant heat source.

14. Test and Trials

RDSO has conducted record speed trials and issued speed certificates for introduction of various types of rolling stock.

Besides speed certificate, RDSO has also conducted testing and field trials viz. Oscillation Trials, Coupler Force, Controllability, EBD, R&P and Jerk trials, COCR trials, Squeeze Test etc.

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	BITES	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	KMRCL	2008	To implement East-West Metro Corridor connecting the twin Cities Kolkata and Howrah from Salt lake to Esplanade.
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 Navratna Central Public Sector Enterprise under the Ministry of Railways, has followed a trajectory uniquely rooted in India's growth story. Since its inception in the year 1974, RITES, a multidisciplinary consultancy organization, has been taking on challenges with foresight and fortitude. A future-ready organization, RITES is providing customized, diversified, comprehensive, and concept to commissioning services and integrated solutions in the transport infrastructure sector in India and abroad.

RITES is uniquely placed in terms of geographical reach and consultancy services in sectors such as railways, highways, airports, ports, ropeways, metros, bridges & tunnels, urban engineering and sustainability, green mobility, inland waterways, and renewable energy. Equipped with sophisticated software (including for designs) and modern equipment, RITES is also a unique inspection organization with in-house material-testing laboratories with national/international accreditation/certification. With the Independent Safety Assessor (ISA) certificate, RITES has become the second company to have this certification in India.

RITES has served clients in more than 55 countries across Asia, Africa, Latin America, South America, and Middle East region.

The Financial Year 2023 (further termed as FY) was another pivotal year for RITES. With a well-diversified business model, the company demonstrated agility and adaptability, which allowed them to record the best-ever performance in the Consultancy segment despite export headwinds.

With highest-ever consultancy, including international consultancy, RITES recorded a total income of ₹2,639 crore in FY 2023 compared to ₹2,661 crore in the previous year. Profit after tax for the year stood at ₹531 crore as against ₹497 crore in the year. It earned an operating turnover of ₹2,520 crore as against ₹2,575 crore in the previous year. This revenue is achieved on account of growth in all segments, barring exports. The net worth has grown from ₹2,399 crore to ₹2,503 crore and RITES has remained debt-free. Also, the company has spent ₹14.10 crore towards corporate social responsibilities in FY 2023.

Continuous satisfactory performance to win clients' confidence and efforts on business development have contributed to close FY 2023 with an order book of ₹5,769 crore with orders worth ₹3,080 crore secured in FY 2023 only.

FY 2023-24 Performance

RITES operating revenue (consolidated), excluding other income stands at ₹1,127 crore in FY 2023-24 (April to September) as against ₹1,264 crore in the corresponding period of the FY 2022-23. Total revenue stands at ₹1,171 crore as against ₹1,321 crore in the same period of the previous FY 2022-23. EBITDA and Profit After Tax (PAT) stand at ₹301 crore and ₹230 crore against ₹361 crore and ₹285 crore, respectively, in same period of the previous FY 2022-23.

Select Projects (FY 2022-23)

- Supply of 1 loco, 4 DEMU trainsets and 25 passenger coaches to CME, Mozambique
- Completion of Railway doubling works of Gotty-Dharmavaram
- Construction of DEMU/MEMU shed at Lumding, Assam
- Mavali-Bari Sadri railway electrification works
- PMC for Railway sidings at multiple locations
- DPR for tunnels between Abu Road and Taranga Hill
- Redevelopment of Ayodhya and Varanasi railway stations
- Consultancy for Mauritius Metro Phase III Project
- Depot construction work for Bengaluru Metro
- Consultancy for Ahmedabad Metro Rail Project Phase-II
- Consultancy services for Shivamogga Airport, Karnataka
- Third Party Inspection for works under Jal Jeevan Mission

Green Touch

- ‘Transforming to Green’, RITES has charted a roadmap to emphasis the integration of infrastructure and green solutions, hasten green growth, and provide smart solutions for shaping tomorrow’s mobility. Taking forward its vision for sustainable consultancy, a dedicated Sustainability Unit was created and in a short period, it has started getting orders in the fields of National Clean Air Programme (NCAP) and Swachh Bharat Mission etc.
- RITES’ subsidiary REMC Ltd involved in power management and generation and has a mandate to handle the entire power procurement under open access for Indian Railways, besides handling renewable energy and energy-efficiency projects.

Awards & Recognition

RITES has received several awards and accolades, some of these are:

- **Dream Companies to Work For (Infrastructure)** by Times Ascent at World HRD Congress-2023
- **ICAI Award for Excellence in Financial Reporting** 2021-22 (Silver Shield)
- **‘Best Engineering Consulting Firm’ Award** at Diplomatic Nite-2022
- **‘Most Admired Consultancy for Rail & Metro Sectors’ Award** (PMC & Consultancy category) at the 2nd Urban Infra Business Summit & Awards
- **SAFA Gold Award for Best Presented Annual Report (Infra & Construction category)** at ‘Best Presented Annual Report Awards, Integrated Reporting Awards & SAARC Anniversary Awards for Corporate Governance Disclosures 2021’ ceremony

IRCON International Limited (IRCON)

Ircon International Limited (a Navratna PSU), formally known as Indian Railway Construction Company Limited was incorporated on 28th April, 1976, mainly for the purpose of construction and development of Railway Infrastructure in India and abroad with the expertise from Indian Railways.

During its operation of 47 years the company has diversified and developed core competence in other areas also like Highways, Tunnels, Bridges, Flyovers, ROBS, Airport Hangar & Runways, Metro rail and Buildings (Industrial, Commercial & Residential complexes), EHV Transmission Line & Grid Sub-stations, Industrial Electrification, Signaling and Telecom Systems etc. Considering its major share of business from projects abroad, its name was changed to “Ircon International Limited” w.e.f. 17th October, 1995.

IRCON has so far completed more than 401 infrastructure projects in India and 128 projects across the globe in more than 25 countries.

IRCON is actively engaged in infrastructure development in several Asian and African countries. IRCON's expertise coupled with its experience has helped in successful completion and commissioning of a mega project valuing over USD 1 billion in Malaysia, the largest ever Transportation project completed by any Indian company abroad. Also, IRCON is executing Railway projects in Sri Lanka, Bangladesh, Algeria and Nepal. In the year 2021-22 IRCON has secured a strategic road project for Construction of Road from Paletwa (Myanmar) to Zorinpuri (Mizoram) under Kaladan Multi Modal Transit Transport Project (KMMTTP), in Myanmar on EPC Mode.

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

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

Achievements in FY 2022-23

Overall

➤ In the year 2022-23, IRCON has secured following projects

- Stage-III i.e. detailed Engineering & Project Management Consultancy

(PMC) Services for “Development of Rail Infrastructure for proposed 02 nos. RLS (20 MTY) for Ananta OCP of Jagannath Area, MCL at modified route (i.e. through excavated de-coaled area of Ananta & Bharatpur OCP of MCL) at Talcher” .

- Establishment of Railway Siding along with Railway Station contiguous to Mine Lease Boundary of Gare Pelma Sector-III Coal Mine.
- Procurement of Design, Installation, Testing, Commissioning and Certifying of Signaling and Telecommunication System from Maho Junction (Including) to Anuradhapura (Excluding) under Indian Line of Credit.
- Engagement of Central Public Sector Undertaking (CPSUs) for development of New Industrial Estates in Union Territory of Jammu and Kashmir.

➤ **In the year 2022-23 IRCON has successfully completed following projects:**

- Construction of Eight lane Vadodara Kim Expressway from Km. 323.00 to 355.00 (Sanpa to Padra Section of Vadodara Mumbai Expressway) in the State of Gujarat under NHDP Phase - VI on Hybrid Annuity Mode (Phase IA Package II).
- ECR - Doubling between Hajipur - Bachwara with electrification project (72km) including planning, design and construction of all service and residential buildings, circulating area, parking, platforms, subways, shelters and other allied structures of all stations, including Electrical, Signal & Telecommunication works and any other works.

Major achievements of ongoing projects in FY 2022-23 are as follows:

1. In Jayanagar (India) Bijalpura (Nepal) Project, Cross border rail section from Jayanagar (Km. 0.00) to Kurtha (Km. 34.90) was inaugurated.
2. An international standard fully air-conditioned multi-purpose Indoor Stadium with state-of-the-art facilities at Behala was inaugurated on May 30, 2022.
3. In the USBRL Project, achieved a milestone for the breakthrough of two Main tunnel and three escape tunnel including the longest tunnel (T49-12.76Km long) of the project during the year.
4. In the Sivok Rangpo new line project, achieved a milestone for second breakthrough of Tunnel T-5 on 18.06.2022, third breakthrough of Tunnel T-9 on 19.10.2022, fourth breakthrough of Tunnel T-2 (896 m.) on 23.11.2022, Fifth breakthrough of Tunnel T-12 (1404 m.) on 24.12.2022, Sixth breakthrough of Tunnel T-11 (3232 m.) on 23.01.2023 and longest

Adit tunnel of this project i.e. Adit-1 (1,144 m) of Tunnel T-10 on 19th Feb, 2023.

5. In Katni-Singrauli Doubling Project, four block sections
 - i. Saraigram to Gajrabahra (10.7 km)
 - ii. Gajrabahra to Deoragram (10.4 km)
 - iii. Khannabanjari to Mahroi section (11.9 Km) and
 - iv. Niwas Road to Saraigram section (28.7 Km) were commissioned during the year.
6. The CRS inspection of Akshayawat Rai Nagar-Sahdei Buzurg (14.5 Km) of HJP BCA doubling project was held on 28.09.2022 and section was allowed to open for running of passenger and goods trains at maximum speed of 80 KMPH. With commissioning of this section, the super critical project of doubling of entire Hajipur-Bachhwara stands commissioned including the yard remodeling of Bachhwara.
7. In Kiul-Gaya Doubling Project, CRS inspection (Commission of Railway Safety inspection) of Wazirganj-Tilaiya section (18.01 Km) was conducted on 02.09.2022 and the section was commissioned at a permissible speed of 100 kmph.
8. In Kiul-Gaya Doubling Project, the entire Lakhisarai-Sheikhpura section (25.32 Km) was commissioned with 100 kmph on 21.02.2023.

Accolades

- Ranked in Top 250 International Contractors and Top 250 Global Contractors by Engineering News Record (ENR), USA. Also ranked amongst the Top 500 Indian Companies in Fortune India Magazine.
- Healthy profitability margins & comfortable liquidity position with its CARE Credit Rating of AAA/A1+ for long & short-term non-fund based borrowings. Continuously profit making company since its inception.
- Conferred with several awards in the last two years including Governance Now 8th PSU Award in CSR Commitment category, National Awards for Excellence in PSU
- (Category: Innovation Social Media Outreach), National Awards for Excellence in PSU (Category: Increasing the Geo-Strategic Reach), Greentech Foundation Safety Award for Construction Safety, Greentech Environment Award for Environment Protection, ENR – Construction World Global Award and Dun & Bradstreet PSU & Government Summit – Aatma Nirbhar Bharat Initiatives.

Financial Performance

In the year 2022-23, the Company has registered total income of ₹10,262

Crore. The Profit before tax achieved by the company is ₹883 Crore and the Profit after Tax achieved is ₹777 Crore. The Net Worth of the company is ₹5,178 Crore.

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, Secunderabad and Chennai. It develops and manages the IT systems of the Indian Railways, with terminals and counters spread across the country from Kargil to Kanyakumari, 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.

CRIS is developing and managing IT applications in all areas of Railway working, and has been focusing on interfacing these applications to provide a unified IT platform for Indian Railways. The activities & developments during the year 2022-23 (April 2022 to March 2023) done by CRIS, are given below-

1. Passenger Business

Enhanced E-Ticketing System for Indian Railways (ETIR) - Android IRCTC Rail Connect versions 4.2.2 and 4.2.3, both of which were made available on March 31, 2023. Likewise, for the Rail Saathi version of IRCTC Rail Connect, versions 5.2.2 and 5.2.3 were also released on the same date via the Google Play store. An Android mobile app update was carried out, involving various enhancements. Firstly, the IRCTC Rail Connect app received an upgrade, now incorporating Hindi language capability. Additionally, the Momagic SDK used for push notifications was also upgraded. Furthermore, the logo for the iPay payment provider was updated to reflect compatibility with Net banking. One notable feature of this update was the activation of the E-wallet registration option. Users were provided with the ability to register for an E-wallet within the app. An iOS IRCTC Rail Connect version 3.1.32 was released on 20th February 2023, on the Apple App Store. As for improvements, the AskDisha Chatbot URL was updated, and the range of webservices under Akamai POC was expanded to reinforce the security measures in the mobile app.

Integrated Computerized Reservation and Ticketing System (CONCERT) - The system was modified to allow pass/PTO bookings in GN quota for Jan Shatabdi trains.

Modernization of CONCERT Phase 1 & 2 (MOC1 & MOC2) - Modified PNR Search report to include cancellation status and introduced a new report under the Vigilance category for Status-wise passenger reports. These reports are now available on PRIMES (Passenger Reservation Information Management Enhanced System), including "Status-wise Revenue from Cancellations" and "Workload Analysis Report" under Special Reports, along with "Seized PNR" in

Monitoring Reports for future data. Modernization of CONCERT Phase-2 - The Divyangjan application was launched. In the CORE module, various business rules were implemented, including PNR service calls in Normal Booking, as well as rules for Student concession, Foreign Tourist Reservation, Duplicate Ticket Issue, Quota reservation from wait list, Pre-bought Booking, and Quota Reservation in different TDRC.

Expansion of Hand-Held Terminals for TTES Over IR (EHHT) - A total of 10,000 Handheld Terminals (HHT) devices along with their accessories were procured and subsequently distributed among the Zonal Railways. The central site, comprising all 10,000 HHT devices, was successfully installed and configured on the CRIS cloud platform. Online training sessions were conducted for the ticket checking staff, aligning with the recommendations of the Zonal Railways.

