

## Track and Bridges

IR's route length covers 63,332 kms. with running track of 84,370 kms. Total track including yards, sidings etc. stands at 109,808 kms. The table below compares the network at the end of 2005-06 with earlier years:

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
2001-02	15,994	63,140	29,567	82,354	39,030	109,227
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
<b>2005-06</b>	<b>17,907</b>	<b>63,332</b>	<b>33,540</b>	<b>84,370</b>	<b>44,815</b>	<b>109,808</b>

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



*Completed track on a section of Jammu-Udhampur rail line.*

## State-wise Route kms:

Following table shows route kms. of Railway lines in various States/ Union Territories at the end of 2005-06:

State/Union Territory	Route kms.	State/Union Territory	Route kms.
Andhra Pradesh	5,185	Mizoram	2
Arunachal Pradesh	1	Nagaland	13
Assam	2,284	Orissa	2,281
Bihar	3,330	Punjab	2,134
Chhatisgarh	1,186	Rajasthan	5,838
Delhi	205	Tamil Nadu	4,171
Goa	69	Tripura	64
Gujarat	5,283	Uttaranchal	345
Haryana	1,595	Uttar Pradesh	8,546
Himachal Pradesh	285	West Bengal	3,911
Jammu & Kashmir	138		
Jharkhand	1,955		
Karnataka	3,002	<b>Union Territory</b>	
Kerala	1,050	Chandigarh	16
Madhya Pradesh	4,903	Pondicherry	11
Maharashtra	5,528		
Manipur	1	<b>Total</b>	<b>63,332</b>

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

## New Lines:

During the year, 180 kms. of new lines were constructed as indicated below:

Railway	Section	Length (kms.)
Eastern	Banka-Barahat	13
East Central	Sanjauli-Bikramganj	12
Northern	Chandigarh-Morinda	45
North Western	Kolayat-Phalodi (part)	45
South Western	Hassan-Shravanabelagola	42
South East Central	Bishrampur-Ambikapur	23
	<b>Total</b>	<b>180</b>

## Gauge Conversion:

During 2005-06, a total of 744 kms. of track was converted from MG/NG to BG.

## Doubling:

Double/multiple lines totalling 231 kms. were completed in 2005-06.

## Gauge-wise Analysis:

Broad gauge, though forming 76.7% of the route, generated 99.6%

of the freight output (NTKms) and 96% of the passenger output (Pkms). Metre gauge comprises 18.7% of the total route.

Route length as on 31.03.2006 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)	4,452	27,245	31,697	13,320	3,557	16,877	48,574
Metre (1000 mm)	135	11,679	11,814	—	20	20	11,834
Narrow (762mm/610 mm)	—	2,924	2,924	—	—	—	2,924
<b>Total</b>	<b>4,587</b>	<b>41,848</b>	<b>46,435</b>	<b>13,320</b>	<b>3,577</b>	<b>16,897</b>	<b>63,332</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 2005-06, traffic density (million GTKms. per running track km.) has increased from 4.29 to 18.83 on BG.

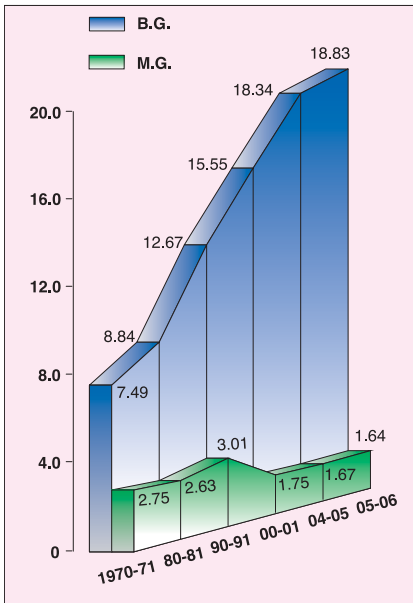
### Track:

A non-lapsable Special Railway Safety Fund (SRSF) amounting to Rs.17,000 crores had been created in the year 2001-02 to liquidate arrears of replacement of assets including track. After creation of this fund track renewal work has got a boost. The year-wise track renewal done and expenditure incurred during the first four years of X Plan are as under:

