EXECUTIVE SUMMARY
WORKING GROUP REPORT FOR XII PLAN - RAILWAY SECTOR

REVIEW OF ELEVENTH PLAN PERFORMANCE

FREIGHT BUSINESS

Period	Loading (MT)	Growth (%)	NTKM (billion)	Growth (%)
Original Target for Terminal Year 2011-12	1100	8.6%	702	7.8% (CAGR)
Mid Term Review Target for Terminal Year 2011-12	1020	7%	674	7% (CAGR)
Performance in 2007-08	794.21	8.98	511.8	7.7% (YoY)
Performance in 2008-09	833.31	4.92	538.23	5.16% (YoY)
Performance in 2009-10	887.99	6.56	584.76	8.65% (YoY)
Performance in 2010-11	921.5	3.77	605.99	3.63% (YoY)
Target for 2011-12*	993	7.76	658.54	8.67% (YoY)
CAGR for XI Plan Period		**5.75**		**6.51**

*Loading of 970 mT is expected in 2011-12

PASSENGER BUSINESS

Item	Xth Plan Actuals in terminal year 2006-07	XIth Plan targets for terminal year 2011-12	XIth Plan revised targets in mid- term review for terminal year 2011-12	2007-08	2008-09	2009-10	2010-11	2011-12 (Target)
Originating Passengers (Millions)	6219	8400 (CAGR =6.2%)	8200	6524	6971	7384	7831	8272
Passenger KM (Billions)	695	924 (CAGR =5.9%)	1100	770	857	924	1007	1085

INFRASTRUCTURE CAPACITY CREATION

(figures in km)

Item	Xth Plan Achieve-Ment	XIth Plan Original Target	Revised Target for XIth Plan during Mid Term Appraisal	Actual Achieve-ment up to 2010-11	Target for 2011 -12	Likely achieve-ment in the XIth Plan
New Lines	920	2000	2000	1480	1075	2555
Gauge Conversion	4289	10000	6000	4465	1017	5482
Doubling	1300	6000	2500	2006	867	2873
Railway Electrification	1810	3500	4500	3391	1110	4501

ROLLING STOCK PRODUCTION & PROCUREMENT

Item	Xth Plan Achieve-Ment	XIth Plan Original Target	Revised Target for XIth Plan during Mid Term Appraisal	Likely achieve-ment up to 2010-11	Target for 2011 -12	Likely achieve-ment in the XIth Plan
Wagons	36,222	62000	62000	44964	18000	62964
Coaches (including EMU/MEMU/DEMU	12,202	22500	19863	13488	3786	17274
Diesel Loco	622	1800	1019	987	300	1287
Electric Loco	524	1800	1205	945	280	1225

THROW FORWARD OF INFRASTRUCTURE PROJECTS (as on 1.4.2011)

Infrastructure	Number of works in progress	Length in Kms.	Cost in Rs. Crores	Throw Forward 1.4.2011 (Rs Crore)
New Lines	129	14094	100408	72161
Gauge conversion	45	10543	33025	19200
Doubling	166	8496	40733	32889
Electrification	39	4700	4100	
DFC Project	2	3338	81200	79200
Total	381	41171	259466	203450

INVESTMENT AND RESOURCE MOBILIZATION

(Rs in cr)

XI Plan	Approved		2007-08	2008-09	2009-10	Prov. Actual 2010-11	2011-12 (BE)	Total for the XI Plan	Excess/ Shortfall
Gross Budgetary Support	63635	*	8668	10110	17716	19485	21041	77021	13386
	27.3%		*29.9%*	*27.8%*	*44.7%*	*47.9%*	*36.5%*	*37.9%*	*21.0%*
Internal Generation	90000		14948	18941	12196	11528	14219	71832	-18168
	38.6%		*51.6%*	*52.1%*	*30.7%*	*28.3%*	*24.7%*	*35.3%*	*-20.2%*
Extra Budgetary Resources	79654		5364	7284	9760	9680	22370	54458	-25196
	34.1%		*18.5%*	*20.0%*	*24.6%*	*23.8%*	*38.8%*	*26.8%*	*-31.6%*
Total	**233289**		**28980**	**36336**	**39672**	**40693**	**57630**	**203311**	**-29978**
** includes Rs.13,572 cr as additional Budgetary Support for National Projects*									

Investment of Rs 2,33,289 Cr was planned in the XI plan with Rs 63,635 as Gross Budgetary Support, which included railways share from Central Road Fund and Rs 13,572 cr as support for National Projects, Rs 90,000 Cr from Internal Resource component and Rs 79,654 Cr from Extra Budgetary Sources.

The financial achievement of the Plan is short of the target by Rs 29,978 cr (12.9%). The Internal Resource component is short by Rs.18,168 cr (20.1%) and the Extra Budgetary Sources are short by Rs 25,196 cr (31.6%). The Gross Budgetary Support has exceeded the target by Rs 13,386 cr (21%).

The internal resource generation has been impacted due to the increase in salaries and allowances of railway employees and additional outgo due to increase in pension payments with the implementation of the recommendations of VI CPC in the Plan period. Additional outgo on this account is estimated at Rs 73,000 crore.

CHALLENGES FACED IN ELEVENTH PLAN

- To sustain and increase its market share in the face of increasing competition from other modes like Roads & Airlines.
- To improve profitability of the passenger business.
- Expansion of the network and terminals to keep pace with the growing demand of traffic.
- Resource mobilisation and project implementation capabilities to handle the large shelf of sanctioned projects.
- Implementation of major projects like DFC project, new rolling stock manufacturing facilities, world-class stations, etc.
- Innovative financing for socially desirable but economically unviable projects.
- Resource mobilisation and project implementation through PPP mode.
- Technology up-gradation.

OUTLOOK FOR THE TWELFTH PLAN

Planning Commission's Approach Paper to the Twelfth Plan lays down the objective for the Twelfth Plan as faster, more inclusive and sustainable growth. Target range of GDP growth of 9 to 9.5% has been proposed. Agriculture, Industry, Power and Infrastructure would be the key drivers of growth in the Twelfth Plan. Agriculture growth is targeted at 4% against likely achievement of 3% in current plan. Industrial growth in Twelfth Plan period is targeted at 11 to 12% compared to 8% in the current plan. New power capacity addition in the Twelfth Plan is envisaged as 1,00,000 Mega Watt against likely achievement of 50,000 Mega Watt in the Eleventh Plan. Domestic Coal availability would be a constraint and coal imports would increase to 250 MT. Unsettled global economy, volatile commodity prices, inflation and growing skill shortages are some of the key challenges in the short to medium run to sustain high growth whereas in the longer run, the environment and natural resources, particularly energy and water, pose serious challenges.

The above projected aspirations of high economic growth and sharp rise in manufacturing output would need to be enabled by commensurate and timely development of transport and logistics infrastructure in the country. The Approach Paper emphasizes much faster expansion in transport infrastructure than we have seen in the past to support the high GDP growth. It also stresses on the shift from road to rail in freight from energy considerations.

From the national perspective there is a high level of expectation from Indian Railways to not only providing adequate transportation capacity but also to meet the accelerating

demands for high quality services imposed by the vibrant economy. The key areas where Indian Railways need to focus are creation of capacity, modernization of network, improvement in asset utilization and productivity, modernization of rolling stock & maintenance practices and improving the quality of services. Capacity creation focus needs to be especially on creating new capacities on high density corridors and removing bottlenecks on existing network to support higher traffic volumes. Eastern & Western DFCs are major capacity enhancing investments for I.R. and would need to be completed in the Twelfth Plan. The Dedicated Freight Corridors are expected to be commissioned by March 2017. The advantage of the capacity generated by this major infrastructure project shall not be available during the XII plan.

Investment needs to be prioritized in these important areas viz Dedicated Fright Corridors, high capacity rolling stock, last mile rail linkages & port connectivities. Development of logistics parks would also need to be taken up on priority to create matching terminal and handling capacity and facilitate integration of rail with other modes. Enhancing Project execution capabilities would be critical for speedy capacity creation and improving returns on investments.

Along with new capacity addition, improving productivity of existing network and assets would also be crucial to increase transportation output. A study of the Chinese and Russian Railway Systems which are comparable to Indian Railways in terms of network size & characteristics and employee strength, reveals that network productivity of Chinese Railways is more than double of Indian Railways [Total Transportation Output (NTKM + PKM)/Route Km is 52 million in China vis a vis 23.5 million in India] and employee productivity is also nearly higher by 50% [Total Transportation Output (NTKM + PKM)/Route Km is 1.61 million in China vis a vis 1.10 million in India]. The higher productivity on Chinese system is mainly due to higher level of asset utilization and modernization. Indian Railways would need to increase asset utilization by running heavier, longer and faster freight trains to achieve higher levels of productivity.

Enhancing profitability would be essential to generate sufficient Internal Surplus for funding the capacity augmentation and modernization plans. Railway's finances need to be improved to be able to support the capacity augmentation & modernization plans. A much higher Plan size of Rs 7,19,671 Crore would call for a stronger business focus and achieving high revenue growth. Clear Strategies would need to be formulated and executed to identify segments where it can play low cost strategy by playing on volumes, taking advantage of economies of scale & scope and segments where it can play differentiation strategy by providing high quality services and command premium prices. The market driven Dynamic Pricing initiative introduced in the Eleventh Plan needs to be carried forward and institutionalized and made broad based to cover wider customer base. Activity Based Costing would need to be introduced to facilitate managerial decision making for right pricing of services to different customer segments. Rationalization of freight & passenger fares would be crucial to achieve financial viability. For further increasing revenues, Railways would need to look beyond transportation and capture more value in the logistics value chain. Warehousing, Multimodalism, growing containerizable cargo etc. offer excellent opportunities for increasing the top line. Railways would need to think of entering into Businesses other than conventional and develop new required capabilities and form strategic alliances where required to increase its share in the logistics value chain.

The other important source of funding the capacity augmentation where Railways needs to focus is Private Investment. A beginning has been made in this direction by Railways in the Eleventh Plan however there is big potential to achieve. Private investment mobilization in the Eleventh Plan is likely to be to the tune of 4% of Plan Outlay. This is far less compared to the Private Capital share in other sectors like Ports – 80%, Telecom 82%, Electricity 44%, Airports 64% and Roads 16%. PPP Projects relating to rolling stock manufacturing units, modernization of railway stations, multifunctional complexes, logistics parks, private freight terminal, freight train operators, liberalized wagon investment schemes, Dedicate Freight Corridors etc. which are in pipeline offer excellent opportunities for private investment. These need to be speedily executed in the Twelfth Plan.