Rail Madad, Complaint Management System - A single portal for enquiry, assistance, and grievance services, for passengers, freight and parcel customers. An easy-to-use interface in 12 languages, available through 9 channels (Rail Madad mobile app, web browser, email, 139 IVRS, Umang app, social media, CPGRAMS, surface mail, and 112 emergency helpline), it routes the complaints / suggestions to the correct authority and uses auto-escalation to provide time-bound service delivery.

Umang (Unified Mobile Application for New-age Governance) integration - IR services such as availability and fare enquiry, PNR status, train schedule and running position, Freight and parcel rates and consignment status, and Rail Madad services have been provided in the Umang app of Government of India by API-based integration through IR's API Gateway. Recently, season ticket booking has been provided through Umang.

Unreserved Ticking System (UM01) - Provision for printing Tamil or Malayalam regional language tickets for locations in the Puducherry Union Territory (UT) is available through UTS, ATVM, and the mobile app. Transaction summaries based on mobile numbers was made online on the PRIMES portal, detailing transactions carried out via mobiles within a 30-day period. During the Annual Rath Yatra festival, UTS tickets with enhanced passenger limits were provided. The Other Coaching Earning report was made available on the eDrishti portal. New payment option, such as the SBI QR code on ATVM/CoTVM, has been introduced. Vande Bharat train type tickets were issued in UTS for the inaugural run on September 30, 2022.

RPF Security Management System (RSMS) - RSMS has been Implemented at All India Level. The objective of RSMS is to implement paperless working in RPF by instant transmission of messages, optimizing manpower utilization, facilitating one-time data entry and online generation of the MCR.

2. Freight & Parcel Business

Freight Operation and Information Systems (FOIS) - TTMS (Terminal Management System) underwent modifications related to Demurrage Waiver

against multiple Railway Receipts (RRs), Empty Weighment, and Mis-declaration of Weight during Unloading. This was carried out in TMS application version 9.7.2. The Military Freight Calculator was introduced to facilitate the calculation of tariffs for Military Traffic. The “Satark” mobile app for capturing TI (Traffic Inspector) inspections and monitoring was launched. In November 2022, a wagon census took place, enumerating 48,000 wagons and generating wagon status and exception reports for monitoring purposes.

Roll Out of Parcel Management Systems (RPMS) - The PMS was tailored to grant India Post access for booking and delivery purposes. Necessary business changes were seamlessly integrated to accommodate this new feature. This service was initiated from the locations of Surat and Varanasi. Another notable accomplishment was the VAP, which entailed integration with the FOIS {FBD (Freight Business Development) portal}.

Implementation status of CPMS Phase-II - Several key milestones were achieved in the logistics and operations landscape during the specified time periods. Successful testing evaluated the functionality of the PMS (Parcel Management System) application over the FOIS (Freight Operations Information System) network. In December 2022, a collaborative venture called the Joint Parcel Product of Indian Railways and India Post was introduced at various locations.

3. Train Operations

Real-Time Train Information System of Indian Railway (RTIS) - As of November 2022, the movement GPS data of approximately 6,702 locomotive devices was being transmitted to the Central Operating Authority (COA) through the Railways Train Information System (RTIS) central server. A total of 4,521 RTIS locomotive devices, comprising 2,700 devices in Phase-1 and 1821 devices in Phase-2, had been successfully installed and integrated into the electronic locomotives (e-locos) for the purpose of automatic control chart plotting. The RDSO had granted approval for the final fitment scheme applicable to all types of e-locos. These software alterations were executed in collaboration with the Indian Space Research Organization (ISRO). This project is being further executed successfully marking significant progress in enhancing rail network monitoring and control.

Control Office Application (COA) - In the continued pursuit of operational enhancement and optimization, a series of notable accomplishments and advancements were realized. On a daily basis, a diligent effort was undertaken to update approximately 5.70 lakh Arrival, Departure, and Run Through events within the Control Office Application (COA) by all Divisions. The COA system seamlessly integrated data from approximately 5,500 locomotives outfitted with REMMLLOT/RTIS Devices, alongside data loggers positioned at around 640 different locations. The process of updating train movements within the COA system was further refined by the successful integration of GPS updates from locomotives provided by industry leaders such as Alstom, Medha, and SIEMENS.

S/W Aided Train Scheduling System (Timetabling Project) (SATS)

- In December 2022, significant strides were made in enhancing rail services. Integration with the WA Project, aimed at sharing train schedules and train master data for the Rail Sewa app through a Web API, was successfully accomplished. In February 2023, the compilation and sharing of fresh infrastructure data from 14 divisions were meticulously carried out. A meticulous simulation of bare runtime was successfully conducted for Vande Bharat Trains (T18) across six distinct routes: RKMP-NDLS, AII-NDLS, CBE-MAS, SC-TPTY, NJP-GHY, and TVC-CAN.

Crew Management Systems (CMS) - In the realm of Crew Management Systems (CMS), notable advancements were made in the Lobby Performance Indicator report during the past. This enhancement manifested through the integration of four distinct filters, thereby enabling the scrutiny of performance on multiple levels: lobby, division, Zonal, and IR. These filters collectively facilitated a comprehensive comparative analysis of IR crew booking lobbies, bringing valuable insights to the forefront. The chronicle of progress continues, as in July of 2022, a pivotal stride was taken with the installation of the Application server development Virtual Machine on CRIS Cloud, specifically catering to the GOAL project. As October 2022 graphical representations illuminating exceptional Crew performance were embedded into the CMS dashboard interface, spanning IR, Zone, Division, and Lobby categories.

Coaching Operation Information Systems Maintenance (CO-M) - A Mobile App was developed and deployed to assist COIS users in inputting Train Consist positions based on physical numbers for printing Vehicle Guidance (VG) with Caution Order improvements. Integration was carried out with the SLAM (Software for Loco Asset Management) project to share Asset failure data. COA implemented automatic GPS loco attachment to running trains based on GPS coordinates, with integration between the Loco module of ICMS and COA for synchronization. The Spot Your Train option in NTES iOS App offered running train instances and Station search capability.

Safety Information Management System (SIMS) - Accident Reporting, Accident Inquiry (CRS/ Departmental), DAR Inquiry, Safety Drive, Inspections, Audit, Safety hazard reporting, Safety Drive, MCDO, Safety Shield etc. Monitoring of Accidents on real time through log sheet. More than 10,000 accident reported and more than 14,000 DAR inquiry performed. SMDMS for messaging and document sharing between safety officials of Railway Board and zonal/divisional Railways. Integration with '139' IVRS to provide accident details to general public. Integration with Incident Report System (IRS) of Ministry of Home Affairs (MHA) for reporting of major Rail accident.

4. Asset Management-Rolling Stock

Rollout of Maintenance Module for Coaching Phase I (CDMM) - In the past, several important developments and improvements were made in accordance with Railway Board directives. This included the implementation of

“air brake pressure testing” and “under gear check” DDR formats, which became mandatory for rake BPC generation. Furthermore, a new interface for Wheel Drive was developed, with enhancements made to capture the “ICF bogie type” parameter. Additionally, ESB Integration was successfully established between CMM and WISE for coach master sharing.

Freight Maintenance Management Roll Out (FMMR) - For the first time in Indian Railways, an online wagon census was conducted using IRFMM to gather information on unconnected wagons that had not undergone TXR examination or BPC preparation in FOIS/FMM over the past six months. A dedicated module was developed for this purpose, accessible via a mobile app and web browser. The wagon census identified a total of 6,082 wagons. In terms of FMM usage, 170 freight yards across IR generated a total of 10,875 BPCs in March 2023, contributing to a cumulative total of 1,31,478 BPCs for the current financial year.

Automated Wagon Track and Trace System Using RFID - In September 2022, a total of 8,009 wagons and 537 coaches were newly tagged, with 334 coaches tagged by RITES through a CRIS contract. As of March 31, 2023, the tagging process had been completed for 1,82,101 wagons and 18,533 coaches. Additionally, in March 2023, 1,828 wagons and 1,083 coaches received fresh tagging.

S/W for Locomotive Asset Management Pilot Phase Stage-II (SLAM) - The SLAM rollout progress reached several milestones. The SLAM application successfully went live at three sheds: Kazipet Junction/SCR, Royapuram/SR, and Etarsi/WCR, using Rail net/FOIS net. Training for SLAM Application was completed in all 27 sheds, and two additional batches, consisting of 12 Trip Sheds and 31 TLCs, also received training.

5. Asset Management-Fixed Infrastructure

Signaling Maintenance Management System - A significant step was taken as a Memorandum of Understanding (MoU) regarding the transfer of SMMS work to M/s Railtel was formalized through signing executed on the 6th of May 2022. Further, responding to the dynamics of the project, SMMS infrastructure at CRIS was brought to a halt in alignment with a request from M/s Railtel. The seamless coordination and execution of this shutdown demonstrated the adaptability of the project’s stakeholders to evolving needs.

Track Management Systems (TMS) - TMS login page underwent a redesign to improve user experience on different devices. Two-Factor Authentication, bolstered by CAPTCHA, was implemented for heightened security. The process for identifying Grinded Rail was redesigned, aligning it with Track Machine (RGM) progress entries by Engineering Control. To facilitate intermediate inspection of Points & Crossing, an Inspection Performa along with an Inspection Register and defect compliance functionality were developed. Several USFD ACS-6 features were integrated, including weld testing status on loop lines and varying testing frequencies on CC+8+2t routes. Inspection modules such as LWR, SEJ, Buffer

Rail, Points & Crossing, Level Crossing, and Curve were refined to address defects within revised threshold limits as defined in the New IRPWM.

Rail Road Crossing Approval & Monitoring System (RORACS) - Web application for approval and monitoring of proposal status for General Arrangement Drawings (GAD) from Railways for ROB (Road Over Bridges) / RUB (Road under Bridges) proposed by various stakeholders (MORTH, NHAI & State Govt. etc.). Joint effort of Ministry of Railways and Ministry of Road Transport & Highways to facilitate speedy construction of ROB/ RUBs and eliminate level crossings on National Highways. Implemented in all 68 divisions of Indian Railways.

6. Resource Management-Material

e-Procurement System-Phase I (EPS) - “Gati Shakti” Units were established across various divisions to enhance synergy and improve system efficiency, thereby expanding rail infrastructure. Vendor registration processes were simplified, allowing for return requests during registration, eliminating the need for new requests. E-Dispatch was introduced, requiring vendors to generate comprehensive reports in IREPS during material dispatch.

Maintenance of E-Procurement System (EPSM) - A modified feedback mechanism was implemented for various IREPS modules.

7. Resource Management-Finance & Accounts

Human Resource Management System (HRMS) - IR employs about 12 lakh persons, spread across thousands of locations across the country. Human resource management is being progressively automated through the in-house developed HRMS. Modules for Employee Master, Cadre management, e-Service record, Settlements, Loans and Advances, Grievances, etc. have been developed. Employees can access their information conveniently and access relevant services through the Employee Self Service (ESS) module and HRMS app.

Accounting Reforms Management System (ARMS) (Part of AIMS) - In the past, there was a parallel trial run of the Transaction-based Accrual Accounting System on the live data of IPAS within the Indian Railways. During this period, the mapping of 8 to 10-digit allocation codes (cash to accrual code) in the IPAS transactional data for March 2023 exhibited significant progress, achieving a mapping accuracy of 96.7%.

Traffic Accounts Management System on Indian Railway (TAMS) -

- Seamless integration between FOIS and TAMS for the Error Sheet Module
- Goods has been successfully completed. A dashboard has been developed to oversee “Goods-e-CR notes” received from FOIS, enabling detailed note summaries, reconciliation, and corrections as needed.

Integrated and Payroll Accounting System over Indian Railways (IPAS) - IPAS successfully integrated with the “Jeevan Pramaan Portal” to capture Digital Life Certificates of Railway Pensioners via SFTP. The Workshop General Register

Module of Workshop Accounting Management System (WAMS) was launched at Jodhpur Workshop on North Western Railway. A revenue expenditure Dashboard was developed in IPAS, facilitating expense analysis through charts and comparisons with budgets and past years. Payroll and pension modules were implemented at Rail Coach Factory (RCF), while IREPS integration allowed online refund of Demurrage / Wharfage charges. Warranty-based payment withholding, e-MCDO entry and Manufacturing Suspense modules were introduced in IPAS. A Web Service enabled Capital and Revenue Expenditure sharing with My-Drishti. RESS Desktop & Mobile App accessibility was extended to Railway employees using HRMS ID.

Miscellaneous E-Receipt System (MERS) - After successful testing, the integration of PRS with MERS for electronic advance payments from YTSK agents transitioned to the production environment. During March 2023, approx. ₹89.54 crore were received via MERS.

8. Infrastructure, Business Continuity

RCLD - Rail Cloud Phase – 1 - The successful migration of the HRMS project to the CRIS Private Cloud was achieved. A total of 27 projects were deployed in the development environment, while 23 projects were deployed for the production environment.

Data Sharing with NATGRID (DSWN) - The deployment of Use Cases/APIs from CRIS's dedicated centralized production infrastructure to NATGRID was successfully completed.

Indian Railways Information Security Group Project (ISGP) - CRIS's Cyber Crisis Management Plan received approval from CERT-In. The Multi-Agency Audit (NAAT) conducted by C-DAC, Hyderabad, was finalized.

Network Security Infrastructure at 06 PRS/UTS Data Cent (NS-I) - Till March 2023, approximately 5.27 lakh cyber-attacks were successfully blocked.

9. Dashboards, Integration and Analytics

Enhancement of e-Drishti (DRST) - A Dashboard for I.R. – From the outset of the Financial Years 2021-22 and 2022-23, e-Drishti statistics underwent data initialization, archival, and validation. A production-level integration was established to link Rail Kaushal Vikas Yojna (RKVY) data with e-Drishti. Furthermore, a new dashboard tab concerning Sundry earnings of Indian Railways was designed, developed, and rolled out. This included integration with IPAs, along with activities related to past year data accumulation.

