INDIAN RAILWAYS
VISION 2020

सत्यमेव जयते

Government of India
Ministry of Railways
(Railway Board)
December, 2009

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STATEMENT BY MINISTER OF RAILWAYS ON VISION 2020

In the month of July 2009, I had promised the Hon'ble Members that I would present a document which will capture the Vision 2020 of the Indian Railways. I take pleasure in presenting this important document in Parliament, as promised.

When I was the Railway Minister last time (1999-2001), Indian Railways was the second largest railway network under a single management in the world in terms of route length, after the Russian Railways. It has now slipped to the third position. Our Vision is to put it on the road to regain the Number Two position in the coming decade and thereafter gain the Number One position in the subsequent decades not just in size, but in every other significant respect.

VISION 2020 will address four strategic national goals:

- Inclusive development, both geographically and socially;
- Strengthening national integration;
- Large-scale generation of productive employment; and
- Environmental sustainability.

RAILWAYS AS A VEHICLE OF INCLUSIVE DEVELOPMENT AND NATIONAL INTEGRATION

The Indian Railways' contribution to national integration has been unparalleled. It has knit India together by connecting all the regions, and almost all the states, in a single transport network. It has always played a unique role in meeting the transportation needs of the common man, while simultaneously serving as a critical infrastructure facilitator for the carriage of goods. In the coming decade, it will continue to keep its service focus on the underprivileged and the poor, even as it expands its services for the more fortunate. It will cater to the needs of the people across geographies and income strata as well as ethnic, religious and social diversities. It will better connect centres of commerce and industry, places of pilgrimage, historical sites, and tourist attractions, as also ports to hinterland. Railways also must reach the remote and underserved areas of the country to bring them into the national mainstream of development. The Indian Railways has been playing this role in the past, but not fully. Our Vision is to deepen and broaden this agenda of inclusive and integrative growth and to take it to new heights.

RAILWAYS AS A CATALYST OF CREATION OF LARGE-SCALE EMPLOYMENT OPPORTUNITIES

Vision 2020 addresses one of the biggest development challenges of contemporary India, namely, Growth with Jobs and not Jobless Growth. Productive employment opportunities must be created for all able-bodied Indians, especially for our youth and preferably in their own habitats. By pursuing bold and unprecedented, ambitious targets in the much-needed expansion and modernization of the railway network in India, Vision 2020 aims at considerably enhancing the Indian Railways' contribution to the national goal of achieving double-digit GDP growth rate on a sustainable basis. **It will accelerate economic growth, open up new avenues for employment in the primary, secondary and tertiary sectors and also promote geographically and socially balanced growth.**

RAILWAYS AS A PROMOTER OF ENVIRONMENTALLY SUSTAINABLE DEVELOPMENT

Vision 2020 also addresses another major development challenge, which is both national and global in nature, namely, reducing hazardous carbon emissions that have triggered climate change. So far, there has been inadequate recognition of the Railways' contribution towards India's climate protection efforts. Railways are more energy-efficient and less polluting than other modes of transport. It uses less land than the road sector. By **carrying more people and goods than other modes of transport, Railways can help protect the environment while promoting balanced development. Therefore, I believe that Indian Railways can be India's principal and foremost response to the challenge of Climate Change.**

The specific targets and measures to achieve the above-mentioned strategic goals are summarized below and presented in greater detail in the main document.

1. LEAPFROGGING TO A HIGHER GROWTH TRAJECTORY

Gross Revenue of the Indian Railways has remained at a level of around 1.2% of India's GDP over the last 10 years. Our Vision is to take it to 3% in the next 10 years.

India's GDP is expected to exceed US$ 2 trillion (Rs. 90 lakh crore) by the year 2020. With GDP at this level, Indian Railways has the potential to grow to around Rs.2,70,000 crore of revenue from around Rs. 90,000 crore at present[1] . **To realize this potential, the Indian Railways must achieve annual growth of 10% over the next 10 years by developing a sharper commercial focus with a strong social commitment.**

[1]Assuming an elasticity of transport to GDP of 1.25 as assessed by World Bank studies.

Realisation of this potential calls for a quantum jump in every dimension, **breaking away from the path of 'incremental change' to one of rapid growth.** It also calls for shunning the 'business as usual' mode of functioning in favour of an organization-wide mindset that is ready to accept bold and innovative ideas at all levels. **The central theme of the Vision is to prepare the Indian Railways for this Big Leap Forward.**

2. NETWORK EXPANSION

The route network of Indian Railways has expanded very slowly in the past. In 1947, Indian Railways inherited 53,996 of route kms of rail network and today we stand at 64,099 kms - **an increase of only 10,000 kms over 62 years.** We have to **break away from this orbit of low achievement to reach a higher orbit of ambitious growth.** While doubling of lines, gauge conversions, electrification and many other positive things did happen during the last six decades, the overall expansion of the Indian Railways to areas it did not serve earlier has been unacceptably slow.

Therefore, the **Vision proposes to add 25,000 kms of New Lines by 2020, supported by government funding and a major increase in Public Private Partnerships (PPPs).** Of this, at least 10,000 kms would be socially desirable lines regardless of their economic viability in the short run. This will, of course, include the completion of the backlog of 11,985 kms of lines already sanctioned.

This programme would specifically aim at improving the connectivity to our far-flung areas such as Uttarakhand, Himachal Pradesh, Jammu & Kashmir, and all the States in the North-East, namely, Arunachal Pradesh, Assam, Nagaland, Mizoram, Tripura, Manipur, Meghalaya and Sikkim. We also must not forget smaller States and Union Territories and large districts unconnected by the railways today.

3. CAPACITY CREATION

The ambitious goals of growth cannot be achieved without creating adequate capacity in the Indian Railway's network. The Vision aims at **a major augmentation of capacity through doubling and quadrupling of lines, complete segregation of passenger and freight lines on High Density Network (HDN) routes, substantial segregation on other routes, and electrification on busy trunk routes.**

By 2020

- **More than 30,000 kms of route would be of double/multiple lines** (compared to around 18,000 kms today). Of this, **more than 6,000 kms would be quadrupled lines with segregation of passenger and freight services into separate double-line corridors.** This shall include Delhi-Kolkata, Delhi-Mumbai, Kolkata-Mumbai and Delhi-Chennai routes on which Dedicated Freight Corridors would come.

  Maximum speed of passenger trains would be raised from 110 or 130 kmph at present to 160-200 kmph on these segregated routes and, similarly, maximum speed of **freight trains would be**

raised from 60-70 kmph to over 100 kmph. The gap between maximum and average speeds of both passenger and freight trains will be minimized.

- **Gauge conversion programme would be completed.** The entire network (barring the hill and heritage railways) would be in Broad Gauge.
- **33,000 kms of routes would be electrified** (i.e. additional electrification of 14,000 kms in 10 years).

While expanding the network, the Railways will examine and adopt innovative land-saving solutions like building infrastructure in a multi-tier format.

4. TRAIN SAFETY MISSION - ZERO TOLERANCE FOR ACCIDENTS

The Vision aims at making railway operations free of accidents, be it derailment, collision or fire on trains. Advanced technologies in all spheres including track, rolling stock and signaling would be used for this purpose. High-quality training to improve the skills of employees to manage new technology is critical, and steps would be taken to provide the same. Nearly 70% of the fatalities in railway mishaps take place at unmanned level crossings. Today there are around 17000 unmanned level crossings. We envisage that in the coming years not a single level crossing in the country will remain unmanned or unprotected. Here too, advanced technologies would be adopted to meet the challenge. I urge State governments to partner with the Indian Railways in this major task.

5. REDUCING THE INDIAN RAILWAYS' CARBON FOOTPRINT

Indian Railways has already taken several measures to perform its responsibility towards climate protection. Some of these measures are:

(a) Introduction of new suburban trains in Mumbai with regenerative braking features saving up to 35-40% of the energy.

(b) A Project Design Document (PDD) has been developed in association with the World Bank for registration under Clean Development Mechanism (CDM) with United Nations Framework Convention on Climate Change (UNFCCC). The project has already received Host Country Approval and is expected to result in annual reduction of approximately 100,000 tonnes of CO2 emissions

(c) Annual reduction of 0.14 million tonnes of CO_2 emissions through free distribution of 26 million CFLs (4 CFLs per family) to Railway employees in replacement of energy inefficient incandescent lamps. The project is entirely financed with the carbon credits earned under CDM framework.

(d) Induction of light-weight stainless steel coaches with enhanced passenger carrying capacity and new designs of freight stock with higher payload to tare ratio.

(e) Increased production of high-horse power, fuel-efficient diesel locomotives with plan to switch over completely to the manufacture of these locomotives at Diesel Locomotive Works (DLW).

In the coming decade, besides big initiatives like the Dedicated Freight Corridors and the High-Speed Passenger Train Corridors, which have the potential to reduce millions of tonnes of CO_2 emissions per annum, the following additional initiatives are being envisaged:

(i) Harnessing both existing tools (like CDM) and emerging tools like Nationally Appropriate Mitigation Actions (NAMAs) for transfer of technology as well as financing.

(ii) Saving up to 15% of energy through a improved **energy efficiency** in both traction (accounting for 87% of energy consumed by Indian Railways) as well as non-traction use.

(iii) **Induction of new-generation locomotives and rolling stock**, that use less energy and less material.

(iv) **Energy audits** to improve energy efficiency on thousands of its stations and offices and adoption of **LED lighting** and Energy Conservation Building Code **(ECBC).**

(v) Sourcing at least 10% of energy used from renewable sources such as solar power and biomass.

(vi) Procurement of only 3-star or higher-rated products for achieving energy efficiency

(vii) Railways will also **undertake a massive plantation drive** along the Railway tracks, in railway colonies and **use grass-turfing** as a protective anti-erosion measure on the slopes of the banks along the track.

All these measures would not only save our environment but also yield a good stream of revenue through carbon credits.

6. NEED FOR BOLD AND INNOVATIVE MEASURES

In order to achieve the ambitious goals set out in the Vision, Indian Railways will have to think out-of-the-box and undertake numerous bold and innovative steps in every area of its activities. Some of these are mentioned here:

6.1 REINVENTING PASSENGER SERVICES WITH 'CHANGE FOR A BETTER TOMORROW' AS THE MOTTO

The look and feel of Indian Railways in 2020 will be radically different from what it is today. **Railways will eliminate shortage and meet the demand for rail travel in full.** Passengers travelling long distance or short distance between cities or availing of our suburban services must **find the journey on Indian Railways pleasant- fast, punctual, comfortable, clean, and, indeed, memorable.**

Increasingly, Passenger trains must run at **high speed** in **separate corridors**. Railways must cater to all classes, eliminate queues for tickets and congestion in coaches. Innovative marketing ideas and modern technology will be used to make tickets and travel information accessible by internet and mobile phones across the country within the next two years. **It will be our endeavour to see that no train traveller has to wait for more than 5 minutes for getting a ticket even in the unreserved category.** This will be done to achieve an important passenger-friendly objective of reducing the total journey time. When buying a train ticket is quick and

hassle-free, and the journey itself is fast and comfortable, we envisage that many travelers would prefer railways over other modes of transport, thereby increasing Indian Railways' passenger revenues.

Double-decker coaches and longer trains will be used on popular inter-city routes. Modified Electrical Multiple Units or Diesel Multiple Units will gradually replace old coaches of slow passenger trains to improve passenger experience and bring down cost of operation.

Partnerships with State and City Authorities will be established to augment the infrastructure and manage suburban services under a single management. Suburban trains must be passenger-friendly with adequate accommodation for all categories of passengers, especially for ladies, students, senior citizens and the physically disabled. **Both suburban and long-distance trains must also look smart and colourful, reflecting our belief in and commitment to *'Change for a Better Tomorrow'.***

Development of Metro rail services in unserved cities is another area in which the Indian Railways has significant core competence. It has all the capabilities to execute such projects with substantial cost reduction. **A separate Indian Railways Metro Development Authority could be formed for this purpose**. This authority could also execute Light Rail and Mono Rail projects, wherever appropriate.

The Railway Stations and trains must set the highest standards of hygiene, sanitation, safety, security and hospitality and yet offer these services at affordable prices. **Special attention must be paid to the needs of women, students, elderly and the physically disadvantaged.**

Production of passenger coaches must go up from the present level of **2500 per annum to at least 5000 per annum within the next 3 years to begin with and further to 10,000 per annum.** The Vision, therefore, envisages expansion of the existing coach production units of railways and setting up of new coach factories, in partnership with the private sector. This would ensure that modern technology is transferred to India and indigenized here. **It will not only satisfy the demand for rail travel fully in the country but also make India an export hub for modern passenger coaches.** To achieve this ambitious plan, a separate governance and investment structure for production units will be put in place shortly.

Design of passenger coaches must combine the state-of-the-art technology and the best of aesthetics with an Indian touch. These would not only carry passengers from place A to place B but also act as business and knowledge centres on wheels, providing facilities like **conferencing, banking and other IT-enabled services**. To begin with, these new amenities will be introduced in Rajdhani and other high-end trains within the next two years. Trains must also act as Healthcare on Wheels. These could also be carriers for spreading awareness about science and technology across the country. In future, special trains would be introduced as **Art Museums on Wheels** for the youth and **Culture Expresses** to take performing Arts countrywide in a spirit of national integration.

Special trains will also be introduced to serve places of pilgrimage for all religions on special occasions. **Railway stations at all pilgrimage centres will be expanded and modernized.** I seek the cooperation and participation of State governments and local bodies in executing these plans.

HIGH-SPEED RAIL TRAVEL

In the coming decade, Indian Railways must catch up with the developed railways of the world in the matter of

speed of trains. The current effort to provide fast non-stop train services under the new brand of Duronto will continue. In addition, **the Vision aims at raising the speed of regular passenger trains to 160-200 kmph on segregated routes, which will bring about a major transformation in train travel.** For example, train journey between Delhi-Mumbai and Delhi-Kolkata will become an overnight service.

The Vision 2020 also envisages the implementation of **at least 4 high-speed rail projects to provide bullet train services at 250-350 kmph**, one in each of the regions of the nation and planning for at least 8 more corridors connecting commercial, tourist and pilgrimage hubs.

Six corridors have already been identified for technical studies on setting up of High Speed Rail Corridors. These are:

i. **Delhi-Chandigarh-Amritsar;**

ii. **Pune-Mumbai-Ahmedabad;**

iii. **Hyderabad-Dornakal-Vijayawada-Chennai;**

iv. **Howrah-Haldia;**

v. **Chennai-Bangalore-Coimbatore-Ernakulam;**

vi. **Delhi-Agra-Lucknow-Varanasi-Patna**

These could be built as elevated corridors in keeping with the pattern of habitation and the constraint of land in our country. The Railways will use the PPP mode for investment and execution, and draw on frontier technologies incorporating the highest standards of safety and service quality.

In the next 10 years, we would develop 50 World Class Stations which compare with the best, internationally. Once redeveloped, these stations would be well-integrated with other modes of transport in the cities and easy to access and use. ***There would be no congestion. Large, well-designed passenger concourses with adequate and high-quality waiting space easily accessible to platforms, conference halls, business centres, retail shops, restaurants, entertainment and cultural facilities, museums and art galleries, and a variety of other attractions would make the passengers' stay pleasant and memorable.*** In other words, these stations would go beyond being mere transport hubs. They would become vibrant centres of the life of the cities, for commerce, entertainment and social space. They would also become major tourist attractions, as is happening with redesigned railway stations in many parts of the world. **In addition, at least 200 large stations would be developed to provide multifarious facilities like offices, retail, entertainment, restaurants, theatres, hotels, and health and education services.**

All this would be achieved using the PPP route, for which an attractive enabling policy and implementation structure will be presented shortly.

Our Catering services must ensure availability of hygienically prepared and nutritionally balanced food to passengers and cater to the diversity of India's palate and pocket. To achieve these goals, railway catering services will soon undergo major reform.

6.2 RE-INVENTING FREIGHT SERVICES

The Vision targets a **significant reversal of the erosion of market share**, lost to the road sector in the past, and will take Railway's share in the freight movement **from 35% at present to at least 50%.** This will be done by **creating adequate carrying capacity, achieving cost-effectiveness, improving quality of service and providing new value-added services on a customized basis.** Railways will establish partnership with major logistics providers and close linkages with customers with a view to satisfying the specific needs and helping the customers reduce their logistics costs. Information technology would be used to track the movement of cargo and meet delivery schedules. The Railways would strengthen their position in the bulk segments they serve at present and expand into new commodities like automobiles, fly-ash, consumer goods, etc.

In keeping with this goal, adequate number of wagons including high-speed and high-capacity wagons to meet specific requirements of commodities would be procured. We envisage that the annual procurement of wagons would go up from a level of **less than 25,000 wagons now to a level of around 75,000 wagons in four wheeler units.**

Two Dedicated Freight Corridors (DFC), on the Eastern (Ludhiana-Dankuni) and Western (Mumbai-Delhi) routes would be operational well before 2020. This would create adequate capacity to meet the freight demand and also elevate the quality of service to global standards. In addition to these two corridors, we plan to **start work on four more DFCs, namely North-South (Delhi to Chennai) and East-West (Howrah to Mumbai), Southern (Chennai to Goa) and East-Coast (Kharagpur to Vijaywada).**

The Railways would use their existing land bank to the maximum extent and help set up multi-modal logistics parks and industrial hubs along with DFCs, on the pattern of the Delhi-Mumbai Industrial Corridor (DMIC) project.

In addition, other capacity enhancement works on the high-density network of Railways will be completed. Wagons with higher pay load to tare ratio will be developed and deployed.

Railways will also establish and improve connectivity to all the ports in partnership with the parties concerned. Major customers will be incentivised to invest in improvement in efficient terminal handling systems and share the efficiency gain accruing from reduced turn-round of the wagons.

6.3 MOBILISING OTHER SOURCES OF REVENUE

(a) PARCEL SERVICES

Parcel services will be managed as a separate business and run from dedicated terminals with separate parcel trains rather than from station platforms. **On major routes, this service will be run as efficiently and professionally as air cargo services.** The revenue from parcel services would be targeted for at least a **five-fold increase** in ten years from the present level of around Rs. 1600 crore per annum.

(b) ADVERTISING

Indian Railways will adopt a new market-driven strategy to unlock the enormous potential to increase its earnings from advertising on its websites, trains and at stations. Freight trains and passenger trains (both inside

and outside), CCTV at stations, multi-lingual magazines for rail passengers and merchandising opportunities for a number of items ranging from tickets to food stuff and other material served on trains offer promising possibilities for advertising. Railways can also think of **launching a separate TV channel** to disseminate information and earn revenues through advertisement.

(c) COMMERCIAL USE OF RAILWAY LAND

Similarly, commercial utilization of vacant railway land, not required for operational use, can generate sustainable streams of revenue to finance the growth of Railways. This will be done in a professional, transparent and accountable manner. Some of such land may also be utilized for setting up of schools, medical colleges, nursing colleges, etc. where wards of railway employees will have priority in admission.

(d) TELECOM & IT

Our Vision is also to tap similar revenue generation potential in the telecom and IT sector, using the 64,000-km-long 'right of way' for laying optic fibres, signaling towers and other infrastructure assets that Indian Railways owns. This will be done in collaboration between the **Railtel Corporation and private sector companies in a transparent framework.**

6.4 TECHNOLOGICAL EXCELLENCE

Technology is an integral part of the Vision to move Indian Railways towards the goals set out. Some of the areas for which technology will be used are:

- Design of modern coaches including Double Decker coaches.
- Re-design of second class coaches to make them more comfortable.
- Design of high-capacity wagons.
- Reduction in cost of operations by enhancing productivity and asset life.
- Track, signaling and rolling stock including predictive and diagnostic tools, anti-collision devices and protection of level crossings for improvement in safety and reliability of operations to achieve zero accidents and zero failure in equipments.
- Raising the speed of trains.
- Improvement of the interface with passengers and freight customers.
- Ticketing through mobile phones.
- Improvement of control and voice/video communication to aid IT applications across the Indian Railways.
- A satellite-based train tracking system to provide real-time information on train location and other train related information to passengers through a variety of devices including mobile phones.
- Green toilets in all coaches
- Mechanical cleaning of trains, stations and platforms with requisite training to railway employees to use technology for maximum recycling of water.

- Waste management, with the aim of achieving "near-zero waste", by adopting the principle of 3-Rs - Reduction, Recycle and Reuse

We must establish one of the worlds's most advanced Research and Development capabilities for transfer and indigenization of technology and breakthrough innovations. For meeting these objectives, the Research, Design and Standards Organization (RDSO), CRIS and other technical bodies of the Indian Railways would be revamped to enable them to work with clear mandates and deliverables. R&D will be integrated with the core of Railways operations.

COLLABORATION WITH PREMIER INSTITUTIONS

Synergies would be developed with premier institutes like IITs, National Institutes of Technologies and research laboratories of CSIR and DRDO. Opportunities for postgraduate and doctoral studies in railway infrastructure and services would be significantly enhanced. **Railway research centres should attract hundreds of young and talented persons with fresh minds, ready to tackle the most difficult challenges.** The spin-offs of the breakthroughs in railway technologies developed in-house would be used by Institutes, Universities and other centers of learning. A vibrant indigenous railway component and equipment industry will also get developed.

By 2020, Railways would have developed cutting-edge indigenous technologies and turned a net exporter of technology.

6.5 ORGANIZATIONAL REFORMS FOR GREATER EFFECTIVENESS AND BETTER GOVERNANCE

Our Vision is not to privatize but to enhance the effectiveness and accountability of the Railway organization through necessary reforms at all levels of Indian Railways within the Government framework. A combination of Government initiative and PPP, of external expertise and in-house talent will be used to deliver on the challenging goals. We shall rely on judicious internal reorganization and decentralization of decision-making and authority, both financial and executional to zonal and divisional levels. In the past, corporatisation within railways, has yielded good results. Examples are Container Corporation, RITES, IRFC, IRCON International and other PSUs of Railways. We can further examine the possibility of widening the scope of such internal corporatisation of activities that can yield much higher results. In doing so, employees' interests will not only be protected but also be further enriched.

Our ongoing work on accounting reforms will be expedited to provide us better analytical tools and aid better decision- making in this endeavour.

Achieving and managing high growth by meeting the expectations of customers and project execution on a scale envisaged in the Vision would no doubt pose a major challenge. This challenge can be met by separating the function of operations in which Indian Railways has excellent capabilities, from planning and execution of projects. In carrying out this separation, greater, better and more challenging career opportunities will be created for all. Transparency and accountability on the part of management, effectiveness and efficiency in achieving goals as well as productivity of assets would be the guiding principles.

6.6 ENRICHING HUMAN CAPITAL

As a Government organization, we are proud of the 1.4 million committed and dedicated employees of Railways. They constitute our strength as we embark on the challenges of Vision 2020. Our vision is to train, motivate and equip each and every member of the Railway family to reach his or her unique and full potential. The training must cover not only the hard skills but also soft skills as well - hospitability, humane-ness, humility and people-friendly service approach. In order to do so, we have to benchmark ourselves to global standards in training befitting one of the world's largest railway networks. Railways have a number of training institutions. Not only these would be upgraded and expanded but a number of new training institutions will also be set up.

Indian Railway has been a model employer and over the years has developed exemplary systems of participative management and a Permanent Negotiating Machinery (PNM) for a continuous dialogue with the employees. These systems would be strengthened.

