

The Indian Railways Report – 2001

Policy Imperatives for Reinvention and Growth

Volume 1
Executive Summary

Expert Group on Indian Railways
New Delhi

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July 28, 2001

Dear Hon'ble Railways Minister,

I have great pleasure in submitting to you the Report of the Expert Group on Railways.

I regret very much the delay in submission of this report. Indian Railways is a large and extremely complex organisation with a proud history of performance and service to the nation. It is not easy for outside experts to grasp the many complexities that govern the operation of this massive enterprise. We have tried our best to comprehend these complexities with the help of our Railways colleagues.

IR is at crossroads. As you know, its financial situation is extremely difficult. But we believe that it has a bright future and that it can continue to contribute to the nation's development in as significant a manner as it has done in its almost 150 years of existence. We are convinced that if IR is to attain financial viability in the foreseeable future very significant organisational changes have to be resorted to, and a new investment programme launched to achieve high traffic and revenue growth along with safety. If such a strategy is followed it will become creditworthy and be able to raise the required resources. Exceptional government support will also be required if Indian Railways is to articulate and achieve such a vision.

Railways around the world have gone through major restructuring over the last 15 years. We have reviewed their experience with care and find that our solutions will have to be our own. Accordingly, we are proposing **our** approach to reorganisation. There has been considerable debate within the Expert Group on this suggested approach : we would agree that there could be other approaches. In suggesting this particular approach we would propose that it be offered for national debate so that the most practical strategy can be adopted. There would be alternative approaches using the core ideas presented in this report. In order to initiate wider discussion we would strongly suggest that this report be disseminated to all stakeholders and the public at large.

Of one thing we are convinced : if Indian Railways is to recapture its past glory, and serve the transportation needs of India in the 21st century, radical structural change is necessary along with a new strategy for investment.

I would like to acknowledge the generous help and time given by Members of the Expert Group, the Chairman, Members and Staff of the Railway Board, and many other colleagues.

With warm regards,

Yours sincerely,

(Rakesh Mohan)

Shri Nitish Kumar
Minister for Railways
Rail Bhawan
New Delhi 110 001

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I. KEY ISSUES FACING INDIAN RAILWAYS

The Indian Railways : Background

The Indian Railways (IR) has played a crucial role in the social, political and economic life of the country. IR's transportation network has helped greatly in weaving India into a nation. This network has not only integrated markets but also people across the length and breadth of this huge country. IR's role in times of war or natural calamities has also been commendable. It has always risen to the occasion and transported men and materials in large numbers at short notice. It is because of all these reasons that IR is one of the foremost institutions of the country today.

As the growth of the country's economy accelerates, the supply of all transportation services will also have to accelerate accordingly. With an increasingly competitive environment in the world the cost incurred in transportation will also have to be increasingly competitive with similar services provided elsewhere, with competitiveness being measured in terms of both costs and quality of services. India being a large continental economy the role of Indian Railways in providing such competitive services will be a critical part of the solution to India's infrastructure needs.

Infrastructure services have long been seen as the domain of the public sector mainly in view of the public goods characteristics of many segments of infrastructure services. It is useful to distinguish different infrastructure services according to their characteristics and the nature of their usage:

- **Open Access Services:** Those services from which people cannot be easily excluded such as public lighting, intra-city roads, public water supply and the like.
- **Limited Access Services:** These are typically services which can be provided on an exclusive basis. Such services can be provided on a user-pays principle so that those who cannot pay can be excluded. Such services can, in principle, be self financing through the provision of user charges. Should there be overwhelming social and other reasons for providing these services at less than cost to specific classes of consumers, this could always be done on a transparent subsidy basis.

Railways clearly fall in the latter category of services. Unlike the usage of roads it is easy to exclude both freight users and passengers from the usage of railway services without adequate payment in return. However, a tradition has been built up to see the railways as part of essential public service, the usage of which should not be denied to even those who are unable to pay fully. Freight users have been seen as those classes of users who can easily pay for the railway services they consume, and more. Similarly passengers using higher classes of services are also seen as those who can pay adequately and more. It is the users of lower class passenger services who are seen to have inadequate ability to pay and are therefore charged inadequate tariffs. Consequently, freight services subsidise passenger services as a whole and upper class passengers subsidise others.

With an increasingly competitive environment in the world the cost incurred in transportation will also have to be increasingly competitive. India being a large continental economy the role of Indian railways in providing such competitive services will be a critical part of the solution to India's infrastructure needs

These tendencies got accentuated in the 1990s, and the economics of IR are now extremely vulnerable. For first time in 17 years, in 2000-01, IR was not able to pay a dividend to the government on its past investment. This situation has continued in 2001-02. It is in a financial crisis. Its ability to invest adequately in providing efficient and cost competitive services in the future is seriously in question. Thus IR is in a watershed period in its history today and therefore drastic action needs to be taken in different areas to make this proud organisation the country's pride once again.

New Competitive Pressures

Apart from the internal difficulties that IR suffers from today, economic reforms of the 1990s have also subjected it to greater external pressures. With the opening up of the economy in 1991, and trade and tariff reforms accompanied by different measures of internal deregulation, Indian firms have become more and more conscious of all their cost elements. In an open economy framework internal prices of goods have to, more or less, follow world prices except as mediated by the existing level of customs tariffs. With the drop in international transport cost the natural protection enjoyed by domestic industries has also fallen. The consequence is that for domestic firms to be competitive in the world, the cost of infrastructure also has to be competitive with that in other countries.

Competition has been increasing across all sectors of the economy and the transportation business is no different. Over the years railways have faced stiff competition from the roadways. After trucking was de-regulated in the 1980s, road transportation has grown rapidly and has impacted Railways' market share. Features like greater customer orientation, flexibility and lower cost for short leads are increasing the share of roadways even in bulk commodities which have traditionally been a stronghold of the Railways.

Companies that were used to a "cost plus" approach to pricing are finding that their bottom-lines are under pressure. Public sector undertakings that purchase transport services have to find means of reducing these costs or become un-competitive. The private sector has become even more cost conscious than before.

Over the last decade, the proportion of the total production of bulk commodities that was transported by rail has gone down in almost all commodities. IR has seen a slowdown in the rate of growth of freight cargo transportation. The annual growth rate measured in 'net tonne kilometres', averaged 5.33 per cent between 1984 to 1991, but dropped to 1.86 per cent in the next eight years 1992-99.

Road dominance is likely to increase even further with the measures the Government has already set in motion for the road sector, like the four-laning of the "Golden quadrilateral" and the development of new expressway stretches. The increasing use of pipelines for the transportation of POL products is likely to further reduce demand for transportation of POL products in the future.

The coastal shipping and inland water-ways modes enjoy advantages in terms of a ready-made infrastructure, favourable levels of energy efficiency, and support through Government policy for their growth. In recent times, coal and cement have started moving in significant volumes through coastal shipping.

Over the last decade, fundamental changes in government policy have set in motion forces that are likely to have significant impact on the Indian economy. The process of economic liberalisation that started in 1991 has had far reaching consequences that have changed the way most industries were evolving

One of the reasons for the decline in Railways' market share, particularly in the freight business has been the **pricing of its services**. The ratio of average passenger fare to the average freight tariff for the Indian Railways is amongst the lowest in the world.

The railways therefore have to invest and reorganise in significant fashion over the next 5 to 10 years in order to meet these new challenges.

Quality and cost of infrastructure, of freight transport especially, are also of critical importance for a country seeking foreign investments. They influence trans-national corporations in their decisions as to where the new investments should be located. Cost reductions and the increased speed of freight movements over the past few decades have been increasingly based on multi-modal transport involving containerization which requires interactive coordination by shippers across rail, port, air and road freight modes. These developments call for a basic change in IR's approach to freight transportation.

Impending Financial Crisis

Indian Railways is at present in a financial crisis. Its ability to invest adequately in providing efficient and cost competitive services in the future is seriously in question.

Since independence, investment in IR has been controlled in a manner similar to all other public investments through the central planning process. It has been financed through a combination of internal generation, budgetary support from the Government and market borrowings. Availability of government finance has varied over the time depending on the state of public finance in the country and changing relative priorities. **There is a large backlog of investment that IR needs in order to finance major modernization and capacity expansion requirements.**

The internal generation of funds has come under severe pressure after the implementation of the recommendations of the Fifth Central Pay Commission. The share of the budgetary support in the plan size has been coming down over the years from 75 per cent during the fifth five-year plan to 23 per cent during the Eighth five-year plan.

Financial Situation of the Government: In recent years the financial pressures on the Government have increased. In order to understand the current fiscal predicament of the central government it is necessary to examine the pattern of central government expenditure and revenues over at least the last 20 years. As already mentioned above, the key threat to sustainable economic growth and to economic security is the substantial decline in investment expenditures made by the government.

The total expenditure of the central government increased from an average of 16.8 per cent of GDP in 1980-85 to about 20.5 per cent in 1985-90 and has then declined to between 16 to 17.5 per cent in the late 1990s. At the same time non-plan expenditure has increased substantially from about 10 per cent in the early 1980s to about 13 per cent of GDP now. What is most notable is the very significant increase in expenditure that occurred in the second half of the 1980s. These increases took place in almost all categories of non-plan expenditure such as interest payments, defence expenditure, subsidies, pensions, and loans to states. During this period other non-plan expenditures, which consist mostly of salary payments

The increasing competition from other modes has strengthened in recent years due to focussed development. Road dominance is likely to increase even further with the measures the Government has already set in motion for the road sector, like the 4-laning of the "Golden quadrilateral" and the development of new expressway stretches. In addition, induction of more modern, larger trucks is expected to improve the competitiveness of roadways

to government servants, remained roughly stationary at about 2.25 per cent of GDP. Plan expenditures were kept high at about 6.5 per cent to 7 per cent of GDP throughout the 1980s. Correspondingly capital expenditures of central government were sustained at levels of 6 per cent to 7 per cent of GDP. However, both **plan expenditures and capital expenditures of the central government have fallen to levels of about 4 per cent of GDP or less now.** With the increase in non-plan expenditure, particularly that in interest payments, the government simply has no money to invest in productive activities such as the railways.

Although the Indian Railways may have a justifiable claim on the central government for resources for investment in the public interest, the fiscal situation of the central government is such that it may be simply incapable of providing the volume of resources required by IR to be competitive in the future. It has to be much more careful in the investment it makes so that it obtains returns at least equivalent to the cost of funds in the market, regardless of whether they are raised directly by the railways or through central government

The debt service burden of the government would not rise as a proportion of total expenditure if the investments made by the government from borrowings yield adequate returns, either through the generation of non-tax revenues or through tax revenues. As the government borrows resources from the public to invest in new assets, tax revenues should rise through additions to public goods assets. Improvement in public infrastructure should lead to improvement in efficiency and in aiding new private investment, and hence to buoyancy in tax revenues. Similarly, non-tax revenues should rise through increasing dividends from public enterprise investments in infrastructure and other activities. If, however, resources are borrowed for investment in activities which do not yield adequate returns, debt service payments will rise continuously as a proportion of total revenues. This is what seems to have happened in India in general over the last 20 years, and in the Railways in particular over the last 10 years. The return on net worth in central public sector enterprises, excluding the petroleum companies is not significantly different from zero. Thus investments made in infrastructure or other activities through public sector enterprises have not yielded pecuniary returns to the government. Wrong pricing policies, inefficient public enterprise operations and other difficulties have all contributed to this situation of low returns. With the government running a revenue deficit since the early 1980s, all government and public sector investments have come from resources borrowed by the central government. In the absence of any returns from such investments, debt service payments are bound to become an increasing burden.

Quality and Cost of Railway Investment

Every rupee of investment such as that in the railways comes from sources borrowed at market interest rates in the capital market. The capital at charge committed by the central government in the railways at 7 per cent dividend rate, therefore, results in further loss to the central government. Hence, although the Indian Railways may have a justifiable claim on the central government for resources for investment in the public interest, the fiscal situation of the central government is such that it may be simply incapable of providing the volume of resources required by IR to be competitive in the future. It has to be much more careful in the investment it makes so that it obtains returns at least equivalent to the cost of funds in the market, regardless of whether they are raised directly by the railways or through intermediation of the central government.

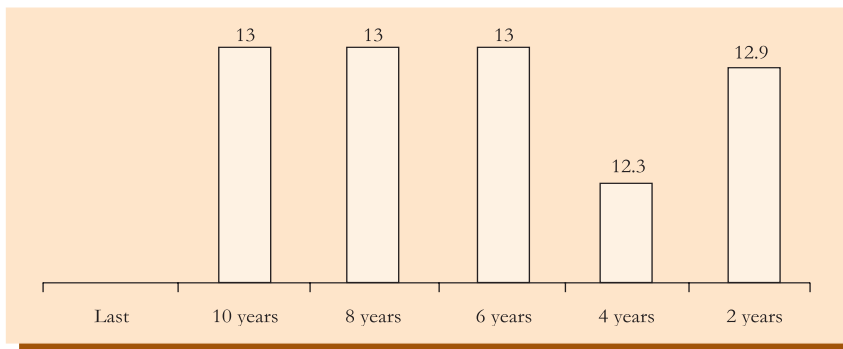
Today IR is on the verge of a financial crisis. The loss of market share in the profitable freight business, lack of flexibility in pricing, high cost of internally sourced products and services together with investments in unremunerative projects have meant that the **rate of growth in revenues (Exhibit 1)** has been outstripped by **the rate of increase in costs.** Revenues

have been growing at the rate of 13 per cent per annum over the last ten years. Costs too have grown at the rate of 13 per cent per annum during this period. However, in the last five years, costs have grown faster than revenues (**Exhibit 2**).

Investment in unremunerative projects has escalated during the 1990s. First, the adoption of the unigauge project which has involved large investments during this period has been particularly harmful to the finances of IR. Whereas it is possible that economic returns from this project may be felt over the long term, though many experts even dispute this, it is clear that there have been no short-term returns. Second, the temptation to begin a myriad of new lines for political reasons has been much greater during the politically fractured 1990s. Although progress in actual investment in these new lines is miniscule, this activity does divert engineering and managerial resources to a significant extent, detracting from other serious tasks.

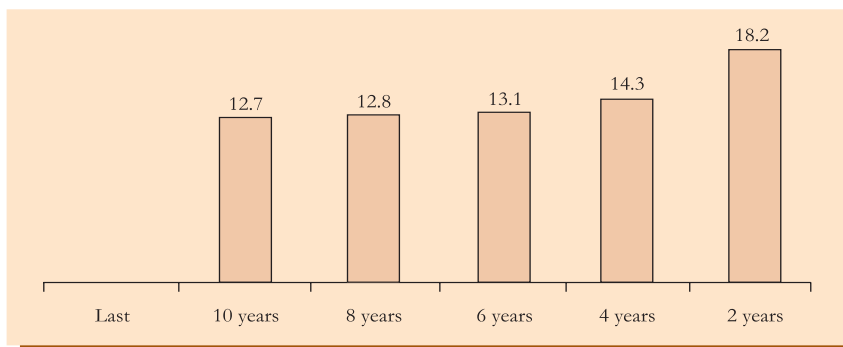
Revenue growth has also probably suffered from the saturation of freight traffic on trunk routes, particularly the golden quadrilateral. This is partly due to the large differential in speed between passenger and freight trains, which severely constrains the freight carrying capacity of trunk routes. Thus expansion of traffic on these routes requires both managerial action and investments on new technology to raise the speed of freight trains significantly.

Exhibit 1: Annual Growth in Revenue



Source : Indian Railway Accounts.

Exhibit 2: Annual Growth in Costs



Source : Indian Railway Accounts.

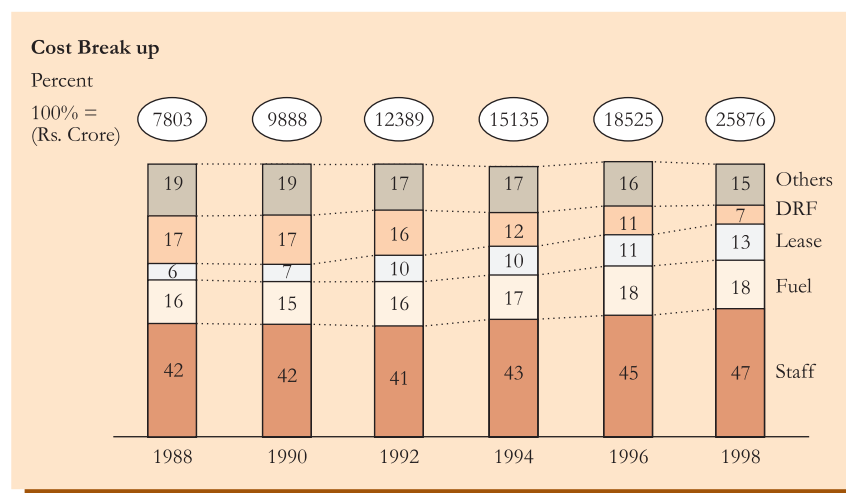
On the one hand, IR is seen by the government, and by itself as a commercial organisation. It should therefore be financially self-sufficient. On the other hand, as a department of the government it is seen as a social organisation which must be subservient to fulfilling social needs as deemed fit by the government. It is now essential for these roles to be clarified. Segregation of the two roles would enable the Railways to focus on each one of them separately, and hence achieve the desired objectives in each function

The success that IR has had in setting up and managing a complex network despite many constraints in the Indian operating environment offers lessons for other organisations. However, its past success has meant that IR has continued with the same business practices even as the operating environment has changed quite significantly. Due to this inability to respond to the changes in economic scenario, there are several serious issues currently facing the Indian Railways

These problems have essentially resulted from the wrong structure of IR which devalues accountability at every level. Rising employee costs, poor productivity and declining budgetary support have compounded the problem. Staff costs, which account for about 50 percent of the costs have been growing the fastest (refer **Exhibit 3**). This percentage is likely to increase even faster with the implementation of the recommendations of the 5th Pay Commission. The relatively low levels of employee productivity in the Indian Railways (**Exhibit 4**) compound the problems of having a large workforce.

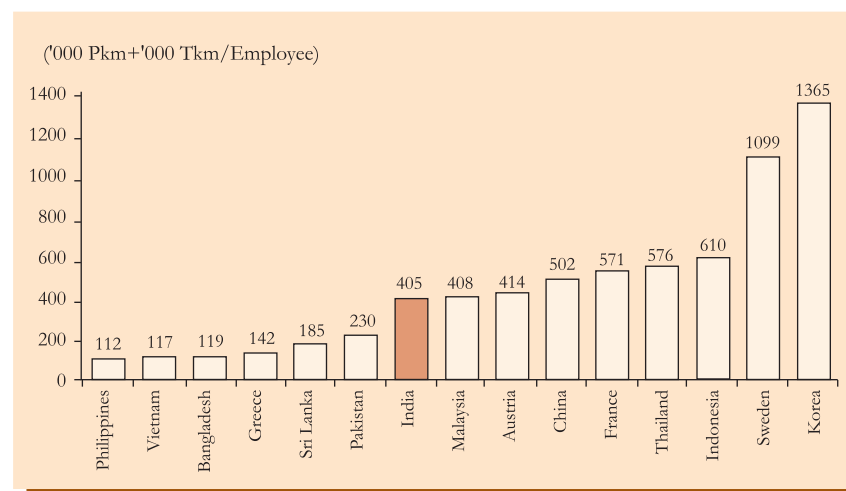
The proportion of expenditure on repairs and maintenance has been declining steadily over the years. The strain on the Railways resources has also prevented adequate investment in track renewals and other safety related areas. This is another consequence of the unigauge project. Consequently, the arrears of track renewals have grown from 3,548 km to 12,260 km over the last ten years. Though the overall number of accidents and the number per million train kilometres have shown a declining trend, the absolute numbers are still high with scope for improvement.

Exhibit 3 : Cost Break up



Source : Indian Railway Accounts.

Exhibit 4 : Employee Productivity



Source: World Bank.

In addition to the requirements for new investment for modernisation and remunerative capacity expansion, IR now has considerable backlog of investment for track maintenance and repair. The existing managerial, financial and accounting systems are such that these new financial requirements can not be met in a business-as-usual scenario.

To arrest the steep decline in its share, and to improve the quality of its services, the Railways need to increase investments in infrastructure. However, if the existing trends of increase in costs, uneconomical tariff setting and investments in unremunerative projects were to continue, it would be impossible for the Railways to generate funds internally for these investments. An “As-is” scenario constructed by assuming that there are no significant changes in performance projects that **by 2003 the Railways would have an operating deficit of approximately Rs. 3700 crore**. Recent trends indicate budgetary support is unlikely to account for more than 25 percent of the plan outlay. In this situation, Railways’ dependence on borrowings is likely to increase substantially and lease payments are expected to grow from Rs.1974 crore per annum in 1998 to nearly Rs. 5000 crore per annum by 2003. **Clearly continuing the current system of Railway operations into the future is not a feasible option.**

World Trends: Need for Restructuring

After a relatively stable period experienced by the railways around the world since the Second World War, there has been widespread reform in most railways over the last twenty years. Flowing from the changes that have taken place in India’s economic environment, IR also has to undergo major structural change in its organization if it is to serve the emerging needs of the country; this is the considered view of the Expert Group.

When infrastructure facilities are developed by the state or state agencies, there is typically little connection between cost of funds and the returns from the investment. Efficiency of investment has assumed new importance in the context of fiscal stringency. Ironically, as the state of public finance has become more difficult in India in the 1990s, the efficiency of investment in the railways has declined particularly during this period.

Issues Facing Indian Railways

(i) Customer Needs and Expectations

Customers of freight transport services typically want higher reliability of service, flexible solutions that make the right kind of capacity available at the right place at the right time, ‘one-stop-shopping’ with intelligible and simple documentation, customer-friendly interface and competitive, and stable prices.

Imports and exports can be expected to increase their share in an economy where the opening to trade is still incomplete. The quality of service and cost will have to be particularly competitive in this traffic segment.

Passenger services can be segmented into **long distance, inter-city** and **suburban** transport. They can also be clubbed under two heads: **value** and **premium**, depending on the quality of services provided. The business traveler segment is relatively price-insensitive and is willing to accept a fairly high price for good service and flexible reservation conditions. With increasing incomes, demand for leisure travel can be expected to increase for

Flowing from the changes that have taken place in India’s economic environment, IR also has to undergo major structural change in its organization if it is to serve the emerging needs of the country; this is the considered view of the Expert Group

the indefinite future. Given the long distances in the country, those not able to afford air travel will find the railways the most convenient form of travel.

India's urban population growth is projected to accelerate further. This implies that growth in suburban railway traffic will continue in the medium term. Demand for inter-city travel will also increase, particularly in the premium segments. Thus, the rationalization of passenger fares is crucial for IR's survival, both suburban as well as inter-city.

The rationalisation of passenger fares is crucial for IR's survival, both suburban as well as inter-city

The urban commuter expects fast, reliable, and regular suburban and intra-urban services at concessional season ticket rates. The inevitable growth in urbanization and the generally greater level of awareness of the urban commuter will only add to the problem.

Urban commuters are receiving a heavy subsidy due to the excessively concessional season ticket rates. The rationalisation of these fares will also be critical.

The lack of customer focus is characteristic of the "government department" attitude of IR. Competing modes of transport (primarily road transport) are far more responsive to market requirements. National Highway Development Project linking the four metro cities is likely to provide the biggest threat to the Indian Railways' freight and passenger shares. Frequent air-conditioned bus services will increase tremendously with the availability of fast, quality four lane highways.

It is now essential for IR's commercial and social roles to be clarified. The social role requires distinct resources and effort, which the accounting system must be enabled to reflect through costs adequately

(ii) Lack of Clarity Regarding Purpose

IR suffers from a split personality. On the one hand, at least since the separation of accounts in 1924, IR is seen by the government, and by itself as a commercial organisation. It should therefore be financially self-sufficient. On the other hand, as a department of the government it is seen as a social organisation which must be subservient to fulfilling social needs as deemed fit by the government. It is now essential for IR's commercial and social roles to be clarified. The social role requires distinct resources and effort, which the accounting system must be enabled to reflect through costs adequately.

Since the objectives for commercial activities are different from those for social activities, **separate parameters to assess performance** need to be identified. Commonly accepted financial parameters like revenues, profits, return on capital employed etc. could be used to assess performance of all commercial projects. For social projects, operational parameters such as an improvement in connectivity, increase in the traffic etc. could be used.

A contemporary business structure that is aligned with the organisational strategy is a pre-requisite for success. The structure should allow the organisation to focus on its core strengths / businesses. IR has not been able to customise its offering to suit the changing needs of the customers

(iii) Outdated Business Structure

A contemporary business structure that is aligned with the organisational strategy is a pre-requisite for success. The structure should allow the organisation to focus on its core strengths/businesses. It should also empower employees to take quick decisions with the objective of enhancing customer satisfaction. Measured against these criteria, the Railways business structure requires changes. These are basically due to two reasons:

• Functioning as a Government Department

IR currently functions as a Government department. This has limited its flexibility to respond to changes in the market place. The inability to change prices in response to increase in costs or the market scenario

highlights the various compulsions under which the Railway operates. In comparison, competing modes of transport (primarily road transport) are far more responsive to market requirements. In an economic scenario where transporters are increasingly competing on customer service, the lack of market focus and flexibility is a serious drawback for the Indian Railways.

