INDIAN RAILWAYS

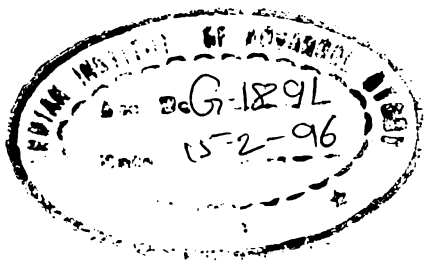
OK–1993-94

सत्यमेव जयते

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

INDIAN RAILWAYS

YEAR BOOK 1993-94



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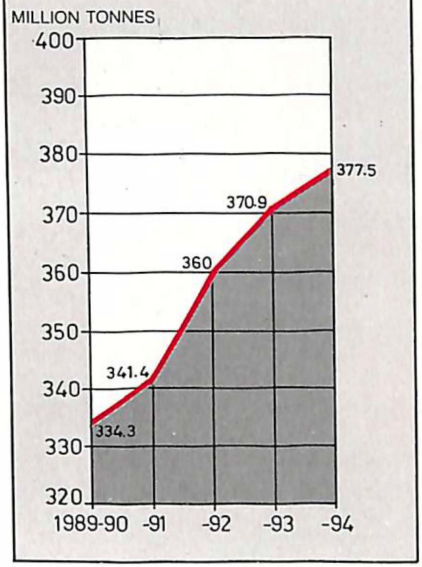
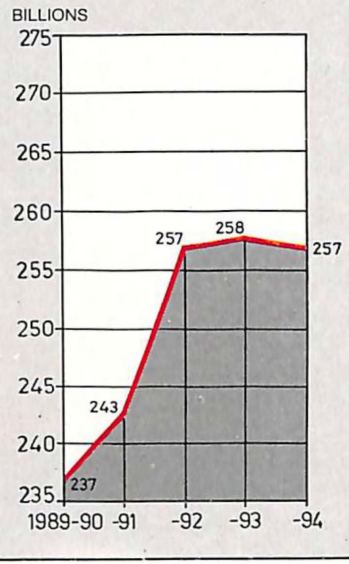
FREIGHT TRAFFIC

TOTAL LOADING



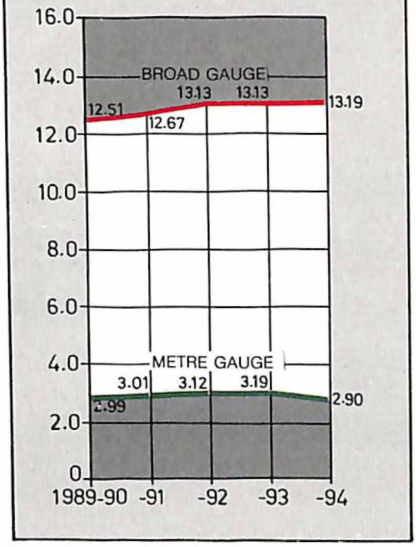
NET TONNE KILOMETRES

(TOTAL TRAFFIC)



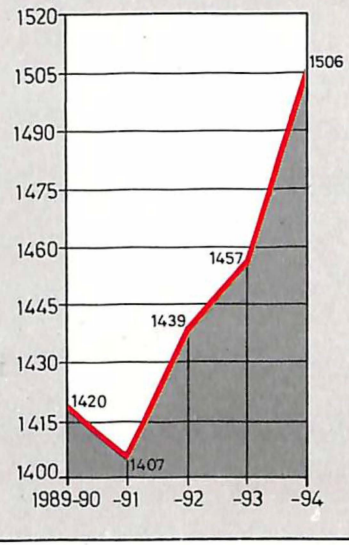
TRAFFIC DENSITY

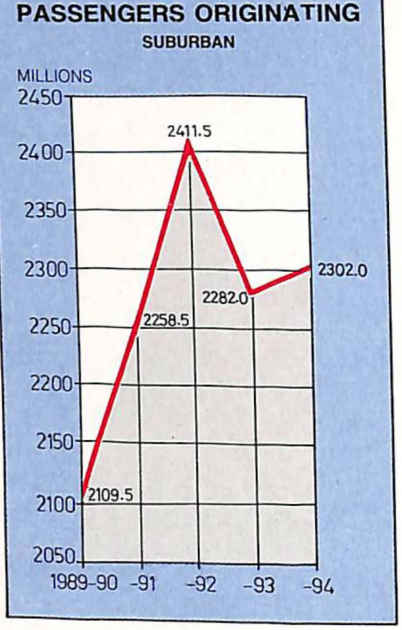
MILLION GTKM
PER RUNNING TRACK KM

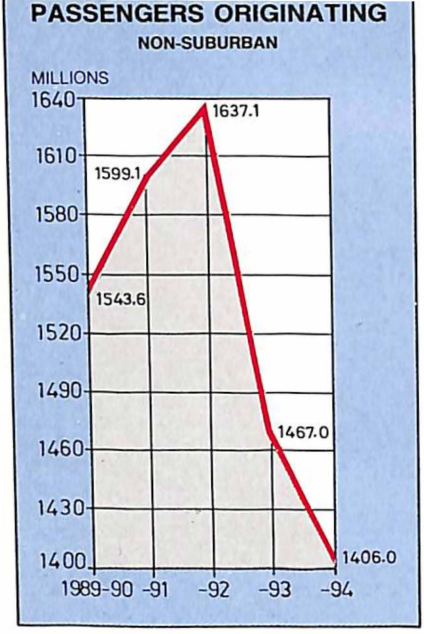


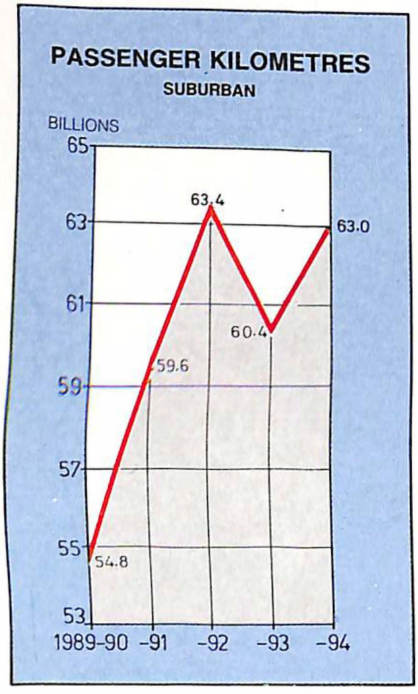
WAGON UTILIZATION

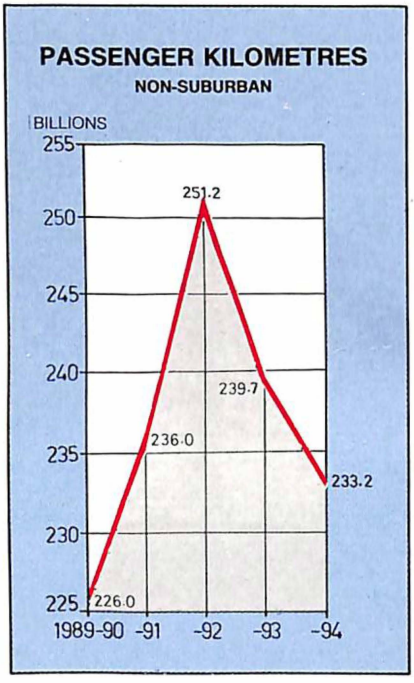
NTKM PER WAGON DAY (BG)



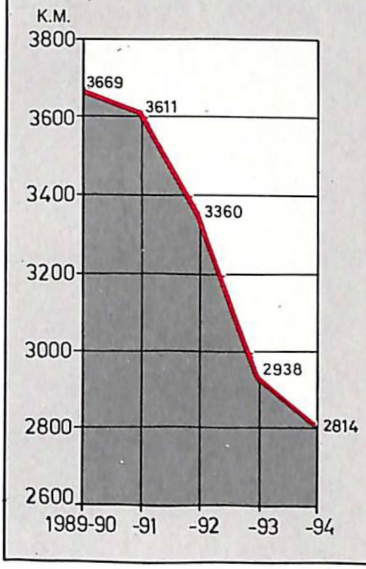

PASSENGERS ORIGINATING
SUBURBAN
MILLIONS
2450
2400
2350
2300
2250
2200
2150
2100
2050
2411.5
2302.0
2282.0
2258.5
2109.5
1989-90
-91
-92
-93
-94


PASSENGERS ORIGINATING
NON-SUBURBAN
MILLIONS
1640
1610
1580
1550
1520
1490
1460
1430
1400
1637.1
1599.1
1543.6
1467.0
1406.0
1989-90
-91
-92
-93
-94


PASSENGER KILOMETRES
SUBURBAN
BILLIONS
65
63
61
59
57
55
53
63.4
63.0
60.4
59.6
54.8
1989-90
-91
-92
-93
-94

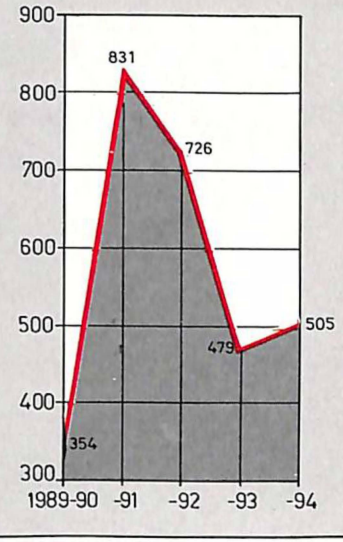

PASSENGER KILOMETRES
NON-SUBURBAN
BILLIONS
255
250
245
240
235
230
225
251.2
239.7
236.0
233.2
226.0
1989-90
-91
-92
-93
-94

TRACK RENEWALS PER ANNUM



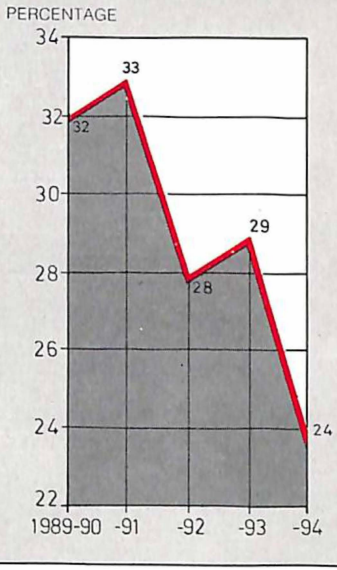
RAILWAY ELECTRIFICATION

ANNUAL COMMISSIONING OF ROUTE KILOMETRES



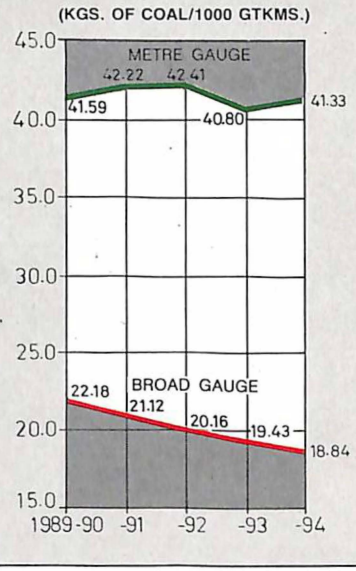
INVENTORY TURNOVER RATIO

(EXCLUDING FUEL)

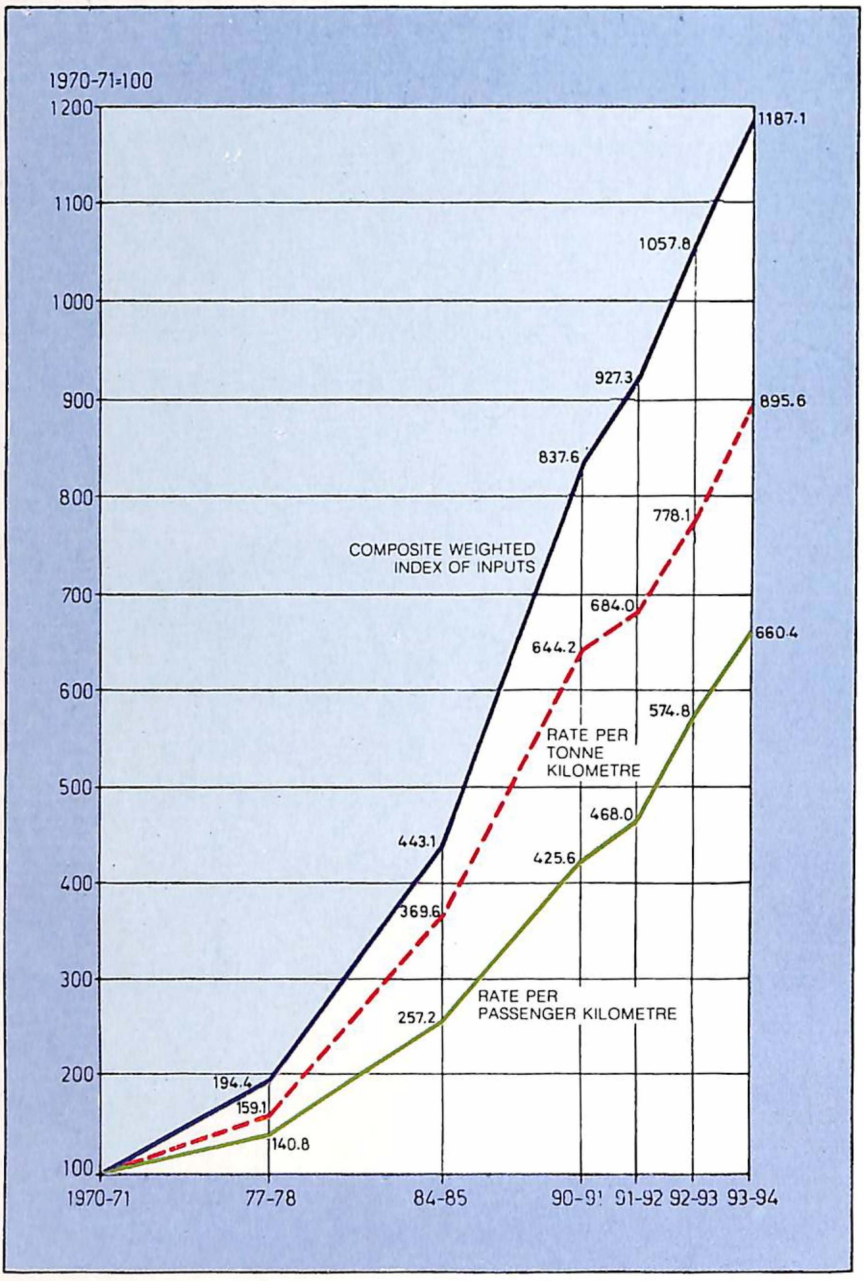


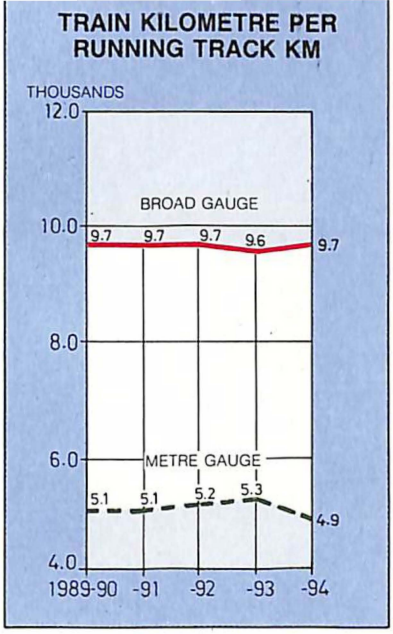
ENERGY CONSUMPTION (IN COAL EQUIVALENT) GOODS SERVICES

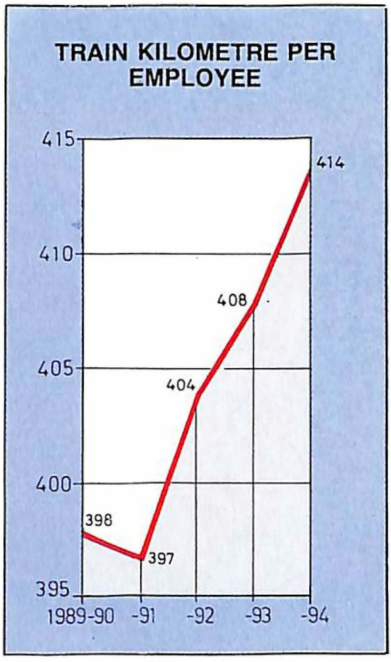
(KGS. OF COAL/1000 GTKMS.)



UNIT RECOVERY VS UNIT OF INPUT COST




TRAIN KILOMETRE PER RUNNING TRACK KM
THOUSANDS
12.0
10.0
8.0
6.0
4.0
BROAD GAUGE
9.7
9.7
9.7
9.6
9.7
METRE GAUGE
5.1
5.1
5.2
5.3
4.9
1989-90
-91
-92
-93
-94


TRAIN KILOMETRE PER EMPLOYEE
415
410
405
400
395
414
408
404
398
397
1989-90
-91
-92
-93
-94

functional Members. Wide powers are vested in the Board to effectively supervise the running of the nine Zonal Railways, Metro-Railway, Calcutta, the Production Units, Construction Organisations and other Railway establishments. These are generally headed by General Managers. The Zones are further grouped into 59 operating Divisions for better management.

Economic Review

Several important developments in the macro-economic situation took place in 1993-94. The Quick Estimates of national income by the Central Statistical Organisation place the growth of Gross Domestic Product (at factor cost) in 1993-94 at 4.3%, at the same rate of growth as in 1992-93 (Provisional Estimates). A spectacular increase in exports was realised. The exchange rate of the rupee remained quite stable. There was a sharp increase in foreign capital inflows. These developments in the external sector resulted in a very substantial build-up of foreign exchange reserves. The industrial climate improved signalling a definite turnaround from the recessionary situation. The agricultural production improved over the peak level attained in 1992-93. Helped by record procurement, the foodgrain stocks increased very substantially—much above the minimum buffer stock norms. A comfortable foreign exchange situation and availability of a very sizeable foodgrain stocks enhanced the capacity of the Government to maintain economic stability and broaden and deepen economic reforms. However, partly owing to increase in money supply beyond the targetted level, in turn, due to large foreign capital inflows and fiscal deficit being much higher than the level envisaged in the budget, and partly due to some commodity imbalances, seasonal factors and rationalisation of administered prices of certain items, the inflationary pressures in the economy started rebuilding.

The Quick Estimates of GDP (at factor cost) showed a growth of 4.3%, at the same rate as that achieved in 1992-93 (Provisional Estimates). This was contributed mainly by high growth in banking & insurance and communication sectors, while most other sectors also recorded growth. Net National Product (NNP) at factor cost at 1980-81 prices increased from 4.1% during 1992-93 to 4.4% in 1993-94.

Agricultural production, which had attained a peak level in 1992-93, increased further in 1993-94. The foodgrains output in 1993-94 is estimated at 182.04 million tonnes as compared to 180.01 million tonnes in 1992-93. Production of major non-food crops also showed improvement—oilseeds

21.8 million tonnes (up about 8 %), sugarcane 239.9 million tonnes (up 3.9%) and cotton 11.9 million bales (as against 11.6 million bales in 1992-93).

Industrial performance during 1993-94 showed a turnaround. Industrial production recorded a growth rate of 3.5% as compared to 3.0% in the preceding year. The manufacturing sector, which was sluggish in the first half, recovered in the second half registering 2.9% growth in 1993-94 as a whole; which was marginally higher than that in the two previous years. The revival in output was stronger in chemicals and chemical products, paper and paper products, transport equipment, basic metals and allied products. The performance of mining and quarrying and electricity sectors during 1993-94 was better than that in the previous year with growth rates of 2.3% and 7.4% respectively.

The six basic infrastructure industries comprising electricity, coal, saleable steel, crude petroleum, petroleum refinery products and cement, recorded a rise of 5.3% in 1993-94 as compared with 3.0% during 1992-93. Growth rates in infrastructure industries other than petroleum refinery products, coal and saleable steel, also improved. Petroleum crude output recorded a marginal growth of 0.2 % during 1993-94 as against a decline of 11.2% in the previous year.

The remarkable improvement in balance of payments, which reflected in an unprecedented accretion of foreign exchange reserves, is one of the most important features of the economic performance in 1993-94. With an increase of US $ 8634 million in 1993-94, the foreign currency assets with the Reserve Bank of India by the end of March 1994 reached US $ 15.1 billion, equivalent to nearly 8 months of imports. Exports in dollar terms increased by 20.4% in 1993-94 as against 3.8% in 1992-93. The imports correspondingly increased by 6.8% as compared to 12.1% in 1992-93. The trade deficit came down to US $ 1.04 billion as compared to US $ 3.34 billion in 1992-93.

Re-emergence of inflationary pressures became a matter of concern. The Wholesale Price Index showed an uptrend almost throughout the year, particularly from June 1993 onwards. On an average basis, however, the inflation rate was lower in 1993-94 at 8.4% as compared to 10.0% in the preceding year. Inflation rate at the close of the financial year 1993-94, stood at 10.8% in terms of Wholesale Price Index and 9.9% in terms of the Consumer Price Index for Industrial Workers.