7. INVESTMENT FOR GROWTH

It has been tentatively assessed that 64% of the investment of roughly Rs.14,00,000 crore needed for augmentation of capacity, upgradation and modernization of Railways in the next 10 years could be mobilized by Railways through surpluses from high growth in freight and passenger traffic, supported by prudent borrowing and use of PPP initiatives. PPP can be used to establish win-win partnership with private sector in a number of areas such as developing world class stations, setting up of rolling stock manufacturing units, logistics hubs, Kisan Vision projects, high-speed corridors, expansion and management of the extensive network of Optical Fibre Cables (OFCs) and big infrastructure projects like new lines and Dedicated Freight Corridors.

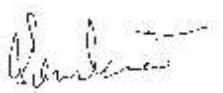
Even then, it is obvious that the cost of completing this massive expansion and modernization of the railway system cannot be borne by Indian Railways alone. Internal and extra budgetary resources will simply not be adequate to finance the Vision. There is thus a need for Government to set up an **Accelerated Rail Development Fund (ARDF)** to finance the remaining 36% to the tune of Rs. 5 lakh crore to be spent over the next 10 years. An amount of roughly Rs. 100,000 crore would need to be set aside from the **ARDF** to clear the pending backlog of socially desirable, New Line and Gauge Conversion projects as a one-time grant for the Government. Higher levels of budgetary disbursement from this Fund in the initial years would ensure that infrastructure is built quickly to support growth.

8. The above, however, is a tentative assessment and the details have to be worked out. A Committee of Experts drawn from various disciplines such as economics, management, finance, engineering and project management would go into the issues of determination of the investment levels required and the mechanism for financing and implementing the Vision, including methods of funding socially desirable projects and action plans for the immediate short-term and the long-term.

9. The resource mobilization and allocation plan has to be an inseparable part of the whole Vision. It would be instructive that China, which is currently undertaking one of the most ambitious rail expansions, has earmarked US$ 300 billion (Rs. 14 lakh crore approximately) for investment over the next 3 years.

10. Citizens of India are ultimately the owners of the Indian Railways. The Vision 2020, briefly outlined here and spelt out in the accompanying document, is an attempt to meet their rising expectations and aspirations. It is also an attempt to build a modern world-class railway system commensurate with the emergence of India as a major economic power in the next few decades.

I present the Vision 2020 Document to Parliament and hope that the Document would benefit from the wisdom and guidance of the House.



(Mamata Banerjee)

Minister of Railways

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CHAPTER-I

SERVING THE NATION: ROLE OF INDIAN RAILWAYS

VISION STATEMENT

Indian Railways shall provide efficient, affordable, customer-focused and environmentally sustainable integrated transportation solutions. It shall be a vehicle of inclusive growth, connecting regions, communities, ports and centers of industry, commerce, tourism and pilgrimage across the country. The reach and access of its services will be continuously expanded and improved by its integrated team of committed, empowered and satisfied employees and by use of cutting-edge technology.

Indian Railways (IR) has played a critical and historical role in weaving our huge country into a nation. Its network of over 64000 route-kms has integrated markets and connected communities over widely spread out geographies across the length and breadth of the country. In the year 2008-09, IR carried over 6900 million passengers and lifted 833 million tonnes of freight traffic, making it the third largest railway network in the world in terms of size, the world's topmost passenger carrier (in terms of Passenger Kilometers) and fourth largest rail freight carrier.

1.1 IR is the backbone of India's transport infrastructure, along with the national highways and ports. It is estimated that more than 35% of the total freight traffic (tonne-kilometers) of the country moves by rail (Total Transport System Study by RITES, 2009 carried out for Planning Commission). Moreover, for certain core infrastructure sectors such as coal, power, steel and cement and other critical sectors like fertilizer, the share is much higher, in some cases as high as 70%. Indian Railways employs 1.4 million employees directly and several times larger the number indirectly through forward and backward linkages. The quality, capacity and the performance of IR's infrastructure, therefore, is of crucial importance for the nation. The Indian economy and the citizens of the country deserve modern and efficient railways which could impart a competitive edge to the country in the present era of an integrated global economy.

1.2 The purpose of this document is to lay down the vision which would enable IR to meet the expectations of the nation and play its rightful role as the catalyst of economic development of the country in the times to come. Indian Railways will be guided by the following Vision to live up to this role:

Indian Railways shall provide efficient, affordable, customer-focused and environmentally sustainable integrated transportation solutions. It shall be a vehicle of inclusive growth, connecting regions, communities, ports and centers of industry, commerce, tourism and pilgrimage across the country. The reach and access of its services will be continuously expanded and improved by its integrated team of committed, empowered and satisfied employees and by use of cutting-edge technology.

1.3 The core objective underlying the above Vision is to take Indian Railways to a new trajectory of high growth and reinforce its centrality to the growth momentum of the Indian economy. This shall be achieved by:

(a) Providing compelling value to all customers and citizens through highly competitive high-quality services.

(b) Expansion and modernization of Railway network to provide inclusive service remove bottleneck and create capacity.

(c) Improving productivity of assets and efficiency of operations through technological and managerial innovation.

(d) Judicious reorganization of Railway's activities into distinct business lines and profit centres.

(e) Building a highly cohesive and motivated organization with emphasis on Human Capital.

CHAPTER-II

2. National Growth Trajectory, International Comparison and Indian Railways

2.1 Macro-economic environment

Performance of IR is closely tied to the overall macro-economic environment and growth of GDP in the country. Goldman Sachs in their research paper (Global Economics Paper:99,2003) had predicted that with a steady rate of annual GDP growth at 5-6% Indian GDP will overtake that of France and Italy by 2020 and would be well on course to overtake that of U.K. and Germany by 2025 making it the fourth largest economy of the world. Given that our economy has been growing at a rate close to 8% in the last six years, the prediction may be realized sooner. There is a great deal of confidence and optimism that the Indian economy would continue to grow at 8% or more for several years ahead. At this rate, by 2020 the per capita income would more than double from the US$ 2972 (in PPP terms) in 2008-09. Simultaneously, the proportion of the population living in urban areas is set to increase from 27.8% in 2001 to around 41% by 2030 (India: Urban Poverty Report, 2009, Government of India and UNDP). Industrial sector's share as a percentage of GDP will also grow in line with increasing global integration, rising prosperity and sophistication of the Indian industry. As per Government of India's trade policy, India's share in international trade is targeted to rise from the present level 1.5% to 5% by 2020. Quality of infrastructure will be a key determinant in the realization of these projections. Therefore, investment on infrastructure is likely to witness a major step-up. All these macro-economic developments would have a positive impact on the growth of travel and transport in general and railway transport in particular.

2.1.1 GDP and Transport

Demand for transport is directly and positively correlated to GDP growth. It has been established that in developing economy like ours, the elasticity of transport to GDP is around 1.25. GDP growth of 9% would, therefore, translate into increase in demand for transport to the tune of 11%. How much of this growth could be captured by Railways? This would obviously depend on the capacity and quality of Indian Railway's infrastructure and services to measure up to the expectations of the customers. If these aspects are taken care of (which the Vision Document seeks to do), Indian Railways will have the opportunity to launch into a phase of high growth in the next ten years.

2.1.2 Railway traffic growth vis-à-vis GDP

Table-1: GDP growth vis-à-vis growth in Railway Traffic (Figures in %)

Period	Average GDP growth	Potential for growth of Railway traffic @ elasticity of transport of 1.25	Average growth in freight traffic of railways	Average growth in originating passengers
1991-92-2001-02	5.6	7	3.9	2.4
2002-03-2008-09	7.9	9.9	7.2	4.6*

Note: *1.Based on Economic Survey, 2008-09 and Ministry of Railway's data on Railway traffic growth.*

**This includes an average growth of 7% in non-suburban and 3% in sub-urban segments. Growth of Passenger Kilometres (PKMs) has been more impressive at 9.7% in the recent period (2004-2005 - 2008-2009).*

In recent years, the performance of the railways has exhibited a marked departure from the earlier long-term trend of trailing GDP growth by a large margin (Table-1 above). While the upward shift in the trend of traffic growth is unmistakable, the figures in table also reveal the extent of underachievement vis-à-vis the potential. Further, the improved results are attributed to the certain operational initiatives such as flexible tariffs and optimization of the loading/carrying capacity of rolling- stock, as well as efficiency of use of asset, expansion of capacity in passenger services. While these have played a useful role, **a completely different strategic approach would be required to reap the full potential and achieve a quantum jump in growth.**

This document seeks to prepare a road-map for Indian Railways to take the fullest advantage of the opportunities unfolding in the economy so that it is able to expand and grow consistently at the rate of 10% p.a. in line with the expected growth of our GDP at 9% per annum.

2.1.3 Transport landscape for the future: Competition

(a) Road Transport

Railways face stiff competition from road transport in both freight and passenger businesses and from aviation sector in respect of the premium-class passenger business segment. Given the massive scale of expansion of the National Highway network, build-up of huge capacity in the highly competitive trucking industry and entry of modern multi-axle commercial vehicles, competition from road carriers will intensify. However, Railways score over other competing modes by virtue of the minimal impact on environment and efficiency of land use. Given the density of population in our country and the pace of urbanization, road networks will face severe congestion. The

effort to match capacity with the explosive pace of growth of vehicular traffic will be an uphill struggle. Road transport is increasingly associated with pollution and accidents. It accounts for a significant share of the emission of greenhouse gas (CO_2) and other pollutants. In the year 2007, more than 1,13,000 people were killed and 5,13,000 were injured in road accidents in the country (Source: Road Accidents in India, 2007, Transport Research Wing, Ministry of Road Transport & Highways, Government of India). Safety on roads has been steadily deteriorating over the years. In contrast, Indian Railway's safety record has been very impressive, and improving. In the year 2008-09, there were 177 accidents (down steadily from 320 in 2003-04) and 207 persons were killed. With well-planned and directed investments, Railways can be made virtually accident-free. India's National Highway network comprising 2% of the country's road system carries 40% of the traffic and is already under strain. Finding land to meet the ever-rising requirements of road expansion and resources to meet the rising cost of fossil fuels will impose prohibitive costs on the economy.

(b) Aviation

Air-travel, starting from its relatively low base, will also grow over time. Already airfares between several cities are highly competitive vis-à-vis the air-conditioned class fares of Railways. The threat from airlines, however, can be squarely met if issues of speed, comfort and convenience in inter-city travel are addressed.

Advantage of rail transport

Increasing concerns over global warming, greenhouse gas emission and congestion and accidents on road would make Railways an increasingly attractive alternative to road transport. Railways, which can generate high capacity with less land and at relatively less cost, have to be an important part of the solution. However, Railways would need to build adequate capacity and work assiduously to make its services economically attractive, especially in respect of freight, by improving quality of service and offering a compelling value proposition.

Railways are ecologically benign, highly land and energy-efficient and must be a significant part of the long-term transport solution of the country.

2.1.4 International Comparison

To be counted amongst the world's best railway systems, IR has to benchmark itself to the best Railways of the world. While inter-country comparisons do present methodological issues, the Table below briefly summarizes the comparative position in respect of some key parameters based on figures published by International Union of Railways (UIC), Paris.

Table-2: IR vis-à-vis others: International comparison (All figures pertain to the year 2008)

	Million traffic units (PKM + NTKM) per employee	Route kms per million population	Route kms per square kilometer area
USA	15.3	747.4	23.6
China	1.6	45.5	6.4
Germany	0.7	410.9	94.9
France	2.1	466.5	54.2
Russia	2.6	598.1	4.9
India	0.9	55.2	19.3
Japan	2.2	157.5	53.0

Source: *UIC, Paris*

2.1.5 Comparison

Indian Railways lags behind the developed countries (U.S.A, Germany, France and Japan) in terms of route-kms per square kms or route-kms per million population served which are broad indicators of the level of rail connectivity in the country. This can be redressed by expeditious expansion of the network to the unconnected regions. In terms of the productivity (traffic units/employees) also, IR is way behind many of the Railways. This can be improved by easing capacity constraints, expanding services, providing efficient, cost- effective and customer-focused services and rationalizing staff strength.

2.1.6 World-wide, advanced Railways systems have been gravitating towards heavy-haul in freight, high-speed in passenger services and rail-based mass transit in urban transport. All the railways in the table except IR have either high-speed rail networks or are building these. Heavy-haul freight operations are also common in USA, China and Russia with trains carrying in excess of 20,000 tonnes each compared to 5000 tonnes in our case. Japan, Germany, France and Russia have very well-developed rail-based urban transit systems.

2.1.7 Other lessons that IR can usefully learn from the advanced railway systems pertain to predictive/diagnostic tools in monitoring performance of assets/equipment over life for building nearly infallible levels of reliability of operations.

2.1.8 Central Challenges

The central challenges for the Vision, therefore, are to leap-frog into a high-growth trajectory and join the front ranks of the world's railways through technological upgradation, network expansion and augmentation and delivery of highly efficient customer-focused services. A healthy and growing Railway can be a vehicle for environmentally sustainable, inclusive, integrative growth and generation of millions of productive jobs in one economy.

CHAPTER-III

Opportunities, Challenges and Constraints

Our rapidly growing economy will offer promising possibilities for growth in future. However, such growth will not be automatic and will be attained only if Railways approach the task with a carefully crafted and meticulously executed plan. Railways can outperform other competing modes by offering mass-scale services very reliably and efficiently and providing differentiated services at value-based rates. Efficiency of railway operations is predicated upon capacity, more tonnage/passengers per train and speed. Identification and satisfaction of customers' specific needs would be necessary for premium services. To achieve the Vision for ambitious growth, Indian Railways has to offer a range of cost-competitive and differentiated services. The first and foremost pre-requisite for this is adequate capacity. Other challenges that IR must embrace and overcome would pertain to alignment of material and organizational resources towards design and delivery of efficient, high-quality services and time-bound project execution. Some of the major specific challenges include the following:

3.1 Key Challenges

(a) Capacity Constraints

The growth in Railway's freight and passenger traffic in recent years has highlighted a number of systemic constraints in railway operations. Foremost among these is capacity constraints on most of the high-density routes of the railways. The trunk routes of the railways comprising merely 16% of the network carry more than 50% of the traffic. These routes, on most of the stretches, have already reached over-saturated levels of capacity utilization. To manage a system reliably, capacity utilization must not exceed 80% and planning must ensure that capacity augmentation by way of doubling/quadrupling and other traffic facility works takes place well before saturation sets in.

(b) Reliability of Assets

A lot of effort in recent years has gone into improving asset reliability by use of upgraded track structure, better maintenance practices and improvement in locomotive as well as signal technology. However, on a saturated network the impact of an asset failure on operation is often severe. Use of shared tracks by both freight and passenger traffic, speed differential between passenger and freight trains and the precedence accorded to passenger trains exacerbate the effect. As a consequence neither the freight nor the passenger services run optimally. Freight services, in particular, suffer the most. Investment in technological tools and managerial systems that ensure reliability of assets is, therefore, a major challenge, if Indian Railways is to achieve high growth by offering superior services.

(c) Safety

Safety performance of Indian Railways measured in terms of number of consequential train accidents (accidents with serious repercussions in terms of loss of human life or injury or damage to railway property or interruption to

railway traffic beyond the defined threshold level). These include collision, derailment, fire in trains, accident of road vehicles with trains at level crossings and other specified types of miscellaneous train mishaps or accidents. Accidents per million train-kilometers have been steadily improving as illustrated by the following table:

Table: 3 Train accidents on Indian Railways

Year	Collision	Derailment	L-Xing accidents	Fire in train	Total	Incidence of accidents per million train kms.
1960-61	130	1415	181	405	2131	5.50
1970-71	59	648	121	12	840	1.80
1980-81	69	825	90	29	1013	2.00
1990-91	41	446	36	9	532	0.86
2000-01	20	350	84	17	473	0.65
2001-02	30	280	88	9	415	0.55
2002-03	16	218	96	14	351	0.44
2003-04	9	202	95	14	325	0.41
2004-05	13	138	70	10	234	0.29
2005-06	9	131	75	15	234	0.28
2006-07	8	96	79	4	195	0.22
2007-08	8	100	77	5	194	0.21
2008-09	13	85	69	3	177	0.20

Note: *The total also includes accidents under the miscellaneous category apart from the four categories shown in the table.*

Remarkably, the improvement is even more marked in respect of the more serious types of accidents like collision and fire in trains. However, notwithstanding the steady trend of improvement, a number of significant challenges still remain. Interruption to traffic due to accidents is a cause of concern. A large number of derailments, as well as failure of railway staff as a major contributory cause of accidents, show that considerable room for improvement exists.

Table-4: Traffic disrupted or Train movement disrupted/halted/affected lost due to accidents

Year	Interruption to through communication (in hours)
2003-04	2806
2004-05	1692
2005-06	1904
2006-07	1148
2007-08	4381

In the year 2007-08, 84 of 194 accidents were caused by failure of railway staff (43 % of the total), and 100 of these accidents (52% of total) were derailments. This is typical and representative of the pattern for a number of years. A lot more work needs to be done by way of technological upgradation, HR interventions of right recruitment, promotion, training and motivation of employees before preventable accidents are eliminated from the Railways. Ongoing initiatives like manning of busier level-crossings and pre-warning and education of road-users at unmanned level crossings need to be scaled up to minimize mishaps at level-crossings. **Safety is a challenge but a close -to -zero accident goal is attainable. This issue has to be addressed with proper planning and determination.**

(d) Slow Speeds

The speed of freight trains on IR has stagnated at around 25 kmph for a long time. Passenger services are also slow by international standards. The maximum permissible speed on Indian Railways is 130 kmph for Rajdhani/Shatabdi trains and 110 kmph for other mail/express trains, compared to a maximum permissible speed of 200 kmph on several European Railways on conventional networks and more than 300 kmph on high speed corridors in Europe and Japan. Chinese Railways are presently engaged in construction of 12, 000 kms of dedicated passenger corridors with speeds of 250-350 kmph.

Currently, eastern and western routes of dedicated freight corridors (DFCs) totaling 3400 kms from JNPT (Mumbai) to Delhi and Ludhiana to Dankuni have been sanctioned. Pre-feasibility studies for other dedicated freight corridors for North-South (Delhi to Chennai), East-West (Howrah to Mumbai), Southern (Chennai to Goa) and East-Coast (Kharagpur to Vijaywada) have also been carried out. The DFCs are being planned with high axle-load and modern technology. These would provide the opportunity to achieve substantial segregation of freight and passenger traffic on the trunk routes and improve the speed and reliability of both services. The key challenge is to find and devote adequate financial and human resources to execute these projects in time.

Segregation of freight and passenger services, creation of adequate capacity and raising of speeds of both services would be a key challenge if Indian Railways are to retain their market share and improve upon it.

(e) Door-to-door handicap: partnership with private players

Railway's inability to provide door-to-door service and transport of small volumes is a handicap. This can be overcome by forging partnership with logistics providers and establishing presence in large logistics hubs serviced by the Railways. Similarly, close attention to the totality of passenger services including use of information and technology to provide information and assistance in terms of other value-added services such as booking of taxies and hotel services prior to and after the railway journey would enhance attractiveness of the Railways.

(f) Project Execution

Railway projects suffer from chronic shortage of funds, as available funds are spread thinly over a large shelf of projects. Time and cost-over runs adversely affect the viability of projects. **Efficient execution of projects**

within time and budget is, therefore, an urgent necessity. There are managerial and organizational issues that need to be addressed to fast-track project execution and meet the challenges of massive capacity creation within a short period of 10 years.

A list of the ongoing Railway projects is shown at **Annexure-I**. As can be seen, the shelf of ongoing projects is huge and Railways would require resources of the order of more than 1,43,000 crore to merely complete the projects on hand. (For a summary of the information, see Table 5 below).

Table-5: Shelf of Infrastructure Projects

Category	Number of works in progress	Length in Kms	Cost in Rs. Crores (as per sanctioned cost)
New lines	109	11985	50405
Gauge conversion	51	7380	17309
Doubling	126	4822	11748
Electrification	21	3201	2766
DFC project	2	3289	50,000
MTP	7		10,912
Total	316		143,140

It is also to be noted that most of the New lines and Gauge conversion projects come under the economically unviable, but socially desirable category. An amount of around Rs. 57,000 crore at sanctioned cost (Rs. 80,000 crore approximately at updated cost) would be required to complete the pending backlog of these projects alone. The Railways face unrelenting pressure to take up more such Projects. In fact, as per records available, there are 428 new line and gauge conversion proposals for which Surveys have been carried out at some time or other in the past but have not been considered. In addition, there are 70 doubling proposals for which surveys have been completed (see **Annexure-1 A**). A very tentative assessment indicates that if these projects were to be taken up, it would add Rs 4,21,546 crore to the value of the pending shelf of projects.

New line projects

Execution of new line projects presents a unique set of challenges. Of the 109 new line projects already sanctioned and taken on hand, 8 are national projects (which enjoy assured funding) and 12 are financially viable. Others have been sanctioned on socio-economic grounds. Railways face insurmountable pressures to add more such projects each year, but are unable to earmark more than Rs.1500 crores per annum for these projects. Needless to say, the amount is barely sufficient to neutralize the annual escalation in cost. At this rate, the projects would languish forever. A solution has to be found to ensure funding of these projects. Possible solutions would include:

(i) Projects in which state governments are willing to share more than 50% could be allocated assured funding by Railways and completed in a time-bound manner.

(ii) A non-lapsable dedicated fund could be set up outside the normal railway budget for construction of lines sanctioned on socio-economic considerations, so that all the projects could be completed by 2020.

Indian Railways has to expand its network at a fast pace to connect the far-flung areas of the country, especially the hill states, the states in the North-East and areas, un-connected or inadequately connected to the Railways network. This is necessary to bring them into the national mainstream of development. Without a well-thought-out plan to clear the backlog and find funding for the massive expansion needed, Railways will not be able to meet this expectation.

(g) Technological Upgradation

Indian Railways has been adopting international best practices in various facets of railway infrastructure construction and induction, maintenance and operation, albeit with a time lag. A conscious policy to close the gap with the developed railway systems and compress the technology adoption and adaptation cycle on a continuous basis with a view to achieving steady improvement in cost of operations and quality of services needs to be evolved. **A vibrant indigenous railway component and equipment industry also needs to be developed as a part of the policy.**

(h) Improving carrying capacity

There are ongoing plans to improve payload to tare ratio of freight wagons by use of lighter-weight materials like stainless steel and aluminum so that net payload per wagon increases. Simultaneously, there are also plans to make feeder routes of dedicated freight corridors and other identified routes on the network fit for 25 tonne axle load. These measures would improve the load per train from the existing level of less than 5000 tonnes to 6000 tonnes in future. Popular passenger services in high demand are also being augmented to 24 coaches after building requisite facilities at passenger platforms and terminals en route. These measures will provide useful quick-fix solutions in the short and medium term till adequate capacity is built up to match the requirement in the long run.

Optimal use of maximum moving dimensions (width and height dimensions can be used to design larger-sized wagons and coaches) is another important area. This would require a systematic study of the "kinematic profile" of Indian Railways and adoption of the best of the know-how available so that with minimum investment on infrastructure, maximum usable dimensions in terms of double-decker coaches or optimally designed wagons can be pressed into service.

There is a need to closely monitor these measures with regard to timelines and full realization of their potential.

