

## Track and Bridges

IR's route length extends to 63,327 kms. with running track of 85,389 kms. The total trackage including yards, sidings etc. stands at 109,996 kms. The table below shows the size of rail network in comparative terms.

Year	Route kms.		Running track kms.		Total track kms.#	
	Electrified	Total	Electrified	Total	Electrified	Total
1950-51	388	53,596	937	59,315	1,253	77,609
1960-61	748	56,247	1,752	63,602	2,259	83,706
1970-71	3,706	59,790	7,447	71,669	9,586	98,546
1980-81	5,345	61,240	10,474	75,860	13,448	104,480
1990-91	9,968	62,367	18,954	78,607	25,305	108,858
2000-01	14,856	63,028	27,937	81,865	36,950	108,706
2002-03	16,272	63,122	29,974	82,492	39,358	109,221
2003-04	16,776	63,221	30,589	83,859	41,916	108,486
2004-05	17,495	63,465	32,686	84,260	43,364	108,805
2005-06	17,907	63,332	33,540	84,370	44,815	109,808
<b>2006-07</b>	<b>17,786</b>	<b>63,327</b>	<b>33,623</b>	<b>85,389</b>	<b>44,804</b>	<b>109,996</b>

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



*A view of the 3rd Bridge over river Godavari*

### State-wise Route kms:

Following table shows route kms. of Railway lines across various States/Union Territories at the end of 2006-07:

State/Union Territory	Route kms.	State/Union Territory	Route kms.
Andhra Pradesh	5,172	Mizoram	2
Arunachal Pradesh	1	Nagaland	13
Assam	2,284	Orissa	2,247
Bihar	3,411	Punjab	2,134
Chhatisgarh	1,185	Rajasthan	5,911
Delhi	182	Tamil Nadu	4,121
Goa	69	Tripura	64
Gujarat	5,309	Uttarakhand	345
Haryana	1,540	Uttar Pradesh	8,574
Himachal Pradesh	285	West Bengal	3,911
Jammu & Kashmir	138		
Jharkhand	1,941		
Karnataka	3,006		
Kerala	1,050	<b>Union Territory</b>	
Madhya Pradesh	4,884	Chandigarh	16
Maharashtra	5,520	Pondicherry	11
Manipur	1		
		<b>Total</b>	<b>63,327</b>

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

### New Lines:

During the year, 250 kms. of new lines were constructed as indicated below:

Railway	Section	Length (kms.)
East Coast	Keonjhar-Tumka (Daitari)	98
Northern	Kakapore-Budgam of Udhampur-Srinagar-Baramulla	28
North Western	Kolayat-Phalodi (part)	66
South Central	Karimnagar-Jagtiyal	48
Western	Gandhinagar-Kalol	10
	<b>Total</b>	<b>250</b>

### Gauge Conversion:

During 2006-07, a total of 1,082 kms. of track was converted from MG/NG to BG on the following sections:

Railway	Project/Sections	Length (kms.)
Central	Latur-Osmanabad of Miraj-Latur	80
East Coast	Samastipur-Khagaria (part)	54
North Eastern	Farrukhabad-kasganj of Kanpur-kasganj-Mathura	107
Northeast Frontier	New Alipurduar-New Coachbehar of New Jalpaiguri- New Bongaigaon	23
North Western	Ajmer-Chhitturgarh	185
South Central	Kinwat-Mudkhed	117
Southern	Pudukkottai-Karikudi of Trichy-Manamadurai	89
Southern	Salem-Attur of Salem-Cuddalore	56
Southern	Manamadurai-Rameshwaram	111
South Eastern	Sonamukhi-Shera Bazar of BDR line	15
South Western	Basawana Bagewadi-Bagalkot	52
Western	Samakhyali-Gandhidham	53
Western	Beraval-Somnath new line of Rajkot-Veraval	5
Western	Neemuch-Ratlam	135
	<b>Total</b>	<b>1,082</b>