Rail co-efficients (percentage of output carried by rail) of coal and fertilizers at 67.9% and 80.7% respectively during 1993-94 recorded improvement over 66.2% and 67.8%, respectively, achieved during 1992-93. Iron ore, cement, foodgrains and POL recorded lower rail co-efficients in 1993-94 compared to 1992-93, the fall being significant in the case of iron-ore, from 70.6% in 1992-93 to 66.7% in 1993-94. During the first six months of 1994-95 (April 1994-September 1994) rail co-efficients of coal, cement, fertilizers and Iron & Steel stood at 79.2% , 50.7%, 79.6% and 64.5% , respectively, as against 78.0% , 55.0% , 78.6% and 70.3%, respectively, achieved during April-September, 1993.

A statement showing percentage of output of major products carried by rail over the years is given below:

Year	Coal	Iron ore	Cement	Food-grains	Fertili-sers	POL pro-ducts
1984-85	62.1	63.7	57.1	14.2	54.0	54.7
1985-86	65.9	65.9	54.2	16.0	58.0	46.7
1986-87	66.0	62.2	54.1	20.2	68.1	46.4
1987-88	66.7	66.0	56.4	21.5	69.0	48.5
1988-89	65.8	66.3	58.5	14.6	66.7	49.4
1989-90	64.8	65.2	60.0	13.8	65.5	49.9
1990-91	63.8	62.8	59.2	14.4	68.7	51.5
1991-92	63.9	66.1	57.0	16.4	66.6	52.9
1992-93	66.2	70.6	56.2	15.2	67.8	51.1
1993-94*	**67.9**	**66.7**	**56.1**	**14.7**	**80.7**	**49.5**

* Provisional

During 1993-94, the Wholesale Price Index (WPI) of major inputs of Railways recorded variations of (+)14.8% for non-coking coal, (+)27.8 % for electricity, (+)10.5% for HSD, (+)7.8% for basic metals & alloys, (-)0.3% for cement, (+)19.8% for lubricants and (+)7.8% for manufactured products over 1992-93. The average variations in WPI recorded by these commodities during April-September, 1994 over the corresponding period of preceding year were of the order of (+)4.9% for non-coking coal, (+)18.0% for electricity, (+)10.6% for HSD, (+)8.8% for basic metals & alloys, (+)9.0% for cement, (+)2.2% for lubricants and (+)9.9% for manufactured products.

Selected economic indicators are given on the next page.

SELECTED ECONOMIC INDICATORS

	ITEM	Unit/base	1980-81	1984-85	1989-90	1990-91	1991-92	1992-93	1993-94@
I.	(a) National Income :								
	(i) At 1980-81 prices	Rs. crores	110685	133808	177552	185683	185503	194093	**202670**
	(ii) At current prices	Rs. crores	110685	185018	357931	416495	477868	543566	**615273**
	(b) Per capita income:								
	(i) At 1980-81 prices	Rs. in units	1630	1811	2160	2213	2167	2226	**2282**
	(ii) At current prices	Rs. in units	1630	2504	4354	4964	5583	6234	**6929**
II.	Gross Domestic Capital Formation								
	(a) Total Public Sector:								
	(i) At 1980-81 prices	Rs. crores	11767	17588	20629	21896	20349	20449	**21848**
	(ii) At current prices	Rs. crores	11767	24915	48611	55662	61764	62356	**69819**
	(b) Railways (Excluding Manufacturing Units*):								
	(i) At 1980-81 prices	Rs. crores	814	882	982	1055	1009	1436	**1450**
	(ii) At current prices	Rs. crores	814	1404	2684	3142	3412	4921	**5208**
III	Foreign Trade:								
	(a) Value of exports including re-exports	Rs. crores	6711	11744	27658	32553	44041	53688	**69547**
	(b) Value of imports	Rs. crores	12549	17134	35328	43198	47851	63375	**72806**
IV.	Index of Agricultural Production (with Weights):	(Triennium ending 1981-82 =100)							
	(a) All Crops (100.00)@						145.5	151.5	**154.8**
	(b) Foodgrains (62.92)	-do-	Figures before 1991-92 are not available				137.6	144.3	**148.3**
	(c) Non-foodgrains (37.88)@	-do-	due to change in Triennium.				158.8	163.6	**165.8**
V.	Index of Industrial Production (with weights):	(1980-81=100)							
	(a) General Index (100.00)	-do-	100.0	130.7	196.4	212.6	212.5	218.9	**226.6**
	(b) Mining & Quarrying (11.46)	-do-	100.0	160.8	211.6	221.2	221.5	223.7	**228.8**
	(c) Manufacturing (77.11)	-do-	100.0	124.8	190.7	207.8	204.6	210.7	**216.9**
	(d) Electricity (11.43)	-do-	100.0	140.4	219.7	236.8	257.0	269.9	**289.9**

@ Provisional.

* Includes private Railways also which is negligible.

SELECTED ECONOMIC INDICATORS (CONTD.)

	ITEM	Unit/base	1981-82	1984-85	1989-90	1990-91	1991-92	1992-93	**1993-94@**
VI	Wholesale Price Index Number (Financial Year Average with weights):	(1981-82 =100)							
	(a) All Commodities (100.00)	-do-	100.0	120.1	165.7	182.7	207.8	228.7	**247.8**
	(b) Primary Articles (32.295)	-do-	100.0	125.5	163.6	184.9	218.3	234.6	**250.9**
	(c) Fuel, Power, Light and Lubricants (10.663)	-do-	100.0	117.3	156.6	175.8	199.0	227.1	**262.4**
	(d) Manufactured Products (57.042)	-do-	100.0	117.5	168.6	182.8	203.4	225.6	**243.2**
VII.	Wholesale Price Index Number of Important Commodities used by Railways (Financial Year Average with weights):								
	(a) Non-coking Coal (0.798)	-do-	100.0	147.0	228.4	228.4	245.8	297.3	**341.4**
	(b) Mineral Oils (6.666)	-do-	100.0	107.1	129.7	154.7	179.6	204.1	**223.6**
	(c) Electricity (2.741)	-do-	100.0	124.8	187.7	200.9	222.8	249.0	**318.3**
	(d) Basic Metals & Alloys (4.784)	-do-	100.0	123.2	196.3	207.4	220.1	242.4	**261.4**
	(i) Iron & Steel (2.441)	-do-	100.0	117.5	188.8	201.5	212.6	233.0	**252.7**
	(ii) Ferro Alloys (0.196)	-do-	100.0	115.8	207.6	216.0	230.4	240.6	**258.3**
	(iii) Non-Ferrous Metals (1.025)	-do-	100.0	120.8	242.6	255.8	271.4	295.6	**308.2**
	(e) Electrical Machinery (2.991)	-do-	100.0	108.9	158.8	169.4	195.5	216.5	**228.2**
	(f) Chemicals & Chemical Products (7.355)	-do-	100.0	112.0	140.0	147.9	168.4	192.6	**207.8**
	(g) Non-metallic Mineral Products (Abrasives, Refractories, etc.) (2.477)	-do-	100.0	138.6	167.0	185.6	215.7	232.8	**255.1**
	(h) Cotton Textiles (6.093)	-do-	100.0	113.0	160.1	172.8	197.7	215.4	**234.6**
	(i) Logs & Timber (0.571)	-do-	100.0	164.5	238.0	245.5	261.9	262.7	**292.3**
	(j) Cement, Lime & Plaster (0.916)	-do-	100.0	157.0	152.1	180.9	206.0	217.8	**217.1**
	(k) Lubricants (0.453)	-do-	100.0	104.3	152.2	182.1	226.5	275.5	**330.0**
	(l) HSD oil (2.154)	-do-	100.0	108.5	120.0	155.2	173.0	195.9	**216.4**
VIII.	Consumer Price Index Number (Working class)	1982=100		118	173	193	219	240	**258**

@ Provisional.

Planning

Outlays in Five Year Plans:

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

(Rs. in crores)

	Upto Fourth Plan* 1950-74	Fifth Plan 1974-78	Sixth Plan 1980-85	Seventh Plan 1985-90	Eighth Plan 1992-97
Railways	3,200	1,523	6,555	16,549@	27,202
Transport sector	6,039	4,078	13,841	29,548@	53,966
Total Plan Outlay	30,988	28,991	109,292	218,729@	434,100
Transport as %age of total Plan	19.5	14.1	12.7	13.51	12.43
Railways as %age of total Plan	10.3	5.25	6.00	7.57	6.27

*Excludes inter-plan period 1966-69.

@Revised figures.

Eighth Five Year Plan:

Some of the main objectives in the Eighth Five-Year Plan are:

i) Generate adequate capacity.
ii) Complete the process of rehabilitation/replacement and renewal of overaged assets.
iii) Modernise and upgrade the system to reduce cost and improve reliability.
iv) Adopt unigauge—6,000 km. of metre/narrow gauge to be converted to broad gauge.
v) Phase out steam locomotives completely on broad and narrow gauges by 1996-97.
vi) Electrify 2,700 route km. of dense corridors to reduce dependence on diesel fuel.
vii) Expand and upgrade inter-modal operations including containerisation.
viii) Improve manpower productivity.

The Year 1993–94 in Retrospect:

During the year 297 locomotives, 2,211 coaches, 278 EMU coaches and 19,649 wagons were acquired.

505 route km. of track was electrified and 211 km. of new lines constructed. Doubling of 295 km. was completed while 2,814 km. of track was renewed.

The Plan allocation in 1993-94 and actual expenditure were as follows:

(Rs. in crores)

	Plan Head	Allocation (R.E.)	Actual Net Expenditure
1.	Rolling Stock	2,530.00*	2,320.20**
2.	Workshop and Sheds	194.16	136.47
3.	Machinery and Plant	70.07	39.96
4.	Track Renewals	952.29	970.10
5.	Bridge Works	80.65	72.25
6.	Traffic Facilities	1,236.58	1,309.83
7.	Signalling and Safety	161.25	156.44
8.	Computerisation	33.89	26.28
9.	Electrification	248.47	277.56
10.	Other Electrical Works	43.57	43.93
11.	New Lines	207.38	225.75
12.	Staff Quarters	27.24	28.70
13.	Staff Welfare	31.04	31.11
14.	Users' Amenities	63.32	67.85
15.	Other Specified Works	22.28	19.36
16.	Inventories	47.54	(-)142.78
17.	M.T. Ps.	194.25	224.08
18.	Railway Research	5.02	2.68
19.	Investment in PSUs.	51.00	51.00
	Total	**6,200.00***	**5,860.77****

* Inclusive of Rs. 900.00 crores raised through Bonds.

** Inclusive of Rs.856.34 crores raised through Bonds.

Corporate Plan:

IR has drawn up a Corporate Plan for the 15-year period 1985-2000, providing a basic frame-work for Planning. The main objectives enunciated in the Corporate Plan are:

i) Build up capacity of the Railway system to carry by 2000 AD.
   (a) 370-400 billion NTKm. of freight traffic.

(b) 310-330 billion pkm. non-suburban passenger traffic.
(c) 105-110 billion pkm. suburban passenger traffic.

ii) Achieve 15% reduction in cost of transport in real terms.

To achieve these objectives, IR plans to adopt the following strategies:

(a) Optimise investment and improve productivity of assets.
(b) Upgrade technology.
(c) Bring down costs by reducing fuel consumption, material costs etc.
(d) Adopt cost-based tariff policy.
(e) Rehabilitate and maintain assets, particularly track and rolling stock.
(f) Develop human resources.
(g) Divest auxilliary activities.

Productivity:

The following table shows the indices of growth of traffic output vis-a-vis inputs:

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

Year	Traffic Output Indices			Investment Input Indices			
	Freight traffic (NTKms)	Passenger traffic (non-suburban passenger km.)	Wagon capacity	Passenger coaches	Route km.	Running track km.	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
1989-90	537	377	276	214	116	132	192
1990-91	550	394	278	219	116	133	192
1991-92	582	419	286	225	117	133	194
1992-93	585	400	285	231	117	134	194
1993-94	**583**	**389**	**273**	**233**	**117**	**134**	**188**

Key Statistics

		Unit	1992-93	1993-94
PLANT & EQUIPMENT:				
Capital-at-Charge		Rs. in crores	20,123.20	**22,620.57@**
Total investment		"	28,524.34	**32,212.04**
Route length		Km.	62,486	**62,462**
Locomotives		Nos.	7,806	**7,202**
Passenger service vehicles		"	33,766	**34,088**
Other coaching vehicles		"	6,158	**5,955**
Wagons		"	337,562	**312,405**
Railway stations		"	7,043	**7,050**
OPERATIONS:				
Passenger:	Train km.	Millions	377.1	**383.3**
	Vehicle km.	"	9,170	**9,367**
Freight:	Train km.	"	248	**244**
	Wagon km.	"	20,759	**21,326**
VOLUME OF TRAFFIC:				
Passengers originating		Millions	3,749	**3,708**
Passenger km.		"	300,103	**296,245**
Tonnes originating		"	370.86	**377.47**
Tonne km.		"	258,131	**257,130**
EMPLOYMENT AND WAGES:				
Regular employees		Thousands	1,645.5	**1,623.2**
Wage bill of regular employees		Rs. in crores	6,562.4	**7,290.0**
Average annual wage per regular employee		Rupees	40,466	**45,339**
FINANCIAL RESULTS:				
Revenues		Rs. in crores	15,688.44	**17,946.02**
Expenses		"	13,980.08	**15,134.54**
Misc. transactions		"	247.07	**290.65**
Net reveune (before dividend)		"	1,955.43	**3,102.13**
Rate of return on capital		Percent	9.7	**13.71**
Dividend on capital		Rs. in crores	1,514.38*	**1,296.05**
Shortfall(-)/Excess(+)		"	(+) 441.05	**(+) 1,806.08**

@ Includes investment (Rs.1,746.99 crores) from Capital Fund.

* Includes payment of deferred dividend.

The IR System

Indian Railways (IR) is the principal mode of transport in the country. In 141 years of its existence, it has successfully adapted to the changing needs of travel and transport in the country. It has also absorbed advances in railway technology in tune with the requirement of moving large volumes of passenger and freight traffic. In 1993-94, IR carried over ten million passengers per day and lifted more than a million tonne of freight traffic daily on a network spread over 62,462 route km. covering 7,050 stations.

The network consists of Broad, Metre and Narrow Gauges totalling 108,920 track km. Gauge-wise breakup as on 31st March, 1994 and route length under each Zone are given in the following two tables:

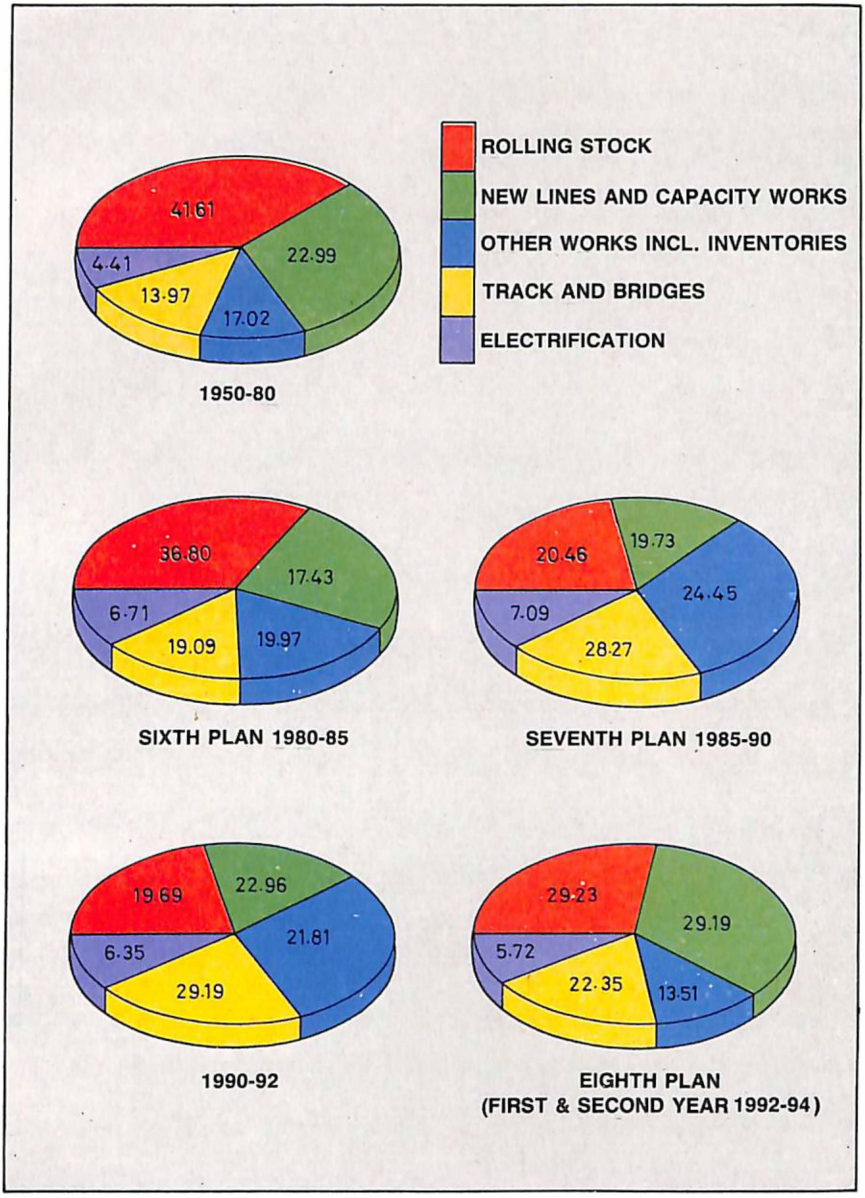
Gauge	Route km.	Running track km.	Total track km.
Broad Gauge (1676 mm)	37,824	53,560	76,295
Metre Gauge (1000 mm)	20,653	21,643	28,156
Narrow Gauges (762 mm and 610 mm)	3,985	3,985	4,469
Total	**62,462**	**79,188**	**108,920**

Zones	Headquarters	Route km.
Central	Bombay	7,158
Eastern	Calcutta	4,303
Northern	New Delhi	10,993
North Eastern	Gorakhpur	5,144
Northeast Frontier	Maligaon (Guwahati)	3,728
Southern	Madras	7,021
South Central	Secunderabad	7,227
South Eastern	Calcutta	7,161
Western	Bombay	9,727
Total		**62,462**

The Ministry of Railways functions under the guidance of the Minister for Railways. The day-to-day affairs and formulation of policy are managed by the Railway Board comprising the Chairman, Financial Commissioner and

ANALYSIS OF PLAN EXPENDITURE

(PERCENTAGE)



Track and Bridges

IR's route length stretches to 62,462 km. with running track extending to 79,188 km. Inclusive of track in yards, sidings etc., the total stands at 108,920 km. 18% of the route is electrified.

The table below compares the network at the end of 1993-94 with earlier years:

Year	Total route km.		Running track km.		Total track km.*	
	Electrified	Total	Electrified	Total	Electrified	Total
1950-51	388	53,596	937	59,315	1,253	77,609
1960-61	748	56,247	1,752	63,602	2,259	83,706
1970-71	3,706	59,790	7,447	71,669	9,586	98,546
1980-81	5,345	61,240	10,474	75,860	13,448	104,480
1989-90	9,100	62,211	17,332	78,320	23,409	108,429
1990-91	9,968	62,367	18,954	78,607	25,305	108,858
1991-92	10,653	62,458	20,049	78,969	26,585	109,338
1992-93	11,064	62,486	20,819	79,200	27,423	109,149
1993-94	**11,260**	**62,462**	**21,223**	**79,188**	**27,898**	**108,920**

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

Platform and station building on elevated structure – MTP, Madras.

State-wise route km:

The following table shows route km. of railway lines in various States/ Union Territories at the end of 1993-94:

State/Union Territory State	Route km.	State/Union Territory State	Route km.
Andhra Pradesh	5,063	Mizoram	2
Arunachal Pradesh	1	Nagaland	9
Assam	2,336	Orissa	2,002
Bihar	5,288	Punjab	2,121
Delhi	168	Rajasthan	5,808
Goa	79	Tamil Nadu	4,021
Gujarat	5,281	Tripura	45
Haryana	1,499	Uttar Pradesh	8,944
Himachal Pradesh	266	West Bengal	3,825
Jammu & Kashmir	88	**Union Territory**	
Karnataka	3,078	Chandigarh	11
Kerala	1,053	Pondicherry	27
Madhya Pradesh	5,987		
Maharashtra	5,459		
Manipur	1		
	Total		**62,462**

Note: 1. Remaining States/Union Territories have no railway line.
2. Reduction in route km. in some of the States is due to dismantling of lines as a result of gauge conversion.

Increase in line capacity:

New Lines:

During the year, 211 km. of new lines were constructed on the following sections:

Railway	Section	Length (km.)
Central	Deeg-Alwar	79
North Eastern	Rudrapur-Lalkuan	14
Southern	Chitradurg-Rayadurg	100
South Eastern	Sambalpur-Maneswar	18
	Total	**211**

Gauge conversion:

During the year 1,619 km. of track, converted from NG and MG to BG, as per details below, was opened to traffic. Gauge conversion on 25 other sections involving a route length of 5,931 km. is in progress.

