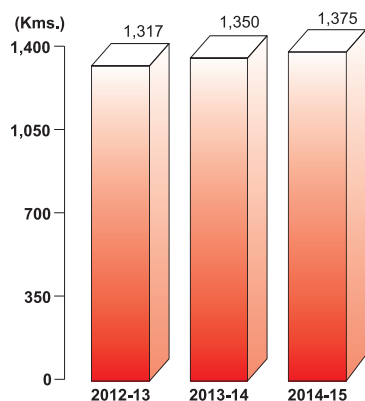


**ANNUAL RAILWAY ELECTRIFICATION
(ROUTE KILOMETRES)**



Railway Electrification

I Executive Summary of Railway Electrification

With a view to reduce the Nation's dependence on imported petroleum based energy and to enhance energy security to the Country, as well as to make the Railway System more eco- friendly and to modernize the system, Indian Railways have been progressively electrifying its rail routes.

In pre-independence period, electrification remained confined to 388 Route kilometers (RKMs) and it is only in the post independence period that further electrification was taken up. While, 1,810 RKMs were electrified during Xth five year plan (2002-07), the progress increased to 4,556 RKMs in the XIth plan, 2007-12 (against the target of 4500 RKMs). In XIIth plan(2012-17), the target has been further enhanced to 6,500 RKMs, out of which, 4,042 RKMs have been electrified in the last three years of XIIth plan i.e. (in 2012-15) as against the proportionate target of 3,900 RKMs. Upto March 2015, 22,224 Route kilometers has been electrified as compared to total electrified RKMs on 31st March, 2014 i.e. 21,614 RKMs. On this electrified route 65.40% of freight traffic & 51.20% of Passenger traffic is hauled with fuel cost on electric traction being merely 36.32% of the total traction fuel cost on Indian Railways.

II Plan Period wise Progress of Railway Electrification

S.No	Plan Period	RKM Electrified
1.	Pre-Independence - 1925-1947	388
2.	1st Five Year Plan - 1951-56	141
3.	2nd Five Year Plan - 1956-61	216
4.	3rd Five Year Plan - 1961-66	1678
5.	Annual Plan - 1966-69	814
6.	4th Five Year Plan - 1969-74	954
7.	5th Five Year Plan - 1974-78	533
8.	Inter Plan - 1978-80	195
9.	6th Five Year Plan - 1980-85	1522
10.	7th Five Year Plan - 1985-90	2812
11.	Inter Plan - 1990-92	1557
12.	8th Five Year Plan - 1992-97	2708
13.	9th Five Year Plan - 1997-02	2484
14.	10th Five Year Plan - 2002-07	1810
15.	11th Five Year Plan - 2007-12	4556
16.	1st year of 12th Five Year Plan	1317
17.	2nd year of 12th Five Year Plan	1350
18.	3rd year of 12th Five Year Plan	1375



Lifting of ROB for OHE underneath by CORE

III Sections Opened for Electric Traction After Inspection by Commissioner of Railway Safety in 2014-2015.

S.No.	Section	Railway	State	RKM
1	Vellore-Villupuram	SR	Tamil Nadu	150
2	Pathankot-Jammu Tawi	NR	Punjab and Jammu & Kashmir	100
3	Barabanki-Gonda	NER	Uttar Pradesh	88
4	Chhapra-Siwan-Thawe	NER	Bihar	88
5	Khurja-Meerut	NR	Uttar Pradesh	84
6	Virudunagar-Vanchi Maniyachchi-Tirunelveli, including Vanchi Maniyachchi-Tuticorin	SR	Tamil Nadu	143
7	Hajipur-Muzaffarpur- Bachhwara	ECR	Bihar	140
8	Kachujor-Sainthia	ER	West Bengal	22
9	Siwan –Bhatni	NER	Bihar and Uttar Pradesh	50
10	Vizianagaram-Garudaballi	ECOR	Odisha	13
11	Mathura-Alwar	NCR	Uttar Pradesh & Rajasthan	123
12	Kanpur Anwarganj-Kalyanpur	NER	Uttar Pradesh	10
13	Shoranur-Kozhikkode (Excluding)	SR	Kerala	84
14	Manmad-Puntamba-Shirdi	CR	Maharashtra	81
15	Total			1,176