Thrust areas during the XII plan would be:

i. Achieving growth on freight traffic by running of heavier (higher axle load), speedier (100 kmph) and longer freight trains to maximize utilization of existing track capacity
ii. Quantum jump in rolling stock acquisition to support high growth in traffic
iii. Maximization of revenue through tariff restructuring
iv. Delivery of major capacity enhancement infrastructure projects including Eastern & Western DFCs
v. Accelerated expansion of network
vi. Enhancement of market share by 2% in freight
vii. Modernization of network and rolling stock
viii. Improvement in safety and quality of service
ix. Special focus on last mile rail linkages, port connectivity, development of logistics parks and provision of total logistics solution
x. Identification of actionable projects for PPP implementation
xi. Adoption of New Technologies, Energy efficiency and Green Energy initiatives

FREIGHT TRAFFIC PROJECTIONS

Traffic projections for XII Plan have been developed with GDP growth rate of 9%, correlation of NTKM to GDP varying as 0.84, 1.0 and 1.2 and lead increasing from 663 to 670 km, lead decreasing from 663 km to 660 km and lead constant at 663 km. Though the target of freight loading for the terminal year of XI plan is 993 MT the actual performance is expected to be 970 MT. XII projections have been based on the assumption that freight loading for 2011-12 will be 970 MT.

NTKM in billion, Lead in km

T.Y. of XI Plan		Lead increasing			Lead decreasing			Lead constant		
	NTKM	643	643	643	643	643	643	643	643	643
	Lead	663	663	663	663	663	663	663	663	663
	MT	970	970	970	970	970	970	970	970	970
GDP		9%	9%	9%	9%	9%	9%	9%	9%	9%
Correlation of NTKM to GDP		0.844	1	1.2	0.844	1	1.2	0.844	1	1.2
Growth		7.6%	9%	10.8%	7.6%	9%	10.8%	7.6%	9%	10.8%
2012-13	NTKM	692	701	712	692	701	712	692	701	712

	Lead	665	665	665	665	665	665	663	663	663
	MT	1040	1054	1071	1040	1054	1071	1044	1057	1075
2013-14	NTKM	744	764	789	744	764	789	744	764	789
	Lead	666	666	666	664	664	664	663	663	663
	MT	1118	1147	1185	1121	1151	1189	1123	1152	1191
2014-15	NTKM	801	833	875	801	833	875	801	833	875
	Lead	667	667	667	663	663	663	663	663	663
	MT	1201	1248	1311	1208	1256	1319	1208	1256	1319
2015-16	NTKM	862	908	969	862	908	969	862	908	969
	Lead	668	668	668	661	661	661	663	663	663
	MT	1290	1359	1451	1304	1373	1466	1300	1369	1462
2016-17	NTKM	927	989	1074	927	989	1074	927	989	1074
	Lead	670	670	670	660	660	660	663	663	663
	MT	1384	1477	1603	1405	1499	1627	1399	1492	1620
CAGR (MT)	CAGR	7.4%	8.8%	10.6%	7.7%	9.1%	10.9%	7.6%	9.0%	10.8%
CAGR (NTKM)		7.6%	9.0%	10.8%	7.6%	9.0%	10.8%	107.6%	9.0%	10.80%

The above table shows that with Correlation of NTKM to GDP being at a level of 0.84 and lead increasing to 670 km, the total traffic projections by end of 2016-17 would be at a level of 1384 MT and with Correlation of 1.2 this would be at a level of 1603 MT. With leads constant at 663 km, traffic is varying from 1405 MT to 1627 MT. With lead decreasing to 660 km Kms and correlation of 0.8, the level of traffic by 2016-17 would be 1405 MT. This appears to be more plausible scenario for the sheer fact that even with high growth rates in the economy during the XIth Plan, the correlation of traffic was primarily at a level of 0.8 to 0.9 and lead is likely to reduce more due to dispersion of economic activity as a result of much more even economic growth. This has been considered as scenario I.

If Railways has to increase the freight market share by 2% then figures obtained under Scenario II (decreasing Lead) and Correlation of NTKM to GDP of 1 would have to be achieved. Under this scenario freight loading of 1499 MT would need to be achieved in the terminal year of the Twelfth Plan with a CAGR of 9.1%

Final projections for XII Plan year wise have been prepared for the above two scenarios:

Traffic Projections for Scenario I: No increase in market share

Loading	2012-13	2013-14	2014-15	2015-16	2016-17
MT (million)	1040	1121	1208	1304	1405
CAGR	7.7%				
NTKM (billion)	692	744	801	862	927
CAGR	7.6%				
Lead	665	664	663	661	660

Traffic Projections for Scenario II: 2% increase in market share

Loading	2012-13	2013-14	2014-15	2015-16	2016-17
MT (million)	1054	1151	1256	1373	1499
CAGR	9.1%				
NTKM (billion)	701	764	833	908	989
CAGR	9%				
Lead	665	664	663	661	660

Final Commodity-wise projections (MT) for XIIth Plan for Scenario I

Loading projection for XIIth Plan (million Ton)							
Commodity	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	% Share
Total Coal	451	490	533	580	631	686	48.83%
RMSP except Iron ore	16	16	17	17	18	18	1.28%
Total Iron & Steel	35	39	43	47	52	58	4.13%
Iron ore for export	15	14	12	11	3.93	9	0.64%
Domestic Iron Ore	96	108	120	135	150.95	169	12.03%
Total Iron Ore	111	121	133	146	161	178	12.67%
Cement	108	118	128	139	152	165	11.74%
Foodgrains	49	50	51	53	54	55	3.91%
Fertilizers	48	49	51	52	54	55	3.91%
POL	41	42	42	43	43	44	3.13%
EXIM Container	21	32	36	40	45	50	3.56%
Domestic container	10	11	13	15	17	20	1.42%
Total Container	39	44	49	55	62	70	4.98%
Balance other goods	72	73	74	74	75	76	5.41%
Total	970	1042	1120	1207	1301	1405	100%

Final Commodity-wise projections (MT) for XIIth Plan for Scenario 2

Loading rojection for XIIth Plan (million Ton)							
Commodity	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	% Share
Total Coal	451	492	538	587	641	700	46.7%
RMSP except Iron ore	16	17	17	18	19	20	1.33%
Total Iron & Steel	35	39	44	49	55	61	4.07%
Iron ore for export	15	14	14	13	12.58	12	0.8%
Domestic Iron Ore	96	108	122	137	153.77	173	11.54%
Total Iron Ore	111	122	135	150	166	185	12.34%
Cement	108	123	140	159	180	205	13.68%
Foodgrains	49	50	52	54	55	57	3.8%
Fertilizers	48	49	51	53	54	56	3.74%
POL	41	42	43	43	44	45	3%
EXIM Container	29	34	39	45	52	60	4%
Domestic container	10	12	13	16	18	21	1.4%
Total Container	39	45	52	60	70	81	5.4%
Balance other goods	72	75	78	82	85	89	5.94%
Total	970	1055	1150	1255	1371	1499	100%

Technological measures to be adopted

Proliferation of 25 t axle load running for iron ore - Routes have already been identified on the IR network and planned for upgradation during the XI Plan period itself. Track upgradation of many of these routes has been completed. The only drawback in this has been non-induction of 25t axle load designed wagons. These have to be inducted into the IR system on top most priority**.** Along with this, Feasibility of 30 tonnes axle load running and induction of 30 tonnes axle load wagon has to be planned. Certain routes like the Daitari-Banspani line and the Obulavaripalle – Krishnapatnam new line were earlier planned to cater to 30 tonnes axle load.

Raising the current axle load regime from 22.82 tonnes to 23.5 tonnes - It is observed that 98% of Indian Railways loading comes within a gross weight of wagons being equivalent to 94 tonnes which translates to 23.5 t axle load. The new BOXNHL wagons primarily designed for coal have sufficient volumetric capacities for loading additional 2 tonnes of coal in the existing wagon. Since coal is going to be the major commodity being carried by the Indian Railways during the XII Plan, this measure by itself will generate sufficient capacity to carry traffic during the XII Plan. Necessary track upgradation, if required, may be undertaken.

Proliferation of Long Haul: To save on crew and on paths which would be critical on the IR system during the XII Plan, long haul trains which have been introduced during the XI Plan have not only to be proliferated but the proliferation has to be done with Distributed Power System (DPS) and EOTT so that major savings in crew requirements is made possible. To make the running of long haul trains practical and possible in large numbers, it is necessary that longer loops are planned in each section with at least four station intervals so that precedence/crossing of trains can be planned.

Use of GPS technology and RFID technology for tracking purposes.

Use of EOTT and Distributed Power Systems

The Freight Strategy is to run "**HEAVIER, LONGER, FASTER"** trains

PASSENGER TRAFFIC PROJECTIONS

Originating Passenger Traffic Projection has been made on the basis of average correlation with GDP calculated for the preceding 5 years.

YEAR	GDP Pers-ective	Average 5year Correlation Factor	Rail Growth Factor	Sub Ratio in %	Non Sub Ratio in %	Projected Passengers Originating (in Millions)		
						Sub.	Non-Sub.	Total
2010-11						4069	3815	7885
2011-12						4449	3823	8272
2012-13	9.00%	0.8	7.2	51.25	48.75	4545	4323	8868
2013-14	9.00%	0.8	7.2	51.07	48.93	4855	4651	9506
2014-15	9.00%	0.8	7.2	50.89	49.11	5186	5005	10190
2015-16	9.00%	0.8	7.2	50.71	49.29	5540	5385	10924
2016-17	9.00%	0.8	7.2	50.53	49.47	5917	5793	11711

Projection of Class Wise Non-Suburban Passengers based on GDP correlation, projected growth in economy and %age ratio

(In Millions)

Year	AC Ist	Exec. Class	AC Sleeper	AC 3-tier	First Class Mail	First Class Ordy	AC Chair Car	Sleeper Class Mail	Sleeper Class Ordy	Second Class Mail	Second Class Ordy	Total
2009-10	1.66	0.64	17.37	45.03	1.62	5.47	14.56	249.2	7.22	726.69	2300.94	3370.37
2010-11	1.91	0.68	19.79	52.71	1.66	5.94	16.78	282.54	8.13	821.67	2603.64	3815.43
2011-12	1.91	0.64	19.96	54.56	1.50	5.69	17.11	283.57	8.10	822.33	2607.65	3823.00
2012-13	2.16	0.68	22.71	63.67	1.50	6.15	19.68	321.18	9.12	928.77	2947.41	4323.00
2013-14	2.33	0.68	24.59	70.62	1.41	6.31	21.54	346.12	9.76	998.05	3169.64	4651.00
2013-14	2.50	0.67	26.63	78.27	1.29	6.45	23.57	373.08	10.44	1072.74	3409.39	5005.00
2015-16	2.69	0.66	28.83	86.67	1.15	6.59	25.78	402.06	11.18	1152.81	3666.63	5385.00
2016-17	2.90	0.65	31.21	95.87	0.98	6.70	28.18	433.23	11.96	1238.67	3942.69	5793.00
% Ratio	0.05	0.01	0.55	1.75	0.01	0.1	0.5	7.5	0.2	21.33	68	