Railway	Section	Length (km.)	Railway	Section	Length (km.)
Central	Daund-Baramati	42	Southern	Mysore-Ashokpuram	5
Northern	Bathinda-Hissar	157		Tambaram-Egmore	27
	Phulera-Jodhpur-Bhagat-Ki-Kothi	261	South Central	Narsaraopet–Donakonda	75
	Patel Nagar–Sarairohilla	3		Jalna-Parbhani	116
	Merta Rd-Merta City	15		Falaknuma – Secunderabad	28
				Bolarum-Secunderabad	14
North Eastern				Falaknuma-Mehboobnagar	99
	Mehmoodabad–Bhurwal	60	South Eastern	Gondia-Arjuni	82
	Varanasi-Allahabad	126			
	Lucknow-Manak–nagar	5	Western	Jaipur-Phulera	55
	Lalkuan-Kathgodam	29		Jaipur-Durgapur	8
Northeast Frontier	Guwahati-Lumding	181			
Southern	Tumkur-Chikjajur	215			
	Chikjajur-Chitradurg	16			
	Total			**1,619**	

Doubling:

Double/multiple lines totalling 295 km. were commissioned to traffic in 1993-94.

Strengthening of arch bridge for gauge conversion.

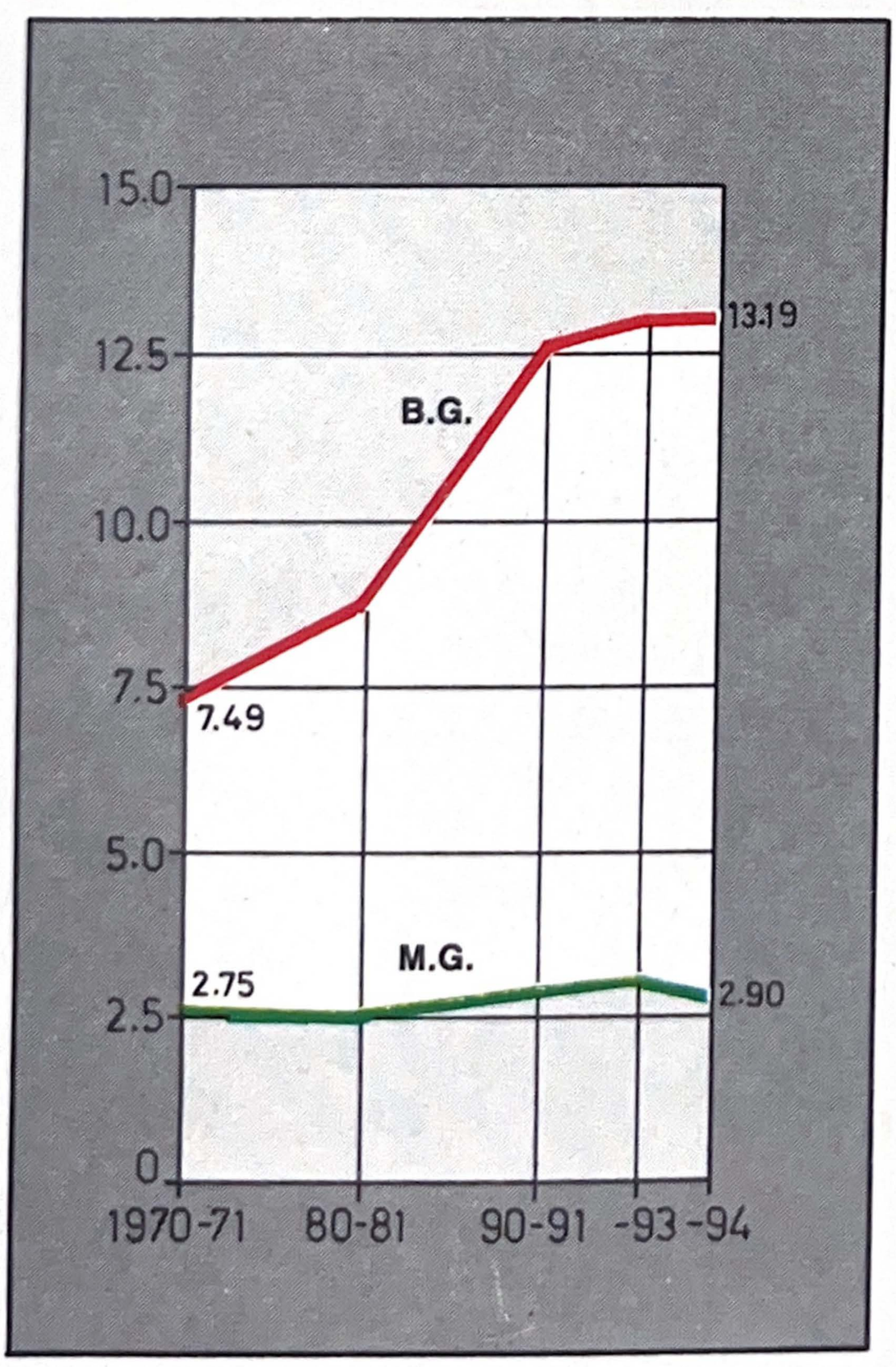
Gaugewise analysis:

Broad Gauge, although forming 60.6% of the route, generated 92.9% of the freight output (NTKm) and 87.1% of the passenger output (PKm). Metre Gauge, with 33.0% of the route, generated 7% of freight output and 12.5% of the passenger output.

On IR, Broad Gauge is predominant. Route length in each gauge showing double/multiple line, single line and electrified route, is given below:

Gauge	Route km. (as on 31.3.1994)						
	Total	Single line			Double/multiple line		
		Elect rified	Non-elec- trified	Total	Elec- trified	Non-elec- trified	Total
Broad (1676 mm)	37,824	2,167	20,916	23,083	8,927	5,814	14,741
Metre (1000 mm)	20,653	106	20,236	20,342	60	250	310
Narrow (762 mm and 610 mm)	3,985	—	3,985	3,985	—	—	—
Total	**62,462**	**2,273**	**45,137**	**47,410**	**8,987**	**6,064**	**15,051**

Almost all the double/multiple track sections and electrified route lie on Broad Gauge. Metre and Narrow gauges are mostly single line and not electrified. From 1950-51 to 1993-94, traffic density (million GTKms per running track km.) has increased from 4.29 to 13.19 on BG.



Track:

With the adoption of unigauge policy,, arrears of planned track renewals are only on BG, being 3,600 km. as on 1.4.94. In 1993-94, 2,814 km. of track (CTR units) were renewed, including 270 km. on MG, compared to 2,938 km. in 1992-93. 2,173 km. of track was relaid with new rails and 2,814 km. with new sleepers. In addition, 445 km. of rails and 752 km. of sleepers were used as second-hand serviceables to restore tracks falling below the prescribed standards. As on 31.3.1994, IR had a total of 5,837 km. track laid with 60 kg/M rails and 21,237 km. laid with concrete sleepers.

36,697 km. of mechanised tamping was completed during the year over the IR network. 1,284 km. of track renewal with pre-stressed reinforced concrete sleepers was carried out by machines. To improve the quality of track running and reduce the interference by way of frequent maintenance, Shoulder Ballast Cleaners and Points and Crossing Changing Machines were commissioned during the year. On stabilised track such as on the Rajdhani routes, maintenance tamping cycle, by machines, of two years was achieved. In-house upgradation of two Track Recording Cars was completed and their productivity enhanced by attaching these, with mail/express trains for the purpose of recording.

Track patrolling:

IR undertakes monsoon patrolling and manning of vulnerable spots and bridges to ensure safety of track. In times of crisis, patrolling and protection drills automatically come into force.

Welded rails:

On most of the hard-core routes, rails have been welded into continuous lengths of 2 to 3 km. On other routes, short-welded rails of 39m length and single rails are adopted.

Concrete sleepers:

Production and laying of concrete sleepers were stepped up for meeting the requirements of high-speed and heavy-density sections which are expected to carry increased traffic. Use of concrete sleepers provide economy, safety and riding comfort, besides minimising the use of wooden sleepers. 64.3 lakh concrete sleepers were produced in 1993-94. The intake of wooden line sleepers has been stopped completely.

Kundalika bridge on Roha-Veer section, Konkan Rly.

Bridges:

IR has nearly 1.18 lakh bridges, 10,283 of which are 'Major Bridges' with a waterway of more than 18m or a clear opening of 12m in any one span. In 1993-94, 396 bridges were rebuilt and 244 rehabilitated.

For convenience of road users, busy level crossings are replaced by over/under bridges, wherever justified. Of the 135 such road over-bridges, earmarked for construction, 13 were completed in 1993-94, while the others were in different stages of planning and execution.

Level crossings:

As on March 31, 1994, IR had 38,828 level crossings of which 15,629 had gatekeepers. Unmanned crossings considered unsafe because of visibility problems or density of traffic are taken up for conversion to manned gates. Busy crossings are being upgraded with advanced safety devices and lifting barriers.

Land management:

IR owns 4.19 lakh hectares of land which is mainly used for locating operational and service infrastructure such as track, stations, workshops and colonies. The break up of the land is as under:

(Area in lakhs of hectares)

i)	Track and structures including stations, colonies etc.	3.32
ii)	Afforestation	0.36
iii)	'Grow more food' scheme	0.19
iv)	Commercial licensing	0.04
v)	Other uses like pisciculture	0.01
vi)	Encroachment	0.02
vii)	Vacant land	0.25

Since land is also one of the requirements of IR's future development, preservation and meaningful interim usage of land is the main objective of IR's land use policy. An intensive afforestation programme has been initiated by IR with the twin benefits of improving the environment and preventing encroachment. During 1993-94, 128 lakh saplings were planted on railway land. To curb encroachment, measures like construction of boundary walls and eviction of unauthorised squatters were undertaken.

Electrification

Electric traction is a pollution-free and energy efficient mode of transport and offers an excellent alternative to fossil fuels as a source of energy. Electrification was introduced on IR in 1925 with 1500 Volts DC and subsequently extended by installing 3000 Volts DC system. Very soon 388 route km. had been electrified by the year 1936. In 1957, IR decided to adopt 25 KV AC traction and thus selected main lines and high-density routes were taken up for energisation in a planned manner. Today, out of the seven major trunk routes connecting Bombay, Calcutta, New Delhi and Madras, five are fully electrified and work is in progress on the other two.

Over the years, progress of electrification on IR has been as under:

Period	Route km. electrified	Period	Route km. electrified
Upto 1978	4,723	1990-91	831
Annual Plans (1978-80)	195	1991-92	726
VI Plan (1980-85)	1,522	VIII Plan 1st year (1992-93)	479
VII Plan (1985-90)	2,812	2nd year (1993-94)	505
Total as on 31.3.1994	**11,793***		

*Also includes electrified route km. not opened to traffic.

2x25 KV auto transformer system of traction, which is a state-of-the-art technology for heavy-haul freight traffic, is being introduced on Bina-Katni-Anuppur-Bishrampur/Chirimiri sections of Central and South Eastern Railways.

A view of an electrified section.

18.8% of the total route km. on IR is electrified. Of the total electrified route km., 1,379 route km. are on the suburban sections and the balance 10,414 on heavy density freight routes. During 1993-94, 42% of passenger train km. and 54% of the BG freight gross tonne km. were operated on electric traction.

Signal and Telecom

Signalling:

To cope with rising traffic density on some routes and to meet better safety standards, IR is steadily modernising its signalling systems. Route Relay Interlocking, Panel Interlocking, Colour Light and Automatic Block Signalling and Solid State Interlocking have been introduced on many routes. Safety aids like track circuiting and interlocking of level crossing gates have been adopted in a big way.

Progress of signalling and safety works, which are closely interlinked, is indicated in the table below:

Nature of Signalling/Safety Works	Total No. of installations provided at the end of 1993-94
1. Interlocking of stations	5,600
2. Route Relay Interlocking	156
3. Centralised electrical operation of points & signals	1,309
4. Multiple Aspect Colour light Signalling	2,277
5. Automatic Block Signalling (Track kms)	2,695
6. Track Circuiting:	
a) Fouling Mark to Fouling Mark on run-through lines	2,842
b) Fouling Mark to Fouling Mark on loop lines (Trunk & Important main lines)	1,224
c) Fouling Mark to Block Section Limit (Trunk & Important main lines)	1,226
7. Safety devices at level crossings:	
a) Interlocking at level crossings	5,538
b) Telephones at manned level crossings	10,808
c) Lifting barriers at level crossings	4,712
8. Auxiliary Warning System (Route kms.)	313

Improvement to Signalling and Safety:

Solid State Interlocking (SSI) as an alternative to relay/mechanical interlocking is being planned for introduction on IR. Two SSIs one each on Southern Railway and South Central Railway, are already in use. Indigenous development of SSI by RDSO in association with trade and IITs has progressed and one system is already undergoing trials on Central Railway.

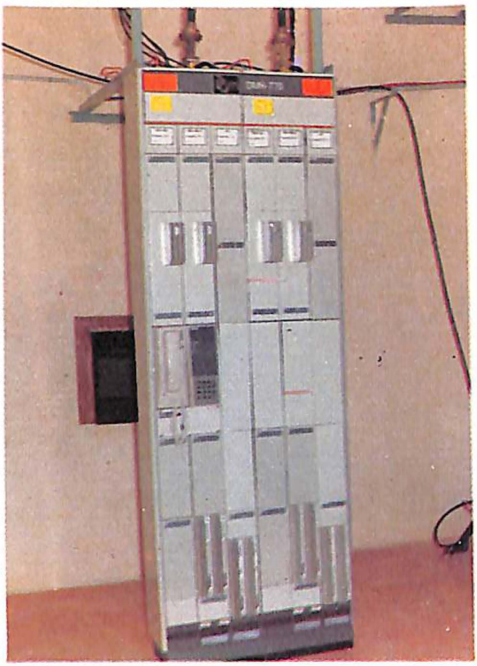
Block Proving Axle Counter System for ensuring complete arrival of trains has been installed on Central and Western Railways.

Telecommunication:

IR is rapidly converting to digital microwave technology and optic fibre to bring about qualitative improvement in telecommunication network.

The existing electro-magnetic telephone exchanges are being replaced by electronic digital exchanges for better flexibility.

Optical Fibre Communication offers complete immunity from electro-magnetic interference besides larger channel capacity. Optical Fibre communication links have been commissioned on Western Railway on a 63 km. section in Bombay, on 625 km. on the Itarsi-Nagpur-Bhusaval section of Central Railway and on 265 km. on the Itarsi-Durg section of South Eastern Railway.



Digital Microwave Radio Equipment, Southern Rly.

Cost-effective point to multi-point radio systems capable of connecting remote locations to a central location were commissioned in Delhi area for the computerised passenger reservation system. 18 GHZ digital microwave system was installed on 437 route km. of Eastern Railway to improve reliability of train control circuits in areas prone to theft of underground copper cables, and work is in progress on other sections.

Telecom equipment installed at the end of the year is given below:

Description of telecom facility	Upto the end of 1992-93	Added during 1993-94	Total at the end of 1993-94
1. Telephone Exchanges (lines)	98,504	**6,627**	**105,131**
2. Long-Haul MW (Route km.)	17,612	**-**	**17,612**
3. Short-Haul UHF/VHF (Route km.)	5,765	**469**	**6,234**
4. Optical Fibre communication (Route km.)	953	**-**	**953**
5. RE Telecom Quad Cable for control communication (Route km.)	9,846	**303**	**10,149**
6. Railway owned ACSR alignments (Route km.)	18,510	**(-)3,358**	**15,152**
7. Trunk Telephone Channels (Channel km.)	728,901	**55,373**	**784,274**
8. Telegraph/Teleprinter Channels (Channel km.)	156,517	**(-)25,564**	**130,953**

Passenger facilities:

Additional facilities to passengers like auto-answering facility, electronic train display systems and public address systems have been provided at important junction stations as per details given below:

Amenity	Installed at number of stations		
	Upto the end of 1992-93	Added during 1993-94	Total at the end of 1993-94
1. Auto-answering facility for passenger information	53	**11**	**64**
2. Electronic Train Display Board	159	**43**	**202**
3. Public Address System	1,119	**188**	**1,307**

Rolling Stock

Locomotives:

IR's fleet as on 31st March, 1994 consisted of 911 steam, 4,174 diesel and 2,117 electric locomotives. The table below shows the change in the distribution of locomotives by traction and their average tractive effort.

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
1989-90	3,336	3,610	1,644	8,590	23,632	12,183
1990-91	2,915	3,759	1,743	8,417	24,088	12,438
1991-92	2,492	3,905	1,871	8,268	24,778	12,593
1992-93	1,725	4,069	2,012	7,806	26,090	13,393
1993-94	**911**	**4,174**	**2,117**	**7,202**	**26,366**	**14,500**

By reducing its steam loco fleet, IR could wind up a number of steam sheds. 40 steam sheds were shut down this year.

WAG-5, WAP-1 and WAG-7 types of electric locos built by CLW.

Coaching Vehicles:

IR's passenger fleet has not grown commensurate with traffic demand due to financial constraints. Limited capacity for manufacture of coaches is also a factor. A new coach factory at Kapurthala was set up to overcome this problem. Meanwhile, IR tried to absorb growing traffic demand by

improving the design of the existing stock. New coaches with better layout and more seating capacity are being manufactured. Two-tier and 3-tier A.C. coaches have replaced First Class coaches of lower capacity in most trains. Similarly, higher capacity double-decker coaches have replaced conventional coaches on some short-distance routes.

Exterior view of Driving Power Car of DMU.

The passenger carrying fleet with aggregate seating capacity in different years, is shown below:

Passenger Coaches

Year	EMU coaches		Conventional coaches		Other coaching vehicles (Number*)
	Number	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
1989-90	3,100	603,761	27,992	1,814,842	6,861
1990-91	3,142	609,042	28,701	1,864,136	6,668
1991-92	3,366	651,944	29,493	1,910,381	6,491
1992-93	3,444	667,583	30,322	1,989,339	6,158
1993-94	**3,527**	**684,927**	**30,561**	**2,070,477**	**5,955**

$-Includes standing accommodation.
@-Includes Rail Cars.
*Includes luggage vans, mail vans etc.

Wagons:

IR's wagon fleet as on 31st March, 1994 was 312,405 comprising 138,642 covered, 101,160 open high-sided, 11,922 open low-sided, 49,208 special type and 11,473 departmental wagons.

The following table indicates the holding of different types of wagons:

Year	Total Wagons on line (Number in units)	Percentage of total number of wagons					
		Covered	Open high sided	Open low sided	Special (BOX, BOB etc.)	Depart-mental	Total
1950-51	205,596	58.9	25.5	3.4	7.2	5.0	100
1960-61	307,907	57.3	25.5	2.5	10.6	4.1	100
1970-71	383,990	53.4	25.6	1.8	13.0	4.2	100
1980-81	400,946	53.3	28.3	3.2	11.8	3.4	100
1989-90	349,661	49.8	29.3	3.5	14.1	3.3	100
1990-91	346,102	49.1	29.6	3.6	14.4	3.3	100
1991-92	346,394	47.7	30.7	3.6	14.6	3.4	100
1992-93	337,562	46.7	31.2	3.6	14.9	3.6	100
1993-94	**312,405**	**44.4**	**32.4**	**3.8**	**15.7**	**3.7**	**100**

IR is gradually replacing four-wheeler stock by bogie wagons having higher payload and speed potential for optimum utilisation of line capacity. These include BOX, BCS, BOBX, BOY, BOX'N', CRT etc. wagons.

During the year, 2,293 BOX'N' wagons were put into service. This new design has enabled IR to increase trailing loads on most of the important routes from 3,600 to 4,500 tonnes. The table below shows the number of important special type wagons at year end:

Special types of wagon fleet

Type of Wagon	Stock at the year end		Brief description
	B.G.	M.G.	
BOX	40,515	–	High-sided open bogie wagons with side discharge arrangement for transport of coal and other bulk traffic.
BOY	860	–	Low-sided open bogie wagons to carry iron ore.
CA/BCA	1,326	623	Wagons designed for the transportation of cattle.
BRH	7,040	–	Flat wagons for rails, steel bars etc.
BFU	52	106	Well wagons for over-dimensional and heavy consignments.
Tank	35,289	4,266	Tank wagons for liquid consignments like petroleum products, molasses, vegetable oils.
Container Flat	235	4	Flat wagons to carry containers for door-to-door service.
BCX	18,616	–	Water-tight covered wagons for foodgrains, cement etc.

Type of Wagon	Stock at the year end B.G.	M.G.	Brief description
BOBS/BOBX	2,592	–	Open hopper wagons with bottom discharge arrangement to carry ballast, ores etc.
CRT	19,445	–	Water-tight 4-wheeler covered wagons having higher capacity for general goods.
BOX'N'	40,706	–	High-sided bogie open wagons with improved components like cast steel bogies, high tensile couplers, cartridge taper roller bearing, air brakes etc. for enabling greater trailing loads for movement of bulk commodities like coal, iron ore etc.

Carrying capacity per wagon has increased on Broad Gauge and Metre Gauge over the years as 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
1989-90	338	11.44	278	36.3	57	22.7
1990-91	335	11.50	276	36.9	55	22.9
1991-92	335	11.84	278	37.9	54	23.3
1992-93	326	11.79	272	38.7	51	24.0
1993-94	**301**	**11.32**	**259**	**39.7**	**40**	**25.0**

* Excludes departmental service wagons and brake vans.

