

# INDIAN RAILWAY ELECTRIFICATION DETAILED ANALYSIS

## (1950-1997)

Year	Total Route (Kms.) - Electrified	Total Route (Kms.) - Total	Percentage Route (%) Electrified	Running Track (Kms.) - Electrified	Running Track (Kms.) - Total	Percentage Track (%) Electrified	Total Track* (Kms.) - Electrified	Total Track* (Kms.) -	PercentageT otal Track* (%) Electrified
1950-51	388	53596	0.724	937	59315	1.58	1253	77609	1.615
1960-61	748	56247	1.33	1752	63602	2.755	2258	83706	2.698
1970-71	3706	59790	6.198	7447	71669	10.391	9586	98546	9.727
1980-81	5345	61240	8.728	10474	75860	13.807	13448	104480	12.871
1990-91	9968	62367	15.983	18954	78607	24.112	25305	108858	23.246
1991-92	10653	62458	17.056	20049	78969	25.388	26585	109338	24.315
1992-93	11064	62486	17.706	20819	79200	26.287	27423	109149	25.124
1993-94	11260	62462	18.027	21223	79188	26.801	27898	108920	25.613
1994-95	11772	62660	18.787	21866	79495	27.506	28648	108513	26.401
1995-96	12306	62915	19.56	22684	80441	28.2	29425	108336	27.161
1996-97	13018	62725	20.754	24101	80754	29.845	31583	107360	29.418

MAX	13018	62915	24101	80754	31583	109338
MIN	388	53596	937	59315	1253	77609
AVERAGE	8202.545	60813.3	15482.36	75190.909	20310.182	102255.909

Total Route (Kms.) - Electrified		Total Route (Kms.)		Running Track(Kms.) - Electrified		Total Track (Kms.) - Electrified	
Counter	100	Counter	500	Counter	500	Counter	500
Iterations	100	Iterations	500	Iterations	500	Iterations	500
Average	8202.545	Average	75190.909	Average	15482.364	Average	20310.182
Probabilty Above	1.76	Probabilty Above	0.282	Probabilty Above	0.386	Probabilty Above	0.372
probabilty Below	3.24	probabilty Below	0.718	probabilty Below	0.614	probabilty Below	0.628

Iteration no.	Random_Res
1	5505.552097

Iteration no.	Random_Res
1	69285.12135

Iteration no.	Random_Res
1	6191.74131

Iteration no.	Random_Res
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414 23523.71564  
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416 22870.4045  
417 17072.3265  
418 18929.00206  
419 18476.34286  
420 12106.67161  
421 12933.58301