Projection of originating PKM on the basis of last 5 year correlation with GDP

YEAR	GDP Pers-Pective	Average Correlation Factor	Rail Growth Factor	Sub Ratio in %	Non Sub Ratio in %	Projected PKMs Originating (in Millions) Sub.	Non-Sub.	Total
2010-11		1.07	9.63			139219	867962	1007181**
2011-12		1.07	9.63			147644	937014	1084658
2012-13	9.00%	1.13	10.17	13.32	86.68	159170	1035798	1194968
2013-14	9.00%	1.13	10.17	12.97	87.07	170223	1146273	1316496
2014-15	9.00%	1.13	10.17	12.54	87.46	181878	1268505	1450384
2015-16	9.00%	1.13	10.17	12.15	87.85	194143	1403744	1597888
2016-17	9.00%	1.13	10.17	11.76	88.24	207022	1553371	1760393

**As per Explanatory memorandum on the Railway Budget for 2011-12

Total Non-Suburban - Passenger Originating (In Millions)

Distance slab-wise Projections

Total Non-Suburban - Passenger Originating (In Millions)				
	≤300 Kms	301<1050 Kms	≥1050 Kms	
1	2	3	4	5
Year	Total of All Classes	Total of All Classes	Total of All Classes	Grand Total
2004-05	1774.97	320.82	104.21	2200
% to Grand Total	80.68	14.58	4.74	100
2005-06	1923.02	357.33	115.65	2396
% to Grand Total	80.26	14.91	4.83	100
2006-07	2175.14	407.83	122.03	2705
% to Grand Total	80.41	15.08	4.51	100
2007-08	2271.8	430.44	132.76	2835
% to Grand Total	80.13	15.18	4.68	100

Total Non-Suburban - Passenger Originating (In Millions)				
	≤300 Kms	301<1050 Kms	≥1050 Kms	
2008-09	2512.78	502.54	102.67	3118
% to Grand Total	80.59	16.12	3.29	100
2009-10	2709.19	544.84	115.97	3370
% to Grand Total	80.39	16.17	3.44	
2010-11	3059.34	618.60	137.05	3815
% to Grand Total	80.19	16.22	3.59	
2011-12	3308.54	672.62	154.84	3823
% to Grand Total	79.99	16.26	3.74	
2012-13	3578.01	731.34	174.65	4323
% to Grand Total	79.80	16.31	3.90	
2013-14	3868.38	794.97	196.65	4651
% to Grand Total	79.60	16.36	4.05	
2014-15	4182.66	864.22	221.12	5005
% to Grand Total	79.40	16.41	4.20	
2015-16	4522.25	939.44	248.31	5385
% to Grand Total	79.20	16.45	4.35	
2016-17 (Projection)	4890.10	1021.35	278.55	5793
% to Grand Total	79	16.5	4.5	100

Measures to upgrade quality of passenger services

Enhancing accommodation in trains: Augmenting the load of existing services with popular timings and on popular routes to 24/26 coaches would help generating additional capacity and availability of additional berths/seats for the travelling public.

Enhancing speed of trains: At present, speed of trains of Mail/Express trains is below 55 kmph. These are low as per international standards**.** Segregation of freight and passenger traffic, enhancing the sectional speeds, and rationalization of stoppages are important measures for speed enhancement.

The speed of especially the passenger trains is quite low at present primarily because of the coaching stock in use and due to multiplicity of stoppages enroute. There is scope for speeding up of these services by replacing trains with conventional stock by fast moving EMUs/MEMUs/DEMUs. Enhancing the sectional speeds is another enabling factor in speeding them.

Introduction of tailored services: The travelling requirement of various sectors and various classes of passengers differ. Between major cities and metros, fast services with very limited stoppages are preferred. Introduction of non-stop services and services with higher accommodation between popular destinations would serve passenger requirement well.

Measures to improve Commutor service:
Due to increase in passenger and freight traffic, the local trains running with conventional stock need to be replaced with DEMU, MEMU and EMU stock as per the requirement to cater to enhanced quantum of traffic and also for faster and smooth operations.

Major strategies to enhance average speed of trains would be:

- Enhancing the sectional speeds.
- Segregation of freight and passenger services.
- Enhancement of production capacity of production units so the replacement of the conventional trains by EMUs/MEMUs/DMUs which have better acceleration/ deceleration is undertaken at a faster pace.
- Rationalization of stoppages.

Strategies for decongesting major passenger terminals:

Terminal congestion has emerged as the single biggest constraint for running of greater number of train services. Major inputs are required for the projected introduction of over 300 trains every year in terms of expansion in the infrastructural facilities like pit-lines, platforms, stabling facilities etc.

To ease out congestion at major terminals, the following needs to be done:

- Development of alternative terminal at sub-urban areas of major cities & such other congested and saturated terminals will have two advantages – one, it will help decongest the concerned terminal from operational point of view and second, it will help handle suburban traffic. This will segregate the sub-urban services from the non sub-urban services around major population centers. The maintenance requirements of the non sub-urban trains can be shifted to these sub-urban hubs which would be equipped with modern facilities. This will permit the passenger terminals within the city to be much more intensively utilized through quicker despatches and dedicated passenger handling only.
- Expeditious operationalization of the Dedicated Freight Corridor will help easing out congestion. Segregation of passenger and freight traffic would have several spin off effect in form of larger number of passenger services, faster passenger services, quicker freight movement, also help decongesting major terminals.

ROAD MAP FOR DEVELOPING HIGH SPEED RAIL CORRIDORS

Ministry of Railways has selected following six corridors for conducting pre-feasibility studies:

(i) Delhi-Chandigarh-Amritsar (450 km approx.)
(ii) Pune-Mumbai-Ahmedabad (650 km approx.)
(iii) Hyderabad-Dornakal-Vijaywada-Chennai (664 km approx.)
(iv) Chennai-Bangalore-Coimbatore-Ernakulam (649 km approx.)
(v) Howrah-Haldia (135 km approx.)
(vi) Delhi -Agra-Lucknow -Varanasi - Patna (991 km approx.)

The viability of each corridor identified for prefeasibility study is being examined by Consultants appointed for study. Efforts are being made to complete all such studies, do at least two Detailed Projects Reports and develop one corridor of about 500 km for construction

Formation of National High Speed Rail Authority

Ministry of Railways has decided to set up a National High Speed Rail Authority (NHSRA), as an autonomous body through a bill in Parliament for implementation of

High Speed Rail Corridor projects of Indian Railways. This authority will be entrusted with the work of planning, standard setting, implementing and monitoring these projects.

PARCEL BUSINESS

Projected Parcel Earnings (based on GDP Growth of 9%)

Year	Projected tonnage		Projected earnings	
	Growth rate in %	Projection (in million tonnes)	Growth rate in %	Projection (Rs. in crore)
2010 - 11 (Actual)	6.57	6.35	12.80	1377.38
2011 - 12	6.57	6.77	12.80	1553.68
2012 - 13	6.57	7.21	12.80	1752.56
2013 - 14	6.57	7.69	12.80	1976.88
2014 - 15	6.57	8.19	12.80	2229.92
2015 - 16	6.57	8.73	12.80	2515.35
2016 - 17	6.94	9.33	12.80	2837.32

Strategy to achieve growth in Parcel Business

Rationalization of Tariff policy: To achieve the above projected earnings there is need to adopt following strategy**:-**

- Evolve a Pricing Policy for parcel tariff. Escalation in freight for parcel traffic should be based on the Whole Sale Price Index and increase in the cost of petrol and diesel.
- Concessional pricing, based on marginal costing principle can be tried out for parcel express trains in empty flow direction.
- Indian Railways carry 'Magazines' parcel traffic at highly subsidized rates. Nowadays the cost of magazines is very high and it is a profitable business. The 'Magazines' are not read by poor class of the society. There is need to withdraw the concessional rates for the transportation of 'Magazines' parcel traffic. The enhance freight can easily be borne by this traffic. 'Newspapers' can continuously be carried at subsidized rates.

Strategy for segregation of passenger and parcel terminals as well as trains

There should be differential pricing for different types of parcel service - As per IR's strategic plan and commitment made to the Parliament; parcel business is to be segregated from the passengers' handling area. Hence, there is need to discourage the customers to avail the service of Parcel Vans through passenger carrying trains. There should be higher pricing for availing the service of Parcel Vans through passenger carrying trains than the pricing of Parcel Vans which are to be attached by Parcel Express train. This will help the Railway to shift the parcel traffic from passenger's trains to exclusive Parcel Express trains.

Action Plan for Capacity Augmentation

- Increase in rake loading
- Introduction of High Capacity Parcel Vans

- Increase rake size of parcel express trains
- Development of dedicated Parcel terminals
- Mechanization of handling
- Provision of end logistics with value added services
- Introduction of premium super fast parcel express service between major production and consumption centers with guaranteed transit and assured supply on the nominated day of loading.
- Computerization of Parcel Management System

Strategies to explore opportunities in White goods and Agri-produce

Perishable cargo Centres under Kisan Vison Project:- With a view to encourage creation of facilities of setting up cold storage and temperature controlled perishable cargo centres through Public Private Partnership mode, six potential locations namely Dankuni, Mechheda, Nasik, New Jalpaiguri, New Azadpur and Singur has been identified for the pilot project to be developed by logistics based PSUs like Container Corporation of India Ltd. (CONCOR), Central Warehousing Corporation Ltd. (CWC). Policy guideline for implementation of pilot project has already been issued on 14.01.2010. Construction work at Singur, Nasik and Newj Jalpaiguri has been completed. Based on the experience gains and response from the public, its expansion will be considered.
Manufacturing of more Refrigerated Vans (VPRs) - With a view to provide total cold-chain for perishable cargo, there will be need to manufacture 20 Refrigerated Vans (VPRs) every year.

TARIFF & PRICES

Tariff Regulatory authority
Planning Commission has recommended for setting up of a Rail Tariff Regulatory Authority to rationalize tariff and to remove distortion in the inter-modal mix of transport and at the same time ensure that the Railways meet the transport requirement at the minimum cost to economy. The Finance Ministry recommended for this Authority on the ground that Railways being a monopoly, need an independent regulatory mechanism for tariff fixation and that the authority will help Railways to improve performance and tighten productivity loss.

Currently, at the national level, such authority is functional in the telecom sector as there are large number of operators. Although road transport segment is entirely in the private sector and there are both private and public operators in the Aviation Sector, there are no regulatory authorities in these segments. Efficiencies and economies in these sectors are being achieved through free market competition.

Extant mechanism of regulation
Under Railways Act, 1989, full powers for fixation of tariff have been vested with the Ministry of Railways. As Indian Railway has a social obligation to provide transport at affordable cost to economically weaker sections of society, it cannot function entirely on commercial lines. Secondly, in both freight and passenger segments, Railways are facing stiff competition from both road as well as aviation sectors, warranting a flexible and competitive policy on pricing. In fact, the tasks of regulatory functions are being exercised in the form of Parliamentary intervention by way of scrutiny by various Parliamentary Committees and through Railway Budget. Moreover, a Regulatory

Authority is generally required when there are more than one service providers so that there is a level playing field between various operators. Tariff Regulatory Authority cannot appreciate/permit the requisite flexibility for the Railways to adjust rates/incentives, keeping in view the stiff competition from the road sector where there is no Regulatory Authority at present.