3.2 Challenges for freight services

(a) Quality of service

In recent years, there have been attempts to adopt flexible tariffs to smooth out seasonal imbalances, utilize empty-flow directions and incentivise loyalty of customers. However, major tasks that still remain are development of special-purpose rolling-stock to suit specific needs of the customers and the ability to promise and deliver time-sensitive cargo in time. At present Railways are neither geared to meet pre-registered requirements of customers for specified pick-up and delivery schedules nor those of guaranteed transit times. This issue is closely related to carrying capacity and reliability of the system. There is also an issue of marketing and mindset to develop closer market linkages with customers so that products are tailored to meet their specific needs. Also pertinent is the fact that although, there is generally no shortage, occasional peaking of demand

and mismatch in rolling stock procurement programmes have at times exposed the Railways to the risk of losing customer loyalty. These issues need to be resolved through close linkages with customers and evolving responsive market-driven systems for procurement of rolling-stock and operational management.

(b) Connectivity Issues

As the dynamics of manufacturing, distribution and logistics change, the transport landscape would throw up newer challenges. Ports, private mining blocks and third party logistics providers are already emerging as major transport generators. Ability to establish IR's presence and linkages to these customers and service their needs would be crucial in the future. **A clear-cut and workable policy on connectivity to railway's network in partnership with the entities concerned, wherever necessary and feasible, would be needed.**

Railway's ability to improve the logistics and supply- chain efficiency of freight customers will be the prime determinant of success.

3.3 Challenges for Passenger Business

(a) Supply constraints and under-recovery of cost in passenger business

IR's network of 64099 route-kilometers admittedly does not reach many regions and the existing network of MG/NG of over 12000 kms grossly under-serves the population in the respective regions. Even for the population connected to the B.G. network, Railway's passenger business is characterized by supply-side shortages. Infrastructure capacity, in particular, acts as a constraint on the expansion of service to the fullest extent to meet the increasing demand. The supply constraint can be resolved with determined action to ease constraints in line-capacity, terminals and rolling-stock. **Railways must prepare to meet the demand for passenger transport in full.**

A second feature relates to the non-recovery of full cost of the services as a whole resulting in losses, compensated by cross-subsidization from freight services. While passenger services consume nearly 60% of the network capacity, their share in the traffic earnings amounts to only 33%. Competition from different modes, low-cost air carriers in particular in respect of long distance and luxury buses in short to medium distance segments, is beginning to threaten Railway's hold on the upper-class passenger segment. As a result, Railways are under pressure not to increase premium class fares. On the other hand, second- class fares, especially suburban fares, have been spared any hike for several years as these are considered critical for the underprivileged sections of society. The net result is that passenger business of railways has been a losing preposition. The following table illustrates the point:

Table-:6 ECONOMICS OF PASSENGER SERVICES

Year	Earnings per train passenger kilometer (Rs.)	Cost of hauling a passenger train kilometer (Rs.)	Net earnings on working a passenger train one kilometer
2005-06	322.02	454.50	(-)132.48
2006-07	368.07	509.06	(-)140.99
2007-08	412.22	550.97	(-)138.75

For the year 2008-09, estimated losses on passenger business amounted to roughly Rs.14,000 crore.

Railways presently serve a range of price points by providing as many as 21 classes of seats/berths and 9 categories of train services. In our country complexity, this is necessary and will continue to be relevant for a long time. Serving the second-class passengers, who would continue to constitute the majority, at an affordable cost will be a key challenge. However, loss of 18 paise per each passenger kilometer run (more than 40% of the cost) is not sustainable. **A two-pronged approach to achieve significant cost-efficiencies and target the subsidy only to the needy sections of population would need to be followed to address this issue.** Cost innovations in passenger operations to bring down the unit costs and progressive introduction of upgraded services would aid better cost recovery. This would include running of 24 to 26 coaches per train in sectors with high demand, standardization of coach compositions to the extent feasible and rationalization of maintenance regimes to maximize rake availability for operations.

(b) Upgradation of Quality of Services

Increasing population, prosperity and urbanization combined with a favourable demographic profile would continue to fuel the growth of passenger traffic across all segments. There would be a steady upward movement towards the premium classes. **However, to reposition rail travel as a first-choice option among passengers, including tourists, would call for a major make-over in the image of trains, stations and passenger services.** A number of initiatives have already been taken to cater to this trend but there still is a large number of areas which would require close attention. **These include: development of modern passenger stations and terminals, re-design of trains with pleasing, soothing colours and exteriors, plush interiors and green toilets, responsive expansion of supply to match demand, raising of speed, use of information technology to make the entire interface of passengers with the Railways a pleasant one and a systematic approach to provision of on-board services like catering, bed-roll supply, entertainment etc. Re-design of second class coaches to make them more comfortable for passengers should also be a priority.**

Modernizing passenger information, enquiry and guidance systems at the stations and its integration to real-time train running by use of intelligent technological aids would be another important challenge.

(c) Redevelopment of Stations

Many of the railway stations located in major metropolitan cities individually handle more passengers than the combined numbers handled by all airports of the country put together. However, the stations are inadequately designed and equipped to handle such large multitudes of passengers. They do not provide easy access or comfortable experience prior to boarding or after disembarkation from trains. Street-level access is generally restricted to one or two end-platforms (except at terminal type of station layouts). Inter-platform connectivity is through foot over-bridges which are often inadequate, apart from being passenger-unfriendly. Good-quality waiting space and modern shopping or retail, pertinent to passengers' needs is largely absent. Incoming and outgoing passengers are not segregated at platforms. Platforms are also used for parcels. Catering stalls occupy a part of the limited space on platforms. All these lead to severe congestion on platforms. In addition, lack of sustainable waste management practices mark out our major stations for lack of hygiene and cleanliness.

Besides these functional inadequacies, most of the stations have not been built with any architectural or aesthetic consideration and as a result act as poor introduction to the cities they serve.

These stations must be easy to access and use, pleasant to spend time in and must be fully integrated with the surrounding city. 50 stations have already been targeted for development as world-class stations. New directional terminals need to be built in major metropolitan cities. This calls for massive resources and organizational capabilities. Leveraging a part of the real-estate occupied by the stations, including the use of the airspace, and viability gap funding by government could make development of such stations an attractive proposition for PPP. However, developing, awarding and executing projects of such complexity through PPP are a serious challenge.

d) Slow-moving Passenger Services

Passenger services stopping at all stations are run with poor-quality coaches. These also pose a serious challenge to management of train operations in a freight-passenger mixed environment. Introduction of modern, comfortable Electrical Multiple Units/ Modified Electrical Multiple Units/Diesel Multiple Units (EMU/MEMU/DMUs) capable of quick acceleration/deceleration to replace slow-moving passenger trains would not only enhance the quality of service, but also help improve operations.

(e) Raising of Speed

Improvement of speed to 160-200 kmph on segregated passenger corridors would be necessary to meet the requirement of fast intercity travel between major cities. In the long run, however, genuine high speed trains with travel speeds exceeding 300 kmph would be needed to keep pace with developments in other parts of the world.

(f) High-speed trains

Construction and operation of high speed lines is, however, very expensive and would require capital infusion and passenger patronage of a very high order. Massive capital investment would necessitate running of trains at frequent intervals of 5-10 minutes with sufficient load factors. Farebox revenues may not be sufficient to cover cost of infrastructure and operation for a long time. **This would, therefore, call for innovative approaches; a mix of viability gap funding from government - both at central and state levels- and leveraging of real-estate would be necessary to attract successful PPP interest in these projects.**

(g) Suburban Transport

In the suburban segment, the main challenges are the creation of adequate capacity, segregation of commuter lines from long-distance lines and expansion of services to ensure comfort of commuters. Partnership with state authorities will be necessary for development of suburban rail systems. Railways may also aim at integrating the metro-rail and sub-urban rail-systems under a single management in partnership with the respective state/city authorities.

3.4 Challenges for Parcel Business

In parcel business, the main challenges are enhancement of carrying capacity (rolling stock and dedicated terminal infrastructure) and re-positioning the business as a separate service rather than a piggy-back service of

the passenger business as now. Unexplored or under-exploited opportunities in the white-goods and agri produce sectors could be realized through investment in storage and handling facilities at loading and unloading ends and development of allied infrastructure for connectivity to road and other modes, in partnership with aggregators and logistics players in the field. This would call for a separate organization.

3.5 Other Challenges

(a) Human Resources

Indian Railways is one of the largest employers in the world with a 1.4 million strong workforce. **The committed work-force of Indian Railways constitutes a key pillar of its strength.** Over the years, conscious steps have been taken to match the skill of employees with the emerging challenges thrown up by advances in technology and changes in the market environment. As a corporate policy, Indian Railways has set itself a goal of 1% reduction in the sanctioned strength per annum, assuming a 3% annual natural attrition, to reach an equilibrium level of right-sized staff-strength. Recruitment and training of railways have been tailored to adapt to modern technology in rolling-stock, track and signaling systems and use of information technology. **However, to meet the future challenges and prepare the employees to play their expected role in a changing environment, a focused HR strategy will be needed.** This would encompass alignment of organizational goals with employees' career advancement expectations, Participative Management, training of employees through tie-up with top-notch management and technical Institutes and upgradation of in-house training facilities and creating in the right motivational climate for employees to excel in their jobs.

(b) Organizational Structure

To be successful in its mission, any organization has to achieve a balance between the forces of differentiation and integration. Presently, Indian Railways are organized on departmental lines in terms of functions such as Civil Engineering, Mechanical Engineering, Electrical Engineering, Signal & Telecom, Stores, Security, Traffic, Accounts and Personnel etc with administrative overlays at divisional, zonal and Railway Board level to integrate these functions in achieving the basic goal of the organization to produce railway transportation services for freight customers and passengers coherently and efficiently. This structure has mostly delivered in an era when the competitive landscape was characterized by fewer challenges and the task to be performed could be broken down to the simplest elements for specialization by various departments. As the competition from road and aviation sectors hots up and expectations of customers rise, an organization steeped in a departmental and differentiated culture would prove increasingly rigid and incapable of analyzing and responding to the challenges. Organizational restructuring is, of course, fraught with challenges of its own and needs to be carefully attempted. One possible approach to address this issue could be to reconfigure the organization by separating infrastructure from operations and reorganization on business lines i.e. passenger, freight and parcel and other auxiliary services so that each service could be managed and measured on a profit-centre basis. Areas, other than core operations, where appropriate, could be corporatised to impart business focus and managerial autonomy for such tasks.

CHAPTER-IV

Potential for Growth

Prospects for GDP growth and transport elasticity of more than unity indicate that IR has an opportunity to plan for and aim at high growth. A disaggregated and bottom-up analysis of the freight, passenger and parcel businesses, as shown below, also broadly corroborates the conclusion.

4.1 Freight Business

The freight basket of Indian Railways is dominated by nine major commodity groups, namely coal, iron and steel, iron ore (both for export and domestic steel plants), other raw materials for steel plants cement, food grain, fertilizer, petroleum products and container traffic (See Table-7 below).

Table-7:

Table-7: Composition of freight traffic in 2008-09

Commodity	Tonnage (Million)	Percentage	NTKM (Billion)	Percentage
Coal	369	44.3	21.4	39.7
Iron ore	131	15.7	51.0	9.5
Pig Iron & Steel	27	3.3	25.3	4.7
Cement	86	10.3	47.3	8.8
Fertilizer	41	5.0	35.0	6.5
Mineral Oil (POL)	39	4.7	24.9	4.6
Food grains	34	4.1	44.5	8.3
Container traffic	29	3.5	36.0	6.8
Others	77	9.1	60.6	11.1
Total	833	100.0	538.2	100

Future Prospects

4.1.1 Coal

Presently, coal accounts for close to 45% of the total loading of Indian Railways. In the year 2008-09, IR carried 369.4 million tonnes of coal, 71% of the quantity being for thermal power stations, 11% for steel plants and the rest for other industries and public use. It has been projected in Ministry of Coal's Vision 2025 document that the country's coal production is set to increase to almost 1060 million tones by 2025 from the present level of 470 million tonnes. Most of the growth would come from Eastern Coalfield Limited (ECL), Northern Coalfield Limited (NCL), Central Coalfield Limited (North Karanpura), Southeastern Coalfield Limited (Korba) and Mahanadi Coalfield (Ib Valley and Talcher). Central Electricity Authority (CEA)'s projections show that by the end of the XII plan demand of coal for coalbased power plants would be around 770 MT, of which around 60 MT would be

imported. Extrapolation of the anticipated trend to 2020 shows that demand would rise to around 880 MT. Some of the newer plants located near pitheads or ports would use non-rail alternatives such as conveyer belts or merry-go-round systems. However, for most of the rest, coal will move over longer distances as the sources of coal would be increasingly limited to South-eastern Coalfield and Mahanadi Coalfields (ECL and NCL being primarily dedicated to pithead plants) and imports at various ports. Steel and cement industries and other bulk users of coal are also set to expand on a big scale.

It is estimated that coal traffic would increase to 700 MT by the year 2019-2020. Movement of quantities on this scale would call for capacity augmentation on the new routes through which the traffic would traverse and innovations in operations and rolling-stock to bring down terminal detentions, transit times and unit cost of operation. Last-mile connectivity to new blocks, especially captive mining blocks which would account for more than 200 MT of coal by the year 2020 and terminal handling infrastructure at various coal importing ports will also be crucial.

4.1.2 Iron & Steel

During the year 2008-09, IR carried 27 MT of finished steel and pig iron. Sustained growth in GDP and the investment in infrastructure would increase the steel intensity of the economy. This would ensure that demand for steel would rise. Major capacity additions will take place in the states of Orissa, Jharkhand, Chhatisgarh and West Bengal. Ministry of Steel has projected that capacity of steel production in the country would reach the level of 124 MT by the year 2011-12, up from the present level of around 55 MT. Judging by the MOUs worth 276 MT signed with various states, it is expected that the country would have a production capacity of around 180 MT of steel by the year 2020. Presently, around 50% of the domestically produced steel moves by rail. The share can be improved to 60% with appropriate marketing and technological interventions. It would, therefore, be possible to attract 108 MT of steel to rail by the year 2020. Given that each million tonne of steel gives rise to the movement 1.8 MT of iron ore, iron ore loading would also rise pro rata. A part of the steel industry will be serviced by maritime transport or slurry pipe lines. Even on a conservative assessment, 150 MT of iron ore traffic can be expected.

4.1.3 Iron-ore for export

Iron ore for export had stagnated at between 10 and 15 MT during the period 1975 to 2001, but witnessed an explosive phase of growth in the recent years following a spurt in demand from China, reaching 52 MT in 2007-08. The traffic is vulnerable to demand fluctuations in export market and changes in the export policy. However, for a long time in the foreseeable future, the country will have considerable exportable surplus of iron-ore fines. It is, therefore, expected that iron ore for export may grow, albeit slowly and unevenly. It is expected to stabilize at around 75 MT by the year 2020.

4.1.4 Food-grain

Food-grain movement is typically difficult to predict. As the locus of agricultural growth shifts gradually away from the Punjab and Haryana region towards the eastern and the southern parts of the country, transportation requirement of food-grain may grow slowly. On the other hand, international trade in food-grains is likely to gain in importance. The pattern of movement would be uncertain. The implications for railways are, therefore, difficult to assess. On balance, given the growth in population, the imperatives to iron out inter-regional imbalances from

year to year and anticipated expansion of exim trade in agri- produce, it can be assumed that approximately 50 MT of food-grains would be loaded by the year 2020 against the present level of about 40 MT.

4.1.5 Fertilizer

Fertilizer constitutes approximately 5% of the Railway's total traffic, but share of rail transport in fertilizer movement is about 76%. Over the last decade, while indigenous production of fertilizers has stagnated, imports have gone up to bridge the gap. Demand of fertilizer is expected to grow in the coming years because of the concerns of food scarcity, stress on spreading the Green Revolution to the eastern and southern parts of the country, increased acreage under cultivation and improvement in irrigation facilities. A compounded annual growth rate of 5% in fertilizer demand would be a reasonable assumption and the total fertilizer movement by rail by 2020, assuming that the rail-co-efficient remains unchanged, will be 70 MT. Infrastructure at ports will be crucial for this traffic.

4.1.6 Cement

Growth of the cement industry is closely aligned with GDP growth. Cement production has been growing steadily at the rate of 8% per annum and it is expected that by the year 2020 the cement manufacturing capacity in the country may reach 500 MT, going up from the present level of around 230 MT. Presently, Railways carry around 43 % of the cement and clinker. Future trends in cement transportation would be marked by a shift to bulk movement of clinker to grinding units, short-radius distribution of cement, decline in the movement of bagged cement in favour of bulk cement and ready mix concretes. Fly-ash from power plants will also be increasingly used as a raw material for cement production. It is expected that the rail share in cement/ clinker movement may rise to 50% (i.e. 250 million tonnes) provided Railways seriously approach the task and prepare themselves to carry bulk cement. Railway would, however, be under pressure to hold on to their share in bagged cement movement with the grinding units coming up closer to consumers.

4.1.7 Petroleum

The projected demand of petroleum products by 2025 will be 370 million tonnes as per the Hydrocarbon Vision 2025. It is anticipated that about 45% of the POL products will move by pipelines, 26% by rail, 16% by road and 16% by coastal shipping. Petroleum movement by rail in the last 8 years has been growing at a slow average rate of 1.6%. Projected rail movement for POL traffic is estimated to be around 48 MT in the year 2020 (This assumes that the traffic will grow at an average rate of 2% from 38.9 MT in 2008-09).

4.1.8 Container Traffic

With increasing integration with the global economy, our share in world trade will continue to rise steadily from the present level of 1.5%. The present trend of increasing containerization of cargo will also continue. Maritime container traffic in India is growing at an annual rate of nearly 14% compared to the global growth rate of 7-8%. Till 2006, container service by rail was operated only by Container Corporation of India (CONCOR), a public sector undertaking under the Ministry of Railways. In 2006, private operators were permitted and licensed to enter the container rail business. Many of the operators started operations in 2007-08. While CONCOR's business grew

by 15.2% in 2007-08 over 2006-07, the total container business grew by 23.4% during the same period. The difference is explained by the additional traffic brought in by the private players. These growth rates, however, mask the true potential of the market which is limited at present by constraints at ports, inland container depots and to some extent, carrying capacity of the Railways. These constraints are now being addressed by the respective agencies. Container Train Operators are bringing in their own rolling stock and also adding to terminal capacity. Increased competition among the container operators will not only expand the market served by the Railways, but also improve service levels.

In addition to maritime container traffic, containerized movement of domestic traffic is also emerging as a traffic stream of considerable promise. It is expected that the level of containerization would rise from 45% to about 70% in 2020. Containerization of various products presently moving piecemeal and mostly by road could facilitate aggregation and thus make it amenable to rail movement. Container Train Operating companies are already engaged in tapping this market. It is expected that the market will grow as adequate terminal capacities are built, bottlenecks on congested routes are removed and transit times improved. An annual growth of 20% in container tonnage appears to be a reasonable assumption.

Container traffic, therefore, is expected to touch 210 million tonnes by 2020.

4.1.9 Others

Apart from the traditional segments where Railway already have a dominant presence, several other opportunities will unfold in respect of commodities such as fast moving consumer goods (FMCG), fly-ash and automobiles. However, in order to tap these opportunities and build them into new growth platforms, Railways would have to forge partnerships with logistics providers and develop industry- friendly special-purpose rolling stock and transportation services. A total of 100 MT of other traffic is anticipated by 2020.

4.1.10 In summary, the above analysis adds up to the following level of freight traffic by 2020

Table-8: Summary of projected freight loading by IR by 2020

S.No.	Commodity	Originating loading (Million tonnage)
1.	Coal	700
2.	Raw Material for Steel Plants	39
3	Pig Iron & Finished Steel	108
4	Cement	250
5	Iron Ore (Exports)	75
6	Iron Ore (Domestic)	150
7	Food grains	50
8	Fertilizers	70
9	POL	48
10.	Containers	210
11.	Others	150
12.	Total	1850
		(1203 billion NTKMs)

The above implies a CAGR around 8% and an average lead of 650 kms as at present. However, given the goal of high growth and the need to keep ahead of GDP growth, planning must be done on the basis of 10% growth per annum. On this basis and assuming that Indian Railways shall pursue an aggressive customer-centric and market-focused high growth strategy, expected freight loading and movement for the years of years of 2011-12 and 2019-20 would reach the following level:

Table-9:		
	2011-12	2019-20
Originating loading (MT)	1010	2165
NTKMs (Billions)	656	1407

4.1.11 Market Share

Railways will aim at capturing 50% of the freight moving over 300 kms distance and more than 70% of the bulk cargo moving in large volumes in the same distance range.

Vision for Freight Services

Freight services would be transformed by segregation of freight and passenger corridors, construction of dedicated freight corridors, improving the speed of transit, cost-efficiencies in bulk transport and meeting the needs of customers in terms of service delivery, logistics services, transit time and tariff.

4.2 Passenger Business

IR's passenger traffic has been growing at a fast pace in the recent years. The following tables show the trends of passenger growth over the last five years and the composition of the traffic in 2007-08, respectively.

Table-10: Growth of Passenger Traffic on IR:						
	Originating passenger (Million)	% change over previous year	Passenger kms (billion)	% change over previous year	Passenger revenue (Rs.crores)	% change over previous year
2003-04	5112	2.84	541.2	5.08	13260	5.73
2004-05	5378	5.20	575.7	6.37	14073	6.13
2005-06	5725	6.45	615.6	6.93	15081	7.16
2006-07	6219	8.63	694.8	12.86	17176	13.89
2007-08	6524	4.90	770.0	8.82	19811	15.34

Table-11: Composition of Passengers (2007-2008):						
	Passenger (Million)	%	PKMs (Million)	% PKMs	Revenue (Crore)	%
Suburban (total)	3689	56.5	119842	15.6	1570	8.0
Non Suburban						
Upper Class	65.6	1.0	40948	5.3	4308	21.8
Sleeper class M/E Ord.	222.4	3.5	157674	20.5	5026	25.4
Second class M/E	554.1	8.5	227161	29.5	5420	27.4
Second class Ord.	1993	30.5	224381	29.1	3459	17.5
Non- suburban (total)	2835	43.5	650114	84.4	18214	92.0

4.2.1 Demand for passenger services will continue to outstrip supply for some time to come owing to increasing prosperity, urbanization and the attendant increase in propensity to travel. **Train travel also has to be re-positioned and perceived as the mode of choice by passengers. Railways would aim at fully meeting the demand.** This would require close attention to the issues of ***speed, comfort, convenience, choice, elimination of shortage, punctuality maintenance, elimination of equipment failures, improved quality of service and a very pleasant travel experience overall right from booking of ticket to disembarkation at the destination point.***

4.2.2 To achieve the above, constraints on the trunk routes need to be eased and busy passenger service corridors need to be segregated from the freight corridors by provision of separate dedicated double-line tracks for each service. Routes approaching major cities need to be provided with additional lines to run commuter services separately.

The speed on passenger corridors needs to be improved from 130 kmph (Rajdhani/Shatabdi) or 110 (other Express trains) to 160 to 200 kmph on trunk routes so that important inter-metro journeys like Delhi-Kolkata and Delhi-Mumbai could be completed by overnight runs.

Manufacture of modern coaches to meet incremental as well as replacement requirements (at the rate of 1000 to 1200 coaches per annum) would be essential. Existing plans to expand the capacity at Integral Coach Factory, Perambur and Rail Coach Factory, Kapurthala and set up new manufacturing facilities at Rae Bareily, Palghat and Kanchrapara need to be implemented in time. High-horse power locomotives need to be inducted into coaching service to improve speeds and punctuality.

The maintenance regime would need to be reviewed to optimize utilization of coaches. Terminal and maintenance facilities, remodeling of coaching terminal yards would also require commensurate investment.