• High Degree of Vertical Integration

The high degree of vertical integration has resulted in its diversification from its core business of transportation to other activities. IR also runs manufacturing facilities for its coaches and locomotives, catering facilities for its passengers, and educational and medical facilities for its employees. While it was perfectly necessary to adopt an integrated model in the past, the structure has its limitations in the current context. In the new context, it is necessary to examine the necessity of each of these activities critically. The presence in a variety of peripheral businesses also takes up management time and reduces focus on the core transportation business.

Today, there exist capable suppliers for many of the products and services that the IR currently generates in-house. By being vertically integrated IR has reduced its cost competitiveness and is finding it difficult to keep pace with technology in select areas.

(iv) Lack of Autonomy: Political Control

Although the Railway Board is currently provided considerable autonomy within the existing framework, the organization has historically been subject to significant political pressures. As a result, the Railways have often found it difficult to take decisions that may be beneficial from a commercial viewpoint but are perceived to be politically unpopular, particularly in the area of pricing of passenger services. Other infrastructure sectors in India (Power, Telecom) have made considerable headway in finding institutional solutions to conflicts of interest of this type.

Indian Railways: Purpose

Indian Railways is at crossroads. As has been brought out clearly, IR faces a serious threat due to its inability to adapt to the changing external environment. If IR is to continue its vital role in the future development of the nation, it has to rethink its very purpose of existence

Importance of Purpose Statement

To effectively discharge its numerous responsibilities, it is important that the entire IR organization work in concert towards a common stated purpose.

A good purpose statement should address four basic questions

- What do we do?
- For whom do we do this?
- What should we aim at?
- How does it help society?

To meaningfully address its role as an engine of national growth, the Railways needs to offer compelling value to its target segments. **Profitable growth** would be met through a combination of **clear strategy** that focuses on **customer orientation** and allows the best value to be delivered to the

If IR is to continue its vital role in the future development of the nation, it has to rethink its very purpose of existence

To effectively discharge its numerous responsibilities, it is important that the entire IR organization work in concert towards a common stated purpose

customer, and **financial discipline** to continuously reduce costs.

These concerns as also the over-riding objectives of **playing a central role in India's overall economic growth** and **helping to integrate the country through phased and sustainable expansion** figure in the draft purpose statement for IR that has been proposed by the Expert Group (See **Exhibit 5**). The purpose statement is aimed to help the management to respond to a dynamic environment, help guide Indian Railways out of the present crisis and put it on a path of sustained growth and profitability.

Exhibit 5 : Purpose Statement of the Indian Railways

Our purpose is to play a **central role in India's overall economic growth** by providing **customer focused, cost effective transportation solutions**. We will do this through an integrated transport system, which includes the Railways and other modes of transportation.

Our transportation business will cater to **three target customer segments**

- Freight
- Passenger
- Suburban Passenger

Our multi-modal network should provide the **most compelling value** to target customer segments. We will aim to **profitably grow** our services by providing **superior customer service** to our target segments. We will work towards enhancing our market share by equaling or exceeding the transport industry growth in freight and passenger traffic, subject to the profitability of such growth. We will achieve these objectives through the **integration** of:

- Clear Strategy
- Financial Discipline
- Customer Orientation

We will also aim to **help to integrate the country** through our transport services and aid the Indian Government in its efforts in the social/ developmental sphere by **using the funds provided exclusively and separately by the Government** for:

- **Phased and sustainable** expansion into socially desirable/strategically important routes including operational losses in their lifetime.
- Subsidising services deemed essential by the Government.

II. RAIL RESTRUCTURING : GLOBAL EXPERIENCES AND THEIR IMPLICATIONS FOR INDIAN RAILWAYS

Railways Restructuring : A Global Phenomenon

Between 1970 and 1995, railways across the world went through a process of change: once the pride of their countries, they had become liabilities. Unless they restructured, they were bound to lose the ability to shape their own destiny. Different railways adopted different restructuring models to rebuild themselves.

Railways were the first form of motorised transportation in the world. Their dominance was challenged by rapid growth in road and air transportation in the second half of the twentieth century. As a result, railways' market share declined and they began to experience financial problems. The rail market share in Europe almost halved from 30 per cent in the 1960s to 16 per cent in the late 1980s.

Freight customers were increasingly trying to reduce external costs in their supply chain. In many railways, the employees had acquired civil servant status. This sometimes led to higher overall costs, and also made negotiations for improving productivity quite complex. Truck and car users did not need to pay infrastructure costs except as taxes generally levied on fuel. The trucking industry could now offer not only lower costs, but valuable door-to-door service as well. Increasing containerisation of cargo further enhanced this advantage. Because of increasing burden of social security, governments wanted to reduce subsidies wherever possible. A vicious cycle of state funding leading to greater inefficiencies and a higher demand for subsidies was the consequence (**Exhibit 6**).

Continuous financial losses over several years resulted in large debts. Financial crisis of growing proportions became a threat to the very survival of the railways. An added impetus for change affecting the entire rail system in Europe was the creation of a single European market. Governments and organizations like the European Commission concluded that repositioning railways as a business could create both economic and environmental value for economies. Among the advantages of this mode are: **(a) railways are cleaner and energy efficient, and (b) railways are more economical for certain freight and passenger customers**, such as long haul freight transportation and high-speed trains for medium-distance passengers.

Consequently Railways in almost all countries have changed radically in the last two decades. Each railway adopted a different approach to change. All of these approaches had their advantages and disadvantages. There was no single "right" approach to restructuring. However, there were several lessons to be learnt. These were:

- The change in most countries was too late. For a long time, railways were denied the opportunity to change by the governments and incumbent management. Slowly the governments, typically the finance arm, recognised the imperative to change railways and forced them to improve customer service and become commercial entities.

Phenomenal investment in road infrastructure allowed roadways to achieve the dominant position that railways had commanded for decades. It could now offer not only lower costs, but valuable door-to-door service as well. Increasing containerisation of cargo further enhanced this advantage. In the late 1980s and early 1990s, governments, because of the increasing burden of social security, wanted to reduce subsidies wherever possible. As a sizeable portion of government budgets was kept for the railways, cutbacks directly affected the funds available to them

- It was important for the railways to be run as independent corporations and not as government departments.
- Almost all governments inducted fresh talent and external professionals in the top management of railways.
- To focus on the core transportation business, most railways spun off their non-core businesses such as manufacturing, catering, telecommunications, and maintenance.
- Post-restructuring, the railways improved their performance on several fronts such as customer service (price, quality), safety, market share, investments, and productivity.

Today, Indian Railways is at crossroads, too. To improve its performance and secure its position, it will need to find new ways and structures to operate. While it can learn from other's experiences, the restructuring approach it finally adopts will have to be tailored to the socio-economic realities of India.

Railways had undertaken a large number of unrelated activities such as manufacturing, catering, maintenance, telecommunications, etc. themselves, that were not core to the rail operation. The large set of non-core operations took away valuable senior management time, better spent on the core business

Exhibit 6 : Four Major Forces have pushed the Railways towards Change

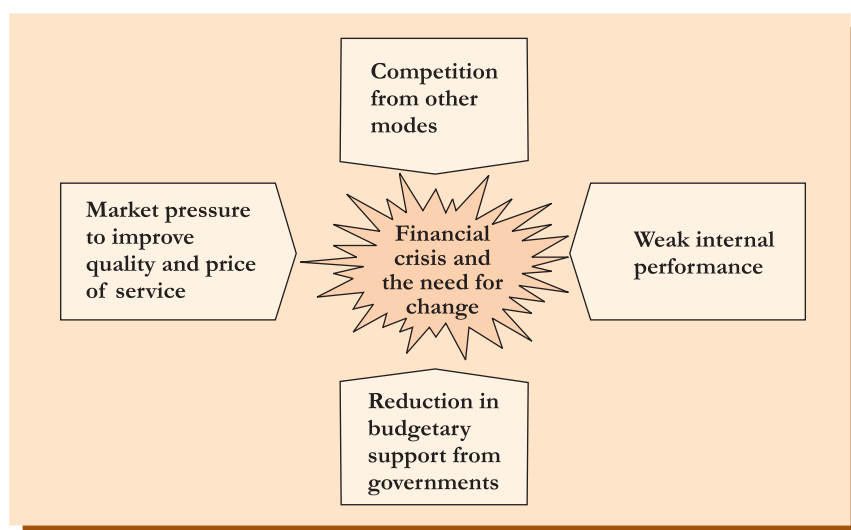


Exhibit 7 : Several Railways were Burdened by Financial Losses, Debts and Subsidies

	Financial losses \$ million	Total debt \$ million	Public subsidies \$ million
Japan, 1985	11,300	200,000	5,000
Germany, 1992	2,500	33,500	6,500
France, 1996	2,200	28,800	3,000
Britain, 1993	270	N.A.	1,300
Sweden, 1988	200	650	590

Note: Years just before restructuring exercise.

Source: EU, SJ, East Japan Railways, SNCF, Deutsche Bahn, SJ Cargo, Railtrack.

Common Principles Guiding Restructuring

All railways adopted three restructuring principles: (1) creating an arms-length relationship between the railways and the government; (2) inducting management with commercial skills to create customer-focused organisations; and (3) defining the appropriate business focus and spinning off non-core businesses.

Today, Deutsche Bahn (DB) in Germany, Railtrack among others in Britain, Ferrovie Dello Stato in Italy and all railways in Japan, are autonomous railway companies, distinct from the government. As part of this new relationship, railways identified their public service obligations. Distinct performance measures were set up for the commercial and the social service segments of the business.

Railways created customer-focussed units such as Passenger and Freight units in Sweden, and Long Distance Passenger, Short Distance Passenger and Freight units in Germany. The Japanese government created a new organization called the Japanese National Railway Settlement Corporation. This corporation took over most of the debt of JNR amounting to \$ 189 billion. In Germany, too, the government created an organisation (BEV), which took over the legacy of debt and redundant staff.

To increase customer focus, the railways had to attract talent from outside the industry. CEOs of more than seven out of ten large railways in Europe and Japan today have non-railway backgrounds. Fresh talent was recruited also at middle and junior levels. Railways in Europe and Japan have long outsourced activities like rolling stock manufacturing. Political and economic conditions led to specific restructuring paradigms that distinguish European from Asian railroads.

The European Commission introduced two important structural changes (1) it separated the infrastructure and railway operations; and (2) created an independent regulator to oversee contractual relationships between railway operators and the “neutral” infrastructure. This model is similar to that of airlines, where the management of airports is separated from operating the airplanes (**Exhibit 8**).

In order to operate like a business, the railways needed to be separated from the government. Railways identified their public service obligations. They then drew up contracts with their governments to ensure state funding of these obligations as well as the efficient use of these funds

Exhibit 8 : Synthesis of the Elements Common to European Rail Deregulation

Separating the infrastructure	<ul style="list-style-type: none"> • Effective separation to facilitate access of other operators • Setting an access fee to finance the infrastructure – at least partially
Opening railroad operation to competition	<ul style="list-style-type: none"> • Gradual competitive bidding of passenger railroad markets, clarifying rules and access mechanisms <ul style="list-style-type: none"> – Stage One: Regional and commuter traffic (state-subsidised) – Stage Two: Long-distance traffic • Liberalisation of freight market with free access to rail network
Active role of the State	<ul style="list-style-type: none"> • Creations of a regulatory body-independent from the operators and infrastructure – to act as an arbitrator for the system • Structural rationalisation of the railroad system (debt and surplus staff) • Driver of the business adaptation of the traditional operator

As distinct from the European approach, Japan and China have adopted a very different model of restructuring – regionalisation, chiefly for geographical reasons. At the same time, Chinese railways separated several parts of the railway business into independent subsidiaries and even private companies. Regionalisation has helped Chinese railways to decentralise operations and push decision-making to the regions.

Managing the Transformation Process

In the interviews with railway experts, almost everybody agreed that the transformation process for all railways could have been started sooner. The government and the railway management in each country had denied the railways the opportunity to be a business and not a bureaucracy. This had resulted in enormous financial losses and a public loss of faith in the railways system. Only when the situation became very serious, the government decided to take a firm action and initiated the reform process. A radical change in the railways was vital if the industry was to continue.

European countries also created a regulator to act as an “umpire” between the new entities (primarily, the operations and infrastructure) and to be responsible for defining standards and ensuring fair competition

Railways restructuring models, both universal as well as specific, were radical, and involved the complete overhaul of these colossal organisations. While governments orchestrated the change, the process required careful management of other stakeholders such as, railways management and unions.

• Managing government support

The government took an active role in restructuring. It was the government that imposed the change in most countries.

• Managing railways management

Most railways supplemented their senior management teams with commercial managers from outside. While the new managers and the government drove many decisions, renewal was required at all levels of the operations, from top management to frontline leadership. As most of these managers were outsiders, they brought in a fresh perspective, and acted as change leaders. At the same time, it was critical to use the knowledge within the railways system to define and create new roles.

Exhibit 9: Government’s Role in Deregulation

	Common elements	Differentiating elements
State as a change facilitator for historical legacy management	<ul style="list-style-type: none"> Active participation in debt write-off and personnel restructuring processes 	<ul style="list-style-type: none"> Different models for managing the historical legacy <ul style="list-style-type: none"> – Partial and progressive – Total and initial
State’s regulatory role	<ul style="list-style-type: none"> Regulatory role performed by an entity that depends on the State, and completely independent from railway operating companies Regulatory functions imply license issuing, slot allocation and security regulation 	<ul style="list-style-type: none"> Regulatory can be performed by a single body (Germany), by two bodies (Britain), or even three (Netherlands) In some models slot allocation is still performed by the infrastructure manager (Germany)
State ownership of different elements/rights of the models	<ul style="list-style-type: none"> Infrastructure owned by State (except in Great Britain) Operator owned by State, at least for the short term (except in Great Britain) 	<ul style="list-style-type: none"> Articulation through State agencies or entities (BV in Sweden, NS Trust in Netherlands, RFF in France) or through a State-owned corporation (DB Netz AG in Germany) In some cases, possible transformation of Company structure and possible privatisation (Germany)
State as body responsible for contracting out public services	<ul style="list-style-type: none"> Definition of local services requirements transferred to local authorities except in Great Britain (CTAs in Sweden, Regions in the Netherlands and France, Lander in Germany) Participation of local authorities in granting licenses for local traffic (except in Great Britain) 	<ul style="list-style-type: none"> Participation by Swedish CTAs in planning developing and maintaining local lines

Source : McKinsey & Co.

- **Working with trade unions**

Effectively working with labour unions and garnering their support was crucial in almost all railways restructuring efforts. The unions had the potential to become a severe roadblock if they opposed the restructuring process, as it was the case in Italy and France. Making successful agreements with unions required continuous dialogue to ensure common understanding of the criticality of the situation and the need for action, between management, the railways, and the unions.

- **Phased restructuring**

Most restructuring efforts took more than 10 to 15 years and are still ongoing. Details such as management of railway stations, marshalling yards etc., are still being resolved in many European railways. However, with the knowledge acquired during the transformation process, from today's perspective, the overall time can be significantly reduced. In addition to the length of time taken, restructuring took place in several phases. The restructuring process has not been a smooth ride. Hindsight underlines the importance of dialogue with the unions and transforming the hearts and minds of railways managers.

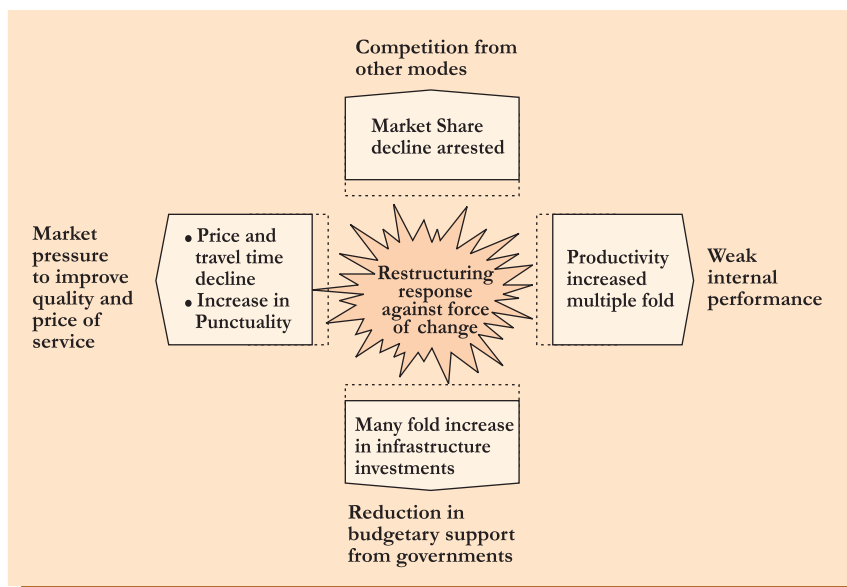
Benefits of Restructuring

Restructuring has helped the railways improve customer service (in terms of quality, price, and safety), market share, productivity, and investments, and thereby respond to the forces of change (**Exhibit 10**).

(i) **Customer service (quality, prices and safety).** The customer has clearly benefited in most countries in terms of quality, prices, and safety. The irony, however, is that he does not seem to be fully aware of the extent of improvement! Despite the negative publicity received by Britain's railways, punctuality and hence the quality of service has actually improved. The average delay per passenger fell from 2.5 minutes to 2.2 minutes. The consumer benefited to a great extent from the efforts made. One of the consequences of privatisation and more regulation is that performance monitoring has become more transparent and the customers more demanding. In Japan, restructuring

Transformation was a long process. Most restructuring efforts took more than 10 to 15 years and are still ongoing. Most rail executives agree that, with the knowledge acquired during the transformation process, they can now undertake the change much faster

Exhibit 10 : Impact of Restructuring against the Forces of Change



helped reduce travel time by almost 25 per cent. There was a similar impact on prices. Post-restructuring price levels for passengers in Sweden fell at almost 5 per cent per annum and freight prices declined at approximately 7 per cent. Britain witnessed a marginal decline in passenger price levels that had been increasing at 2 per cent a year before restructuring started.

Railways restructuring also helped improve safety levels. The number of accidents in Japan could be reduced by 50 per cent after the restructuring. In Britain, accidents per million train miles declined from 1.0 to 0.3. Increased safety was also observed in Sweden and Germany. The railway experts considered the increase in safety indicators to be a direct output of accountability. The restructuring in railways led to the creation of standard procedures and transparency, that could not be avoided or shirked by the operators – public or private. Also the performance parameters became public and hence were more rigorously adhered.

(ii) Market share. Although restructuring has not yet helped all railways reverse the downward trend in market share, most have either stopped the decline or are in the process of showing positive growth.

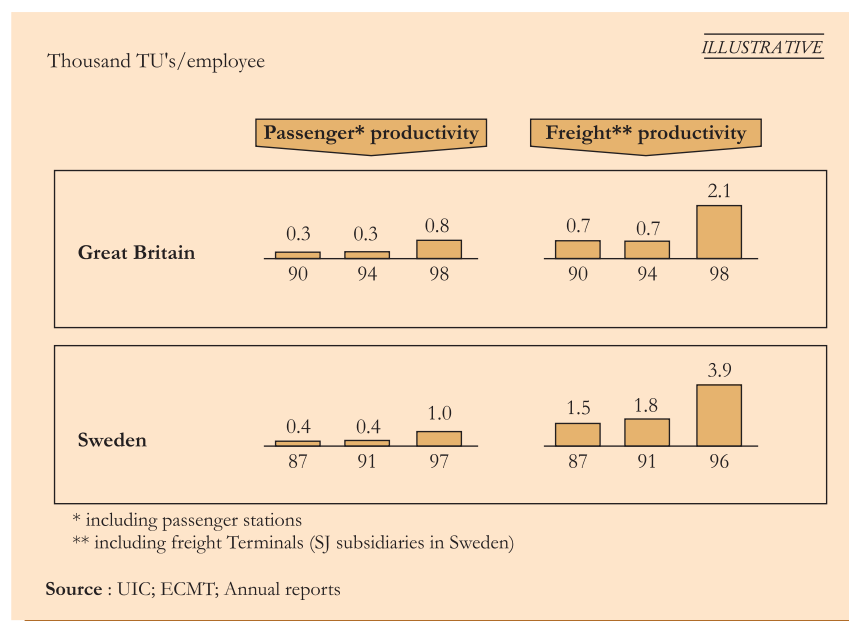
Cumulative rail traffic in the three largest European railways, Sweden, Germany, and Britain, had been declining at 7.5 per cent per annum. Restructuring reversed the trend; traffic began to grow at almost 2 per cent per annum.

(iii) Productivity. Restructuring made the railways more efficient. Employee productivity improved dramatically in most countries after the restructuring. Japanese productivity levels tripled from 500-passenger ton km per employee in the early 1980s to more than 1,500 passenger ton km per employee within five years of restructuring. This growth was replicated in other countries, too. In Germany, this figure rose by approximately 95 per cent between 1993 and 1998. Employee productivity more than doubled in Britain and Sweden (**Exhibit 11**).

(iv) Infrastructure investments. Restructuring raised infrastructure

Restructuring in railways led to the creation of standard procedures and transparency, that could not be avoided or shirked by the operators – public or private. Also the performance parameters became public and hence were more rigorously adhered.

Exhibit 11 : Productivity of Railways Increased after Restructuring



investments and reduced public subsidies in each country. The capital expenditures of the East Japan Railway Company alone increased from \$500 million before restructuring to almost \$2 billion a year. Similarly, in Britain, infrastructure investments doubled from less than \$1.4 billion a year in the late 1980s and early 1990s to more than \$2.8 billion per annum by 1999-2000.

Lessons Learnt from Restructuring

Several lessons can be learnt from the rail restructuring process. These are:

(i) Involve the unions. While the governments and railway management in Germany, Sweden, and Austria, involved the unions significantly to ensure their commitment to the transformation process, others did not. In Italy (FS), Britain (BR), Spain (RENFE) and France (SNCF) the unions remained unconvinced about the scope and timing of restructuring, and the railways faced several problems on that score. In fact the British and Italian unions staged angry strikes against the reform process.

(ii) Find the right model. While the principles common to all railway restructuring (arms-length relationship, professional management, and appropriate business focus) should be agreed on quickly, deciding on the detailed organisation model needs careful consideration. The restructuring of British Rail, for example, in which the railway was split into more than 100 companies, was considered a hasty process by many. Several of these companies, such as three of the freight companies, later re-merged. Countries such as Germany and Sweden adopted a more cautious approach towards privatisation. Hence, understanding and deciding on the future model, as a carefully orchestrated process involving all stakeholders is important.

(iii) Create a well-designed roadmap. A clear roadmap and restructuring plan helps to set aspirations and manage stakeholder expectations. A clear balance between the length of the plan and adherence to it is critical. In Germany, a 10-year plan was created, whereas British privatisation was completed in two years. Ensuring that the plan is managed and continuously challenged by outside stakeholders is just as crucial. Germany used the services of an “expert group”, comprising academicians, industry experts, and rail managers, to develop its 10-year restructuring plan.

(iv) Find the right mix of internal railways managers and external skills. To create a customer-focused, commercially oriented organisation, during and after restructuring, it is important to blend the operational experience of railways managers with the commercial skills of external managers.

To decide which of these is the best model in detail is difficult and probably a premature exercise. The rail reform process is still underway in most countries.

Implications for Indian Railways

Indian Railways has a great tradition of public service. However, due to the many economic and growth challenges it faces, it was unable to match the rapid expansion of Indian industry.

Today, Indian Railways is in a similar position to where European Railways were 15 years ago. Indian Railways has been facing sharp market share decline

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in both freight and passenger segments. Indian Railway's freight share, which was more than 80 per cent in the 1950s, has declined to 40 per cent today. With the significant increase in expressways and 4-lane highways over the next decade, its share is likely to further decline to 25 per cent. The passenger share has declined in proportion with rapid increase in short-distance bus transportation, increase in car travel and deregulation in the airlines sector. Indian Railways productivity, at 400 Traffic Units per employee, is lower than even in China (with 3.3 million employees) and several other South-Asian countries. Indian Railways financials, recast in a corporate format, show large cash losses.

India, on the other hand, is currently in a high growth phase. The acceleration of the economy has just begun. The creation of an efficient transportation support system is essential to sustain this growth. Indian Railways can play a vital role in this, but it will have to match the rapid acceleration of Indian industry and the demand of freight customers for reliability and service. In order to achieve this, Indian Railways will have to be transformed into an efficient, customer-focused organisation.

Drawing from the experience of others, Indian Railways would need to define the principles behind a successful restructuring and the future organisation that will be required to achieve this.

III. THE DEMAND FOR AND SUPPLY OF RAILWAY SERVICES : TRENDS AND PROSPECTS

Growth is the Key

If IR is to survive as an ongoing transportation organisation, it has to modernize and expand its capacity to serve the emerging needs of a growing economy. This will require substantial investment on a regular basis for the foreseeable future. With the prospect of getting substantial free or subsidised resources from the government being unlikely, new investment will have to be financed on a commercial basis. This is the challenge facing the Indian Railways.

The ability of the Indian Railways (IR) to accelerate the growth rate of their revenues from freight and passenger traffic is central to the success of any effort to restructure the organization and to finance the necessary investments. All the new investment and organizational restructuring that is envisaged will be of little use if the demand for railway services does not increase apace.

The current mix of revenues, about 70 per cent from freight and the remainder from passenger services, does not allow for the entire burden of improvement to be borne by either segment. Both will have to show progress for the restructuring to be worthwhile.

Our financial projection exercises show that for IR to be financially viable as a commercial organisation, incremental improvements in traffic growth will not be adequate. For IR to survive over the next 20 years and beyond, it has to adopt a “strategic perspective” where it rekindles high growth in both the passenger and freight segments. It is imperative that IR achieves this “strategic growth”. Although this scenario is ambitious in its goals, it provides an attainable target for IR with respect to growth in revenues.