Ministry of Railways have reservations about the efficacy of the Regulatory Authority in fulfilling the objectives. As the service operator has control over expenditure and cost efficiency, the role of this Authority will be limited to set up tariff fixation parameters without any influence on the cost of operation. Hence, it will not be able to drive the Railways towards achieving a more economic and efficient operation nor will be able to achieve productivity improvements.

Thus, there appears to be no *rationale of* the proposed authority at least under the present organizational structure of the Railways.

Rationalisation of Passenger & Freight Tariff

Rebalancing of tariff by rational indexing of Line Haul cost

Freight structure is periodically examined by independent High Level Expert Committees like Railway Freight Structure Enquiry Committee, 1958; Rail Tariff Enquiry Committee, 1980 and Railway Fare and Freight Committee, 1993.

On freight side, rationalisation in the freight structure was initiated in the Railway Budget 2002-03 and is being continued. There has been a thrust on bringing in transparency, simplification and introducing measures to make rail tariffs competitive and attractive.

As a result of the rationalisation process, the number of classes has been reduced from 59 to 16 and all classes are in percentage relationship with Class-100, which is now the base class covering the fully distributed cost at all distances. The number of commodities has also been reduced from 4000 to 26 commodity groups and a uniform taper has been introduced for all class rates to attract long lead traffic. As a result of the rationalisation process, almost more than 95% of the freight traffic moved by IR are above cost plus and are now fixed between the cost of service and what the commodity can bear keeping inview the competitive pressures. During the plan period, the approach should be to bring up commodities which are presently below the base class, to the base class so as to meet the fully distributed cost. However, keeping in view the market dynamics and competition from other modes of transport, the railways will continue to resort to dynamic pricing as is done now in case of export iron ore traffic, reclassify commodities to thwart competition from other modes like road, pipelines and coastal shipping etc. and provide incentives to attract volumes or as a demand management strategy.

As far as passenger fare structure is concerned, there has been a downward revision of passenger fare since 2002-03 resulting in the index of the passenger fare reducing from 100 to 75-98 in different classes of travel. Presently, there is no linkage between the input costs and passenger fare. As a result of this, the level of cross subsidization has also increased drastically as shown in the table below.

Losses in Passenger services					
2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
6159.41	6022.66	6449.22	7067.67	13901.22	18960.67

In view of the steady upsurge in losses in passenger services, the percentage of cross subsidisation of passenger services by freight earnings has gone up from 20% in 2004-05 to 32% in 2009-10. Unless the trend is arrested by rationally linking passenger fare to input costs, the Railways will be out priced in the freight market sooner than later.

Suitable tariff structure to cover not only cost of operation but also provide for replacement of assets and growth of business

The present system of working out the costs, all the accounted expenses are included, including appropriation to DRF from revenue which covers the replacement of assets, dividend liability as interest and lease charges to IRFC from the revenue. However, as per principles of costing, the capital investments are not cost elements and hence are not covered as input costs.

Rationalisation of fare structure in Suburban sector

Although, Suburban services contribute almost 54% in number of passengers over the IR's total passenger traffic, their earning share is only 7.13% (2009-10). The losses suffered in the segment during 2008-09 and 2009-10 were Rs. 1651.19 Crores and Rs. 2214.06 Crores respectively. At the current level of input costs, rationalization of suburban fares needs an increase of about 129% to match the cost. Needless to say, that this is a mass transport system and the service is extremely price sensitive.

However, in line with the proposed indexation of lower class fares, future escalations in the suburban fare index would be reflected to take care of future escalation. This would reduce the burden of losses in this segment in future.

A suitable costing system to segregate different activities involved in rail transportation to accurately determine cost of providing services for different business segments like freight, passenger, parcel, etc.

The present costing system on Indian Railway operates on fully distributed cost methodology. It provides data regarding marginal costs on estimation rather than actual expenditure. It may not be possible to work out an accurate and satisfactory data regarding cost of hauling a train or wagon, making it difficult to devise a dependable pricing strategy.

The present system is time consuming and provides only indicative costing at macro level and may not be helpful in working out a pricing strategy at the micro level application. The system depends on a number of parameters where, dependence on ad-hoc figures become inevitable and reliability of results becomes the causality.

The project for Accounting Reforms is already underway and it is expected that on implementation, it will be able to plug the costing information gaps. Till the AR project is implemented, pricing will have to depend on the existing costing system.

A customer responsive and market driven Tariff policy

With the process of rationalisation of tariff introduced since 2002-03 a number of anomalies have been removed and the rating structure have become simpler, more transparent and attractive.

Dynamic Pricing Policy was announced in Railway Budget 2006-07, which refers to tariff measures in response to prevailing market conditions for management of seasonal

and regional skew in demand like; Differential rates for Peak/ Non peak season, Incentives in Empty flow directions, Busy/ Non-busy routes and Premium/ Non-premium services, etc.

Considering the buoyancy in the international pricing of iron ore, a distance based charge was introduced; linked to the prevailing international iron ore pricing. Application of the principle ensures that, any volatility in the international pricing of iron ore will have an impact on the freight structure and the Railway will have a due share in the margins of profit available.

In addition to these measures, a slew of Freight Incentive Schemes have been introduced keeping in view the customer requirements viz;

- Incentive Scheme for Loading Bagged Consignments in Open and Flat wagons:
- Incentive Scheme for Traditional Empty Flow Directions:
- Incentive Scheme for Freight Forwarders:
- Incentive Scheme for Incremental Traffic
  These would be carried forward in the XIIth Plan

NETWORK EXPANSION, RAILWAY ELECTRIFICATION AND FIXED INFRASTRUCTURE CREATION

	Physical Target (km)	Outlay Proposed (Rs Crore)
New Line	10000	1,22,300
Eastern & Western Dedicated Freight Corridor	6250	100,460
Gauge Conversion	5000	17,810
Doubling	5344	32,513
Railway Electrification	6500	7,400
MTP		14,324
Traffic Facility		14,232

Upgradation of balance 1575 RKM of Iron Ore route for 25 T Axle Load (5425 kms done in Eleventh Plan).

Upgradation of Feeder Routes of DFC to run 25 T Axle Load.

Upgradation of Speeds of Passenger Trains

- Running of 130/140 kmph trains in Delhi-Jaipur, Delhi-Chandigarh, Delhi-Agra, Howrah-Sitarampur & Howrah-Tata Nagar.
- Upgradation of Delhi-Mumbai & Delhi-Howrah routes to 160 kmph in XIIth Plan to be further upgraded to 200 kmph.

Road Safety: Level Crossings, Road Over/ Under Bridges, Limited Height Subways

There are 14896 unmanned and 17839 manned level crossings on IR as on 01.04.2011. These level crossings contribute to 30% of fatalities in Railway mishap and statistically contribute to about 40% of accidents on IR. Accordingly, Indian Railways Vision – 2020 and Railway Budget Speech documents envisage elimination of all unmanned level crossings by provision of subway, diverting road traffic from unmanned level crossing

gates to existing ROB/RUB and manned gates by constructing diversion road, closure of very low TVU gates, manning of unmanned level crossing gates; up-gradation of infrastructure, provision of interlocking of gates, lifting barrier, etc, in the next five years. Railways also envisage provision of ROB/RUB in lieu of manned level crossings with heavy traffic density (high Train Vehicle Units i.e. above one lakh about 2122 nos. And those level crossings located in station yard/limits about 842 nos.) In addition to ROB, provision of light FOB & subway have been planned in suburban/city area to facilitate passage of 2/3 wheelers, etc. Above works have been planned on Indian Railways to achieve zero accidents at level crossings, minimum detention to road and punctual train operation. Total fund required for Road Safety Works (to be apportioned from Central Road Fund, under CRF Act 2000 by the Planning Commission/ Ministry of Road Transport & Highway to Ministry of Railways) during the 12th Five Year Plan is Rs.16567 Cr.

In addition to this and outlay of Rs 6000 Crore would be required for construction of ROBs/RUBs on DFC route.

Track Renewals

- Renewals due in the beginning of plan – 3500 km
- Renewals expected to become due during plan – 17500 km
- Renewals for replacement of 52 kg rails with 60 kg rails on Group A routes during plan – 1500 km
- Renewals Planned During Plan – 19000 km

New and Renewable Energy Projects

- Wind Mills
- Grid connected Solar Panels at major stations
- Provision of roof top Solar Panels on passenger coaches running in Close Circuits
- Provision of solar Panels, Solar Water heaters, Solar Pumps etc. in Hospitals, Running Rooms, Rest Houses.
- LED based lighting & Display Systems

Setting up of Captive Power Plant for availing power supply on economical tariff

- 2 x 660 MW Thermal Plant at Adra, West Bengal
- 700 MW gas based plant at Thakurli, Maharashtra

Thrust areas in Signalling & Telecomm

- Deploy proven and reliable Onboard Train Protection System.
- Isolation of run through line and provision of complete track circuiting of station section.
- Provision of improved safety systems with Audio-Visual Warnings to road users in advance of approaching trains.
- Computerised real time monitoring of assets and use of conditions based productive maintenance system.
- Increasing Line Capacity through use of suitable technology options viz. Automatic Block Signalling, Intermittent Block Signalling, Automatic Train Control with Cab Signalling, Integrating Train Controlling and Signalling System
- Switch over to systems and equipment of higher reliability and safety levels and built in design redundancy.

ROLLING STOCK REQUIREMENT

Type of Stock	Requirement* on additional account (2012-13 to 2016-17)	Requirement on replacement account ** (2012-13 to 2016-17)	Total requirement (2012-13 to 2016-17)	Anticipated acquisition 2012-2017
Coaches (incl. EMUs, MEMUs and DEMUs)	25440	7626	33066	24000
Diesel Locos	1500	500	2000	2000
Electric Locos	1800	210	2010	2010
Wagons (in VUs)	76396	29263	105659	105659

* Requirement of coaches is projected based on 10% annual growth.
Requirement of wagons is based on growth in freight traffic at 100 MT per annum and assuming a 2 % increase in utilization during XIIth Plan

****** Requirements on replacement account for all rolling stocks are based on actual over age arising and the trend of average condemnation.

Anticipated requirement year wise

Type of Rolling Stock	Year					
	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Coaches	4000	4200	5000	5200	5600	24000
Diesel Loco	325	327	448	450	450	2000
Electric Loco	350	351	404	455	450	2010
Wagons	18659	22197	22020	21043	21740	105659

Planned increase in capacity of PUs is in the XII Plan

DLW - 200 to 300 Diesel Locomotives per year
CLW - 200 to 275 Electric Locomotives per year
ICF - 1500 to 1700 Coaches per year
RCF - 1500 to 1700 Coaches per year
DMW - Assembly of 100 Diesel Locomotives per year including that of Parel/CR

Setting up of Electric Loco Factory at Madhepura & Diesel Factory at Marauhra.

