Rolling Stock

Locomotives:

IR's fleet as on 31st March, 2006 consisted of 44 steam, 4,793 diesel and 3,188 electric locomotives. The table below shows the distribution of locomotives, traction-wise, along with 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
1990-91	2,915	3,759	1,743	8,417	24,088	12,438
2000-01	54	4,702	2,810	7,566	29,203	18,537
2001-02	53	4,815	2,871	7,739	29,274	18,577
2002-03	52	4,699	2,930	7,681	29,289	18,531
2003-04	45	4,769	3,004	7,818	30,340	18,603
2004-05	44	4,807*	3,065	7,916*	31,768*	18,570
2005-06	**44**	**4,793**	**3,188**	**8,025**	**32,012**	**18,376**

*revised

Coaching Vehicles:

Coaches of LHB design imported under 'Transfer of Technology' with M/s. ALSTOM were mainly air conditioned chair cars. These coaches, besides having higher passenger carrying capacity, are lighter in weight, are maintenance friendly and have superior riding comforts and state-of-the-art furnishings. Other variants of LHB design viz. air conditioned first class, AC 2 tier sleeper, AC 3 tier sleeper, hot buffet (pantry) car etc. have been indigenously designed, developed and manufactured at the Rail Coach Factory, Kapurthala. The first such rake was introduced for Mumbai-New Delhi Rajdhani Express in December, 2003.

Coaches of LHB design have been further proliferated during the year and all rakes of Mumbai-Hazarat Nizamuddin August Kranti Rajdhani Express and Howrah-New Delhi Rajdhani Express are now running with LHB design coaches. During the year, New Delhi-Bhopal Shatabdi Express comprising of LHB design chair car coaches became the first train in the history of Indian Railways to run at a maximum speed of 150 kmph.

Development of Crashworthy Coaches:

In line with the efforts to enhance safety of passenger coaches, a prototype rake incorporating crashworthy design features in the coaches (which shall minimize the extent of damage during collisions/accidents etc.) has been manufactured at Rail Coach Factory and are presently running on the Amritsar-Barauni Jan Seva Express.

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

Year	Passenger Coaches						Other Coaching Vehicles (Number+)
	EMU Coaches		Conventional Coaches		DMU/DHMU		
	Number	Capacity $	Number @	Seating Capacity	Number	Seating capacity	
1950-51	460	87,986	13,109	854,678	–	–	6,059
1960-61	846	150,854	20,178	1,280,797	–	–	7,415
1970-71	1,750	340,541	24,676	1,505,047	–	–	8,719
1980-81	2,625	500,607	27,478	1,695,127	–	–	8,230
1990-91	3,142	609,042	28,701	1,864,136	–	–	6,668
2000-01	4,526	859,701	33,258	2,372,729	142	13,884	4,731
2001-02	4,636	882,259	34,363	2,454,872	243	23,356	4,827
2002-03	4,696	905,771	34,896	2,506,947	261	24,936	4,904
2003-04	4,962	1,060,284	35,691	2,566,917	316	30,232	5,519
2004-05	5,029*	1,044,622*	37,125*	2,668,841*	559*	52,767*	5,600*
2005-06	**5,316**	**1,049,867**	**38,196**	**2,756,521**	**578**	**53,855**	**5,990**

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

Wagons:

On 31st March, 2006, IR's wagon fleet consisted of 207,176 units comprising 61,088 covered, 93,475 open high-sided, 8,723 open low-sided, 33,587 other types and 10,303 brake vans/departmental wagons.

Following table indicates the holding of different types of wagons.

Year	Total wagons on line (In units)	Percentage of total number of wagons				
		Covered	Open high sided	Open low sided	Other types	Depart-mental	Total
1950-51	205,596	58.9	25.5	3.4	7.2	5.0	100
1960-61	307,907	57.3	25.5	2.5	10.6	4.1	100
1970-71	383,990	53.4	25.6	1.8	13.0	4.2	100
1980-81	400,946	53.3	28.3	3.2	11.8	3.4	100
1990-91	346,102	49.1	29.6	3.6	14.4	3.3	100
2000-01	222,193	34.1	41.0	3.6	17.5	3.8	100
2001-02	216,717	33.2	41.7	3.5	17.2	4.4	100
2002-03	214,760	31.9	42.4	3.3	17.5	4.9	100
2003-04	227,752	29.8	44.0	3.9	17.3	5.0	100
2004-05	222,409*	29.0	45.8	3.9	16.4	4.9	100
2005-06	**207,176**	**29.5**	**45.1**	**4.2**	**16.2**	**5.0**	**100**

* revised

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

Year	All Gauges		Broad Gauge		Metre Gauge	
	Total number of wagons$ (000)	Total capacity (Million tonnes)	Number$ (000)	Average capacity (Tonnes)	Number$ (000)	Average capacity (Tonnes)
1950-51	195	4.14	149	22.6	43	17.1
1960-61	295	6.30	207	23.1	83	18.0
1970-71	368	9.35	271	27.8	91	19.1
1980-81	387	11.14	299	30.6	83	23.0
1990-91	335	11.50	276	36.9	55	22.9
2000-01	214	10.19	199	48.7	14	34.4
2001-02	207	10.09	194	49.7	12	34.8
2002-03	204	9.98	192	50.0	12	33.5
2003-04	216	10.66	205	50.3	11	32.0
2004-05	211	10.60	202	50.9	9	32.5
2005-06	**197**	**9.93**	**188**	**51.3**	**8**	**32.1**

$ Excludes departmental service wagons and brake vans.