Long Term Traffic Growth Patterns

One of the major reasons for the deterioration of the organization’s financial condition has been a steady decline in the growth rate of freight traffic in recent years. The growth rates of passenger traffic, in contrast, have been fairly healthy, and there is a significant increase in the share of revenues being realized from the higher classes of passenger services. Despite this trend, however, an overwhelming proportion of passenger revenues is still dependent on lower classes’ fares.

There are well-known factors underlying these patterns. Some of these emerge from the broader political context in which IR operates. Since pricing is an inherently political decision, the organization has to bear the burden of pricing decisions that are not always taken on the basis of commercial viability. In this context, it is widely perceived that freight movement, on the whole, has been subsidizing passenger movement. Passenger fares, specially for the lower classes are set with clear political considerations in mind, which almost inevitably leads to subsidization. Some of this is made up by inflating upper class fares, but despite rapid growth during the last two decades, with their share of passenger revenues in the total increasing from 10 per cent to 20 per cent, this continues to be a relatively small source of revenues. So, the potential for fully compensating for the subsidy for the lower classes from

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A striking feature of the changing patterns of IR’s freight traffic is the drop in the share of “other commodities” from around about 40 per cent at the end of the 1960s to below 15 per cent by the end of the 1990s

In a business line in which IR faces open competition from other modes, it has witnessed a significant decline in market share, reflecting its competitive weakness

Commodities such as cement and steel, whose production has increased significantly, appear to be using IR services to a lesser and lesser degree. New investment in some of these commodities is taking place in the private sector, which is more cost and quality conscious

this source has been limited. To maintain some control over IR's financial deficit, the burden of cross-subsidization inevitably falls on freight traffic. IR has been steadily losing its market share of freight to road largely because it has not been able to compete on prices.

The changing structure of freight traffic over the last three decades, as represented by the revenues, shows the continuing movement of IR towards bulk commodities. The trend of concentrating on bulk commodities is attributable in part to the overall policy of public sector predominance. The requirements of transportation of both raw materials and finished goods going into and emerging from public sector plants had to be met by IR, whose services were increasingly drawn away from the rest of the economy. IR tariffs began to discriminate in favour of rake movement relative to individual wagon movements. The only sectors to benefit from this were precisely the ones dominated by the public sectors, and who consequently came to dominate IR freight.

The drastic decline of share of the commodity grouping "Other Commodities" in the Railways' freight basket is particularly noteworthy. It shows that in a business line in which IR faces open competition from other modes, it has witnessed a significant decline in market share, reflecting its competitive weakness. Its core strength in the transportation of bulk commodities is also under threat, judging from the fact that many commodities such as cement and steel appear to be using IR services to a lesser and lesser degree.

In contrast with freight, passenger traffic has been growing at a relatively healthy rate. Total passenger kilometers (PKM) grew at a trend rate of about 4.5 per cent over the last 15-year period, and the last five years have seen an acceleration to about 5.8 per cent. The patterns for physical volumes show a significant increase in the share of the upper classes, particularly after the 1980s, but the overwhelming share of traffic remains in the lower classes.

Foreseeable Trends

Looking to the future, the changing structure of production in the economy in the next decade may reinforce this erosion of competitive strength. Firstly, there are clear indications that manufacturing activity, which on the whole is relatively more transport intensive than services, and particularly with respect to bulk transportation, appears to be peaking at somewhat less than 30 per cent of GDP. This is in sharp contrast to historically observed patterns of development, where the share of this sector in GDP would go up to around 50 per cent, before declining as the services sector caught up and became the dominant sector. In India, the service sector is already by far the dominant sector, accounting for about 48 per cent of GDP and also appears to be the fastest growing. The implication of this pattern is that every increase in GDP will require less and less transport services. IR will have to compete even harder with other modes in order to sustain its traffic volumes, let alone accelerate growth.

International trade has increased and will continue to increase in its importance relative to GDP. This means that transportation services will become increasingly integrated, with road, rail and sea striving to become a part of a seamless chain of goods movement. To exploit the potential in the non-bulk segment, mere pricing will not be sufficient. IR can compete for this traffic only if it offers an attractive total logistics package.

As a result of the changes in the economic policy over the 1990s, there is a high probability that the average growth rate over the next decade may be even higher than during the one just ended. IR has been losing freight traffic to roads in an environment of relatively rapid growth. This tendency will accelerate with the construction of the planned golden quadrilateral and cross-country highway systems.

These trends indicate a major revamping of IR's approach to freight traffic. They have to regain their primacy in bulk freight, and at the same time, have to increase their competitiveness in the haulage of "other commodities". This requires a combination of price-based and non-price based strategies. With respect to pricing, tariffs would need to be lowered to lure traffic away from the roads. To exploit the potential in the non-bulk segment, however, mere pricing will not be sufficient. **IR can compete for this traffic only if it offers an attractive total logistics package.** IR has to develop the capability of picking up small loads, and then aggregating, disaggregating and delivering them. This will require arrangements with road transporters and a host of other related services. **Without expanding its service capabilities in this direction, IR stands to lose the opportunity being presented by the evolving structure of the economy.**

Economic Growth and Income Patterns: Effect on Passenger Demand

The central problem with respect to the IR's movement of passengers is that more than 90 per cent of the traffic is in the low-price segments. The key challenge to IR is to maintain its obligations in the lower price services, while at the same time increasing both capacity (through investment) and utilization (through innovative pricing and other marketing instruments) of the upper classes. The revenue potential from the upper classes needs to be exploited to the maximum extent.

On the passenger side, economic growth provides an opportunity. The railways have a virtual monopoly on a large range of travel options in the middle of the transportation price hierarchy. This represents an opportunity to increase the usage of higher-class services and thereby increase revenues. The relatively rapid growth of the past decade-and-a-half or so has succeeded in shifting large numbers of households from subsistence levels of income to levels where substantial discretionary disposable income is available. The changing traffic distribution in recent past, dramatic as it has been particularly with respect to the newly positioned price segments, has not kept pace with the upward mobility of households.

The patterns of passenger traffic over the last 15 years reveal a relatively market sensitive face of IR. As more and more people have shown a willingness to pay more for better services, IR has responded by increasing their capacity to provide these services. Starting with the relatively wide gap between premium and basic travel, represented by AC I class at the top and Ind ordinary at the bottom, IR has been steadily operationalising pricing points in between the extremes. While I class services still exist, they are being phased out as part of IR's long term strategy to provide air conditioned services at the upper end of the price ladder. II AC was introduced during the early 1980s and II AC 3 tier during the mid 1990s. Both of these classes have proved to be enormously popular. It is this market sensitivity that will lie at the core of any strategy to accelerate the growth of revenues from passenger traffic. In fully realizing the potential gains from its marketing strategy, it must

IR's freight traffic has been shifting from the relatively high-tariff commodities to the relatively low-tariff ones. Looking to the future, the changing structure of production in the economy in the next decade may reinforce this erosion of competitive strength

It is characteristic of travelers in developing countries to use a variety of modes simultaneously. Traffic patterns in any city, ranging from pedestrians to bicycles to taxis and cars to public and contract buses attest to this

pay the closest attention to quality of service, right from the reservation process to the journey, and in-train services to the convenience of boarding and alighting. However, the broader political constraint, the requirement that IR meets the national mass transportation needs at prices that may not be justified by costs, places serious restrictions on how such a strategy can be implemented. The key challenge to IR in this respect is to maintain its obligations on the lower price services, while at the same time increasing both capacity (through investment) and utilization (through innovative pricing and other marketing instruments) of the upper classes.

Enhancing Capacity and Quality

Looking at economic trends in the context of broader macroeconomic trends gives us a sense of what the potential for growth in IR freight traffic is. **If we anticipate a GDP growth rate of about 6.5 – 7 per cent per year over the next decade, IR can look at a potential growth rate of about 8 to 10 per cent per year if it follows a strategy designed to regain its lost market share.** However, as was also pointed out earlier, there may be changes going on in the structure of the economy, which would make this an unrealistic target. Nevertheless, this rate of GDP growth offers an opportunity.

GDP growth appears to generate demand for travel at an almost proportionate rate, but the average journey seems to have become shorter, which has adverse implications for revenue, given the pricing structure. Based on this estimated relationship, there is far greater room for optimism about growth in passenger traffic keeping pace with GDP growth. A restructuring plan which visualizes passenger traffic growth at about the GDP growth rate should therefore be viewed as feasible. However, the problem of the distribution of revenues across passenger classes needs to be dealt with explicitly in any such plan. Volume growth, which is biased towards the lower classes will not generate the kind of revenue buoyancy necessary for the plan to be viable. IR needs to take steps to increase the capacity and utilization of the upper class segments. There is potential to do this with the use of price changes in the passenger tariff structure.

On the passenger side, the revenue potential that the income dynamics represent for the railways has so far not been exploited because of supply constraints. New investments in upper class rolling stock, as well as in increasing average speeds of passenger trains may allow IR to cash in on this untapped potential. Towards this end, there is very little to be gained from retaining its in-house rolling stock manufacturing capacity.

The attainment of financial health will necessitate both higher growth in traffic as well as tariff rebalancing. **IR has little option but to rebalance passenger tariffs in a manner consistent with the elasticities of demand for the various classes.**

This tariff rebalancing is construed as a restructuring of passenger fares *on the average*. This means that IR must exploit every opportunity to discount fares in order to fill vacant seats and berths. It should look at the possibility of off-season discounts, standby discounts and various other ways in which to attract those travellers who are most sensitive to prices, and would be willing to travel if they could pay less than the listed fares, particularly for the upper classes. It will need to use information technology more creatively for revenue enhancement.

Economic growth, while providing an opportunity for higher business volumes, may not be sufficient to generate these. The organization has to have the capacity to go after this business, and once having obtained it, to sustain it

The railways have a virtual monopoly on a large range of travel options in the middle of the transportation price hierarchy. This represents an opportunity to increase the usage of higher class services

Review of Concessional Fares

Some sample surveys conducted by railway officials suggest that the proportion of concessional passengers travelling in all the classes combined may be as much as fifteen per cent of all passengers. The proportion may be even higher for upper class travel. A significant proportion of such travel is accounted for by railway employees. If these estimates are correct, then a serious review of concessional fares is urgently called for. Concessional travel by employees on personal travel must only be on a stand by basis; they should not displace fare-paying passengers.

Feasibility of High Growth

On the freight side, IR has been losing market share in a variety of commodities in which they have a natural competitive advantage, not to mention commodities in which they are subject to competitive threat. Structural changes taking place in the economy suggest that the demand for transportation, particularly bulk transportation which is IR's core strength, will not be as responsive to GDP growth as it has been in the past. This means that the recovery in market share cannot be taken for granted, nor will it emerge from minor variations in the existing strategy. A radical change in IR's approach to freight transportation must be visualized and a strategic approach adopted.

From the freight mover's point of view, it may not just be the freight tariff that determines his decision to ship by rail or road. He is concerned with waiting times, uncertain delivery schedules, the inconvenience of loading and unloading, and a host of other factors that increase his costs of using IR services. The demand may be sensitive to the "true" cost, but is not particularly sensitive to the observable price, which may only be a fraction of the user cost. Price revisions, can only be one part of a broader package designed to reduce the user cost of IR's services.

If IR takes steps to recover its market share through a combination of tariff re-balancing and quality enhancement measures, and to increase its share of the transportation of "other commodities", growth rate of 7 per cent per year or more over the next decade does not appear to be an infeasible objective. A medium annual growth rate of 5 per cent for freight traffic can be achieved without major organisational changes provided the physical capacity is made available. **However, there is potential for increasing this rate further through a strategy that has pricing and operational components in addition to providing physical capacity. This will require significant organisational restructuring. The Expert Group made detailed projections for freight growth possibilities. If appropriate measures are taken to capture back lost bulk freight and to carry a greater proportion of non bulk freight, freight revenues could rise by an average of 6.9 to 7.2 per cent per year in real terms for the next 15 years.**

Unlike the tendencies towards stagnation in freight traffic, passenger revenues have been growing at a reasonably healthy rate during the last few years. However, even this rate is not adequate to sustain the financial viability of IR. A significant acceleration in revenues is considered to be possible through the implementation of a combination of measures. One component of the overall strategy is to improve the overall quality of service across the board, from ticketing to embarkation and disembarkation. This would

The massive investment programme laid out for the highway system will significantly improve the capacity of the road transport system and therefore make road movement relatively more attractive. The sustainability of IR depends on its ability to make the investments necessary to enhance its capacity, as well as to generate higher revenues from the increased capacity

induce streamlining the ticketing procedure creating large new capacities for reservation by exploiting internet-based franchising opportunities and dramatically improving the quality of services available at railway stations. Once again, this is unlikely to happen without a complete change in the orientation of the railways: this would need significant organisational restructuring.

The Expert Group made detailed projections for the potential of passenger traffic and revenue growth. The projections are based on:

- Greater availability of upper class services consistent with the changes in income distribution taking place in the economy.
- Tariff rebalancing consistent with the observed elasticities of demand as estimated by the Expert Group.

It is found that with tariff rebalancing over the next 5 years, passenger revenues can grow by about 8.6 per cent per year; without tariff rebalancing, the growth in revenue would be about 7.5 per cent per year, both in real terms. These projections account for some fall in growth in passenger volume growth in the lower classes that would result from fare increases.

The Expert Group finds that appropriate tariff rebalancing will require an annual adjustment of about 10 per cent increase in second class sleeper fares and 8 per cent in second class ordinary fares on a continuous basis for about 5 years, assuming about 6 per cent annual inflation over the period. It is also found that upper class demand elasticities are such that revenues will increase if upper class fare increases are muted to around 1-2 per cent a year over the same period, assuming that capacities are expanded appropriately in terms of coach availability to meet the enhancement in demand expected. The Expert Group is aware that such differential increase in tariffs would appear injudicious and therefore difficult to implement. This is the result of excessive increases in upper class fares in the past relative to those in second class fares. It may also be noted that the 1993 Railway Freight and Fare Committee had recommended that the ratio of average fares between second class (mail and express) and AC I class should be about 1:9.6. It is found that if the kind of tariff rebalancing that has been suggested is carried out, this ratio would be about 1:9. If this kind of fare restructuring is to be carried out it must be accompanied by tangible improvements in services for all second class services.

We have not studied the structure of suburban fares in any degree of detail. But it is evident that similar measures will have to be taken there. Alternatively, if the relevant cities or states are keen to subsidise their urban commuters, the resources should come from them. An appropriate way to fund the subsidy inherent in suburban fares is to levy a transportation cess on all employees in the metropolitan area, as is done in the Paris region in France.

With the kind of measures suggested for both freight and passenger traffic, the Strategic High Growth Scenario would see average annual revenue growth at about 7.5 per cent per year at constant prices over the projection

In nominal terms, the second class sleeper fares can be raised about 10 per cent per year and second class ordinary fares by about 8 per cent per year over the next 5 years, assuming about 6 per cent annual inflation over the period

Such fare restructuring would have to be accompanied by tangible improvements in service, for all II class services

IV. THE FUTURE OF INDIAN RAILWAYS: INVESTMENT REQUIREMENTS 2001-2016

Introduction

Indian Railways is at crossroads. All the indications are that IR is facing a financial crisis and without a strategic change in direction its future as a viable entity is dim. Yet, at the current stage of India's development railways will remain an essential component of India's transportation infrastructure. It is vital for IR that it accelerates the growth of both freight and passenger traffic and revenues. Apart from the tariff rebalancing that is required to accomplish this there is need for a more focussed investment programme that enhances IR's productivity all round and which expands its capacity to cope with the traffic growth projected. Investment expenditures that do not result in additional revenues must be eschewed. An important cause of IR's current financial predicament is that a good proportion of investments in the 1990s have been un-remunerative.

Five Decades of Planning in Indian Railways

Significantly heavy investments were made in IR during the Second and Third Plans for creation of a network of lines required to support the core heavy industries that were being set up then. The Seventh Plan period in the late 1980s also saw heavy investment in this period of heavy infrastructure focus, which could only be made with the introduction of borrowing through the Indian Railway Finance Corporation (IRFC).

The largest share of plan investments has always been used up on Rolling Stock. Continuing improvements in technology and design over the years enabled Indian Railways to increase the traffic output per unit of assets significantly. However, IR operations were always hamstrung by shortage of locomotives and wagons and high proportion of overage coaching stock. The effects of resource constraints were even more pronounced in the second largest investment area of 'Replacements' (other than rolling stock). As a consequence, arrears in replacements have tended to accumulate at different stages. Here IR has not followed a systematic method of accounting for depreciation: allocations to the Depreciation Reserve Fund have often been dependent on the extent of availability of funds.

From the observed priorities, the half century of Railway planning can be categorized into three different phases. The main priorities in the first phase, spanning broadly the first four plans was to remove major gaps in the network and to lay additional tracks on the key sections of the trunk routes. Overall, this phase was oriented towards improving the system network. The second phase (mid 1970s to 1990) witnessed a shift of focus to rehabilitation of track and upgrading of technology.

In contrast to the earlier concerns, "socio- political" objectives are the most prominent in the on-going third phase of planning dating from 1990. Along with continued support for metro projects (commenced in the second phase) and increase in outlay on track renewals, new areas of priority have emerged in this phase, chiefly gauge conversion through the unigauge project. Even more critical to the investment policy are some crucial changes in emphasis in favour of a larger shelf of projects – especially new line projects – approved for implementation. This has been accompanied by lowering of the

There is need for a more focussed investment programme that enhances IR's productivity all round and which expands its capacity to cope with the traffic growth projected. Investment expenditures that do not result in additional revenues must be eschewed

Expansion of the order achieved was made possible because of the priority that IR was consistently accorded in plan investments. Barring the Fourth and Fifth Five Year Plans, IR has accounted for about half or more of public investments in the transport sector

standards criteria adopted for project selection in more than one Plan head.

Funding Patterns and Financial Crisis

The share of budgetary support has dropped sharply in recent Plans and internal resources have declined, leading to increasing market borrowings and financial stress in IR. Leasing arrangements through IRFC are now being drawn not only for additions of rolling stock but also for their replacements; the effect of shortage of internal resources is therefore more acute on other replacements financed through DRF, i.e., track renewals, bridges and other fixed assets. These have adverse effects on train operations.

Railways' limitations of transport capacity are because of inadequate investments in wagons, locomotives and line capacity and the sub-optimal utilization of assets. Correct targeting of investments has a crucial role in order to secure significant improvements in productivity.

The current state of plan investments is such that IR has faced great difficulties in the 1990s in keeping up adequate levels of investment. Moreover, it has encountered increasing difficulty in raising the resources required even for these low investment levels: being forced to raise the levels of its public borrowing through IRFC thereby raising its overall level of resource costs. The problem has been compounded by the change in investment priorities where greater attention has been given to unremunerative projects. The emphasis on gauge conversion has yielded negative returns. There has also been an increase in the number of unremunerative projects because of political pressures. This problem has also been compounded by the relative greater frequency in government changes in the 1990s.

Because of the diversion of resources to these unremunerative projects, maintenance and timely replacement of assets has suffered and large arrears have built up. Consequently wheel-track interface has deteriorated leading to slower speeds in some segments and safety problems overall. The investment strategy followed in the 1990s has also not contributed to capacity enhancement in the golden quadrilateral, hence leading to traffic saturation in this high revenue segment of IR. The slowdown in revenue growth, particularly in freight, coupled with reduced availability and higher costs of resources has led IR into the financial crisis that it now faces. As we will see nothing short of a strategic change in direction can now salvage the situation.

Internal Resources – Cost of Finance: For projects funded out of 'internal resources', the cost of finance is equivalent to the returns on investments thereby foregone. Projects funded thus need to be selected through a rigorous screening process and identified as being of the highest organizational priority on which the limited internal resources should be invested. The recent trends in investment and financing policies in Railways need a complete review from this perspective, if a high traffic growth option is to be followed up with the appropriate investment priorities.

Along with the lowering of standards, another factor adversely affecting profitability of railway operations and generation of internal resources is inadequate follow-up measures to secure cost savings made possible by the new investments. Typically, gauge conversions should yield cost savings by enabling closing of maintenance facilities and reduction in staff. Likewise electrification should also generate similar savings by facilitating the elimination of duplicate facilities for different traction modes. In general, follow-up action to secure the saving has been slack. Railways' internal management and control systems are involved here. The estimated cost savings

The investment strategy followed in the 1990s has also not contributed to capacity enhancement in the golden quadrilateral, hence leading to traffic saturation in this high revenue segment of IR

The slowdown in revenue growth, particularly in freight, coupled with reduced availability and higher costs of resources has led IR into the financial crisis that it now faces. As we will see nothing short of a strategic change in direction can now salvage the situation

should be programmed in the project schedule itself and the project should not be treated as completed until these measures are also implemented.

Railways Resources: Trends and Prospects

Critical Juncture in Railway Finances

With the changes in approach that have taken place in the 1990s, railway finances are at a point of grave decline. Signs of distress are several. Internally generated resources have fallen. The railway budget for 2000-01 reflects the following:

- The central index of revenue performance – the operating ratio – has touched a level very close to 100 (98.8), marking the worst financial performance in the last fifty years.
- After 17 continuous years of full discharge of its obligatory dividend payment to general revenues, IR has had to take recourse to deferring large part of the amount due (Rs. 1500 crore out of Rs. 2115 crore).
- Railway Fund balances have dropped precipitously from Rs. 3,564 crore in 1997-98 to only Rs. 253 crore at the end of March 2000.
- Loans have been drawn from general revenues to finance plan expenditure that is charged to Railways' Capital Fund and Development Fund.

The most worrisome feature is that there is no early prospect of improvement in finances. Reserves available in the Railway Funds have been drawn down over the last five years and the ratio of fixed costs – principally regular staff wages and pensions – to total expenses has increased substantially. The proximate reason for this shift is the implementation of the salary and pension revisions through the Fifth Pay Commission. Total employee wages of Railways along with pensions accounted for **53 per cent** of the total revenue earned by Railways in 1998-99. The share was 41 per cent – in itself a very high ratio – in 1996-97.

Wage Increases and Productivity

Being run as a government department, IR wage increases are linked to overall government employee wage increases as recommended by successive Pay Commissions. However, the most recent Pay Commission awards and resulting downslide in IR's finances are not the cause but the reflection of a deep-rooted structural imbalance in the system. The underlying problem is that trends in average productivity per employee have not improved in line with increase in real wages, and the causes for this disparity need to be identified and addressed. Productivity *per employee* has, no doubt, been improving steadily. However, progressive increases in staff-related costs have outstripped any employee productivity gains.

As compared with the increase in real wages (average per railway employee) of 108 per cent the increase in average productivity measured in terms of output in 'Traffic Units' over the period 1981-82 and 1998-99 works out to 82 per cent only. The disparity would be still more adverse if the component of pensioners' benefits is added to the average staff costs. Pension outgo accounted for 14 paise out of every rupee earned by IR in 1998-99 – a steep increase as compared to 1981-82 when it was just 3.4 paise to each railway rupee. **The root of the financial problem confronting IR is therefore found in the lack of adequate productivity increases that are commensurate with the real wage increases over the time.**

If Indian Railways is to become a truly modern transportation system offering services that could face up to the emerging competition, the issue of an

The most recent Pay Commission awards and resulting downslide in IR's finances are not the cause but the reflection of a deep-rooted structural imbalance in the system. The underlying problem is that trends in average productivity per employee have not improved in line with increase in real wages

Progressive increases in staff-related costs have outstripped any employee productivity gains

accelerated reduction in manpower has to be addressed without delay. In the financial situation confronting IR today, this is now an issue of viability and survival.

In any set of financial projections, a substantial net reduction in employee strength (at least twenty per cent of the total) has to be provided for. Retention of current strength would rule out any upturn in IR's performance, even in a high traffic growth scenario. Going by the conclusions of a diagnostic study on this problem, carried out by RITES for the Railway Board [**Manpower Planning for Indian Railways: A Diagnostic Study** (Reduction/Redeployment of Manpower in IR) 1991] the excess manpower could be more than 25 per cent of the total. On a very conservative basis, therefore, a reduction of twenty per cent of the present overall strength should be targeted over the next seven years. This will require, apart from reductions through normal retirements, the 'spinning off' of ancillary activities to be implemented early, in phases.

The issue of an accelerated reduction in manpower has to be addressed without delay. In the financial situation confronting IR today, this is now an issue of viability and survival

Key Issues in Railway Planning

A review of the current railway planning process shows that public and parliamentary pressures are only some of the factors adversely affecting railway investments and that even in areas where these pressures do not apply, the investments do not follow proper priorities. The results are evident in the declining trends in productivity.

In a situation of severe financial scarcity, it is imperative that the limited funds available are put to the most productive use. This has not happened because of failings, again of a structural nature. IR's too close relationship with government and increasingly politicized annual budget exercise are key factors for this. The shift of focus of investment policy from investments relevant to the system needs towards so called broader social and political concerns is also due to the absence of an effective process of setting priorities. This has led to misallocating the limited investible surplus and the sliding financial fortunes of the organization. **An inherent conflict of approach is evident in the promotion of an investment strategy that perpetuates resource constraints.**

The shift of focus of investment policy from investments relevant to the system needs towards so called broader social and political concerns is also due to the absence of an effective process of setting priorities

From the analysis of IR's Planning policy certain trends are evident. These are:

- Unsustainable shares of investments get allocated to projects of low priority and doubtful remunerativeness.
- Standards of project selection have slackened, especially in recent Plan years, and the investments made have not – and in many cases, could not have – improved traffic output to a corresponding degree.
- Overall, the incremental approach to capacity augmentation is now yielding diminishing returns.