63% of BG wagons are now fitted with roller bearings to avoid hot axle problems. To enable hot axles being detected 'on run', two imported electronic 'Hot Box Detectors' have been tried out. More such detectors are planned for extensive application at vulnerable locations.

To reduce damage during 'humping', hydraulic retarders have been put on trial and proved effective.

Repairs and maintenance:

135 loco sheds and 411 Carriage and Wagon sick lines and central repair depots service the entire fleet. 44 workshops undertake Periodic Overhaul.

There are 6.59% arrears of Periodic Overhaul of coaches on BG and 4.00% on MG. For wagons, the arrears are 9.67% on BG and 5.51% on MG.

Central Organisation for Modernisation of Workshops (COFMOW):

COFMOW was established in 1979 to implement the Modernisation Programme of workshops in 3 phases. It has emerged as a specialised organisation on machine tool technology. It has prepared 815 technical specifications for sophisticated tools, evaluated over 3,300 offers of machine tools from Indian and foreign suppliers, and procured Machinery and Plant worth Rs. 514 crores. It is now extending its role to new areas, some of which are:

(i) Conversion of Metre Gauge machines for use on Broad Gauge in view of the "Unigauge" policy of IR.
(ii) Plan re-building/re-conditioning of older machines to avoid procurement of new machines.
(iii) Retro-fitment of modern controls for improving productivity of the existing machines.

Traction

On I.R. 49% of freight (in terms of GTKMs) is hauled by diesel and the remaining predominantly by electric traction. 91% of passenger services (in terms of train km.) are operated by diesel or electric power and the rest by steam.

Tables below show the gradual shift to diesel and electric tractions since 1950-51.

Percentage of train km. by types of traction

Year	Passenger				Freight		
	Steam	Diesel	Electric		Steam	Diesel	Electric
			Loco	EMU			
1950-51	93	—	2	5	99	—	1
1960-61	91	—	2	7	94	5	1
1970-71	77	7	7	9	46	39	15
1980-81	49	25	14	12	18	62	20
1989-90	25.0	39.8	22.5	12.7	3.5	62.6	33.9
1990-91	21.8	42.4	22.6	13.2	3.0	60.6	36.4
1991-92	19.6	43.5	23.6	13.3	2.5	59.6	37.9
1992-93	14.7	45.7	26.2	13.4	1.6	57.4	41.0
1993-94	**8.7**	**49.4**	**28.4**	**13.5**	**1.0**	**53.7**	**45.3**

Percentage of gross tonne km. by types of traction

Year	Passenger				Freight		
	Steam	Diesel	Electric		Steam	Diesal	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
1989-90	18.4	45.0	28.5	8.1	1.0	60.2	38.8
1990-91	15.1	47.1	29.5	8.3	0.8	57.8	41.4
1991-92	13.4	46.6	31.7	8.3	0.5	55.8	43.7
1992-93	9.6	47.4	34.8	8.2	0.4	52.5	47.1
1993-94	**5.4**	**49.2**	**37.1**	**8.3**	**0.2**	**49.0**	**50.8**

In an effort to cut costs and improve efficiency, IR is going ahead with its policy of converting all routes to diesel and electric tractions. Electrification of high density routes has the added advantage of a pollution free system.

Energy Costs and phasing out of Steam Locomotives:

Steam locomotives are expected to be phased out by 1997, except those of tourist interest. 40 steam sheds were closed down in 1993-94 and over 800 steam locos withdrawn from service. As a result, consumption of coal reduced from 2.94 million tonnes in 1992-93 to 1.96 million tonnes in 1993-94– a 33% reduction.

A comparative analysis of energy usage is given below:

Consumption of Energy

	Unit	Quantity consumed			
		For traction		For other than loco purposes(including manufacturing units)	
		1992-93	**1993-94**	1992-93	**1993-94**
Coal	Million tonnes	2.94	**1.96**	0.09	**0.07**
HSD Oil	Million litres	1,741.75	**1,782.98**	30.53	**28.05**
Electricity	Million KWH	4,994.90	**5,450.34**	1,589.82	**1,637.13**

Passenger Business

Passenger journeys at 3,708 million in 1993-94 were less by about one percent from the level of 3,749 million in 1992-93. Passenger km. also dropped by about one percent from 300 billion in 1992-93 to 296 billion in 1993-94. However, passenger earnings were up by Rs. 580.03 crores (13%) compared to last year.

The long-term trends of passenger traffic since 1950-51 are shown below. Table-I shows the number of originating passengers, Table-II the passenger km. and Table-III, the lead, i.e. average distance travelled by a passenger.

I-Number of originating passengers

(In millions)

Year	Suburban (all classes)	Non-suburban					Grand Total
		Upper Class	Second Class			Total Non-sub-urban	
			Mail/ Exp.	Ordy.	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
1989-90	2,109.5	18.2	343.3	1,182.1	1,525.4	1,543.6	3,653.1
1990-91	2,258.5	18.8	357.2	1,223.1	1,580.3	1,599.1	3,857.6
1991-92	2,411.5	19.7	370.7	1,246.7	1,617.4	1,637.1	4,048.6
1992-93	2,282	20	332	1,115	1,447	1,467	3,749
1993-94	**2,302**	**21**	**314***	**1,071**	**1,385**	**1,406**	**3,708**

* Also includes newly introduced Sleeper Class.

II-Passenger kilometres

(In millions)

Year	Suburban (all classes)	Non-suburban					Grand Total
		Upper Class	Second Class		Total	Total Non-suburban	
			Mail/ Exp.	Ordy.			
1950-51	6,551	3,790	12,537	43,639	56,176	59,966	66,517
1960-61	11,770	3,454	22,251	40,190	62,441	65,895	77,665
1970-71	22,984	4,394	37,856	52,886	90,742	95,136	118,120
1980-81	41,086	5,140	86,712	75,620	162,332	167,472	208,558
1989-90	54,803	8,362	132,341	85,342	217,683	226,045	280,848
1990-91	59,578	8,712	138,054	89,300	227,354	236,066	295,644
1991-92	63,390	9,256	148,336	93,582	241,918	251,174	314,564
1992-93	60,448	9,751	142,444	87,460	229,904	239,655	300,103
1993-94	**63,045**	**10,147**	**138,552***	**84,501**	**223,053**	**233,200**	**296,245**

* Also includes newly introduced Sleeper Class.

III-Average lead

(In Km.)

Year	Suburban (all classes)	Non-suburban					Grand Total
		Upper Class	Second Class		Total	Total Non-suburban	
			Mail/ Exp.	Ordy.			
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
1989-90	26.0	458.5	385.5	72.2	142.7	146.4	76.9
1990-91	26.4	462.8	386.5	73.0	143.9	147.6	76.6
1991-92	26.3	470.1	400.1	75.1	149.6	153.4	77.7
1992-93	26.5	487.2	428.9	78.4	158.8	163.3	80.0
1993-94	**27.4**	**473.9**	**442.1***	**78.9**	**161.1**	**165.9**	**79.9**

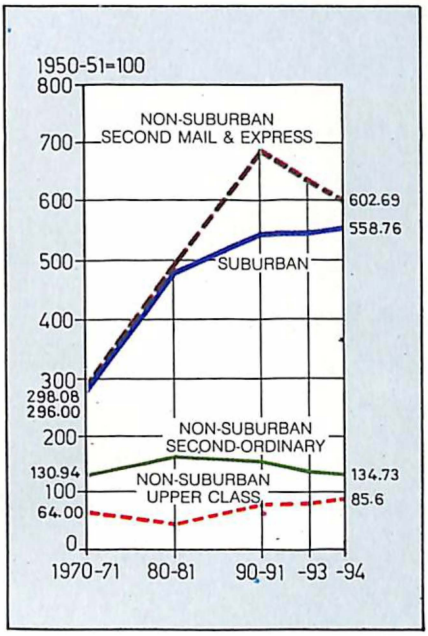
* Also includes newly introduced Sleeper Class.

A few conclusions emerge from these trends:

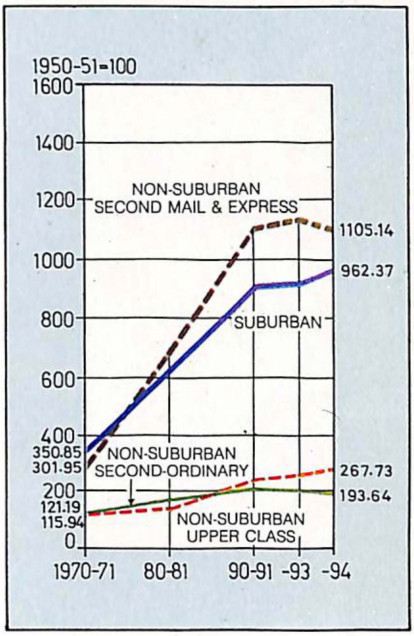
i) Suburban as well as Mail/Express traffic have shown a higher rate of growth since 1950-51 than the overall average.

ii) Suburban lead rose from 15.9 km. in 1950-51 to 27.4 in 1993-94, while the non-suburban lead rose from 68.8 km. to 165.9 km. during the same period.

INDEX OF GROWTH OF ORIGINATING PASSENGERS



INDEX OF GROWTH OF PASSENGER KILOMETRES



The varying growth rates of the different passenger segments had its impact on the composition of services and number of trains run in each category.

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

	1950-51	1960-61	1970-71	1980-81	1990-91	1992-93	1993-94
Non-suburban:							
Second Class							
Ordinary	62.0	50.38	42.82	37.14	31.70	29.74	**28.89**
Second Class							
Mail/Express	4.0	6.02	6.38	7.20	9.26	8.86	**8.45***
Upper Class	2.0	0.94	0.66	0.30	0.49	0.53	**0.58**
Total	68.0	57.34	49.86	44.64	41.45	39.13	**37.92**
Suburban							
(all classes)	32.0	42.66	50.14	55.36	58.55	60.87	**62.08**
Grand Total	100.0	100.00	100.00	100.00	100.00	100.00	**100.00**

*Also includes newly introduced Sleeper Class

II-Passenger km. (Percentage)

	1950-51	1960-61	1970-71	1980-81	1990-91	1992-93	1993-94
Non-suburban:							
Second Class							
Ordinary	65.6	51.75	44.77	36.26	30.20	29.14	**28.52**
Second Class							
Mail/Express	18.8	28.65	32.05	41.58	46.70	47.47	**46.77***
Upper Class	5.7	4.45	3.72	2.46	2.95	3.25	**3.43**
Total	90.1	84.85	80.54	80.30	79.85	79.86	**78.72**
Suburban							
(all classes)	9.9	15.15	19.46	19.70	20.15	20.14	**21.28**
Grand Total	100.0	100.00	100.00	100.00	100.00	100.00	**100.00**

*Also includes newly introduced Sleeper Class

Passenger Revenue:

Passenger earnings in 1993-94 were Rs. 4,891.22 crores (excluding Rs. 3.99 crores earned by Metro Railway, Calcutta). This was Rs. 580.03 crores (13%) more than in 1992-93.

Suburban traffic, at concessional fares, contributed only 11.7% of the total. The remaining 88.3% came from Non-suburban passengers. Second Class Mail/Express (including Sleeper Class) earnings from long-distance passengers contributed 56.6% of the entire passenger earnings.

Earnings per passenger km. rose from 14.37 paise in 1992-93 to 16.51 paise in 1993-94. Earnings per passenger km. for different classes were:

	1992-93	(In paise) 1993-94
Non-suburban:		
Upper class	61.28	**67.33**
Second Class-Mail/Express	16.37	**19.99***
Second Class-Ordinary	9.97	**10.25**
Average (all classes)	15.86	**18.52**
Suburban (all classes)	8.44	**9.07**
Overall average	14.37	**16.51**

*Also includes newly introduced Sleeper Class.

Passenger revenue in different classes with corresponding number of passengers and passenger km. for 1993-94 is given below:

	No of passengers (Millions)	Percentage	Passenger km. (Millions)	Percentage	Revenue (Rs. in crores)	Percentage
Non-suburban:						
Upper Class	21.4	0.58	10,147	3.43	683.19	13.97
Second Class Mail/Express	313.4*	8.45*	138,552*	46.77*	2,770.32*	56.64*
Second Class Ordinary	1,071.1	28.89	84,501	28.52	865.76	17.70
Total	1,405.9	37.92	233,200	78.72	4,319.27	88.31
Suburban (all classes)	2,302.1	62.08	63,045	21.28	571.95	11.69
Grand Total	**3,708.0**	**100.00**	**296,245**	**100.00**	**4,891.22$**	**100.00**

* Also includes newly introduced Sleeper Class.

$ Excludes Rs. 3.99 crores earned by Metro Railway, Calcutta.

Passenger Services:

Train km. and vehicle km. with density of train services for some selected years, were:

Year	Suburban (EMU)		Non-Suburban		Train km. per running track km. per day	
	Train km. (Million)	Vehicle km. (Million)	Train km. (Million)	Vehicle km.@ (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
1989-90	46.77	806.0	321	7,691	38.7	11.7
1990-91	48.37	840.7	316	7,739	40.0	11.5
1991-92	49.33	861.9	323	8,034	40.6	11.7
1992-93	50.52	885.7	327	8,278	41.2	11.8
1993-94	**51.68**	**911.3**	**332**	**8,449**	**41.2**	**12.0**

@-Including suburban services hauled by other than EMU but excluding Rail Cars and Departmental.

*Excludes Departmental but includes Rail Cars.

Number and Speed of Trains:

The table below indicates the average number of trains run daily, and average speed of each type of service.

I-Number of trains

Type of trains	Broad Gauge 1992-93	Broad Gauge 1993-94	Metre Gauge 1992-93	Metre Gauge 1993-94
EMU	3,001	**3,051**	290	**291**
Mail/Express	869	**930**	247	**236**
Ordinary Passenger Trains and Mixed Trains	1,773	**1,898**	1,088	**950**

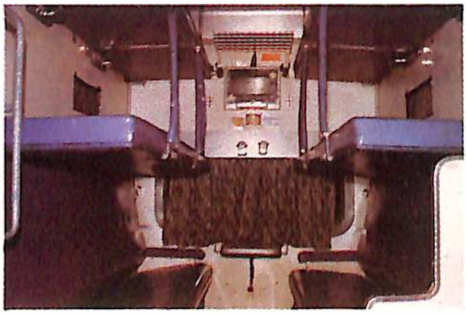
II – Overall average speed including halts (kms/hr.)

Type of trains	Broad Gauge 1992-93	Broad Gauge 1993-94	Metre Gauge 1992-93	Metre Gauge 1993-94
EMU	34.2	**34.4**	37.1	**33.2**
Mail/Express	46.4	**46.3**	36.2	**37.0**
Ordinary Passenger Trains	29.0	**29.8**	25.5	**26.2**
Mixed Trains	25.4	**26.6**	19.4	**19.7**

Passenger Service Improvements:

IR has been steadily bringing about qualitative improvements in passenger train operation. As a result, vehicle km. per vehicle day (coach utilisation) increased from 410 km. in 1992-93 to 414 km. in 1993-94 on BG. However, on MG. this decreased from 249 km. in 1992-93 to 240 km. during 1993-94, mainly due to distruption of MG services on account of ongoing gauge conversion works.

In 1993-94, IR introduced 135 new trains (single) including 4 Rajdhani Expresses, extended the run of 49 trains and increased the frequencies of 10 trains in non-suburban sector. Similarly, in suburban sector, IR introduced 88 trains and extended the run of 154 trains.



Interior view of 3-tier AC coach.

IR has been taking steps to segregate the short-distance passenger traffic from long-distance and has introduced 37 Diesel Push Pull trains during the year, besides starting Main line EMU and DMU services on experimental basis.

Ticketless Travel:

The tempo of the drive against ticketless travel was increased despite difficult law and order conditions in certain parts of the country.

Passenger Amenities:

DRUCCs and ZRUCCs have been constituted to foster a close relationship with rail users and elicit their suggestions. Computerised reservation facilities have been set up in 59 cities. Work is in progress in 8 more cities. The system covers 82% of the reservation requirements of IR. There are plans to extend computerised facilities to more cities. Facilities for onward and return journey reservations through computerised system have been provided between Madras, Calcutta, Bombay and Delhi.

The facility of Automatic Message Switching System has been provided at about 60 stations. 38 standard pictograms have been developed for display at 225 major railway stations.

229 additional water coolers were installed at railway stations and 91 more stations were electrified during the year.

Dormitory at Bangalore city station.

Catering Services:

Catering facilities are now available at 3,000 stations and over 100 pairs of trains. While 2,894 stations and 58 pairs of trains are being privately managed, 34 stations are having catering provided partly by private contractors alongwith departmental catering units. 68 stations and 51 pairs of trains are catered to by Railway departmental units. Besides, new services were

provided during 1993-94 on 4 pairs of trains viz. Guwahati-Dadar Express, Purushottam Express, Nizamuddin-Madras Rajdhani Express and Madras-Madurai Superfast Express.

The sales turnover of the departmental catering units during 1993-94 was about Rs. 107 crores and Licence fee realised from the catering/vending contractors amounted to Rs. 264 lakhs.

Mass Rapid Transit System for Metropolitan Cities:
Calcutta:

(i) **Metro Railway:** Out of a total length of 16.45 km. of the project, about 12.12 km. length is under Commercial operation. Work from Shyam Bazar to Chandni Chowk is in progress.

(ii) **Circular Railway:** 13.5 km. long, non-electrified single line track from Dum Dum Junction to Princep Ghat for running commuter trains with diesel traction has already been commissioned. Minor residual works are in progress.

Bombay:

(i) **Extension of Railway line from Mankhurd to Belapur with a bridge across Thane Creek:**
18 km. long Mankhurd-Belapur link to New Bombay has already been completed. Residual works are in progress.

(ii) **Additional pair of lines between Bandra and Andheri:**

The project entails construction of an additional pair of lines between Bandra and Andheri (7.2 km.) on the suburban system of Westen Railway. The project, when completed, would make it possible to run direct services between Bombay V.T. and Andheri.

Madras:
Rapid Transit System between Madras Beach and Luz:

The 8.55 km. long project envisages a surface-cum-elevated rail line, the first of its kind in India. It will be a double line electrified section along Buckingham Canal alignment.

A sub-section from Madras Beach to Park Town (2.75 km. on surface) was commissioned to traffic on 16.6.1991. Work on the remaining section is in progress.

Freight Operations

IR loaded 358.72 million tonnes of revenue earning freight in 1993-94 (8.67 million tonnes more than the previous year), generating 252.41 billion NTKms. Over-all loading including non-revenue traffic was 377.47 million tonnes.