Production programme of Coaches PU wise

Anticipated Production/Acquisition of coaches from PUs/other sources						
	2012-13	2013-14	2014-15	2015-16	2016-17	Total
ICF (Coaches)	1500	1500	1600	1700	1700	8000
RCF/Kapurthala (Coaches)	1600	1600	1600	1600	1700	8100

Anticipated Production/Acquisition of coaches from PUs/other sources						
	2012-13	2013-14	2014-15	2015-16	2016-17	Total
RCF/RBL(Coaches)	60	75	500	500	1000	2135
Kancharapara (EMUs)			100	250	250	600
Haldia (DMUs)	16	64	120	200	200	600
Palghat (Coaches)				100	100	200
Singur (Metro and EMU)				50	50	100
BEML/Others(Coaches & EMUs)	824	961	1080	800	600	4265
Total	4000	4200	5000	5200	5600	24000

Technological Upgradation and Modernisation of Rolling Stock

Wagons

- TOT from USA for track-friendly bogie of higher technology capable of carrying enhanced axle loads of 25 t / 32.5 t while exerting lesser forces on track.
- Design capability for 25 T and 32.5 T axle load wagons with world-class pay to tare ratio.
- Wheel Impact Load Detectors (WILD) alongside tracks.
- Development of indigenous high-capacity CBC for high-speed heavy haul wagons.
- Development of special-purpose wagons for carrying automobile traffic and flyash.

Diesel locos

- CRDI system to be tried out on a small subset of ALCO design diesel locos. This promises fuel saving over the existing design.
- Proliferation of hotel load features on diesel locomotives.
- Proliferation of distributed power system in diesel locos.
- Introduction of REMMLOT for real time monitoring to reduce fuel consumption and expansion of 120 day schedule.
- Production of DEMUs for intercity traffic is being enhanced. It is proposed to turn out AC - AC DEMUs with IGBT based technology from ICF. All future DEMUs are planned to be manufactured with toilet facilities.
- Production of bio-diesel for blending with HSD oil.
- Development of gas turbine locomotive.
- Running of dual fuel DEMUs using HSD and CNG.
- Development of twin cab locomotives in diesel locos to be taken up on priority as it releases extra capacity of one wagon in the loop holding.

Electric locos

- Induction of more new generation, higher horse power, higher productivity, reliability and energy efficiency locos with feature of regenerative braking.
- Modern layout of maintenance sheds, modification of yard layout in sheds, double exit / entry with shunting signals controlled centrally.
- Use of Information Technology and Decision Support System in loco operation & maintenance.
- Large scale switch over from GTO to IGBT technology.

- Provision of Remote Monitoring & Diagnostic feature on all class of locomotives.
- Provision of Wireless MU coupler / Locotrol for electric locos.
- Provision of Hotel load converter on all passenger locos.
- Up gradation of speed potential of electric locos similar to the train operations worldwide.

Coaches/ EMUs

- Complete switch over to new manufacture of only LHB design coaches by the end of XIIth Plan.
- Raise the crash worthy quotient of coaching stock on IR through larger deployment of LHB coaches, and incremental enhancement in ICF coaches.
- Introduction of AC/non-AC trains at speeds more than 130 kmph by induction of LHB design coaches.
- Introduction of automatic under gear and wheel profile measuring/ examination system to improve efficiency of train examination at terminals and pit lines.
- Development and implementation of on-board coach diagnostic systems.
- Induction of more no. of double-decker LHB FIAT AC coaches with high speed and higher carrying capacity for inter-city travel.
- Induction of automatic fire alarm system in coaching trains for early detection of fire. Introduction of automatic fire detection and suppression system for power cars, pantry cars which are more vulnerable to fire accidents.
- Introduction of standard block rake concept for coaching trains.
- Design and development of under slung DG set power car for improved utilization for commercial purposes.
- Introduction of high speed high carrying capacity VPUs on LHB FIAT platform.
- Setting up of mechanized laundries on BOOT model for managing the daily volume of bed rolls with superior wash quality.
- Introduction of new super AC class for improved comfort and features and more exclusivity.
- Introduction of Green toilet technology in coaches.
- With new sections in BG coming on the IR network either due to gauge conversion or due to new lines ,need for branch line operations of passenger trains is increasing. This is best addressed by DEMUs since they are low cost, do not require massive infrastructural investments and they release locos for freight and passenger operations on main line. With a new factory coming up at Haldia which is slated to manufacture upto 400 DEMU coaches per annum priority to be given to large scale proliferation of DEMU services in the North East, North Bihar, Eastern and North Eastern UP, Gujarat, J&K and many other far flung areas of the country.
- Introduction of High speed bogies for Self-propelled coaches (SPART/DEMUs).
- New design of Stainless Steel DEMUs with 3 phase technology.
- Design and development of differently abled friendly coaches and enabling facilities for their travel in AC and non-AC coaches.

EMUs/MEMUs and Kolkata Metro

- Acquisition of light weight EMU/MEMU/Kolkata Metro stock with stainless steel car body and IGBT based 3-phase propulsion system having regenerative features.

- Each major EMU/MEMU shed to have Automatic Car Washing Plant.
- Opening of new MEMU car sheds at Bangaluru, Jhansi/Bina & Nagpur.
- After setting up of new coach factory at KPA for EMUs/MEMUs & Kolkata Metro coaches, new EMU/MEMU depots are also proposed to be set up by the company, land for which is to be provided by Railways. New Rail Coach Factory exclusively for EMUs/MEMUs & Kolkata Metro coaches is being set up under PPP. It is planned to go for comprehensive maintenance contract from OEMs for next 10 years for coaches to be acquired from RCF/KPA in company depots. The tentative location of EMU/MEMU car sheds are as under:

    - Shaktigarh - EMU car shed (ER)
    - Kanpur - MEMU car shed (NCR)
    - Sitarampur - MEMU car shed (ER)
    - Chennai - EMU car shed (SR)
    - Dadri - EMU/MEMUcar shedNCR)

SAFETY

Safety performance

Consequential train accidents have came down from 473 in 2000-01 to 141 in 2010-11 and train accidents per million train kilometres have also came down from 0.65 in 2000-01 to the order of 0.15 in 2010-2011.The trend of consequential train accidents on Indian Railways since 1990-91 is given below.

Consequential Train Accidents on Indian Railways								
Year	Collisions	Derailments	Level Crossing Accdts.	Fire in trains	Misc.	Total	Million Train Kms.	Accidents/ Million Train Kms.
1990-91	41	446	36	9		532	617.1	0.86
1991-92	30	444	47	9		530	629.2	0.84
1992-93	50	141	51	9		524	632.3	0.83
1993-94	50	401	66	3		520	634.2	0.82
1994-95	35	388	73	5		501	641.9	0.78
1995-96	29	296	68	5		398	655.9	0.61
1996-97	26	286	65	4		381	667.1	0.57
1997-98	35	289	66	6		396	675.8	0.58
1998-99	24	300	67	6		397	686.9	0.58
1999-2000	20	329	93	21		463	717.7	0.65
2000-2001	20	350	84	17	2	473	723.8	0.65
2001-2002	30	280	88	9	8	415	756.4	0.55
2002-2003	16	218	96	14	7	351	786.2	0.44
2003-2004	9	202	95	14	5	325	790.8	0.41
2004-2005	13	138	70	10	3	234	810.1	0.29
2005-2006	9	131	75	15	4	234	825.4	0.28
2006-2007	8	96	79	4	8	195	847.8	0.23
2007-2008	8	100	77	5	4	194	890.2	0.22
2008-2009	13	85	69	3	7	177	905.2	0.20
2009-2010	9	80	70	2	4	165	997.2	0.17
2010-2011	5	80	53	2	1	141	(Tentative)	0.15

Above are inclusive of Konkan Railway and Kolkata metro.

Major causes of train accidents which occurred in Indian railways during the last 5 years, i.e. 2006-07 to 2010-2011 are as under:

Causes of Accidents	2006-07	2007-08	2008-09	2009-10	2010-11 (provisional)
Failure of Railway Staff	85	87	76	63	58
Failure of other than Railway Staff	84	81	75	75	58
Failure of equipments	9	9	-	6	2
(a) Rolling Stock					17
(b) Track					1
(c) Electrical					
(d) S&T					
Sabotage	8	7	13	14	17
Combination of factors	1	0	4	1	1
Incidental	7	8	5	4	4
Could not be established	1	2	4	2	1
Under Investigation					
Total	195	194	177	165	141

Ministry of Railways after a thorough analysis of susceptibilities and trends of accidents has already prepared a Corporate Safety Plan (2003-13) in August 2003 which envisages accident prevention and mitigation directed towards continuous reduction in risk level to its Customers. The Plan aims to progressively reduce accidents attributable to human failure and passenger fatalities in accidents. The Corporate Safety Plan states the objectives and strategies for fulfilling the above to which the Indian Railways are committed to achieve by 2013. The Plan also wherever possible encompasses priorities of the identified safety related works and indicates a broad timeframe to complete them along with the assessed approximate requirement of financial investments.

In the absence of commonality of environment it is difficult to lay hands on any world standards for improving safety in train operations. Railways even have different definitions for train accidents. Public perceptions may also vary from country to country.

Based on the major technological and policy initiatives included in Corporate Safety Plan, latest trends, emerging vulnerabilities, new technological developments, recommendations of the accident inquiry reports, etc. a gap analysis has been undertaken to dwell upon the suggested approaches and solutions and assess their relevance to safety in rail operations on Indian Railways to meet some of the best practices observed globally. The paradigm behind most of world class railways also being minimal human dependence, which is best achieved by technological aids together with reliability of assets, it is noted with satisfaction that the Corporate Safety Plan already lays emphasis on certain technological aids, improvement in asset reliability to include renewals & up-gradation of assets, and to move away from fail safe to fail proof concepts using more reliable design and redundancy.

Further, during XIIth Plan period of 2012-17, efforts would be made to expedite balance of the safety related efforts planned in the Corporate Safety Plan of Indian Railways. There are various technological and policy related issues which need to be funded and

capabilities nee d to be developed to deliver them at the functional level. Priority is to be given to solutions which are likely to reduce human dependence both during normal and abnormal conditions in case of failures.

Trends of rail accidents from 2006-07 to 2010-11 amply demonstrate that railway staff failures followed by failure of other than railway staff (mostly road users) still accounts for about 42% and 41% of total accidents respectively. At this juncture, it is worthy highlighting that detailed rules have been prescribed for continuing the train operation during various failure situations increasing human dependence disproportionately to the levels of traffic. These create stressful conditions which are very often the cause behind accidents.