### Doubling:

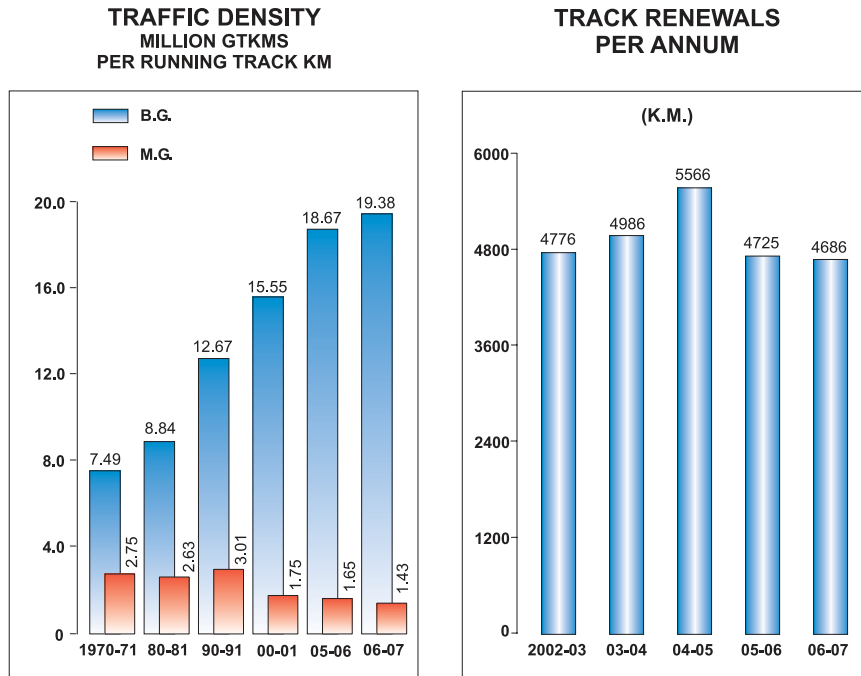
Double/multiple lines totaling 386 kms. were completed in 2006-07.

### Gauge-wise Details:

Broad gauge, though forming 78.7% of the route, generated 99.7% of the freight output (NTKms) and 96.6% of the passenger output (Pkms). Metre gauge comprises 16.8% of the total route.

Route length as on 31.03.2007 on each gauge, indicating double/multiple line, single line and electrified route, is given below:

Gauge	Single line			Double/multiple line			Grand Total
	Electrified	Non-electrified	Total	Electrified	Non-electrified	Total	
Broad (1676 mm)	4,361	28,107	32,468	13,425	3,926	17,351	49,819
Metre (1000 mm)	-	10,607	10,607	-	15	15	10,622
Narrow (762mm/610 mm)	-	2,886	2,886	-	-	-	2,886
<b>Total</b>	<b>4,361</b>	<b>41,600</b>	<b>45,961</b>	<b>13,425</b>	<b>3,941</b>	<b>17,366</b>	<b>63,327</b>



Almost all double/multiple track sections and electrified routes are broad gauge. Metre and narrow gauges are mostly single line and non-electrified. From 1950-51 to 2006-07, traffic density (million GTKms. per running track km.) has increased from 5.24 to 27.63 on BG.

### Track Renewal and Maintenance:

During 2006-07, 4,686 kms. of track renewal was carried out. The year-wise track renewals done during X Plan are as under:

Year	Achievement (in kms.)
2002-03	4,776
2003-04	4,986
2004-05	5,566
2005-06	4,725
<b>2006-07</b>	<b>4,686</b>

During the year, 83,506 kms. of mechanized tamping was completed over the IR network. Also 1,385 kms. of track renewal was

carried out by machines. High output tampers for straight track and Unimats for turnouts are being used for tamping. Similarly, ballast cleaning machines are being used to improve drainage of track. Dynamic track stabilizers and ballast regulators are also being used to improve the retentivity of packing by tampers. Also, T-28 machines are being used for laying concrete sleepers under turnouts. During the year, 1,797 concrete sleeper turnouts were laid with the help of machines. Track Recording Cars (TRC) are being further upgraded by providing contactless sensors. This will add to the reliability of Track Recording Car results at higher speeds. With the help of TRC, 156,058 kms. of track recording was carried out during 2006-07.

### **Track Upgradation:**

Track constitutes the basic infrastructure of a railway system and bears the burden of coping with ever increasing traffic. High speed and heavy axle load operation on IR has necessitated upgradation of the track structure. Several policy initiatives have been taken in order to upgrade the track.

Track structure is upgraded at the time of renewals. Sleepers are being upgraded from wooden, steel and CST-9 to PSC sleepers. Heavier section and high tensile strength rails are being used. Presently 52 kg/60 kg 90 UTS rails are being used in place of 90 R 72 UTS rails. Similarly welded rails are used instead of earlier fish-plated joints. As on 31.03.2007, on the BG track of main lines of IR, about 82% of the length is covered by long welded rails, 90% with PSC sleepers and 79% with 52 kg/60 kg 90UTS rails.

### **Welded Rails:**

On most important routes, rails have been welded into continuous lengths - station to station and smaller lengths of 2 to 3 kms. as well. On other routes, short-welded rails of 39 m. length and single rails are being used. As on 31.03.2007 total length of welded track on IR was 72,697 kms. out of which 56,732 kms. was with long and continuous welded rails and 15,965 kms. was with short-welded rails.