Commodity-wise tonnage of revenue traffic in 1993-94 compared to 1992-93, was as follows:

Commodity	Tonnes loaded (Millions)		Variation over last year	
	1992-93	1993-94	Tonnage	Percentage
Coal	157.73	**167.00**	9.27	5.88
Raw material to steel plants	32.97	**33.40**	0.43	1.30
Pig iron and finished steel from steel plants	12.03	**12.08**	0.05	0.42
Iron ore for export	10.47	**10.46**	(-)0.01	(-)0.10
Cement	30.38	**32.54**	2.16	7.11
Foodgrains	27.30	**26.68**	(-)0.62	(-)2.27
Fertilisers (Chemical manures)	18.94	**19.50**	0.56	2.96
POL (Mineral oils)	26.41	**25.95**	(-)0.46	(-)1.74
Balance other goods	33.82	**31.11**	(-)2.71	(-)8.01
Total revenue earning traffic	350.05	**358.72**	8.67	2.48

Six tables showing the trend of growth in freight traffic are given below:

I. Revenue earning freight traffic

Year	Tonnes (million)	Index (1950-51 =100)	Net tonne km. (million)	Index (1950-51 =100)	Lead (km.)	Index (1950-51 =100)
1950-51	73 . 2	100.0	37,565	100.0	513	100.0
1960-61	119 . 8	163.7	72,333	192.6	603	117.6
1970-71	167 . 9	229.4	110,696	294.7	659	128.5
1980-81	195 . 9	267.6	147,652	393.1	754	147.0
1989-90	309 . 97	423.5	229,602	611.2	741	144.4
1990-91	318 . 40	435.0	235,785	627.7	741	144.4
1991-92	337 . 98	461.7	250,238	666.1	740	144.2
1992-93	350 . 05	478.2	252,388	671.9	721	140.5
1993-94	**358 . 72**	**490.1**	**252,411**	**671.9**	**704**	**137.2**

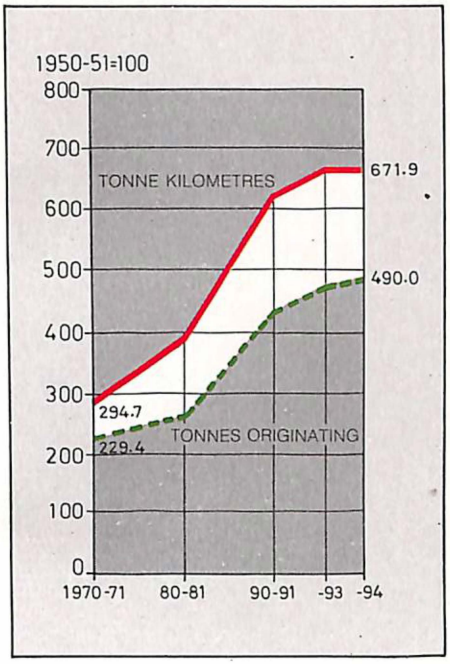
II. Movement of Bulk Commodities in the last four years

Sl. No.	Commodity group	1990-91 Million Tonnes	1990-91 Percentage	1991-92 Million Tonnes	1991-92 Percentage	1992-93 Million Tonnes	1992-93 Percentage	1993-94 Million Tonnes	1993-94 Percentage
1.	Coal	135.16	42.45	146.43	43.32	157.73	45.06	**167.00**	**46.56**
2.	Foodgrains	25.35	7.96	27.38	8.10	27.30	7.80	**26.68**	**7.44**
3.	Iron & steel	12.48	3.92	13.42	3.97	13.49	3.85	**13.03**	**3.63**
4.	Iron ore & other ores	37.63	11.82	40.93	12.11	41.37	11.82	**41.23**	**11.49**
5.	Cement	28.88	9.07	30.76	9.10	30.38	8.68	**32.54**	**9.07**
6.	POL (Mineral oils)	24.99	7.85	25.56	7.56	26.41	7.54	**25.95**	**7.23**
7.	Fertilizers (Chemical manures)	18.36	5.76	18.61	5.51	18.94	5.41	**19.50**	**5.44**
8.	Limestone and dolomite	8.67	2.72	9.30	2.75	9.56	2.73	**9.32**	**2.60**
9.	Stones (including gypsum) other than marble	4.17	1.31	4.82	1.43	4.24	1.21	**3.56**	**0.99**
10.	Salt	3.49	1.10	3.41	1.01	3.49	1.00	**3.55**	**0.99**
11.	Sugar	1.90	0.60	2.02	0.60	2.26	0.65	**1.94**	**0.54**
12.	Total bulk commodities	301.08	94.56	322.64	95.46	335.17	95.75	**344.30**	**95.98**
13.	Balance other goods	17.32	5.44	15.34	4.54	14.88	4.25	**14.42**	**4.02**
	Total	318.40	100.00	337.98	100.00	350.05	100.00	**358.72**	**100.00**

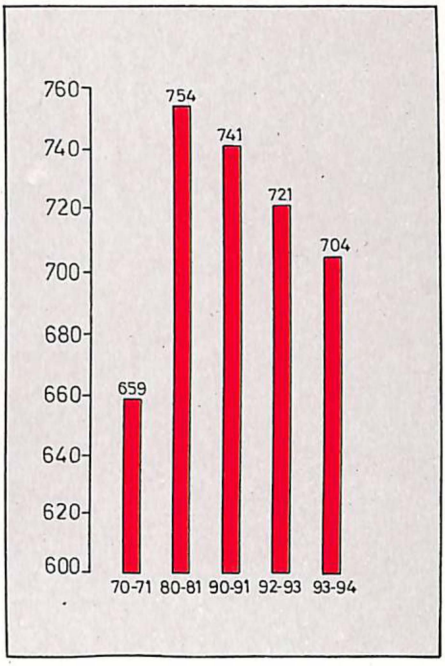
III. Freight train kilometres and Wagon kilometres

Year	Freight train km. Total (Million)	Freight train km. Per running track km per day	Wagon kilometre (in terms of 4-wheelers) Total (Million)	Wagon kilometre (in terms of 4-wheelers) 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
1989-90	242	8.5	18,736	65.2
1990-91	245	8.5	19,230	65.5
1991-92	250	8.6	20,292	65.6
1992-93	248	8.6	20,759	64.7
1993-94	**244**	**8.4**	**21,326**	**63.9**

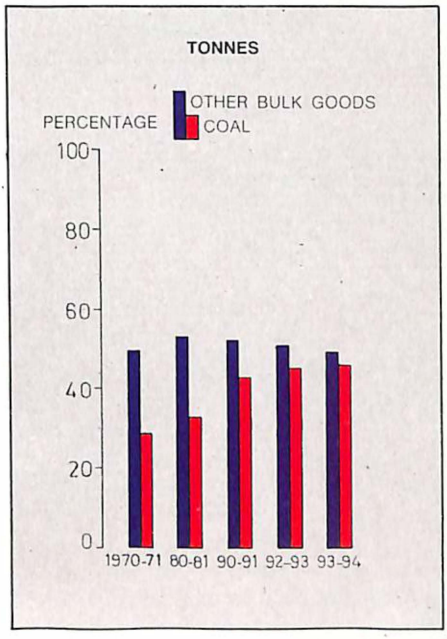
INDEX OF GROWTH OF FREIGHT (REVENUE TRAFFIC)

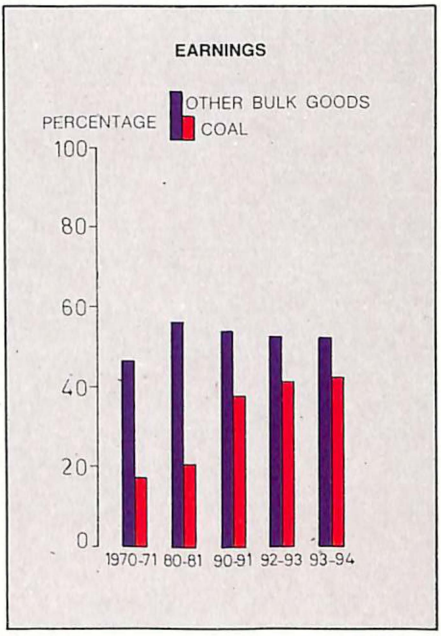


AVERAGE LEAD OF FREIGHT (KMs.)



SHARE OF BULK COMMODITIES IN FREIGHT TRAFFIC





IV. Tonnes originating, Net tonne km. and Earnings from bulk commoditiesin 1993-94

Sl. No.	Commodity group	Tonnes originating In millions	Tonnes originating %age to total	Net tonne kilometres In millions	Net tonne kilometres %age to total	Earnings Rs. in crores	Earnings %age to total
1.	Coal	167.00	46.56	104,014	41.21	5,193.42	42.31
2.	Foodgrains	26.68	7.44	35,263	13.97	971.53	7.91
3.	Iron and steel	13.03	3.63	13,810	5.47	1,072.95	8.74
4.	Iron ore and other ores	41.23	11.49	15,026	5.95	703.02	5.73
5.	Cement	32.54	9.07	19,739	7.82	1,047.51	8.53
6.	POL (Mineral oils)	25.95	7.23	16,512	6.54	1,459.60	11.89
7.	Fertilisers (Chemical-manures)	19.50	5.44	16,948	6.72	574.62	4.68
8.	Limestone & dolomite	9.32	2.60	5,159	2.04	242.80	1.98
9.	Stones (including Gypsum) other than marble	3.56	0.99	1,762	0.70	80.18	0.65
10.	Salt	3.55	0.99	6,162	2.44	141.04	1.15
11.	Sugar	1.94	0.54	2,728	1.08	122.65	1.00
12.	Total bulk commodities	344.30	95.98	237,123	93.94	11,609.32	94.57
13.	Balance other goods	14.42	4.02	15,288	6.06	666.16	5.43
	Total	**358.72**	**100.00**	**252,411**	**100.00**	**12,275.48**	**100.00**

V. Some selected efficiency indices of freight operation in the last four years are shown below:

			1990-91	1991-92	1992-93	1993-94
Net tonne kilometres		B.G.	1,407	1,439	1,457	**1,506**
per wagon per day		M.G.	810	855	824	**773**
Wagon kilometres		B.G.	110.5	113.2	116.4	**125.0**
per wagon per day		M.G.	69.7	70.6	71.2	**64.5**
Net tonne	Diesel	B.G.	9,774	9,710	9,043	**8,333**
kilometres		M.G.	7,751	8,065	7,595	**7,226**
per engine hour	Electric	B.G.	14,595	15,206	15,028	**15,237**
Net tonne kilometres	Diesel	B.G.	165,571	163,847	152,803	**149,790**
per engine day on line		M.G.	134,119	138,045	130,048	**123,247**
	Electric	B.G.	255,245	266,045	268,250	**289,908**

VI. Share of tonnage, net tonne km. and earnings of 30 selected commodities in 1993-94

Sl. No.	Commodity group	Tonnes originating		Net tonne kilometres		Earnings	
		In 000s	%age to total	In millions	%age to total	Rs. in crores	%age to total
1.	Coal	166,998	46.56	104,014	41.21	5,193.42	42.31
2.	Iron ore	38,338	10.69	13,903	5.51	649.18	5.29
3.	Cement	32,536	9.07	19,739	7.82	1,047.51	8.53
4.	Foodgrains	26,679	7.44	35,263	13.97	971.53	7.91
5.	POL (Mineral oils)	25,951	7.23	16,512	6.54	1,459.60	11.89
6.	Fertilisers (Chemical-manures)	19,505	5.44	16,948	6.72	574.62	4.68
7.	Iron and steel	13,034	3.63	13,810	5.47	1,072.95	8.74
8.	Limestone and dolomite	9,316	2.60	5,159	2.04	242.80	1.98
9.	Salt	3,552	0.99	6,162	2.44	141.04	1.15
10.	Fodder-oil cake	2,853	0.80	3,002	1.19	111.19	0.91
11.	Stones other than marble and gypsum	2,745	0.76	857	0.34	42.46	0.34
12.	Sugar	1,939	0.54	2,728	1.08	122.65	1.00
13.	Ores other than Manganese & Iron	1,833	0.51	753	0.30	35.59	0.29
14.	Manganese ore	1,058	0.30	370	0.15	18.26	0.15
15.	Non-ferrous metals	932	0.26	652	0.26	34.19	0.28
16.	Gypsum	818	0.23	905	0.36	37.72	0.31
17.	Sugarcane	697	0.19	107	0.04	3.16	0.03
18.	Soda ash	486	0.14	839	0.33	38.44	0.31
19.	Timber wrought	351	0.10	840	0.33	33.80	0.28
20.	Jute manufactured	322	0.09	526	0.21	31.41	0.26
21.	Wood unwrought	283	0.08	387	0.15	17.45	0.14
22.	Paper	218	0.06	295	0.12	14.28	0.12
23.	Bamboos	210	0.06	293	0.12	13.50	0.11
24.	Fodder other than oil cake	197	0.06	232	0.09	8.28	0.07
25.	Caustic soda	190	0.05	74	0.03	3.83	0.03
26.	Acids	179	0.05	35	0.01	3.14	0.03
27.	Oil seeds	168	0.05	193	0.08	7.02	0.06
28.	Sand	141	0.04	55	0.02	2.78	0.02
29.	Edible oil	125	0.03	184	0.07	7.18	0.06
30.	Electrical goods	115	0.03	140	0.05	14.79	0.12

Freight structure:

Due to increase in cost of inputs, freight rates were increased by 10% upto 500 km. (inclusive) and by 12% beyond 500 km. with effect from April 1, 1993.

Exemption given in the past from increase in freight rates in respect of grains & pulses. diesel sugar and oil cake were withdrawn.

View of a freight train.

The freight rates for traffic offered in less than wagon loads were rationalised and charged at three new scales of rates, namely LWL-1, LWL-2 and LWL-3, depending on the commodities. These scale-rates were equated to the parcel scale-rates of GPA, CP-1 and CP-2 respectively. The existing "Smalls" classification of commodities was abolished.

The surcharge leviable for "Freight-to-pay" consignments in respect of coal was revised from 5% to 10%.

The Parcel & Luggage scale-rates were rationalised and replaced by new scale-rates.

Double decker freight wagon for transportation of cars.

Road Competition:

About 96% of tonnage lifted by IR consisted largely of bulk commodities like coal, iron ore, fertilisers, foodgrains, etc. In order to counter road competition, specially in the upper segment of the market, guaranteed time and transit services and 'speed link' services for wagon load traffic between metropolitan cities were operated. The Container Corporation of India, a subsidiary of IR, provides door-to-door service in domestic and international cargo. ISO Container trains on scheduled paths and point-to-point/dedicated container rakes have also been introduced. New designs of container have been put into service to suit the requirements of customers to attract road-

borne traffic to rail. Total TEU's handled by CONCOR increased by 52% in 1993-94 over 1992-93.

Loss and damage claims:

The following table indicates a declining trend of claims received during the last 5 years:

Year	No. of claims received	No. of claims paid	Gross amount of complensation paid (Rs. in crores)
1989-90	282,398	129,698	30.29
1990-91	269,918	111,702	26.36
1991-92	258,595	105,055	26.76
1992-93	216,954	81,543	22.34
1993-94	**193,012**	**71,432**	**25.44**

Utilisation of Assets

Utilisation statistics for some selected years are given below to give an idea of the intensity of asset utilisation.

Engine kilometres per day per engine in use
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
1989-90	59	454	395	85	394	201
1990-91	52	445	398	88	399	224
1991-92	41	436	395	83	392	232
1992-93	44	426	412	75	392	239
1993-94	**30**	**407**	**423**	**74**	**389**	**283**

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
1989-90	195	702	513	188	611	378
1990-91	189	673	482	185	569	382
1991-92	183	633	488	186	561	394
1992-93	171	647	502	184	540	361
1993-94	**164**	**594**	**507**	**175**	**476**	**355**

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 with those since 1981-82.

With the introduction of diesel and electric tractions, steam locomotives have been relegated to inferior services. This has brought about improvement in output in terms of gross tonne km. per kg. of tractive effort.

GT Kms (excluding weight of engine and departmental) moved 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
1989-90	3,811	2,241
1990-91	3,873	2,263
1991-92	4,026	2,381
1992-93	4,110	2,395
1993-94	**4,272**	**2,521**

Average freight train speed:

In 1993-94, the average speed of goods trains was 22.7 kmph on BG and 18.2 kmph on MG.

Average speed of goods trains (km./hour)

Year	Broad Gauge			Metre Gauge	
	Steam	Diesel	Electric	All traction	All traction
1950-51	17.1	–	20.8	17.4	15.0
1960-61	15.6	22.2	19.5	16.1	13.7
1970-71	12.0	22.9	25.2	17.9	14.7
1980-81	10.2	21.3	22.8	19.7	15.1
1989-90	9.2	22.9	22.9	22.7	17.5
1990-91	10.1	22.6	23.1	22.7	17.6
1991-92	10.1	22.6	22.9	22.7	17.8
1992-93	10.6	22.6	22.6	22.6	18.0
1993-94	**10.0**	**22.3**	**23.1**	**22.7**	**18.2**

Average freight train load:

The average net load per train in 1993-94 was 1,142 tonnes on BG. The average gross load per train was 2,264 tonnes on BG and 1,012 tonnes on MG.

Average train load (tonnes)

Year	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
1989-90	1,060	576	2,094	979
1990-91	1,079	562	2,122	962
1991-92	1,119	585	2,191	983
1992-93	1,128	574	2,238	986
1993-94	**1,142**	**599**	**2,264**	**1,012**

Net tonne km. per engine hour and goods train hour:

During 1993-94, 25,670 NTKms per goods train hour were generated on BG and 11,837 on MG. NTKms per engine hour stood at 10,865 for BG and 5,518 for MG. The table below reflects the unit output measured by these indices in selected years.

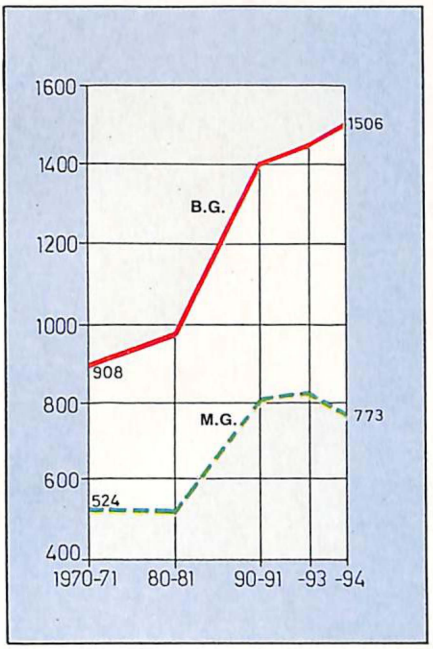
Year	Net tonne km. per engine hour		Net tonne km. per goods train hour	
	B.G.	M.G.	B.G.	M.G.
1950-51	3,283	1,238	8,590	2,884
1960-61	4,170	1,766	10,808	4,232
1970-71	4,904	2,525	13,492	5,824
1980-81	6,295	3,345	17,677	7,562
1989-90	10,054	4,939	24,364	10,664
1990-91	10,393	5,027	24,787	10,551
1991-92	10,911	5,375	25,704	11,192
1992-93	10,901	5,304	25,751	11,129
1993-94	**10,865**	**5,518**	**25,670**	**11,837**

Wagon Utilisation:

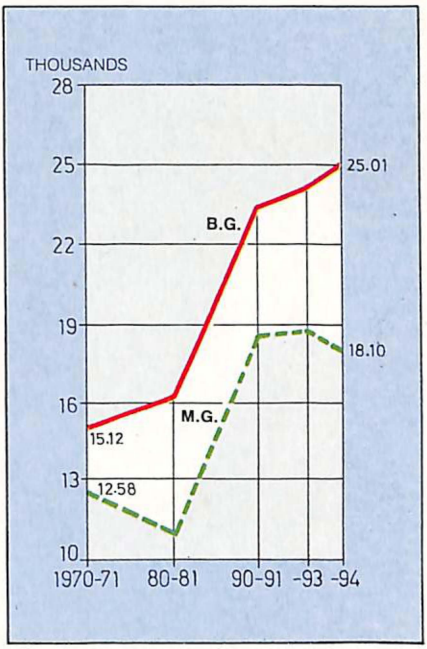
On an average, a wagon moved 125.0 km. per day on BG and 64.5 km. on MG. 'Net tonne kms per wagon per day' reflects productive work done by a wagon. In 1993-94, 'NTKms per wagon per day' on BG was 1,506.

In 1993-94, 'NTKms per annum per tonne of wagon capacity' on BG and MG was 25,009 and 18,098 respectively. Figures of different indices of wagon utilisation are given below:

NET TONNE KILOMETRES PER WAGON PER DAY



NET TONNE KILOMETRES PER ANNUM PER TONNE OF WAGON CAPACITY



(In terms of 4-wheelers)

Year	Net tonne-km per tonne of wagon capacity per annum		Wagon-km. per wagon per day		Net tonne-km. 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
1989-90	23,501	18,524	111.5	68.2	1,420	810
1990-91	23,418	18,629	110.5	69.7	1,407	810
1991-92	23,940	19,806	113.2	70.6	1,439	855
1992-93	24,184	18,786	116.4	71.2	1,457	824
1993-94	**25,009**	**18,098**	**125.0**	**64.5**	**1,506**	**773**

The turn-round time of wagons representing average time lag between two successive loadings, is given below:

Year	Wagon turn-round (in days)	
	B.G.	M.G.
1950-51	11.0	N.A.
1960-61	11.2	7.2
1970-71	13.3	10.1
1980-81	15.2	15.3
1989-90	11.3	12.9
1990-91	11.5	13.3
1991-92	11.1	13.1
1992-93	10.8	12.7
1993-94	**10.6**	**14.8**

A comparison of wagon utilisation on IR with other railway systems is given below:

	Wagon kms. per wagon per day	NTKms.per wagon per day	NTKms. per tonne of wagon capacity
1. French National Railways	53.9	867	7,022
2. German Federal Railways	57.9	636	6,457
3. Italian State Railways	41.8	585	5,535
4. Japanese National Railways	154.5	2,367	32,375
5. Indian Railways (BG)			
1992-93	116.4	1,457	24,184
1993-94	**125.0**	**1,506**	**25,009**

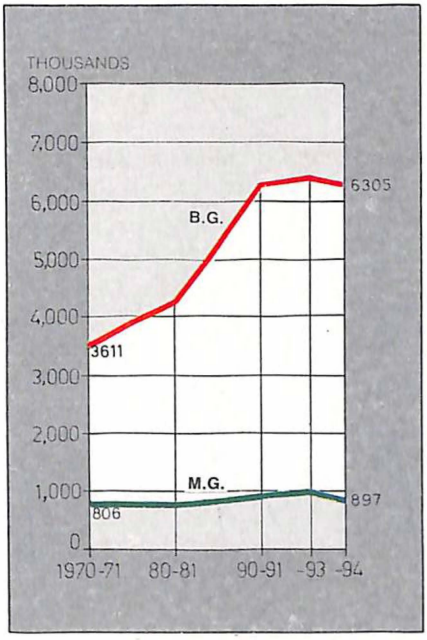
Source: International Railway Statistics, 1992.

Track Utilisation:

The density of traffic in terms of NTKms and PKms per route km. is given below.

Year	Net tonne kms (Millions) per route km.		Passenger kms (Millions) per route km.	
	B.G.	M.G.	B.G.	M.G.
1950-51	1.50	0.25	1.77	0.85
1960-61	2.76	0.54	2.03	0.89
1970-71	3.61	0.81	2.88	1.25
1980-81	4.34	0.80	5.15	1.72
1989-90	6.21	0.95	6.81	1.95
1990-91	6.30	0.97	7.12	1.97
1991-92	6.63	1.03	7.58	2.03
1992-93	6.45	1.02	7.06	1.87
1993-94	**6.31**	**0.90**	**6.82**	**1.79**

NET TONNE KILOMETRES PER ANNUM PER ROUTE KILOMETRE



Safety

IR pays high priority to safety in train operations. This emphasis has helped in achieving reduction in the number of train accidents. There were 520 train accidents in 1993-94 compared to 524 in the previous year. Accidents per million train km. also came down to 0.82 in 1993-94 from 0.83 in 1992-93.