422	8708.735297	422	75997.94372	422	16440.31417	422	20228.45781
423	4448.598915	423	79829.36024	423	4190.902468	423	21057.95651
424	7465.701933	424	75481.8357	424	10537.75501	424	17380.11359
425	6533.261501	425	74438.51537	425	22605.26088	425	28927.46299
426	7603.747494	426	75158.49618	426	6733.990995	426	15936.7546
427	12369.67696	427	77041.34954	427	14366.15448	427	16118.8335
428	7539.255592	428	68644.10647	428	16677.10745	428	13868.2904
429	3442.07504	429	77378.89093	429	22805.93592	429	27927.19393
430	4148.454979	430	72481.01674	430	20522.26058	430	14355.06074
431	3923.540602	431	71933.87844	431	12541.83676	431	27487.13162
432	7076.577041	432	75884.27949	432	22042.13554	432	4371.759843
433	10184.4027	433	74688.69407	433	13268.52632	433	15428.25667
434	8009.181425	434	67497.84323	434	16908.06175	434	13760.22971
435	7533.327099	435	74184.92645	435	10626.10908	435	17580.69876
436	6511.783072	436	76442.23479	436	2413.393087	436	24223.82677
437	4497.425647	437	71995.94545	437	21372.16964	437	20625.47833
438	10232.48551	438	78245.24636	438	22995.89628	438	26764.76984
439	8218.519988	439	74347.98448	439	13062.08776	439	21533.14981
440	7355.245566	440	76239.55441	440	13841.52638	440	27480.23976
441	10163.48347	441	69951.22116	441	20885.48271	441	21075.19331
442	2542.870599	442	76773.27184	442	11068.17627	442	13404.15197
443	5221.246379	443	76315.57599	443	8647.418309	443	14255.75099
444	5017.863369	444	74223.48799	444	17501.99966	444	20765.97746
445	5025.35108	445	76694.48361	445	10215.15077	445	26103.10165
446	7994.414834	446	73270.76805	446	18190.88327	446	16907.14324
447	7167.481515	447	74341.39557	447	10296.53351	447	28625.26191
448	6909.485653	448	74729.05937	448	15970.77938	448	18265.07975
449	4012.879497	449	74808.15567	449	12481.2971	449	24494.13049
450	10170.09177	450	68701.15996	450	19431.33461	450	13756.26064
451	8862.102086	451	74337.99727	451	18567.6028	451	12079.02068
452	7896.6508	452	75436.85555	452	13153.54074	452	22228.7674
453	7395.785282	453	76388.34266	453	17968.23994	453	20653.49878
454	8875.674481	454	70585.3477	454	12849.37074	454	15365.52866
455	7740.470396	455	75493.00015	455	7086.65072	455	26298.08127
456	6237.480459	456	69465.2832	456	22518.89038	456	16082.01455
457	3840.906663	457	73828.46073	457	10256.72356	457	15999.39903
458	4345.84575	458	69469.90581	458	13156.86024	458	24977.55575
459	9980.106283	459	73960.22967	459	15850.96078	459	19449.80668
460	1883.70244	460	71738.15349	460	20593.08204	460	19128.37317
461	8496.449581	461	75240.73838	461	13691.05168	461	19706.199
462	6378.364562	462	74018.57394	462	6336.321532	462	22443.60357
463	9486.878778	463	72815.8823	463	17304.92388	463	14682.07992

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491 23134.72685  
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493 21553.45808  
494 25035.94976  
495 20881.19092  
496 10795.25522  
497 19022.56912  
498 14974.1251  
499 13483.98292  
500 18400.08272

## Triangular Distribution Random Number Generator

*Lower Range=Mode-Min*

*Higher Range=Max-Mode*

*Total Range=Max-Min*

*Cumulate\_Prob=***RAND()**

*if cumulate\_Prob < (Lower Range/Total Range) then*

*Random\_Res=Min+sqrt(cumulate\_Prob\*Lower Range\*Total Range*

*else*

*Random\_Res=Max-sqrt((1-cumulate\_Prob)\*Higher Range\*Total Range*

### Total Route (Kms.) - Electrified

MIN		MAX	AVG		
388		13018	8202.545		
Lower Range	Higher Range	Total Range	Cumulate_Prob	Random_Res	
7814.545	4815.455	12630	0.58419005	7981.30075	

### Total Route (Kms.)

MIN		MAX	AVG		
53596		62915	60813.273		
Lower Range	Higher Range	Total Range	Cumulate_Prob	Random_Res	
7217.273	2101.727	62915	0.04763961	58247.01529	

### Running Track(Kms.) - Electrified

MIN		MAX	AVG		
937		24101	15482.364		
Lower Range	Higher Range	Total Range	Cumulate_Prob	Random_Res	
14545.364	8618.636	23164	0.720098429	16625.69847	

### Running Track(Kms.) Total

MIN		MAX	AVG		
59315		80754	75190.909		
Lower Range	Higher Range	Total Range	Cumulate_Prob	Random_Res	
15875.909	5563.091	21439	0.072784691	64292.2744	

### Total Track (Kms.) - Electrified

MIN		MAX	AVG		
1253		31583	20310.182		
Lower Range	Higher Range	Total Range	Cumulate_Prob	Random_Res	
19057.182	11272.818	30330	0.534011788	18821.75425	

### Total Track (Kms.)

MIN		MAX	AVG		
77609		109338	102255.909		
Lower Range	Higher Range	Total Range	Cumulate_Prob	Random_Res	
24646.909	7082.091	31729	0.968594649	106681.4942	