4.2.3 Passenger trains can also be positioned and targeted at novel uses. Specially designed trains can act as business centres on wheels or carriers and disseminators of cultural and scientific awareness. Indian Railways is already doing this in a small way through tourist trains, Lifeline express and the Red-Ribbon Express. These segments can be expanded.

4.2.4 Projected growth of passenger service based on average growth of originating passengers at 8% and PKMs at 10 % per annum respectively at the horizon years of 2011-12 and 2019-20 is shown below:

Table-12: Projected growth of passenger traffic

Year	Passenger (Million)	PKMs (Billion)
2011-12	8200	1100
2019-20	15180	2360

Passenger Services Vision

By 2020, Railway's passenger services would be ***transformed from a supply- constrained business to a state of availability on demand.*** Quality of services in terms of punctuality, safety, security, sanitation, cleanliness and amenities at stations and onboard, catering and other value- added services (pre-boarding and post -disembarkation) would be upgraded to match the best in the world. Access to railway services will also be improved by using existing and innovative networks of distribution channels like internet, mobile telephones and other vending mechanism. Enquiry services would be transformed by using online data from train operations and emerging technologies of internet and mobile telephones. Speed of trains would be raised to 160-200 kmph on segregated passenger routes and work on a few selected corridors of high speed trains travelling at 250kmph to 300 kmph would be initiated. Special attention will be paid to meet the requirements of lady passengers, students and youth.

4.2.5 Parcel Business

Parcel traffic, mostly carried along with the passenger services is presently estimated to account for barely 2% of the total non-bulk traffic of the country. Recently a number of initiatives have been taken to realize the enormous potential of the parcel business. These include leasing out of parcel vans and a policy shift away from piecemeal traffic in parcel vans in passenger-carrying trains toward movement in rakes of parcel trains between dedicated parcel terminals. Further, stress has been laid on attracting new traffic like automobiles and agri-produce in addition to conventional high-rated parcel traffic like white goods, processed food, FMCG, electronic goods, textiles, perishables. As a result of these measures, there has been a perceptible growth in tonnage and earnings from parcel business during the last five years:

Table-13: Growth in Parcel Business:

Year	Tonnage (In million tonnes)	Earnings (Rs. in crores)
2004-05	4.19	532
2005-06	4.63	637
2006-07	4.94	900
2007-08	5.54	1008
2008-09	5.92	1081

4.2.5.1 A lot more, however, remains to be done to realize the full potential of the business. A market-oriented strategy, with focus on total logistics support, value-added services, rational cost-and-value-based tariff, state-of-the art IT applications for providing real-time online access to information on movement of consignments and adequate and appropriate rolling stock and public private participation in terminal operation and road bridging are needed. Dedicated parcel terminals with mechanized handling facilities , specifically targeted at agri-produce, automobiles, other industrial products and general parcels and a focused organization that would concentrate on marketing, sales and transport of parcel services within an agreed transit time through timetabled trains and parcel specials would be needed. Experimentally, for a few identified corridors, licensing of parcel operators to bring in rolling-stock and handle marketing include first-mile and last-mile activities could be tried. This will be particularly relevant for clusters serving SMEs and agri-produce hubs.

4.2.5.2 Provided that the above measures are taken, the business can be projected to grow at a fast pace. Anticipated growth in parcel business for the three horizon years of 2011-12 and 2019-20 is shown below:

Table-14: Projections of parcel business:

Year (Rs. in crore)	Revenue
2011-2012	1644.00
2019-2020	8000.00

4.3 Sundry Earnings

Apart from the three main businesses, other areas like advertising and commercial utilization of the surplus land of Railways would need to be tapped to the fullest extent. A market driven strategy will be adopted to unlock the enormous potential to increase earnings on advertising using freight and passenger trains (both inside and outside), CCTV at stations, multi-lingual magazines for rail passengers and merchandising opportunities for a number of items ranging from tickets to food stuff and other material served on trains offer promising possibilities for advertising. Railways can also think of **launching a separate TV channe**l to disseminate information and earn revenues through advertisement. Similarly, commercial utilization of land and the right of way alongwith track for laying optic fibres and erection of signaling towers, etc. can be tapped to the fullest extent.Sundry earning are presently are at a level of Rs.3000 crore per annum. By 2020, it is projected that revenues from these sources would witness at least a five-fold increase.

CHAPTER-V

Goals at a glance for 2020

5.0 By 2020, IR would strive to

a) Establish quality of service benchmarked to the best of the Railway systems in the world.

b) Expand its route network at the rate of 2500 kms per annum. By 2020, 25,000 kms of new line will be added and almost the entire network (barring the hill and heritage railways) would be in Broad Gauge. This would include completion of the pending shelf of new line projects of 11985 kms. More than 30,000 kms of route would be of double/multiple lines. Electrification of 14,000 kms of routes would take the total length of electrified route to 33,000 kms. This would include all inter- metro links and the other busy corridors.

c) Have more than 6000 kms for quadrupled lines with segregation of passenger and freight services into separate double-line corridors. This shall include Delhi-Kolkata, Delhi-Mumbai, Kolkata-Mumbai and Delhi-Chennai routes. All these routes would have separate dedicated freight corridors and high-speed passenger corridors.

d) Raise speeds of passenger trains from 130 (110) kmph to 160-200 kmph on segregated routes and speed of freight trains from 60-70 kmph to 100 kmph.

e) Virtually attain a state of "**availability on demand**" in freight, passenger and parcel services.

f) Design and deliver targeted services for transport of perishables, agri-produce and products of small and medium enterprises (SMEs) such as auto-hubs and others similar clusters.

g) Target to achieve **Zero accidents**.

h) Target to achieve **Zero failures** in equipments.

i) Utilize at least 10% of its energy requirement from renewable sources and institute a foolproof eco-friendly waste management system.

j) Complete 4 high-speed corridors of (2000 kms) and plan development of 8 others.

Table - 15: Summary of broad goals

Broad category	Short Term Target (2010-11-2011-2012)	Long- term Target (2012-2013-2019-20)	Total Target
Doubling (including DFC)	1000 kms	11000 kms	12,000kms
Gauge conversion	2500kms	9,500kms	12,000kms
New line	1000kms	24,000kms	25,000kms
Electrification	2000kms	12,000kms	14,000kms
Procurement of wagons	33909	255227	289136
Procurement of diesel locomotives	690	4644	5334
Procurement of electric locomotives	555	3726	4281
Procurement of passenger coaches	6912	43968	50,880
World-class stations (Bid-out/concession)	12 stations	38 stations	50 stations
High-speed Corridors	--	2000 kms	2000 kms

5.1 Attainment of the goals set out above would also call for concerted action on a few key areas on a mission mode. Critical mission areas would, among others, include technology, development of human capital and a culture of innovation. This has been elaborated in some detail in **Chapter-VI.**

5.2 Needless to mention, adequate resources must be found to implement and attain the ambitious goals set out above. This has been dealt with at some length in **Chapter VII.**

5.3 Broad areas of capacity enhancement and modernization to achieve the above goals along with a very rough and tentative assessment of the magnitude of investment needed are shown in **Annexure-II** in terms of Short-term (2010-2011 - 2011-2012) and Long-term (2012-2013 - 2019-2020) plans. The operational strategy to translate the vision into action has been spelt out in **Annexure-III.**

FIVE CRITICAL FACTORS THAT WILL HELP ATTAIN THE VISION

The vision is based on a high-growth and high market-share strategy for freight, passenger and parcels. Growth will be achieved through highly satisfied customers. The shortage syndrome will be consigned to history. This will critically hinge on the following:-

1. Capacity bottlenecks must not constrain growth. Adequate investments will be directed towards building capacity through network expansion, doubling/quadrupling gauge-conversion, speed-raising, last-mile connectivity and traffic facility works.

2. Optimal mix of internal, budgetary and extra-budgetary resources will be found for this purpose.

3. Efficient project execution to ensure efficient utilization of resources and completion of projects within targeted time and cost would hold the key.

4. Near- total level of safety, efficient utilization of assets and infallible levels of reliability of the system benchmarked to the best in the world through predictive and diagnostic tools and highly trained and motivated employees.

IT tools would be used to enhance customer satisfaction, maximize productivity of assets and improve governance.

CHAPTER-VI

Critical Mission Areas

Removal of Infrastructural bottlenecks, creation of adequate capacity, design and delivery of highly efficient market-driven services and safety and reliability of operations are critical elements of the plan to attain the high-growth goals outlined the Vision. Equally important would be the aspect of building institutional and organizational capacity to deliver on these goals. These areas will be taken up in a mission mode.

6.1 Infrastructure

Capacity augmentation on the scale required for the Vision (outlined in Chapter-V) would not only require massive resources but also call for organizational and project-execution challenge of an unprecedented magnitude. Procedures pertaining identification, appraisal, approval and execution of projects would be streamlined. Planning and project-execution process would be reorganized and reoriented to implement and deliver whole projects (for instance, an entire route, rather than small fractions at a time) strictly within the targeted time and budgeted expenditure. Operationally necessary high-priority projects would be identified, sanctioned and assured full funding. PPP would be used to the maximum extent for efficient execution of projects in areas like world-class stations, cold-chain facilities and connectivity to ports.

In the short to medium term, the emphasis would be on quick- payback projects such as freight bypasses, terminal and line capacity works and opening of alternate routes to ease congested corridors. The long-term goal would be to segregate freight and passenger corridors on major trunk routes and raise the speed and efficiency of operations on both routes.

6.2 Safety - Zero tolerance for accidents

In 10 years time, Indian Railways would target to banish accidents from its operations. This would be achieved through a combination of technological and HR interventions. Renewal, replacement, upgradation and technological aids for early detection of flaws and mechanized, integrated maintenance of both track and rolling stock would be planned and managed from the standpoint of attaining the goal of zero derailments. Crash -and-fire worthiness of coaches would be enhanced. Advanced signaling technology (such as automatic verification of train movement and line occupation through track circuiting/axle counters, Train Protection Systems and Anti-Collision Devices) would be used in combination with training of station and running staff to eliminate collisions. Communication, inter-locking and warning devices at manned level crossing gates would be improved. Unmanned level crossing gates would be progressively manned or protected or replaced by subways, Road Over Bridges and Under Bridges (ROB & RUBs) in the next five years' time. Fencing of trucks at vulnerable

locations will be undertaken to eliminate the possibility of trespass onto the track.

Security on stations and running trains and patrolling of tracks on vulnerable areas would be beefed up to safeguard passengers and rail-users from the threat of accidents arising from miscreant activities.

6.3 Technological leap

Role of technology in an industry like Railways can not be overstated. Technology plays a crucial role in enhancing productivity, asset life, safety and reliability of operations as also the interface and experience of customers. It is also a source of significant cost and competitive advantage. Some of the key areas for which technological solutions would need to be found include improving the comfort of passengers, in particular, second- class passengers, development of green toilets and safe, clean coaches, double -decker inter-city trains, improvement in the payload/carrying capacity of freight rolling- stock, improvement in safety and reliability of operations, raising the speed of trains and interface with passenger and freight customers. Technology can also be used for mechanized cleaning of trains and stations while conserving water and for adopting sound waste-management practices. The key challenges in technology are:

a) Adoption of the best , state-of-art and cost-effective technologies in all facets of railway operations- construction and maintenance of infrastructure and rolling stock , use of information technology to monitor performance and improve the ease and access in using railway services on the part of customers,

b) Finding the most optimal route of adoption and diffusion of technology;

c) Adaptation of technology to Indian conditions and continuous upgradation to stay ahead of the race in the technological cycle;

d) Recruitment and training of employees for continuous upgradation of skills to match the requirement of challenging pace of change in technology;

e) Ushering in a culture of innovation and inventiveness; and

f) Use of technology to continuously achieve cost innovation and reduction in cost of operations.

6.3.1 Compressing the technology cycle

In the past, Indian Railways has adopted the route of technology transfer in several areas such as electrification, signaling, manufacturing of locomotives and components, construction and maintenance of track. It has successfully adapted these technologies to Indian conditions and trained its workforce to use the technology effectively. It has also innovated in respect of several areas of asset maintenance, freight rolling stock and information technology, but IR has generally been a late adopter of the leads and strides made in technology. **A conscious strategy to mitigate the risk of obsolescence and continuously stay ahead in technology race would be put in place.** This would be achieved by fostering close linkage between RDSO, functional levels of

railway administration and intellectual resources at premier technology institutes like IIT and NITs and research laboratories of CSIR and DRDO along with targeted investments in R&D. **In ten year's time, IR would be transformed from a net technology importer to technology exporter.**

6.3.2 Development of indigenous capabilities

In most parts of the world with the developed railway systems, technology leadership has generally been achieved through investments in R&D and a vibrant railway equipment industry in the private sector. In our country, this is missing at present. Public Private Partnerships (PPP) and close linkage with private industry would be used to match and surpass the technological capability of the best of the world's railway systems. By 2020, IR will aim at not only sourcing nearly all its requirements from domestic sources, but also relying on entirely indigenously developed state-of-the art technologies. This would enable establishment of a vibrant and globally competitive rail component and equipment industry in the country.

6.4 Human capital

Railways have established an unblemished reputation of being a model employer. It has attracted and retained some of the best civil service and engineering talent in the country to man its managerial cadres. However, in the face of stiff competition for talent in the country, especially from the highly competitive private sector, Railways can not remain complacent on this score. Government ownership confers certain advantages and entails certain disadvantages in this respect. A government job is still regarded attractive but government can not compete with private sector on compensation. The only way to attract and retain talent is to provide a very challenging and stimulating environment where talented employees can realize their full potential, contribute to the growth of railways and take pride in the public service ethos of the organization. Only vibrant and growing railways can provide that attraction.

As a part of the Human Capital Mission, the requirement of jobs at various levels will be assessed and mapped. Recruitment of the right kind of talent, training, grooming and career planning of employees linked to performance and the challenges facing the organization will form part of the Mission. An optimal mix of external and in-house training as well as collaboration with topmost management and technical Institutions will be used to achieve the mission's objectives. Infrastructure at IR's training facilities will be strengthened and augmented to meet the challenge of capacity-building for anticipating and managing change, building, operating and continuous upgrading a market- focused and technologically sophisticated railway system.

6.4.1 Industrial Relations

Management of industrial relations in Railways is underpinned by some exemplary systems like Permanent Negotiating Machinery (PNM) and Participation of Railway Employees in Management (PREM). These systems would be strengthened and used to achieve consensus and generate necessary organizational synergy towards attainment of the ambitious goals.

6.4.2 Innovation

A climate in which innovations are encouraged and rewarded would constitute the third pillar of the management of the human capital. Railways would institutionalize a system to receive innovative suggestions from all quarters- employee, citizens and railway users. These needs would be evaluated and proponents of useful ideas selected for execution would be suitably rewarded. An Innovation Incubation Cell with a dedicated and replenishable fund would be set up to take up follow-up on innovative ideas received from all quarters to their logical conclusion.

6.5 Carbon Mitigation and Carbon Credits

Railway is a highly energy-efficient and eco-friendly mode of transport. The objective of the Mission would be to strengthen the advantage to the furthest limits. The mission would set challenging targets for carbon productivity and devise a road-map to achieve the same in a cost-effective manner. The roadmap would aim at making railway's operations environment-enhancing at an aggregate level. In other words, infrastructure creation and railway operation would not make any draft on the environmental resources and on the other hand would over-compensate the environmental damage caused by transport activities by adopting green technologies. Every facet of railway's operations and infrastructure will be critically reviewed from this angle. Indian Railways has already taken several measures to perform its responsibility towards climate protection. Some of these measures are:

(a) New trains that have been introduced in Mumbai's suburban section equipped with regenerative braking features. These have shown energy regeneration, while braking, to the tune of 35-40% of energy used for hauling these trains.

(b) To take advantage of the Clean Development Mechansim (CDM) framework, Indian Railways has developed, in association with the World Bank, a Project Design Document (PDD) for registration with UNFCCC. The project is expected to result in reduction of 100, 000 (approx.) tons of CO2 emissions per annum. It has received Host Country Approval.

(c) For sensitization of railway employees on their responsibility towards the environment, Indian Railways has taken up a project for replacement of energy inefficient incandescent lamps with energy efficient Compact Fluorescent Lamps (CFLs) in railway quarters. As many as 26 million CFLs (4 CFLs per family) will be distributed to railway employees residing in railway quarters free of cost, upon surrender of equal number of incandescent lamps. This is expected to reduce 0.14 million ton of CO2 emissions per annum. The project is entirely financed with the carbon credits earned under CDM framework.

(d) Light-weight stainless steel coaches with enhanced passenger carrying capacity and new designs of freight stock are being developed with higher payload to tare ratio.

(e) Production of high-horse power, fuel-efficient EMD design of locomotives at Diesel Locomotive Works (DLW) has been increased and complete switch-over to the manufacture of these locomotives has been planned.

In the coming decade, Indian Railways envisages big initiativesas part of the National Action Plan on Climate Change: the Diamond Necklace of Dedicated Freight Corridors and the High-Speed Passenger Train Corridors. Both have the potential to reduce millions of tons of CO2 emissions per annum. It also envisage setting in motion the following initiatives:

(i) Harnessing both existing tools (like CDM) and emerging tools like Nationally Appropriate Mitigation Actions (NAMAs) for transfer of technology as well as financing.

(ii) Energy Efficiency -. upto 15% energy saving is achievable in Indian Railways. Achieving maximum energy efficiency in traction (which accounts for 87% of energy consumed by Indian Railways) as well as non-traction use will receive the highest priority.

(iii) Inducting new-generation locomotives and rolling stock, that use less energy and less material.

(iv) Energy audits would be carried out to improve energy efficiency on thousands of its stations and offices. LED lighting and Energy Conversation Building Code (ECBC) would be adopted.

(v) At least 10% of energy used would be sourced from renewable sources such as solar power and biomass.

(vi) Indian Railways would vigorously implement a policy to procure only 3-star or higher-rated products for achieving energy efficiency. Henceforth, all Indian Railway's Vendors, partners, SPVs and projects are going to be eco-friendly and climate compliant with exacting standards.

(vi) Railways will also undertake a massive plantation drive along the Railway tracks, in railway colonies and use grass-turfing as a protective anti-erosion measure on the slopes of the banks along the track.

6.6 Public Private Partnerships

To achieve the mammoth task Railway has set itself, it has to concentrate on its core activity of creation of railway infrastructure and operations and forge partnerships with private sector to do the rest. The challenge of project execution and efficient provision of service can not be accomplished without involving private sector in a big way. However, the activities and projects to be opened for private participation have to be carefully selected and structured for their amenability to market-based incentives and smooth execution. Several areas currently identified for execution through PPP such as redevelopment/development of world-class stations, high-speed corridors, setting up of Multi-modal Logistics Parks, Kisan Vision projects, expansion and management of the extensive network of Optical Fibre Cables (OFCs) and big infrastructure projects like new lines and Dedicated Freight Corridors, rolling-stock manufacturing units, Multi-functional Complexes at stations and port connectivity projects would need to be developed and awarded on a mission mode. To be able to do so, Railways would have set up dedicated project organizations who would work with model documents and streamlined procedure within the framework determined by Government of India.

6.7 High Speed Corridors

India is unique and alone among the major countries of the world in not having a single high-speed rail corridor capable of running trains at speeds of over 250 kmph. High speed corridors have played a major role in revitalization of Railways in Japan and Europe. Of late, high speed-rail networks are also getting built in China, Taiwan and USA. Indian Railways would follow a two-pronged approach in this respect. The first approach would be to raise the speed of segregated passenger corridors on trunk routes using conventional technology to 160 to 200 kmph. The second approach would be to identify a number of intercity routes, depending on viability, and build state-of- the-art high-speed corridors for speeds up to 350 kmph through on PPP mode in partnerships with the State Governments. Partnerships with the State Governments would be crucial as real-estate development would be a key element of viability of these high-cost projects. By 2020, at least four corridors of 2000 kms would be developed and planning for 8 other corridors would be in different stages of progress.

6.8 Organizational Reform

Professional support would be sought to study and analyze the present organization structure and suggest a roadmap for reorganization to integrate the numerous services and departments into a cohesive organization, committed to the Vision and capable of delivering on the challenging goals. Internal reform through decentralization of decision-making and empowerment of the Zonal and Divisional lands in financial and project execution matters with accountability for results would be undertaken. Reorganization in terms of business lines such as infrastructure, freight, passenger parcel and other auxiliary services could be examined. Activities other than core transportation activities could be corporatised to bring in the needed business focus and managerial autonomy drawing on lessons from successful past examples like CONCOR, RITES, IRCON and IRFC, to name a few of the PSUs of Railways, which have created enormous value for the Government after corporatisation. The ongoing process of Accounting Reforms is seized of the issue of activity-wise costing and will aid accounting separation these activities. By 2020, concrete steps will have been taken to manage each service as a separate and distinct profit centre. The reform will also specifically address the issues of improvement in effectiveness and efficiency in achieving goals and building capacity to execute projects within strict time-schedules and budgetary limits.

CHAPTER-VII

Resource Requirement and Mobilization

A high-growth strategy would require massive investments in capacity creation, network expansion and upgradation. **Annexure-II** shows a list of capacity enhancement and railway modernization works and a very rough assessment of the investment programme needed to support the achievement of the goals of the Vision. Tentatively, it has been estimated that around Rs. 14,00,000 crore over the next 10 years (i.e. up to the year 2020). Of this, most of the investment for world-class stations and high speed corridors could be mobilized through Public-Private Partnerships. A sizeable part of the investment required for port connectivity projects, setting up of electric/diesel locomotive manufacturing units and new coach manufacturing units could also be mobilized through private sector participation by SPV or Joint Venture (JV) route. Metropolitan Transport Projects and some of the new line projects could be taken up with partnerships with the state governments. Public Private Partnerships could also be used in setting up of private freight terminals, logistics parks, wagon investment schemes and licensing of freight service operators who would bring in specialized rolling stock and new terminals. Railways can also borrow within prudent limits through IRFC.

7.1 Availability of internally generated surpluses is expected to go up with 10% annual growth in freight and passenger traffic. It has been tentatively assessed that Railways would be able to generate about 64% of the investment required over the period through internal generation and extra budgetary resources. This implies that the gap of 36% or Rs.5,00,000 Crore would need to be bridged by Gross Budgetary Support (GBS) from the Central Government. In other words, on an average, budgetary support for the programme to implement the Vision 2020 would need to be at a level of around Rs. 50,000 crore per annum.

Attainment of the goals in Vision would require a categorical commitment on the part of Government to ear-mark and ensure a steady-flow of financial support to the programme. This should be ideally in the form of an **Accelerated Railway Development Fund (ARDF)** with budgetary commitment to the tune of approximately, 5,00,000 crore spread over next 10 years. An amount of roughly Rs. 1,00,000 crore of the ADRF could be set aside to clear the pending backlog of socially desirable New Lines and Gauge Conversion projects as a one-time outright grant.

7.2 Budgetary disbursement from the ARDF needs to be front-loaded as a high-growth strategy would necessitate investment in capacity augmentation immediately while the take-off to high-growth and consequently, generation of internal surplus could take at least three years to materialize. During this period, the impact of the implementation of 6th Pay Commission would be fully absorbed and preparatory work to develop and bid out big-scale PPP projects would have been completed to allow a gradual phasing down of the budgetary contribution.