Gap Analysis reveals following vulnerable areas:

- Reception/dispatch during interlocking failures and Signal passing at danger
- Negligence of road users at Level-Xings
- Lack of On-Board Fire detection and Fire Fighting equipment in trains.
- Asset Maintenance-Lack of predictive maintenance of track and signalling
- Infringement to track while undertaking construction activities
- External Threats
- Quality of Training and Skills

Following key areas related to safety need to be addressed and funded during 12th Plan period.

- Development of proven and reliable on-board train protection system by monitoring and executing works of Train protection & Warning System (TPWS) and Anti Collision Device (ACD)/Train Collision Avoidance systems (TCAS). This would minimize human dependence in train operations and enhance the level of safety.
- Provision of improved safety systems with audio visual warning to road users in advance of approaching trains. The system is expected to significantly reduce accidents at level crossing gates.
- For moving towards a fault tolerant zero defect regime, computerized real time monitoring of assets and use of condition based in predictive maintenance systems shall be necessary. This will improve reliability of signalling system and reduce lifecycle cost of maintenance. There will be greater use of these concept to achieve overall corporate objective.
- A complete switchover to system and equipment of higher reliability and level of safety with built-in design redundancy using electronic interlocking, multi section digital axle counters.
- Development of “crashworthy” structural design capable of absorbing high impact loads in unfortunate case of collision/accidents.
- All the furnishing materials in the coaches to have superior fire retardant properties in line with international norms.
- Mobile Communication footprint to be extended substantially as secure mobile communication has significant operational, safety and maintenance benefits. As per the recommendation of RSRC, Board has accepted provision of on Board and mid section communication facilities with a commitment to complete this work on A,B & C routes of IR. Train Radio Communication (MTRC) is proposed for A,B

& C routes in the 12th Plan on 15000RKms. An outlay of 1100 Cr. Is required for providing MTRCV on identified sections of A, B & C routes in 12th Plan (Plan head 33).

- On date, there are 2000 Kms of overhead alignment which is an outdated technology for block and control working. The communication media provided on overhead alignment is noisy and prone to failures. This needs to be replaced at the earliest. It is planned to replace the entire overhead alignment in 12th five year plan at a cost of Rs. 125 Cr.
- Provision of Biometric VCD (Driver's Vigilance Telemetry Control System).
- Provision of Intelligent fire surveillance & Extinguishing system of locos.
- Provision of GPS based Fog safe device

RESOURCE REQUIREMENT AND FINANCING

The plan expenditure of IR is financed through five different sources, namely,

- Capital from General Exchequer;
- Internal Generation of Resources;
- Railway Safety Fund (Railway's share in Central Road Fund); and
- Extra Budgetary Resources including Market Borrowings through IRFC, PPP, States' share etc.

XI Plan (2007-08 to 2011-12)

The investment during the XI Plan is given below:-

(Rs in cr)

XI Plan	Approved		2007-08	2008-09	2009-10	Prov. Actual 2010-11	2011-12 (BE)	Total for the XI Plan	Excess/ Shortfall
Gross Budgetary Support	63635	*	8668	10110	17716	19485	21041	77021	13386
	27.3%		*29.9%*	*27.8%*	*44.7%*	*47.9%*	*36.5%*	*37.9%*	*21.0%*
Internal Generation	90000		14948	18941	12196	11528	14219	71832	-18168
	38.6%		*51.6%*	*52.1%*	*30.7%*	*28.3%*	*24.7%*	*35.3%*	*-20.2%*
Extra Budgetary Resources	79654		5364	7284	9760	9680	22370	54458	-25196
	34.1%		*18.5%*	*20.0%*	*24.6%*	*23.8%*	*38.8%*	*26.8%*	*-31.6%*
Total	**233289**		**28980**	**36336**	**39672**	**40693**	**57630**	**203311**	**-29978**
** includes Rs.13,572 cr as additional Budgetary Support for National Projects*									

The investment in the XI plan was approved for Rs 2,33,289 cr constituting of Rs 63,635 as Gross Budgetary Support, which included railways share from Central Road Fund and Rs 13,572 cr as support for National Projects. The Internal Resource component constituted Rs 90,000 cr and Extra Budgetary Sources Rs 79,654 cr.

The financial achievement of the Plan is short of the target by Rs 29,978 cr (12.9%). The internal resource component is short by Rs.18,168 cr (20.1%) and the Extra Budgetary Sources are short by Rs 25,196 cr (31.6%). However, the Gross Budgetary Support has exceeded the target by Rs 13,386 cr (21%).

With the implementation of the recommendations of VI CPC there has been an adverse impact on the internal resource generation of the Railways due to increase in salaries and allowances of railway employees and additional outgo due to increase in pension payments. It is estimated at an additional outgo of Rs 73,000 crore. The financing pattern of the Railways has progressively shifted towards greater reliance on support from general exchequer and market borrowings during the course of the XI Plan.

The internal resources has decreased from Rs.14,948 cr in 2007-08 to Rs.14,219 cr in 2011-12 (BE), with resultant decrease in its share in the Plan from 51% in 2007-08 to 25 % in 2011-12 (BE). On the other hand, the share of investment in Annual Plan from General Exchequer has increased from 29.9% in 2007-08 to 36.5% in 2011-12 (BE).

The share of budgetary support in the XI Plan has increased to 38 % as against the approved share of 27%. However, the share of internal resources in the overall XI Plan works out to 35% compared to 39%. The share of EBR in the Plan has also decreased from 34% to 27 %.
Thus the trend during the XI Plan has been greater dependence on GBS and market borrowing through IRFC. The expected investment through internal resources and PPP did not materialize resulting in lesser investment in the rail sector.

FINANCING THE XII PLAN

Issues

The XII FYP for IR is being formulated in the perspective of Vision 2020. Some key issues that have to be considered are:-

- Urgent need to modernize, problem of saturated routes, low average speed & payload to tare ratio
- Safety
- An extremely large shelf of projects and new projects still being sanctioned
- Huge committed financial liabilities on assured off-take models, equity requirements and counterpart funding for DFC, ROBs/RUBs, feeder route strengthening, debt servicing of IRFC
- Setting up of North-eastern Region Railway Development Fund
- Growth of earnings not commensurate with increase in expenditure
- Rising Pension liabilities
- PM Rail Vikas Yojna Fund – contours to be decided

The source-wise requirement of funds during the XII Plan period as projected by various sub-groups is as under:-

S.No.	Source	Amount in crore
1.	Gross Budgetary Support	3,54,024
2.	Railway Safety Fund	16,842
3.	Internal Resources	2,01,805
4.	Extra Budgetary Resources	1,47,000
	Total	**7,19,671**

As per the projection for the Plan the requirement under GBS is Rs.3,54,024 cr, under Railway Safety Fund Rs. 16,842 cr, Internal Resources Rs.2,01,805 cr and Extra

Budgetary Resources Rs.1,47,000 cr. Major requirement of funds has been projected under New Lines – Rs.1,22,3000 cr, Rolling Stock – Rs.1,57,818 cr and Investment in PSUs/JVs/SPVs – Rs.1,42,665 cr (out of which Rs 1,06,465 cr is for Western & Eastern DFC being implemented by DFCCIL).

Gross Budgetary Support - Major requirement of GBS is for New Lines, Gauge Conversion, Doubling, Traffic Facilities, Rolling Stock, Workshops incl PUs, Investment in PSUs/JVs/SPVs, Metropolitan Transport Projects and Inventories.

Under Investment in PSUs/JVs/SPVs, the projections include investment in DFCCIL (Rs.96,465 cr as equity and loan and Rs.10,000 as PPP), IRFC (Rs.5181cr), RRT (Rs 1098 cr), Bhartiya Rail Bijlee Co (Rs.150 cr), Adra Thermal Plant (Rs.400 cr), Thakurli Power Plant (Rs.300 cr), Burn Standard Co (Rs.36.5 cr) and Braithwaite Co (Rs.34 cr).

Railway Safety Fund (Rs 16,842 cr) - The transfer from Central Road Fund taken as 'Diesel Cess for Railway Safety Fund' currently stands at around Rs 1,000 cr per year. The requirement of the railways has been projected at Rs 16,842 cr for the plan period. **Therefore the share of railways from the Central Road Fund has to increase to at least Rs 3300 cr per annum.**

Internal Resources (Rs 2,01,8050 cr) - Internal Resources is used to finance Capital Fund, Depreciation Reserve Fund and Development Fund. These funds are required for renewals, replacements, upgradation and modernization of assets and for repayment of principal component of lease charges. It is primarily required for Rolling Stock, Track Renewals, S&T, Other Electrical Works, Amenities for Staff, Passenger Amenities and Other Specified Works.

The requirement under Capital Fund is Rs. 45,525 cr. This is for repayment of capital component of lease charges for rolling stock and for debt servicing for project funding including interest. It has been assumed that Rs.18,000 cr would be raised through market for rolling stock per annum.

The DRF requirement is Rs.1,20,271 cr, with major requirement being under Rolling Stock and Track Renewals.

The requirement under Development Fund is Rs.35109 cr. Major requirement under DF is for Traffic Facilities, Computerisation, S&T, Other Electrical Works, Passenger Amenities and Other Specified Works.

Extra Budgetary Resources (Rs 1,47,000 cr) – The EBR consists of Bonds, Wagon Investment Schemes (WIS), Public-Private Partnership (PPP) and Green Energy Fund, State sharing etc.

Investment from market borrowings through Bonds are utilized for procurement of rolling stock. An amount of Rs 90,000 Crore has been projected in the XII Plan for this.
The PPP initiatives including WIS have been projected to bring in Rs. 57,000 cr into the railway system. Investment through PPP is likely to flow into New Lines, Traffic Facilities, Workshops including PUs, Passenger Amenities and Rolling Stock. In addition, investment from PPP is also projected for DFC, High Speed Rail Project.

Plan Head wise Outlay and sources of funds

(Rs Crore)

	GBS	Internal Resource				EBR				Total
	Capital	Capital Fund	DRF	DF	OLWR	WIS	Bond	PPP	Safety Fund	
New Lines (Construction)	122300									122300
Gauge Conversion	17810									17810
Doubling	32513									32513
Traffic Facilities	4331		50	4709	142			5000		14232
Computerisation	1500		655	4000	187					6342
Railway Research			900	1207	100					2207
Rolling Stock	24989		41277	552		1000	90000			157818
Leased Assets - Cap. Component		45525								45525
Road Safety - Level Crossing									2820	2820
Road Safety - ROB/RUB									14022	14022
Track Renewals			46800							46800
Bridge Works	132		4073	175	6					4385
S & T Works	1338		9534	8217	21					19110
Electrification Projects	7391			9						7400
Other Electrical Works	1500		7500	1764	100			6000		16864
Machinery & Plant	2400		320	225	55					3000
Workshops-inclding P.Us.	4435		2500	750	40			5000		12725
Staff quarters	1166		1823							2989
Amenities for Staff	399		1635	2905	50					4990
Passenger amenities			2750	5985	15			5000		13750
Investment in PSUs/ JVs/SPVs	107665							35000		136665
Other Specified Works	1231		454	4611	184					6480
Inventories (Net)	8600									8600
MTP	14324									14324
Gross Outlay	354024	45525	120271	35109	900	1000	90000	56000	16842	719671
	354024				**201805**			**147000**	**16842**	**719671**

Generation of Internal Resources

The generation of internal resources for plan investment in the Railways depends on traffic earnings, expenditure on maintenance and operations, pension liabilities, dividend payment to general exchequer etc. The internal resource generation for base case scenario of 1405 MT loading in terminal year of XIIth Plan is given below.