One effect of the incremental approach to the Annual Plan is the pressure to keep existing organizational structures going with fresh plan allotments. For example, one of the factors influencing the number of rolling stock units purchased each year through the Plan is the available in-house manufacturing capacity. There is backlog in replacement of coaches but in the case of locomotives, shortages that persisted for long have been overtaken.

Annual Budget

The works programme is part of the annual railway budget. The presentation of railway budget to Parliament each year, two or three days before the general

budget (and the only departmental budget to be accorded this distinction) has a decisive impact on railways' investment, pricing, staffing and organisational policies.

Mechanisms have been devised with respect to the important central public sector enterprises (PSEs) to institutionalise the demarcation of policy – making from implementation. The most serious problem with the railway budget is that it institutionalises the opposite. The issue now is whether the railway budget in its present form should continue at all.

Implications for the Organisation

From the point of view of investment strategy, **the most undesirable feature of the annual budget exercise is the very short-term focus it imparts to all investment initiatives.** Even for the larger projects that ought to rank high in importance, absence of a 'project finance' approach makes project completion uncertain and subject to the varying priorities that make themselves evident over the stretched out implementation period. There is yet another unwelcome effect on investment. As the limitation of funding is removed, the doors are left wide open to any number of fresh entries. This is precisely what has happened.

The hardheaded conclusion is that the Railway Works Programme has lost focus over the last decade and is on the way to becoming an autonomous process with little connection to organizational aims or resource limitations. The prevailing structure has served well in a captive market and the planning needs associated with it. In a changing scenario brought about by the economic reforms, IR is now in a competitive environment where there is need to bring in customer orientation at the project framing stage itself.

Restructuring Investment Programming

The Need for a New Approach

Railways urgently need a compact list of financeable projects that are relevant to a central organizational strategy and not a shelf of ongoing schemes progressed through open-ended funding from year-to-year in accordance with moving priorities. To summarise, IR's established investment programming process suffers from several weaknesses:

- Incremental approach to planning and consequent backward focus.
- Emergence of departmental fund quotas and low flexibility in fund re-allocation for new strategic initiatives, thinly spread investments.
- Lack of integration with business objectives.
- Uncertainty of finance, shifting priorities leading to time and cost over-runs.
- No review of results of projects implemented vis-à-vis aims.
- Large shelf of projects; shrinking ratio of completed projects to the shelf.
- Huge imbalance between the annual outlays and the total commitments generating cynicism regarding the whole planning process.

Reinventing Investment Programming in IR : The following problems require attention in order to get maximum results out of the railway investments.

The issue now is whether the railway budget in its present form should continue at all. The most undesirable feature of the annual budget exercise is the very short-term focus it imparts to all investment initiatives

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The Railway Works Programme has lost focus over the last decade and is on the way to becoming an autonomous process with little connection to organizational aims or resource limitations

The incremental approach shuts out new initiatives by using up the funds on the large body of on-going projects selected without rigorous screening. A complete change of approach is needed to replace the incremental annual investment by a project-oriented investment programme centered on a few all encompassing business objectives

It is imperative that all on-going projects are thoroughly screened once a business strategy is finalized, and those projects of little relevance to the objectives are frozen and deleted from the funding programme

- **Prioritization:** A rigorous process of screening and prioritization should be enforced in which a select pool of major projects should compete for the limited corpus of funds for investment. A fully debated, officially endorsed business plan is necessary to set up correct priority in allocation of investments, section and route-wise.
- **Quick Implementation:** Essential for getting the best results from the large amounts that are invested through Railway plans. For this purpose, identification of the source of funds for each selected remunerative project till its completion is an essential requirement.
- **Coordinated Investments:** Implement projects in a manner that will result in maximum operational or cost saving. Much of the Railway investments have gone into areas that do not bring any improvements in revenues. Also, matching investment in related areas does not support revenue-improving investments in one area. The best example is the failure to bring about the increase in average speed of goods train in spite of large investments in route electrification, deployment of modern electric and diesel locomotive, etc.
- **Scrap the incremental plan heads' based approach to allotments:** The incremental approach shuts out new initiatives by using up the funds on the large body of on-going projects selected without rigorous screening. Special organizations under Railways have a similar effect on the investment programme. The existence of separate organization for railway electrification influences the priority for taking up electrification projects in order to provide continuing work for the organization. In the near future this could become true also for production units. A complete change of approach is needed here to replace the incremental annual investment by a project-oriented investment programme centered on a few all encompassing business objectives.

It is imperative that all on-going projects are thoroughly screened once a business strategy is finalized, and those projects of little relevance to the objectives are frozen and deleted from the funding programme.

Unless new investments that are made result in returns that exceed the cost of funds, the financial predicament of IR will only get worse. Business objectives have to be laid down over a long term, whereas in IR both the investment policies and price setting are determined on a very short-term basis. If a fully debated and officially endorsed business plan were in place, investments more relevant to organizational objectives would have gained priority. IR does have a periodic Corporate Plan exercise, but this Plan lacks integration with the annual or five-year plans.

Shortcomings in the investment policy have been compounded by railway pricing policy rooted again in structural flaws of the system. Just as successes were achieved when overall planning was effective, the most significant difficulties have been encountered in the 1990s when the role of plan or public sector investments in overall investment in the economy has declined. IR can no longer rely on freight loading determined by public sector investments and government diktats. Similarly, on the passenger side, availability of better buses on better roads at one end, and more frequent air services on the other will provide new competition.

A successful corporate planning approach to investment programming is only likely to succeed in a commercial corporate framework, where investment programmes and their implementation are closely linked to the returns to be achieved and the financing structure. Very clearly, where

financing sources are increasingly commercial ones, planning approaches in a governmental framework will not succeed. Long-term corporate planning has to be combined with Short-term flexibility linked to customer requirements and changing market demands. This is simply not possible in the current framework.

Strategy for the Future

Railways are the only high capacity transport mode that can meet the long-term needs of an economy and country of the size of India. Given bold new policy inputs and planned intervention to correct the structural flaws in the system, Railways in India have the opportunity to bypass the phase of historic railway decline and enter a renewed growth phase. This calls for a vision that rises above short-term considerations and looks instead at the huge gains to the system as well as to the economy that renewed efficient Railway growth can bring about.

A railway traffic strategy aiming to boost current prevailing growth rates under freight and passenger would be built around the following:

- (a) Increased average goods train speeds: Reduction in speed differentials between freight and passenger trains will be the best and most economical strategy for expanding the freight haulage capacity of the system.
- (b) High speed, modern passenger services
- (c) Commodity-specific freight strategies
- (d) Introduction of new technology: Experts estimate that a gap of nearly 20 years now separates the technology in use in Indian Railways and that of advanced systems. Inadequate attention has been paid to R & D and technology investments in IR. Being one of the largest rail systems in the world, IR must have access to R&D facilities that can be counted among the best in the world.
- (e) Harnessing Information Technology for freight operations and
- (f) Increase in capacity through advanced signaling and communication systems: Owing to the characteristics of freight and passenger movement in India, most of the potential traffic that will contribute to a high growth rate will move on the major trunk routes. Route-wise studies need to be undertaken and investment programmes drawn up on the basis of full analysis of costs and expected benefits.

Introduction of private management for commercial operations of specialized services is an option that also needs serious consideration.

The Possible Growth Scenarios

The Business as Usual Approach

We have used all the current information available from IR to construct three possible investment strategies for IR over the next 15 years. The first two scenarios, “Low Growth” and “Medium Growth” are constructed in a “Business as Usual” framework, whereas the third scenario, “Strategic High Growth” will require substantial organisational restructuring of IR internally and in its relationship with government, including corporatisation.

The Low Growth case assumes no organisational restructuring and a funds constrained investment programme. The Medium Growth case assumes significantly improved functioning of IR within the current organisational framework, but with higher investment levels and higher revenue growth.

A successful corporate planning approach to investment programming is only likely to succeed in a commercial corporate framework, where investment programmes and their implementation are closely linked to the returns to be achieved and the financing structure

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The first two scenarios, Low Growth and Medium Growth are constructed in a Business as Usual framework. Neither of these two cases is financially viable without excessive levels of budgetary support which do not seem to be feasible

As is shown in subsequent chapters, even with these optimistic assumptions, neither of these two cases is financially viable without excessive levels of budgetary support which do not seem to be feasible. The only feasible, but difficult scenario, is the Strategic High Growth one.

The following are the parameters adopted for making the Business as Usual Low Growth and Medium Growth investment projections:

- Additional capacity for passenger and freight at the respective rates of growth for the two scenarios
- Providing for all accumulated arrears of replacement
- Latest technology obtaining in the system in regard to rolling stock
- No change in track standards and technology
- Conventional safety – ensuring technologies to be implemented through a special programme.

Concentrated investments in the select areas have been the aim rather than an incremental approach applying to all on-going investment areas. Hence the provision for overtaking arrears in replacements and implementing a safety package. Within this framework, the following investment priorities will be followed:

- Renewal of assets (strictly as the replacements fall due)
- Safety works not covered under other categories.
- Capacity building projects
- Rolling Stock
- Passenger interface improvement projects
- Research & Development
- Improving Human skills

In the Medium Growth scenario, there is increase in proposed outlay only with regard to two items, viz., infrastructure capacity and additional rolling stock. In the former, an annual outlay of over Rs.1,250 crore has been estimated for the Low Growth case and nearly Rs.1,550 crore annually for Medium Growth. The total additional requirement on this account is Rs. 4,000 crore. For rolling stock, the needed extra investments are in the region of Rs. 28,000 crore.

The economy has entered a new stage of high economic growth well above what has been achieved in the long term. The Strategic High Growth option is designed to take advantage of these exciting growth prospects

In the current situation, Railway plan investments include outlays on non-remunerative 'New Lines' and on Metro Transport Projects. In a strictly Business-as-Usual scenario, investments on these heads would continue to be part of the Railway Plan. In the IR Budget for 2001-02 these and other unremunerative investments account for about Rs. 1,950 crore of Railways annual plan outlay. In the investment projections given here, outlays on these schemes have been kept out. It is assumed that such projects taken up at Government's behest will be funded separately.

The two alternative projections of growth rates (low and medium) are the two outer limits of IR's range of growth prospects in the prevailing organizational structure and relationship with government (Business-as-usual), and incremental approach to planning investments. These two growth rates are based on short-term and long-term trends of past growth of rail traffic. At the same time, the economy has entered a new stage of high economic growth well above what has been achieved in the long term. The Strategic High Growth option is designed to take advantage of these exciting growth prospects of the economy and notching up a correspondingly high rate of railway traffic growth.

The Strategic High Growth Scenario

The principal strategy for achieving a very high growth lies in aiming at a growth rate of goods traffic that has not been reached in the past. The second part of a plan for very high growth will be to ensure that such high rates of growth are not at the cost of passenger traffic, especially long distance. The third important requirement will be to make the needed structural changes to make the high simultaneous growth of freight and passenger traffic possible, as outlined in subsequent chapters.

Freight Strategy: Freight is the key profit earner for Railways. The long-term strategy of increasing freight rates regularly – too frequently over the Eighth Plan – to protect railway profitability has been counterproductive, driving freight customers to other modes of transport, or even resulting in structural changes in their industries to reduce transportation costs. There is urgent need for a new viable, long-term strategy for the freight business.

This strategy will have three main components:

- Goods transit time, especially for premium segments of freight will need to be reduced significantly, which will mean bringing about planned improvement in average goods train speeds.
- Ensuring that there is no real increase in freight rates which is uncompensated by added value to customer, and that present rate structure is rationalized to remove distortions that have crept in.
- Special focus to customer needs of commodities that are drifting away from railways.

The components will be addressed through investments on the following lines:

Strategy for Passenger Segment: Emerging competitive pressures in the passenger segment point to the need for flexibility in fixing fares by factors like season, convenience of time of departure/arrival, etc., in addition to factors like class of travel and train speed. Induction of private management for commercial operations of specialized services is an option that needs serious consideration. New management skills are also needed in handling freight customer needs – especially information-related.

Meeting Competition: The very high growth rates can be achieved only through carefully planned and targeted investments. There is no possibility that this change in approach can be effected within the existing planning and budget structure. A totally new approach to planning will require to be adopted starting with a comprehensive Strategic Business Plan. This will be possible only if the present government-railway relationship is modified, and a clear distinction between policy making and implementation is enforced.

In Strategic High Growth projection, a qualitative improvement in pricing of freight particularly, will need to be adopted. A market-sensitive approach to pricing will have to be developed and for this purpose, improved organizational skills will be essential.

The Strategic High Growth option is marked by a signal departure from recent investment practices. The new element is an investment package making up a total business plan mainly targeting the needs of the railways users. The five main parts of this business plan are the following:

- **Strategy to improve speed of freight trains:** A significant improvement in freight train speeds will need to be brought about for which it is necessary to eliminate obstacles to fast trains movement. This will include grade separation of all road crossings, starting with the most congested sections and eventually covering all busy corridors and, upgrading track infrastructure of selected routes.

Goods transit time, especially for premium segments of freight will need to be reduced significantly, which will mean bringing about planned improvement in average goods train speeds

The very high growth rates can be achieved only through carefully planned and targeted investments. There is no possibility that this change in approach can be effected within the existing planning and budget structure. A totally new approach to planning will require to be adopted starting with a comprehensive Strategic Business Plan

In Strategic High Growth projection, a market-sensitive approach to pricing will have to be developed and for this purpose improved organizational skills will be essential

The Strategic High Growth option is marked by a signal departure from recent investment practices. The new element is an investment package making up a total business plan mainly targeting the needs of the railways users and technological upgradation

- **Upgrading rolling stock:** The present wagon design will need to be improved in order to make for a smooth interface between bogie and track and thereby reduce cost of maintenance as well as number of break-downs.
- **Specific commodity related investments:** Certain commodities, particularly types of finished steels, cement movement in bulk, require special types of wagons and handling arrangements. This will need to be planned over selected sections that cater to the commodities mentioned. Similar targeted investments in new rolling stock and handling arrangements can be adopted to increase throughput of designated coal and ore traffic streams.
- **Improved signaling and communications:** The elimination of road crossing, together with the planned introduction of higher capacity locomotives and wagons of improved designs will create conditions for reducing the speed differential between freight and passenger trains. The optimum use of the capacity will mean the running of more trains either way in the very busy sections, without having to lay new dedicated lines in the 'saturated' sections. For realizing this improvement, large investments will be needed in signaling and communication.
- **Container terminals:** It has been recommended earlier that new operators should be permitted to enter the field for container traffic, which is a very high growth area. To fully exploit the demand and arrange for co-ordinated growth between road and railways, there is need to set up additional two or three container depots each in the large industrially advanced states, and at least one container depot in all other states.

All the areas mentioned above (aggregating to additional investments of Rs. 34,000 crore) are suitable for new forms of financing either through fully privately owned undertakings or through joint ventures, or fully government sources. Private investments could be of the following types:

- Financing of rolling stock and leasing of wagons.
- Joint ventures between IR and private parties in acquiring latest design passenger coaches and operating high speed passenger trains between select pairs of stations; financing of the related rolling stock requirements.
- Similar arrangements with respect to freight services in select commodities.
- Financing of freight bypasses on busy stations through BLT model (slight variations of financing of bypasses on BOT terms on roads); this should be a promising area because the traffic levels can be forecast and monitored with reasonable accuracy.
- Financing of container terminals by promoting fully or partly private-owned undertakings that would supplement/ compete with Concor (the Railway-owned Container Corporation).
- Financing of improved communication infrastructure through joint venture arrangements for select section. (Maximum number of trains on the section run daily could be substantially increased by modernized train operations that rely on electronic inter-locking systems, continuous track circuiting and automatic block signals. There is no way a very high rate of freight traffic growth can be achieved except through running more trains on dense-traffic sections by adopting latest technology; the alternative of laying whole new tracks would be prohibitively costly).

In summary, the basic differences between three investment options are the following: **(See Exhibit 12)**

- **Low Growth:** Limitations on resources, both internal and extra-

budgetary. Therefore investment on additional capacity is kept to the minimum. However, provision made for unavoidable investments in safety, normal replacements and overdue replacements.

- **Medium Growth:** Approach to investments same as in current internal railway planning processes, namely emphasis on rolling stock and incremental improvements to infrastructure. Limitations on funds relaxed and all unavoidable investments allowed as in low growth.
- **Strategic High Growth:** This involves a break with railways' long – term planning approach. Emphasis shifted to:
 - Improving the infrastructure along with additions to rolling stock.
 - Harnessing technology in a way to improve capacity utilization.
 - Completely modernize the railway system in terms of speed and quality of service over the 15 years.
 - Structural Change in IR's organisation and relationship to government.

It is found that the estimates made for the investment requirements for the Strategic High Growth Scenario as shown in Exhibit 12 cannot be financed in full even with the revenues projected for Strategic High Growth. This further underscores the need for making careful strategic choices in the items of investments that are made: all must be with a view to productivity and revenue enhancement. In the financial projections that are made in the next chapter, adjustments have had to be made in order to find a viable financial scenario for IR.

Further, there are several risks which require immediate attention. These include emerging competition for bulk freight and long distance passenger traffic, and structural risks connected with IR's relationship to government. It is most important that IR set apart a specific proportion of the available investible funds exclusively for line capacity augmentation works.

Along with well-targeted investments, the manpower problem will need to be addressed. The financial projections are based on an overall reduction in Staff strength by 20 per cent to be effected over 7 years. This is a critical

Exhibit 12 : Comparison of Investment Shares: Alternative Scenarios 2001-2016

(Amounts in Rs Crore)

Investment Category	Business as Usual		Strategic High Growth
	Low Growth	Medium Growth	
A. Infrastructure			
Network Expansion	1,000	1,000	1,000
Railway Electrification	2,000	2,000	2,000
Capacity adding schemes*	16,000	20,000	24,000
Technological Upgradation			30,000
Sub-Total Infrastructure	19,000	23,000	57,000
B. Other investments			
Additional Rolling stock	12,000	40,000	44,630
Replacements including Arrears	80,000	80,000	80,000
Safety Works	10,000	10,000	10,000
Other items	8,000	8,000	8,000
Sub-Total 'B'	110,000	138,000	142,630
Total	129,000	161,000	199,630

* Schemes to generate additional capacity including terminals, maintenance facilities.

Maximum number of trains on the section run daily could be substantially increased by modernized train operations that rely on electronic interlocking systems, continuous track circuiting and automatic block signals

The investment requirements for the Strategic High Growth Scenario can not be financed in full even with the Strategic High Growth projected for revenues. This further underscores the need for making careful strategic choices in the items of investments that are made: all must be with a view to productivity and revenue enhancement

The implication of the investment programme for the Strategic High Growth Scenario is that Indian Railways has to step up its investment levels to about Rs 70,000 crore over the next 5 year period. Given the lack of resources available internally within IR, and the fiscal stringency of the Government, IR will have to work out a reform strategy that is credible to potential lenders and investors

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V. FINANCING INDIAN RAILWAYS (2001-2016)

Background

India's railway system went through a process of continuous restructuring for a full century after the first railway line was built in this country. Since the financing of the early railways was a mixture of public and private initiatives throughout the period, a very varied pattern of financing was followed. The original arrangements between the Government of India and private investors in latter decades of nineteenth century look very much like the modern Build Operate and Transfer (BOT) model that is currently in vogue.

Most of the railways were effectively nationalised by the early part of the 20th century. Since the budget of the nationalised railway system formed a significant portion of the total government finances of the day, there was considerable unease in keeping it as an integral part of the overall budget. This led to the setting up of the Acworth Committee which recommended the separation of railway finances from the general exchequer.

What was intended to be achieved through this separation effected in 1924 and creation of an in-house accounting machinery was to make the chief executives of the railways totally responsible for the administration, operation and financial results of the individual railways in their charge on commercial lines. Railway 'Conventions' introduced in 1924 and amended just prior to independence were again intended to ensure flexibility in the financial administration of the railways as a commercial undertaking. These basic aims continue to be relevant even today.

Since then, a number of reviews of IR's financial arrangements have been done, each one of them expressing unhappiness with the existing system where, despite the separation of railway finances, the original intention of commercialization has not been achieved. Indian Railways has continued to be run like a government department rather than as a commercially oriented enterprise, and its accounts are not in line with normally used commercial conventions recommended by ICAI.

The time is again ripe to review and reorganise railway finances along with the necessary organizational restructuring. Reorganisation of a system as complex as Indian Railways is always difficult and time consuming.

The Need for Recasting Accounts

If railways have to attract funds from external sources, accounts need to be in the format that is understood by lenders and investors. The methodology used by IR to do its accounts has served it well as a government entity, so long as government earned sufficient tax revenue to provide for socially desirable service and railways operated under a monopolistic transportation market. The accounting procedures were well understood within the organisation but translucent to outside world.

Railways all over the world have been considered an important element of infrastructure and governments of the day have played important roles in the organisation of railways. In recent times competitive forces from other modes of transport have diminished their distinctiveness, but not their image of an important mode of transport. If government had enough money, it could continue to run railways in the same way as it has done in the past 50

What was intended to be achieved through the separation and creation of an in-house accounting machinery was to make the chief executives of the railways totally responsible for the administration, operation, and financial results of the individual railways in their charge on commercial lines, and to enable the railways to carry out a continuous policy designed to discharge the obligations to make a definite return to General Revenues on the capital provided

If railways have to attract funds from external sources, accounts need to be in the format that is understood by lenders and investors

The problem faced by IR is two fold. First, government is in a financial bind. Second, IR needs a large amount of investment urgently to keep going because it has lived on borrowed time in the last decade by under providing for capital stock. Diminution in investment in the second half of the 1990s as described in the last section is hampering their operations, which makes it imperative for IR to source funds from other than government sources

years i.e. providing grants and subsidised loans from the Consolidated Fund of India. But today, the problem faced by IR is two fold. First, government is in a financial bind. Second, as we have found, IR needs a large amount of investment urgently to keep going because it has lived on borrowed time in the last decade by under providing for capital stock. Diminution in investment in the second half of the 1990s as described in the last section is hampering their operations, which makes it imperative for IR to source funds from other than government sources. If railways have to attract funds from external sources, accounts need to be in the format that is understood by lenders and investors.

Advantages of a standard set of accounts are that they serve as tools (a) for monitoring by management, (b) for the owner to ensure that his investment is performing and (c) for outside capital providers to evaluate efficiency of capital. The key for all stakeholders is to provide a time-tested tool which will allow them to compare with others i.e. the same standards that the rest of the world uses. Apart from this, other reasons to recast IR's accounts according to the provisions of Indian GAAP are:

- First, the existing system of accounts does not give a true and fair financial picture of IR; one that could be easily understood by a trained chartered accountant or a financial analyst. To give an obvious example: in the absence of depreciation provisions in the balance sheet, nobody can ascertain the net block of IR. Similarly, the data are not presented in a way in which one can ascertain labour productivity or employee cost. Equally, there is no clear separation between revenue and capital, or between 'top of the line' and 'below the line'. These and many other reasons make IR's accounts unintelligible to anyone other than those in the IR and in the ministry.
- Second, for any organisation of the size of IR, there has to be tight financial discipline and targeting. The present accounting system precludes that. For instance, the accounts do not allow managers to set revenue and other operational targets whose returns can then be measured against the corresponding cost of capital. In this system it is difficult to set up cost and profit centres that would then communicate the right incentives down the line.
- Third, it is important for IR and the Railway Board to know how the organisation would fare if its accounts were presented as per the Indian GAAP followed by companies incorporated under the Companies Act.
- Finally, IR's survival as a provider of transport services to the growing Indian economy depends upon substantial infusion of investments. These cannot be financed out of the organisation's surplus. Moreover, they are far greater than what the fiscally hamstrung GoI can provide as annual additions to 'capital-at-charge' year-after-year in perpetuity. Hence, it is imperative for IR to source funds from other than annual allocation from the central budget. Unfortunately, no outside investor will be willing to commit funds on the strength of IR's balance sheet without knowing the expected return on capital. For that, investors will insist on a transparent, readily interpretable set of accounts. Even to access capital in the medium-term, when IR has to borrow funds from outside, it must have accounts that lenders can understand.

It is worth emphasising that none of these reasons has anything to do with privatisation. The rationale for recasting is quite different. IR operates entirely in the nature of a commercial going concern. Therefore, its accounts should

reflect that reality in a manner which is readily understandable by the financial and investing community. Recasting is driven by the need for greater financial transparency for the shareholder to know how efficiently money is being spent, and for being used as a dynamic managerial tool. This indeed has been the objective of various reviews since at least 1924. The existing system has been found unsatisfactory by all official review committees. Whether IR is privatised or remains perpetually in the hands of GoI is irrelevant to the transparency which financial statements of IR should exhibit.

IR practices concerning the accounting of asset wastage through use and their replacements run counter to all transparent rules of accounting. A serious lacuna is that the reduction in the value of total assets post-depreciation is not shown. With regard to pensions, the procedure adopted by IR is what is normally termed as “pay as you go”, i.e. meet each year’s outgo from that year’s revenue stream, a system that no commercial enterprise, operating in a market environment, can sustain for long.

Inadequate provision for depreciation has led IR to be significantly over capitalised and hence there is need for substantial restructuring. The Expert Group has suggested such a restructuring and has provided one (of possible several) model for doing so. The recasting of accounts in company format makes it easier to assess the viability of any programme of investment and revenue growth from the point of view of investors or lenders. A company accounting format would also make it easier to cost public activities of IR, showing in transparent manner how these activities are financed.