### **Concrete Sleepers:**

Concrete sleepers are economical and technically best suited for high speed and heavy density traffic. Adequate capacity has been

developed for the production of concrete sleepers to meet the present requirement of IR. However, to meet any additional requirement in coming years, a pilot project for setting up new concrete sleeper plants on IR has been adopted. During the year, about 96.26 lakh broad gauge mono-block concrete sleepers were produced. Use of wooden sleepers for main line track has been completely stopped and emphasis is being laid on using more and more concrete sleepers on turnouts. During the year, 6,687 sets of PSC turnout sleepers have also been produced.

### **Bridges:**

IR has 127,768 bridges, out of which 637 are important, 10,453 are major and 116,678 are minor bridges. In 2006-07, 1,114 bridges including 34 distressed bridges were rehabilitated/rebuilt.

### **Safety Works-ROBs/RUBs:**

To improve the safety and reduce inconvenience to road users, busy level crossings are being replaced by road over/under bridges gradually. The works of road over/under bridges in lieu of busy level crossings are sanctioned on cost sharing basis with the concerned State Governments/Local Authorities. During the year, a total of 35 works were completed on zonal Railways.

At present there are total 582 works of ROBs/RUBs sanctioned on cost sharing basis. Besides, there are 117 works on deposit terms, 63 on BOT basis and 121 ROBs of NHAI are under progress.

### **Level Crossings:**

As on March 31, 2007, IR maintained 34,459 level crossings, out of which 16,286 had gate-keepers and 18,173 crossings were unmanned. In 2006-07, 236 unmanned level crossings were provided with gate keepers.

### **Land Management:**

IR owns about 4.31 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:

<b>Activity</b>	<b>Area (in lakh hectares)</b>
i) Track and structures including stations, colonies etc.	3.26
ii) Afforestation	0.45
iii) 'Grow More Food' Scheme	0.06
iv) Commercial licensing	0.03
v) Other uses like pisciculture	0.04
vi) Encroachment	0.02
vii) Vacant land	0.45
<b>Total:</b>	<b>4.31</b>

Creation of various infrastructure facilities for development of future rail network largely depend on the availability of land. Therefore, preservation and meaningful interim use of railway land is the main objective of IR's land-use policy.

Vigorous efforts are made to reduce the encroachments on railway land. Railways have issued a Joint Procedure Order for better coordination among all departments to prevent, detect and remove encroachments.

In pursuance of Railways' commitment towards environmental improvement through afforestation and also with a view to safeguarding the precious railway land against unauthorized occupation, tree plantation is being undertaken on vacant railway land with active participation of Railway employees. In some States, Railway land in mid-sections has been entrusted to the Forest Departments for plantation so as to ensure purposeful utilization and prevention against encroachments . Further, Railways, have also taken up commercial plantation on railway land as a joint venture with private parties wherein the private party grows the plant at their cost and share the revenue earned on maturity with Railways. 10 sites have been taken up so far.

As part of 'National Mission on Jatropha Curcas' ( for producing bio-diesel) IR has taken up plantation of Jatropha Curcas on a large scale. So far over 100 lakh saplings have been planted. Another 72 lakh saplings have been planned in 2007-08. Apart from departmental

effort, plantation of Jatropha has also been taken up under commercial plantation scheme. So far, 6 sites under this scheme have been taken up on North Eastern Railway.

A Memorandum of Understanding (MOU) has been signed by the Railways with M/s. Indian Oil Corporation (IOC) for producing bio-diesel for use by IR. For this purpose, about 180 hectares of railway land on Western Railway has been handed over to IOC on lease basis on a nominal charge for plantation of Jatropha Curcas and plantation has been completed in above 48 hectares. Besides, railway land is also licensed to railway employees belonging to Group C and D under 'Grow More Food' scheme, for growing vegetables, crops, etc.

Licensing of railway land is permitted for the purposes directly connected with railway working. Plots of railway land at stations, goods sheds and sidings are licensed to other parties for stacking/storing of goods either received or to be dispatched by rail. Railway land is also licensed to schools, welfare organizations and for developing shopping complexes in railway colonies for the welfare of railway employees. Apart from this, sharable railway land is licensed to oil companies for setting up retail outlets, and is also leased to Central/State Government, Public Sector Undertakings on long term basis.

Railways have also taken up commercial use of such land, which may not be required by railway for its immediate future use. Railways have also set up a separate authority namely Rail Land Development Authority (RLDA), through an amendment to Railways Act, 1989 to undertake all tasks related to property development on railway land under the control of Ministry of Railways. The RLDA has been constituted on 1<sup>st</sup> November, 2006 and is functional from January, 2007. So far, 108 sites have been entrusted to the Authority for commercial development.