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

Year	Collisions	Derail-ments	Level crossing accidents	Fire in trains	Total	Train accidents per million train km.
1989-90	34	456	42	8	540	0.87
1990-91	41	446	36	9	532	0.86
1991-92	30	444	47	9	530	0.84
1992-93	50	414	51	9	524	0.83
1993-94	**50**	**401**	**66**	**3**	**520**	**0.82**

Casualties and Compensation:

The number of passengers injured or killed in train accidents and compensation paid from 1989-90 onwards, is as follows:

Year	Number of passengers		Casualties per millon passengers carried	Compensation paid (Rs. in lakhs)
	Killed	Injured		
1989-90	146	662	0.22	53.88
1990-91	220	595	0.21	228.95
1991-92	98	451	0.14	275.94
1992-93	96	467	0.15	237.16
1993-94	**179**	**446**	**0.17**	**178.01**

Note: Compensation is not related to the accidents/casualties occurring in a specific year.

Causes of Train Accidents:

Human failure accounted for 82.7% of the accidents during 1993-94 – 68.8% due to the failure of railway personnel; the rest due mainly to

carelessness of road users. 55 accidents, constituting 10.6% of the total, were due to equipment failures. 8 accidents took place due to factors beyond IR's control and 16 due to sabotage. A combination of causes were responsible for 2 accidents while reasons could not be established in 9 cases.

Damage to Railway Property:

Cost of damage to railway property and interruption to communication caused by accidents and failures of railway equipment in 1993-94, were as under:

Year	Cost of damage (Rs. in lakhs)		Interruption to through communication (Hours)
	Rolling Stock inclusive of engines	Permanent Way	
1993-94	2605.94	1482.99	6018

Safety Measures:

Safety measures were reviewed and new measures introduced on the recommendations of the Commissioner of Railway Safety and departmental enquiry committees. To reduce human error, intensive job training was conducted for staff falling under the 'safety categories.'

Some of the steps taken to avoid accidents include:

i) Rehabilitation of assets like track, bridges, rolling stock etc.
ii) Inspections of signalling gear, wagon and loco maintenance depots and quality checks on out-turn from workshops.
iii) Monitoring the performance of operational staff and their rigorous training.
iv) Counselling the drivers in their driving techniques.
v) Extension of technical aids, i.e. Auxiliary Warning System, Axle Countres, Route Relay Interlocking and Track Circuiting.
vi) Surprise checks on carrying of inflammable or explosive substances in passenger trains.
vii) Providing whistle boards/speed breakers and road signs at unmanned level crossings and improving visibility for drivers.
viii) Audio-visual publicity to educate road users on how to make a safe crossing.
ix) Disaster management courses for staff and officers in training institutes.
x) Making the safety organisation multi-disciplinary to make it more effective.

Personnel

As on 31st March, 1994, IR had 16,23,158 regular employees as against 16,45,521 as on 31st March, 1993 - a decline of 22,363 (1.4 percent).

The table below gives, at a glance, the strength of Railway employees under various groups, together with total expenditure on them, for some selected years:

Year	Number* of staff as on 31st March (in 000)				Expenditure* on staff
	Groups A & B	Group C	Group D	Total	(Rs. in crores)
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
1989-90	13.9	882.1	750.7	1,646.7	4,780.8
1990-91	14.3	891.4	746.1	1,651.8	5,166.3
1991-92	14.3	887.2	752.6	1,654.1	5,760.6
1992-93	13.8	891.5	740.2	1,645.5	6,562.4
1993-94	**13.8**	**894.2**	**715.1**	**1,623.1**	**7,290.0**

* Includes number of Railway Protection Special Force (RPSF) personnel and their cost from 1980-81 onwards. These were not included in earlier years.

Management personnel (Groups A&B) makes up 0.85% of the total strength, while Group C and D comprise 55.09% and 44.06% respectively. Of the employees in Group C and D, 5.13 lakhs (31.85%) are workshop employees and artisans, and 10.97 lakhs (68.15%) form other categories including running staff. Railway Protection Force/RPSF personnel totalled 61,755.

In the non-gazetted cadres, the ratio of Group C to D changed from 25:75 in 1950-51 to 56:44 in 1993-94, indicating a shift towards employment of people with better skills.

Employment of Scheduled Castes (SC) and Scheduled Tribes (ST):

The policy with regard to reserved quotas for recruitment and promotion of SCs and STs continued to receive special attention. Efforts were intensified to increase the representation of SC and ST candidates in Railway services, and a special drive was launched to make good the shortfalls in Groups A,B,C and D by recruitment on Zonal Railways and Production Units. A Special Cell in the Ministry of Railways oversees the implementation of this policy. Similar cells function on Zonal Railways and Production Units.

The comparative position of SC and ST employees on IR as on March 31, 1994, compared to the previous year, is given below:

	Number of Scheduled Castes		Number of Scheduled Tribes	
	1992-93	**1993-94**	1992-93	**1993-94**
Group A	1,035	**1,019**	371	**370**
	(13.97)	**(13.17)**	(5.01)	**(4.78)**
Group B	1,077	**987**	288	**261**
	(16.29)	**(15.91)**	(4.36)	**(4.21)**
Group C	142,870	**141,169**	49,484	**49,374**
	(15.98)	**(15.75)**	(5.54)	**(5.51)**
Group D	125,445	**117,985**	48,980	**48,175**
(excluding safaiwalas)	(18.34)	**(17.82)**	(7.16)	
Group D	40,233	**39,443**	2,380	**2,340**
(Safaiwalas)	(70.77)	**(73.54)**	(4.19)	**(4.36)**
Grand Total	310,660	**300,603**	101,503	**100,520**
	(18.84)	**(18.49)**	(6.16)	**(6.18)**
Grand Total	270,427	**261,160**	99,123	**98,180**
(excluding Safaiwalas)	(16.99)	**(16.61)**	(6.23)	**(6.24)**

(Figures in brackets indicate percentage to total staff in the respective Group)

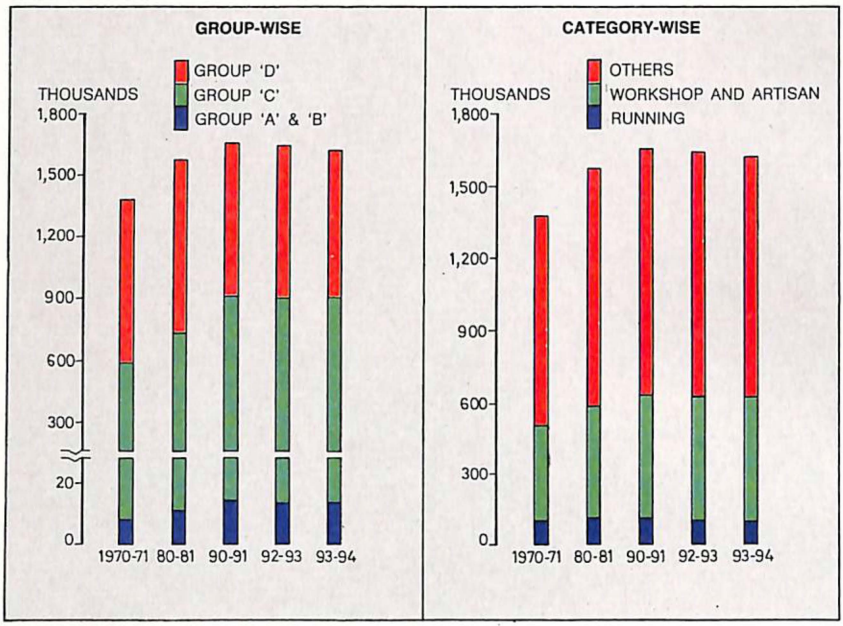
Casual Labour:

There were about 83,000 casual labour on rolls of IR as on March 31, 1994.

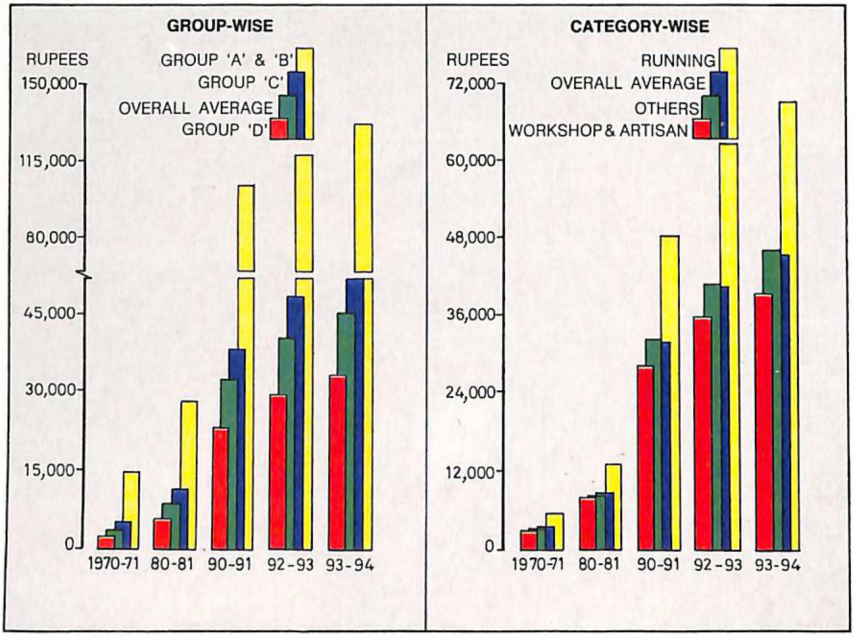
Wage Bill:

Expenditure in 1993-94 on pay and allowances of employees, including those in construction organisations, manufacturing units and central offices like the Railway Board, R.D.S.O., Railway Recruitment Boards and Central Training Schools, was Rs. 7,290.04 crores, showing an increase of

NUMBER OF PERSONNEL



AVERAGE ANNUAL WAGE PER EMPLOYEE



Rs. 727.65 crores (11.1%) over that of 1992-93. The higher staff cost was due to payment of interim relief, enhanced dearness allowance and bonus (PLB) to the employees. 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 46.6%.

The average annual wage (excluding fringe benefits) per employee paid under various categories in 1993-94 is given below:

Category	Groups A & B (Rs.)	Group C (Rs.)	Group D (Rs.)	Total (Rs.)
Workshop and artisan	—	43,806	31,957	39,397
Running*	—	70,915	41,238	69,067
Others	—	57,100	33,380	46,056
Total	131,280	53,725	33,062	45,339

*Emoluments includes running allowances.

Railwaymen (excluding RPF/RPSF personnel) were sanctioned Productivity Linked Bonus equivalent to 49 days' wages for 1993-94. About 15 lakh regular and casual employees were benefitted by this. RPF/RPSF personnel were sanctioned 29 days' wages as ad-hoc Bonus.

Railway Recruitment Boards:

During 1993-94, the Railway Recruitment Boards recommended 5,011 candidates for appointment to Group `C' posts, as against 10,685 candidates recommended in 1992-93.

Human Resource Development and Manpower Planning:

The management development of officers has been restructured through Executive, Senior Management and Strategic Management Development programmes in a phased manner, commensurate with the career progression of the officers. In-house programmes are also being developed to keep the officers abreast of the latest technological and managerial development. The post-graduate programme in design engineering at RDSO is one such programme already in vogue. More such courses are likely to be implemented in future.

Training of officers is conducted in the following 5 Centralised Training Institutions (CTIs):

i) Railway Staff College, Vadodara.
ii) Indian Railways Institute of Civil Engineering , Pune.

iii) Indian Railways Institute of Signal Engineering and Tele-Communications, Secunderabad.

iv) Indian Railways Institute of Mechanical and Electrical Engineering, Jamalpur.

v) Indian Railways Institute of Electrical Engineering, Nasik.

Railway Staff College, Vadodara conducts courses in inter-disciplinary subjects, as also various management programmes both for junior and higher level officers, in addition to foundation and induction training courses for the newly recruited officers. Seminars/workshops are also held for senior officers on important functional areas like energy conservation, productivity, safety, costing etc. The other institutions conduct specialised courses to update technical knowledge of the officers in different disciplines of engineering. 5,099 officers were trained in CTIs during 1993-94.

160 training centres cater to the needs of the training of non-gazetted staff. Modular system, simulators for training of loco drivers, scientifically developed lesson plans and development of multiple skills formed the core of training programmes for the non-gazetted staff. 1,11,732 employees were trained in various Railway Training Schools in 1993-94.

To aid retraining and re-deployment, computerised Manpower Planning Information System is being installed in all the Divisions of IR.

Use of Hindi:

Popularising use of Hindi is a continuing endeavour in keeping with the provisions of the Official Language Act, 1963 and Official Language Rules, 1976. In 168 more offices, 80% of the employees acquired working knowledge of Hindi. They were thus notified in the Official Gazette, raising the number of such offices to 1,690 as against 1,522 in the previous year. A Railway Hindi Terminology Sub-commitee is also working to compile and suggest Hindi equivalents of technical terms used in various Departments of IR.

Many individual and group awards and incentive schemes have been instituted to encourage staff in acquiring proficiency in Hindi language. Prominent among them are the individual Rajbhasha Cash Awards, Railway Minister's Hindi Essay Competition, Prem Chand and Maithilisharan Gupta Prizes and various elocution and noting/drafting cash prizes.

The table below gives the progress of Hindi usage at the end of 1993-94:

Heads	1992-93	1993-94
Devnagari typewriters	3,418	**3,433**
No. of bilingual electronic equipments	285	**614**
No. of personnel having working knowledge of Hindi	274,378	**279,184**
No. of staff trained in Hindi typewriting	3,620	**3,637**
No. of staff trained in Hindi stenography	1,904	**1,936**
Total no. of forms available in Hindi-English bilingual form	24,468	**24,947**
No. of Offices notified under Rule 10 (4) of the OL Rules, 1976	1,522	**1,690**
No. of Hindi workshops organised during the year	128	**216**

Staff welfare:

IR's welfare schemes cover a wide spectrum of activities in areas of education, medicare, housing, sports, recreation, canteens and Staff Benefit Fund.

The main objective of the Staff Benefit Fund is to give additional facilities to employees and their families in the sphere of education, recreation, medicare, sports, scouting and cultural activities. Dispensaries under the indigenous system of medicines, viz. Ayurvedic and Homeopathic, are also run with the help of this Fund.

Typewriting Institute run by Railway Womens Organisation, ICF, for employees' wards.

267 canteens served subsidised meals and refreshments to employees at their work-places. About 40% staff enjoy the benefit of subsidised housing. More than 6 lakh employees have been housed. 5,913 additional staff quarters were electrified in 1993-94.

Cooperative societies are also encouraged as a part of welfare programme to run housing schemes and thrift and credit societies etc. 276 registered Railwaymen's Consumer Cooperative Societies, 36 Railwaymen's Cooperative Housing Societies and 229 labour Contract Cooperative Societies function on IR.

IR attaches due importance to recreation for their employees and provide excellent facilities through institutes/clubs having sports and libraries, and Holiday Homes to enable the employees and their families to enjoy their holidays at nominal expenses.

Medicare:

A network of 122 railway hospitals and 670 health units render medical services to serving and retired railwaymen and their families.

Some of the salient features of its activities during 1993-94 include:

(i) Inauguration of 20-bed Eye Ward and Micro Surgery Unit for inter-occular implantation at South Eastern Railway's Headquarters Hospital, Calcutta.

(ii) 8 bed ICCU in Kharagpur Hospital, South Eastern Railway.

(iii) Cardiac unit of Railway Hospital, Perambur conducted 749 open heart surgeries, 160 closed heart surgeries, 931 catheterization and coronary angiography, 250 cardiac interventional procedures (balloon valvuloplasty, coronary angioplasty), etc.

The table below shows the growth of medical facilities to the Railway employees over the years:

Year	No. of Hospitals	No. of Health Units (including Lock-up dispensaries)	No. of beds	Expenditure on medical and health services (Rs. in crores.)
1950-51	71	345	2,435	2.69
1960-61	77	489	5,944	7.21
1970-71	97	555	10,430	18.82
1980-81	103	562	11,063	47.72
1989-90	111	668	13,025	157.41
1990-91	114	670	13,125	186.67
1991-92	118	670	13,520	189.09
1992-93	122	672	13,725	210.80
1993-94	**122**	**670**	**13,795**	**235.66**

Pension Adalats:

Long-standing disputes or delays in the settlement of dues of superannuated employees are decided on the spot in Pension Adalats organised on Zonal Railways.

Railway Minister's Welfare and Relief Fund:

The Fund provides financial assistance and relief to the Railway employees and their families in times of distress. Voluntary contributions from the

employees and Railway Women's Organisations constitute the primary source of the Fund. In 1993-94, a sum of Rs. 30.70 lakh was sanctioned from the Fund as relief.

Sports:

In 1993-94, IR clinched 12 National titles which included Men's events in Ball Badminton, Basketball, Gymnastics, Weight lifting and Wrestling (Indian style) and Women's events in Athletics, Badminton, Basketball, Cricket, Cross Country, Kabaddi and Volleyball.

Two Railway sportspersons were recipients of the coveted Arjuna Award announced in 1993-94.

Gymnasium, Maharaja Ranjit Singh Stadium, RCF.

Finance

Financial Results:

The financial results of IR for 1991-92, 1992-93 and 1993-94 are given below:

(Rs. in crores)

	1991-92	1992-93	**1993-94**
Capital-at-charge (A)	17,712.46	20,123.20	**20,873.58**
Investment from Capital Fund	—	—	**1,746.99**
Total	17,712.46	20,123.20	**22,620.57**
Passenger Earnings	3,684.62	4,315.08	**4,895.21**
Other Coaching Earnings	398.43	423.93	**442.87**
Goods Earnings	9,462.13	10,903.04	**12,557.36**
Sundry Earnings	302.40	371.12	**363.18**
Gross Earnings	13,847.58	16,013.17	**18,258.62**
Suspense	(-) 117.84	(-) 324.73	**(-) 312,60**
Gross Traffic Receipts	13,729.74	15,688.44	**17,946.02**
Ordinary Working Expenses	9,209.19	10,480.08	**11,759.54**
Appropriation to Depreciation Reserve Fund	2,000.00	2,300.00	**1,875.00**
Appropriation to Pension Fund	1,180.00	1,200.00	**1,500.00**
Total Working Expenses	12,389.19	13,980.08	**15,134.54**
Net Traffic Receipts	1,340.55	1,708.36	**2,811.48**
Misc. Transactions	200.40	247.07	**290.65**
Net Revenue Receipts	1,540.95	1,955.43	**3,102.13**
Dividend payable to General Revenues (B)	1,031.48	1,172.39	**1,296.05**
Payment to deferred Dividend	74.47	341.99	**—**
Excess(+)/Shortfall (-)	(+) 435.00	(+) 441.05	**(+) 1,806.08**
Percentage of Net Revenue to Capital-at-charge and investment from Capital Fund	8.7	9.7	**13.71**
Operating Ratio	89.5	87.4	**82.93**

(A) Excludes investment on Metropolitan Transport Projects and Circular Railway.

(B) Includes payment in lieu of Passenger Fare Tax and contri ution to Railway Safety Works Fund.

Revenue:

The revenue from freight traffic accounted for 68.8% of gross earnings. 92.5% of freight earnings were derived from goods hauled in bulk, 5.3% from general merchandise and 2.2% from miscellaneous charges.

Passenger earnings formed 26.8% of the gross earnings, of which 11.7% were from suburban services, 70.6% from express long distance and 17.7% from ordinary short distance traffic. 87.4% of passenger earnings were contributed by passengers paying full fare while 12.6% by passengers travelling on season tickets or other concessional fares.

Balance Sheet:

A brief summary of the balance sheet as on 31st March, 1994 compared with the previous year, is given below:

(Rs. in crores)

	As on 31.3.1993	**As on 31.3.1994**	Variation
Block Assets	28,524.34	**32,212.04**	(+) 3,687.70
Funds with Central Government			
i) Reserve Funds	1,479.52	**1,316.28**	(–) 163.24
ii) Banking Accounts	3,495.64	**3,483.97**	(–) 11.67
Sundry Debtors	1,090.97	**1,420.71**	(+) 329.74
Cash in hand	551.08	**533.70**	(–) 17.38
	35,141.55	**38,966.70**	(+) 3,825.15
Represented by:			
Capital-at-Charge	20,123.20	**20,873.58**	(+) 750.38
Investment financed from internal resources etc.	8,401.14	**11,338.46**	(+) 2,937.32
	28,524.34	**32,212.04**	(+) 3,687.70
Reserve Funds:			
a) Depreciation Reserve Fund	1,078.08	**985.29**	(–) 92.79
b) Revenue Reserve Fund	0.71	**0.23**	(–) 0.48
c) Development Fund	—	**0.09**	(+) 0.09
d) Pension Fund	274.12	**328.10**	(+) 53.98
e) Accident Compensation, Safety and Passenger Amenties Fund	53.43	—	(–) 53.43
f) Railway Capital Fund	73.18	**2.57**	(–) 70.61
	1,479.52	**1,316.28**	(–)163.24
Banking Accounts:			
i) Provident Fund	2,650.25	**2,924.35**	(+) 274.10
ii) Miscellaneous Deposits etc.	717.36	**415.25**	(–) 302.11
iii) Loan and Advances	128.03	**144.37**	(+)16.34
	3,495.64	**3483.97**	(–) 11.67
Sundry Creditors etc.	1,642.05	**1,954.41**	(+) 312.36
	35,141.05	**38,966.70**	(+) 3,825.15

Note:Capital-at-charge does not include investment in Metropolitan Transport Projects and Circular Railway.