Earnings

The passenger earnings have been projected based on originating passenger and PKM projections made in chapter 4 on the basis of average correlation with GDP in the last 5 years. These are lower than those envisaged in Vision 2020.

The assumptions for passenger earnings are –

- Passenger growth has been assessed at 7 %, with growth in suburban segment being 5.8% and in non-suburban 5.3%.
- PKM growth has been pegged at 8% with the derived yield per PKM having a CAGR of 3.1%.
- The lead has been derived at 33 km for suburban and 234 km for non-suburban and kept constant for the Plan period.
- Passenger earning in the terminal year has been projected at Rs.49,010 cr giving a CAGR of 11.3% over actual of 2011-12.

The assumptions for freight traffic are –

- Terminal year loading of 1,405 mT with a CAGR of 7.7 %.
- Terminal year incremental loading of101 mT.
- The lead is expected to decrease from 665 km in 2012-13 to 660 km in 2016-17.
- NTKM with the above graded lead is expected to have a CAGR of 7.6%.
- Earnings to increase to Rs.1,10,989 cr in 2016-17 with a CAGR of 9.9% over 2010-11.
- YPMT to increase from Rs.72.86 cr in 2012-13 to Rs. 79 cr in 2016-17.
- Yield per NTKM of 109.56 paise to increase to 119.69 paise in 2016-17 with a CAGR of 2.4%.

In other coaching, parcel traffic is assumed to grow at 12.8% and the other traffic at 10% per anum. This gives a CAGR of 11.6% over 2010-11.

Growth rate of 10% has been projected for sundries.

Miscellaneous receipts, for which the major component is subsidy received from MOF, are assumed to grow at 15%. The total receipts have been pegged at Rs.1,82,052 cr entailing a CAGR of 17.9% over 2010-11 mainly because of increase in subsidy.

Expenditure

Ordinary Working Expenses – Consists of Staff Costs, Stores, Contractual Payments, Fuel for traction, Lease charges etc. It is assumed to have a CAGR of 11%, based on the following assumptions –

Staff Cost - CAGR of 10.6% with following parameters:-

Fresh recruitment of additional net one lakh employees by 2012-13. This would result in an additional expenditure of Rs.2400 cr per annum.

- Annual increase of 3% per annum in salaries & allowances
- DA to increase by 14% every year
- With DA crossing 100%, another increase of 25% increase would have to be provided for certain allowances

Fuel for traction purposes

- It has been assumed that there would be an increase in consumption by 7% per annum to cater to growth of freight & passengers
- Annual hike of Rs 3/- per litre in HSD oil has been factored in
- Based on past trends, an annual additional provision of Rs 100 cr has been provided for increase in electricity tariffs
- The above factors will lead to increase in traction expenditure with a CAGR of 11%

Materials

A 15% financial increase every year to cater to activity increase of 7% and inflation of 8%.

Lease Charges

Interest component have been projected to grow with a CAGR of 9.3% based on assumed market borrowing of Rs.18,000 cr per year.

Other Costs

Contractual payments etc have been provided an increase of 15% every year based on an activity increase of 7% and inflation of 8%

Miscellaneous Expenditure: The expenditure under Demand 1 & 2 consisting of Railway Board, RDSO, RRBs, Centralized Training Institutes, RCTs etc. have been provided a CAGR of 11%.

Appropriation to Pension Fund: To cater to increase in number of pensioners and annual DA increases an annual growth of 8% as been assumed.

Dividend: The dividend payout has been based on Budgetary Support of Rs 3.5 lakh crore in the XIIth plan.

Principal Component of Lease charges have been projected based on market borrowing of Rs. 18,000 cr per annum for rolling stock at a borrowing rate of 8.5%

Therefore with Receipts of Rs 7,36,278 cr and Expenditure of Rs 6,99,838 cr the internal resource available during the plan period is only Rs 36,440 cr which is highly inadequate compared to the requirement of Rs 2,01,805 cr i.e. a gap of Rs 1,65,365 cr.

Internal generation for this base case scenario is given below:

Rs Cr

	Approved for XI Plan	Actual XI Plan (with B.E., 2011-12)	PROJECTIONS FOR XII PLAN						
			2012-13	2013-14	2014-15	2015-16	2016-17	CAGR over 2010-11	Total XII PLAN
Receipts									
Traffic Receipts									
a. Passenger		121512	32562	36400	40712	45525	50903	12.0%	206102
b. Other Coaching		11380	3076	3432	3830	4275	4773	11.6%	19386
c. Goods [Loading at 1405 mt. in 2016-17]		290835	75772	83210	91487	100727	110989	9.9%	462185
d. Sundry		15424	4136	4550	5005	5506	6057	10.0%	25254
e. Clearance from Outstanding dues		170	50	50	50	50	50	0.0%	250
1.Gross Traffic Receipts		439320	115596	127642	141084	156083	172772	10.6%	713177
2. Miscellaneous Receipts		10919	3307	4277	4582	5171	5764	17.9%	23101
A. Total Receipts		450239	118903	131919	145666	161254	178536	10.8%	736278
Expenditure									
1. Ord. Working Expenses		302982	86504	95523	105827	116319	127664	11.0%	531837
2. Miscellaneous Expenditure		3534	1055	1171	1300	1443	1602	11.7%	6571
4. Appropriation to Pension Fund		65007	18144	19596	21164	22857	24686	7.7%	106447
5. Dividend (Budgetary Support Rs.3.5 lakh cr.)		26840	7858	10219	10913	12302	13691	18.5%	54983
B. Total Expenditure		398364	113561	126509	139204	152921	167643	11.0%	699838
C. Internal Generation (A-B)	90000	51875	5342	5410	6462	8333	10893	26.3%	36440
Capital portion of IRFC Lease Charges *		16392	7504	8462	9095	9801	10663	19.4%	45525
Net Internal Generation (after Lease Payment)	90000	35483	-2162	-3052	-2633	-1468	230		-9085

*Based on borrowing Rs 18,000 Crore per annum for Rolling Stock

In order to bridge the gap, some measures that can be considered are:-

(Rs in cr)

1	Indexing fare & freight with fuel, inflation	25,000
2	Dividend relief of 1%	6,000**
3	SRSF II	55,000
4	Operating losses (uneconomic)	7,100
5	Land & Advertisement	20,000
6	Market oriented fares	20,000
7	Fuel Efficiency surcharge	10,000
8	No addition of 1 lakh to staff strength	14,000
	Total	**1,57,100**
** if reduced to 3% as per rly's request, it will go up to Rs 12,000 cr		

This still leaves an uncovered gap of Rs 8,265 cr.

Summary of Alternative Financing Scenarios

Freight earnings in Scenario I (Base Case Scenario) explained above is based on a loading of 1,405 mT by the terminal year of the XII Plan with YPMT increasing gradually in the range of Rs.72.86 cr in 2012-13 to Rs 79 cr in the terminal year from the present Rs 69.10 cr in the budget of 2011-12. Details assumptions for this alternative have been given above.

Scenario II is based on freight loading of 1499 mT in2016-17 with an aim to increase market share of Railways by 2%. This provides an additional resource of Rs 19,638 cr over the base case.

Considering the enormity of the resources required for plan investment in rail infrastructure in the XII Five Year Plan, the options suggested meeting the gap in available and required internal resources, will have to be pursued with great vigour. The quantum of GBS projected means an annual budgetary support of **Rs 60,000 crore on an average. Considering the current year's GBS of only Rs 20,000 cr, this seems a difficult proposition unless government's priorities take a paradigm shift in favour of the rail infrastructure.** Similarly, resources expected to be raised through EBR depend heavily on IRFC borrowing and PPP. While debt servicing cost are already touching a very high level and IR finding it difficult to sustain these borrowing, the decision to increase market borrowings will require careful consideration. The past record of IR in raising resources through PPP is not very encouraging and an optimistic scenario of plan investment through this route presupposes putting in place marketable policies that appeal to the private sector.

PUBLIC PRIVATE PARTNERSHIP

Planning Commission envisages that to sustain the GDP growth at 9% or more per annum, investment in infrastructure as percentage of GDP needs to go up from the level of 8.37% in the terminal year of the 11th Five Year Plan to around 10%. As this rate, total investment in infrastructure would be of the order of Rs. 41 lakh crore. Private investment accounted for 25% of the total investment in the 10th Plan and is likely to contribute to

36% in the 11th Five Year Plan. According to Planning Commission's assessment, this would have to go to 50% in the 12th Five Year Plan to meet the investment target.

During the 11th Five Year Plan, major infrastructure sectors like electricity, telecommunication, roads, ports and airports have increasingly relied on private investment - share of private investment in these sectors being: electricity (44%), telecom (82%), roads (16%), ports (80%), airports (64%). In contrast, share of private investment in railways has been negligible (4%).

The infrastructure deficit in the railways is huge. A massive investment would, therefore, be required in the 12th Five Year Plan. In the 11th Five Year Plan, a total investment of Rs.2,02,933 crore is being funded through internal generation (36%), extra budgetary resources (27%) and budgetary support (37%). Internal generation will be limited by capacity constraints and debt-servicing obligations in the short-run. Similarly, availability of gross budgetary support would be constrained by Government's resources and competing needs. PPP has to be assigned a larger role in the 12th Five Year Plan.

However, the implementation of PPP projects in Railways has been beset with a number of problems. Some of these are:-

(a) Generally, milestones and time-lines are either not set up or not considered sacrosanct. Execution is the responsibility of directorates.
(b) There is no proper mechanism for monitoring or course correction.
(c) Lack of credible organization and accountability for delivery of PPP projects.
(d) In several cases we have gone ahead with bidding process i.e. pre-qualification and financial bid without an approved set of documents and the process got held up subsequently.
(e) Lack of understanding of PPP issues.