‘Proforma’ Recasting of IR Accounts

For the present purpose, a ‘proforma’ recasting of IR accounts in the standard commercial format has been attempted. This exercise had to improvise certain solutions and make a number of assumptions.

First, the restructuring required getting an estimate of the accumulated depreciation and bringing this on to the books. Second, based on capital stock, the liability side needed to be split between debt and equity. We further split equity into normal equity and preference capital. Liabilities are therefore structured as normal equity: preference capital: debt in the ratio of 1:2:3. Preference capital is assumed to be given by the government with 1 per cent real expected return, (i.e. inflation + 1 per cent). This structure has two advantages. First, gearing of the combined entity gets reduced, entailing a lower debt service burden. Second, IR’s liability to government of India – sole owner of IR – in terms of servicing of debt and preference capital is approximately the same as servicing of capital-at-charge as of March 31, 2000. This will enable the new entity to have substantial internal cash generation, which it requires to finance its capital expenditure programme.

The assets have been categorized under five major heads – infrastructure, rolling stock separately for passenger and freight, suburban transport and welfare assets – so as to identify the function of the assets, which would then form the basis for the capital restructuring according to prudent norms of an infrastructure organisation. A large part of rolling stock in use in IR at present is funded through the lease arrangement with IRFC, effectively the market-borrowing arm of IR. In the ‘restructured’ accounts, the assets and liabilities of IRFC as of March 31, 2000 have been merged with the recast balance sheet of IR. Cost of welfare assets has been converted into a grant from the government. With this restructured capital base and accounts fitted into a company format, different revenue and investment projections have

Long prevailing IR practices concerning the accounting of asset wastage through use and their replacements run counter to all transparent rules of accounting. The amounts allotted to DRF tend to be fixed in an ad-hoc manner and are not determined by financial principles that would withstand close scrutiny

A company accounting format would make it easier to cost public activities of IR, showing in transparent manner how these activities are financed

been brought together within the framework of a consistent financial model that can be projected into the future.

Building IR's Future: Three Growth Scenarios

Once a restructured capital base of IR is available and its accounts are transformed into a company format, it is possible to simulate different growth scenarios to assess the financial feasibility of different strategies. In preceding sections, we have reported the kind of traffic growth that can be seen to be possible and also provided three possible investment scenarios in chapter 4. These different revenue and investment projections can now be brought together within the framework of a consistent financial model that can be projected into the future. The model framework allows us to assess the different financing strategies implied by the different scenarios projected. Each investment scenario implies the raising of corresponding resources and their servicing over the time from revenues.

The net present value (NPV) technique is used to evaluate different financial scenarios. A negative figure would imply a funding gap which would need to be financed, while a positive NPV essentially demonstrates that the project is financially viable. A positive NPV would mean that the future cash flows generated by the business, over the model horizon, can support the existing liabilities and the projected investments

Among many ways to evaluate viability of an on-going concern, we have chosen a broad definition of 'viability' as used in project financing. The net present value (NPV) technique is used to evaluate different financial scenarios. A negative figure would imply a funding gap which would need to be financed, while a positive NPV essentially demonstrates that the project is financially viable. A positive NPV would mean that the future cash flows generated by the business, over the model horizon, can support the existing liabilities and the projected investments. Once the viability is tested, several financing strategies can be employed to do the actual financing.

We examine various financial scenarios under different assumptions regarding revenue streams, operating costs and capital expenditure: (i) Business as Usual Low Growth, (ii) Business as Usual Medium Growth, and (iii) Strategic High Growth. The base year is the year ending 31 March 2001. The time profile is for sixteen years including the base year. The simulation model allows for multiple scenarios and can be conveniently separated into two time periods: the first five years after the base year, and the next ten. This separation is a useful way of evaluating the cost to GoI and to IR in the medium and long-term horizon.

In this report, a viable scenario implies that it is workable. The viability is evaluated on the following three ascending stages.

1. Given the assumptions embedded in the simulation, is Net Present Value (NPV) of the enterprise (IR) positive or negative?
2. Is there any liquidity risk for a lender: is cashflow sufficiently strong to meet current liabilities?
3. Will it provide sufficient comfort to government who is giving a large amount of subsidies, directly or indirectly, and implicit guarantees on market borrowing?

Among many ways to evaluate viability of an on-going concern, we have chosen a broad definition of viability as used in project financing. The rationale behind this is the immediate investment need of railways that it needs to finance. Hence, in this report the net present value (NPV) technique is used to evaluate different financial scenarios. The NPV of cashflows before financing of existing liabilities is computed for each scenario. After deducting the NPV of existing liabilities (which is the book value of liabilities in the base year) the amount, in present value terms, is utilized to finance investments (capital expenditure plus working capital). The difference between the NPV

of cashflows after financing of existing liabilities and the NPV of investment flows is the figure which reflects the first stage of viability or unviability of the business. A negative figure would imply a funding gap which would need to be financed. A non-negative NPV would mean that the business is viable – in the sense that the future cashflows generated by the business can support the existing liabilities and the projected investments. The advantage in using this approach lies in the fact that the viability is established without any reference to financing. If the NPV analysis indicates viability the financing could be tailor-made to suit the cashflow profile. Any number of financing strategies can then be used to do the actual financing.

Choice of the discount rate determines the viability of the NPV method. The discount rate used for the financial model is the weighted average cost of capital for IR in line with our assumptions of cost of capital IR is to pay on government and market borrowings, and of general rate of increase in prices. In building the financial model of the IR, it was decided to use 2000-2001 prices for future projections i.e. all financial projections are in today's prices. The rationale behind this assumption is to give decision-makers a sense of what the IR would cost, and the benefits it would bring over the sixteen year horizon in today's prices.

For two other critical parameters, namely capital expenditure and devolvement of pension liability, a grid search was carried out. For capital expenditure two alternatives were suggested – first, capital expenditure with unremunerative investments and second, without the unremunerative investments. The unremunerative investments include money spent on new lines, gauge conversion, Metropolitan Transport Projects and a proportion of investments on doubling of lines and Railway Electrification. In the latest IR budget (2001-02) nearly Rs 1,950 crore have been provided under these heads. Assuming that investments under these heads will remain at the same level over the model horizon, as much as 23 per cent of total investments under Business as Usual Low Growth scenario (total investments Rs 129,000 crore) and 18 per cent of total investments under Business as Usual Medium Growth scenario (total investments Rs 161,000 crore) could get crowded out by the outlays on unremunerative projects. Under the Strategic High Growth Scenario it is assumed that unremunerative investments, if any, will be provided for from the central or state government budget.

In regard to pensions, the first alternative was zero devolvement i.e. the railways continue to meet pension liability as they do now from their internal accrual. The second, extreme opposite view was for 60 per cent of all pension liability devolving on the government in perpetuity. The reason put forward is that in the next 30-40 years approximately 60 per cent of the pension outgo will be due to unfunded but contingent liability of the present organisation, and this is the maximum amount government can be asked to provide for. The third alternative is between these two extremes and the number chosen is for government to bear 20 per cent of the pension liability.

Given the reality of overall fiscal situation of the country, we have discarded the scenarios where capital expenditure included un-remunerative investments in all three scenarios. Under the Business as Usual Low Growth scenario, the alternative with zero devolvement of pension was taken for further analysis, the reason being that under the Business as Usual case government cannot shy away from this contingent liability. In the Business as Usual Medium Growth scenario 60 per cent of pension devolvement on government is found to be necessary to provide positive NPV. The project

The difference between the NPV of cashflows after financing of existing liabilities and the NPV of investment flows is the figure which reflects the first stage of viability or unviability of the business. If the NPV analysis indicates viability the financing could be tailor-made to suit the cashflow profile. Any number of financing strategies can then be used to do the actual financing

is not viable without generous government support in this form, along with large cuts in capital expenditure. In the Strategic High Growth scenario 20 per cent of pension devolvement on government was taken, as this alternative is not too burdensome on the exchequer and yet the model remains viable.

Scenario 1: Business As Usual – Low Growth

The basic premise of the ‘Business As Usual - Low Growth’ scenario is that IR will not do anything that is different from its current way of doing things. In other words, despite capital restructuring, IR will continue operating in more or less the same way as before.

The basic premise of the ‘Business As Usual - Low Growth’ scenario is that IR will not do anything that is different from its current way of doing things. Capital expenditure has been pegged at amounts that just about cover the basic operating needs, full maintenance, replacement and safety expenses to keep IR in the same state as it is today

Assumptions

- Revenue from freight will increase at a constant annual rate of 2.5 per cent after adjusting for inflation, which is more or less in line with the past growth rate. Revenue from passenger traffic will increase at 3 per cent per year. The two other minor revenue heads are other coaching (which is targeted to grow at the historical rate of 3 per cent), and other revenue (at 2.5 per cent). These translate to an overall revenue growth rate of 2.66 per cent per year (at constant prices).
- Staff salaries will increase at 5 per cent real. However, this will affect the wage bill in different ways. For the first three years (2001-02 to 2004-05), attrition is expected at the rate of approximately 2 per cent per year, rising to about 3 per cent in the fourth and fifth years and 4.5 per cent in the sixth and seventh years (See Exhibit 6B.2). Staff cost increases in the first seven years will accordingly be tempered by these staff reductions. Thereafter, fresh intake will exactly equal retirement, and real staff costs will rise by approximately 5 per cent in real terms.
- Reasonably detailed data have been obtained for the existing number of pensioners in the base year (2000-01) and the number by which their ranks will increase over the period. The number rises from 1.1 million in the base year to a little over 1.48 million in 2008-09, and is expected to stabilise thereafter. These estimates multiplied by the average pension benefits give the amounts that have to be annually provided for out of revenues. In future, pension benefits increase at the rate of 2.3 per cent every year in real terms.
- Other operating costs — such as fuel, repairs and maintenance and others — are assumed to grow at the same rate as revenue.
- The railways remain a non-tax paying entity.
- Capital expenditure has been estimated on a year-to-year basis. In this scenario, it has been pegged at amounts that just about cover the basic operating needs, full maintenance, replacement and safety expenses to keep IR in the same state as it is today.
- **The government will continue to infuse preferred capital into railways as long as Profit-before-Tax (PBT) is negative.** Debt and future market borrowings are assumed to cost 6 per cent per annum after adjusting for inflation.
- The preference capital from the government will be available at 7 per cent nominal rate and long term rate of inflation is assumed to be 6 per cent; market borrowing will be available at 12 per cent normal rate of interest.

- **Dividend on the preference capital will be paid by the railways so long it has undistributed profits available on the books.** Preference capital is to be redeemed before paying dividends on ordinary capital. Ordinary shares will be eligible for payment of dividends from year-to-year in accordance with Indian GAAP.

Ordinary equity of a commercial organisation carries a cost. In the model, however, no cost is prescribed. The ordinary equity (i.e. a sixth of the restructured capital) is available free to IR. But, ordinary share capital, in line with Indian GAAP, is serviced out of residual income after discharging all pre-committed, contractual obligations, including the cost of preference capital. Therefore, the acid test of whether a scenario is financially feasible or not is to evaluate the net present value of the model's residual cash flow, discounted at the weighted average real cost of capital. If this residual is positive, then the scenario is financially viable. Otherwise, it can never attract equity, except from someone with an altruistic predisposition. This is a stricter condition than the definition of viability mentioned earlier.

The Results

It should not come as a surprise that the Business-as-Usual Low Growth model is not viable. Under this scenario, **IR simply cannot generate the kind of internal resources needed to give market rate of returns on additional debt and additional preference capital which are 6 per cent and 1 per cent after adjusting for inflation.** Indeed, IR is financially non-viable even if it chose to ignore existing base year debt and preference capital. The NPV of the funding gap would still be huge. **To put it bluntly, the Business As Usual Low Growth will rapidly drive IR to fatal bankruptcy, and in sixteen years GoI will be saddled with an additional financial liability of over Rs. 61,000 crore.**

Incidentally, no realistic simulation in the neighbourhood of the Business As Usual Low Growth scenario can make IR viable. As an example, a simulation was run with:

- 0.5 percentage point reduction in fuel, repairs and maintenance and other costs;
- 0.5 percent point increase in revenues; and
- 60 per cent of the pension expenditure devolving to GoI.

Even these assumptions could not turn NPV of the scenario to positive. The key point to note about this scenario is that it cannot be rendered viable by any government support. **On a pure operational level IR is in a terminal debt trap and can only be preserved by continuing and ever increasing subsidies, year-on-year, from the central government. As is well known, such subsidies are not available.**

Scenario 2: Business As Usual – Medium Growth

The basic premises of the Business-as-Usual Medium Growth scenario are that IR will try to recapture the lost market share of the freight, and that passenger business will keep pace with GDP growth (by providing better amenities to passengers). However, the basic organisation of IR continues to be as it is now. The following assumptions were incorporated in the model.

Assumptions

Under the Business as Usual Low Growth scenario, IR simply cannot generate the kind of internal resources needed to give market rate of returns on additional debt and additional preference capital. Indeed, IR is financially non-viable even if it chose to ignore existing base year debt and preference capital. The NPV of the funding gap would still be huge. To put it bluntly, the Business As Usual Low Growth will rapidly drive IR to fatal bankruptcy, and in sixteen years GoI will be saddled with an additional financial liability of Rs 61,000 crore

The basic premises of the Business as Usual Medium Growth scenario are that IR will try to recapture the lost market share of the freight, and that passenger business will keep pace with GDP growth. However, the basic organisation of IR continues to be as it is now

The Low Growth case scenario entails not only higher cost to government but leaves IR in a debt trap. The Medium Growth scenario requires government subsidy; in this option, railways' finances remain a going concern on the crutches of perennial devolvement of 60 per cent of pension liability to GoI

- Real growth in revenue from freight will gradually increase from 3 per cent to 5 per cent in two years time and maintain this growth rate thereafter. Growth in revenue from passenger traffic will increase from 3 per cent to 6 per cent in four years time and keep growing at this rate thereafter. The (other coaching) revenue grows in line with passenger revenue growth rate. These translate to an overall revenue growth rate expanding from 3 per cent in 2001-02 to 5.3 per cent per year from 2004-05 onwards.
- Staff salaries and pension have been assumed to be same as the business As Usual Low Growth case.
- Other operating costs — fuel, repairs and maintenance and others — are assumed to grow at the same rate as real revenue.
- The railways remain a non-tax paying entity.
- Capital expenditure has been estimated on a year-to-year basis. In this scenario, it has been pegged at amounts that cover the basic maintenance, replacement and safety expenses, and larger amounts of money to be spent on infrastructure capacity expansion (to meet the increased traffic demand).
- Capital structure is assumed to be same as in the Business As Usual Low Growth case scenario.
- Similar to the Business As Usual Low Growth case the financing gap is split 40:60 between issue of fresh preference shares by IR to GOI and market borrowings. Cost of the latter is 6 per cent per annum; while the cost of servicing preference capital is pegged at 1 per cent.

The results

The Business As Usual Medium Growth Scenario on its own does not turn out to be viable. The NPV of the funding gap is again highly negative but it is much smaller than the NPV of funding gap of the Low Growth' case, because revenue growth is fairly good after four years and, from then on it is possible for IR to generate sufficient internal resources needed to give market rate of returns on additional debt and additional preference capital, but not to redeem the capital. The Medium Growth scenario requires government subsidy; in this option, railways' finances remain a going concern on the crutches of perennial devolvement of 60 per cent of pension liability to GoI. The business is not likely to generate enough surplus to make it attractive to equity investors. Moreover, risk arising from government support is enormous for anyone to invest in railways.

Scenario 3: Strategic High Growth

The underlying assumption of the third Strategic High Growth Scenario is to transform railways into a commercially viable organization. The traffic growth rates projected are in line with growth expectations of the economy and rapidly growing middle class which can afford higher level of service.

This growth scenario assumes an accelerated and focussed investment programme to yield higher traffic growth in both passenger and freight traffic. The Expert Group is of the view that the projected growth can be achieved with a significant restructuring of Indian Railways towards much greater commercial and customer orientation. The higher levels of investment require an injection of external funds on a significant basis. **It is deemed unlikely that such funds would be available, even with a government guarantee, unless investors and lenders can see commercial viability in**

the long run: hence the need for tariff rebalancing and organisational restructuring.

Assumptions

The specific assumptions while carrying out the simulations are:

- Real revenue from freight will gradually increase from 3 per cent to 7 per cent in the first five years and then settle down to 6 per cent from 11th year onwards. Revenue from passenger traffic will increase from 7 per cent to 9 per cent in three years time and keep growing at this rate thereafter. The growth in other coaching revenue increases at a moderate rate of 3.5 per cent and stays at 8 per cent rate from third year onwards. These translate to an overall revenue growth rate expanding from 4.2 per cent in 2001-02 to 7.7 per cent in 2005-06, and then tapering off to 7.1 per cent in the last five years.
- Staff salaries and pension have been assumed to be same as the Business As Usual Low Growth case.
- Other operating costs — fuel, repairs and maintenance and others — are assumed to grow at the rate of total revenue growth.
- Capital expenditure has been estimated on a year-to-year basis. In this scenario, it has been pegged at amounts that cover the basic maintenance, replacement and safety expenses. A large amount of money is spent on capacity expansion to meet traffic demand and on replacement as utilisation of assets increases substantially compared to the Business As Usual Low Growth case scenario.
- IR continues to be a non-tax paying entity.
- Capital structure is assumed to be the same as in the Business As Usual Low Growth case scenario.
- Similar to the Business As Usual Low Growth case the financing gap is split 40:60 between issue of fresh preference shares by IR to GoI and market borrowings. Cost of the latter is 6 per cent per annum, while the cost of servicing preference capital is pegged at 1 per cent per year after adjusting for inflation.

The Results

The NPV of cash flow suggests that, over the fifteen year period, the Strategic High Growth case on its own is also not viable due to high capital expenditure on safety works and renewal arrears in the first five years, and the expenditure on front-loaded capacity expansion which will generate revenue only after a few years. The NPV of the funding gap comes to (-) Rs.22,750 crore which is much smaller than the NPV of funding gap of the Business As Usual Medium Growth of (-) Rs 52,365 crore and the Business as Usual Low Growth case of (-) Rs 70,151 crore. However, as revenue growth is fairly robust after three years, it is possible for IR to generate internal resources needed to give market rate of returns on additional debt and on additional preference capital. In fact, NPV of the funding gap is smaller than that of existing liabilities of preference capital and debt (Rs 40,990 crore).

A realistic simulation in the neighbourhood of the Strategic High Growth case yields a commercially viable scenario. The initial results show marked improvement in operating margin. To assume that there could be room to increase revenue further from operational efficiency will be quite difficult, but there is ample room for cutting costs. Cost cutting can be achieved by

The Expert Group is of the view that the projected growth can be achieved with a significant restructuring of Indian Railways towards much greater commercial and customer orientation. The higher levels of investment require an injection of external funds on a significant basis. It is deemed unlikely that such funds would be available, even with a government guarantee, unless investors and lenders can see commercial viability in the long run: hence the need for tariff rebalancing and organisational restructuring

We are assuming that in the first few years railways will have an accelerated programme of introduction of technologically superior rolling stock, it should help in improving average speed of passenger as well as freight trains. The new prime-movers and rolling stock being technologically superior will have less of down-time and with regular maintenance can achieve higher operational efficiency

improving operational efficiency and by using technologically advanced rolling stock. As we are assuming that in the first few years railways will have an accelerated programme of introduction of technologically superior rolling stock, it should help in improving average speed of passenger as well as freight trains. The new prime-movers and rolling stock being technologically superior will have less down-time, and with regular maintenance can achieve higher operational efficiency. Avoidance of wastage can also reduce cost substantially. As tare-to-weight ratio will improve, fuel consumption per tonne Km should reduce. Hence, a simulation was run with:

- 0.5 percentage point reduction in fuel, repairs and maintenance and other costs from year 5 to 15 i.e. savings being realised only after introduction of new rolling stock is complete.
- 20 per cent of the pension expenditure devolving to GoI. This devolvement of pension liability is much smaller than Business As Usual Medium Growth where it was 60 per cent.
- IR is able to generate revenue from non-conventional sources to the extent of Rs 500 crore every year. The non-conventional sources include revenue generated from leasing or selling of right of way, land lease, dividend from equity participations from various ventures, advertisements etc.

IR is also able to generate revenue from divestment to the extent of Rs. 500 crore each for five years, beginning from the second year of the plan. The simulation assumes that divestment proceeds will remain with railways to meet its capital expenditure.

These assumptions make the strategic case viable giving rise to a positive NPV of Rs 5,482 crore. Earning before interest and taxes (EBIT) steadily rise from Rs. 3,401 crore in the first year to Rs.26,891 crore in the fifteenth year. Profits after tax (PAT) rises steadily from Rs. 617 crore in the first year to Rs 23,192 crore in the terminal year. Railways would be able to service their preference capital, restructured debt including IRFC's debt, and redeem part of the preference capital injected by the government in the first six years and at the time of restructuring of capital.

The following features that are common to all the scenarios may be noted:

- **Capital Structure:** The restructured capital of IR is divided into Equity; Preference Capital and Debt in a ratio of 1:2:3. Throughout the projection period of 2001 to 2016 no return is provided to ordinary equity. In the current railway accounting practice this can broadly correspond to the capital invested through internal generation. Return on preference capital is fixed at 1 per cent real, and on debt at 6 per cent real. The debt portion roughly corresponds to IRFC borrowings in addition to other debt liabilities of IR.
- **Subsidy for Unremunerative Lines:** It is difficult to estimate what this subsidy should be. Whatever subsidy is available from the government on this account would add to IR's revenues and hence reduce the borrowing needs in each period. Alternatively, the government would have less need to give the subsidy for pension devolvement.

The objective of the exercise is to demonstrate that IR is financially viable at the posited rates of investment and revenue growth. Financial viability is simply not feasible at lower rates of growth. Thus the only feasible option is to go for Strategic High Growth. Any other scenario implies a greater financial burden on government. It should be noted here that the revenue growth

assumptions made are very ambitious: some Members of the Expert Group feel that they are unrealistic even with the kind of reorganisation proposed.

If IR responds to changing needs of its customers, not only would it transform itself into a thriving business, it would also be able to pay most of its liabilities over the 16 year horizon. **The net present value of IR's cash flow is small, but with support from the government during the first seven years of restructuring phase, IR can be financially viable.** Railways would be able to service their preference capital, debt, and redeem the preference capital, injected by the government in the first seven years and at the time of restructuring of capital structure, over the time horizon of the model. If the revenue growth is lower than projected the redemption would take longer. Additionally, the 'Strategic' case will build a financially strong railway organization. Higher revenue growth assumption assumes that after the restructuring process, IR becomes a lean and profitable venture that is run on commercial principle.

As we move from the Business As Usual Low Growth case to 'Business as Usual Medium Growth and to Strategic High Growth cases, dramatic improvement is estimated in two areas: labour productivity and capital productivity. The rationale that commends the Strategic growth option is that:

- (a) it is the least expensive plan of action for the railways,
- (b) in terms of NPV, it calls for the least amount of subsidies from the government, and
- (c) it provides services to customers in the most efficient way, and improves the operational and investment efficiencies.
- (d) it transforms railways into a commercial enterprise with a strong balance sheet, capable of looking after its future investment needs and liabilities.

Government Support and Commitment to Restructure

Commercial viability cannot be aimed at and achieved without an explicit ex-ante commitment to substantial organisational restructuring that would provide the means to achieve financial viability. The projections made here suggest that the government would have to provide significant financial support in the first 7 years of such a programme, but would be able to recoup most of such investments within the 16 year period. In fact, railways would require only a certain level of pension subsidy after year sixteen and will be able to honour all its commercial commitments. Thus, although the government does have to make some financial commitments in the initial period, it will be able to recoup its investments over the programme horizon. Government commitment to both financial support and organisational restructuring of the kind proposed elsewhere in this summary is essential to provide adequate confidence to other investors and lenders for providing funds needed to rejuvenate Indian Railways.

The Expert Group has provided only one feasible Strategic High Growth Scenario; in principle other such scenarios are also possible. Our aim is to demonstrate that there is at least one growth path that is indeed financially viable entailing a certain level of support from the government. Once such a viable financial plan is available, there can be many ways for financing the programme. Such a programme can include the privatisation of peripheral activities over the period of the programme. It can also incorporate alternatives to funding of pension liabilities in a manner other than we have proposed. We have assumed very modest privatisation of mainly the manufacturing

The Strategic case will build a financially strong railway organization. Higher revenue growth assumption assumes that after the restructuring process, IR becomes a lean and profitable venture that is run on commercial principle. As we move from the Business As Usual Low Growth case to Business as Usual Medium Growth and to Strategic High Growth cases, dramatic improvement is estimated in two areas: labour productivity and capital productivity

A bold approach is required to restore the Indian Railways to financial health and make it once again a vibrant organisation

units during the first five years of the model horizon. On pensions we have had to assume that the government would bear 20 percent of the pension liability throughout this period.

The Strategic High Growth scenario assumes an accelerated investment programme to yield higher traffic growth in both passenger and freight traffic. This kind of growth is not feasible to be achieved without a significant restructuring of Indian Railways towards much greater commercial and customer orientation. The higher levels of investment required can also not be achieved from pure government support, and require an injection of external funds on a significant basis. It is deemed unlikely that such funds would be available, even with a government guarantee, unless investors and lenders can see commercial viability in the long run.