Cash Flow:

Finance generated through IR's internal resources provided nearly 81% of the cost of development programmes for 1993-94. Summarised fund-flow statement is given below:

		(Rs. in crores)
Acquisition of new assets and replaement of existing assets:		
Acquisition of new assets and improvement element in replacement of assets	3,667.71	**4,780.34**
Like by like replacement of assets	1,112.63	
Interest on loans, repayment of loans and increase/decrease in Reserve Funds:		
Interest on Development Fund Loans		—
Repayment of loan for Development Fund		—
Reserve Funds		(–) 164.54
Payment for Accident Compensation		—
		4,615.80
Finance for these requirements was provided from the following sources:		
Internal sources:		
Contribution from Revenue/Capital to fund and interest accruing on balance in the fund	2,028.06	
Development Fund financed from excess	132.26	**3,865.42**
Open Line Works financed direct from Revenue	31.28	
Railway Capital Fund	1,673.82	
Cash-excess in working results		**1,806.08**
Payment of Deferred Dividend Liability		—
Appropriation to Development Fund		(–) 132.26
Appropriation to Railway Capital Fund		(–) 1,673.82
Borrowing from General Exchequer for capital expenditure		**750.38**
		4,615.80

To reduce the burden on the common man, IR deliberately kept passenger fares and freight rates on products of mass consumption less than the cost of operation. This policy resulted in earnings per unit of output trailing behind the increase in the corresponding input costs. A quantitative picture of the gap between increase in input costs vis -a- vis unit revenue realised as a result of IR's policy of price restraint on socio-economic considerations, is given in the table below:

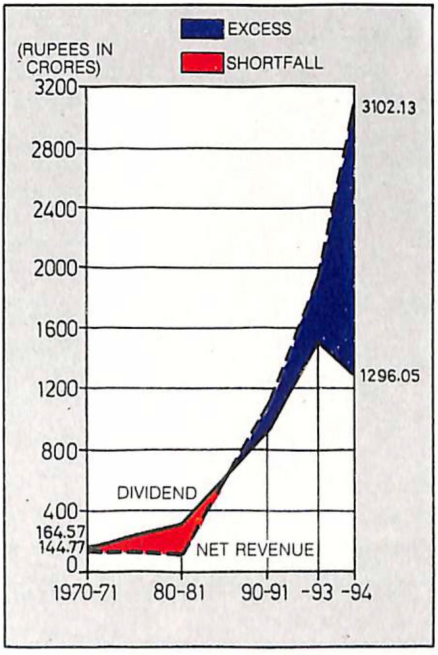
(Base 1970-71=100)

	1992-93		1993-94	
	Revenue Index	Cost Index	**Revenue Index**	**Cost Index**
Unit Revenue:				
Average receipt per passenger km.	574.8		**660.4**	
Average receipt per tonne km.	778.1		**895.6**	
Input Costs:				
Average annual wage per employee		1,190.9		**1,334.3**
Price of fuel:@				
Non-coking coal		1,265.3		**1,453.0**
High speed diesel oil		737.0		**814.1**
Electricity		925.8		**1,183.4**
Price of iron and steel (Basic metals & alloys)		905.8		**976.9**
Price of cement, lime and plaster		759.7		**757.2**
Composite weighted index of inputs*		1,057.8		**1,187.1**

@ Revised wholesale price index series (Base 1981-82) has been converted to 1970-71 base.

* Composite index is based on the price indices of Railway inputs and their weightage as recommended by RTEC.

NET REVENUE, DIVIDEND AND EXCESS/SHORTFALL



Social Costs

IR is a departmental undertaking providing rail transport at reasonable cost while, at the same time, maintaining financial viability of the system. As a part of the Government, IR is expected to provide the basic transport infrastructure for promoting economic development and industrialisation of the country. Traditionally, IR has been providing certain services below the cost of operation. The losses accruing from uneconomic objectives are termed as 'Social Costs'.

Railway Board have identified the following areas for working out the financial effect of social obligations on Railways:

i) Loss on transport of essential commodities carried at low rates below cost.
ii) Loss on passenger and other coaching services.
iii) Loss on uneconomic branch lines.
iv) Loss on new lines opened for traffic in the last 15 years.

The extent of net Social Cost in 1993-94 is assessed at Rs.1,216.50 crores, excluding the staff welfare and law and order costs amounting to Rs. 709.96 crores (staff welfare Rs.473.27 crores and law and order Rs. 236.69 crores). There is need to take cognizance of these costs while assessing the Railways' financial performance for the year, as they are not reimbursed by the Exchequer.

Essential Commodities Carried at Low Rates below Cost:

Low rates are applied to essential commodities of mass consumption like sugarcane, salt, wood unwrought, edible oils, etc. in order to contain prices. To reduce the cascading effect on prices, certain industrial raw materials such as other ores, acids, bones, etc. were also carried at low rates.

The total loss on the movement of these commodities is assessed at Rs. 65.42 crores during 1993-94. The break-up is as under:

S.No.	Particulars	(Rs. in Crores) 1993-94
1.	Sugarcane	**20.82**
2.	Salt	**16.91**
3.	Wood unwrought	**5.89**
4.	Timber wrought	**4.53**
5.	Fruits & vegetables	**3.55**
6.	Live stock	**2.98**
7.	Coir products	**2.67**
8.	Firewood and other fuel	**1.75**
9.	Provisions	**1.41**
10.	Edible oils	**1.16**
11.	Other ores	**1.15**
12.	Other commodities*	**2.60**
	Total (1 to 12)	**65.42**

(*Other commodities include cotton raw unpressed, oil seeds, bones, acids, jute raw unpressed, matches, manganese ore and tobacco unmanufactured.)

The low rated commodities contributed 3.87 percent of revenue NTKms., while contributing only 2.42% of freight earnings in 1993-94.

Losses on Passenger and Other Coaching Services:

Analysis of the profitability of coaching services for 1993-94 showed an overall loss of Rs. 1,861.04 crores. Of this, suburban losses in Bombay, Calcutta and Madras having EMU and non-EMU services, amounted to Rs. 205.44 crores.

Apart from the basic fact that passenger fares have not kept pace with the increase in input costs, the following factors contributed to coaching losses:

(i) Short distance passenger traffic by second class ordinary fares.

(ii) Non-suburban passengers availing season ticket concessions.

(iii) Commuters availing concessional monthly and quarterly season tickets on suburban sections of Bombay, Calcutta, Madras and elsewhere between two stations, upto a distance of 150 kms. The journeys performed by passengers holding season tickets formed 69 percent of suburban and 37 per cent of non-suburban traffic.

(iv) Concession in fares extended to:

(a) Dronacharya Awardees, President's Police Medal Awardees, Vir Charkra/Ashoka Chakra Awardees, Arjuna Awardees, teachers honoured with national awards, etc.

(b) Handicapped persons, viz. deaf, dumb, blind, orthopaedically handicapped, mentally retarded persons, TB/cancer/leprosy patients, etc.

(c) Other categories of passengers, viz. military personnel, students, scouts and guides, nurses and midwives, accredited press correspondents, war widows, senior citizens, etc.

Out of the coaching traffic other than passengers, military traffic was carried below cost, rates for postal traffic left no scope for earning profit, whereas parcels, such as seeds, milk, vegetables, etc. were carried on rates lower than normal parcel rates, thereby putting a further strain on profitability.

Uneconomic Branch Lines:

The Railways have to operate a number of branch line services, in which meagre traffic offerings lead them to become commercially unviable to the extent that even operating costs of services is not being recouped. The Railways were once the sole mode of transportation in these areas, but have lost their pre-eminence with the development of road networks, coupled with the scenario of shift in the nature of urbanisation and industrial activities. Several high-level committees, such as the Railway Reforms Committee, have recommended closure of these lines. The pace of implementation of closure has been very slow due to stiff public resistance, coupled with a marked reluctance of the State Governments to either agreeing for withdrawal of services or to reimburse even a part of operating loss to the Railways. A review of financial results of uneconomic branch lines for the year 1993-94 shows that, on an original investment of Rs. 64 crores, the operating losses added upto Rs. 146 crores in as many as 117 branch lines.

Financing Social Costs:

The Railways have traditionally cross-subsidised their services to finance social costs. Railways, over the years, have had to take on the role of bulk carriers of raw materials for the core sector of the economy, such as coal for power, fertilisers for agriculture, food for public distribution, sugar, salt, etc. As a result, the scope of cross-subsidisation has gradually become limited. It has become increasingly difficult to meet social costs through cross-subsidisation.

Increase in social burdens, change in the pattern of traffic and decreasing scope for cross-subsidisation had necessitated a thorough review of Railway costs and pricing. A Committee consisting of an eminent transport economist

and railway tariff experts was appointed to go into all aspects of cost and pricing. They have since submitted their report and have, inter-alia, recommended that the new policy of IR in respect of cross-subsidisation should be that losses due to social responsibilities be the least component of IR's corporate aim. This and other recommendations on social burdens are under examination of the Ministry of Railways. The Railway Convention Committee (1991), in their V Report dated 23.2.94, recommended that the Railways should also be properly compensated for carrying the social burdens.

The Railway Reforms Committee (RRC), in Part XI of their report on 'Economies' (October, 1983), recommended closing down of 40 unremunerative branch lines, where alternative road facilities are already available. They suggested that in case State Governments disagreed to closure for their own reasons, losses should be shared on a 50:50 basis. However, this concept has not yet been brought into practice. So far, Railways have closed down 15 lines.

Subsidies for Social Costs in Foreign Countries:

The practice of bearing social obligations is a built-in feature of Railway systems the world over. However, to cover such deficits, grants are sought by Railways and sanctioned by Governments in many countries. In some countries, these are made good by revenue grants or subsidy for covering specific deficits, while in others, the growing railway deficits are compensated by other financial arrangements. In many countries, the Railways are compensated for their Public Service Obligations for operating uneconomic services, complying with price restrain orders, carrying traffic at concessional rates, etc. The practice in this regard varies from country to country, but the reliefs are mainly in the following forms:

(a) Out-right grant to cover the deficits,
(b) Soft loans to meet the accumulated burdens,
(c) The facility of writing off accumulated debts and unproductive capital,
(d) Making Railway Organisations financially viable and capable of earning marginal profits,
(e) Equalisation of terms of compensation, and
(f) Compensation for socially reduced tariffs.

In the United Kingdom, British Railways were given Public Service Obligation Grant of £ 808.9 million in 1993-94 to sustain the quality and level of passenger business on Provincial Services and Net Work South East. The Swiss Federal Government contributed SW Fr. 2,439 million in 1993 as Federal compensation towards regional passenger and piggyback freight

services, support for investment and infrastructure maintenance. By way of financial support, the Federal Republic of Germany in 1992, granted the German Railway (DB& DR) D.M. 22,683 million towards compensation for social services, payment for welfare activities, investment grants, etc. The French Government granted the French National Railways (SNCF) their support amount of F.Fr. 42,900 million in 1993 towards infrastructure, pensions, compensation for socially reduced tariffs and regional passenger services.

The percentage of social obligations reimbursed to the total revenue can be seen from the following table:

	Railway System	Passenger earnings (In millions)	Subsidy (In millions)	Total revenue earnings (In millions)	Percentage of subsidy to total revenue
1.	British Railways*	£ 2010.3	£ 808.9	£ 2601.9	31.09
2.	Swiss Federal Railways	SWFr. 1693	SWFr. 2439	SWFr. 6279	38.8
3.	German Railways (DB & DR)	DM 7574	DM 22683	DM 33416	67.9
4.	French National Railways (SNCF)	FFr. 31356	FFr. 42900	FFr. 89247	48.1

* Excluding inter - city services.

Source: Jane's World Railways, 1994-95 edition (Latest available figures)

Financial results of new lines opened for traffic during the last 15 years:

Concurrent review of financial results of new lines opened for traffic, during the last 15 years, is undertaken in order to gauge the profitability or otherwise of these new lines as also to monitor their performances. 27 such lines were reviewed in 1993-94. Results of the review have highlighted that on some of the new lines, the net return on investments were either commensurate with or even exceeded the projections. On the other hand, in some of the other new lines, the return was below expectations. 8 of the new lines under review were sanctioned as project-oriented lines to cater to industrial growth, as also for exploitation of mineral deposits. Another 11 new lines were built to relieve bottlenecks or to bridge the gaps on the existing sections. The remaining 8 lines under review were taken up as a part of social obligations of the Railways for development of backward areas in order to amalgamate them with national mainstream.

Out of the 8 project-oriented lines, 4 are showing more than anticipated returns, while in the cases of the remaining 4 lines, the return was less than that anticipated at the time of sanction of the new lines. In the case of lines constructed to bridge the missing links, barring a few, majority of lines are yielding lower returns due to poor materialisation of traffic. As for lines constructed for development purposes, all of them are showing negative returns.

The financial results of new lines opened during the last 15 years, are furnished below:

Financial Results of New Lines for 1993-94

S. NO.	Name of lines	Date of Opening	Cost (Rs. in lakhs)	Expected return on the investment (%)	Actual return on investment 1991-92 (%)	1992-93 (%)	1993-94 (%)
	Central Railway						
1.	Wani-Pimpalkutti	March '84 (goods traffic only)	22,55	7.09	28.00	26.00	13.00
2.	Diva-Vasai Road	May '89	65,39	3.86	(–) 8.73	(–) 8.00	(–) 0.89
	Eastern Railway						
3.	Kalyani-Kalyani Simanta	April '79	81	1.24	(–) 37.83	(–) 20.00	(–) 33.00
4.	Karaila Rd.-Jayant	May '85	23,60	43.01	42.81	39.06	24.82
5.	Lakshmikantapur-Kulpi	Oct. '92	32,06	—	—	—	(–) 13.92
	Northern Railway						
6.	Rohtak-Bhiwani	Jan. '80	92	0.55	(–) 113.24	(–) 126.15	(–) 121.00
7.	Shahdara-Shamli-Saharanpur	Jan. '79 Nov. '80	60,23	0.89	(–) 2.37	(–) 2.61	(–) 2.45
8.	Gohana-Panipat	April '79	32,56	—	(–) 143.58	(–) 123.46	(–) 167.00
	Northeast Frontier Railway						
9.	New Bongaigaon-Guwahati	April '84	96,22	1.58	(–) 12.09	(–) 15.74	0.75
10.	Dharmanagar-Kumarghat	Jan. '90	48,11	—	(–) 21.59	(–) 24.03	(–) 13.73
11.	Lalabazar-Jamira-Bairabi	April '88	43,82	—	(–) 21.27	(–) 23.09	(–) 13.82
12.	Silchar-Jiribam	March '90	44,57	—	(–) 20.90	(–) 23.81	(–) 14.20
13.	Balipara-Bhalukpong	Jan. '90	16,59	—	(–) 20.99	(–) 28.04	(–) 19.20
14.	Amguri-Tuli	March '92	14,54	—	(–) 21.54	(–) 22.24	(–) 10.73
	Southern Railway						
15.	Hassan-Mangalore	Dec. '79	73,92	2.26	(–) .006	(–) 1.59	(–) 3.35
16.	Trivandrum-Nagercoil Kanyakumari-Nagercoil Tirunelveli	April '81	46,53	8.00	15.85	16.12	16.70
17.	Ernakulam-Alleppey	Oct. '89	61,97	13.16	1.50	2.55	3.90
18.	Alleppey-Kayankulam	Nov.'92	60,62	13.16	—	(–) 0.51	(+) 1.17

S. NO.	Name of lines	Date of Opening	Cost (Rs. in lakhs)	Expected return on the investment (%)	Actual return on investment 1991-92 (%)	1992-93 (%)	1993-94 (%)
	South Central Railway						
19.	Bibinagar-Nadikude	April '90	50,63	12.42	19.21	16.83	17.73
20.	Motumari-Jaggayyapet	Sep. '87	19,26	11.97	32.47	33.64	Under DCF 33.11
21.	Manickgarh-Ghatchandur	May '85	11,55	10.30	37.22	37.47	Under DCF 38.14
22.	Bhadrachalam Road-Manuguru	Aug. '83	18,62	10.96	25.73	26.35	Under DCF 26.93
23.	Telapur-Patancheru	April '93	14,78	10.93	—	—	Under DCF (–) 7.73
	South Eastern Railway						
24.	Santragachi-Baragachia	Aug. '85	24,19	Less than0	(–) 16.53	(–) 15.36	(–) 16.04
25.	Jakhapura-Daitari	March '81	9,77	8.01	(–) 12.52	(–) 16.39	(–) 13.26
26.	Tupkadih-Talgaria	March '87	22,18	8.20	(–) 17.36	(–) 19.53	(–) 21.00
	Western Railway						
27.	Kota-Chittorgarh-Neemuch	March '89	16,09	20.56	—	(–) 23.18	20.70

Research and Development

The Research, Designs and Standards Organisation (RDSO) is the sole Research & Development unit of IR, providing direction to the technological developments in almost all the fields of railway activities. It functions as the technical advisor and consultant to IR.

Development and Designs:

Some of the important research and development projects taken up were:

i) 25 kV ac/1500 V dc mixed traffic locomotive.
ii) 25 kV ac/5000 hp passenger locomotive.
iii) Bogie air brake tank wagon "BTPGLN" for transportation of liquified petroleum gas.
iv) Special bogie wagon for transport of Maruti cars.
v) Modern light-weight coach with improved interior as well as higher degree passenger ride comfort suitable for speed of 160 km/h.
vi) 25 kV ac BG 10'-8" wide mainline EMUs for operation on main line electrified routes.
vii) Composite shell made out of corten steel and stainless steel to minimise corrosion problems.
viii) Aerodynamic profiling of WDM2 loco to reduce the wind resistance from 21.6% to 2%.
ix) Over-head equipment recording-cum-test car.
x) Roof mounted AC package unit.
xi) Universal emergency communication system.
xii) 30.5m PSC girder with ballastless track for MBG-87 loading.
xiii) Aluminium alloy girder for laying blanket with geo-synthetic under traffic.
xiv) 1 in 12 BG 60 kg turnout with CR-120 thick web tongue rails CMS crossing for use on concrete sleepers.
xv) Steel channel sleepers suitable for MG and BG bridges for gauge conversion.
xvi) Double storeyed passenger platform shelter.

Testing and Trials:

Important projects taken up included:

i) Interference due to WAM4 thyristor locomotives and dc chopper EMUs on signalling and telecommunication installations.

ii) Trial for running 24 coach train on Igatpuri - Kasara section of Central Railway.

iii) Oscillation trials carried out for:
   a) WAP3 locomotive at speed of 160 km/h.
   b) AC 3-tier coach for a maximum operating speed of 140 km/h.
   c) WAG5 electric loco at speed of 115 km/h.
   d) CRT wagons with modified coil springs.

iv) Stress investigations and fatigue testing of the prototype IR-15 high speed coaching bogie frame for 2 million cycles.

v) The rating, performance, adhesion, starting resistance, rolling resis tance and continuous rating trials of WAG7 locomotive.

vi) Studies of vibration signature as technique of inspection of PSC bridges.

vii) Solar energy power supply for signalling for wayside non electrified stations, using solar photo-voltaic panels in conjunction with low-maintenance lead acid batteries.

viii) Critical job requirements due to technology progression, related changes in working conditions and procedure to develop a battery of psychological tests for selection of Motormen.

Reliability and Safety:

Emphasis continued to be laid on reliability and safety engineering. Important works include development of alumina based insulators to improve the mechanical strength; jointless contact wire using continuous cast wire rods to avoid failure at contact wire joints; multi channel double rail tester for ultrasonic flaw detection (USFD) of rails; electronic timer for time delay relay Q44/Q118, cable head termination system for locomotive transformer, a new axle counter system using hybrids and ASICs having "self-diagnostics" and "near zero maintenance" fea-

Track Lab, RDSO

tures; techniques for ultrasonic testing of different types of rolling stock, axles/components; test programme for AC coaches and periodical psychological check-up of mail/express drivers.

Energy Conservation Measures:

Some of the important projects undertaken were:

i) Development of microprocessor-based energy monitoring system for ac and dc EMUs and electric locomotives.
ii) Development of 13% series reactor with shunt capacitor bank.
iii) Development of 150 sq. mm contact wire in place of 107 sq. mm.