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 development needs. IRFC has been successfully meeting the borrowing targets set for it year after year. Funds are raised through issue of bonds, 54EC Capital Gain Bonds, Term loans from

banks/financial institutions and though external commercial borrowings etc. The Department of Public Enterprises has consistently rated the company as “Excellent” for its performance vis-à-vis the parameters set out in the MoU.

The Company has leased rolling stock assets worth ₹3,00,267 crore to the Railways up to 31st March 2023. Rolling stock assets worth about ₹16,634 crore were financed during 2022-23. 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 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 ₹1,62,743 crore till 31st March, 2023. Besides, earlier IRFC has also funded Railway Projects under EBR-S worth ₹55,991.91 crore up to 31st March, 2023.

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 11.06% p.a. in 2022-23, which compares favorably with the borrowing of the Government of India. The Ministry has been making lease payments to IRFC regularly.

IRFC has consistent profit earning track record. It has so far paid ₹7,469.08 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 rating at par with ‘Sovereign’ from four major International Credit Ratings Agencies.

IRFC has also become the first Central Public Sector Enterprise (CPSE) to list its USD 500 million green offshore bonds exclusively at NSEIFSC and India INX in the GIFT City (Gujarat International Finance Tech City), Gandhinagar.

Also IRFC has been ranked 95th in Fortune India 500 list of companies based on financials of fiscal year 2022-23.

Container Corporation of India Ltd. (CONCOR)

Container Corporation of India Limited, a Navratna CPSE of Ministry of Railway, Government of India was incorporated in March 1988 and commenced operation in November, 1989. CONCOR has expanded its network on PAN India basis having a terminal network of 61 ICDs/CFSs by starting from 7 ICDs taken from Indian Railways. In addition to providing inland transport by rail for containers, it has also expanded to cover management of Ports, Air Cargo complexes and establishing Cold Chain. It has and will continue to play the role of promoting containerization in India by virtue of its modern rail wagon fleet, customer friendly commercial practices and extensively used Information Technology. Though rail is the main stay of our transportation plan, road services are also provided to cater to the need of door-to-door services, whether in EXIM or Domestic business.

The company was setup with the core objective to facilitate trade and industry/stakeholders by developing Multi Modal Logistics Parks on PAN India

basis. CONCOR's core business is characterized by three distinct activities, that of a carrier, a terminal operator, and a warehouse operator.

Carrier

Rail is the mainstay of CONCOR's transportation plans & strategy. Majority of CONCOR terminals are rail-linked, with rail as the main carrier for haulage. Facilities are, however, provided for First and Last Mile transportation by road also. As rail is price-competitive over long distances, the price advantage can be passed on to clients, thus allowing for flexible and competitive pricing. The rail link also plays a major role in decongesting our ports and the road corridors that lead to these ports.

Though rail is the mainstay of CONCOR's transportation plan, some CONCOR terminals are exclusively road-fed as well. Road services are mostly in the form of supplementary services to provide the door to door linkages having carried the bulk of long lead by rail. However, where ever it is operationally or economically a superior option, road is used as an alternative to rail as well.

Terminal and CFS Operator

CONCOR started operations in November 1989 with 7 Inland Container Depots (ICDs). The Company has since extended the network to a total of 61 terminals, of which 5 are export import container depots, 17 exclusive domestic container depots as well as 36 terminals perform the combined role of domestic as well as international terminals out of which 3 terminals are having strategic tie-ups.

CONCOR's customs bonded Inland Container depots are dry ports in the hinterland, and serve the purpose of bringing all port facilities including Customs clearance to the customer's doorstep. The terminals are almost always linked by rail to the Indian Railway network, unless their size or location dictates that they be linked by road. The rail links enable CONCOR to facilitate the moving of large volumes over long distances in the most cost effective manner.

CONCOR's terminals provide a spectrum of facilities in terms of warehousing, container parking, repair facilities, and even office complexes. As CFS operator, CONCOR adds value to the logistics chain by offering value added services such as:

- Bonded warehousing, enabling importers to store cargo and take partial deliveries, thereby deferring duty payment
- Less than Container Load (LCL) consolidation and reworking of LCL cargo at nominated hubs
- Air cargo clearance using bonded trucking
- First Mile and Last Mile (FMLM) and Distribution Logistics

In the area of domestic business door pick up and door delivery services are the most popular. The company also uses its terminal network to plan hub

and spoke movements that allow single customers to move cargo to multiple locations at a single time, with CONCOR taking care of the distribution and redistribution requirements.

The key value the company offers the provision of a single-window facility co-ordinating with all the different agencies and services involved in the containerized cargo trade, from Customs, Gateway Ports, and Railways, to road hauliers, consolidators, Forwarders, Custom House Agents and shipping lines. To achieve a high degree of customization, it offers packages designed to provide the most cost-effective combination of road and rail. This enables it to offer services which can be individually tailored to every customers specifications, minimizing customers own efforts.

Two new facilities were developed during the year namely Multi Modal Logistics facility at Paradip (Odisha) and Multi Modal Logistics facility at Dahej (Gujarat).

Financial and Physical Performance

In terms of Performance, CONCOR achieved a gross operating turnover of ₹8,103.40 Crore while handling a total of 4.36 million TEUs. In terms of tonnage, the company carried a total tonnage of 49 million tons.

IT Initiatives

Artificial Intelligence (AI)

CONCOR has implemented AI/ML based Container Terminal Management System (CTMS) at one of its flagship terminals, i.e., Inland Container Depot – Tughlakabad to automate complete terminal operations.

All the activities at each of the major operational areas, namely, Gate, Rake Yard, Cargo handling area, Warehouse and Customs examination block are planned to be digitalized using a combination of various automation technologies and digital applications.

Each of the operational areas shall provide real time Dashboards and reports to the specific location while, rolling the information into the centralized systems for organization wide dashboards, reports and business perspective views and decisions.

It has been anticipated that the overall digitalisation process will enable better resource utilization with real time information for CONCOR and its stakeholders/customers.

The other IT initiatives taken by CONCOR to better its logistics services for the trade and industry are mentioned below:-

1. Know Your Container Location (KYCL)
2. Automation of Contract Management / Billing
3. Digital Workplace Solution: eOffice
4. e-Reverse Auction for Road Transportation – eLogistic App

Medium Term and Long Term Strategy

- CONCOR is also exploring Agency Business and Bulk Cargo movement which will create great opportunity and value addition to the trade.
- CONCOR plans to enhance more and more double stack operations for efficient utilization of its rolling stocks, improve dwell time of containers on port and its terminals at a reduced logistics cost.
- CONCOR is closely studying the freight designs being evolved for bulk transportation of Cement, Aggregate, Liquid cargo and Auto Cars etc. for new opportunities.
- CONCOR is also planning for it's off shore presence in the neighbouring countries.

Konkan Railway Corporation Limited (KRCL)

The Company 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:

The total revenue of the Company for the year 2022-23 was ₹5,152 crore as compared to ₹3,364 crore (figure restated) of 2021-22. The net profit during the year was ₹279 crore as compared to the loss of ₹141 crore (figure restated) of 2021-22.

Key Financial Highlights:

		(₹ in crore)
PARTICULARS	2021-22	2022-23
Total Income	3,363.70	5,152.24
Operating Margin	132.42	632.91
Profit After Tax	(-) 140.87	278.93
Net Worth	1,473.77	1,792.44

Train Operating Performance:

- a. On an average, forty six passenger carrying trains per day were run on this single line section during the year 2022-23. Presently forty six (46) pairs of Mail/Express and four (04) pairs of passenger trains are running over Konkan Railway. In addition to this, 629 Nos of special trains were run during summer, Ganpati, Diwali, winter, Anganewadi yatra & Holi festival to clear extra rush of passengers during the year 2022-23. Besides this, 1529 nos. of other special trains were run during the year including FTR special, Election special, Military special etc. Highest ever Coaching earnings of ₹975.10 crore (Passenger and other coaching revenue) was

achieved during the year which is 61.75% more than previous year's ₹602.83 crore.

- b. On the freight front, on an average, 17 freight trains were run per day including Roll on-Roll off (RO-RO) services during the financial year 2022-23. The freight revenue during the financial year was ₹746.41 crore, which is 37% higher than that of previous year's ₹543.15 crore, and it is the highest ever.
- c. **Operationalization of Indo-Nepal Cross Border Railway:** Nepal Railway Company has engaged the Corporation for Operations & Maintenance support for a period of one year. As part of this agreement, Konkan Railway carried out operations & maintenance of trainsets, provided training of Nepal Railway employees, supplied expert manpower and minimum equipment, created basic systems for railway operations and provided technical support for maintenance of track and signaling systems. This is the first ever International Project of KRCL in Railway Operation & Maintenance. The operationalization of Indo-Nepal Cross Border Railway between Jaynagar and Kurtha stations of Nepal Railway has been started by KRCL from 03.04.2022 with two up and two down train services every day with inauguration of train services on 02.04.2022. Konkan Railway has successfully completed one year contract awarded by Nepal Railway Company (NRCL) for Operationalisation of cross border Rail link between Jaynagar (India) and Kurtha (Nepal). During this period, Konkan Railway operated 528 DEMU services with 100% punctuality.

Project Performance:

- a. **Udhampur-Srinagar-Baramulla Rail Link (USBRL PROJECT, J&K):** The Corporation has completed 44.36 km tunnel excavation, out of total 44.59 km while constructing Katra-Dharam Section of Udhampur-Srinagar-Baramulla Rail Link (USBRL) Project. 2,343 m of tunnel excavation, 9,504 m of Tunnel Lining and 5,202 MT of launching have been completed during the year. A turnover of ₹3,135.15 crore (excluding GST) was achieved as compared to ₹1,997.88 crore (excluding GST) of the previous year 2021-22, which is the highest ever. On 26th March 2023, Motor Trolley Inspection of the Iconic Chenab Bridge was conducted marking the completion of the most challenging part of the whole USBRL project.
- b. **Anakkampoyil - Kalladi - Meppadi Tunnel Road Project:** Government of Kerala has assigned KRCL as Special Purpose Vehicle (SPV) for the execution of the Anakkampoyil – Kalladi - Meppadi Road Tunnel Project. A Tripartite Agreement has been signed between Konkan Railway, Public Works (H) Department and Kerala Infrastructure Investment Fund Board (KIIFB) to implement the project. KRCL has prepared DPR for Twin Tube unidirectional Tunnel with 4 lane approach road and two parallel

major bridges at southern end at an estimated cost of ₹2,043.74 crore. Administrative sanction for DPR from Government of Kerala has been received. Comprehensive Environmental Study, Land acquisition and Tender process are in progress.

- c. Rail connectivity to Vizhinjam International Seaport, Kerala:** MOU has been signed between KRCL and Vizhinjam International Seaport Ltd (VISL) to link the Vizhinjam Seaport (11 km). The Detailed Project Report (DPR) with an estimated cost of ₹980.93 crore has been approved by Southern Railway under NGR model. Land acquisition for the project is in progress.
- d. Final Location Survey for Raxaul – Kathmandu new Electrified BG Line:** East Central Railway had awarded Final Location Survey work for new BG Line (136 Km) between Raxaul (India) and Kathmandu (Nepal) to Konkan Railway. Traverse Survey, Topographic Survey, Geological Mapping & Field Survey are completed for full stretch. FLS Report has been approved by East Central Railway. Project Evaluation Committee / Gatishakti, Railway Board, has accepted the report and recommended to take the project forward.
- e. Tata Chemicals Magadi Limited (Kenya):** Konkan Railway signed a contract with M/s. Tata Chemicals Limited, Magadi, Kenya on 24.12.2022 for Rehabilitation of Railway Systems including Track, Locomotives and Rolling stock. The work on this project has already been started and First Report has been submitted. This will be the first International Project in African continent by Konkan Railway after successful performance in Nepal.

RailTel Corporation of India Limited (RailTel)

RailTel Corporation of India Ltd. (Mini Ratna Category-1 CPSU), was formed on 26th September 2000 to facilitate Railways in expeditiously modernizing train operation and safety systems by providing state of art communication network infrastructure to Indian Railways through an internal entity. The PSU started functioning with a hand full of talented, experienced and motivated Signalling & Telecommunication engineers of Indian Railways.

Over the years, it has grown from a small entity to one of the largest secure Neutral Telecom Services Provider in the country and an ICT service provider. It has two UPTIME, USA certified Tier-III Data centers and MeitY empaneled Railcloud. The biggest USP of RailTel is its ownership of a Pan India 61,000+ RKM of optic fibre network with access network of 21,000+ KM, including North Eastern States covering all important towns & cities and several rural areas. RailTel occupies a proud place with its unparalleled networking high bandwidth backbone segment. The network has the ability to provide mission critical customized connectivity platform for enhanced efficiency and growth. Presently this network is available at more than 800 cities in multiple rings of STM-64/16.

RailTel Network has capability of service delivery from 2 mbps to 800 Gbps links and 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 round the clock by Network Operation Centers and trained field manpower. All the equipment provided on the network is of State-of-the-Art Technology and are as per International Telecom Standards. Additionally, RailTel is actively considering establishing another state-of-the-art data center in Noida in PPP mode.

The company has diversified into many fields offering a bundle of services viz. Internet Bandwidth, leased lines, Tower Co-location, HD Video Conferencing service, MPLS-VPN services, Data Centre services such as Co-location Hosting, Managed Services, Cloud computing Services, Data recovery services e-office implementation, HMIS (Hospital Management Information System), Security Operation Centre as a service (SOCaaS) & IT enabled services etc. to private and Government clients.