Annexure-I

DETAILS OF ONGOING RAILWAY PROJECTS

S. No.	Rly	Year of inclusion in Budget	Name of the Project (s)	State	Length (in Kms)	Latest anticipated cost	Balance fund required to complete as on 01.04.09
			New Line			(Rs. In Crore)	
1	CR	1995-96	Ahmednagar-Beed-Parli Vaijnath	Maharashtra.	261.25	462.67	420.27
2	CR	1993-94	Amravati-Narkher	Maharashtra	138	284.27	75.02
3	CR	1998-99	Baramati-Lonad	Maharashtra.	54	138.48	108.32
4	CR	2008-09	Wardha-Nanded	Maharashtra	270	697	696.99
5	ECoR	1997-98	Angul-Sukinda Road	Orissa	98.76	344	323.13
6	ECoR	1996-97	Haridaspur-Paradeep	Orissa	82	594	496
7	ECoR	1994-95	Khurda Road-Bolangir	Orissa	289	700	622.26
8	ECoR	1993-94	Lanjigarh Road-Junagarh	Orissa	56	170	84.69
9	ECoR	2003-04	Talcher-Bimlagarh	Orissa	154	810.78	782.8
10	ECR	2008-09	Ara-Bhabua Road	Bihar	122	490.8	490.7
11	ECR	2008-09	Araria-Supaul	Bihar	92	304.41	304.4
12	ECR	2007-08	Bihta-Aurangabad	Bihar	118.45	326.2	324.8
13	ECR	2006-07	Chhapra-Muzzafarpur	Bihar	84.65	378.56	314.75
14	ECR	2006-07	Darbhanga-Kusheshwar Asthan	Bihar	70.14	205	204.86
15	ECR	2008-09	Dehri on Sone-Banjari	Bihar	36.4	106.2	103.95
16	ECR	1998-99	Fatuha-Islampur Restoration and Sheikhpura to Neora	Bihar	171.5	406.92	177.72
17	ECR	2008-09	Gaya-Chhtra	Bihar, Jharkhand	97	415.67	415.55
18	ECR	2008-09	Gaya-Daltonganj via Rafiganj	Bihar	136.88	445.25	445.21
19	ECR	1997-98	Giridih-Koderma	Jharkhand	102.5	451.35	279.46
20	ECR	2003-04	Hajipur-Sagauli	Bihar	148.3	324.66	234.9
21	ECR	1996-97	Khagaria-Kusheshwarsthan	Bihar	42.3	162.87	96.85
22	ECR	1998-99	Koderma-Ranchi	Jharkhand	202	1099.2	874.91
23	ECR	2001-02	Koderma-Tilaiya	Bihar, Jharkhand	65	418.17	388.64
24	ECR	2003-04	Kosi Bridge	Bihar	21.85	341.41	274.46
25	ECR	2008-09	Kursela-Bihariganj	Bihar	57.35	192.56	192.55
26	ECR	2006-07	Motihari-Sitamarhi	Bihar	76.7	211	206.74
27	ECR	1997-98	Munger-rail-cum-road Bridge on river Ganga	Bihar	19.8	981	669.94
28	ECR	2008-09	Muzaffarpur-Darbhanga	Bihar	66.9	281.3	281.23
29	ECR	2008-09	Muzaffarpur-Katra-Orai-Janakpur Road	Bihar	66.55	228.05	228.04
30	ECR	1997-98	Muzaffarpur-Sitamarhi	Bihar	64.5	232.15	51.21
31	ECR	2008-09	Nawada-Laxmipur	Bihar	137	620.57	620.56
32	ECR	1997-98	Patna-Ganga bridge with linking lines bet. Patna & Hajipur	Bihar	19	1389	943.73
33	ECR	2001-02	Rajgir-Hisua-Tilaiya & Islampur -Natesar MM	Bihar	67	245.18	23.32
34	ECR	1996-97	Sakri-Hasanpur	Bihar	76	175.68	49.76

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S. No.	Rly	Year of inclusion in Budget	Name of the Project (s)	State	Length (in Kms)	Latest anticipated cost	Balance fund required to complete as on 01.04.09
35	ECR	2008-09	Sitamarhi-Jayanagar-Nirmali via Susand	Bihar	188	678.62	678.61
36	ER	2001-02	Azimganj(Nasipur)-Jiaganj up to the Ghat	West Bengal	6.6	95.55	55.64
37	ER	2007-08	Bariarpur-Mananpur	Bihar	67.78	450.55	449.77
38	ER	1998-99	Deogarh-Dumka	Jharkhand	72.25	335	63.97
39	ER	2000-01	Deogarh-Sultanganj, Banka -Barahat and Banka-Bhitiah Road	Jharkhand, Bihar	151.28	607.09	454.81
40	ER	1995-96	Mandarhill-Rampurhat via Dumka	West Bengal, Bihar, Jharkhand	130	676	430.2
41	ER	2007-08	Sultanganj-Katuria	Bihar	74.8	450	449.99
42	ER	2000-01	Tarakeshwar-Bishnupur with Ext up to Kumarkundu Bypass connecting Howrah-Bardhman Chord	West Bengal	85	566.99	438.18
43	NCR	1999-2000	Agra-Etawah via Fatehabad and Bah	Uttar Pradesh	114	214.9	110.67
44	NCR	1997-98	Etawah-Mainpuri	Uttar Pradesh	60	142.48	62.63
45	NCR	1985-86	Guna-Etawah	Madhya Pradesh, Uttar Pradesh	344	540.96	135.7
46	NCR	1997-98	Lalitpur-Satna, Rewa-Singrauli & Mahoba-Khajuraho	Madhya Pradesh, Uttar Pradesh	541	925	621.34
47	NER	2006-07	Chhitauni-Tumkuhi Road	Bihar,Uttar Pradesh	58.88	235	221.55
48	NER	2005-06	Hathua-Bhatni	Uttar Pradesh, Bihar	79.64	230.03	128.54
49	NER	2003-04	Kichha-Khatima	Uttarakhand	51.5	208.4	208.251
50	NER	2003-04	Maharajganj-Masrakh	Bihar	36.155	134.43	87.81
51	NER	1995-96	Rampur-Lalkuan-Kathgodam ROB on NH	Uttar Pradesh	0	16.05	15.62
52	NFR	2008-09	Agartala-Sabroom	North East Region & Tripura	110	813.34	812.2
53	NFR	2006-07	Araria-Galgalia (Thakurganj)	Bihar	100	529.88	523.55
54	NFR	2006-07	Azra-Byrnihat	North East Region, Assam, Meghalaya	30	546.47	546.13
55	NFR	2008-09	Bhairabi-Sairang	North East Region & Mizoram	51.38	619.34	618.76
56	NFR	1997-98	Bogibeel bridge with linking lines between Dibrugarh and North Bank line	North East Region, Assam	73	3087.44	1695.24
57	NFR	2006-07	Dimapur-Kohima (Zubza)	North East Region, Nagaland	88	850	849.17
58	NFR	1992-93	Dudhnoi-Depa	North East Region, Assam, Meghalaya	15.5	86.22	82.13

Annexure-I

DETAILS OF ONGOING RAILWAY PROJECTS

S. No.	Rly	Year of inclusion in Budget	Name of the Project (s)	State	Length (in Kms)	Latest anticipated cost	Balance fund required to complete as on 01.04.09
59	NFR	1984-85	Eklakhi-Balurghat & Gazole-Itahar	West Bengal	113.11	285.93	63.52
60	NFR	1996-97	Harmuti-Itanagar	North East Region, Assam, Arunachal Pradesh	33	160.48	126.47
61	NFR	2008-09	Jalalgarh-Kishanganj	Bihar	50.077	282.92	282.82
62	NFR	2003-04	Jiribam-Imphal	North East Region, Manipur	97.9	2492.53	2418.89
63	NFR	2000-01	New Maynaguri -Jogighopa	West Bengal, Assam	257	1480.71	1175.34
64	NFR	2008-09	Sivok-Rangpo	West Bengal, Sikkim	53	1339.48	1339.48
65	NR	1997-98	Abohar-Fazilka	Punjab	42.72	209.57	96.54
66	NR	2008-09	Bhanupalli-Bilaspur-Beri Punjab	Himachal Pradesh,	63.1	1046.88	1046.78
67	NR	2007-08	Chandigarh-Baddi Pradesh	Punjab, Himachal	33.23	328.14	327.98
68	NR	1997-98	Chandigarh-Ludhiana	Punjab	112	699.99	129.06
69	NR	2007-08	Deoband (Muzzaffarnagar) -Roorkee	Uttarakhand, Uttar Pradesh	27.45	164.8	150.11
70	NR	2003-04	Jind-Sonipat	Haryana	88.9	234.45	196.22
71	NR	1981-82	Nangal Dam-Talwara & Taking over siding of Mukerian Talwara	Punjab, Himachal Pradesh	83.74	730	538.55
72	NR	2003-04	Rewari-Rohtak	Haryana	81.26	475.17	220.56
73	NR	1997-98	Tarantaran-Goindwal	Punjab	21.5	42.34	10.39
74	NR	1994-95	Udhampur-Srinagar -Baramula	Jammu & Kashmir	292	11270	5929.81
75	NWR	2000-01	Ajmer-Pushkar	Rajasthan	31.4	106.2	48.91
76	NWR	2008-09	Banaguram-Ras	Rajasthan	27.8	125	124.99
77	NWR	1996-97	Dausa-Gangapur City	Rajasthan	92.67	410.08	336.87
78	SCR	2008-09	Cuddapah-Bangalore (Bangarapet)	Karnataka, Andhra Pradesh	255.4	1000.23	1000.22
79	SCR	1998-99	Gadwal-Raichur	Karnataka, Andhra Pradesh	60	156.6	58.92
80	SCR	1997-98	Gulbarga-Bidar	Karnataka	140	554.55	433.99
81	SCR	2006-07	Jaggayapet-Mallacheruvu	Andhra Pradesh	19.1	94.69	34.67
82	SCR	1999-2000	Kakinada-Pithapuram	Andhra Pradesh	21.5	85.51	85.5
83	SCR	2000-2001	Kotipalli-Narsapur	Andhra Pradesh	57.21	695	685.58
84	SCR	1997-98	Macherla-Nalgonda	Andhra Pradesh	92	243.17	242.9
85	SCR	2006-07	Manoharabad-Kotapalli	Andhra Pradesh	148.9	497.47	497.04
86	SCR	1997-98	Munirabad-Mehbubnagar	Karnataka, Andhra Pradesh	246	497.47	450.04
87	SCR	1996-97	Nandyal-Yerraguntla	Andhra Pradesh	126	429.49	222.37

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DETAILS OF ONGOING RAILWAY PROJECTS

S. No.	Rly	Year of inclusion in Budget	Name of the Project (s)	State	Length (in Kms)	Latest anticipated cost	Balance fund required to complete as on 01.04.09
88	SCR	2006-07	Obulavaripalle-Krishnapatnam	Andhra Pradesh	113	732.81	637.81
89	SCR	1993-94	Peddapally-Karimnagar -Nizamabad	Andhra Pradesh	177.87	517.63	220.6
90	SCR	2006-07	Vishnupuram-Janapahar	Andhra Pradesh	11	54.57	48.22
91	SECR	1995-96	Dallirajahara-Jagdalpur	Chhattisgarh	235	968.6	968.16
92	SER	1974-75	Howrah-Amta & Bargachia -Champadanga	West Bengal	73.5	154.3	69.62
93	SR	1997-98	Angamali-Sabarimala	Kerala	146	550	504.88
94	SR	2008-09	Attipattu-Puttur	Tamil Nadu, Andhra Pradesh	88.3	446.87	446.56
95	SR	2008-09	Chennai-Cuddalore via Mahabalipuram	Tamil Nadu, Puducherry	179.28	523.52	523.51
96	SR	2008-09	Erode-Palani	Tamil Nadu	91.05	288.87	288.86
97	SR	1996-97	Karur-Salem	Tamil Nadu	85	613.11	381.88
98	SR	2006-07	Tindivanam-Gingee -Tiruvannamalai	Tamil Nadu	70	227.4	222.95
99	SR	2006-07	Tindivanam-Nagari	Tamil Nadu	179.2	582.83	573.79\
100	SR	1999-00	Tirunnavaya-Guruvayoor	Kerala	50.23	137.71	128.97
101	SWR	1996-97	Bangalore-Satyamanglam	Karnataka, Tamil Nadu	260	901.62	901.34
102	SWR	1996-97	Hassan-Bangalore	Karnataka	166	412.91	101.65
103	SWR	1996-97	Hubli-Ankola	Karnataka	167	997.58	952.78
104	SWR	1996-97	Kadur-Chickmagalur -Saklesphur	Karnataka	93	122.32	50.55
105	SWR	1995-96	Kottur-Harihar via Harpanhalli	Karnataka	65	328.06	159.71
106	SWR	2007-08	Rayadurg-Tumkur	Karnataka, Andhra Pradesh	213	1027.89	1027.88
107	WCR	2000-01	Ramganjmandi-Bhopal	Rajasthan, Madhya Pradesh	262	726.05	706.45
108	WR	2007-08	Chhotaudepur-Dhar	Gujarat, Madhya Pradesh	157	570	566.26
109	WR	1989-90	Dahod-Indore via Sardarpur, Jhabao & Dhar	Madhya Pradesh, Gujarat	236	948.8	906.6
			Funds required for financial adjustments of completed projects				193.27
			Total		**11979.9**	**65646.40**	**50405**
			Gauge Conversion				
1	CR	1993-94	Miraj-Latur	Maharashtra.	374	823.08	287.66
2	ECoR	1997-98	Naupada-Gunupur	Orissa, Andhra Pradesh	90	168.88	19.79

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DETAILS OF ONGOING RAILWAY PROJECTS

S. No.	Rly	Year of inclusion in Budget	Name of the Project (s)	State	Length (in Kms)	Latest anticipated cost	Balance fund required to complete as on 01.04.09
3	ECR	1997-98	Jayanagar-Darbhanga -Narkatiaganj	Bihar	268	393.55	152.28
4	ECR	1996-97	Mansi-Saharsa & Saharsa -Dauram Madhepura-Purnia	Bihar	142	257.01	76.43
5	ECR	2003-04	Sakri-Laukaha Bazar-Nirmali & Saharsa-Forbesganj	Bihar	206.06	355.81	350.81
6	ER	2007-08	Burdwan-Katwa	West Bengal	51.52	346.47	336.3
7	NCR	1995-96	Mathura-Achnera	Uttar Pradesh	35	76.02	26.02
8	NER	2003-04	Aunrihar-Jaunpur	Uttar Pradesh	50.6	100.79	40.8
9	NER	2007-08	Bhojipura-Pilibhit-Tanakpur	Uttarakhand, Uttar Pradesh	101.79	144.99	144.955
10	NER	1997-98	Gonda-Bahraich as Ph I of Gonda-Bahraich-Sitapur -Lucknow	Uttar Pradesh	60	73.42	67.96
11	NER	1997-98	Gonda-Gorakhpur Loop with Anand nagar Nautanwa	Uttar Pradesh	260	381.17	221.84
12	NER	1997-98	Kanpur-Kasganj-Mathura -Bareilly & Bareilly-Lalkuan	Uttarakhand, Uttar Pradesh	545	1062.36	200.71
13	NER	1999-2000	Kaptanganj-Thave-Siwan -Chhapra	Uttar Pradesh, Bihar	233.5	522.56	304.25
14	NFR	2006-07	Aluabari Road-Siliguri	West Bengal, Bihar	76	255.96	244.22
15	NFR	1997-98	Katakhal-Bairabhi	North East Region, Assam, Mizoram	84	88.7	48.83
16	NFR	1993-94	Lumding-Dibrugarh with linked fingers, Haibargaon -Mairabari (44.8 kms) and Senchoa Jn.-Silghat Town (61.85 kms).	North East Region, Assam, Nagaland	734.65	950.07	870.23
17	NFR	1996-97	Lumding-Silchar including alignment between Migrendisa -Dittockchera and extension from Badarpur to Bhariagram	North East Region, Assam, Manipur	367	2500	942.25
18	NFR	1997-98	New Jalpaiguri-Siliguri-New Bongaigaon - Branch lines.	West Bengal, Assam	419.48	970	21.71
19	NFR	2003-04	Rangia-Murkongselek alongwith linked fingers	North East Region, Assam	510.33	1555.23	1483.59
20	NWR	2005-06	Ajmer-Phulera-Ringus-Rewari	Rajasthan, Haryana	294.97	716.64	171.63
21	NWR	1991-92	Bhildi-Samdari (Viramgam -Jodhpur)	Rajasthan, Gujarat	223	352.44	90.58
22	NWR	2008-09	Jaipur-Ringus-Churu & Sikar-Loharu	Rajasthan	320.04	653.55	653.54
23	NWR	2007-08	Sadulpur-Bikaner & Ratangarh-Degana	Rajasthan	394.35	681.69	408.76
24	NWR	1997-98	Sriganganagar-Sarupsar	Rajasthan	116	168.8	111.59
25	NWR	2008-09	Suratpura-Hanumangarh -Sriganganagar	Rajasthan	240.95	542	541.99

Annexure-I

DETAILS OF ONGOING RAILWAY PROJECTS

S. No.	Rly	Year of inclusion in Budget	Name of the Project (s)	State	Length (in Kms)	Latest anticipated cost	Balance fund required to complete as on 01.04.09
26	SCR	1997-98	Dharmavaram-Pakala	Andhra Pradesh	227	610.07	204.93
27	SECR	2005-06	Chhindwara-Nagpur	Madhya Pradesh, Maharashtra	149.52	617.51	532.13
28	SECR	1996-97	Jabalpur-Gondia including Balaghat-Katangi	Madhya Pradesh, Maharashtra	285	642.87	90.13
29	SER	1998-99	Bankura-Damodar River Project GC, Bowaichandi -Khanna NL, Rainagar-Chanchai NL & Bankura-Mukutmanipur NL	West Bengal	196	400.45	140.19
30	SER	1996-97	Ranchi-Lohardaga with extension to Tori	Jharkhand	111	449.83	236.67
31	SER	1995-96	Rupsa-Bangriposi	Orissa	90	137.56	22.14
32	SR	2006-07	Dindigul-Pollachi-Palghat & Pollachi-Coimbatore	Tamil Nadu, Kerala	224.88	557.27	503.07
33	SR	2008-09	Madurai-Bodinayakkanur	Tamil Nadu	90.41	182.66	182.65
34	SR	2006-07	Manamadurai-Virudhnagar	Tamil Nadu	66.55	156.4	114.86
35	SR	2007-08	Mayiladuturai-Karaikudi & Tiruturaipundi-Agastiyampalli	Tamil Nadu	224	711.16	696.45
36	SR	1997-98	Quilon-Tirunelveli-Tiruchchendur & Tenkasi-Virudhnagar	Tamil Nadu, Kerala	357	712.11	238.56
37	SR	1998-99	Thanjavur-Villupuram	Tamil Nadu	192	425.9	329.73
38	SR	1995-96	Tiruchchirappali-Nagore-Karaikkal (200 Kms) with extn. Nagapattinam -Tiruthiraipundi (43 Kms)	Tamil Nadu	243	536.89	203.31
39	SR	2000-01	Villupuram-Katpadi	Tamil Nadu	161	503.26	139.68
40	SWR	2006-07	Kolar-Chickballapar	Karnataka	96.5	200	123.12
41	SWR	1997-98	Mysore-Chamarajanagar(Ph-I) with extn to Mettupalayam	Karnataka	148	608.58	426.77
42	SWR	1992-93	Shimoga-Talguppa (Bangalore -Hubli-Birur-Shimoga)	Karnataka	630	679.44	177.9065
43	WR	2008-09	Ahmedabad-Himmatnagar -Udaipur	Rajasthan, Gujarat	299.2	742.88	742.87
44	WR	2006-07	Bharuch-Samni-Dahej	Gujarat	62.36	165.66	150.66
45	WR	1990-91	Bhildi-Viramgam	Gujarat	157	398.03	314.71
46	WR	2008-09	Bhuj-Naliya with extn. To Vayor		125	318.24	318.23
47	WR	2005-06	Pratapnagar-Chhota Udepur	Gujarat	99.27	227.52	47.63
48	WR	1994-95	Rajkot-Veraval, Wansjalia to Jetalsar with new line from Veraval to Somnath	Gujarat	281	446.54	27.2
49	WR	2006-07	Rajpipla-Ankleshwar	Gujarat	62.89	196.97	188.81
50	WR	2008-09	Ratlam-Mhow-Khandwa-Akola	Madhya Pradesh, Rajasthan	472.64	1421.25	1421.24
51	WR	1996-97	Surendranagar-Bhavnagar, Dhola-Mahuva & extn. to Pipavav	Gujarat	387	463.53	263.4
			Funds required for financial adjustments of completed projects				1653.23
			Total		**11636.4**	**26653.77**	**17309**

Annexure-I

DETAILS OF ONGOING RAILWAY PROJECTS

S. No.	Rly	Year of inclusion in Budget	Name of the Project (s)	State	Length (in Kms)	Latest anticipated cost	Balance fund required to complete as on 01.04.09
			Doubling				
1	CR	2006-07	Panvel-Pen	Maharashtra	35.46	99.38	95.57
2	CR	1996-97	Panvel-Roha land acquisition	Maharashtra		3.9	1.3
3	CR	2007-08	Pen-Roha	Maharashtra	40	130.35	125.6
4	ECoR	2009-10	Brundamal-Jharsuguda-Flyover connection for joining down line	Orissa	6.6	38.44	38.44
5	ECoR	2003-04	Cuttack-Barang	Orissa	12.3	178.98	55
6	ECoR	2005-06	Jharsuguda-Rengali	Orissa	25.96	150	119.55
7	ECoR	2003-04	Khurda-Barang 3rd line	Orissa	35	207	65
8	ECoR	2006-07	Kottavalasa-Simhachalam North 4th line	Andhra Pradesh	16.69	94.73	75.22
9	ECoR	2007-08	Raipur-Titlagarh	Orissa, Chhattisgarh	203	614.35	548.35
10	ECoR	1999-00	Rajatgarh-Barang	Orissa	29.32	242.87	76.51
11	ECoR	2002-03	Sambalpur-Rengali	Orissa	22.7	106.54	23.12
12	ECoR	2006-07	Sambalpur-Titlagarh	Orissa	182	474.25	399.25
13	ECoR	2006-07	Vizianagram-Kottavalasa 3rd line	Andhra Pradesh	34.7	194.89	185.65
14	ECR	2005-06	Begusarai-Khagaria	Bihar	40.23	105.57	25.99
15	ECR	2003-04	Bela-Chakhand	Bihar	9.98	23.19	3.4
16	ECR	2008-09	Chandrapura-Rajabera -Chandrapura-Bhandaridah	Jharkhand	10.6	21.87	21.86
17	ECR	2003-04	Jehanabad-Bela	Bihar	27.47	75	74.99
18	ECR	2005-06	Kursela-Semapur	Bihar	27.78	55	24.33
19	ECR	2003-04	Sonepur-Hajipur including Gandak Bridge	Bihar	5.5	59.97	42.19
20	ECR	2002-03	Taregna-Jehanabad	Bihar	15.2	43.62	33.29
21	ECR	2005-06	Thanabihpur-Kursela	Bihar	34.2	45	5.14
22	ECR	2005-06	Tilrath-Begusarai	Bihar	7.24	16.36	2.17
23	ER	2001-02	Bandel-Jirat	West Bengal	22.01	60.13	4.87
24	ER	2000-01	Barasat-Hasanabad doubling with electrification Ph-I (Barasat-Sondalia)	West Bengal	12.12	20.65	5.89
25	ER	2003-04	Barharwa-Tinpahar	Jharkhand	16.49	41.13	8.21
26	ER	2000-01	Baruipur-Lakshmikantpur Ph-I(Baruipur-Dakshni Barasat)	West Bengal	17	31.82	9.56
27	ER	2001-02	Baruipur-Magrahat	West Bengal	15	30.09	6.32
28	ER	2003-04	Chandpara-Bongaon	West Bengal	9.77	22.23	13.65
29	ER	2005-06	Chinpai-Sainthia	West Bengal	29.71	91	32.72
30	ER	2009-10	Dakshin Barasat -Lakshmikantapur	West Bengal	19.68	89.42	89.42
31	ER	2009-10	Ghutiari Sharif-Canning	West Bengal	14.5	61.54	61.54
32	ER	2000-01	Habra-Chandpara	West Bengal	22.25	40.89	10.43
33	ER	2009-10	Jirat-Ambika Kalan	West Bengal	20.23	63.62	63.62
34	ER	2002-03	Kajra-Kiul	Bihar	15	23.73	4.76