Consultancy:

Consultancy and modern testing services rendered included:

i) Guidance to RITES for framing of technical specification for traction equipments and rail coaches for mass rapid transport system, New Delhi.
ii) Strengthening/rebuilding of bridges for gauge conversion projects.
iii) Dynamic load testing of rehabilitated steel sleeper assembly with elastic fastenings for Bangladesh Railways.
iv) Consultancy to RITES for fitment of CBC on YDM4 loco for Malaysian Railway.
v) A consultancy project taken up with M/s. Transmark of U.K. to revise the track geometry standards to meet the future challenges of heavier traffic and higher speeds.

Rail India Technical and Economic Services Limited (RITES):

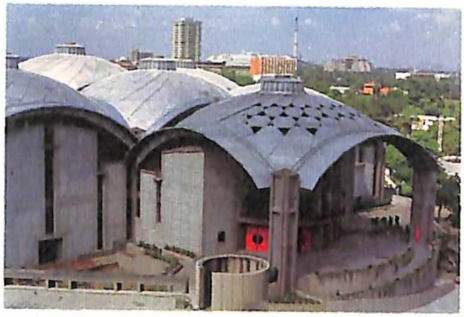
RITES provide comprehensive consultancy services in sectors such as railways, airports, highways, urban transport, inland waterways, ports and harbours and industrial engineering. Its expertise has been internationally recognised, having been credited with experience in 35 countries in Africa, Middle East, South-East Asia, etc.

Business Operations - Overseas:

Some of the important projects undertaken abroad by RITES include: (i) operation and management of various railway systems in Africa and Middle East, (ii) technical assistance to railway systems in Zimbabwe, Swaziland, Mozambique, Ghana, Zambia, Botswana, Tanzania etc., (iii) rehabilitation of tracks and bridges in Vietnam and Cambodia, (iv) design, upgradation and construction management of Maun Airport, Botswana, (v) project management for 18 bridges of MRM (East West Highway, Nepal), (vi) optimisation of port activities in Luanda, Angola, and (vii) worldwide inspection of railway equipments and other materials, etc.

Business Operations - India:

RITES have taken up a number of projects in India such as: (i) formulation of Urban Transport Policy for the country, (ii) development works of national waterways in India including Ganga and Brahmaputra, (iii) automated simulation system for operation and running of trains for Konkan Railway and Central Railway for various track and train configurations, and (iv) consultancy in ISO-9000 to Hero Group of Industries, Auto Meters, etc.



'Hall of Technology' at Pragati Maidan built with construction management support from RITES

The company has bagged the ``Best Exporters Award'' in services sector

from OCCI for the 5th consecutive year and the highest "Excellent" rating in respect of MOU targets in 1993-94.

Financial Performance:

The comparative financial performance of the Company during the last two years is summarised below:

		(Rupees in lakhs)
	1992-93	**1993-94**
Gross earnings	5,931	**6,523**
Net Profit (before tax)	1,087	**1,354**

Indian Railway Construction Company Limited (IRCON):

Set up in 1976, IRCON has diversified into areas other than railway construction such as roads, bridges, highways, industrial and residential complexes, etc.

Business Operations - Overseas:

New projects secured during 1993-94 include: (i) railway electrification project in Turkey, and (ii) Transmission Line Project in Nepal.

Senen flyover in Indonesia constructed by IRCON.

Among the on-going projects, the important ones include: (i) design, supply and commissioning of heavy machinery equipment for a major maintenance workshop of Saudi Railway Organisation at Dammam in Saudi Arabia, (ii) track rehabilitation and turnkey doubling projects in Malaysia, and (iii) construction of 4-line flyovers in Jakarta, Indonesia.

The successfully completed 4 international projects in Malaysia and Bangladesh include rehabilitation of existing railway tracks and construction of new lines inclusive of all civil works in Malaysia, for which IRCON has earned the prestigious ISO-9002 Certification from SGS Yarsley International

Certification Services Limited of U.K.

Business Operations–India:

Some important projects secured by the Company in 1993-94 are; (i) construction of residential and office complexes for Canara Bank, (ii) construction of railway siding and sub-stations for Indian Oil Corporation, and (iii) contract for modernisation of Bombay airport for National Airport Authority.

Important works completed during 1993-94 include: (i) signalling and telecommunication system for multiple rake operation of MGR system of Korba, (ii) construction of railway siding for IOC Limited at Jayant (Singrauli), and (iii) construction of railway siding ex. Karonji to Bhatgaon.

Financial Performance:

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

		(Rs. in million)
	1992-93	**1993-94**
1. Turnover and other receipts	4,247.95	**3,913.11**
2. Expenditure	3,787.35	**3,563.29**
3. Depreciation	166.93	**160.25**
4. Profit before tax	293.67	**189.57**
5. (i) Taxation for the year	104.40	**20.00**
(ii) Taxation for the earlier year	15.24	**-**
6. Net profit	174.03	**169.57**
7. Net foreign exchange earnings (direct)	288.61	**290.78**

So far, the Company has received 15 awards from OCCI, 13 from EEPC and 3 from the Ministry of Commerce for export excellence.

Indian Railway Finance Corporation Limited (IRFC):

Set up in 1986 to partly finance the Plan outlay of IR, IRFC raised Rs. 6,101.25 crores including Rs. 131.14 crores for Konkan Railway Corporation through bonds till 31.3.94.

Container Corporation of India Ltd. (CONCOR):

CONCOR provides multimodal transport services. Some of the highlights of its performance are: (i) increased handling of containers - 237,160 TEUs handled during 1993-94 as against 155,585 during 1992-93 (i.e. +52%), (ii) commissioning of ICDs at Whitefield (Bangalore) and Tughlakabad during 1993-94, (iii) starting of block-rake services on important routes like Delhi-Bangalore, Delhi-Madras, Ahmedabad-Calcutta and Moga to Guwahati, Patna, Indore and Hyderabad, (iv) stepping in for promoting container manufacturing industry, (v) providing consultancy services in the area of container transport to State Governments of Madhya Pradesh and Orissa, NALCO, Iran, etc.

Financial Performance:

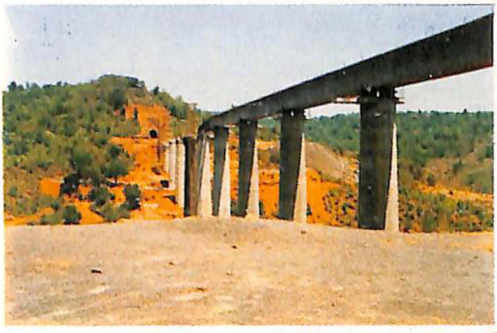
The following table depicts the financial performance of CONCOR during 1993-94 vis-a-vis 1992-93.

(Rs. in crores)

	1992-93	1993-94
Turnover	81	**115**
Net profit	17	**21**

Konkan Railway Corporation (KRC):

The construction of 760 km. Konkan Railway between Roha (near Bombay) and Mangalore is progressing at a fast pace. The 68 km. section between Mangalore and Udupi and the 47 km. stretch between Roha and Veer have already been commissioned.



Incremental launching of PSC box girder on Panvel-Nadi viaduct bridge, Konkan Rly.

According to the latest estimates, the project is likely to cost Rs. 1,750 crores. Out of this, Rs. 600 crores are to be contributed as equity by the Ministry of Railways and the four participating States of Maharashtra, Karnataka, Goa and Kerala. The rest of the cost is to be financed through tax-free bonds. Rs. 1,270 crores

have been spent till 31.3.94.

The project is targetted to be commissioned for freight traffic from March, 1995 and for passenger traffic from December, 1995. It will reduce journey time between Bombay - Mangalore, Bombay - Cochin and Bombay - Goa. This line is likely to accelerate industrial development and tourism in the region.

Centre for Railway Information Systems (CRIS):

CRIS was set up in 1987. Some of the important projects undertaken by it are:

(i) Freight Operations Information System (FOIS): This on-line, real-time system with terminals at all functional centres of IR, when implemented, will be one of the largest networks of its kind anywhere in the world.

(ii) Passenger Reservation System: Substantial progress has been made in the development of the new rservation software, which will provide for networking of the PRS computers at all the selected locations.

(iii) Micro-processor based Self-printing Ticketing Machines (SPTM): The system is designed to replace manual issue of printed card tickets for unreserved rail journey. Presently, operational at New Delhi, Guwahati and Bangalore, the system has been upgraded at New Delhi during 1993-94.

Self-Sufficiency

The value of stores imported by IR is only 6 percent of the total stores purchased. Table below shows the value of imported stores during the last five years:

(Rs. in crores)

S. No.	Nature of stores	1989-90	1990-91	1991-92	1992-93	1993-94
1.	Steam loco parts and fittings	4.9	12.1	18.2	2.1	**0.9**
2.	Diesel loco parts and fittings	160.3	131.3	160.0	141.7	**119.0**
3.	Electric loco parts and fittings	108.9	40.0	38.1	49.1	**96.7**
4.	Carriage, wagon and EMU parts and fittings	42.1	66.8	39.8	69.3	**29.8**
5.	Electrical stores	8.1	3.8	4.8	5.7	**7.1**
6.	Engineering stores	21.4	33.1	5.4	10.4	**14.8**
7.	Ball and roller bearings	7.3	8.7	6.3	6.4	**5.8**
8.	General stores covering acid, chemicals, drugs etc.	5.2	7.1	11.9	12.1	**14.3**
9.	Metal ferrous	54.0	80.2	61.2	102.0	**43.7**
10.	Other items (including complete units of rolling stock i.e. bogies, wheel - sets, couplers etc.)	144.8	57.0	80.0	16.9	**66.7**
	Grand Total	557.0	440.1	425.7	415.7	**398.8**

Strategy for Self-sufficiency:

Capacity has been developed for manufacturing a range of components in workshops owned by IR and manufacturing facilities in the public and private sectors.

Locomotives:

IR's locomotives are manufactured by CLW, Chittaranjan and DLW, Varanasi. A few electric locos are also manufactured by BHEL, a public sector

Computer aided designing of bogie

company. By 31st March, 1994, CLW had manufactured 1,914 electrics, 660 diesel shunters, 141 NG diesels and 41 MG diesels, all hydraulic types. Since its inception in 1964, DLW had produced 2,226 BG and 572 MG diesel electrics and 439 high-capacity diesel shunters besides 5 O-B-O shunters.

WAG-5 class electrics manufactured by CLW use only 4.8% imported components, while WDM-2 class use 6.0% and YDM-4 MG diesel 8.63%.

Diesel Component Works:

DCW, Patiala fabricated components worth Rs. 53.28 crores in 1993-94 in addition to rebuilding 68 diesel locos and 7 power packs.

Passenger Service Vehicles:

The bulk of pasenger coaches are manufactured in Integral Coach Factory (ICF), Madras and Rail Coach Factory (RCF), Kapurthala. Since its inception in 1955, ICF had turned out 24,229 coaches by 31st March, 1994. RCF manufactured 1,025 coaches in 1993-94. Two more units – Jessops and Co. Ltd., Calcutta and Bharat Earth Movers Ltd., Bangalore– also manufacture coaches. Jessops and ICF also produce Electric Multiple Units (EMUs). Electrical equipment for these EMUs is provided by Bharat Heavy Electricals Ltd., Bhopal and NGEF Ltd., Bangalore.

Wagons:

IR's entire requirement of wagons is met by units in public sector and private industry supported by the Railway workshops. In 1993-94, production of wagons totalled 19,649 in terms of four-wheelers. Of these, 1,149 four-wheelers were manufactured by Railway workshops and the rest by the industry.

Wheel and Axle Plant:

Wheel and Axle Plant, Bangalore produced 32,664 wheel-sets in 1993-94. In terms of wheels and axles, the production was 69,484 wheels and 47,698 axles in terms of BOX'N' units.

Cast steel BOX 'N' wheels on conveyor inside hot wheel kiln, W&AP.

Signalling:

IR's signal workshops are now manufacturing critical electrical signalling items to meet emergent requirements. Major workshops are located at Podanur on Southern Railway, Mettaguda on South Central Railway and Gorakhpur on North Eastern Railway. Capacity and production during 1993-94 were as under:

		Present capacity (No. per annum)	Actual production in 1993-94 (Number)
1.	Relays	18,300	**17,451**
2.	Electric Point Machines	540	**484**
3.	Double Line Block Instruments	216	**208**
4.	Tokenless Block Instruments	240	**175**
5.	Axle Counters	120	**79**
6.	Panels	52	**50**

Materials Management

217 Stocking Depots spread all over the railway network ensured uninterrupted supply of materials to the construction projects, Zonal Railways and Production Units of IR. These Depots stock over 2.8 lakh components having more than 1 lakh unique items.

Another important function of the materials management is the management of surplus and obsolete materials and industrial wastes. During 1993-94, the total value realised through disposal of various unserviceable items was Rs.850 crores, which is about Rs. 170 crores higher than that of the previous year.

Purchases:

Expenditure on purchase of materials needed for operation, maintenance and production of Rolling Stock was of the order of Rs. 6,592.60 crores during 1993-94 showing a decline of Rs.575.00 crores over 1992-93. These purchases, however, do not include cost of ballast and materials supplied by contractors for civil engineering works.

A broad analysis of purchases made is given below.

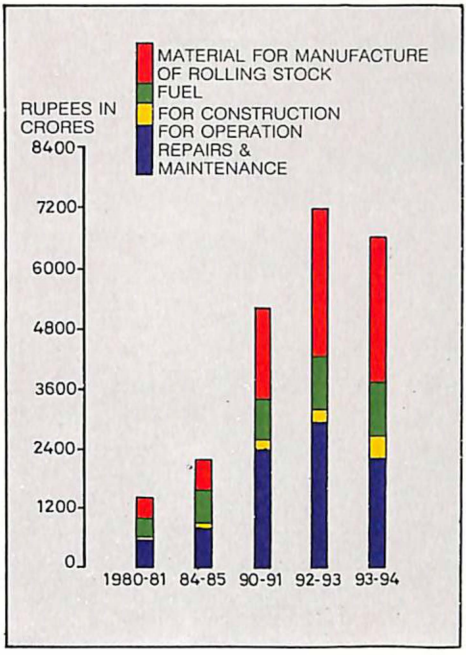
(Rs. in crores)

		1992-93	**1993-94**
i)	Stores for operation, repairs and maintenance	2,913	2,235
ii)	Stores for construction	286	454
iii)	Fuel	1,041	1,005
iv)	Stores for manufacture of rolling stock	2,928	2,898
	Total	7,168	**6,592**

Mode of Procurement:

Zonal Railways and Production Units mostly procure the materials they

VALUE OF STORES PURCHASED



need, but depend on Railway Board for purchase of a few items. Certain purchases are reserved for procurement through DGS&D. Of the Rs. 6,952.60 crores worth of stores procured in 1993-94, 50% was done by Zonal Railways and Production Units, 41% by Railway Board and the balance 9% against rate contract finalised by DGS&D.

Rs. 282 crores worth of goods was bought in 1993-94 from the Small Scale Sector and Khadi and Village Industries. Public Sector Undertakings contributed 18% of the supplies and private industry 82%.

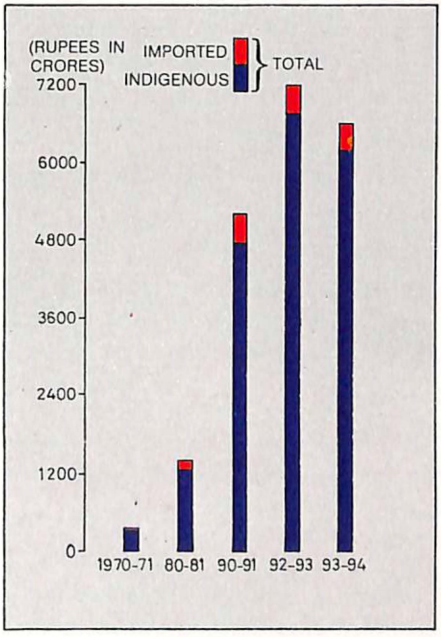
Indigenous Development:

The indigenous purchase content of stores was 94% of total purchases of Rs. 6,592.60 crores in 1993-94. However, IR has to depend on imports for certain components of its diesel and electric loco fleet, as also for sophisticated signal and telecom equipment and raw materials not manufactured or in short supply within the country.

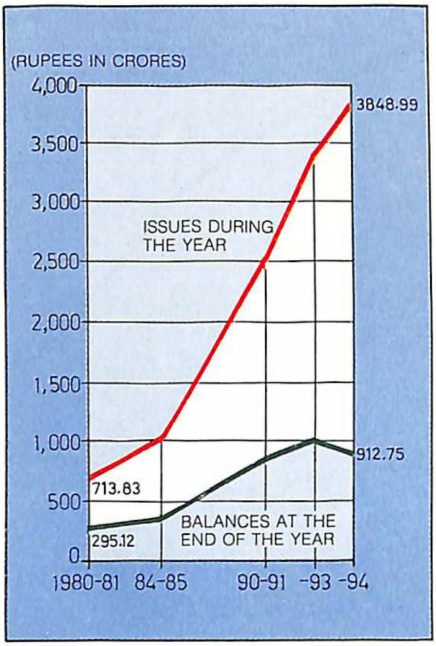
Inventories:

Inventory Management has been progressively modernised on IR. Use of modern gadgets like Computers is playing a vital role in accountal and

STORES PURCHASES



STORES-BALANCES & ISSUES (TOTAL WITHOUT FUEL)
(ZONAL RAILWAYS AND PRODUCTION UNITS)



day-to-day monitoring of inventory performance. Computer aided applications are being refined and extended to new areas of materials management.

IR achieved all time best inventory performance in 1993-94 with best ever Turn Over Ratio of 24% (without fuel). This improvement in inventory performance resulted in a saving of Rs.222 crores under Plan Head Inventories in 1993-94 compared to Budget allocations. Inventories (Stores Suspense) held exclusively on Zonal Railways as on March 31, 1994 was Rs. 568.80 crores. Inventories (Stores Suspense) held on IR as a whole was Rs. 912.75 crores against issues of Rs. 3,849 crores during this period.

Printing and Stationery Organisation:

11 general printing presses, an equal number of ticket printing presses and 'books and forms' depots on IR having a work force of 5,817 employees meet the entire requirement of passenger card tickets, money value books and books and forms.

General printing presses gave an out-turn of 53.47 crores standard A-2 metric size impressions in 1993-94. IR made considerable progress in implementing Government's directive to print bilingual forms and rule books by expanding the capacity for Hindi composing. In order to avoid loss of revenue to the Railways, the availability of vital money value items like PW Bills, Railway Receipts, EFTs, BPTs etc. has been ensured throughout the year.

The ticket printing presses printed 120.49 crores card tickets in 1993-94 by maintaining 'outstanding load' on printing presses well below one month's capacity with no indent, which are more than 30 days old, outstanding.

The 'books and forms' depots stocked 12,766 separate items. Transactions of receipts and issues at these depots were worth Rs.19.31 crores and Rs. 19.38 crores respectively in 1993-94.

Security

Law and order and prevention of crime on Railways is handled by the Government Railway Police (GRP) functioning under the control of State Governments. The Railway Protection Force (RPF) under the Ministry of Railways assists the GRP, for which 50% of the expenditure is borne by IR.

Some of the significant steps taken to prevent thefts were the provision of luggage chains on the lower berths and the closing of vestibules at night. These have had a visible impact on crime on running trains. Facilities to passengers to lodge formal complaints of theft on running trains without having to detrain has been welcomed.

A comparison of crime situation on the Railways during 1993-94 vis-a-vis 1992-93 is given below:

Year	Cases registered (Nos.)	Persons arrested (Nos.)	Value of property (in lakhs of Rs.)	
			Stolen	Recovered
Railway materials and fittings:				
1992-93	87,504	12,099	525.43	206.02
1993-94	**77,906**	**10,948**	**463.71**	**214.56**
Booked consignments:				
1992-93	16,555	1,850	681.02	81.12
1993-94	**12,802**	**1,446**	**595.98**	**63.08**

Meritorious Service:

14 RPF personnel were awarded Police Medals for distinguished and meritorious service on Independence Day - 1993 and Republic Day - 1994.

Preserving Railways' Heritage

The Rail Transport Museum at New Delhi preserves some of the rich heritage of IR tracing its development from the early days.

The display area has 69 antique exhibits consisting of locomotives, coaches, wagons and saloons which once belonged to Maharajas and high dignitaries. The eye-catching locomotives are the Fairy Queen (Leeds-1855), Ramgotty (Anjubolt Paris-1863), Decauville (Begnall-1902), Phoenix (Nasmyth Wilson-1907), HG-27059 (Vulcun Foundry-1909), Sentinal (Sentinal Wagged-1926) and the XG-M911 (Beyer Peacock-1928). Visitors to the museum can also ride on the Patiala State Monorail. The Museum has numerous stationary and working models of toy trains and rolling stock. Photographs, records and monograms of historical value are also displayed in such a way as to depict the evolution of IR to the present day.

A unique 101 year old miniature working steam locomotive and a working whistle section having whistles of Steam, Diesel and Electric locomotives have been commissioned recently in this Museum.

The archives and library of the Museum have a large collection of books, periodicals and photographs dating back to the earliest times of the Railways in our country. A number of Railway publications and souvenirs are available at the Museum Shop.

Fireless loco - 1953

The Regional Museum at Mysore displays two exotic saloons of the Royal train of Mysore Darbar and some interesting Narrow Gauge locos.

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