Financial Performance

Despite extremely competitive market scenario, RailTel has achieved a record-breaking total income of Rs. 2002 crore, marking a remarkable 27% growth compared to the previous financial year's income of ₹1,578 crore. During the year 2022-23, the company's operating revenue experienced a significant surge of 27%, reaching a turnover of ₹1,964 crore, as opposed to ₹1,548 crore in the preceding financial year. RailTel has made payments of ₹42 crore as revenue share to Indian Railways and ₹77 crore to the Department of Telecommunications (DoT) for license fees. The company has also paid ₹1.50 per share as interim dividend which is 15% of the paid up share capital to all our shareholders. Further, the Board has proposed final dividend of ₹1.05 per share which is 10.5% of the paid up share capital. With a revamped approach and focused efforts, the company is confident in achieving improved financial results and further strengthening its position in the industry.

Focus Areas

Hospital Management Information System (HMIS)

RailTel has completed the work of providing Hospital Management Information System over 709 Hospitals/Health Units/ polyclinics of IR. This is integrated clinical information system for improved hospital administration and patient health care for providing an accurate, electronically stored medical record.

The features of the software include customizing clinical data according to the departments and laboratories, multi hospital feature that provide cross consultation, seamless interface with medical and other equipments. The patients will have the benefit of accessing all their medical records on their mobile device. To minimize footfall at Railway hospitals/ Health units for generic treatments, a tele-consultation app and HMIS beneficiary app has been developed and

integrated with the (HMIS). The beneficiary app enables the medical beneficiaries to access their medical record at a single point. Railway HMIS has also been integrated with Ayushman Bharat Digital Mission (ABDM).

Station Wi-Fi

RailTel is transforming Railway stations into Digital hubs by providing public Wi-Fi at all railway stations. 6,108 stations are live with RailTel's RailWire Wi-Fi including 15 Station of Kashmir valleys. This is one of the largest and fastest public Wi-Fi networks of the world. Passengers use this facility for streaming High Definition (HD) Videos, download of movies, songs, games, and do their office work online. Out of the stations commissioned 70% are in rural areas which are bringing free high-speed Wi-Fi services in the vicinity of a major chunk of rural population.

Security Operation Centre

With world going digital, it is becoming increasingly important to safeguard data from cyber security threats. To provide a centralized and consolidated cyber security solution to organizations, the company has set up a Security Operation Centre (SOC) at Gurugram. It provides onsite and offsite cyber security incident prevention and security event monitoring services. RailTel's Security Operations Centre as a Service (SOCS) proactively addresses the increasing threat to Data Security with detection and response capabilities.

E-office in Indian Railways

RailTel started implementation of e-office over IR to bring more efficient, effective and transparent government transactions and processes. e-Office is a Cloud Enabled Software Application developed by NIC, hosted at RailTel Tier-III Certified Data Centre at Secunderabad with Disaster recovery at Gurugram. e-Office has been implemented in 236 Units of Indian Railways. As on date, more than 1.54+ lakh users of Indian Railways are using e-Office Application. e-office has proven to be a boon in a crisis time and a part of Railway workforce was able to WORK FROM HOME, which would have been impossible in case of manual filing system. The Company has also provided this service to other PSUs such as DFCCIL, IRCON, RVNL, IRCTC and CWC etc.

HD Video Conference

RailTel' offers an end-to-end, full high-definition video conferencing service that gives users a virtual, face-to-face meeting experience. Before adoption of Video Conference Service, Indian Railways were spending huge amount of money/man hours for meetings /events, now a number of travels for meetings/ events has dropped drastically saving man hour, travel & lodging expenses. This has also helped in saving significant amount of carbon footprint. The success is a result of the significant ease of use & 24X7 customer responsiveness of the RailTel team vis-a-vis the challenges faced with other service providers.

Video Surveillance System (VSS)

RailTel is also executing provision of IP camera-based Video Surveillance System at 5,000+ railway stations. This will go a long way in enhancing the safety and security of the passengers travelling over the IR network. RailTel is also integrating the various standalone video surveillance system installed at various stations by respective Zonal Railways so that the video recordings can be seen and monitored at the Divisional and Zonal head quarter level centrally.

Tunnel Radio Communication

RailTel is executing the work of installing state-of-the-art Integrated Tunnel Radio Communication System at a number of crucial Railway tunnels in difficult terrains to improve operational safety. Currently, RailTel is executing this system for different sections of various Railways. Communication inside the tunnels is interrupted due to poor signal coverage, which can hamper train operation & maintenance activities. This state-of-the-art Integrated Tunnel communication system is designed to provide uninterrupted radio communication between handheld radios inside tunnel, to the base station at tunnel control rooms and Station Masters of adjacent stations. The Technology being used in these projects is the first for Indian Railways. This will improve train operation in these sections significantly.

Rail Wire – Retail Broadband Service

It is a collaborative model in partnership with local entrepreneurs & local cable operators for providing Last Mile Connectivity. There are more than 5.45 lakh + RailWire broadband customers in the SMEs/Household segment. Using the Point of Presence (PoP) of existing station Wi-Fi at rural stations, the company is extending the service to a number of nearby villages and towns.

Data Center & RailCloud

RailTel has two UPTIME (USA) certified Tier-III Data Centers at Secunderabad and Gurugram & a MeitY Empaneled “RailCloud”. Company offers a host of Data Centre & Cloud services like Colocation Services, Managed services, Cloud Computing, Managed e-Office, Aadhaar Authentication Services, Dedicated Solutions etc, from these two state-of-the-Art Data Centres with combined total gross capacity of more than 6,000 Sq.ft Server Farm area.

Modernization of Signaling System

RailTel Enterprises Ltd, a wholly owned subsidiary of RailTel Corporation of India Ltd., has been awarded the work of replacement of old mechanical signaling equipment with state-of-the-art electronic interlocking system at 26 stations of Northern Railway. The new Electronic Interlocking signaling system will now enable lowering the signal and changing of tracks by click of a mouse and will enhance safety and improve efficiency of train operation.

Centre of Excellence – For Training in Signaling and Cyber Security

In order to ensure the availability of competent and skilled manpower in the field of Railway Signalling, RailTel has set up a Centre of Excellence (CoE). The CoE will offer a range of certification and diploma courses in collaboration with esteemed institutions such as IITs and IIMs. These courses will cover fundamental concepts of Kavach, advanced designing of KAVACH's Station, RFID network, onboard equipment, and Cyber Security.

Corporate Social Responsibility

RailTel is dedicated to making a positive impact on society through our Corporate Social Responsibility (CSR) initiatives. RailTel's CSR endeavours primarily focus on areas such as health, nutrition, education, economic empowerment of women, and sustainability. In FY 2022-23, the company allocated an amount of ₹436.87 lakh towards various CSR projects. Thus, RailTel aims to contribute to the betterment of society and create meaningful and sustainable change in the lives of those in need.

Indian Railway Catering And Tourism Corporation Limited (IRCTC)

IRCTC, founded on 27th September, 1999 as a wholly owned Government of India enterprise under the administrative control of the Ministry of Railways, is the only entity mandated to provide railway tickets, catering services to Railways, and packaged drinking water with tourism and hospitality services over Indian Railways network.

The NGeT System's outstanding performance and success is another break through to the IRCTC's commitment to innovation and technological advancement. The magnificent growth, efficiency, and seamless experience of the system have enabled millions of people to access affordable and convenient online ticketing service, further solidifying its status as a leading e-commerce website in Asia and India.

During the year 2022-23, a total amount of ₹54,313.46 crore were collected as Ticket Fare from the users as E-ticketing revenue, which is 42.26% more than the last year's collection of ₹38,178.32 crore.

A total of 4,313.00 lakh tickets have been booked in 2022-23 as compared to 4,174.49 lakh in 2021-22. In total, 7,706.40 lakh passengers got booked on E-Tickets in 2022-23 as compared to 7,343.26 lakh passengers in 2021-22.

The core activities of the Company are detailed below:

Internet Ticketing

IRCTC has been the pioneer of internet based railway ticketing in the country. Today, the company's website www.irctc.co.in is the most visited e-commerce site in the entire South East Asia.

In the financial year 2022-23, the IRCTC Website and Mobile App recorded an average daily ticket sale of 11.82 lakh tickets, representing an increase from the previous financial year's average of 11.44 lakh tickets.

IRCTC Rail Connect Mobile App Bookings - Total 9.95 crore Mobile App (on Android & iOS) Downloads till 31st March, 2023. The average Mobile App bookings during 2022-23 were 5.60 lakh tickets per day, as compared to 5.25 lakh tickets in 2021-22. 47.35% of IRCTC e-Tickets have been booked through IRCTC Rail Connect Mobile App during FY 2022-23.

IRCTC has developed a dedicated website to maintain the e-ticketing system along with the Warrant Management System for booking of e-tickets through this portal to travel in trains in a hassle-free manner. Giving further impetus to this progress e-ticketing service for Indo-Tibetan Border Police (ITBP) has been launched on 09.02.2023. Presently, it is serving Seven Central Paramilitary Forces, namely NSG, CRPF, NDRF, AR, CISF, BSF and ITBP.

Kolkata Metro Rail Corporation Limited (KMRCL)

Kolkata Metro Rail Corporation (KMRC) was formed in 2008 to implement East-West Metro Corridor, Kolkata Project as an 'SPV' with 50:50 Equity Partnership of Government of India and Government of West Bengal. Later in Aug, 2012, project was transferred to Ministry of Railways (MoR) in equity partnership of 74:26 in between MoR and Ministry of Urban Development (MoUD), Government of India.

Project in brief

Project was sanctioned by Ministry of Housing and Urban Affairs (MoHUA), Government of India in Feb, 2009 for a length of 14.67 Km from Salt Lake Sector-V to Howrah Maidan for ₹4,874.58 crore. Due to land acquisition and R&R issue at Central station and traffic blockade in Mahakaran area, the work was completely stopped from Dec., 2012 to Aug, 2015. Realignment of the route was done in Aug, 2015 increasing project length by 1.88 Km and Station at Esplanade in new route. The present Project length is revised to 16.55 kms after realignment. Revised Cost Estimate due to realignment & other changes amounting to ₹8,574.98 crore was sanctioned in Oct, 2020. For completion of project, proposed Revised Cost Estimate amounting to ₹10,442.41 crore submitted to Railway Board for sanction. Some of the unique features of this corridor are:-

- 1st transportation tunnel under any mighty river in India.
- Corridor connects major terminals Howrah & Sealdah, North-South metro line with upcoming Joka Esplanade Metro Line at Esplanade Metro Station.
- Howrah Metro Station is one of the deepest metro stations in India.
- Deepest Metro Escape shaft of India at Strand Road.
- Institution of Civil Engineers, UK/ICE had recognized this project

among 200 global projects which had significant impacts in making people lives better.

Salient features of the project

S.No.	Item	Details
1	Project length	16.55Km [Elevated : 5.74 Km & Underground : 10.81 Km]
2	Stations	12 Nos. [Elevated-6 Nos. & Underground - 6 Nos.]
3	Gauge	Standard Gauge : 1,435mm
4	Speed	Design speed - 90 KMPH, Operational Speed - 80 KMPH
5	Rolling Stock	2.88m wide 6 – Car train [BEML manufactured under Make in India], Max. train capacity 2068 passengers
6	Traction System	750 Volt DC, Current collection: Third Rail [Top]
7	Signalling System	Communication Based Train Control [CBTC: Onboard Signal]
8	Traffic forecast	Daily Ridership 7.5 lakhs passenger per day in the year 2025
9	Special features	Platform Screen Door/ Gates for fall protection, Divyang friendly [wheel chair space in train], NBC -2016 & NFPA compliant for Life & Fire Safely
10	Depot	Central Park [At grade] in 39 Acres

Physical Progress

Out of 16.55 Km of the corridor, 9.30 Km from Salt Lake Sector-V to Sealdah has already opened for the public in Phase-I. Remaining 7.25 Km of Underground Section will be completed in Phase-II. The details are as under:

Phase-II	Balance Section	Length	Target
II A	Howrah Maidan - Esplanade [Underground station - 04 nos. Howrah Maidan, Howrah, Mahakaran & Esplanade]	4.80 Km	Jan'2024
II B	Esplanade – Sealdah	2.45 Km	June'2024

Key Financial Highlights:

Particulars	(₹ in crore)
Estimated Budget	8,574.98
Proposed Revised Budget	10,442.41
Expenditure for the FY 2023-24 (upto Nov., 2023)	286.49
Expenditure since inception of the Project	8,889.01

KMRCL is mandated for construction of 16.55 km East-West Metro Corridor Project, Kolkata. The operation of the completed Metro project rests upon Metro Railway, a Zonal Railway under Ministry of Railways. KMRCL does not earn any revenue and therefore, does not earn any profit and no dividend is paid too.

Challenges faced during construction

This project faces unique engineering challenge due to Kolkata's soft ground conditions, tunneling below Hooghly river, busy railway yards (Howrah station yard), Bankim Setu, Brabourne Road flyover, Sealdah Flyover, existing North South Metro Station at Esplanade and densely populated urban environment and under old building area. Several milestones have been achieved like tunneling under River Hooghly which is the 1st transportation tunnel in India under any mighty river. The underground station at Howrah and Intermediate Ventilation Shaft at Stand Road is one of the deepest Metro station and Ventilation Shaft respectively.

Benefits of East West Metro Project

This corridor connects major terminus at Howrah & Sealdah and also connects existing North South Metro and Joka- BBD Bag project at Esplanade station. Kolkata East West Metro Project itself is a modern, safe, eco-friendly mass transportation system which will eradicate the vehicular pollution, to reduce traffic congestion, travel time, carbon footprints and road accidents in the city of Kolkata and surrounding urban areas to a great extent and will also promote regional economic growth & urban environment. It will boost up the mass transport scenario of the region providing a fast train communication across river for the twin cities of Howrah and Kolkata.