Annexure-I

DETAILS OF ONGOING RAILWAY PROJECTS

S. No.	Rly	Year of inclusion in Budget	Name of the Project (s)	State	Length (in Kms)	Latest anticipated cost	Balance fund required to complete as on 01.04.09
35	ER	2000-01	Kalinarayanpur-Krishnanagar incl. Ext. as GC from Krishnanagar -shantipur and NL Krishnanagar to Chartala	West Bengal	51	102.6	45.68
36	ER	2009-10	Magrahat-Diamond Harbour	West Bengal	19.67	97.93	97.93
37	ER	2009-10	Nalikul-Tarakeshwar	West Bengal	17.18	83.03	83.03
38	ER	2004-05	Pandabeswar-Chinpai	West Bengal	21.41	75.55	21.47
39	ER	2000-01	Tarakeshwar-Sheoraphulli Ph-I (Sheoraphulli -Nalikul)	West Bengal	17.76	48.79	3.01
40	ER	2008-09	Tinpahar-Sahibganj Ph-I of Tinpahar-Bhagalpur	Bihar	37.81	135.7	135.69
41	NCR	2003-04	Aligarh-Ghaziabad 3rd line	Uttar Pradesh	106.15	230.73	65
42	NCR	2005-06	Palwal-Bhuteshwar 3rd line	Haryana, Uttar Pradesh	81	330	156.14
43	NCR	2005-06	Panki-Bhaupur 3rd line	Uttar Pradesh	11.38	42.69	6
44	NCR	1995-96	Tundla-Yamuna Bridge	Uttar Pradesh	21	88.62	52.81
45	NER	2007-08	Barabanki-Burhwal	Uttar Pradesh	39	79.98	66.99
46	NER	2006-07	Bhatni-Baitalpur	Uttar Pradesh	28	78.46	55.82
47	NER	2006-07	Bhatni-Jiradei	Uttar Pradesh, Bihar	38.11	100.27	63.49
48	NER	2005-06	Ekma-Jiradei patch doubling	Bihar	43.6	94.88	9
49	NER	2006-07	Ghagharaghat-Chowkaghat	Uttar Pradesh	5.63	91.58	69.28
50	NER	2006-07	Gorakhpur Cantt.-Baitalpur	Uttar Pradesh	37.93	89.18	20.31
51	NER	1997-98	Gorakhpur-Sahjanwa	Uttar Pradesh	17.3	86.62	0.79
52	NER	2007-08	Mau-Indara	Uttar Pradesh	8	36.52	29.4
53	NER	2006-07	Munderwa-Babhnan	Uttar Pradesh	45.25	102.1	35.43
54	NER	2005-06	Sahjanwa-Munderwa patch doubling	Uttar Pradesh	32.19	109.01	30.06
55	NFR	2007-08	Malda & Old Malda	West Bengal	0.38	20.7	9.46
56	NFR	2007-08	New Guwahati-Digaru	Assam	29.81	116.24	78.74
57	NR	2006-07	Balance section of Utretia -Sultanpur-Zafrabad	Uttar Pradesh	148	369.9	351.84
58	NR	1999-00	Dayabasti-Grade separator	Delhi	6	54.15	53.85
59	NR	2008-09	Jakhal-Mansa - Doubling on SPR section	Haryana	45	109.13	108.48
60	NR	1997-98	Jallandhar-Pathankot-Jammu Tawi	Punjab, Himachal Pradesh, J&K	203	759.3	74.95
61	NR	2007-08	Kukrana-Panipat	Haryana	8	36.08	31.65
62	NR	2009-10	Lohta-Bhadoi	Uttar Pradesh	39	94.13	94.13
63	NR	2009-10	Mansa-Bhatinda (Ph-I)	Punjab	52	103.83	103.83
64	NR	1998-99	New Delhi-Tilak Bridge 5th and 6th line	Delhi	2.65	58.45	8.54
65	NR	2009-10	Phaphamau-Allahabad	Uttar Pradesh	12.9	47.85	47.85
66	NR	2003-04	Sahibabad-Anand Vihar - 3rd & 4th line	Uttar Pradesh, Delhi	4	88.86	33.13
67	NR	2006-07	Tughlakabad-Palwal 4th line	Delhi, Haryana	33.5	123.9	121.66

Annexure-I

DETAILS OF ONGOING RAILWAY PROJECTS

S. No.	Rly	Year of inclusion in Budget	Name of the Project (s)	State	Length (in Kms)	Latest anticipated cost	Balance fund required to complete as on 01.04.09
68	NWR	2007-08	Alwar-Harsauli	Rajasthan	34.86	90.79	85.11
69	NWR	2006-07	Dausa-Bandikui	Rajasthan	29.04	81	63.55
70	NWR	2007-08	Harsauli-Rewari	Haryana	39.33	110.95	108.9
71	NWR	2005-06	Jaipur-Dausa	Rajasthan	61.28	148.38	25.3
72	SCR	2001-02	Gooty-Renigunta - Patch doubling	Andhra Pradesh	151	515.9	219.72
73	SCR	2008-09	Raghavapuram-Mandamari patch tripling	Andhra Pradesh	24.47	92.29	92.28
74	SCR	2003-04	Raichur-Guntakal	Andhra Pradesh, Karnataka	81.1	221.93	84.93
75	SCR	2007-08	Samalkot-Kakinada	Andhra Pradesh	15.6	114.49	29.46
76	SECR	2005-06	Bhilai-Durg 3rd line	Chhattisgarh	13.16	61.53	5
77	SECR	2004-05	Bilaspur-Salka Road	Chhattisgarh	39.4	106.92	2.14
78	SECR	1997-98	Bilaspur-Urkura	Chhattisgarh	110	362.55	200.39
79	SECR	2007-08	Byepass at Annupur	Chhattisgarh	6	21	9.93
80	SECR	2007-08	Byepass at Champa	Chhattisgarh	14	31	27.37
81	SECR	2008-09	Champa-Jharsuguda 3rd line	Chhattisgarh, Orissa	165	872.12	870.18
82	SECR	2007-08	Kalumna-Nagpur	Maharashtra	6.16	21.61	19.68
83	SECR	2006-07	Khodri-Anuppur with flyover at Bilaspur	Chhattisgarh	61.6	223.45	223.449
84	SECR	2005-06	Salka Road-Khongsara Patch Doubling	Chhattisgarh	26	96	95.13
85	SER	2007-08	Adra-Joychandipahar	West Bengal	6	25.31	24.75
86	SER	2008-09	Banspani-Jaruli	Orissa	9	90.88	89.82
87	SER	2007-08	Barbil-Barajamda	Orissa	10	50.01	31.3
88	SER	2007-08	Bimlagarh-Dumitra	Orissa	18.3	99.01	92.04
89	SER	1997-98	Goelkera-Manoharpur 3rd line (Chakradharpur -Bondamunda)	Jharkhand	40	186.92	185.06
90	SER	2007-08	Gokulpur-Midnapur New bridge on diversion alignment with substructure & steel super structure on Br.No. 143.	West Bengal	2	34.15	33.61
91	SER	2008-09	Muri-North Outer Cabin/Muri -Doubling of section with provision of 2nd bridge over Subarnarekha	Jharkhand	1	11.74	11.67
92	SER	2006-07	Padapahar-Banspani	Orissa, Jharkhand	28	129.74	26.38
93	SER	2008-09	Panskura-Kharagpur 3rd line	West Bengal	44.7	195.35	160.35
94	SER	2008-09	Rajkharsawan-Sini-3rd line	Jharkhand	15	91.61	90.64
95	SER	2000-01	Tikiapara-Santragachi IV line	West Bengal	5.6	50.14	26.88
96	SR	2007-08	Ambalapuzha-Haripad	Kerala	18.13	48.38	47.18
97	SR	1999-2000	Attipattu-Korukkupettai	Tamil Nadu	18	140.1	42.65
98	SR	2006-07	Chengalpattu-Villupuram -Tiruvannamalai	Tamil Nadu	103	369.21	296.2

Annexure-I

DETAILS OF ONGOING RAILWAY PROJECTS

S. No.	Rly	Year of inclusion in Budget	Name of the Project (s)	State	Length (in Kms)	Latest anticipated cost	Balance fund required to complete as on 01.04.09
99	SR	2006-07	Chenganur-Chingavanam	Kerala	26.5	132.25	123.19
100	SR	2003-04	Chennai Beach-Attipattu 4th line	Tamil Nadu	22.1	102.42	102.26
101	SR	2003-04	Chennai Beach-Korukkupet	Tamil Nadu	4.1	85.7	84.52
102	SR	2003-04	Cheppad-Haripad patch doubling	Kerala	5.28	29.28	16.3
103	SR	2003-04	Cheppad-Kayankulam	Kerala	7.76	45.54	18.32
104	SR	1996-97	Irugur-Coimbatore	Tamil Nadu	17.7	75	6.49
105	SR	2006-07	Kankanadi-Panamburu Patch Doubling	Karnataka	19	147.8	147.57
106	SR	2007-08	Kurruppantara-Chengavannam	Kerala	26.58	99.2	96.38
107	SR	2003-04	Mavelikara-Chengannur	Kerala	12.3	61.47	20.71
108	SR	2003-04	Mavelikara-Kayankulam	Kerala	7.89	62.94	15.21
109	SR	2005-06	Mullanturutti-Kuruppantara	Kerala	24	173.95	168.56
110	SR	2008-09	Tiruvallur-Arakkonam 4th line	Tamil Nadu	26.83	78.92	78.91
111	SR	2008-09	Villupuram-Dindigul (With electrification)	Tamil Nadu	273	822.39	822.38
112	SWR	2007-08	Arasikere-Birur	Karnataka	44.28	136.01	85.49
113	SWR	1997-98	Bangalore-Whitefield-Bangalore City-Krishnarajpuram Quadrupling	Karnataka	23.08	85.00	84.991
114	SWR	2006-07	Dharwad-Kambarganvi	Karnataka	26.68	96.76	40.05
115	SWR	2006-07	Hubli-Hebsur	Karnataka	17.17	62.62	29.83
116	SWR	2007-08	Ramanagaram-Mysore incl. elect. of Kengeri-Mysore	Karnataka	91.5	126.69	109.47
117	SWR	2009-10	Yelahanka-Chennasandra	Karnataka	12.89	37.82	37.82
118	SWR	2009-10	Yeswantpur-Yelahanka	Karnataka	12.07	27.23	27.23
119	WCR	2008-09	Bhopal-Beena 3rd line	Madhya Pradesh, Maharashtra	143	428	378
120	WCR	2008-09	Guna-Ruthiyai	Madhya Pradesh	20.5	66.5	66.49
121	WR	2003-04	Akodia-Shujalpur Patch doubling	Madhya Pradesh	13.15	34.4	1.68
122	WR	2009-10	Gandhidham-Adipur	Gujarat	8	24	24
123	WR	2009-10	Gandhidham-Kandla Port	Gujarat	12	31	31
124	WR	1990-91	Kalapipal-Phanda/Maksi -Bhopal	Madhya Pradesh	41.49	125.77	5.78
125	WR	2000-01	Surat-Kosamba PH-I of 3rd line bet. Vadodara & Virar	Gujarat	35	49	48.99
126	WR	2008-09	Udhna-Jalgaon with electrification	Gujarat, Maharashtra	306.93	714.6	714.09
			Funds required for financial adjustments of completed projects				523
			Total		**4776.81**	**16300.99**	**11748.11**

Note: The anticipated cost and balance to complete is based on the sanctioned cost which will undergo upward revision on updation.

Annexure-IA

List of surveys done since Independence

S. No.	Name of the proposal	State passing through	Length in Kms
A	*NEW LINES*		
A-1	*NEW LINES IN DEFFICULT TERRAIN (Himalyan Region)*		
1	Salona to Khumtai	Assam	98
2	Rangia-Sandrupjongkhar via Darranga (Bhutan)	Assam, Bhutan	41
3	Jogighopa to Silchar via Panchratna	Assam, Meghalaya,	437
4	Bilaspur-Rampur Bushahr	Himachal Pradesh	135
5	Parwanoo-Darlaghat	Himachal Pradesh	92
6	Bilaspur to Leh (via Kullu& Manali)(400Km) Jogindernagar to Mandi(48 Km)	Himachal Pradesh, Jammu & Kashmir	498
7	Baramulla - Kupwara	Jammu & Kashmir	39
8	Jammu to Poonch via Akhnur,Rajaori,Bajalta.	Jammu & Kashmir	223
9	Kathua-Basoli-Bhadarwah-Kishtwar	Jammu & Kashmir	259
10	Kathua-Riasi	Jammu & Kashmir	128
11	Udhampur/Katra - Bhairawah, Doda to Kishtwar	Jammu & Kashmir	224
12	Byrnihat-Shillong	Meghalya	108
13	Rangpo-Gangtok	Sikkim,	69
14	Dehradum-Dak Pathar-Kalsi	Uttarakhand	43
15	Ramnagar-Chaukhutiya	Uttarakhand	87
16	Rishkesh-Karanprayag	Uttarakhand	125
17	Tanakpur-Bageshwar	Uttarakhand	155
	Total for new lines in difficult region		**2761**
A-2	***OTHER NEW LINES***		
1	Port Blair-Diglipur	Andaman and Nicobar islands	239
2	Armoor to Adilabad	Andhra Pradesh	136
3	Bhadrachallam-Bavannapalem	Andhra Pradesh	36
4	Bhadrachallam-Kovvur	Andhra Pradesh	151
5	Bhadrachellam Rd (Kothagudem)- Vishakapatnam	Andhra Pradesh	277
6	Chandrampalem-Sarpavaram	Andhra Pradesh	12
7	Cuddapah to Nellore	Andhra Pradesh	181
8	Cuddapah-Gangayapalli	Andhra Pradesh	17
9	Donakonda-Bitragunta	Andhra Pradesh	197
10	Donakonda-Vodarevu	Andhra Pradesh	113
11	Falaknuma-Umdanagar Airport	Andhra Pradesh	20
12	Gadag-Wadi via Yelburga	Andhra Pradesh	252
13	Hyderabad-Gazwal-Siddipet-Sircilla-Vemulwada connecting Karimnagar-Nizamabad	Andhra Pradesh	149
14	Jadcherla-Nandyal New Line	Andhra Pradesh	182
15	Jaggayyapet-Miryalgudda	Andhra Pradesh	66
16	Kachiguda - Chityal	Andhra Pradesh	87
17	Kottavalasa - Anakapalli bye pass line	Andhra Pradesh	33
18	Krishna-Vikarabad	Andhra Pradesh	148
19	Kurnool- Kamalapuram	Andhra Pradesh	180
20	Machlipattnam-Repalli	Andhra Pradesh	45
21	Mancherial-Chinur	Andhra Pradesh	36
22	Mantralayam Road- Kurnool via Yemmanagar	Andhra Pradesh	111
23	Manuguru-Ramagundam .	Andhra Pradesh	200

S. No.	Name of the proposal	State passing through	Length in Kms
24	Medak-Akkanapet	Andhra Pradesh	18
25	Nadikudi-Sri Kalahasti	Andhra Pradesh	308
26	Nidubrolu-Nizamapatnam	Andhra Pradesh	22
27	Nizamabad-Ramagundam	Andhra Pradesh	155
28	Ongole-Donakonda	Andhra Pradesh	87
29	Pandurangpuram-Bhadrachalam	Andhra Pradesh	13
30	Patancheru - Adilabad	Andhra Pradesh	317
31	Patancheru - Akkanapet	Andhra Pradesh	102
32	Pattancheru-Jogipet	Andhra Pradesh	45
33	Pattancheru-Pedapally Sangareddy	Andhra Pradesh	301
34	Ponduru-Rajam	Andhra Pradesh	19
35	Tungbadra-Krishna Road	Andhra Pradesh	227
36	Zaheerabad-Secunderabad	Andhra Pradesh	120
37	Yerraguntala - Dharmavaram	Andhra Pradesh, Karnataka	120
38	Ramagundram-Baladilla	Andhra Pradesh, Madhya Pradesh	271
39	Gooty-Adilabad-Warda	Andhra Pradesh, Maharashtra	592
40	Chittor - Bangarapet	Andhra Pradesh, Karnataka	140
41	Dharwad Belgaum via Bailhongal and Kittis	Andhra Pradesh,Karnataka	97
42	Barpeta Rd - Tihu.	Assam	58
43	Chaparmukh-Dibrugarh	Assam	350
44	Dangri-Dhola	Assam	6
45	Makum - Saikhova Ghat	Assam	6
46	Sarthabari to Changasari	Assam	60
47	Naginimora- Amguri	Assam,	30
48	Lekhapani-Kharsang	Assam, Arunachal Pradesh	31
49	Murkongselek-Pasighat	Assam, Arunachal Pradesh	30
50	Rupai-Parashuramkund via Mahadevpur, Namsai, Chingkham	Assam, Arunachal Pradesh	98
51	Kokrajhar-Gelephu-(Bhutan)	Assam, Bhutan	58
52	Pathsala-Nanglam (Bhutan)	Assam, Bhutan	51
53	Digaru to Byrnihat	Assam, Meghalaya,	20
54	Guwahati-Burnihat	Assam, Meghalaya,	27
55	Lalabazar-Vairengte	Assam, Mizoram	20
56	Badlaghat-Alamnagar-Bhawanipur-Purnea-Dalkhola	Bihar	150
57	Bagaha-Bhaisa Lotan-Siswa Bazar	Bihar	91
58	Banka-Nawadah via Jamui	Bihar	148
59	Bihariganj - Chattarpur Rd. via Murliganj	Bihar	85
60	Bihariganj-Simribakhtiarpur	Bihar	54
61	Chunar - Sasaram	Bihar	124
62	Darbhanga and Saharsa via Kukeshwarasthan	Bihar	94
63	Dauram Madhepura - Pratapganj via Singheshwar Asthan,Bhimnagar and Triveniganj	Bihar	94
64	Hajipur-Motipur	Bihar	67
65	Hajipur-Samastipur via Nathuwa	Bihar	63
66	Hasanpur - Barauni	Bihar	43
67	Janakpur Road -Jayanagar via Madhubani	Bihar	50
68	Jhanjharpur-Laukahi	Bihar	14

S. No.	Name of the proposal	State passing through	Length in Kms
69	Jogbani-Biratnagar(Nepal)	Bihar	18
70	Kursela-Rupali-Saharsa	Bihar	91
71	Kusheshwarasthan-Laheria Sarai via Singhia, Behati	Bihar	55
72	Madhubani-Sitamarhi-Bairgnia via Shivpur, Pakri Deal, Dhaka,	Bihar	163
73	Muktapur - Kusheshwarasthan	Bihar	54
74	Pirpainiti to MGR	Bihar	17
75	Pratapganj - Bhimnagar - Bathanaha	Bihar	57
76	Saharsa-Tarapith	Bihar	15
77	Salauna (Bakhri) - Alauli	Bihar	20
78	Sitamarhi to Jayanagar via Sonbarsai & Janakpur to Jaynagar via Madhubani	Bihar	117
79	Tejnarayanpur-Bhaluka Road	Bihar	24
80	Nawadah-Giridih via Satgawan	Bihar, Jharkhand	136
81	Rail-cum-Road bridge between Tejnarayanpur-Sahibganj	Bihar, West Bengal	12
82	Dallirajhara-Dantewara	Chhatisgarh	219
83	Pendra Rd-Korba/Gevra Rd	Chhatisgarh	122
84	Bijwasan to Bahadurgarh via Ghumanakera-Hasanpur-Jaffarpur	Delhi, Haryana	36
85	Tughlakabad-Bahadurgarh	Delhi, Haryana	61
86	Bhavnagar-Mahua	Gujarat	118
87	Bhavnagar-Tarapore	Gujarat	135
88	Gandhidam-Lakhpat via Mundra Mandvi	Gujarat	287
89	Harij-Mahesana-Radhanpur	Gujarat	108
90	Kharaghoda-Santhalpur	Gujarat	111
91	Kodinar - Pipavav coastal line.	Gujarat	99
92	Mobha Road-Bhadran	Gujarat	29
93	Ningala-Gadhad-Babra-Khijadia Jn.	Gujarat	68
94	Porbandar-Porbandar Port	Gujarat	5
95	Pratapnagar-Dholka	Gujarat	105
96	Rajkot-Jadasan	Gujarat	61
97	Rajula-Jafrabad	Gujarat	26
98	Somnath-Kodinar	Gujarat	33
99	Dahod-Banswara	Gujarat, Rajasthan	120
100	Bhattu Kalan - Jakhal via Fatehabad and Ratia .	Haryana	92
101	Hissar to Sirsa via Agroha & Fatehabad	Haryana	92
102	Jagadhari-Chandigarh	Haryana	80
103	Kaithal - Yamuna Nagar via Karnal	Haryana	128
104	Kurukshetra-Pehowa	Haryana	24
105	Rewari-Bahadurgarh via Jhajjar	Haryana	77
106	Rohtak - Hissar via Meham and Hansi	Haryana	68
107	Jagadhri-Paonta Sahib-Rajban	Haryana, Himachal Pradesh	74
108	Abohar-Tohana via Bhuna & Fatehabad.	Haryana, Punjab	207
109	Patiala - Jakhal/Narwana via Samana	Haryana, Punjab	93
110	Yamuna Nagar to Patiala via Kurukshetra	Haryana, Punjab	142
111	Loharu-Bhiwani	Haryana, Rajasthan	64
112	Panipat - Meerut	Haryana, Uttar Pradesh	104
113	Panipat - Muzzafarnagar via Kairana	Haryana, Uttar Pradesh	93
114	Una - Hoshiarpur	Himachal Pradesh, Punjab	44
115	Una-Jaijon Doaba	Himachal Pradesh, Punjab	40
116	Barajamda-Tatina	Jharkhand	7
117	Bhojudih-Mohuda	Jharkhand	23