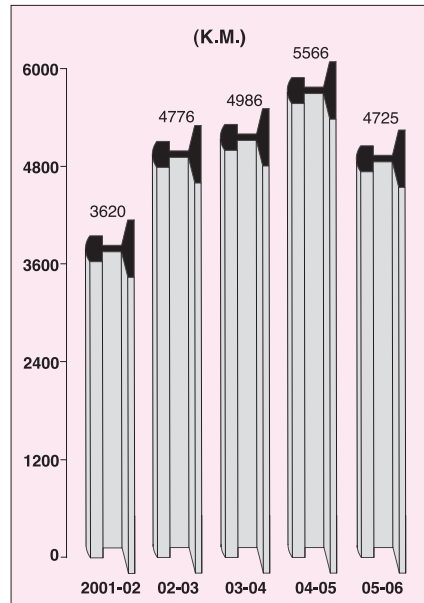
Year	Achievement (in kms.)	Expenditure (Rs.in crores)
2002-03	4,776	3,298
2003-04	4,986	3,484
2004-05	5,566	4,125
<b>2005-06</b>	<b>4,725</b>	<b>3,779</b>

During the year, 75,114 kms. of mechanised tamping was completed over the IR network. Also, 1,134 kms. of track renewal was carried out by machines. High output tampers for straight track and

**TRAFFIC DENSITY**  
MILLION GTKMS  
PER RUNNING TRACK KM



**TRACK RENEWALS**  
PER ANNUM



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, 1,802 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, 155,897 kms. of track recording was carried out during 2005-06.

### Track Upgradation:

Track constitutes the basic infrastructure of a railway system and bears the brunt 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 modernize the track.

Track structure is upgraded at the time of renewals. Sleepers are being upgraded from wooden, steel and CST-9 to PSC sleepers. 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 rail with fish-plate joint. As on 31.03.2006, on the BG track of main lines of IR, about 79% of the length is covered by long welded rails, 87% with PSC sleepers and 75% with 52 kg/60 kg 90UTS rails.

### **Welded Rails:**

On most of the 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 31.03.2006 total length of welded track on IR was 71,686 kms. out of which 54,300 kms. was with long and continuous welded rails and 17,386 kms. was with short-welded rails.

### **Concrete Sleepers:**

Concrete sleepers are most 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, IR has approved setting up of 15 concrete sleeper plants including 2 departmental plants. During the year, about 45 lakh broad gauge PSC line sleepers and 4,900 sets of concrete sleeper turnouts 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.

### **Bridges:**

IR has 1,27,768 bridges, out of which 637 are important, 10,453 are major and 116,678 are minor bridges. In 2005-06, 1,431 bridges including 38 distressed bridges were rehabilitated/rebuilt.

To improve the safety of rail and road users and also to ensure smooth and unobstructed running of trains, the existing busy level crossings having heavy traffic density are being replaced by road over/under bridges in a phased manner. Out of the 452 sanctioned works for constructing road over/under bridges, 21 were completed and



*Construction of Veith bridge (Jammu-Udhampur line) in progress.*

commissioned in 2005-06. In addition, 17 works were completed on deposit terms and 22 under BOT scheme. The remaining works are at different stages of planning and execution.

Close coordination is being maintained with the Ministry of Road Transport and Highways to expedite the works of road over bridges being constructed on National Highways. Monthly meetings at zonal level with the State Government authorities are being held regularly to remove bottlenecks in execution of these works. Substantial headway has been made in this direction.

To ease the State Government's burden of bearing 50% cost of the works as was suggested by the Standing Committee of Parliament for Railways in their 15<sup>th</sup> Report, the Ministry of Railways have initiated a proposal for consideration of the Cabinet to enhance Railways' share of allocation of central road fund. The proposal also provides for exemption of Railways from the levy of cess on consumption of diesel and petrol to facilitate Railways taking up the entire work of road over/

under bridges alongwith the approaches thereof at its own cost instead of depending on the State Governments to share the cost. As per advice of the Cabinet, this issue is being pursued in consultation with concerned Ministries and the Planning Commission.

To ensure safety at unmanned level crossings, a policy decision has been taken to convert unmanned level crossings into limited height subways. General Managers of Zonal Railways have been empowered to sanction works costing upto Rs.50 lakh. This will help to ensure safe and smooth flow of road and rail traffic.

**Level crossings:**

As on March 31, 2006, IR maintained 34,132 level crossings, out of which 16,600 had gate-keepers and 18,297 crossings were unmanned. In 2005-06, 291 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:

Activity	Area (in lakh hectares)
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>

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. 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 own cost and share the revenue earned on maturity. 14 such sites have already been finalized. Besides, Railway land is also licensed to railway employees belonging to group C and D categories under 'Grow More Food' scheme for growing vegetables, crops, etc.

As part of 'National Mission on Jatropha Curcas' (for producing bio-diesel) IR has taken up plantation of Jatropha Curcas on a large scale. During 2005-06, 100 lakh saplings have been planted. Apart from departmental effort, commercial plantation of Jatropha has also been taken up. So far, 3 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 has been identified on Western Railway for leasing to IOC on nominal charges for plantation of Jatropha Curcas. Plantation has been completed in over 48 hectares.