Rail Vikas Nigam Limited (RVNL)

RVNL is embarking on a new journey with Quality, Speed and Transparency, the three hallmarks of our existence. Over the years, it is consistently endeavored to foster transparency across all our business operations. This has helped us earn the trust of our clients and stakeholders and enabled us to establish strong partnerships with them. While we strive to deliver projects on time, we also ensure that our projects meet the highest quality standards. Our efforts have been recognised, with us receiving Navratna status on May 1, 2023.

Adopting an asset-light model, we have gained a robust financial track record. Following a turnkey approach, innovative execution models, and efficient contract management practices, we have also gained a strong order book with a large share of projects under execution. We undertake all stages of project development and execution, underscoring our expertise in translating concepts into commissioning.

As per the Financial Year 2022-23, RVNL has a strong foothold with 30 Project Implementation Units (PIUs) across India, including 1 in Maldives and have 425 Total Workforce.

Impressive Physical & Financial Performance

Financial Performance

In 2022-23, RVNL increased its expenditure on project execution from ₹19,381.71 crore to ₹20,281.57 crore thus crossing the coveted milestone of

₹20,000 crore, which excludes the element of ₹3,343.47 crore as GST. This reflects an increase of 4.64%. Profit before Tax increased from ₹1,406.10 crore in 2021-22 crore to ₹1,644.38 crore in 2022-23, and Profit After Tax (PAT) of the Company is at ₹1,267.41 crore, showing an increase of 16.57 % over the previous year. In view of the improved financial performance, the Directors of your Company have recommended/paid payment of the highest ever dividend (Interim and Final) of ₹444.11 crore for 2022-2023, compared to ₹329.43 crore in the previous year. As a result, the effective management fee of RVNL got reduced from 8.5% to 6.58%, with this, the cumulative Dividend paid to the Ministry stands at ₹1,826.34 crore (excluding ₹75.06 crore towards final dividend recommended by the Board of Directors to the Shareholders). The success journey continues in the financial year 2023-24.

Physical Performance

During the year, RVNL again crossed 1000 km commissioning benchmark for New Lines, Doublings and Gauge Conversion. 1343.30 km of project length was commissioned consisting of 119 km of New Line, 925.00 km of Doubling and 299.3 km of Railway Electrification. These were handed over to Zonal Railways for operations. Additionally, Railway Electrification of 655 km was also carried out as part of Doubling.

Doubling / New Line / Gauge Conversion

During 2022-23, 863.02 km project length was completed including 67.06 km of New Line, 497.88 km of Doubling, 271.12 km of Railway Electrification and 26.96 km of Metropolitan Transport Project (MTP). In addition, Railway Electrification of 334.59 km was also carried out as part of Doubling. During the year, eight important projects were fully commissioned. These are:

- a. Sambalpur-Titlagarh (182 km)
- b. Bhimsen-Jhansi (206 km) with RE
- c. Daund- Gulbarga- Doubling (224.9 km)
- d. Pune- Guntakal -Electrification (641.37 km)
- e. Vijaywada - Gudivada - Bhimavaram - Narasapur, Gudivada-Machlipatnam and BhimavaramNidadavolu (221 km) - Doubling with electrification
- f. Bina -Kota (282.66 km) with electrification, Palanpur- Samakhiali (247.73 km)

Railway Electrification

RVNL commissioned 299.3 Route km (681.6 Track km) of pure Railway Electrification works on important routes. Apart from pure RE work, 655 km of RE was also commissioned with the doubling projects. Thus, 924.30 km of electrified sections were commissioned in 2022-23. Railway Electrification of Sambalpur-Titlagarh Doubling project (96.596 km) & Palanpur- Samakhiali (247.73 km) project was fully commissioned during the year.

Signalling & Telecom

Signaling & Telecommunication (S&T) domain is a core expertise of providing signalling solutions for efficient and safe operation of trains on Indian Railways.

RVNL is a major contributor in providing EI installations on Indian Railways in connection with most complicated projects of Doubling, 3rd Line, New Line and Gauge Conversion. Keeping its tradition high, during FY 2022-23, RVNL has commissioned 93 new EI/PIs installations on Indian Railways. Apart from new EIs; RVNL has commissioned Alterations in 53 EIs/PIs installations on Indian Railways.

RVNL has also commissioned many Major Yard remodellings of Bhatinda RRI Station (717 signaling routes), Kota station (534 signaling routes), Garwha Road station (336 signaling routes), Titlagarh (254 signaling routes), VKT station (249 signaling routes), ANB station (192 routes) & PGU station (177 routes) thus manifesting its technical + managerial capability.

RVNL executed 146 Non-Interlocking (NIs) of stations for commissioning of Doubling & 3rd Line projects during the year. RVNL also commissioned the high number of 52 IBS/Auto signals and Interlocking of 46 midsection level crossing gates. Not only on the Signalling front, but RVNL also had the incredible achievement in telecommunication by providing 1,350 km of Fibre Optic Network and 6 Quad Cable network during the year.

Corporate Social Responsibility

RVNL is conscious of its social responsibility. During 2022-23, the Company spent ₹26.26 crore on CSR initiatives, which is more than 2 percent of PBT for the last three proceedings Financial Years i.e. ₹23.68 crore. ₹22.13 lakh set off in pursuance of sub-rule (3) of rule 7 of the Companies (CSR Policy) Rules, 2014 due to excess expenditure more than 2 percent in last financial 2021-22. Thus, CSR liabilities of RVNL in FY 2022-23 was ₹23.46 crore. The main focus of the Company is in the areas of education, health, and sanitation.

Awards & Accolades

RVNL has won numerous Awards in the recent past, to list a few:

- Outstanding Achievement Award in the Construction Safety Category in 21st Greentech Safety Awards 2023.
- Best CFO Infrastructure Award in Mid Cap 2023 category to Director (Finance) RVNL.
- Operational Performance Excellence Award in PSE Excellence Awards 2023.
- Won Quality Innovation Award during Institution of Engineers India Ltd. 2023.
- SKOCH Gold Award 2023 for Excellent Physical and Financial Performance.

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.

Functions of RLDA

In terms of Section 4(D), RLDA has to discharge functions and exercise such powers of the Central Government. In relation to the development of Railway land as are specifically assigned to it by the Railway Board. In terms of section 4(E) of the Act, specifically subject to such directions as may be given to it by Central Government, RLDA has been empowered to enter into agreement on behalf of Central Government and execute contracts.

In terms of section 24 of RLDA (Constitution) Rule 2007, the Authority may set up any special purpose vehicle, joint venture or other legal entities for the performance of all or any of its functions under the Act with the approval of Central Government.

Business of the Authority

Commercial Development of Vacant Railway Land

During the year 2022-23, total earning of ₹508.54 crore has been realized by RLDA. Sites for commercial development are entrusted to RLDA by the Ministry of Railways. Till the beginning of 2022-23, net 122 sites were entrusted. During 2022-23 15 no. of new sites were entrusted and 11 sites were de-entrusted, making net total 126 sites available to RLDA for Commercial Development till 2022-23.

Besides commercial sites, 18 stadium and 4 Railway lines (Darjeeling Himalayan Railway, Kalka Shimla Railway, Neral-Matheran Railway, & Nilgiri Mountain Railway) have also been entrusted to RLDA for Commercial Development.

During 2022-23, 16 nos. Letters of Acceptance (LOA) for commercial sites have been issued. Out of these LOA of 3 sites (i.e., 1. Bhusawal along Station Road, 2. Walltex Road Chennai, and 3. Good Luck Colony Solapur) have been cancelled on account of non-payment of 1st installment of lease premium by selected bidder.

In the beginning of the year 2022-23, total 24 commercial sites were awarded. During the year 2022-23 total 16 sites were awarded. But, 3 sites awarded in 2022-23 and 2 sites awarded earlier have been cancelled during the year. Thus, on date total awarded commercial sites are 35.

Redevelopment of Railway Colony

Till the beginning of 2022-23, net 84 sites were entrusted. During 2022-23, 20 nos. of new colony sites were entrusted, making net total 104 colony redevelopment sites available to RLDA for colony redevelopment till 2022-23.

In the beginning of the year 2022-23, total 4 Colony redevelopment sites were awarded. During the year 2022-23, total 09 sites were awarded. 01 site awarded in 2022-23 has been cancelled during the year. Thus, on date total awarded colony redevelopment sites are 12.

Construction of Multi-Functional Complexes (MFCs)

Land for MFCs is 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, MFCs were assigned to PSUs for development [IRCON (24), RITES (14), and RVNL (02)], out of these, 24 MFCs have been commissioned by IRCON. However, as per the directions of the Railway Board, 14 MFC Buildings completed by RITES have been handed over back to Railways without any cost. RVNL has also handed over 02 nos MFCs to concerned Zonal Railways. RLDA has been entrusted 123 MFCs for development through private developers. Out of these, 53 MFCs have been awarded; and on account of poor viability in Technical & Financial context, Railway Board has been requested vide letter dtd. 11.03.2021 to withdraw 39 MFC sites from RLDA.

Redevelopment of Stations

104 stations have been entrusted to RDA for redevelopment (out of which work of 02 stations have been completed, work is in progress at 13, DPR prepared and handed over to Zonal Railways in 49 stations, tenders have been invited/to be invited at 04 stations and planning of 32 stations is in progress. Further, 04 stations have been proposed for dropping.

Dedicated Freight Corridor Corporation of India Limited (DFCCIL)

About DFCCIL

Dedicated Freight Corridor Corporation of India Limited (DFCCIL) is a public sector undertaking under the administrative control of the Government of India (Ministry of Railways). The golden quadrilateral and the diagonal linking the four major metropolitan cities of Delhi, Mumbai, Chennai and Kolkata are strategically crucial to Indian Railways. This route comprises 16% of the total route but, carries 52% of passenger traffic and 58% of freight traffic. The Eastern corridor (Kolkata-Delhi) and the Western corridor (Mumbai-Delhi) were highly saturated. To ease congestion on these routes, a Dedicated Freight Corridor (DFC) was developed. DFC was formed to decongest the saturated road network and promote rail freight transport while ensuring efficiency and enabling significant

reduction of Green House Gas (GHG) emissions. The total scope of Dedicated Freight Corridors is 2,843 km route passing through 9 states.

Advantages of DFCCIL

- The unit cost of transport is expected to reduce significantly.
- DFC routes are constructed with double lines and are also provided with automatic signalling; thereby more than 120 trains can be run in each direction.
- Modal shift from Road to Rail. Initially, it is planned to divert 70% of the freight traffic running on the parallel routes of Indian Railways and during the course of time, the road traffic will also get diverted to rail as DFCs will provide a very efficient, economical, safe and faster mode of transport.
- Industrial corridors are also coming up along the Eastern DFC and Western DFC.
- Savings of 457 million tones of CO₂ emission over a 30-year period. It will help in achieving net zero carbon emissions by 2070.

Significant Achievements of the Year 2022-23

DFCCIL successfully commissioned 2,089 Route km of DFC Network out of the planned 2,843 Route km. This milestone significantly enhances the connectivity between the ports of Gujarat and Northern India through the vital feeder routes of Indian Railways.

Highlights

Two important sections of DFC – New Palanpur-Madar section (353 km) of WDFC on 18.06.2022 and New Palanpur- Mahesana Section (75 km) of WDFC on 30.09.2022 were dedicated to the nation. These sections are critical links for connecting parts of Western India to the northern part and provide faster access.

812 km (28.6%) of DFC sections were completed and commissioned during FY 2022-23. Important sections are as mentioned below:-

- Rewari-Dadri (127 km) of WDFC.
- Palanpur-Sanand North (Including Palanpur Connecting Line) (152 km) section of WDFC.
- Khurja-Dadri (46 km) Broad Gauge Double Line electrified section of EDFC, which facilitates seamless train operation between EDFC & WDFC.
- Bhaupur-Bhimsen (50 km) Broad Gauge Double Line electrified section of EDFC.
- Shujatpur-New Ahruara Road (195 km) Broad Gauge Double Line electrified section of EDFC.
- Khurja-Khatauli (134 km) Broad Gauge Single Line section of EDFC.
- Bhestan-Sanjan Broad Gauge Double Line electrified section (108 km) of WDFC with high-rise OHE.

- State-of-the-art Operations Control Central (OCC) of WDFC was commissioned at Ahmedabad on 30.03.2023.

Progress of Works

In the FY 2022-23, 75 Major Bridges, 13 Rail Fly Overs (RFO) & 36 Rail Over Bridges (ROB) were completed.

- Highest ever track linking with modern New Track Construction (NTC) machine of 988 Tkm was done during the FY 2022-23 taking the cumulative linking to 5,151 Tkm.
- Highest ever OHE wiring of 1343 Tkm was completed by Mechanized Wiring Train in the FY 2022-23. Cumulative 4,454 Tkm OHE wiring has been completed till 31.03.2023.
- DFCCIL achieved CAPEX of ₹13,851.57 crore (including land) during FY 2022-23 and a capex of ₹1,03,287.57 crore as on 31.03.2023.

Land Acquisition

For FY 2022-23, the total land acquisition for EDFC was 24,170 Ha, WDFC 46,452 Ha and for Sonnagar- Dankuni 35,860 Ha. The cumulative land acquisition for EDFC was 4,743.5 Ha, WDFC – 6,081.45 ha, and Sonnagar – Dankuni – 1,191.95 Ha respectively.

Operations

In FY 2022-23, the Company successfully operated an average of 170 trains per day. The number of trains per day witnessed a significant increase. In FY 2022-23, the Company achieved a substantial 134 million gross ton-kilometers (GTKM) & 61.2 million Net ton-kilometers (NTKM).