S. No.	Name of the proposal	State passing through	Length in Kms
118	Gomoh-Chandrapura (Bye-pass)	Jharkhand	7
119	Gua-Manoharpur	Jharkhand	48
120	Hansdiha to Godda	Jharkhand	29
121	Kandra-Namkom	Jharkhand	106
122	Lohardaga-Gumla, and extension to Simdega	Jharkhand	54
123	Ranchi-Kandra	Jharkhand	93
124	Tori-Chatra	Jharkhand	66
125	Jhajha-Girdih via Sonuchakai	Jharkhand, Bihar	82
126	Barwadih-Chirmiri	Jharkhand, Chhatisgarh	182
127	Lohardaga - Korba	Jharkhand, Chhatisgarh	326
128	Raigarh-Mand Colliery to Bhupdeopur	Jharkhand, Orissa	63
129	Tori-Bimitrapur	Jharkhand, Orissa	188
130	Thalassery-Mysore via Kodagu	KAR, KER	298
131	Almatti to Yadgir	Karnataka	154
132	Bagalkot-Kudachi	Karnataka	111
133	Bangalore City -Belur-Mudigere-Sringeri	Karnataka	99
134	Bangalore-Nangli	Karnataka	120
135	Bijapur-Athani-Shedbal.	Karnataka	112
136	Bisanattam -Marikuppam	Karnataka	12
137	Davangere- Bhadravati via Channagiri	Karnataka	90
138	Dudda- Tiptur	Karnataka	37
139	Gadag - Harihar via Harpanahalli	Karnataka	94
140	Gunji-Kulem	Karnataka	113
141	Krshnaraja Nagar-Kushal Nagar	Karnataka	59
142	Kushalnagar-Channarayapatna via Kananur	Karnataka	80
143	Medikeri-Channarayapatna via Holenarsipur	Karnataka	117
144	Mysore-Mangalore via Medikeri & Subramanya	Karnataka	272
145	Nipani-Raibag via Chikodi	Karnataka	97
146	Pandavapura - Shravanabelagola	Karnataka	60
147	Ranjitpura-Yeshwantnagar	Karnataka	11
148	Talguppa-Honavar	Karnataka	82
149	Tumkur-Davangere	Karnataka	199
150	Whitefield-Kolar	Karnataka	53
151	Yashvandur-Chitradurg	Karnataka	68
152	Hyderabad-Raichur	Karnataka, Andhra Pradesh	190
153	Nanjangud-Nilambur via Sultan Bathery	Karnataka, Kerala, Tamil Nadu	238
154	Angadippuram-Kozhikode	Kerela	77
155	Bulb rail line at Shoranur	Kerela	5
156	Erumeli-Punalur- Trivandrum	Kerela	136
157	Idappalli - Tirur	Kerela	77
158	Kanjangad-Panathur	Kerela	41
159	Kayankulam-Trivandrum via Adoor and Kottarakkara	Kerela	103
160	Nilambur Road - Feroke via Manjeri and Mavur	Kerela	69
161	Thakazhi-Tiruvalla - Pathanamthitta	Kerela	50
162	Tirur-Angadipuram	Kerela	41
163	Vaikam-Vaikam Road	Kerela	10
164	Nanjangud - Badagara via Vyitri,Poozhi,Hithod.	Kerela, Karnataka	230
165	Madurai-Kottayam	Kerela, Tamil Nadu	234
166	Sabarimala to Dindigul	Kerela, Tamil Nadu	201
167	Biyavra-Rajgarh-Sirong and Bina	Madhya Pradesh	147

S. No.	Name of the proposal	State passing through	Length in Kms
168	Damoh to Kundalpur	Madhya Pradesh	35
169	Gotegaon-Ramtek via Seoni	Madhya Pradesh	275
170	Hirdagarh-Dauma	Madhya Pradesh	14
171	Indore - Budhni	Madhya Pradesh	223
172	Jabalpur - Panna via Damoh	Madhya Pradesh	246
173	Katangi-Tirodi	Madhya Pradesh	15
174	Rewa-Beohari	Madhya Pradesh	72
175	Bilaspur to Jabalpur.	Madhya Pradesh, Chhatisgarh	372
176	Rajnandgaon-Jabalpur	Madhya Pradesh, Chhatisgarh	427
177	Khandwa - Nardana via Khargone, Sendhwa	Madhya Pradesh, Maharashtra	225
178	Ujjain-Ramganjmandi via Agar, Susner Jhalawar.	Madhya Pradesh, Rajasthan	190
179	Rewa-Mirzapur,	Madhya Pradesh, Uttar Pradesh,	170
180	Jhansi - Sawai Madhopur via Shivpuri, Sheopurkalan	Madhya Pradesh, Uttar Pradesh, Rajasthan	311
181	Bandra-Kurla	Maharashtra	5
182	Beed-Jalna	Maharashtra	111
183	Bhokar-Dharwad-Mothibagh	Maharashtra	182
184	Chinchwad - Roha	Maharashtra	95
185	Dahanu Road - Nasik Road	Maharashtra	168
186	Dhule-Amalner	Maharashtra	39
187	Ghatnandur-Ambajogai	Maharashtra	21
188	Goregaon-Borivali	Maharashtra	7
189	Jalna-Khamgaon	Maharashtra	155
190	Kalyan - Ahmednagar via Murbad	Maharashtra	240
191	Kolhapur -Ratnagiri	Maharashtra	211
192	Kurla-Mahul	Maharashtra	6
193	Latur Road-Mudkhed	Maharashtra	138
194	Manmad -Indore via Malegaon & Dhule	Maharashtra	350
195	Nasik-Kopargaon via Shirdi	Maharashtra	92
196	Pune-Nasik	Maharashtra	265
197	Rotegoan-Puntamba	Maharashtra	27
198	Solapur-Tuljapur-Osmanabad	Maharashtra	80
199	Wadsa-Amrohi-Gadchiroli	Maharashtra	50
200	Wardha-Katol	Maharashtra	80
201	Warora - Umrer	Maharashtra	106
202	Tuli line to Tuli Town(Tuli-Tuli Road)	Nagaland	9
203	Bargarh-Nawapara Road	Orissa	136
204	Extension of Rupsa-Bangriposi to Gurumahishani	Orissa	42
205	Jeypore - Navarangpur	Orissa	38
206	Jeypore-Kottametta	Orissa	148
207	Jeypore-Malkangiri	Orissa	130
208	Phulbani - Berhampur	Orissa	170
209	Puri-Konark	Orissa	35
210	Talcher station to Talcher-Sambalpur line	Orissa	7
211	Talcher/Hindol Rd. - Berhampur/Gopalpur	Orissa	293
212	Gunupur-Theruvali	Orissa	76
213	Raipur-Jharsuguda via Khartapalan, Baloda Bazar, Batgaon and Sarangarh	Orissa, Chhatisgarh	310
214	Anandpur Sahib via GarhShankar	Punjab	45
215	Badowal-Sahnewal	Punjab	29

S. No.	Name of the proposal	State passing through	Length in Kms
216	Ferozepur-Patti	Punjab	25
217	Ferozpur Cantt.-Taran Taran	Punjab	47
218	Kapurthala - Beas	Punjab	19
219	Khemkaran-Firozpur	Punjab	31
220	Nangaldam-Bhakra	Punjab	11
221	Qadian to Beas	Punjab	40
222	Rajpura-Chandigarh	Punjab	14
223	Sahnewal-Ladowal	Punjab	31
224	Sarna-Madhopur	Punjab	12
225	Rama Mandi-Maur Mandi via Talwandi Sabo	Punjab, Haryana	32
226	Hoshiarpur - Una	Punjab, Himachal Pradesh,	40
227	Chandigarh -Dehradun via Jagadhari	Punjab, Himachal Pradesh Haryana, Uttarakhand	217
228	Ajmer-Kota	Rajasthan	145
229	Ajmer-Merta Rd	Rajasthan	65
230	Amarpura(Jorasi) to Chirawa via Tathwari and Singhana	Rajasthan	50
231	Anupgarh to Bikaner	Rajasthan	155
232	Anupgarh to Kolayat via Khajuwala	Rajasthan	200
233	Anupgarh-Khajuwala -Jaisalmer-Ramgarh	Rajasthan	485
234	Bikaner-Chhattargarh	Rajasthan	55
235	Bilara-Bar	Rajasthan	52
236	Churu - Taranagar	Rajasthan	48
237	Hanumangarh - Ratangarh via Sardar Shahr	Rajasthan	198
238	Jaipur-Tonk	Rajasthan	97
239	Jalore-Falna	Rajasthan	72
240	Jhunjhunu-Pilani	Rajasthan	18
241	Jodhpur bye pass line	Rajasthan	18
242	Kolayat-Pokaran- Barmer	Rajasthan	300
243	Kota-Devgarh-Madaria	Rajasthan	272
244	Loharu-Pilani	Rajasthan	22
245	Merta City - Beawar	Rajasthan	86
246	Nathdwara-Falna	Rajasthan	140
247	Nathdwara-Todaraisingh	Rajasthan	236
248	Nokha-Sikar via Bedasar and Sujangarh	Rajasthan	180
249	Phalodi - Balotra via Shergarh, Shaitrawa & Dechhu	Rajasthan	165
250	Phalodi-Nagaur	Rajasthan	147
251	Pushkar-Merta road	Rajasthan	59
252	Ramsinghpur-Rajasthan canal	Rajasthan	27
253	Rewari-Bhiwadi	Rajasthan	27
254	Ringus-Didwana via Khatu Shyamji	Rajasthan	105
255	Sambhar Lake-Thathana Mithri	Rajasthan	29
256	Sawaimadhopur-Tonk	Rajasthan	62
257	Tonk-Deoli	Rajasthan	62
258	Jaisalmer to Kandla	Rajasthan, Gujarat	562
259	Palwal - Alwar	Rajasthan, Haryana	111
260	Baran-Shivpuri	Rajasthan, Madhya Pradesh	150
261	Bari Sadari- Nimach	Rajasthan, Madhya Pradesh	48
262	Ratlam-Banswara-Dungarpur	Rajasthan, Madhya Pradesh	176
263	Ujjain-Jhalawar-Ramganjmandi	Rajasthan, Madhya Pradesh	190

S. No.	Name of the proposal	State passing through	Length in Kms
264	Arakkonam to Tindivanam via Walajapet, Ranipet and Arcot	Tamilnadu	96
265	Avadi-Sriperumpudur	Tamilnadu	25
266	Chennai-Sriperumbudur via Poonamalli	Tamilnadu	38
267	Chidambaram-Attur via Ariyalur, Perambalur	Tamilnadu	167
268	Dindigul-Gudalur	Tamilnadu	131
269	Dindigul-Kumuli (lower camp)	Tamilnadu	134
270	Erode to Satyamanglam	Tamilnadu	63
271	Jolarpettai-Hossur via Krishnagiri	Tamilnadu	101
272	Katpadi-Chennai via Guindy-Poonamallee	Tamilnadu	212
273	Kumbakonam - Namakkal	Tamilnadu	178
274	Madurai-Karaikkudi va Melur,Tiruppattur	Tamilnadu	91
275	Madurai-Tuticorin	Tamilnadu	144
276	Mailaduturai-Tirukkaidaiyar-Taramgambadi-Tirunallar-Karaikal	Tamilnadu	47
277	Manamadurai - Tuticorin	Tamilnadu	126
278	Morappur-Dharmapuri via Mukkanur	Tamilnadu	36
279	Needmangalam-Pattukottai via Mannargudi, Madukkur	Tamilnadu	54
280	Rameshwaram-Dhanuskoti	Tamilnadu	17
281	Sabrimala-Chengannur	Tamilnadu	64
282	Satyamangalam- Mettur	Tamilnadu	90
283	Thanjavur-Chennai Egmore via Ariyalur	Tamilnadu	315
284	Thanjavur-Pottukkotai	Tamilnadu	47
285	Tindivanam to Cuddalore via Pondichery.	Tamilnadu	77
286	Tiruvannamalai-Jolarpettai	Tamilnadu	85
287	Villivakkam-Katpadi	Tamilnadu	153
288	Mettur - Chamarajnagar	Tamilnadu, Karnataka	182
289	Kollengode-Trichur	Tamilnadu, Kerala	59
290	Haridwar-Kotdwar-Ramnagar	Uttarakhand	142
291	Muzaffarnagar to Haridwar via Roorkee	Uttarakhand	51
292	Rishikesh - Dehradun	Uttarakhand	20
293	Rishikesh-Doiwala	Uttarakhand	20
294	Agra area provision of Bye pass line	Uttar Pradesh	2
295	Aligarh-Jhinjhak via Sikandraro and Mainpuri	Uttar Pradesh	268
296	Aligarh-Kasganj	Uttar Pradesh	64
297	Allahabad-Prayag-Phaphamau	Uttar Pradesh	13
298	Anandnagar - Ghuguli	Uttar Pradesh	50
299	Anandnagar - Kaptanganj	Uttar Pradesh	60
300	Bad-Bhainsa	Uttar Pradesh	5
301	Baraut-Chhaprauli	Uttar Pradesh	16
302	Barhaj Bazar - Faizabad via Dohrighat	Uttar Pradesh	194
303	Berhan- Etah via Shahjahanpur	Uttar Pradesh	150
304	Bhadol-Babatpur	Uttar Pradesh	36
305	Bindhyachal-Bhadohi	Uttar Pradesh	38
306	Chola-Bulandhshahar	Uttar Pradesh	16
307	Daurala-Hastinapur	Uttar Pradesh	31
308	Deoria Sadar-Padrauna	Uttar Pradesh	63
309	Dhampur-Afzalgarh-Kalagarh & Afzalgarh-Aliganj	Uttar Pradesh	157
310	Etah-Kasganj,	Uttar Pradesh	29
311	Farukhabad - Gola Gokarnath	Uttar Pradesh	158
312	Hamirpur-Hamirpur Road	Uttar Pradesh	6

S. No.	Name of the proposal	State passing through	Length in Kms
313	Idgah-Fatehpur bye pass line	Uttar Pradesh	6
314	Jeonathpur-Vyasanagar	Uttar Pradesh	2
315	Khalilabad - Naugarh	Uttar Pradesh	71
316	Khalilabad-Balrampur	Uttar Pradesh	145
317	Khurja-Raya new line via Mat, Surir, Bajna	Uttar Pradesh	90
318	Konch-Jalaun	Uttar Pradesh	25
319	Laksar- Baksar	Uttar Pradesh	130
320	Lalganj-Bachhrawan via Gurubakshganj	Uttar Pradesh	39
321	Lohta-Janghai	Uttar Pradesh	69
322	Madhoganj-Auhadpur	Uttar Pradesh	27
323	Mau-Gazipur city	Uttar Pradesh	42
324	Orai-Jalaun	Uttar Pradesh	23
325	Panki - Mandhana	Uttar Pradesh	12
326	Sahjanwa-Dohrighat-Indara	Uttar Pradesh	103
327	Sambhal Hatim Sarai to Rajghat	Uttar Pradesh	49
328	Sambhal Hatim Sarai-Gajraula	Uttar Pradesh	43
329	Shahganj-Sultanpur-Amethi-Garhimanikpur	Uttar Pradesh	142
330	Shahjahanpur-Badaun	Uttar Pradesh	113
331	Sitapur-Bahraich via Biswan	Uttar Pradesh	65
332	Sitapur-Bahraich via Laharpur-Tambore and Mihirpuwa	Uttar Pradesh	110
333	Sitapur-Nanpara	Uttar Pradesh	135
334	Tanakpur-Purnagiri	Uttar Pradesh	12
335	Tarighat-Gazipur	Uttar Pradesh	9
336	Maripet-Tuglakabad	Uttar Pradesh, Delhi	36
337	Khurja-Palwal-Rewari-Rohtak	Uttar Pradesh, Haryana	213
338	Meerut-Panipat	Uttar Pradesh, Haryana	95
339	Bhind-Orai-Mahoba	Uttar Pradesh, Madhya Pradesh	216
340	Nautanwa-Bhairwaha	Uttar Pradesh, Nepal	15
341	Nepalganj Road(India)- Nepalganj(Nepal)	Uttar Pradesh, Nepal	12
342	Dehradun - Saharanpur	Uttar Pradesh, Uttarakhand	69
343	Amta-Bongaon	West Bengal	16
344	Bakreshwar-Siuri	West Bengal	16
345	Balurghat-Hilly	West Bengal	29
346	Bandel-Naihati - Bye pass	West Bengal	9
347	Bankura-Raniganj via Mejhia	West Bengal	43
348	Bongaon-Bagdaha	West Bengal	25
349	Budge Budge - Falta	West Bengal	25
350	Budge Budge-Namkhana-Frazerganj	West Bengal	132
351	Budge Budge-Pujali	West Bengal	11
352	Budge Budge-Uluberia	West Bengal	25
353	Burdwan - Tarakeswar	West Bengal	61
354	Canning-Golabari	West Bengal	20
355	Canning-Sonakhalii	West Bengal	17
356	Chowrigacha-Kandi	West Bengal	16
357	Dankuni - Sheakhala	West Bengal	17
358	Dankuni-Champadanga via Seakhala & Seakhla to Bargachia	West Bengal	42
359	Gunjaria to Gazole via Ithar , Raiganj	West Bengal	107
360	Hasnabad-Pratapadityanagar	West Bengal	29
361	Jhargram-Purulia	West Bengal	136
362	Joynagar to Jamtala	West Bengal	20

S. No.	Name of the proposal	State passing through	Length in Kms
363	Kaliaganj-Buniadpur	West Bengal	33
364	Kathalberia-Pratapadityanagar	West Bengal	30
365	Kharagpur-Dankuni	West Bengal	15
366	Krishnanagar - Karimpur	West Bengal	65
367	Mekhliganj and Haldibari and extension from Mekhliganj to Chanderabhanga	West Bengal	26
368	Murshidabad-Kandi via Khagraghat and Behrampur	West Bengal	31
369	Park Circus to Dhamakhali	West Bengal	36
370	Prantik-Siuri	West Bengal	34
371	Raiganj-Chilampur	West Bengal	37
372	Ramsoi-Binnaguri	West Bengal	33
373	Samsi-Chanchal-Harishchandrapur	West Bengal	28
374	Shaktigarh-Naihati	West Bengal	13
375	Sonarpur-Dhamakhali	West Bengal	50
376	Tarakeshwar-Magra restoration	West Bengal	52
377	Banarhat-Samtse (Bhutan)	West Bengal, Bhutan	23
378	Hasimara, Phuentsholing (Bhutan)	West Bengal, Bhutan	18
379	Barsoi-Chanchal	West Bengal, Bihar	33
380	Samsi-Dalkhola	West Bengal, Bihar	22
381	New Jalpaiguri-Kakrabitta(Nepal)	West Bengal, Nepal	46
382	Digha-Jaleswar	West Bengal, Orissa	41
	Total for other New Lines		**36848**
	Total for New Lines		**39609**
B	*GAUGE CONVERSION*		
B-1	*GAUGE CONVERSION DIFFICULT TERRAIN*		
1	Baraigram-Dullabcherra	Assam	29
2	Karimganj-Maishashan	Assam	10
3	Pathankot-Joginder Nagar-Kangra Valley with extension of BG from Baijnath to Bhanupali via Mandi-Bilaspur	Himachal Pradesh, Punjab	352
	Total for Gauge Conversion in difficult region		**391**
B-2	*OTHER GAUGE CONVERSIONS*		
1	Jaynagar - Bijalpura(Nepal) with extension to Bardibas.	Bihar, Nepal	70
2	Mehsana -Taranga Hill (GC)wih ext. upto Ambaji (NL)	Gujarat	108
3	Gwalior-Shivpur Kalan GC with extension to Kota New Line	Madhya Pradesh, Rajasthan	284
4	Katihar - Tejnarayanpur line via Manihari with extension to Bhaluk Rd via Amdabad	Bihar, West Bengal	57
5	Raipur-Dhamtari, including Abhanpur-Rajim	Chhatisgarh	89
6	Bhadran-Bochasan-Ptelad-Nadiad	Gujarat	59
7	Bharuch-Samni-Jambusar-Vishwamitri	Gujarat	96
8	Botad-Ahmedabad	Gujarat	170
9	Dhasa-Jetalsar	Gujarat	104
10	Jambusar-Kavi	Gujarat	26
11	Kalol-Kotasan	Gujarat	37
12	Kosamba-Umarpada	Gujarat	65
13	Miyagam-Dabhoi-Samlaya	Gujarat	97
14	Chhindwara-Nainpur	Madhya Pradesh	140
15	Achalpur-Mutajpur-Yavatmal,Pulgaon-Arvi	Maharashtra	221
16	Naghbir - Nagpur	Maharashtra	106
17	Pachora-Jamner with extension upto Ajanta caves	Maharashtra	104
18	Pulgaon-Arvi with extn. to Amla	Maharashtra, Madhya Pradesh	154

S. No.	Name of the proposal	State passing through	Length in Kms
19	Dholpur-Sirmuttra with extension upto Gangapur City.	Rajasthan	144
20	Marwar-Mavli	Rajasthan	183
21	Mavli to Bari Sadari	Rajasthan	82
22	Thanjavur-Tiruchchrappalli	Tamilnadu	50
23	Dohrighat-Indara	Uttar Pradesh	35
24	Gonda-Bairaich-Mailani-Sitapur-Lucknow including Nanpara Nepalganj	Uttar Pradesh	479
25	Pilibhit - Sahajahanpur	Uttar Pradesh	84
26	Katwa-Ahmedpur	West Bengal	53
	Total for Gauge Conversion in other region		**3097**
	Total for Gauge Conversion		**3488**
C	***DOUBLING***		
1	Kazipet-Vijaywada - Gudur 3rd line	Andhra Pradesh	555
2	Krishna Canal- Guntur-Tenali	Andhra Pradesh	53
3	Nalapadu-Bibinagar	Andhra Pradesh	243
4	Pendurti-Simhachalam North	Andhra Pradesh	7
5	Secunderabad- Dronachallam via Mehbubnagar,Gadwal,Kurnool	Andhra Pradesh	297
6	Secunderabad-Bhongir 3rd line	Andhra Pradesh	38
7	Vijaywada-Gudivada-Bhimavaram-Narasapur and Gudivada-Machlipatnam	Andhra Pradesh	175
8	Guwahati- 2nd rail bridge over Saraighat	Assam,	7
9	Kiul-Nawadah-Gaya	Bihar	123
10	Samastipur-Darbhanga	Bihar	37
11	Valmikinagar-Narkatiaganj-Muzaffarpur	Bihar	210
12	Bhagalpur-Barharwa	Bihar, Jharkhand	129
13	Godhara-Anand	Gujarat	79
14	Viramgram-Surender Nagar	Gujarat	65
15	Virar-Ahmedabad	Gujarat, Maharashtra	504
16	Ambala Cantt.-Chandigarh	Haryana, Punjab	45
17	Ambala Cantt-Sirhind 3rd line	Haryana, Punjab	53
18	Jakhal-Bhatinda	Haryana, Punjab	96
19	3rd line between Dongraposi-Pendrasali and extention opto Rajkharswan	Jharkhand	75
20	Patratu-Chandil via Barkakhana	Jharkhand, West Bengal	139
21	Hospet-Swamihalli (58.97 km)	Karnataka	29
22	Tornagallu-Ranjitpura	Karnataka	23
23	Yelahanka-Penukonda	Karnataka, Andhra Pradesh	120
24	Hospet-Hubli-Alnawar-Londa-Vaso-de-gama	Karnataka, Goa	342
25	Ernakulam-Kayankulam via Alleppy	Kerela	100
26	Trivandrum-Kanniyakumari	Kerela, Tamil Nadu	86
27	Bhopal-Itarasi 3rd line	Madhya Pradesh	106
28	Itarsi-Nagpur-Wardha-Ballarshah 3rd line	Madhya Pradesh	306
29	Ujjain-Indore	Madhya Pradesh	80
30	Daund - Manmad with electrification	Maharashtra	238
31	Kalyan-Kasara 3rd line.	Maharashtra	67
32	Kolhapur-Pune	Maharashtra	326
33	Pune-Lonavla Quadrupling	Maharashtra	64
34	Pune-Miraj-Kolhapur	Maharashtra	326
35	Vidhroli-Trombay to Vadala	Maharashtra	13
36	Ballarshah-Kazipet 3rd Line	Maharashtra, Andhra Pradesh	234
37	Bhadrak-Nergundi 3rd line	Orissa	105

S. No.	Name of the proposal	State passing through	Length in Kms
38	Khurda Road-Puri (Delang -Puri)	Orissa	29
39	Sambalpur-Talcher	Orissa	168
40	Koraput-Kirandul (256 km)	Orissa, Chhatisgarh	150
41	Rajpura - Bathinda	Punjab	174
42	Bandikui-Alwar	Rajasthan	60
43	Phulera to Merta Rd	Rajasthan	153
44	Chengalpattu-Tuticorin	Tamilnadu	513
45	Chennai Central-Villivakkam 5th & 6th line	Tamilnadu	152
46	Doubling of Salem(Magnesite)-Omalur-Mettur Dam	Tamilnadu	37
47	Laksar-Haridwar-Dehradun	Uttarakhand	79
48	Aligarh-Ghaziabad 4th line	Uttar Pradesh	103
49	Aunrihar-Varanasi-Manduadih	Uttar Pradesh	39
50	Ghaziabad-Panki Ph II (Tundla-Aligarh -3rd line	Uttar Pradesh	78
51	Khurja-Hapur-Meerut	Uttar Pradesh	93
52	Lohta-Jhangai	Uttar Pradesh	75
53	Lucknow-Malhaur	Uttar Pradesh	20
54	Lucknow-Varanasi via Bareilly and Amethi	Uttar Pradesh	281
55	Meerut-Saharanpur	Uttar Pradesh	114
56	Panki-Mughalsarai 3rd line	Uttar Pradesh	356
57	Panki-Tundla -3rd line	Uttar Pradesh	219
58	Shahadra-Shamli	Uttar Pradesh	87
59	Shikohabad-Farukkabad	Uttar Pradesh	106
60	Baruipur and Sealdah(Ballygunge) (3rd line)	West Bengal	20
61	Burnpur-Asansol	West Bengal	5
62	Howrah- Bandel 4th line	West Bengal	39
63	Jirat-Katwa	West Bengal	83
64	Kharagpur-Midnapore via Girimaidan	West Bengal	8
65	Lalgola-Krishnanagar with electrification	West Bengal	127
66	Rajgoda-Durga Chak & Durga Chak Haldia	West Bengal	54
67	Santipur-Kalinarayanpur	West Bengal	16
68	Sealdah-Dum Dum 5th & 6th line	West Bengal	7
69	Shaktigarh-Dankuni 4th line	West Bengal	128
70	New Jalpaiguri-New Alipurduar	West Bengal, Assam	168
	Total for doubling		**9236**

Note: The list of surveys completed but projects not taken up have been prepared based on available records.