IR is gradually replacing four-wheeler stock by bogie wagons with higher payload and speed potential for optimum utilisation of line capacity. These bogie wagons include BCN, BTPN, BOX'N' etc.

The table below shows the number of major special type wagons as on 31.3.2006.

Special types of wagon fleet (B.G.)

Type of wagon	Units available	Brief description
BOX'N'	64,320	High-sided bogie open wagons with improved components like cast steel bogie, high tensile couplers, cartridge tapered roller bearings, air brake, etc. for enabling greater trailing loads for movement of bulk commodities like coal, iron ore etc.
BCN/A	42,899	Water-tight covered bogie wagons with cast steel bogie, cartridge tapered roller bearings and air-brake.
BCX	7,785	Water-tight covered wagons for food-grains, cement, etc.
BOX	7,405	High-sided open bogie wagons with side discharge arrangement for transport of coal and other bulk traffic.
BTPN	7,311	Tank wagons for liquid consignments like petrol, naptha, ATF and other petroleum products.
BOBS/BOBX	1,522	Open hopper wagons with bottom discharge arrangement to carry ballast, ores etc.
BLCA/BLCB	4,707	Low platform container flat wagons. Light weight all-welded skeletal design under-frame for an optimum 'tare to payload' ratio. 840 mm wheel diameter, AAR 'E' type central buffer coupler and slack less draw bar system.
BLLA/BLLB	405	Container flat wagons same as BLCA/BLCB, but with a longer platform of 45 ft.
BFKN/BFKI	1,571	BFKNs are CASNUB bogie container flat wagons with air brake, converted from BFKI.
BOY	880	Low-sided open bogie wagons to carry iron ore.

BOXN CR	286	In order to reduce substantially the problem of corrosion, 3 CR12 stainless steel has been used in the manufacture of BOXN CR wagons.
BOXNHA	731	Higher axle load wagon (having tare weight 23.17 t and payload 65.13t) suitable for 22.1 t axle load and 8.25t/m Track Load Density for coal loading. Payload per rake shall increase to 3,783 t as against 3,411 t in the existing BOXN wagon, resulting in 11% increase in throughput per rake. Fit for 100 kmph.
BCCNR	35	Covered bogie wagon for transportation of automobile cars. Low platform with wheel diameter 840 mm and fitted with air brake. Fit for 100 kmph

Repairs and Maintenance:

98 loco sheds and 299 carriage and wagons sick lines and central repair depots attend to the entire fleet of Rolling stock 45 workshops undertake periodic overhaul. There are 2.2 % arrears of periodic overhaul of coaches on BG and 4.1% on MG. For wagons the arrears are 5.9% on BG and 7.3% on MG.

Central Organisation for Modernisation of Workshops (COFMOW):

Central Organisation for Modernisation of Workshops (COFMOW) caters to the modernization of all manufacturing units, repair workshops and maintenance depots of Indian Railways. It provides consultancy and engineering inputs for technology upgradation, productivity improvement, machinery selection and procurement besides training personnel in operation and maintenance of manufacturing infrastructure. Playing a proactive role, it has been instrumental in assisting suppliers in manufacturing special purpose machines for exclusive application by the Railways.

Since its inception in 1979, the organization has assisted in the modernization of Chittaranjan Locomotive Works (CLW), Integral Coach Factory (ICF) and ten other major maintenance workshops, all these projects being financed by loan from the World Bank. The project for

upgradation of manufacturing infrastructure at Rail Coach Factory to cater to the new design of LHB coaches is being supported by COMOW. COFMOW is procuring a large number of state-of-the-art machines with higher productivity. A complete new axle machining line of Rail Wheel Factory (RWF) is being set up by COFMOW for increased production of axles. A second axle machining line for RWF is also under procurement now. A new coil spring manufacturing line for Rail Spring Karkhana is also under process for manufacture of springs. COFMOW has recently installed seven diesel loco simulators and two electric loco simulators and has plans to install additional three electric loco simulators for training drivers for the current requirements as well as for future requirements involving heavy haul freight and high speed passenger trains.

COFMOW has also been nominated as the nodal agency for providing disaster management equipment to all zonal railways. Equipment like oxycutting tools , inflatable air bags, synthetic packing, portable electrical tools, fire fighting equipment with advanced fire fighting technology and inflatable tents are being procured centrally. COFMOW is also the central purchase agency for hydraulic rescue device and hydraulic re-railing equipment.

COFMOW has been assisting IR in:

- Providing industrial engineering inputs to workshops and production units.
- Preparation of technical specification, procurement, delivery and commissioning of machinery and plant.
- Training of personnel in operation and maintenance of machines.
- Preparation of standard workshop layout for overhaul and maintenance of sub-assemblies.
- Development of indigenous suppliers of manufacture of special purpose machines.
- Arranging reconditioning of surface and under floor wheel lathes thereby effecting significant monetary savings.