- **DFC Speeds:** DFC has achieved impressive average speeds, with the highest recorded at 99.82 kmph. In the fiscal year 2022-23, the EDFC maintained an average speed of 52 kmph, while the WDFC closely followed with an average speed of 51 kmph. These speeds exemplify the efficiency and effectiveness of the DFC in facilitating freight transportation.
- **Improved Freight Speed and Congestion Alleviation:** DFC significantly enhances freight traffic's average speed while concurrently relieving congestion on IR tracks. This translates into more Passenger trains & improved train punctuality, particularly on highly congested routes.
- **Higher carrying capacity:** The existing track structure of Indian Railways allows trains with 20.32/22.9 Tones axle load. The track structure of DFC is designed for carrying axle load of 25T, which can be further upgraded to 32.5 Tones axle load. The maximum moving dimension on DFC is also greater than that on Indian Railways. Therefore, bigger wagons with higher carrying capacity can be run over DFC.

As on date, 17 Rail connectivity projects are getting linked with the DFC network. 33 Goods shed (26-WDFC, 7-EDFC) have been notified till now. EOI has been invited to develop Gati Shakti Cargo Terminals (GCTs) at 112 stations of DFC and response has been received for 28 locations. First GCT at Rewari has started. Second GCT at New Bhaupur has been awarded.

- **Development of industrial hubs:** Delhi-Mumbai Industrial Corridor along WDFC, connection to inland waterways & Amritsar-Kolkata Industrial Corridor along the EDFC.
- **Boost to export-import traffic:** DFC connects the major industrial hubs, mining areas and ports. Faster connectivity to and fro these areas will give a boost to export-import traffic. A prime example of it is in connectivity of West Coast Ports with National Capital Region (NCR), where container traffic from ports on DFC takes almost one-third of the time it used to take earlier. This reduction in time can open the railway mode of transportation for perishable commodities where time is the essence.
- **Environmentally friendly mode of transport:** Carbon emission by train transportation is 28 gm. per NTKM, significantly less than 64 gm. per NTKM for road transportation. This makes rail transportation an eco-friendly option. In this process, DFC contributes significantly to the environment by saving 457 million tons of CO2 emissions in 30 years.
- **Safe operations:** There will be no level crossing (more than 861 LCs eliminated by 304 ROBAs & 557 RUBs) along the DFC's alignment, making it much safer for people commuting and dwelling around railway tracks. Advance signalling and safety systems like train protection systems are used on DFC for maintaining safe operation.
- **Innovative services:** The Company has the potential to introduce innovative services like Truck on trains (ToT), EMU-based parcel express, refrigerated special trains for perishable commodities, e-commerce special trains, triple stack dwarf containers services, etc.

Business Development

DFCCIL is focusing on the expansion of new terminals in alignment with the Gati Shakti MultiModal Cargo Terminal (GCT) Policy of the Indian Railways, as part of the DFC network. This initiative involves the integration of multiple rail connectivity projects from various organizations into the DFCCIL network. Notably, there are two rail connectivity projects from the National Industrial Corridor Development Corporation (NICDC), four from the Container Corporation of India Limited (CONCOR), and 1 each from Pristine Logistics and Navkar. All these projects are seamlessly being incorporated into the DFC network.

DFCCIL is pursuing opportunities to tap into the vast potential of the e-commerce sector within the realm of rail transportation. To achieve this ambitious goal, the Company initiated a transformative process, by using Indian Railways' converted old GS Coaches into state-of-the-art NMGS coaches.

DFCCIL has played a stellar role in adding 2089 RKm of Dedicated Freight Track to the total routes of kms of Indian Railways (IR), boosting its freight loading capacity and augmenting the passenger network by taking over a major share of goods trains earlier running over IR network. It is expected to play a pivotal role in improving freight transport within the country, minimising transit time coupled with lower logistics costs and contributing towards "Atma Nirbhar Bharat."

Mumbai Railway Vikas Corporation Ltd. (MRVC)

Mumbai Railway Vikas Corporation Ltd (MRVC Ltd), is a PSU of Government of India under Ministry of Railways (MOR), executing the Rail Component of the Mumbai Urban Transport Project (MUTP).

Mumbai Urban Transport Project – I

MUTP I was sanctioned in Railway Budget 2003-04. It was successfully completed in 2012 and its completion cost was ₹4,452 crore.

Major Infrastructural Inputs in MUTP Phase – I (Rail Component)

- Addition of 93 track Kms. (5th and 6th lines Kurla-Thane, 3rd and 4th lines Borivali-Virar)
- Induction of 101 new 9-car rakes (909 coaches)
- Resettlement & Rehabilitation of 15,857 Project affected households.
- Running of 12-car rakes on all lines (excluding Harbour Line) by extending the length of all platforms
- 1,500 V DC to 25k V AC conversion on Central & Western Railway – Traction conversion work on entire Western Railway.

Mumbai Urban Transport Project – II

Cost of the project is ₹8,087 crore the project is bifurcated into MUTP 2A and 2B as follows

MUTP 2A – Completed. cost ₹4,803 crore Loan from World Bank ₹1,727 crore.

S.No.	Name of Work	Executing Agency	Status
1	EMU Procurement/Manufacture (ICF)	MRVC/RDSO/ICF	Completed
2	1500v DC to 25kV AC Conversion	CR, MRVC	Completed
3	EMU Maintenance Facilities & Stabling Lines	CR, WR, MRVC	Completed
4	Trespass Control measures	MRVC	Completed

MUTP 2B – In progress. cost- ₹3,284 crore.

S.No.	Name of Work	Executing Agency	Completion Target / Status
1	Extension of Harbour Line between Andheri-Goregaon	MRVC	Completed in December 2017
2	5th and 6th lines between Thane-Diva	MRVC	Completed in February 2022
3	5th and 6th lines between CSTM-Kurla	CR	March 2025
4	6th Line between BCT-Borivali	WR	March 2025
5	Resettlement and Rehabilitation	MMRDA	Along with project

S.No.	Name of the work	Cost (₹in Crore)
1	New Suburban Railway Corridor Panvel-Karjat (double line) (28 Kms)	2,782
2	New Suburban corridor link between Airoli-Kalwa (elevated)on Central Railway (4 Kms)	476
3	Quadrupling of the Virar-Dahanu Road on Western Railway (31.5 Kms)	3,578
4	Procurement of Rolling Stock (565 coaches)	3,491
5	Trespass Control on mid-section	551

S.No.	Name of the work	Cost (₹in crore)	Executing Agency
1	Extension of Harbour Line between Goregaon-Borivali (7 Rkm)	826	Western Railway
2	5th & 6th line between Borivali-Virar (26 Rkm)	2,184	MRVC
3	4th line between Kalyan-Asangaon (32 Rkm)	1,759	Central Railway
4	3rd & 4th line between Kalyan-Badlapur (15 Rkm)	1,510	MRVC
5	Kalyan Yard - Segregation of Long distance and Suburban Traf-fic	866	Central Railway
6	a) CBTC on CSMT-Panvel on Harbour Line and Trans Harbour	1,391	MRVC
	b) CBTC on CSMT-Kalyan on Central Railway	2,166	MRVC
	c) CBTC on CCG-VR on Western Railway	2,371	MRVC
7	Station Improvement – at 19 stations	947	MRVC
8	Procurement of Rolling Stock - 191 AC EMU rakes	15,802	MRVC/ICF/MCF
9	Maintenance facilities for Rolling Stock	2,353	MRVC
10	Stabling Lines	557	CR & WR
11	Augmentation of Power Supply Arrangement	708	CR & WR
12	Technical Assistance	250	MRVC
	Grand Total	33,690	

Braithwaite & Co. Limited

Braithwaite & Co. Limited (BCL) is a Schedule – B, 'Miniratna – I' Heavy Engineering CPSE under Ministry of Railways. It is headquartered in Kolkata, has set-ups at Delhi & Mumbai, 2 manufacturing units in and around Kolkata and project sites across India. BCL has been a dominant player in Railway Rolling Stock Industry in India, especially wagon manufacturing, since decades. Its other major products & services include repairing of wagons, civil construction & structural steel fabrication of bridges, container manufacturing, operation & maintenance of Railway workshop, manufacturing of cranes and their maintenance, steel castings (Bogie, Coupler etc), wagon sub-assemblies etc.

Recently, BCL has further diversified into Railway Station development, renewable energy sector for installation of solar PV plants and setting up of a Welding Training Center. Being Pioneer in Crane & wagon Manufacturing & Services, the Company is venturing to create Single Window service for PSUs.

On the physical front, Company attained highest production of new wagons & bogies and in financial front too, achieved highest ever Sales and Profit during 2022-23, highlights of the same are as below:

Particulars	2021-22	2022-23
Revenue from Operations (₹crore)	764.14	1,043.30
Profit before Tax (₹crore)	46.43	64.03
Net Worth (₹crore)	150.59	200.32
New Wagon (Nos)	1,201	1,800
Bogie (Nos)	1,673	2,230

Major Achievements during 2022-23

- As enumerated above, BCL is continuing its journey of surpassing the previous year's achievements, recorded highest ever Sales, PBT & Net Worth during the FY 2022-23.
- Achieved highest outturn of POH, NPOH & Corrosion repairing jobs of 2005 Nos at Vadlapudi Workshop of Railways, since commencement of the job outturns.
- BCL has secured total orders of ₹183 crore during the year and as on 31.03.2023, the total Order-in-hand is of ₹2,346 crore which is highest ever.
- Entered into 2 major new business verticals in the following areas –
 - ✓ Installation of 500 MW Solar Power Plant under MSKVY Scheme of Government of Maharashtra and 10 MW Solar PV Power Plant from DVC.
 - ✓ Redevelopment of Vizag Railway Station on EPC Mode from ECoR. Work initiated in this regard.

- Firmed up the new business line of manufacturing containers, executed ₹12.13 crore in the year.
- Enhanced the diversified business of civil construction and bridges, executed worth orders worth ₹27.51 crore in the year, against ₹5.68 crore of previous year.
- Expanded market for legacy business of Crane services and penetrated deep into existing markets by taking up design and manufacture of repairs and overhauls. Partnered with various PSUs, thus making BCL a comprehensive Crane service provider.
- Entered in to Maritime Market by Commissioning Ship Launching Cradles for HCSL yard, Howrah.
- Successfully developed the new design wagons – BLCS, BLSS.
- Implementation of e-procurement, with the customized utilization of e-MSTC portal.
- Automated the facilities, by way of inducting Ind 4.0 compliant machinery and CAPEX.

Self – Sufficiency

Stores imported by IR constitute 0.98% of the total stores purchased. The cost of stores imported in the last three years are as under:

Item	(₹ in crore)		
	2020-21	2021-22	2022-23
Diesel loco parts and fittings	71.93	58.10	4.58
Electric loco parts and fittings	147.10	76.33	139.87
Carriage, Wagon and EMU parts and fittings	190.93	132.81	446.62
Electrical stores	0.47	2.49	1.00
Engineering stores	0.48	42.31	1.17
Ball and Roller Bearings	-	0.14	0.18
General stores covering acids, chemicals, drugs, etc.	30.12	22.24	30.58
Other items including metal ferrous, complete units of rolling stock i.e. bogies, wheel -sets, couplers, etc.	11.70	334.42	15.52
Grand Total	452.73	658.87	639.52

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 Proforma charges) for different types of Rolling Stock manufactured in Indian Railway Production Units for the year 2022-23 is furnished below:

LOCOMOTIVES/COACHES		2021-22	2022-23
DLW	WAP-7	1.26	1.48
	WAG-9H	0.51	0.5
	Diesel Loco (Mozambique Loco)	1.16	-
RCF	LGS	0.94	3.25
	LSLRD(LC)	0.90	3.09
	EOG/LHB/FAC	0.72	2.49
	SCZAC/EOG/LHB	0.76	-
	VPHX	1.22	4.19
	LWSCZ	0.93	3.22
	LWSCN	0.91	-

	LOCOMOTIVES/COACHES	2021-22	2022-23
	ACCB/EOG/LHB	0.74	2.54
	ACCW/EOG/LHB	0.78	2.67
	LACCNX	0.74	2.56
	LWACCN (GARIB RATH)	0.81	2.79
	LRM500SX	0.64	-
CLW	WAG-9HC	0.35	0.72
	WAG-9	0.35	-
	WAP-7	0.81	-
	WAP-5	2.84	3.03
MCF	LWFAC	1.63	1.80
	LWCBAC/T	1.47	1.61
	LWFAC/T	1.36	1.50
	LWACCN/T	1.31	1.44
	LWACCW/T(2AC)	1.31	1.44
	LWACCW (2AC)	1.76	2.00
	LWFCWAC	1.61	1.77
	LWACCNE	1.79	1.79
	LWACCNE	-	1.98
	LWCBAC	1.64	1.75
	LWSCCZ	-	2.44
	LWSCZAC	-	1.94
	LSLRD	1.83	2.39
	LWSCN(G)	2.08	2.35
	LWS DEEN	2.14	2.35
	LWSCZ	2.14	-
	LWSCN	2.05	2.25
	BRAK VAN/T	-	1.24
	BRAKE VAN /T(LWLRRM/T)	1.13	-
	LWLRRM	1.22	-
	LWLRRM(PC)	-	2.06
	PARCEL VAN	3.56	3.91
ICF	LSDD	1.05	2.75
	LACCN	0.98	2.36
	LACCN E	-	1.85
	LWACCN E	0.82	-
	LACCW	1.05	2.27
	LACCW LW	0.97	-
	LFCWAC	1.11	2.17
	LSCN	2.19	2.65
	LSLRD	2.97	2.7
	LPV	1.35	3.55
	LSCZ	1.24	-
	LSCZ AC	1.04	-

LOCOMOTIVES/COACHES	2021-22	2022-23
LRAAC	0.67	1.42
VISTADOME	0.62	1.23
LWCB AC	0.98	2.48
LWCB AC DQ	-	1.95
LFAC	1.06	2.91
LWLRRM	-	1.93

Manufacturing of Rolling Stock

The performance of Production Units during 2022-23 was as under:

- **Chittaranjan Locomotive Works (CLW), Chittaranjan** manufactured 436 nos. state-of-the-art BG 3-phase HHP electric equipped with IGBT technology based propulsion system & auxiliary converters.
- **Banaras Locomotives Works (BLW), Varanasi**, manufactures 346 locomotive including 3 diesel locomotive for Non Railway Customers (NRC). The total sale value for NRC/Exports was ₹ 41.62 crore.
- **Integral Coach Factory (ICF), Chennai** manufactured 2,702 coaches including 2,261 LHB coaches, 184 trainset coaches, 104 three phase MEMU, 120 EMUs, 15 high speed Self Propelled Accident Relief Trains (SPART), and 18 nos. Tower car/inspection coaches.
- **Rail Coach Factory (RCF), Kapurthala** manufactured 1,651 coaches including 1,438 LHB coaches and 213 MEMU coaches.
- **Modern Coaches Factory (MCF), Raebareli** manufactured 1,461 coaches including 1,434 LHB coaches and 27 cape gauge coaches for Mozambique Railways.
- **Rail Wheel Factory (RWF), Bengaluru** assembled 81,480 wheel-sets, manufactured 1,90,976 wheels and 91,889 (units) axles. The sale value for Non Railway Customers (NRC) customers was ₹217.22 crore.
- **Rail Wheel Plant (RWP), Bela** manufactured 24,518 wheels during the FY 2022-23.
- **Patiala Locomotive Works (PLW), Patiala** manufactured 198 High Horse Power BG electric locomotive and 55 nos. Tower car.