As a result, Railway's PPP initiatives have either not got off the ground or not yielded the desired results. The following examples would illustrate the point:

(a) A number of freight marketing schemes have been launched – Private Freight Terminal policy, Special Freight Train Operation, Automobile and Ancillary Hub Policy, Automobile Freight Train Operation Policy, Liberalized Wagon Investment Scheme. The general perception is that most of the schemes are overly loaded in favour of railways. As a result, they have not led to the kind of investment we had expected.
(b)
(c) Seven port connectivity SPVs (initial two by Railways and the rest through RVNL) have been implemented (or under implementation) in the SPV model. A private line was also facilitated between Adipur and Mundra. Following the success of the model, a number of other proposals came up subsequently but were not permitted. Instead, an exercise for formulating a new R3i policy was initiated. For the last three years, no progress whatsoever has been made.
(d) Since 2006, through a series of announcements in the course of budget speeches or elsewhere by Minister of Railways, 50 stations were identified for redevelopment into world-class stations. Some of the best architects and consultants were appointed for New Delhi, Patna and Mumbai (Carnac bunder) stations. In New Delhi and Patna, issues have cropped up in respect of managing the architects and concerns of the local authorities. In Mumbai, the master plan prepared by the architect has not yet been approved by the Railways or the local authorities. For other stations, consultants have not been appointed. A Standard

and Specification document has been prepared but the equally important Model Concession Agreement has not been finalized. No discernible or tangible result has been achieved.

(e) A technical consultant was appointed in the year 2008 to carry out the feasibility study for Elevated Rail Corridor between Churchgate and Virar in Mumbai. The report has been received. For last two years, the issue of alignment between Mahalaxmi and Churchgate remains unresolved. It needs to be finalized in discussion with the State Government. No further work on the project has been taken up.

(f) Setting up of electric locomotive manufacturing factory at Madhepura and diesel locomotive factory at Marhowra has had a chequered history. These projects have witnessed policy flip-flops between production units, JVs with assured off-take, back to PUs and again to JVs with assured off-take. The pre-qualification process has been completed. However, some of the basic terms of the Procurement-cum-Maintenance Agreement are yet to be finalized. As a result, the RFP or financial bid process has got stalled. Projects which were intended to be similarly structured e.g. Kancharapara coach manufacturing unit and Dankuni ancillary unit of CLW has also suffered delays on this ground.

(g) Setting up of six packaged drinking water bottling plants was announced in MR's budget speech or the year 2010-11. Till now, the business model has not been finalized and the prequalification process which was initiated in the month of March, 2011 has not been completed.

(h) Potentially, high speed corridors are very good potential PPP projects. However, only one pre-feasibility study has so far been completed (Pune-Mumbai-Ahmedabad) and another has been awarded (Delhi-Agra-Lucknow-Patna). No tangible work for development of the project through PPP project has been undertaken.

To execute PPP projects successfully, the following structure to be adopted:

(a) A multi-disciplinary PPP Cell to be entrusted with implementation of PPP projects.

(b) At the Zonal or field-level an adequate organization manned with competent officers to work with consultants and manage the bid process under the guidance of Railway Board needs to be constituted. The officers should be exclusively devoted to the projects and judged on the basis of the success of implementation.

(c) All the directorates involved in or handling PPP project to earmark an officer for this purpose.

(d) The decision-making process for PPP project should be streamlined. An empowered committee of the Board may consider the issues before the decision is taken by the competent authority.

(e) PPP Cell to spearhead the PPP projects as well as the policy initiatives meant to attract private investment.

(f) Officers handling PPP projects at the Zonal Railways or Board to be provided exposure and training to acquire and have basic skills and tools to manage PPP projects.

(g) All the project documents should be got ready by an inter-disciplinary team of officers with the help of consultants before the bidding process is initiated. Standardization of projects. PPP Cell would be responsible for preparation of all PPP related project documents.

(h) Project-wise milestones and targets to be set up and monitored.

Projects and investments envisaged in the XIIth Five Year Plan:

S.No.	Project	Investment expected (Rs Crore)	Value of projects to be awarded (Rs Crore)
1.	High speed corridor-Mumbai-Ahmedabad.	20,000	60,000
2.	Elevated Rail corridor in Mumbai suburban.	-	20,000
3.	Redevelopment of stations.	5,000	10,000
4.	Private freight terminals, leasing of wagons and other freight-marketing schemes.	5,000	5,000
5.	Port connectivity and SPV.	5,000	5,000
6.	Dedicated freight corridors.	10,000	10,000
	Other Projects*		
7.	Loco and coach manufacturing units.	5,000	6,000
8.	(a) Renewable energy projects (solar, wind, etc.) (b) Energy saving projects. (c) Captive power generation.	1,000 1,000 4,000	1,000 1,000 4,000
	Total	**56,000**	**1,22,000**

* These projects are not strictly investment in railway infrastructure. These have been taken into account as these are in addition to and in lieu of Railway investment.

HUMAN RESOURCE MANAGEMENT

HR management would be critical to achieving the challenging goals set for Indian in the XII Plan. The foremost challenge for HR would be to create a system in which good performance is rewarded and protected from hindsight based witch-hunting and non-performance is penalized and not tolerated. This would require that personnel at all levels are recruited and trained with a view to building skills and attitudes required for attainment of the organizational goals.

The first step towards this end would be to compile an inventory of skills required at various levels to transform IR into a smart organization through a constant process of technological upgradation and stress on customer – focused growth. IR would work closely with academic institutions to devise and impart specialized courses, curricula and diplomas to impart these skills. This would help create a large pool of eligible candidates available for recruitment. Induction of unskilled staff would be reduced and eventually eliminated altogether. The recruitment process would be supplemented by well researched and meticulously developed induction and in service training to constantly upgrade the skills of employees.

Rationalization of multiple services and cadres would be attempted to bring unity and coherence in the organization without sacrificing the benefit of specialization and business oriented capabilities in project execution, procurement, operations, maintenance and marketing etc. While the recruitment process through UPSC may continue to provide the core cadre of railway officers in the medium term, for specialist functions, recruitment

from highly qualified PhDs from IIMs/IITs and lateral recruitment from the market for jobs in R&D, marketing and finance, HR could be thought of.
A system of reward for collective performance and variable pay linked to incremental surplus generated by various units of the organization would be implemented to incentivize superior performance.

Organizational Reforms
Organizational reforms that achieve the results without distracting the organization and its energy from the pressing tasks would be best suited for I.R. Following reforms would be pursued:

Separation of policy making and operational responsibilities at the Railway Board level Railway Board would concern itself with strategic planning, policy making and the usual functions of a government Ministry and not with day- to- day operations. It should function as much like a board of a company as is possible. Day- to- day operations monitoring and decision making could be delegated to a separate executive body with power of oversight over the Zonal Railways and project organizations. The Railway Board would, however, continue to undertake periodic review of performance to ensure that the strategic plans and the policies are implemented. It will hold special quarterly meetings where fixed number of nominated external experts having expertise in technical, managerial and financial and economic fields would be invited as special invitees. This would help Railway Board in getting fresh thinking on strategic issues.

Hiving off of non-transportation tasks – The entire range of activities falling outside the core transportation operations such as manufacturing of rolling stock, parcels, management of major stations and staff colonies etc, would be critically reviewed from the perspective of either retention or out sourcing/hiving off on the basis of organic integration with operational need and the logic of "make or buy". These activities can be classified into two categories: one group consisting of activities that are required for transport but can be done by another agency more efficiently (e.g. cleaning of coaches, provision of linen in trains etc.) and at lesser cost; and the other consisting of major activities that are related to transport but not strictly a part of transport activities (e.g. manufacturing facilities for locomotives, coaches, wagons and provision of health care). Outsourcing would be a solution for the former and corporatization and gradual, partial disinvestment could be a solution for the latter. Parcel management would be an ideal candidate for corporatization. Going ahead, other activities could also be considered. In several railways, as for example, Chinese Railways and Japanese Railways, corporatization of manufacturing units, transportation of special cargo (container, special freight and parcel), and management of stations has been successfully implemented to facilitate quick upgradation of technology, independent R&D and sharpen focus on upgradation of passenger facilities and revenue generation.

Reorganization on business lines - Freight transportation, inter-city and suburban passenger transportation, parcel and miscellaneous activities will be organized as separate profit-centres. IR should concentrate on providing cost-efficient solutions in each activity by doing its part efficiently and taking the assistance of private partners or special created SPVs for other activities such as development and management of terminals, marketing, road bridging etc. In the suburban passenger transport, the attempt should be to achieve physical separation of the long-distance network for the suburban network. Modern accounting practices would ensure that infrastructure and rolling-stock resources used by

these lines of business can be properly costed and charged for. Railway Board at top level will also reflect this re-organization.

Empowerment of Zonal Railways - GMs of Zonal Railways could be empowered to take decisions that could enhance the revenue, reduce costs or build platforms for higher growth in future. For example, if a freight bye- pass or traffic facility work or a signaling change can increase capacity or remove a bottleneck, GMs could have the power to take such decisions without reference to Railway Board within a framework of rules and investment limits. The present system of seeking sanction for investment to be included in the Works and Rolling Stock Programmes irrespective of the size of investment should give way to a more decentralized decision- making at the zonal level. Simultaneously, the Zonal Railways would be made accountable for return on capital, transport output, profitability and safety. An enabling framework can be created to stimulate internal competition among Zonal Railways with incentives and bonuses for high performers.

Accounting Reform- The accounting system would be revamped so that separation between the cost of infrastructure services and the operational activities and rational pricing is achieved and train-wise, route-wise profitability analysis is available. This would help assess the usage charge of infrastructure and rolling-stock resources and also in accurate allocation of overheads. This would help in computation of the cost of operation of trains and services and appraisal of profitability of various business lines. This would also provide an important input for determination of tariff, recovery of O&M cost from SPV/PPP projects, where applicable and financial computation of the social service obligations and subsidies.

Regulatory Structure – Under the provision of Railway Act, 1989, fixation of freight and fares is the prerogative of Ministry of Railways. Railway Rates Tribunal (RRT) can be approached for relief in respect of freight tariff only. The scope of Railway Rates Tribunal can be expanded to cover passenger fares and parcel tariff also. RRT at present has only one bench at Chennai. Regional benches of RRT need to be set up.

At present, Sections 30-32 of the Railway Act empower the Central Government to fix the tariff and Sections 33-48 of Railway Act deal with Railway Rates Tribunal, an Appellate Authority for disputes relating to tariff. Passenger fares are outside the jurisdiction of tribunal. With entry of multiple players through the PPP route, dispute resolution would assume urgency. The role of Ministry of Railways as licensor, regulator and a key player may not be conducive for attracting sizeable private investment into railways. An independent regulatory authority to fix tariff and deal with matters relating to tariff affecting PPP players would be needed. A Dispute Settlement Tribunal for PPP contracts of MoR would also greatly help in imparting credibility and predictability to the process. Appropriate changes in the Railway Act would need to be enacted to bring this about. This in turn would help in expansion of the PPP programme of Railways.

At present, Sections 11-20 of Railway Act deal largely with issues relating to construction of a railway line from the standpoint of a Government Railway and Section 70 prohibits undue preference as a public carrier. Appropriate changes need to be made in these Sections of Railway Act to enable construction and operation of non-government railways and its supervision/regulation by Ministry of Railways.

Business process re-engineering - The decision-making process will be streamlined to bring about accountability, result-orientation and responsiveness at all levels. IT tools will be harnessed towards this end.

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