In the Expert Group's opinion, at the current state of India's development, it is indeed quite possible for the Indian Railways to become a financially viable entity. It needs to go for a strategic high growth programme that recaptures some of the freight traffic and generates faster passenger revenue growth by taking advantage of the rapidly changing income distribution of the population as outlined in an earlier section. It would also have to undertake significant tariff re-balancing in both the passenger and freight service segments to provide value for money to its customers. It is our considered view that such a bold approach is required to restore the Indian Railways to financial health and make it once again a vibrant organisation.

To achieve this growth there is an imperative need for a major step up in investment of the order of about 50 per cent above the current levels, for at least the next five years. Such a step up is essential to cover the backlog of neglected investments from the past, and for the expansion of necessary capacity and improvement in productivity. **The investment programme envisaged in the Strategic High Growth Scenario requires an annual investment of about Rs. 14,000 to 15,000 crore per year from 2002 to 2006, about Rs. 12,500 crore per year from 2007 to 2011 and about Rs. 13,500 crore per year from 2012 to 2016.** In five year tranches, this investment programme amounts to Rs. 70,000 crore or US \$ 14 billion from 2002 – 2006, Rs. 62,500 crore or US \$ 12.5 billion from 2007 to 2011, and Rs. 67,500 crore or US \$ 13.5 billion from 2012 to 2016, making for a total of about Rs. 200,000 crore or US \$ 40 billion over 15 years. Internal resources are expected to provide for just over a third of the requirements in the first five years, and little over half in subsequent years. Market borrowing would finance about 40 per cent of requirements in the first five years and about 30 per cent in subsequent years. **Government support for this investment programme in the first five years would finance about a quarter of the investment programme, but less than 10 per cent in subsequent years.** Thus it is only in the first 5 to 7 years that exceptional government support is needed in this programme. Greater levels of government support would of course make the task of railways restructuring somewhat easier, and would be welcome.

It is evident therefore that the strategic high growth scenario envisages a major turn-around in the finances of Indian railways. Such a turn-around would be beneficial to the country at large and therefore actions required from the government to make this scenario possible must be given the highest priority. **Just as the road scenario in the country has been fully**

transformed through the levy of the fuel cess and the highest importance given to the National Highway Development Programme by the Prime Minister, Indian Railways can also be similarly transformed if such importance is given to this programme by the highest authority in the country. As stressed throughout this report this will not be feasible unless IR is substantially restructured in order to run on a commercial basis. Tariff rebalancing of the kind suggested in chapter 3 would be an essential component of this restructuring programme.

Exhibit 13 : Financing of Indian Railways : Key Messages

- The **first message** is that IR can not survive if it adopts the Business-as-Usual Low Growth Scenario. This should not be surprising to anyone familiar with the recent working of IR, but it nevertheless needs to be emphasised in no uncertain terms. In such a scenario, the NPV of the funding gap after 15 years – the difference between the NPV of cash flow after financing existing liabilities and the NPV of investment flows – is a staggering Rs 70,151 crore. Virtually all interest cost will need to be funded by government, and there will have to be a continuous injection of capital from the Central exchequer just to keep IR alive. The NPV of cash flows from the Central Government to IR will amount to an unsustainable Rs 55,384 crore. Simply put, this is a recipe for a debt trap and the financing of perpetual and ever worsening bankruptcy.
- The **second message** is that the Medium Growth Path, though better than the Low Growth variant, is also not good enough. The only way for this scenario to make sense is for the Central Government to take up 60 per cent of IR's pension liabilities in perpetuity – something that is unrealistic to expect from a severely fiscally constrained exchequer.
 - It has been argued by some that the Medium Growth Path should not result in the Central Government having to pick up 60 per cent of IR's pension liabilities in perpetuity if the subsidies due to IR are properly estimated. The argument is that the Rs. 800 crore annual subsidy to be provided for by government to IR for unremunerative services is an underestimate. If all unremunerative and socially dicated services are taken into account – as envisaged by the Purpose Statement – the subsidy ought to be significantly higher. And, if IR were to be reimbursed the full cost of subsidy every year, the required pension support from the Central Government would be lower – which might make the Medium Growth Path more attractive than before. In either case, the relevant fact is that the government will have to inject an average amount of about Rs. 8,000 crore on a sustained, indefinite annual basis.
 - This is an argument about fungibility: if government could give greater budget support for unremunerative activities, such inflows would enter IR's revenue stream and, thus, reduce the quantum of pension support. However, the issue here is not fungibility but fiscal reality. Given the state of the central exchequer and the assumption that it will not improve dramatically over the next decade, it is unrealistic to assume that either the government will bear the full cost of subsidy, or will be able to shoulder the burden of 60 per cent of IR's pension liabilities. It is precisely because of this reason that the Committee was constrained to reject the Medium Growth Path.
- The **third message** is that salvation for IR can only be through the Strategic High Growth Scenario, coupled with relentless cost cutting. Here, the NPV of the cash flow to IR from the government is Rs. 13,111 crore (versus Rs. 55,384 crore in the Low Growth, and Rs. 56,737 crore in the Medium Growth Scenarios). Unlike the Medium Growth Path, this variant is viable with government taking up only 20 per cent of IR's pension liabilities. In this situation, IR will be able to service its preference capital, restructured debt (including IRFC's liabilities), and also redeem a part of the preference capital that has to be injected by government in the first six years. Moreover, the Strategic High Growth case helps rebuild IR as a financially viable organisation.
 - Are the revenue assumptions governing the Strategic High Growth variant too optimistic? The Committee believes otherwise. Even without tariff rebalancing, revenue is assumed to grow from 4.2 per cent in 2001-02 to 7.7 per cent in 2005-06, and then taper off to 7.1 per cent in the last five years. Assuming an income elasticity of unity, this is akin to expecting an average GDP growth of about 7.3 per cent per year over the next 15 years. The Committee believes that such a target is achievable for the economy and IR.
- The **fourth message** is that the entire exercise has been carried out without any assumptions regarding tariff re-balancing. Chapter 3 (Exhibit 3.15) shows that by 2005-06, proper tariff re-balancing alone can result in an annual revenue gain of Rs. 735 crore. If this is taken into account, the Strategic High Growth scenario will become even more attractive, and shall significantly reduce the government's 20 per cent pension liability. Indeed, the unstated message in this chapter is that revenue growth must be pushed up further by sustained tariff re-balancing.
 - One of the main recommendations of this report is that through a process of tariff rebalancing, the subsidies to second ordinary class should be phased out. Explicit subsidies calculated on efficient costs should be reimbursed by the government/local administration. The closing down of totally unviable branch lines and services will further bring down this burden on railways. As regards suburban services, there will have to be a move towards more rational tariff setting, along with a search for more creative means of alternative financing. As illustrated elsewhere in this report (Box 5.3 and Box 8.10) the bulk of this burden can be distributed among employers and local governments, leaving a manageable share for the transport system.
- The **fifth and final message** is simple. Business-as-usual will not do, for it will lead to massive bankruptcy. Although tempting, the middle path, too, will not do, for it implies that the government must take up a financial burden that it realistically can not afford. The only salvation lies in the Strategic High Growth scenario. To be sure, this variant will require some managerial 'stretch'. But the Expert Group believes that the targets are not unrealistic and that IR has the depth and width of human resources and an *esprit de corps* to meet these stretch targets. It has to be done. Because, as the chapter shows, the alternative could be oblivion.

VI. FINANCING PLAN FOR THE STRATEGIC HIGH GROWTH SCENARIO

Strategic High Growth: A Sustainable Option

The Strategic High Growth scenario is identified as the sustainable course open to IR. The investment projection in this scenario is what is needed to support requisite growth to meet customer demand. It is a turn-around story from a condition of financial distress to a vibrant commercial organization that is capable of meeting customer demand and transport requirements of a growing economy. This is what makes this scenario the sustainable option. The 'Restructuring' project requires approximately Rs.200,000 crore of investment over the fifteen year period, of which the requirement for the first 5 years will be about Rs. 70,000 crore. It is a 'hot seat' restructuring plan without disturbing IRs current services and meeting almost all its financial obligations. The financing plan of the Strategic High Growth Scenario shows that it is viable and fulfils the three ascending conditions of viability referred to in the preceding sections.

The Expert Group is convinced that IR requires a large amount of investment upfront to finance renewal arrears and safety works – essentially those investments which railways should have done in the last few years but have not done – if it is to continue to play a leading role in the transportation sector.

Hence, financing of restructuring of railways, in the initial period, rests heavily on preference capital supplied by the GOI and a loan to be accessed from multilateral institutions on easy repayment terms. Its main purpose is to build confidence among other lenders through the GOI's commitment to the restructuring plan.

The kind of growth and investment envisaged in the Strategic High Growth Scenario requires an exceptional commitment from IR to reform and reinvent itself in order to achieve these ambitious targets. It also requires extraordinary support from the Government to help it achieve these aims. Chapter 8 outlines the kind of reorganisation that will be required. Exceptional support from government will also be necessary for IR to raise the kind of resources required for this strategy.

There are many financial instruments and options for financing the investment required. In the financing model adopted here, the first guiding principle is to demonstrate that IR is able to honour all its financial obligations. This will generate the needed confidence among lenders and investors. Sustained increase in operational efficiency generates additional internal resources to fulfil the debt obligations (both interest and repayments) and capital expenditure requirements.

The second principle followed is that IR should redeem the principal and accrued interest on the stock of existing debt as soon as it turns the corner. The third principle was to follow a conservative approach and not take credit of any money that may accrue from complex restructuring deals or innovative financing options. Credit has been taken only for Rs. 500 crore per year over the programme period under the heading of non-conventional means of raising finances, and sale of assets worth Rs 2,500 crore over the first five years.

IR requires a large amount of investment upfront to finance renewal arrears and safety works – essentially those investments which railways should have done in the last few years but have not done

The Strategic High Growth Scenario requires an exceptional commitment from IR to reform and reinvent itself in order to achieve the ambitious targets. It also requires extraordinary support from the Government to help it achieve these aims

As a large infrastructure service provider, Indian Railways will be an attractive avenue of investment for equity investors, pension funds and insurance companies etc.

A funding plan linked to pre-determined reform measures will encourage IR to achieve pre-committed milestones. Such a plan will be welcomed by markets as it will demonstrate that government is financing reforms and not railways' deficit

Financing Approach

The Expert Group has developed a financing model for the Strategic High Growth Scenario in the corporate accounting framework outlined in Chapter 5. The main sources of funds in this framework would be:

- Preference capital from the Government at 1 per cent real rate of return.
- Internal generation of funds, including depreciation in a corporate accounting framework.
- Market borrowing
- Privatisation Proceeds

In view of the current state of IR's finances, it is projected that it will take about 7 years of accelerating revenue growth before IR will be able to stand on its own feet in commercial terms. Thus financing requirements of the first 5-7 years should be met through borrowing that has a long repayment schedule.

By choosing plain debt financing to fund IR's restructuring plan, our estimates of funds requirement are set at the extreme. For funding such a large capital expenditure, especially in the first five years, it is advisable to follow financial conservatism and orthodox methods. The Government of India will have to provide preference capital at the rate of about 40 per cent of financing requirements for the first 5-7 years, after accounting for internal generation. The rest 60 per cent will have to come from borrowing.

Investment needs of IR are too large to be met through one debt instrument as market of each instrument is shallow. IRs' demand itself can be an influencing factor in pricing of the instrument; hence IR will have to go for various types of debt instruments to raise funds from the capital market.

The financial analysis in the short and medium term indicates that as a large infrastructure service provider, Indian Railways will be an attractive avenue of investment for equity investors, pension funds and insurance companies etc. Its debt servicing capacity is well within the prudent norms of infrastructure projects.

Multilateral Assistance and Government of India Support

The financing model envisages that IR seek a multilateral loan of a little over US \$ 1 billion with 30 per cent counterpart funding coming from GOI. Such a loan will normally have a five-year moratorium and will be easier to pay from the future revenue streams. The preference capital being committed by the government can be combined with such a multilateral loan to commit the GOI and IR alike to the required reform programme. The primary benefit of conditionality-linked loan and preference capital programme from the government is that it provides a means by which a reform-minded government can publicly commit to policy measures and send a signal that the reform programme is credible. The objective of these conditionalities is to guard against the possibility of a reversal in the restructuring plan, and to reduce market uncertainties.

The benefit of such a programme would be that it unequivocally ties the borrower to specified performance criteria. A funding plan linked to pre-determined reform measures will encourage IR to achieve pre-committed

milestones. Such a plan will be welcomed by markets as it will demonstrate that government is financing reforms and not railways' deficit.

Manageable Borrowing Levels

The debt funds required in the first five years of the restructuring process are of the order of Rs. 4,600 crore per year. With some marketing efforts, this money can be raised by IR on the strength of railways' and governments' commitment to a reform Plan. A combination of 10-year deep discount bonds (10 tranches), 5 year zero coupon bonds and 5 year medium term notes have been used to raise the required debt. If government is to give permission to railways to issue upto Rs 1,000 crore worth of tax-free bonds for five years, IR can bring down its interest liability by Rs 400-500 crore per year in the later part of the reorganisation phase.

If the revenue growth assumptions of this model are met, from about the seventh year of restructuring IR will not need substantial subsidy from GoI and capital expenditure requirements of the organization could then be met from internal cash generation. The second half of the cash flow projections shows substantial increase in internal revenue generation which is used to meet financial obligations arising from restructuring of capital and reducing overall debt burden.

One of the important financial indicators of a profitable organization is the amount of return it can generate for its stakeholders. The total cash flow statement shows that over the sixteen-year horizon, the Railways will be in position to distribute some returns also to its equity holders which as of today is the Government of India. In fact, within seven years, its internal generation of cash will be sufficient to meet its capital expenditure needs. This would take longer if all growth assumptions are not met.

Financial ratios have been worked out over the model time-frame. The improvement in the Interest Coverage Ratio and the Debt Service Coverage Ratio over successive periods suggests that creditworthiness of railways improves substantially after the first five years. One can infer from the results that the strong cash-flow situation after the first five years would provide IR adequate cushion to withstand any shortfall in cash flow during the implementation period.

Efficiency Gains and Restructuring Options

We have provided a relatively simple financing plan using instruments that are currently available in the Indian capital market. As the Indian capital market becomes more sophisticated it would be possible to use a greater diversity of financial instruments to raise resources for the investments required. We have also treated the Indian Railways as a monolithic organisation in this financing plan. As IR becomes commercially viable in a 5-7 years framework it could also be unbundled into different corporations accomplishing different functions. Each of such subsidiaries could raise funds in the commercial market in different ways. We have not looked into such possibilities since our main aim is to demonstrate the financial viability of the Strategic High Growth programme. Our emphasis is on commercialisation rather than privatisation of IR. However, the financial projections suggest that privatisation would be feasible after about 7 years. In that case resources could also be raised from equity offerings in the privatised entities.

As the Indian capital market becomes more sophisticated it would be possible to use a greater diversity of financial instruments to raise resources for the investments required. We have also treated the Indian Railways as a monolithic organisation in this financing plan. As IR becomes commercially viable in a 5-7 years framework it could also be unbundled into different corporations accomplishing different functions. Each of such subsidiaries could raise funds in the commercial market in different ways

Pre-requisite of Strategic High Growth Scenario

Underlying the success of the roll-out plan for financing IR's restructuring is the improvement in operational and investment efficiency. This can only be achieved if there is a compatible incentive structure and there is improvement in the 'software' side of IR operations. A coherent approach to railways reform must differentiate between a desire to improve rail services and a desire to attract private capital to remedy lack of public funds. The latter, which retains investment decisions within the public sector, and merely seeks to access private money, is unlikely to deliver what rail users need, as the decisions are not driven by market incentives. The first task of railways reorganisation must therefore be to transfer these decisions to a commercialised entity, whose incentives to cater to the consumer are much stronger. At the same time it is important to note that a commercial entity also delivers the goods only when it is faced with competition.

It would be necessary to draw up a coherent programme of review which inspires confidence among lenders such as multilateral agencies and other investors. This would require a widespread consensus and constant monitoring of the reform programme

National Priority and Government Support

The investment for the Strategic High Growth scenario is approximately 60 per cent more than the investment announced for the National Highways in the next seven years. A rail network – organized on closed access basis – is more environmental friendly, energy efficient and cost effective to meet nation's growing transportation demand. Money spent by GoI on railway restructuring will build quality assets for the government, for which it can find private investors without compromising transportation needs of the economy provided by railways.

Government support is absolutely necessary during the initial phase of restructuring. The High Growth scenario will derail if this support is not assured. In order to transform itself into a commercially viable organization ready to compete with other modes of transport, railways must restructure itself and adopt strategies and incentives that are responsive to the needs of its customers.

The success of the financing programme proposed for the strategic high growth scenario is crucially dependent on the credibility of the commitment shown by the government to undertake the kind of organisational restructuring proposed in chapter 8. It would be necessary to draw up a coherent programme of review which inspires confidence among lenders such as multilateral agencies and other investors. This would require a widespread consensus and constant monitoring of the reform programme. It would also mean that infructuous investments are no longer proposed, nor made, and an explicit focus on growth and efficiency is demonstrated. Hence, organisational restructuring as described later is the lynchpin of the Strategic High Growth scenario.

VII. RAILWAYS RESTRUCTURING : USING INFORMATION TECHNOLOGY FOR GREATER EFFICIENCY

The Need for IT in Indian Railways

A large complex infrastructure system such as the Indian Railways can benefit greatly from the intelligent use of information technology (IT). The previous chapters have demonstrated the urgent need for both enhancing IR's revenues on a consistent and sustainable basis, and for achieving significant cost savings. Use of IT can aid in these activities greatly. Similarly, a key requirement for the transformation of IR is a major reorientation of the system toward focussed concern for customer needs. IT can greatly aid in improving the customer interface with IR. Putting in appropriate profit and cost centres for providing the right incentive structure for improving efficiency will also require the use of IT in management accounting, internal business process as well as financial accounting. Better utilisation of existing assets such as rolling stock can also be achieved by the use of IT in tracking these assets. Thus the kind of investment and revenue growth that is indicated in previous chapters cannot be achieved without very explicit attention being given to the use of IT in Indian Railways. The potential for the extensive use of IT in IR is indicated by such use in other large infrastructure networks, such as the large international airlines and even the large car rental systems in the United States. **Indeed, the survival of railways will be determined by the capability of IR to live up to the challenge of merging their historical heavy engineering technology base with modern day information technology in order to become a profitable, logistical solution provider.**

Given the size and breadth of Indian Railways, use of information technology for efficient management is critical. In the context of overall strategy and restructuring, it is imperative that information technology be used effectively to integrate roles across the traditional functional groups and to help accelerate the efficiency and productivity improvements needed to generate necessary financial resources.

In view of these considerations of the importance of IT for Indian Railways, the Expert Group decided to give explicit attention to this issue.

In the area of information technology, India is emerging as a global power to reckon with. However, the capabilities provided by this technology have not been exploited adequately by Railways. IR has two notable successes in passenger reservations and long-range decision support; there is considerable scope for enhancing the reach and effectiveness of both applications. In MIS, IR was in fact one of the earliest undertakings in the country to introduce computing in the 1960s, but the systems are inadequately linked to the organization's business objectives. In the area of freight management that holds rich potential for effecting efficiencies through IT applications, initiatives are yet to take off.

Guiding Principles and Objectives

The basic guiding principles for developing and sustaining IT would be:

- **Create customer involvement and connect to the customer domain**

A large complex infrastructure system such as the Indian Railways can benefit greatly from the intelligent use of information technology (IT)

The kind of investment and revenue growth that is indicated in previous chapters cannot be achieved without very explicit attention being given to the use of IT in Indian Railways

– internet access provides enormous scope to transcend conventional railway boundaries and reach the customer domain.

- **Implement decision support systems** – IT will enable efficient processing and analysis of huge volumes of data to improve quality of decisions regarding freight and passenger business and asset management.
- **Initiate integration with communication systems and other technologies** – includes exploiting the scope to leverage their right of way to build communication capacity for “selling” to other users, and use of Geographic Information Systems (GIS) in ways that could greatly benefit IR freight and passenger businesses.
- **“Re-engineering” at the monitoring and planning levels** – example, monitoring of train punctuality not only at the originating and terminating stations as is done at present, but also at intermediate ones.
- **Continuous improvement in technology** – an important requirement to make applications better and to identify new applications.

In order to achieve the aim of time-bound restructuring, Indian Railways needs to clearly articulate its IT objectives. Recommended objectives are:

- **Increased revenue from freight business by giving higher level of information services to freight clients.**
- **Improvement in public image and upper class passenger revenue**
- **Reduction in operational costs by improved management of rakes, wagons, locomotives, crew, etc.**
- **Improving Decision Making**

Status of On-going Efforts

While railways in several countries have gone in for computerization of their freight operations information system to improve the productivity of their manpower and rolling stock, IR has lagged significantly behind in this critical area.

IR did launch two initiatives in **Freight Business Operations** – the first one as far back as 1985 and the second in 1998. The first effort ended in virtual failure and a fresh start has now been made with the recently launched FOIS. It aims to develop an integrated system to improve control and monitoring of operations and allied commercial, mechanical, traction and accounting functions to optimise the utilization of assets.

It is not a happy augury that the implementation strategy for FOIS, framed initially, has been changed before the system could start. The plan now is first to implement Rake Management System on global basis followed by phased implementation of Terminal Management System. Implementation has been planned in four phases commencing with select railway divisions and zones and to be completed by 2003 by covering the goods terminals of all Railway zones. The system needs to be strengthened with the implementation of a Wagon and Crew Management System (WCMS), for achieving full efficiency gains.

In Passenger Business area, Passenger Reservation System (PRS) has been implemented and is being maintained by CRIS. PRS is the world’s largest integrated reservation system and connects close to 2500 terminals in different cities to allow them simultaneously to reserve passenger seats and

In order to achieve the aim of time-bound restructuring, Indian Railways needs to clearly articulate its IT objectives

While railways in several countries have gone in for computerization of their freight operations information system to improve the productivity of their manpower and rolling stock, IR has lagged significantly behind in this critical area

issue tickets.

The implementation and training of this application which now covers close to 1 million out of the 5 million long distance passengers travelling every day, has been smooth. PRS has improved the image of Indian Railways considerably.

A few other systems have also been created in the Passenger business area. These are the **National Trains Enquiry system, Grievance & Complaints Handling System, Self-printing ticketing machines for unreserved ticket issue, and Telebooking and IVRS based booking.** Several other IT initiatives are also planned – among them the introduction of ‘smart’ cards, reservations through the Internet, and ‘touch screen terminals’.

Indian Railways have created a Long Range Decision Support System (LRDSS), and have several Management Information Systems (MIS) in position for the shorter-term decision support.

LRDSS is one of the world’s most advanced and complex tools for investment and strategic planning for the railway network. It currently focuses on the freight traffic movement but is relatively less advanced on the simulations of passenger traffic and terminal handling. LRDSS uses Geographical Information System (GIS) extensively and extracts static data from several other sources, including demand surveys.

As noted, IR was one of the earliest public organizations to go in for mainframe computers in the 1960s. Functions relating mainly to Payroll, FMIS, Inventory and some Operating Statistics have been addressed in MIS so far, with full coverage at zonal level and limited coverage at divisional level. It is critical to ensure that these systems are linked to the business objectives of IR. This remains to be done.

Recommended Measures

The four key areas where IR can maximize gains through Information Technology are freight revenue enhancement, passenger revenue enhancement, operational cost reduction and investment optimization.

(i) Freight Revenue Enhancement

In the freight area, Indian Railways should actively consider introducing yield management systems with variable pricing for customers, based on dynamic demand situation. One such mechanism is creation of an open freight exchange where Indian Railways participates as a customer. Applications for efficient scheduling of freight trains are also to be considered.

(ii) Passenger Revenue Enhancement

MIS reports of PRS are not effectively used at present by the decision support systems within the organization. Indian Railways can significantly improve its information and customer service to the passengers as well as enhance revenue through Revenue Management techniques. Here, the un-reserved ticketing segment requires major consideration. When capacity is abundant, discounts can be offered to induce customers to travel, and increase capacity utilization.

Other needed initiatives:

- Identify means to **increase the coverage of Passenger Reservation System** from 20% to a higher number of long distance passengers.
- **Outsourcing of distribution** can also help Indian Railways reduce

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Indian Railways can significantly improve its information and customer service to the passengers as well as enhance revenue through Revenue Management techniques

Outsourcing of distribution can help Indian Railways reduce the high cost of ticketing and distribution

the high cost of ticketing and distribution.

- **Integrate output of PRS** into MIS and LRDSS systems. Integration of this information would be the key to take faster decisions as would be needed to run the new corporate entity.
- **Introduce Revenue Management System:** Indian Railways should also consider introducing flexible pricing through a Revenue Management System. In such a system, the Railway should increase the price of certain number of seats (e.g., *tatkal* scheme), when demand is very high, and when the train is going empty reduce the price to increase demand, and thereby fill the train. A seat being a perishable commodity, every rupee earned on the empty seat directly increases profits. Creating such a mechanism requires a strong technology system.
- **Initiatives required for improving image:** Information Technology can be used effectively for improving Indian Railways' image among the various stakeholders, especially the passenger customers. IT can be used to offer high speed and easily accessible information about timing, rules, seat availability, booking information, etc. to the customers. More importantly, IT can be used to make each interaction with the customer efficient and fast.