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 2022-23, 22,790 wagons were inducted in Indian Railway System. Out of these, 1,561 wagons (including 151 BLC wagons) were manufactured by Railway Workshops and the remaining 21,229 wagons (including 632 BLC wagons) were manufactured by wagon industry.

Signalling Workshop:

Railway Signaling installations use a number of specialized equipment for smooth & safe running of trains. With upgradation of technology and shift towards electrical/electronic system of Signaling, 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, 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. Year wise out-turn achieved by these S&T workshops are as under:

Year wise Out Turn of Signal and Telecommunication Workshop:

Year	Out Turn in Lakhs
2020-21	25,041.89
2021-22	31,300.00
2022-23	34,033.42

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 and Kanpur.

The workshops are equipped to provide comprehensive support for Indian Railways’ traction motor needs, including rewinding, repair and re-shafting services for three phase electric locomotive and EMU/MEMUs. The primary focus is on addressing arising and repair requirements to ensure seamless operational support for the Zonal Railways of Indian Railways.

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 2022-23 was ₹64,956.50 crore.

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

		(₹ in crore)
	2021-22	2022-23
Stores for operation, repairs and maintenance	12,527.08	15,878.97
Stores for construction	3,345.50	5,174.69
Fuel	10,362.24	19,227.74
Stores for manufacture of Rolling Stock and purchase of Complete units	22,478.95	24,675.10
Total	48,713.77	64,956.50

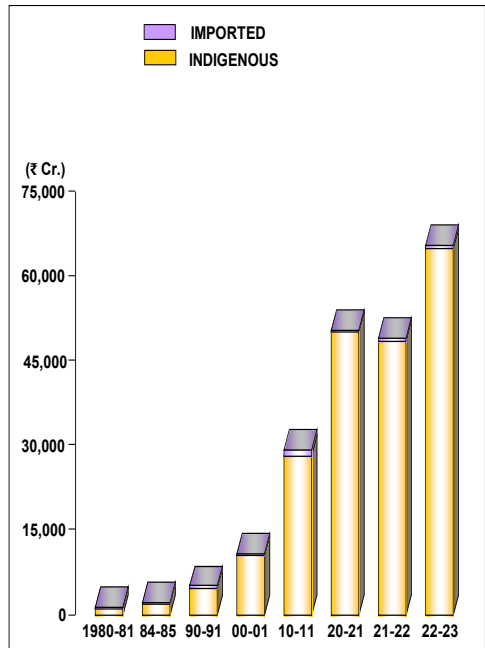
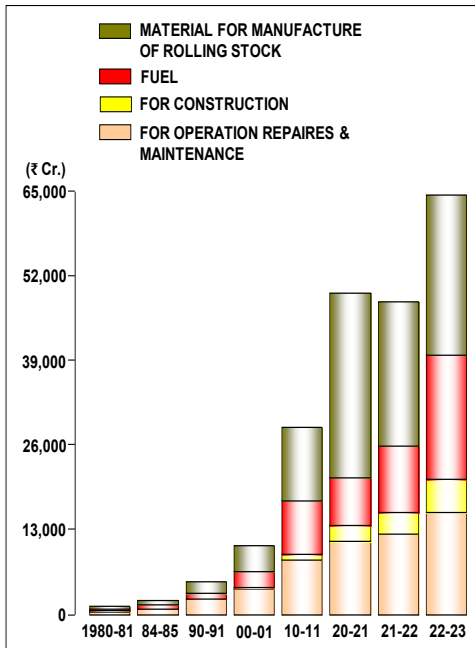
Stocking Depots

Warehouse management is an important aspect of materials management. Indian Railways has extensive warehouse network dedicated to provide the required material close to the point of consumption as efficiently as possible. To meet this requirement, Zonal Railways and Production Units have 306 stocking depots spread all over the Railway Network. These depots stock over 2.42 lakh items consisting of raw materials, components, spares, consumables etc.

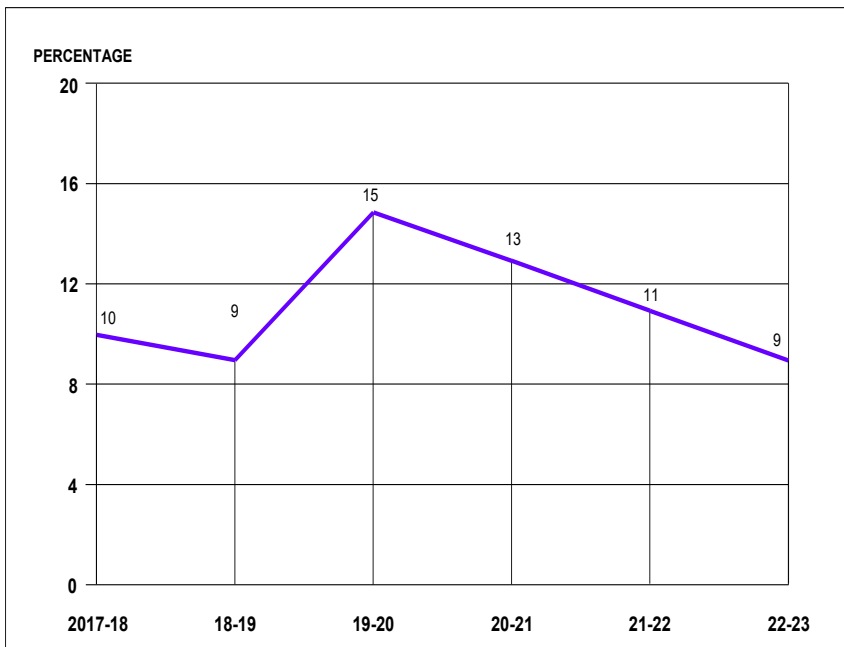
Disposal of unserviceable Items

Efficient Materials Management also involves timely and efficient disposal of scrap 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

VALUE OF STORES PURCHASED



INVENTORY TURNOVER RATIO (EXCLUDING FUEL)



is an important source of revenue for Railways. Total revenue generated through disposal of scrap, during 2022-23, was ₹5,756.98 crore, as against ₹5,316.24 crore during 2021-22.

Digitisation

Indian Railways has taken long strides as far as Supply Chain Digitization is concerned. Indian Railways has built strongly on the humble start that flagged off with implementation of e-tendering and e-auction on Indian Railway E-Procurement System (IREPS) platform. Today this journey has evolved into single web portal i.e. www.ireps.gov.in for all type of tenders viz. Goods & Services, Works, Earning/Leasing and sale of scrap. Integrated Material Management System (IMMS) which is a part of IREPS caters all the material management activities of Railway.

Key initiatives during the year:

- User Depot Module (UDM) of IREPS for digitization of all material management activities at user end has been implemented across all user depots and all material transactions at user end are now being carried out through digital ledgers on UDM.
- 100% E-Bills for both stock and non-stock items for payment to vendors against supply contracts issued through IREPS have been implemented with effect from 1st July 2022.

Now, all the processes of the supply chain, such as, stocking proposals, generation of demands, Quantity Working Sheet, Purchase Proposal, NIT creation and publication, payments of EMD, bidding, tender finalization including technical scrutiny, issue and online delivery of LOA/Purchase Orders, refund of EMD, Inspection Certificates, material receipt and Accountal, online bill submission and passing, material issue upto the end user etc. has been digitized.

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 ₹64,956.50 crore worth of stores procured in 2022-23, 66.44% was done by Zonal Railways and Production Units, 2.90% through GeM and 30.66% by Railway Board.

Stores worth ₹10,814.06 crore were bought from Small Scale Sector and Khadi and Village Industries in 2022-23.

Public Sector Undertakings contributed 25% and other industries contributed 75% towards supplies.

Indigenous Vendor Development

Indian Railways has fully implemented Public Procurement (Preference to Make in India) Order. The value of Indigenous stores at ₹64,316.98 crore during 2022-23 constituted almost 99.02% 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 2022-23 was 9% (without fuel) and 7% (with fuel), as against 11% (without fuel) and 8% (with fuel) during 2021-22.

Wagons and Steel Procurement

During the year 2022-23, 22,790 wagons were inducted in Indian Railway System. Out of these, 1,561 wagons (including 151 BLC wagons) were manufactured by Railway Workshops and the remaining 21,229 wagons (including 632 BLC wagons) were manufactured by wagon industry. Procurement of iron and steel material, during 2022-23, was 1,27,864 MT (valued ₹1,031.59 crore) as against 1,22,306 MT (valued ₹683.7 crore) during 2021-22.

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 is headed by an officer of the rank of Director General, who 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. Further ambit of powers of RPF has been enhanced by the Central Government to exercise the powers and perform the specified duties under sections 42 and 67 of "The Narcotic Drugs and Psychotropic Substances Act, 1985" and under section 25 of "The Cigarettes and other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003" within the areas of their respective jurisdiction respectively.

The administrative set-up of the Railway Protection Force is in sync with the administrative set-up of the Indian Railways. In addition, a special formation called Railway Protection Special Force (RPSF), which is organized on Battalion pattern, provides specialized service to assist the RPF in zonal railways. At present, there are 15 battalions of RPSF located in various parts of the country, including one Mahila Battalion and one Commando battalion (CORAS).

Separate specialized intelligence units, viz. Special Intelligence Branch (SIB) and Crime Intelligence Branch (CIB) also function at Divisional as well as Zonal Railways for collection of special and criminal intelligence respectively. Besides above, Stores, Dog Squad and Band are other specialized units of the Force and located at Divisional, Battalion and Zonal levels, as per requirements of the Force.

On 14.08.2019, Hon'ble Minister of Railways inducted the first Commando force for railways: CORAS (Commandos for Railway Security). Comprising RPF and RPSF personnel, the CORAS in distinctive uniform is armed with bullet-proof jackets, helmets, sophisticated arms etc. CORAS

commandos have undergone training programmes, including basic and advanced commando courses with specialization in handling landmines and improvised explosive devices, hostage rescue, sniping and breaching. The unit is being envisaged as a responder for any situation pertaining to damage, disturbance, disruption of train operations, attack/hostage/hijack, and disaster situations in railway areas. Though ‘Police’ and ‘Public Order’ are State subjects under the Seventh Schedule to the Constitution of India and, therefore, State Governments are responsible for prevention, detection, registration and investigation of crime and maintenance of law and order on Railways through their law enforcement agencies viz. Government Railway Police (GRP)/District Police. Railway Protection Force (RPF) supplements the efforts of GRP/District Police to provide better protection and security to railway property, passenger area and passengers and for matters connected therewith. Cases of damage, destruction of government property including railway property are registered and investigated by the concerned GRP/State Police under IPC & others Acts. Also, the administrative expenses incurred on GRP are shared by Central Government and State Government.

Round the clock security related assistance to passengers by RPF

- **Railway Helpline-** Train Passengers can seek assistance by making calls/complaints on Rail Madad Portal directly or through Helpline Number 139 (integrated with National Emergency no. 112). Their concern is addressed on an urgent basis and necessary action/assistance is provided to them.
- **Twitter-** Complaints/suggestions, relating to Security, received through MR Twitter handle @Rai1MinIndia and @RailwaySeva, are swiftly attended and necessary follow-up action is initiated.

Details of complaints attended over Twitter and Helpline No. :

Year	No. of complaints attended on Twitter	No. of complaints attended on Help Line No.
2022-23	25,089	2,22,328

Efforts made to strengthen Railway Security

In order to provide safe and secure journey to train passengers, surveillance is kept through CCTV cameras provided at 866 stations and in 7,264 coaches. To provide security & facilitation to Railway passengers, various initiatives have been undertaken to boost the confidence & sense of security among all stake holders of Indian Railways including passengers by Team RPF. RPF is performing duties and responsibilities entrusted to them with full dedication and commitment all over India.

- a) **Operation “Nanhe Faristey” (Rescue of children):** RPF undertakes the noble cause of identifying and rescuing children in need of care & protection who are lost/separated from their family due to various reasons. Revised Standard Operating Procedure (SOP) for the Railways 2021 to ensure care and protection of children in contact with Railways has detailed guidelines, Procedure to be adopted by Railway Staff & other stakeholders in cases of lost, left behind, destitute children found in the railways.

Details of children rescued by RPF in the year 2022 - 2023	
Year	No. of children rescued by RPF
2022-23	17,031

- b) **Operation ‘Yatri Suraksha’** - RPF provides special attention towards the security and safe travel of passengers through the railways. RPF is also available on call (Railway helpline 139 and other social media forums i.e. Twitter, facebook, Instagram, koo etc.) round the clock to receive and resolve security and other grievances of passengers. RPF has arrested 5,525 criminals and handed over them to concerned GRPs for further legal action during the year 2022-23.