Since the surveys in the list date back to the year 1947, the ground realities over the years have changed considerably in the intervening years. As such, the assessment of the cost arrived at in those surveys may not be realistic cost estimates on date. Accordingly, the present day costs for new lines, gauge conversions and doublings being incurred presently for such works have been used as a basis for assessing the cost of the earlier surveys.

APPROXIMATE COST ESTIMATES	Fig. in Rs. Crore
Total cost for new lines	**359068**
Total cost for gauge conversions	**16298**
Total cost for doubling.	**46180**
Total for New Lines, Gauge Conversions and Doublings	**421546**

VISION 2020

Annexure-II

CAPACITY ENHANCEMENT AND MODERNISATION WORKS

(Investment figures in Rs. Crore)

Broad category	Sub category	Short Term (2010-11--2011-12)		Long-Term (2012-13--2019-20)		Total	
		Physical Target	Investment	Physical Target	Investment	Physical Target	Investment
1. Bottleneck removal	Traffic Facilities(e.g.Freight bypass, Terminal Facilities for freight and parcel services including Logistics Parks)	-	3,000	-	20,000	-	23,000
	Speed raising	-	0	-	25,000	-	25,000
2. Capacity augmentation: (Investments are for both works in progress & for works soon to be completed)	New Line	1000 kms	10,000	24,000kms	170,000	25,000 kms	180,000
	Doubling / Tripling / Quadrupling (including DFCs)	1000 kms	6000	11000kms	124,000	12000 kms	130,000
	Gauge conversion	2500 kms	7000	9,500kms	28,000	12000 kms	35,000
	Metropolitan transport project	-	9450	-	51,000	-	60,450
	Electrification including 2x25KV system for high-speed density network	2000 kms	1800	12,000kms	10,800	14,000 kms	12,600
3. Rolling stock	Freight-Wagon	33909	10173	255,227	76,567	289,136	86,740
	Diesel Locomotives	690	7245	4644	48,762	5334	56,007
	Electrical Locomotives	555	6720	3726	58153	4281	64,873
	Passenger Coaches ,EMU/DEMUs/MEMUs	6912	11061	43,968	71,462	50,880	82,523
	* Upgradation/expansion ,settin-g up of PU/Workshops	-	10364	-	91,231	-	101,595
4. Service improvements	Passenger:World-class stations and MFCs	12stns.	20000	38stns	70,000	50stns	90,000
	Adarsh station	-	200	-	800	-	1,000
	Security	-	600	-	4,000	-	4,600
5. Technological up gradation and Safety	Track renewal and 25 T axle load	11030 kms	16275	30210kms	55,130	41240 kms	71,405
	Bridges	2800	1000	18000	7,000	20,800	8,000
	S&T/Mech/Elct works	-	8577		27,789	-	36,366
	IT	-	1383	-	8,400	-	9,783
6. High speed corridor		-	0	2000	200,000	2000 kms	200,000
7. Others	Research/staff Qtrs/investment. in PSU,power plant etc	-	9900	-	99,000	-	108,900
8. **Total**			**140,748**	**-**	**12,47,094**	**-**	**1,387,842**

Includes setting up of new depots/upgrading workshops etc.

Note : The investment figures represent a rough and tentative assessment only.

Annexure-III

OPERATIONAL STRATEGY
Plan of Action: Short-term and Long-term

The following strategies will be adopted to attain the goals outlined in Chapter-V.

1. Infrastructure

a) In the short to medium term, the emphasis would be to remove bottlenecks and create capacity quickly. This would be achieved by providing freight bypasses in the large cities, by identifying and completing traffic facility works such as splitting of block sections, removal of conflicting movements and improvement of terminal facilities etc. Simultaneously, effort would be directed towards opening alternate routes to the busy routes through gauge conversion or by closing missing links, if any. In the long run segregation of passenger and freight routes on HDN and substantial segregation on most of the busy routes would be the goal. Dedicated freight corridors and speed raising projects on the passenger corridors would be completed in a time-bound manner.

b) Project execution capability would be strengthened.

c) Port connectivity works would be taken up on priority in partnership with ports and other major users.

d) A non-lapsable dedicated fund will be set up to fund new line projects and wipe out the entire throw-forward of new line projects. A mechanism for mobilizing the support of State Governments towards capital costs and sharing of operational losses will be institutionalized.

e) Connectivity projects to the North-East (new line and gauge conversion) and J&K (new line) would be accorded priority. All state capitals would be connected by rail.

f) Segregations between commuter and non-commuter lines in large cities with population exceeding one million shall be achieved by partnership with state governments and city authorities.

g) All construction projects would be executed by use of modern technology and construction equipment. Emphasis would be to create maintenance-free, economic and durable assets. Mechanized maintenance would be adopted to maintain the health of the track assets and provide reliable, uninterrupted service.

h) PPP will be used for efficient execution of projects especially in areas like construction of world-class stations, multi-modal logistics parks, cold-chain facilities and connectivity to ports/industrial clusters.

2 Marketing

a) **Freight-** Railways would concentrate on strengthening its presence in the bulk traffic segments and container cargo i.e. in commodities it already serves and attracting new commodities like fly ash, automobiles etc. through partnership with private sector freight operators. Special mini-or two-point rake services will be designed. Special-purpose rolling stock suited to meet the specific requirements of commodities will be inducted. These will be encouraged through Liberalized Wagon Investment and Leasing Scheme. Long-lead traffic will be courted with special effort.

b) **Passenger -** In the passenger segment, the enhanced capacity of the system would be used to raise speeds and fully satisfy the demand for passenger travel. Services will be progressively upgraded. Distribution channels for railway tickets would be constantly innovated so that obtaining a railway ticket is

completely hassle-free. PRS/UTS terminals, e-ticket services, tickets through post offices, ATMs, petrol pumps and smart-card based tickets for unreserved travel would be expanded to improve access. New and emerging technologies will be harnessed towards this end.

c) Periodic and regular passenger/market surveys would be conducted. The results will be used to re-design services and delivery. IT tools would be used to develop - Customer Relationship Management (CRM) and Yield Management Systems.

3 Freight Business

a) The emphasis would be to meet the exacting needs of customers in terms of timeliness and quality of service. Time-tabled and guaranteed- delivery freight services would become the norm. Freight services will also be designed to meet pre-determined schedules of customers. Dedicated freight corridors will greatly help in achieving this goal.

b) There would be a constant stress on cost efficiencies through reductions in terminal and en route detections and rationalization of carriage and wagon examinations.

c) Loyal customers who transport their cargos from siding to siding on rail and contribute to the efficiency of operations by installation and operation of efficient freight terminals and handling systems would be incentivised by sharing a part of the efficiency gain with them.

d) Freight terminals and sidings for use of multiple users will be encouraged.

e) Tariff-setting would be a dynamic and market-based exercise.

f) Rolling stock with high payload to tare ratio(at least 3.5 vis-à-vis 2-2.5 now), tailored to the needs of customers would be developed and deployed.

g) IT-based MIS and customer relationship management (CRM) systems would be adopted for inter alia, paperless transaction for indenting, freight payment and invoice forwarding as well as real time tracking of cargo.

h) Average speed of freight trains would be improved from 25 to 50 kmph.

4 Passenger Business

a) Passenger business will be reorganized into three distinct segments, namely, fast intercity, slow-moving passenger and suburban. A separate organization for sub-urban business, replacement of conventional rolling-stock of the slow passengers by MEMU/DMUs and a range of fast services including high-speed services would be the thrust of the policy.

b) **50 stations already announced for development into world-class stations through PPP would be completed and more would be taken up. Multi-functional complexes will be developed at 50 stations** to provide the passengers with high-quality services and amenities.

c) 375 stations identified as Adarsh Stations would be developed and provided with all modern amenities like drinking water, toilets, waiting rooms, dormitory and modern train indication, displays and signages.

d) Terminal capacity will be built up to match demand. Modern maintenance terminals equipped with automatic coach washing plants, train preparation facilities, sustainable waste management systems, all- whether pit lines, mechanized checking, detection and repair systems would be installed.

e) Maximum permissible speeds for premium passenger trains would be improved to 160-200 kms on the

segregated passenger corridors. High speed point-to-point services and overnight connectivity between national and state capitals and between state capitals and other major cities would be provided at regular frequencies.

f) **High-capacity coaches with optimized ergonomic design and double-decker coaches for intercity trains would** be developed. Seats/berths in the coaches would be innovatively designed to allow for flexible use for both day and night travel.

g) Popular trains would be augmented to 24-26 coaches.

h) Adequate rolling stock would be inducted for suburban services. Air-conditioned EMUs would be introduced.

i) Real time on line enquiry systems would be universalized.

j) **Quality of catering would be improved by adopting sound and proven business practices, setting up a chain of modern base-kitchens and branded restaurants at stations and encouraging innovation and local cuisines in on-board catering.**

k) Sanitation and waste management at stations will receive high priority. Each station would be studied for its peculiarities and a well thought out plan will be devised to achieve near-zero-waste by adopting the principle of reduction, recycle and re-use and improve the cleanliness of the stations benchmarked to the best in the world. Performance criteria and standards will be evolved for each element of cleanliness and achievement of these standards will be monitored at all levels.A unified system of responsibility for cleanliness at stations with adequate financial and oranisational resources will be put in place.Infrastructure and amenities like water supply, drainage, sewerage,washable aprons, properly designed platforms and 'pay and use toilets' maintained by competent agencies along with user awareness campaigns will form part of the plan. Coordination with city authorities will be maintained to achieve this objective. Cleanliness of trains would be enhanced by retrofitting all coaches with discharge-free green toilets, mechanized cleaning at maintenance terminals, onboard housekeeping and en route mechanized cleaning at Clean Train Stations. Maximum recycling of water will be planned and achieved. Professional assistance will be utilized for pest and rodent control.

l) Quality cleaning of bed linen would be ensured through mechanized laundries.

5 Parcel

a) Dedicated parcel terminals would be set up and time-tabled super-fast parcel services would be run.

b) The business would be segregated from passenger services.

c) Partnership would be formed with the private sector to provide end-to-end logistics. Adequate number of parcel vans (200 per annum as against 100 at present) would be inducted annually in partnership with the private sector. This would include refrigerated parcel vans to carry fruits, vegetables and perishables and special-purpose rolling stock to the carry automobiles..

6 Rolling Stock (Mechanical)

a) Locomotive and coach manufacturing units would be modernized and augmented. The coach manufacturing capacity at Integral Coach Factory, Perambur and Rail Coach Factory, Kapurthala would be augmented to 1500 per annum each. New coach manufacturing units at Rai Bareily (1000 coaches per annum), Palghat (600 coaches per annum) and Kanchrapara (500 EMU/MEMU/DEMU coaches) would be commissioned.

b) Coaches with stainless steel bodies and crashworthy structural designs incorporating the most modern occupant-protection and fire-retardant properties will be inducted. These would also be equipped with EP brake systems to enhance safety in high-speed operations.

c) Self-sufficiency would be achieved in the production of wheel sets. The existing capacity of the Wheel Axle Plant at Bangalore would be augmented.

d) Long-term savings in cost of manufacturing would be achieved by making smart "make or buy" decisions, developing reliable supply chains and vendors and adopting flexi/lean manufacturing set up.

e) Existing workshops for locomotive, coach and wagon maintenance would be upgraded; augmented and new workshops would be set up in a need-based manner.

f) High horse power locomotives (4500/6000 HP against 3000/3300 HP) would be developed for heavy-haul freight and high-speed passenger services. The availability of locomotive for operation would be extended to 45 to 60 days in case of ALCO locomotives and four months in case of EMD locomotives.

g) 170-tonne cranes with telescopic jib and self propelled accident relief train would be deployed to improve response in the aftermath of accidents.

h) Alternate fuses, such as 10% blending of bio-diesel, CNG, fuel cells and hydrogen fuel, would be explored.

i) Onboard diagnostics and online safety tools such as wheel impact load detectors (WILD), online bearing acoustic detectors and hanging component detectors would be deployed to improve safety.

7 Rolling stock (Electrical)

a) High horse power locomotives (9000 to 12000 HP) vis –a – vis 5000 HP at present would be developed for high speed and heavy haul operations. The loco manufacturing factory at CLW would be expanded by setting up a new ancillary unit at Dankuni.

b) Train sets would be introduced for intercity express train services to achieve high speeds and minimize terminal detention.

8 Infrastructure (Track)

(a) Track structure

Track structure will be standardized with 60 kg, 90 UTS rails and concrete sleepers with elastic fastenings. Improvements in specifications of materials, new types of elastic fastenings, economical designs of concrete sleepers and modern mechanized methods of track-laying and maintenance will be progressively adopted. Composite sleepers will be used at locations unsuitable for standard– design sleepers or those with unballasted deck.

(b) Speed

Tracks on identified, segregated routes would be made fit for running passenger trains at speeds upto 160- 200 kmph and freight trains at speeds upto 100 kmph. Formations, sleeper-fittings and bridge approaches will be specially designed and upgraded. Thick-web switches and moveable crossings will be provided on these routes. Eventually, thick-web switches will be standardized and the conventional curved switches will be replaced. Turnouts would be designed to permit speeds upto 50 kmph.

(c) Rail Panels

Rails will be procured in long panels of 120 metres and would be welded in flash-butt plants and laid with lengths ranging from 250 mtrs to 500 mtrs. Such continuously welded rails would eliminate a large number of rail joints and, in turn, would improve rail metallurgy (i.e. minimal residual stress, higher wear-resistance, higher elongation and better fracture toughness), maintenance and riding comfort. Corrosion-resistant rails shall also be provided in corrosion-prone areas. Joints will be welded in situ by portable flash butt welding plants and in exceptional circumstances by SKV Thermit welding. Rail life will be extended by rail grinding and rail lubrication. Improved types of switch expansion joints (SEJ) would be used in place of the conventional switch expansion joints.

(d) Maintenance

Cost effective options for mechanized track maintenance, including by remote satellite control, shall be explored. There will be complete mechanization of track maintenance activities. A decision support system such as Track Management System (TMS) will be in place to optimize material, machine and equipment and manpower inputs for track recording-cum- monitoring on the entire IR network (including USFD cars capable of recording precisely the location of track irregularities). Suitable techniques for data mining will be developed so that track maintenance philosophy shifts from present "find and fix" to "measure and predict." Permanent-way engineers shall also be provided with PDAs for recording inspection inputs.

All the maintenance and construction activities related to track shall be mechanized. Trackmen will be equipped with small track machines also. Rail Mounted vehicles (RMV)/Rail-cum-road vehicles would be increasingly used to facilitate movement of maintenance units.

All the maintenance units will have communications from worksites in block sections to the control offices. Maintenance blocks shall be taken by P-way and Bridge Engineers through mobile phones by software encoding. Integrated assured blocks shall be made available so that a culture of zero defect and "no surprises" exists during operation of trains.

Human dependence in the form of push trolley inspection, foot-plating, patrolling, etc. for detection of flaws and deficiencies in track parameters will be eliminated. It is envisaged that by 2020, the health monitoring of assets should be completely mechanized.

Vehicle mounted USFD would be stabilized by 2020 to achieve a sharp reduction in the number of rail fractures and increased reliability of assets.

(e) Bridges

Condition of bridges shall be monitored through a Bridge Management System. All new bridges will be on ballasted deck suitable for long-welded rails (LWR) and machine maintenance. Deflection settlement monitoring sensors will be fixed on all important bridges to directly transmit data to computers. New bridges and bridges on dedicated freight corridors and high speed lines will have approach slabs. Retrofitting of bridges (particularly arch- bridges) would be taken up.

9 Infrastructure (Electrical)

a) Energy-efficient, train power supply with LED lighting would be developed to improve energy efficiency. Energy conservation measures such as energy conservation building code (ECBC) would be adopted.

b) 2X25 KV system of overhead supply would be provided in high density routes.

c) Power plants would be set up at Navi Nagar and Adra through the existing Joint Venture with NTPC to meet the increased energy requirements from 2500 MW to 6000 MW to reduce energy cost.

d) 10% of the energy would be from renewable sources.

10 Signal & Telecom

a) Point and signal operation would be centralized at stations with provision of panels and electronic interlocking.

b) Filament signals will be phased out. Signals will be upgraded with LED lighting to improve reliability and visibility. Data loggers would be installed for predictive maintenance of signals.

c) Use of axle counters for block working (BPAC) would be adopted to enhance speeds and improved transaction time in block working.

d) Station sections will be completely track circuited to enhance safety in respect of verification of line occupation.

e) Automatic block signals and intermediate block signals would be used to improve line capacity.

f) On board train protection/collision prevention systems such as the ACD of KRCL, would be installed to avoid collision and driver passing signal at danger.

g) Mobile train radio communication, extension of optical fibre cable (OFC) over the entire route, IP-based train control communication, voice network modernization and replacement of overhead alignment with underground cables/OFCs are among the measures to be used to improve reliability of the communication system and enhance the capability of the transport system.

h) Broad-band internet and multimedia facilities and high quality train information displays and information boards at stations and running trains would be introduced to improve the quality of passenger service.

11 Security

a) Railway Protection Force (RPF) would be strengthened and empowered. Technology and HR interventions would be used to enhance capability.

b) An integrated security system covering major railway stations with CCTV surveillance, electronic access control, personal and baggage screening systems, explosive detection and disposal system would be implemented.

c) All important RPF posts would be networked.

12 Material Management

a) Transparent and competitive procurement systems would be adopted.

b) Just-in-time system of material management would be adopted to reduce inventory costs. IT-based MIS and integrated supply management would be adopted to optimize on materials life-cycle costs.

c) Activity-based requirements and zero based budgeting would be adopted.

13 Human Resource Development (HRD)

As outlined in the Chapter-VI, HRD will constitute a key mission area. Matching of skills and qualifications with requirement, training and motivation, through a challenging workplace environment, incentives for

accountable performance and cross-functional teamwork would form the core of IR's HR strategy. Railways will attract, nurture and retain top talent in the country to meet the challenges ahead.

14 Accounting Reforms

The ongoing process of accounting reform would be speeded up. Complete switchover to accrual-based accounting in consonance with the accounting standards stipulated by Government Accounting Standards Advisory Board (GASAB) would be attempted. This would enable activity-wise costing that can aid pricing decisions and management information and control systems for business lines, cost and profit centres. This could also being the railway's accounting in line with the globally accepted accounting standards. An extensive and state-of-the-art infrastructure of computing and data processing network will constitute the bed-rock of the system. Computerization of earnings and expenditure at the transaction level will be completed as a part of the effort. This exercise will be targeted for completion by 2020

15 Information Technology

IT tools will continue to underpin Railway's efforts to enhance customer satisfaction, maximize productivity of assets and improve governance. Priorities would include improving the interface with and providing real-time information to citizens, freight customers and passengers on various devices including mobile phones using satellite-based in train tracking systems, introduction of paper less mobile ticketing systems and Enterprise Management System to improve productivity and efficiency.

Roll-out of major applications like Passenger Reservation System (PRS), Unreserved Ticketing System (UTS), Freight Operation Information System (FOIS), Rake Maintenance System (RMS) and Terminal Management System (TMS), Control Office Applications (COA), Crew Management System (CMS), Passenger Management System (PMS) etc. will be completed by 2010. Other components of FOIS and Passenger Management System such as Management Systems for locos, coaches, wagons, workshops etc. will be completed and rolled out by 2011. Applications for fixed assets like track, power supply equipment etc and ERP for production units will be completed by 2012-13.

All IT facilities and platforms will be integrated through intelligent and inter-operable systems to enable IR to respond with speed to customer's needs, business opportunities and external challenges. For this purpose it will be ensured that:

All areas of infrastructure management will provide automated information systems.

- Introduction of devices for all monitoring systems have to comply with providing automated data to Management Information System.
- Event capturing for business related applications having customer interface will be automated through use of intelligent devices integrated with the applications.
- Decision Support Systems will be provided in all critical areas of infrastructure management for conducting business.

Vision 2020-Errata

Para & Page No.	Existing	To be read as
Para 5(c) page -iv	"free distribution of 26 million CFLs"	*"free distribution of 2.6 million CFLs"*
Para 6.5 (c) page 30	"As many as 26 million CFLs"	*"As many as 2.6 million CFLs"*
Para 9 (c) page 61	"Power plants would be set up at Nabinagar and Adra through the existing Joint Venture with NTPC to meet the increased energy requirements from 2500 MW to 6000 MW to reduce energy cost."	*"Power plant at Nabinagar is being set up in Joint Venture with NTPC. A captive power plant at Adra would be set up through competitive bidding. This will meet a major part of IR's increased energy requirement (going up from 2500 MW to 6000 MW) and reduce energy cost."*
Para 10 (f) page 61	"On board train protection/collision prevention systems such as the ACD of KRCL, would be installed to avoid collision and driver passing signal at danger."	*"On board train protection/collision prevention systems including ACD would be installed after successful trials and tests to avoid collision and driver passing signal at danger."*

Sd/-
(S.K.Mishra)
ED/Traffic/PPP
23-02-2010