(iii) Operational Cost Reduction

Given that the transportation industry requires the matching of several different types of resource allocations (such as rolling stock on the network, wagon movement, crew management, maintenance scheduling), optimisation by using information technology offers clear benefits in terms of cost reduction. Since the scheduling of such operations for passenger business is relatively fixed, most of these cost reduction opportunities exist in freight operations. Thus Indian Railways should consider implementing freight related management and information systems, such as Wagon and Crew Management system, Parcel Management System, and Inland traffic management system. Among these, the first system is the most critical.

In addition to these systems, Indian Railways can also introduce systems for scheduling freight trains, and also for managing the claims of various customers. While these systems are relatively small, they are important for increasing efficiency and customer service.

Indian Railways own nearly 300,000 wagons and 7000 locomotives for transportation of freight traffic on the broad gauge. On an average, a wagon is on the move only for 3 hours during the day and spends most of its time in marshalling yards and terminals. Hence, there is a considerable scope for improving the utilization of these costly assets as capacity can be freed by improving the management of these resources. A wagon and crew management system (WCMS) is likely to be beneficial in this context. More details on WCMS are given in the box.

(iv) Initiatives to Improve Decision Making

Long Range Decision Support System (LRDSS) project of IR is not fully embedded in the decision making process of Indian Railways. Moreover, the system needs to be expanded to include modules on passenger traffic, and the terminal simulations.

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LRDSS is likely to be a key source of capital efficiency improvements suggested in the investment and financial chapters of this report. Successful examples of such systems in **German and Austrian Railways have shown improvements of up to 30 per cent of capital efficiency.**

MIS structure and organization should be derived using a **top down approach** to meet the requirements at all senior levels. Based on the MIS reporting needs, **appropriate organization should be built** at all necessary locations.

The Telecom Right of Way is a time bound asset for Indian Railways, and can help generate significant revenues, and simultaneously reduce its investments in the telecom area. It would be critical to act quickly as the first mover advantage is key in the telecom infrastructure area and private companies are using other means to build their infrastructure.

LRDSS is likely to be a key source of capital efficiency improvements suggested in the investment and financial chapters of this report

Exhibit 14: Overview of Recommendations on Information Technology

	Freight revenue enhancement	Passenger revenue enhancement	Operational cost reduction	Investment optimization
Current status	<ul style="list-style-type: none"> Freight Operations Information System (FOIS) containing Rake and Terminal management modules implementation started (after unsuccessful attempt of TRACS with implementation delays) 	<ul style="list-style-type: none"> Passenger Reservation System (PRS) successfully implemented along with other information systems such as NTES, CGHS implemented Distribution depth still limited and number of reserved tickets limited to 20% of long distance passengers Passenger information not integrated with other internal systems 	<ul style="list-style-type: none"> Rake management and Terminal management systems likely to offer some solutions for cost reduction Large scale introduction of IT systems for stramlinging operations currently not implemented 	<ul style="list-style-type: none"> Highly advanced decision support tool called Long Range Decision Support System (LRDSS) developed internally that simulates future demand scenarios and helps optimize future investment
Recommendations	<ul style="list-style-type: none"> Institute project review mechanism for implementation of FOIS (Freight Operations Information System) 	<ul style="list-style-type: none"> Expand distribution depth through Internet and larger number of outlets Introduce Revenue Management System Integrate PRS information with MIS and other Decision Support Systems 	<ul style="list-style-type: none"> Introduce Wagon, crew, parcel, and inland traffic management systems Integrate these systems with FOIS Introduce and implement integrated MIS with online data accessible across the organization 	<ul style="list-style-type: none"> Integrate LRDSS with the investment decision making processes as well as the planning of Indian Railways
Final Status	<ul style="list-style-type: none"> Implement FOIS completely in all locations Ensure the FOIS information is fully accessible to all key customers and helps them improve their inventory and production management, leading to higher customer satisfaction and revenue 	<ul style="list-style-type: none"> Integrated Passenger Information, reservation and distribution systems, with information and reservation facilities close to customers, leading to higher passenger revenues 	<ul style="list-style-type: none"> Integrated cost management systems to ensure significant increase in productivity and efficiency. This would enable annual reduction in overall manpower estimated 	<ul style="list-style-type: none"> World class investment optimization system integrated with all decision making processes within the organization

IR should undertake Rs 350-500 crore of operational (working expenses) expenditure on IT each year, and Rs 100-300 crore of capital expenditure on technology annually

While identification of IT applications will still be core to IR, developing and in some instances managing them would be better outsourced. The software industry is very mature and has capabilities and specialization far greater than what IR can probably achieve

Investments and Organization, Out-sourcing

The Expert Group recommends that IR should undertake Rs 350-500 crore of operational (working expenses) expenditure on IT each year, and Rs 100-300 crore of capital expenditure on technology annually. On a large project involving many functions like information technology, networking, infrastructure etc. overall project management and commitment to get the project completed on time are crucial. Failure of any one function leads to cost over run on the other functions. IR's record in this area is unsatisfactory. There is a need to strengthen the organization by:

- **Positioning a Chief Information Officer (CIO) reporting to the CEO**
- **Setting up Dedicated Task Force Reporting to CIO, and**
- **Creating Implementation Teams for Specific Projects**

IT talent requires flexible HR policies, and a different working environment, which IR may not be able to provide in the near future. While identification of IT applications will still be core to IR, developing and in some instances managing them would be better outsourced. The software industry is very mature and has capabilities and specialization far greater than what IR can probably achieve. This outsourcing is especially applicable in certain areas such as sales and marketing through the internet, using right of way for communication capacity, etc. Indian Railways should seek a partner such that the external party has technology as well as the domain knowledge of this business.

Conclusion

To meet the objectives of restructuring and improvement in resource management, the role of various IT systems would be crucial. Unless many of the IT systems, such as freight revenue enhancement and investment optimization systems are fully implemented, gains from the restructuring exercise would be difficult to come by.

VIII. REINVENTING INDIAN RAILWAYS

The previous sections of this report have built the factbase to underpin the case for urgent and deep change – a reinvention – of Indian Railways. It has identified the need to modernise Indian Railways in response to multiple forces which in combination are undermining the fabric of the organisation and the financial viability of the business. The evidence for rapid, deep-seated change is viewed by the Expert Group as clear, compelling and overwhelming. The message of the Expert Committee is that business must *not* be as usual.

The purpose of this chapter is both to provide a synthesis of the key recommendations of the Expert Group and also to provide a flavour of the evolution and spectrum of opinion.

The Choice: To Repair or To Reinvent

Repair: “If it ain’t broke don’t fix it”

In its wide ranging consultations the Expert Group came across no one who suggested that all was well with Indian Railways and that nothing needed to change. There was universal agreement about the symptoms of distress. There was greater debate about root causes and a wider spectrum of opinion about which solutions were appropriate given both the distinctive conditions of I.R.’s scale and complexity and also the unique socio-economic compulsions and constraints facing India today.

Universal agreement exists both around the symptoms of distress and also the need for urgent and purposeful action. No one denied that IR over the past decade has fallen into a vicious cycle of under investment, mis-allocation of scarce resources, increasing indebtedness, poor customer service and rapidly deteriorating economics. No one doubts that financial crises will rapidly follow the absence of forthright action.

The focus of the debate centres on the root causes and therefore the cure. The spectrum of opinion can be usefully polarised into two clusters: the ‘Repairists’ and the ‘Reinventers’.

The ‘Repairists’ can be characterised as conservative, erring on the side of more cautious incremental improvements. Their arguments comprise two strands of thought: first that the majority of improvements can be realised by reverting to the conditions that made IR successful in the past (i.e. pre 1990); second that there was no alternative that can be proven to be better.

The first stream of thought – the ‘ex ante’ reversion to the conditions of success prior to 1990 – makes the point that a model that worked well for more than a century should not be discarded owing to a decade of distress. Their case is based heavily on an assumption that IR is fundamentally sound and that if current management were given the autonomy to operate free of political interference then all would be well – perhaps not perfect but basically fine.

The root cause of the decade of decline is laid at the door of an unstable political system increasingly driven by short term political compulsions. Prices could not be adjusted because of political compulsions. Costs could not be cut because of political compulsions. Investment decisions were increasingly distorted because of political compulsions. In short, the new populist political

Indian Railways has to modernise in response to multiple forces which in combination are undermining the fabric of the organisation and the financial viability of the business. The evidence for rapid, deep-seated change is clear, compelling and overwhelming. The message of the Expert Committee is that business must NOT be as usual

The Expert Group came across no one who suggested that all was well with Indian Railways and that nothing needed to change. There was universal agreement about the symptoms of distress

The Expert Group felt that restructuring any railway – particularly one as large, complex and sensitive as Indian Railways – is one of the most difficult tasks that exists in the business world. Many of the compulsions that drove Europe do not apply to India. Wholesale privatisation pursued in some countries is premature in India

There is no doubt in the minds of the Expert Group that greater autonomy is necessary. The issue is whether this is sufficient to secure the long-term success of railways in India. The answer is probably yes if performance aspirations are modest. The answer is certainly no if the railways are to remain the cornerstone of transport infrastructure that they can and should be

reality effectively tied the hands of management. There exists ample evidence to support this view and everyone agrees that increasing the freedom of management to run IR is an essential prerequisite to survival.

The second stream of thought is the absence of an alternative solution with a proven track record of success either internationally or domestically. The general theme is that it is not worth losing the good in the pursuit of the perfect.

Internationally the Repairists are genuinely alarmed – rightly so – about the traumas faced by many railways undergoing radical restructuring. They point to Europe in general and the UK in particular as a warning. There is no doubt in the minds of the Expert Group that restructuring any railway – particularly one as large, complex and sensitive as Indian Railways – is one of the most difficult tasks that exists in the business world. There is no doubt that many of the compulsions that drove Europe do not apply to India. There is no doubt that the wholesale privatisation pursued in some countries is premature in India. There is no doubt that the UK experience reflects a hasty and ill-considered experiment driven by political expediency and is not a model to be followed.

Domestically the ‘Repairists’ point out that the IR model is probably the best in the public sector. They will argue that the problems facing IR are fewer than most of the ‘navratnas’ and ‘mini navratnas’. They would argue that the key issue is how politicians behave, not how the railway are structured. They fear that changes to the overall structure and relationship with Parliament will only make a bad situation worse. The last thing to do in turbulent seas is to rock the boat.

The apparent absence of a credible alternative model creates uncertainty. Indian Railways is simply too important to experiment with, they would argue. Four billion passengers, 1.5 million employees and 40 per cent of the nation’s freight cannot be used as guinea pigs. “Fools rush in where angels fear to tread” underpins this stream of thought.

Reinvent

The central argument of the ‘Repairists’ is that the experts should be given the autonomy to run the railways and that Parliament should provide support and guidance. Their argument is clear and appears compelling. There is little doubt that if the experts were given greater autonomy matters could improve dramatically – at least in the short to medium run.

There is no doubt in the minds of the Expert Group that greater autonomy is necessary. The issue is whether this is sufficient to secure the long-term success of railways in India. The answer is probably yes if performance aspirations are modest. The answer is certainly no if the railways are to remain the cornerstone of transport infrastructure that they can and should be.

The ‘Reinvention’ argument is also based on two streams of thought: the first is that turning the clock back defies the new reality of a liberalised India; the second is that the experts aren’t as expert as they might like to think, given the host of deep-seated managerial problems that cannot be wished away onto third parties.

The Reinventors argue that to modernise the railway system in India will

require more than running it **better**. It will demand that it is run **differently**. The Reinventors respect the integrity and professionalism of those who have led the Railways. The Reinventors merely observe that the system of governance and management itself must be deeply flawed if – a decade after the winds of economic reform have reshaped almost every other enterprise – IR has yet to start its journey of modernisation. The biggest threat to the future of the Railways in the view of the Reinventors is to do too little too late.

Although a spectrum of opinion undeniably exists, it is equally undeniable that the conservatives and radicals have moved towards some consensus.

What alarms conservatives and radicals alike is not just that Indian Railways is haemorrhaging funds at a life threatening rate, but more worrying still is that those responsible for the health and well-being of the institution are prescribing actions that will accelerate the demise of the system. As has been made clear in previous chapters, the priority for Indian Railways is to invest in debottlenecking points of congestion in the network (particularly on the saturated arterial networks of the Golden Quadrilateral linking Delhi, Kolkata, Chennai and Mumbai). Instead of debottlenecking, Indian Railways is being forced against its wishes to invest in initiatives that make matters worse, not better. About half the Capital Fund has been absorbed in gauge conversion which has produced no discernible performance improvement. New lines have absorbed 20-30 per cent of borrowed capital, only to increase Indian Railways' reach into areas where there is little or no traffic, at a time when non-remunerative lines should have been closed in order to free the resources to liberate those arteries that are clogged with traffic.

Unfortunately, plans for the future are worse still. Indian Railways, which is haemorrhaging funds, is currently being asked to donate even more in the future than in the past. At present, there are 70 new rail line projects included in the railway budget with a total estimated cost of approximately Rs 23,000 crore. If it were not for the fact that the patient will die long before it has the opportunity to transfuse this Rs 23,000 crore into unremunerative lines, these self destructive investments would surely be terminal.

In short, it is the speed and gravity of the financial decline of Indian Railways that has transformed the conservatives into action-oriented Repairists.

It has become clear that – with a few exceptions at the margin – the focus should be on commercialisation rather than privatisation. A secondary reason for adopting the commercialisation not privatisation strategy is global experience. It is clear from international experience that privatising railways is not only exceedingly difficult and controversial but also that no approach has yet proven to be satisfactory. In other words, the jury is out on the subject of which model for privatisation is best. In contrast, the verdict with respect to commercialisation is clear. This involves breaking the rail system into its component parts, spinning off non-core activities, restructuring what remains along business lines and adopting commercial accounting performance management systems.

Having described both the evolution and the spectrum of the opinion within the Expert Committee, the remainder of this chapter will focus on the most important recommendations.

To modernise the railway system in India will require more than running it better. It will demand that it is run differently. The system of governance and management itself must be deeply flawed if – a decade after the winds of economic reform have reshaped almost every other enterprise – IR has yet to start its journey of modernisation. The biggest threat to the future of the Railways is to do too little too late

Although the full Expert Group report has taken a 15 year perspective, this Executive Summary focuses on those recommendations that cover the first 5 years, particularly the first 3 years. The reason has less to do with brevity than priority. The overwhelming sentiment of the Expert Group is that time has run out. Action is overdue. The imperative is to get started fast on a programme of restructuring and reform. Everyone acknowledges that the path ahead is uncertain – no one has the complete answer. What is crucial is to signal clearly that the reform and modernisation of India's Rail System is serious and urgent. The time has come to show in action, not just words, that business is not as usual.

Key Recommendations

Indian Railways is one of the most studied institutions on the planet. For almost every conceivable question that can be asked there already exists a comprehensive and rigorous report that lays out the facts and indicates the answers. What is striking, however, is that there has been little action on the many reports IR has commissioned, both internal and external.

The challenge for the Expert Group was to distinguish the root causes of a problem from its symptoms. The conclusion drawn by the Expert Group was that it was more important to focus on 'why' than 'what'. For example, it was more important to answer why the relative cross subsidisation between freight and passenger has become worse over the past decade rather than to suggest what the appropriate pricing policy should be.

The root cause of most of IR's problems identified by the majority of the Expert Group lay in the model of corporate governance in general, and the relationship between Government and IR.

The Expert Group's focus on root causes highlighted three priority areas: institutional separation of roles; clear differentiation between social obligations and performance imperatives; and the need to create a leadership team committed to, and capable of redefining the status quo.

First is the issue of institutional separation of roles, into policy, regulatory and management functions. Currently these roles are blurred which causes confusion about the underlying vision and mission of IR. Until such time as the fundamental purpose and governance of railways in India is made clear, the root cause of most of IR's problems will not have been addressed.

The need to provide greater clarity and institutional separation will increase rapidly in the future. Ten years ago the topic was largely academic because the government was effectively the sole owner, manager, funder and customer of rail related businesses. Today the system is under pressure because the government will no longer be the sole funder and its role as compliant customer is diminishing. Ten years from now there will be multiple owners, multiple funders, multiple customers and multiple managers. The governance of the many railway related businesses in India needs to be designed in much the same way that airlines, telecommunications and utilities are managed and regulated.

The institutional separation of roles will mean that policy makers are limited to setting policy (and paying for what they ask for); regulators fix competition rules in general and pricing in particular; managements manage and are measured against clear performance indicators. And this is what the

The overwhelming sentiment of the Expert Group is that time has run out. Action is overdue. The imperative is to get started fast on a programme of restructuring and reform. The path ahead is uncertain – no one has the complete answer. What is crucial is to signal clearly that the reform and modernisation of India's Rail System is serious and urgent

Expert Group recommends.

Second is the clear differentiation between social obligations and performance imperatives. In a vibrant democracy such as India, it is not the role of an Expert Group to call into question the objectives of Parliament. It is clear that an institution such as IR is a key asset of the nation and must carry its full weight of social obligations. It is however, the role of the Expert Group to comment on how best to manage the social obligation issue. For example, the Expert Group has concluded that the problem with the Railways Budget is that it blurs the dividing line between policy making and implementation. To make matters worse, the extreme ‘visibility’ of the Railways Budget accentuates political compulsions. It impairs the autonomy of IR management to take commercial decisions.

There is not a shadow of doubt that the ‘social obligations’ pressure has increased substantially in the past decade. Over 70 per cent of the nearly Rs.40,000 crore of ongoing projects, many of which are actually on the back burner and will never be tackled, are in the so-called social sphere. This situation would be perfectly acceptable if these obligations had clear objectives and means of funding. The problem is that the increased pressure to carry social obligations has not been backed up by an increase in funding. In other words, parliament is demanding more and giving less. IR calculates that the annual ‘social obligation’ cost is approximately Rs. 4,000 crore for which it receives Rs. 800 crore compensation. The situation is wholly unsustainable and risks draining the livelihood from the heart of the business.

Third is the need to create a leadership team committed and capable of redefining the status quo. Wars are not won by managers. Independence was not won by managers. Great victories require great leaders. Indian Railways needs a leadership team committed to changing the status quo. The current structure simply does not permit such a team to evolve.

The current system has two flaws that the Expert Group believes must be corrected: tenure and skills.

Tenure is an old chestnut but remains a key issue. Tenure based promotions may have many advantages but forming a powerful team of leaders is not one of them. A system which effectively rewards those who do not make mistakes with a position on the Board for a few months prior to retirement is not the mechanism to breed leaders.

Skills in the leadership team need to be broadened and deepened. The current bias towards home-grown technocrats starves the system of refreshing mindsets. IR urgently requires an injection of fresh ideas and fresh skills to accelerate its development into a commercially savvy market-oriented set of businesses.

In summary, the leadership of an organisation of the scale and complexity of IR cannot be expected to emerge by default. Leadership must be differentiated from management. The leadership team needs to be selected from the best, rewarded for success, measured against performance targets and be in place long enough to do the job properly.

It is clear that IR has many important problems to deal with – safety, cost reduction, pricing, investments, customer retention – but most of these problems are symptoms with a deeper root cause. To get to the source, the Expert Group concluded that it is essential to start at the top.

The institutional separation of roles will mean that policy makers are limited to setting policy (and paying for what they ask for); regulators fix competition rules in general and pricing in particular; managements manage and are measured against clear performance indicators

Indian Railways needs a leadership team committed to changing the status quo. The current structure simply does not permit such a team to evolve

IR does not currently have a vision. IR does have a 5 year plan but this is not a vision, it is not even a strategy, it is merely a worthy exercise to assemble the requirements of the businesses as they exist today. The type of planning system used by IR is one of the most powerful mechanisms ever designed by mankind to avoid change and ensure a status quo

A clean sheet redesign of the vision for rail based transportation would give a lot of attention to doing a small number of things very well. There would be deep commitment to exiting from non-core activities. There would be an extensive discussion about how to provide superior value in multi-modal logistics service to target segments and key customer groups. There would be a sharp focus on how to increase throughput in areas of highest demand

1. Vision : Develop a shared vision for a Modern Railway System

Indian Railways suffers from a split personality. On the one hand, it is the world's largest commercial enterprise (in terms of employees). On the other hand, it has a social obligation to bear. The balance between commercial discipline and social obligation needs urgent clarification and effective resolution in the context of rapidly declining financial health.

IR is in desperate need of a clearly articulated forward looking vision that addresses the issue of creating a modern railway to meet the needs of a modern India.

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An effective vision takes as its starting point a date in the not too distant future. The basic question it tries to answer is: "If we had to design a financially viable rail based transportation network for India in the year 2010, what would it look like?"

The answer to this question is unlikely to include businesses such as schools, hospitals, manufacturing and construction. The answer is unlikely to require an organisational structure based on an inwardly focused cadre system that largely ignores lines of business and customers. The answer is unlikely to require a separate budget to be presented to Parliament. The answer is unlikely to require any investment in new lines, gauge conversion or electrification until the areas of highest demand have been debottlenecked.

In contrast, a clean sheet redesign of the vision for rail based transportation would give a lot of attention to doing a small number of things very well. There would be deep commitment to exiting from non-core activities. There would be an extensive discussion about how to provide superior value in multi-modal logistics service to target segments and key customer groups. There would be sharp focus on how to increase throughput in areas of highest demand. There would be programmes to provide better value to passengers in response to increased fares.

An essential criterion for success in developing a meaningful vision is that it is both owned and understood by the organisation and also syndicated and accepted by all those directly involved in transforming the vision into reality. It is therefore inappropriate for the Expert Group to define the vision for IR. We have, however, drafted a Purpose and Vision statement as a starting point to catalyse the process of debate.

The heart of this vision states that:

"The purpose of Indian Railways is to play a central role in India's overall economic growth by providing customer- focused cost effective transportation solutions. We will do this through an integrated transport system which includes the Railways and other modes of transportation."

"Indian Railways will be run primarily on a commercial basis. This will ensure that Indian Railways at least meets/exceeds the cost of capital on an overall basis.

“In line with our social/developmental role, we will **subsidise select freight and passenger services**. This will be done **only at the instance of the Government and only to the extent of funds made available** by it.”

The central idea embedded in this purpose and strategy statement is that IR is fundamentally a commercial entity that needs to achieve independent self sustaining financial viability. The corollary of this central idea is that IR cannot be expected to make unremunerative business decisions unless it is directly and fully compensated.

2. Strategy: The Business Portfolio: Less is More – Focus on Core, Spin off the rest

IR needs to critically examine its current portfolio and decide which of its many businesses are core and which should be spun off. The view of the Expert Group is that less is more. In other words, IR should engage in only those businesses that are directly related to its core activity of rail-based logistics and passenger transport. Non-core businesses should be spun off on an arms-length basis. The eventual ownership of these entities is not an issue that concerned the Expert Group. The Group does acknowledge, however, that the CONCOR model represents one way forward. **The Expert Group anticipates that priority candidates for accelerated spin off would be all manufacturing units, followed by units related to construction (e.g. IRCON), maintenance and consultancy (e.g. RITES).**

The Expert Group’s preliminary definitions of “non-core” businesses consists of the following:

- Production units
- Residential colonies
- Catering
- Other on-board services
- Security
- Hotels (Yatri Niwas etc.)
- Sanitation
- Printing presses
- Medical facilities
- Schools/Colleges
- Research facilities

IR’s management would be able to concentrate on its core business of transportation if it reduces considerably the burden of managing all these peripheral activities.

Proposed Restructuring Plan

The study of restructuring experiences of railways around the world has revealed that the process is long, often taking 8 to 12 years and sometimes even longer. The sequencing of various actions often depends on the outcomes of the key steps that have been implemented earlier in the process. This makes it difficult to provide a complete restructuring plan at the outset. The Expert Group has therefore defined a broad vision for the medium term and detailed the near to medium term actions necessary to kick-start and sustain

IR is fundamentally a commercial entity that needs to achieve independent self-sustaining financial viability. IR cannot be expected to make unremunerative business decisions unless it is directly and fully compensated

IR should engage only in those businesses that are directly related to its core activity of rail based logistics and passenger transport. Non-core businesses should be spun off on an arms-length basis

the restructuring process. This inevitably reads somewhat like a laundry list. The Group makes no apologies for this in that it will hopefully provide a useful checklist to assess progress for those who have been entrusted with leading the change process, as well as for the other stakeholders, such as the Government of India.

The proposed restructuring plan covers the first five years of the restructuring process. It has been divided into three phases (see Exhibit 14), identifying the key milestones that will need to be reached by the end of each phase. Although we have recommended that corporatisation should take place within 3-5 years, it could well take longer.