Test Charging of DC-AC Conversion, CR

IV Completion of Electrification from Vellore to Villupuram to connect two trunk routes i.e Chennai Beach-Villupuram-Tiruchchirappalli-Madurai-Nagercoil and Chennai - Katpadi – Jolarpettai-Thiruvananthapuram-Nagercoil on electric traction

In the year 2014-15, Railway Electrification of Vellore-Villupuram broad gauge single line section of Southern Railway, covering 150 route kilometers and passing through the State of Tamil Nadu has been completed. This important rail route connects Vellore (Katpadi) on electrified (Chennai-Katpadi – Jolarpettai-Thiruvananthapuram-Nagercoil) trunk route with Villupuram on electrified (Chennai Beach-Villupuram-Tiruchchirappalli-Madurai-Nagercoil) trunk route. This has resulted in seamless flow of electric trains in this section as traction changes/detentions at Katpadi and Villupuram ends is eliminated.

V DC-AC conversion in Mumbai area of Western and Central Railways

Initial electrification in India was on 1500 volt DC which included Mumbai division of Western Railway and Mumbai, Pune divisions of Central Railway. Electrification in Indian Railways started on 1500 volts DC on the sub-urban system of Central Railway with first electric train running on the historic day of 3rd February, 1925. Subsequently, Western Railway was electrified on 1500 volt DC in the year 1928. Electrification



Headquarters Office Building, CORE



AC Jan Shatabdi Chair Car

of Howrah-Bardhaman section was taken up on 3000 volt DC during the first five year plan & the same was completed in 1958. Changing times and a series of events led Indian Railways to switch over to 25000 volt AC electrification; the first section being Raj Kharswan- Dangoaposi of South Eastern Railway in the year 1960. Howrah- Bardhaman of Eastern Railway & Chennai Beach-Tambaram sections of Southern Railway were subsequently converted to 25000 volt AC by the year 1968.

Post independence, the electrification was done on 25000 volt AC, which was a far superior technology, keeping in pace with the changing times. In the year 1996-97, a decision was taken to convert Mumbai division of Western Railway and Mumbai & Pune divisions of Central Railway from 1500 volt DC to 25000 volt AC. The complete section of Western Railway from Virar to Churchgate was converted from 1500 volt DC to 25000 volt AC on the historic date of 5th February, 2012. This has resulted in reduction in cost of operation apart from improving speeds and sectional capacity. This project has also helped to induct more suburban services, augmentation of suburban services from 9 car to 12/15 car services, thereby leading to substantial improvement in commuters' comforts and satisfaction. This has also resulted in reduction in maximum power demand by 20% to 25% for same level of traffic, reduced transmission line losses, improved energy efficiency and reduced energy consumption due to regenerative braking.

On the Central Railway system, which is much larger than the Western Railway system, conversion work of main line portion upto Mumbai Chhatrapati Shivaji Terminus (CSTM) has been completed in June, 2015. The sections, comprising of Vasai-Diva-Jasai, Panvel-Karjat, Pune-Kalyan, Igatpuri-Kalyan, Karjat-Khopoli, Kalyan-Thane.- Lokmanya Tilak Terminus and Thane- Chhatrapati Shivaji Terminus have been opened on 25000 volt AC for public carriage of passengers. Work is in progress for completing the balance portion of harbour & trans harbour lines

VI Major New Electrification Works Sanctioned in 2014-15, under Plan Head-Railway Electrification.

S.N.	Section	Railway	State	RKM
1.	Manpur- Tilaiya - Bakhtiyarpur	ECR	Bihar	132
2.	Chhapra- Ballia -Ghazi pur-Varanasi-Allahabad	NER	Bihar and Uttar Pradesh	330
Total				462