Year	No. of IPC Cases detected	No. of person arrested
2022-23	4,932	5,525

- c) **Operation “Amanat”** - RPF personnel helps in securing of passenger’s belongings, which are left behind by passengers in rush to board the train or forgotten by them in train/station. RPF has detected 32,337 cases of left behind passenger’s luggage in the year 2022-23 where value of recovered luggage stands at about ₹50 crore (approx.) and handed over them to the right person under operation Amanat.

Year	Retrieval of left behind luggage	Value of property recovered (₹ in crore)
2022-23	32,337	50

- d) **Operation “Jeevan Raksha”:** Life of 873 male and 543 female passengers were saved due to alertness and swift action by RPF at platforms, railway track and trains in the year 2022-23 under operation Jeevan Raksha wherein passenger in hurry tried to board/de-board a moving train and slip/fall with the risk of coming under the wheels of train or tried to commit suicide deliberately coming in front of a running train.

Year	Saving life and efforts to reduce deaths on track	
	Male	Female
2022-23	873	543

- e) **Operation “Sewa”** - RPF personnel assists the elderly citizens, women, divyangjan and sick/injured persons in their travel through trains and services associated therewith i.e boarding & de- boarding trains, providing emergent needs like Wheel Chairs, Stretcher, medical help, providing ambulance, medicine and infant food etc.

Year	No. of persons (Elderly/Women/Divyangjan/ Sick/Injured/Infants) assisted by RPF
2022-23	52,062

- f) **Operation “Matrishakti”** - RPF personnel especially ladies RPF personnel which is currently approx. 9% of the total strength of RPF maximum among CAPFs, go out of the way to help pregnant women, who go into labor of child birth during their train journey or in Railway premises. RPF has assisted 158 pregnant women in trains and 220 women in other railway premises in child birth during the year 2022-23 under operation Matrishakti.

Year	No. of cases attended and assistance provided in child birth	
	In Train	In premises
2022-23	158	220

- g) **Operation “AAHT” (Action Against Human Trafficking):** RPF has launched a nation wide “operation AAHT” to curb human trafficking. Under this operation special teams are deployed on long distance trains/ routes with a focus on rescuing victims, particularly women & children from clutches of traffickers. RPF is taking action under operation AAHT in coordination with nominated NGOs and other Stake holders i.e. Law Enforcements Agencies etc. RPF has rescued 562 children and 42 adults who were being trafficked through railway system in the year 2022-23.

Year	No. of Trafficked Persons rescued				No. of traffickers arrested
	Juvenile		Adult		
	Boys	Girls	Male	Female	
2022-23	461	101	15	27	207

h) Operation “Uplabdh”: Procurement of railway tickets for reserved accommodation has been a very tough task for the common man as touts were cornering confirmed railway reservations online which has adversely affected the availability of confirmed tickets to the common man. RPF has been undertaking intensive and continuous action against persons involved in toutting (unauthorized carrying of business of procuring & supply of railway tickets). Similarly in an endeavor to enhance the feeling of security to travelling passengers, action is taken against towel spreaders preventing entry of authorized passengers and unauthorized entry into compartment reserved to physical challenged persons under operation Uplabdh. Regular drives are conducted by RPF against touts over Indian Railway and action is taken against persons found involved in as per extant legal provisions. Actions under relevant legal provisions were taken by Team RPF in such cases.

(i) Action against towel spreaders/Unauthorized entry/Resisting entry of authorized passengers

Year	Case registered u/s 155 Rly Act	Person arrested	Amount of fine released
2022-23	28,720	28,196	₹ 64,68,025

(ii) Action for procuring of illegal tickets.

Year	No. of cases registered	No. of person arrested	No. of ticket seized		Value of ticket seized (₹ in crore)		No. of IRCTC user IDs blocked
			Future journey (in lakh)	Past journey (₹in lakh)	Future journey	Past journey	
2022-23	3,987	4,280	15,296	3,56,162	4.6	18.3	24,518

(iii) Action against persons unauthorized occupied travel space in coaches reserved for passengers with disabilities

Year	No. of case registered	No. of person arrested
2022-23	47,165	47,260

i) Operation “Rail Suraksha” - RPF has been mandated for protection & security of Railway Property. RPF prosecutes offenders involved in theft, misappropriations of railway property under relevant provisions of the ‘Railway Property (Unlawful Possession) Act, 1966’. RPF has arrested 9,179 accused with recovery of stolen railway property worth ₹ 6.3 crore during the year 2022-23.

Booked consignment + Railway Material

Year	No. of case registered	Value of Property recovered (₹ in crore)	No. of person arrested
2022-23	6,283	6.3	9,179

- j) **Operation Satark:** Transportation of contrabands items through trains has become a major conduit for tax evaders/law breakers. This operation is aimed to assist other LEAs in their work under which RPF makes/assist them in recovery of Tobacco product, liquor product, recovery of FICN/Unaccounted gold/unaccounted cash/Unaccounted other precious metal/smuggled goods/ Arms & Ammunitions/ explosives and recovery of banned medicines.

Year	Tobacco Product			Liquor Product			Recovery of FICN/ Unaccounted gold /Cash / Other Smuggled Goods etc.		
	Case detected	Value (₹ in crore)	Person arrested	Case detected	Value (₹ in crore)	Person arrested	Case detected	Value (₹ in crore)	Person arrested
2022-23	260	7.4	118	2,183	2.8	1,439	176	64.5	213

- k) **Operation ‘Dusra’:** Railway premises at remote location and trains are vulnerable to activity of unauthorized vending/hawking through selling of eatables by unauthorized persons. This poses high risk of food adulteration and poor quality of food to passengers. This operation is launched for acting against the menace of unauthorized hawking and vending in Railway premises and in trains.

Year	No. of case registered	No. of person arrested
2022-23	2,07,159	2,08,395

- l) **Operation “NARCOS”:** Narcotics do not only destroy the health of the youth, but they also damage the economy and wellbeing of the nation too. RPF has been empowered to conduct search, seizure, and arrest under NDPS Act since 2019. In order to give focused attention to drive against smuggling of Narcotics through rail, RPF has launched operation NARCOS. RPF has detected 1,435 cases and 1,022 accused were arrested with recovery of illicit items value ₹81crore. during the year 2022-23 under operation NARCOS.

Recovery of NDPS

Year	No. of case detected	Value of NDPS recovered (₹ in crore)	No. of person arrested
2022-23	1,435	81	1,022

m) Operation 'WILEP' : Smuggling of Wildlife, animal organs and forest product is crime against nature. Team RPF has been alive to the issue and has taken stringent action under this operation against the smuggler involved in illegal trade of wildlife through railways under operation WILEP.

Year	No. of case detected		No. of person arrested
	Fauna	Flora	
2022-23	67	41	68

Special efforts made to enhance women security under operation Mahila Suraksha are as under :

- Under 'Meri Saheli' initiative, focused attention has been provided for Safety and Security of lady passengers travelling alone by long distance trains for their entire journey i.e. from originating station to destination station.
- Zonal Railways are instructed for deployment of proper combined strength of male & female RPF/RPSF personnel in train escort parties, to the extent possible.
- Ladies Special trains running in Metropolitan cities are being escorted by lady RPF personnel. In other trains, where escorts are provided, the train escorting parties have been briefed to keep extra vigil on the lady passengers travelling alone, ladies coaches en-route and at halting stations.
- Frequent Drives are conducted against entry of male passengers into the compartments reserved for ladies.

Action taken u/s 162 of the Railways Act (Entering carriage or other place reserved for females)

Year	No. of cases registered	No. of persons arrested
2022-23	61,703	68,051

Vigilance

Vigilance Organization 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 2022-23 were:

- A total of 14,043 preventive checks were conducted throughout the Railways.
- All major Railway Units released E-magazines/Bulletins for circulation. These bulletins contain case studies, dos & don't etc. related to various departments.
- Electronic media was extensively utilized by all Zonal Railways, Production Units and Public Sector for conducting extensive public campaigns during Vigilance Awareness Week, 2022.

Participative Vigilance:

- **24 Hours Vigilance Helpline:** 24 hour vigilance helpline (Helpline No.139) 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 between 31st October and 6th November in the year 2022.

- **Counselling:** As many as 228 Workshops/webinars/ interactive sessions were conducted on topical issues by Vigilance in 2022 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.

Punitive Vigilance

A statement showing number of officials against whom disciplinary action in vigilance-investigated cases was initiated/finalized during April 2022 to March 2023 is given below:

Vigilance investigated cases	2022-23
Number of officials against whom disciplinary proceedings were initiated.	2,892
Number of officials against whom disciplinary proceedings resulted in imposition of major penalty.	804
Number of officials against whom disciplinary proceedings resulted in imposition of minor penalty.	2,317

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 2022, these measures resulted in realization of revenues to the tune of ₹141.58 crore.

Preserving Indian Railways Heritage

Preservation of Railway Heritage and unlocking its potential for significant and meaningful contributions to India's knowledge society shall remain one of the prime social responsibilities of Indian Railways and its associated Public Sector Undertakings.

A slew of measures to institutionalize rail heritage preservation include compilation and digitization of heritage inventory, collaboration with institutions and stakeholders, capacity building of railway officers and introducing modules for training courses. Zonal Railways have carried forward interesting projects related to heritage.

National Rail Museum (NRM) in association with Indian Railway Catering & Tourism Corporation Ltd. (IRCTC) launched online ticketing for NRM in April 2022. On the occasion of World Heritage Day on 18th April exhibitions and events on the theme "Heritage and Climate" were organized at Rail Museums across India to showcase strategies to promote the full potential of heritage conservation, research and practice to deliver climate-resilient pathways to strengthen sustainable development.

Digitization of National Rail Museum archives including books, photographs, maps, documents etc. is underway in collaboration with C-DAC, Pune. The website "Indian Railway Archive – Railway Heritage Portal" can be accessed at www.railheritage.in by rail heritage enthusiasts to read all the digitized documents.

Chhatrapati Shivaji Maharaj Terminus (CSMT) participated in World Heritage Volunteers program 2022 of UNESCO titled "Let's Heritage" to create awareness about heritage among the masses.

Special powers were delegated to Divisional Railway Manager/Ajmer for promoting heritage tourism in MG Khambli Ghat to Phulad Ghat Section (Goram Ghat). Similar powers have already been delegated to DRMs of Mountain Railways of India for Darjeeling, Kalka-Shimla and Nilgiri.

Vistadome coaches, offering a better view of the scenery and landscape have been provided in Mountain Railways of India viz. Darjeeling Himalayan Railway, Kalka Shimla Railway and Nilgiri Mountain Railway to promote tourism in these regions. A heritage coach restaurant has been inaugurated

and opened at Darjeeling Railway Station. It is a major attraction for the tourists as well as DHR passengers at Darjeeling.

Indian Railways maintain a large repository of built heritage like buildings, bridges, via ducts etc. As of now, besides all bridges and tunnels on Kalka Shimla and Kangra Valley Section, about 45 bridges and tunnels, and 68 Heritage Structures/buildings and 72 Heritage stations are designated as Heritage Assets by Indian Railways. Notable among them are Jubilee Bridge near Kolkata, Yamuna Bridge near Naini, Son Nagar Bridge, Pamban via duct, Bandra suburban station, Pratap Vilas Palace, Vadodara, Glenogle Bungalow, Mumbai, South Eastern Railway (erstwhile Bengal Nagpur Railway) Headquarter, Kolkata etc. Indian Railways have been making special efforts to conserve these built heritages with inventories, documentation & policy initiatives. Association with National Academy of Indian Railways (NAIR), Indian National Trust for Art & Cultural Heritage (INTACH), International Council on Monuments & Sites (ICOMOS), International Association of Transport & Communications Museums (IATM), the International Committee for the Conservation of the Industrial Heritage (TICCIH) and International Centre for the Study of the Preservation & Restoration of Cultural Property (ICCROM) assist our endeavours. Training and capacity building in industrial heritage conservation is regularly arranged.

The Heritage Directorate in the Railway Board assists in framing policy related to the UNESCO World Heritage Sites of the Mountain Railways in Darjeeling, Shimla and the Nilgiris, and other built heritage sites across the Indian Railway network. The focus of heritage preservation has been balancing tourism with heritage and sustainable development. Efforts are centred around connecting communities along these linear routes, and ensuring their role as stakeholders in conservation. Heritage rolling stock assets, skills & their transmission are incorporated in an interconnected and dynamic continuity of heritage railways, over more than 150 years' of operation. Truly a blend of Heritage & Modernity.

The chronicled narrative of the industrial heritage of a nation is a historical record of its technological move to modernity. The 'intangible' heritage of the Indian Railways showcased in the National Rail Museum in Chanakyapuri, New Delhi is a constant source of delight to railway enthusiasts. 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 168 years of railway heritage. It is a strong way to reinforce the heritage branding of the organization and its associated entities of the sector.

Indian Railways have inventoried heritage rolling stock assets and also preserved about 247 Steam Locomotives/engines, 223 vintage coaches and wagons and 134 Diesel and Electric vintage locomotives at prominent places including museums, heritage park etc., for public display. Many of these rolling stocks are more than 100 years old and include 40 Steam locomotives as working heritage. The Rewari Heritage Steam Centre 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. Another proud possession is “Akbar” that featured in memorable Bollywood movies like Sultan & Gadar etc. Toy Trains and Exhibits (Locomotives/Coaches) have been sold or gifted as special heritage displays at various cities on request from State Governments/Public bodies.

Indian Railways’ mesmerizing journeys continue to be retold through the “Google Arts & Culture” platform through panoramic views including touching human stories of people associated with railways through the massive reach of this online platform. The content is shared across other railway websites and social medial handles too.



Chittaranjan Locomotive Works, Chittaranjan



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