Governance defines the roles and institutional relationships associated with policy, regulation and management. These roles are currently blurred and need to be clarified and institutionalised based on the assumption that railways in India will evolve into a broad-based industry with multiple players and multiple owners

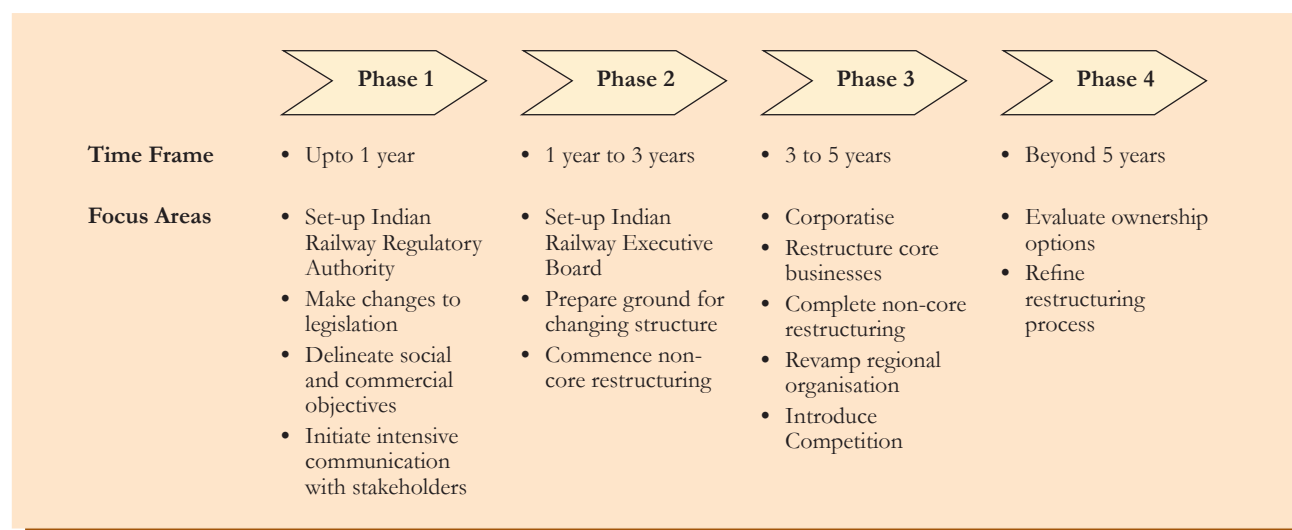
3. Governance: Separate Institutions for separate Roles—policy, Regulatory and Management

If IR is expected to function on commercial principles, its management needs to be allowed a degree of autonomy that is comparable to any other commercial organisation. To grant the railway autonomy by creating an arms-length relationship with government is one of the salient features of railway restructuring around the world. In Europe most countries have separated railway operations from government influence and have introduced independent regulators for the sector. China had stated an aim to ensure complete separation of government and enterprise functions within the railway operations. Russia is currently separating operations, regulations and policy.

Governance defines the roles and institutional relationships associated with policy, regulation and management. These roles are currently blurred and need to be clarified and institutionalised based on the assumption that railways in India will evolve into a broad-based industry with multiple players and multiple owners.

The Expert Group debated long and hard on the most desirable restructuring of the governance of Indian Railways, and on the role of the Government of India (GOI) in governing IR. In view of the mixed record

Exhibit 15: Roadmap for Railway Restructuring



of restructuring elsewhere, there was considerable discussion on the extent of re-organisation that should be suggested. In view of the complexities involved in restructuring as large an organisation as IR there is a great need to ensure that the steps recommended and taken are in the correct direction. One strand of view has been that commercialisation can be done without corporatisation of IR. It has been pointed out that the functioning of a large number of public sector corporations in India would suggest that the mere act of corporatisation does not automatically reduce government interference. This is indeed correct. Mere corporatisation will not accomplish anything. For any reorganisation to be successful there has to be an ex-ante acceptance and commitment by the Government and IR alike that IR will operate on commercial lines. Implicit in this is that non-commercial activities mandated by the government will be clearly demonstrated, and IR appropriately compensated for such activities. Only if there is this initial understanding can the commercialisation of IR proceed apace. We have documented extensively that in view of the state of finances of both IR and GOI, there is little choice. If IR is to recover there is little alternative but to pursue the Strategic High Growth path. Given the key objective of commercialising IR and making its management autonomous, we have concluded that nothing short of major restructuring will be necessary, alongwith eventual corporatisation. However, some Members of the Expert Group expressed their skepticism regarding the usefulness of corporatisation.

It is often argued that the current IR organisation, which combines the policy-making, regulatory and the executive functions, actually makes the decision-making in the railways faster and more effective. This is difficult to accept. The current structure, wherein IR is a Government department, subjects the organisation to numerous pressures that impede its functioning along commercial lines. Rather than speeding up decision-making, a lot of time is wasted in warding off pressures to take decisions that are not commercially viable. As long as policy making and execution are part of the same organisation, IR will find it extremely difficult to have arms-length negotiations with the Government. It is therefore imperative that the restructuring plan addresses the issue of operational autonomy and insulates IR from political/governmental interference.

Indian Railways must aim to be corporatised into the “Indian Railways Corporation”(IRC). The Government of India should be in charge of setting policy direction. It would also need to set up an **Indian Rail Regulatory Authority (IRRA)**, which would be necessary to regulate IRC’s activities as a monopoly supplier of rail services to begin with, particularly related to tariff setting. IRRA is necessary to distance IRC from the government. This kind of restructuring has already taken place in the telecom sector, though that restructuring itself has gone through various stages of thinking and implementation, and is still in some process of flux.

The Indian Railways Corporation (IRC) would be governed by a reconstituted Indian Railways Executive Board (IREB) whose characteristics will be outlined in the next section.

The Government of India should be in charge of setting policy direction, and constituting IRRA and IREB. As key responsibilities, it should:

- Implement changes in the structure, according to its vision. As owner of the system it will constitute Indian Rail Regulatory Authority and Indian Rail Executive Board by approving legislative packages necessary

For any reorganisation to be successful there has to be an ex-ante acceptance and commitment by the Government and IR alike that IR will operate on commercial lines. Implicit in this is that non-commercial activities mandated by the government will be clearly demonstrated, and IR appropriately compensated for such activities. Only if there is this initial understanding can the commercialisation of IR proceed apace

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The Expert Group recommends an immediate and comprehensive review of the legal framework and specific statutes required to create a vibrant rail-based industry grounded in such a structure. One of the features of this review and formation of IRC will be a change of status for IR so that it will no longer be required to present a separate budget to Parliament

Once the broad framework of the proposed restructuring is accepted, the Government of India, Ministry of Railways will have to set up a special task force to frame the new legislation enabling the new organisational framework. This task force would need to commence operations with a thorough review of the Indian Railways Act and the Indian Railway Board Act

to constitute those bodies (new Indian Railways Act, new Indian Railway Board Act and other required laws/bylaws).

- Define the extent and nature of “social obligations” to be fulfilled by the railways and provide adequate funding. Railways will contribute to the Indian social/developmental sphere, expanding socially desirable routes, providing essential services and fostering development in backward regions. The width, depth and limits to those social obligations is a political issue reserved to Indian Government, that will be stated, differentiated and funded with full transparency. Also, Government would have the power to requisition railway services during times of emergency/calamity.
- Appoint/dismiss people holding key responsibilities at both India Rail Regulatory Authority and Indian Railway Executive Board, as ultimately responsible for their overall performance. However these powers should be appropriately circumscribed in the appropriate legislation.

The Expert Group recommends an immediate and comprehensive review of the legal framework and specific statutes required to create a vibrant rail based industry grounded in such a structure. The Group anticipates that one of the features of this review and formation of IRC will be a change of status for IR so that it will no longer be required to present a separate budget to Parliament.

New Legislation

Once the broad framework of the proposed restructuring is accepted, the Government of India, Ministry of Railways will have to set up a special task force to frame the new legislation enabling the new organisational framework. This task force would need to commence operations with a thorough review of the Indian Railways Act and the Indian Railway Board Act. New legislation would need to be drafted that:

- Mandates **corporatisation** of the Indian Railways into the Indian Railways Corporation (IRC) after internal restructuring has been completed.
- Permits a revamp of the Railway Board
- Redefines the relationship between Government and a revamped Indian Railway Executive Board (IREB)
- Provides for exemption from taxation – excise, sales-tax etc. for the period of transition, say 5 to 7 years.
- Permits potential private participation in Railway operations
- Facilitates the induction of personnel from outside the Railways
- Mandates the subsidisation in social areas to the extent of funds provided by Government
- Sets up a social safety net to take care of surplus labour.

The Indian Rail Regulatory Authority will regulate the system setting rules, providing frameworks and upholding supervisory responsibilities required for assuring the good state of the system on a daily basis. The chief responsibilities would include:

- Assistance in devising a legislative framework for investments, tariffs and resource generation.

- Creating a framework for the introduction of competition, selecting the routes capable of supporting multiple operators and providing a fair and well defined regulatory environment.
- Determine the extent of subsidy payable by the government in consultation with the Indian Railway Executive Board.
- Arbitrating between the government and the Indian Railways Corporation.
- Protect consumer interests.

Resolving disputes between the various stakeholders and the Indian Railways Corporation including compensation payable to consumers.

Mechanisms to Determine Subsidies

A clear definition of social and commercial activities would need to be arrived at by the IRRA and agreed to by the government. The resources required for the provision of social obligations would be estimated both in terms of the investment requirements as well as the ongoing support required to fund these activities. The IRRA would then need to work with the Railways and devise mechanisms for the estimation of subsidy payable by the Government for the performance of developmental/social activities.

The necessity of defining the social / developmental / strategic obligations of the Indian Railways cannot be overemphasised. Not only would this provide clarity in terms of the business purpose but also it would enable IR to estimate the funding required to support “social” obligations. As has been brought out previously, the requirement would include not just funds for capital investment but the funds that would support the losses that these projects incur over their lifetime. The IR would therefore require that the Government agrees to provide the capital subsidy for these projects and fund the operating losses incurred. The Government on its part could mandate that IR operate these services at some benchmark levels of operating efficiency. Once the social activities are defined exhaustively, all other projects undertaken by IR can be subjected to stringent scrutiny to assess their financial viability.

Indian Railways Corporation

The Indian Railways Corporation (IRC) will be responsible for managing railway assets and resources to best meet the objectives of the owner. Its main characteristics will be the following:

- It will be an independent, corporatised, customer-focused and financially viable railway, run along commercial principles and subject to generally accepted corporate accounting principles and reporting.
- The Indian Railway Executive Board (IREB) will manage the IRC and be responsible for the restructuring process.
- It will focus on core activities, (eg. provision of infrastructure and the operation of freight and passenger services). To provide adequate focus on the core business as well as improve flexibility and cost competitiveness, the non-core activities of the railways will be fully divested over time, say 5 years.
- It will combine a central organisation with a regional decentralised structure. In that context, passenger, freight and suburban will function

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The necessity of defining the social / developmental / strategic obligations of the Indian Railways cannot be overemphasised. The Government on its part could mandate that IR operate these services at some benchmark levels of operating efficiency. Once the social activities are defined exhaustively, all other projects undertaken by IR can be subjected to stringent scrutiny to assess their financial viability

as profit centres and infrastructure and service as cost centres.

As indicated in Exhibit 14, actual corporatisation is expected to take 3 to 5 years. Recasting of accounts, setting up of IRRA, restructuring of business units, etc. will have to precede corporatisation.

The leaders of each business unit will be held accountable for their unit's performance to a newly constituted Indian Railways Executive Board (IREB). These business units will operate with a large degree of autonomy, yet be held accountable for a balanced scorecard of commercial performance measures. Disaggregation into business units is the first step towards commercialisation

Indian Railways Executive Board

The leaders of each business unit will be held accountable for their unit's performance to a newly constituted Indian Railways Executive Board (IREB). The role of the IREB is to define strategy, allocate resources and ensure effective performance management. The IREB will comprise a diverse cross section of talent including appropriately qualified members of the private sector business community.

The critical next step is to initiate the redesign of the legal framework. A key milestone of great symbolic value is abolishing the Railway Budget. If action on legal framework and corporatisation is initiated immediately, the Railway Budget could be abolished by 2002. This will be a potent symbol of the changing reality and will help set the stage for creating a modern rail system to meet the needs of a modern India.

4. Structure: Outward Looking, Business Oriented, Customer Driven

Structure relates to the internal organisational design of IR. The underlying design principle is to create an outward facing, business oriented customer driven institution. This will involve reorganising the core transportation network into its key component parts: freight, passenger, suburban, shared infrastructure; fixed and shared infrastructure; others. These business units will operate with a large degree of autonomy, yet be held accountable for a balanced scorecard of commercial performance measures.

Disaggregation into business units is the first step towards commercialisation. IR currently consists of many different businesses. Historically, IR was forced to be an integrator of activities – in order to be successful it had both to provide cradle- to-grave care for its employees, and also to produce everything from meals to wheels in order to operate.

Indian Railways today is a complex conglomerate. It runs major businesses as diverse as hospitals, schools, catering, manufacturing, real estate and maintenance. To manage these diverse businesses, however, it has created a monolithic organisational structure based on function first and geography second. This makes life more complex than it should be.

Railways across the world have made significant changes to their business structure to achieve their objectives. These changes typically involve breaking-up the integrated structure into smaller, more manageable units. The first step in this separation follows from the definition of purpose wherein all activities unrelated to the basic transportation business are separated from the core business. When China restructured its railways the rolling stock manufacturing units were separated from the main railway organisation. Japan too separated the construction, research and telecommunications wings of the Japanese National Railway (JNR) into separate units. European Railways have for long been outsourcing activities such as rolling stock manufacturing.

The implication is that the current cadre based system wherein the entire organisation is divided based on disciplines like civil engineering, mechanical

The current cadre based system wherein the entire organisation is divided based on disciplines like civil engineering, mechanical engineering etc. would need to be recast

engineering etc. would need to be recast.

5. Adopt Commercial Systems

The corporatisation of IR into IRC will necessitate the recasting of IR's accounts into company format. The Government will therefore need to initiate the process of restructuring the financial accounts of IR in accordance with the Company's Act 1956. The objective is to develop financial statements (Balance Sheet, Profit & Loss Statement) that can be understood by the financial community and the public at large.

Adopting commercial systems is an essential pre-requisite for a modern railway. For example, the British Railways have adhered to the British Companies Act 1985 even before commencement of the restructuring. Deutsche Bahn accounts comply with the German Commercial Code and German Stock Corporation. In Sweden the recommendations of Sweden Financial Accounting Standards Council are used in preparation of Annual reports.

In addition to adhering to commonly accepted financial accounting norms railways around the world have also focused on capturing and usage of both financial and non-financial information in management decision making. Again IT based MIS systems are now essential for adopting such an approach. Both the Swedish as well as the German Railway use financial parameters like ROE used to measure performance of commercial functions, while operational parameters like efficiency, punctuality are used for the evaluation of social service functions.

The need to revamp systems is a critical in the Indian context. We have shown that the non-adherence to commonly accepted corporate accounting standards has made it difficult to comprehend and assess the financial performance of IR and led to under-provisioning in key areas such as pensions and depreciation.

6. Rebalance Pricing

All the restructuring in the world will not help a jot unless IR generates increased revenues. IR is heading rapidly towards financial crisis and requires a higher level of income – fast – in order to redress the recent history of underinvestment in essential areas.

It is an inescapable fact that the single most important step that must be taken in the short term is to rebalance tariffs both between passengers and freight and between the upper and lower passenger classes. Indications of the kind of re-balancing required have been detailed previously.

The case for raising passenger fares is overwhelming. Consider the following:

- Operational losses on passenger traffic is close to Rs. 4,000 crore/ year.
- Passenger tariffs have increased by 9 per cent per annum over the past 8 years while costs have increased 15 per cent.
- Passengers generate 28 per cent of total revenue but account for 56 per cent of total rail output.
- The ratio of passenger fare to freight fare is amongst the lowest in the world. In China, for example, passengers pay four times what an Indian passenger pays relative to the price charged for freight.

The corporatisation of IR into IRC will necessitate the recasting of I.R.'s accounts into company format. The objective is to develop financial statements (Balance Sheet, Profit & Loss Statement) that can be understood by the financial community and the public at large

IR is heading rapidly towards financial crisis and requires a higher level of income – fast. The single most important step that must be taken in the short term is to rebalance tariffs both between passengers and freight and between the upper and lower passenger classes

- Subsidies are often not for the needy. For example, season tickets are typically used by office workers with steady employment. Furthermore in 70 per cent of the cases, season tickets are paid for or reimbursed by the employer. Subsidies therefore effectively go to the employers.

Passenger fares need to be rebalanced with a series of increases in excess of underlying rate of inflation. This may be politically unpopular but the case is clear and compelling.

In addition to re-balancing passenger fares, consideration should be given to levying a 'safety cess' (about 8 per cent) to pay for overdue investments in safety related infrastructure. Consideration should also be given to raising the break-even point of monthly season tickets from the currently low level of 11 single journeys.

It is crucial to build in "early wins" to provide momentum and inspiration at a time when the destination of the journey still seems unclear for many

Features of Success

The Expert Group has identified three features to be important in developing a successful change programme: momentum and "early wins"; participation and communication; outside management.

Momentum and early wins: For an institution as large as Indian Railways, it has to be expected that the restructuring process will take five to ten years to be completed. Nevertheless, it is crucial to build in "early wins" to provide momentum and inspiration at a time when the destination of the journey still seems unclear to many.

Participation and communication: The restructuring process needs to be designed as a careful balance of top down decision making and bottom up change initiatives. The wealth of IR lies in the hearts and heads of its people. We have been impressed by the loyalty and devotion to the organisation of IR personnel at all levels. This value must not be lost and must be capitalised in the change process. Our experience in conducting the international workshop at the Vadodara Staff College was a positive one. We found railways personnel to be receptive to change but they do have to be convinced. The Expert Group therefore recommends a widespread consultation process at all levels including labour.

Outside management: Examples from railroad transformation around the world show that an influx of experienced commercial managers was required to build critical mass for change. The right blend between competence in rail and commercial experience is crucial for the success of the transformation. At every level, the right mix of rail and change experience needs to be found. Our emphasis is on commercial managers. Induction of government civil servants steeped in governmental non-commercial activities is likely to exacerbate problems.

One of the key recommendations of the Expert Group is to commercialise IR. One of the major challenges of the modernisation of IR is to shift the culture and mindset from that of a government bureaucracy into a market savvy, customer-oriented profit driven business.

Indian Railways has a long history of achievements and is an effective institution that delivers. It is a truly unique institution that cannot be compared lightly with that of any other country. It has a distinctive role to play in a distinctive country. Any recommendations to change an institution of the

The restructuring process needs to be designed as a careful balance of top down decision making and bottom up change initiatives. The Expert Group therefore recommends a widespread consultation process at all levels including labour

scale, complexity and achievement of IR must be based on compelling evidence that suggests a way forward without bringing turmoil to the lifeline of the nation.

Railways is a sunrise industry – not just in India but in many parts of the world. Railways went out of fashion in the West from the 1960s to 1990s because rail was unable to respond to competition from road and air. Railways seemed like dinosaurs, too big, cumbersome and unable to adapt. For decades the only news about rail systems was about decline, strikes and retrenchment.

Recently the decline has been halted and reversed. Railways in many parts of the world are resurging based on new ideas (e.g. high speed trains), new appreciation about the environmental and safety benefits, new customer oriented services (e.g. multimodal), new attitudes amongst management and labour, and new investment. All at a time when there is an increasing strain on the capacity on the roads and in the air which highlights the strategic value of a thriving rail system.

The view of the Expert Group is that the potential exists to double the underlying rate of growth in IR. Accepting anything less would be a loss to the nation. The rail system is too important to permit the withering of IR. The work of the Expert Group, has clearly revealed that such a fate of IR is a clear and present danger – it is the default option if nothing is done to change how IR is structured and run. The decline of the Railways is not an immutable law of economics. The future of India's primary infrastructure asset needs to be a choice. The choice between decisive action to reinvent a modern railway system for a modern India, or dithering debate that will result in the withering away of one of the nation's finest institutions.

Potential exists to double the underlying rate of growth in IR. The withering of IR is a clear and present danger – it is the default option if nothing is done to change how IR is structured and run



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The Indian Railways Report – 2001

Policy Imperatives for Reinvention and Growth

Volume 2
The Main Report
PART I

Expert Group on Indian Railways
New Delhi

NCAER

The National Council of Applied Economic Research (NCAER) was established in 1956 as a registered society. NCAER is an independent, non-profit research institution that is committed to assist government, civil society and the private sector to make informed policy choices. The Council encourages research on Indian themes using Indian data. NCAER seeks to establish linkages with research institutions interested in the areas of industry and infrastructure development, macroeconomic analysis and human development.

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The Infrastructure Development Finance Company Limited (IDFC) was established in 1997 as India's specialised financial intermediary addressing the financial requirements of the infrastructure sector. The mission of IDFC is to:

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July 28, 2001

Dear Hon'ble Railways Minister,

I have great pleasure in submitting to you the Report of the Expert Group on Railways.

I regret very much the delay in submission of this report. Indian Railways is a large and extremely complex organisation with a proud history of performance and service to the nation. It is not easy for outside experts to grasp the many complexities that govern the operation of this massive enterprise. We have tried our best to comprehend these complexities with the help of our Railways colleagues.

IR is at crossroads. As you know, its financial situation is extremely difficult. But we believe that it has a bright future and that it can continue to contribute to the nation's development in as significant a manner as it has done in its almost 150 years of existence. We are convinced that if IR is to attain financial viability in the foreseeable future very significant organisational changes have to be resorted to, and a new investment programme launched to achieve high traffic and revenue growth along with safety. If such a strategy is followed it will become creditworthy and be able to raise the required resources. Exceptional government support will also be required if Indian Railways is to articulate and achieve such a vision.

Railways around the world have gone through major restructuring over the last 15 years. We have reviewed their experience with care and find that our solutions will have to be our own. Accordingly, we are proposing **our** approach to reorganisation. There has been considerable debate within the Expert Group on this suggested approach : we would agree that there could be other approaches. In suggesting this particular approach we would propose that it be offered for national debate so that the most practical strategy can be adopted. There would be alternative approaches using the core ideas presented in this report. In order to initiate wider discussion we would strongly suggest that this report be disseminated to all stakeholders and the public at large.

Of one thing we are convinced : if Indian Railways is to recapture its past glory, and serve the transportation needs of India in the 21st century, radical structural change is necessary along with a new strategy for investment.

I would like to acknowledge the generous help and time given by Members of the Expert Group, the Chairman, Members and Staff of the Railway Board, and many other colleagues.

With warm regards,

Yours sincerely,

(Rakesh Mohan)

Shri Nitish Kumar
Minister for Railways
Rail Bhawan
New Delhi 110 001

PREFACE

The Railway Board, Ministry of Railways constituted an Expert Group on December 31, 1998 to study the railway sector on the pattern of the Expert Group on Commercialisation of Infrastructure Projects which had culminated in the India Infrastructure Report in 1996 (See Annex P.1 for constitution of Expert Group and terms of reference). Shri V. K. Agarwal, the then Chairman of the Railway Board took great interest in constituting this Expert Group and in its work. We are deeply grateful to him for having reposed his confidence in the Expert Group and for providing all possible help in the conduct of our work. Shri Ashok Kumar, his successor has continued a similar warm support.

Shri Kito De Boer, Director, McKinsey & Company and Prof. G.Raghuram of the Indian Institute of Management, Ahmedabad were later co-opted as Members of the Expert Group. Shri R. Tripathi, Adviser, Ministry of Finance was succeeded by Shri R.C.Sharma, Joint Secretary and later Shri Ashok Lavasa, Joint Secretary; and Shri Ananda Mukherjee of ICICI was succeeded by Shri S.Mukherjee, Executive Director, ICICI, as Members of the Expert Group. Shri S. Suryanarayanan served as the Member Secretary of the Group until June 2000 and was then succeeded by Shri R. K. Jain, Executive Director, Railway Board as Secretary from July 2000 onwards.

The Expert Group held a total of 21 meetings over the period of its existence as follows:

List of Meetings/Workshops of the Expert Group

- | | |
|---------------------------------|--|
| 1. March 5, 1999 | New Delhi |
| 2. April 6, 1999 | New Delhi |
| 3. May 5, 1999 | New Delhi |
| 4. June 4, 1999 | New Delhi |
| 5. July 7, 1999 | New Delhi |
| 6. August 3, 1999 | New Delhi |
| 7. September 1, 1999 | New Delhi |
| 8. September 17,18 and 19, 1999 | Vadodara : International workshop on restructuring experiences of foreign countries in railway sector at Railways Staff College. |
| 9. October 14, 1999 | New Delhi |
| 10. November 19, 1999 | New Delhi |
| 11. January 13, 2000 | New Delhi |
| 12. February 18, 2000 | New Delhi |
| 13. February 22, 2000 | New Delhi |
| 14. March 11, 2000 | New Delhi |
| 15. April 8, 2000 | New Delhi |
| 16. May 6, 2000 | New Delhi |
| 17. May 25, 2000 | New Delhi |
| 18. June 24, 2000 | New Delhi |
| 19. September 13, 2000 | New Delhi |
| 20. February 3, 2001 | New Delhi |
| 21. July 7, 2001 | New Delhi |

The Expert Group was provided with somewhat broad terms of reference. Detailed discussions were held during the initial meetings to firm up the scope of the work of the Expert Group. Five sub groups were formed to look in detail at the different terms of reference for helping in the work of the Expert Group. The composition of the sub groups is given in Annex P.2.

I would like to thank all Members of the Expert Group for taking time from their busy schedules for actively participating in and contributing to the work of the Group. As noted, 21 meetings of the Expert Group were held, mostly on Saturdays and attendance was commendable throughout. Special thanks are accorded to all the members who worked in the various sub groups.

As would be evident from the extent of the work that has gone into this report the Expert Group has received a great deal of assistance from a host of organisations and individuals. At the outset I would like to place on record my appreciation to Shri S. Suryanarayanan and Shri R.K. Jain for providing generous and continuing help for the work of the Expert Group. Shri Sushant Mishra and Shri Kabal Singh provided excellent back up in the Secretariat.

We were very fortunate to receive extremely generous assistance on a continued basis from McKinsey & Company throughout the work of the Expert Group. I would like to thank Shri Ranjit Pandit, Managing Partner for India for making this feasible. The dedication of Shri Kito de Boer to the work of the Expert Group has been impressive even after being relocated out of India.

We have also received tremendous assistance in the financial modelling work from various members of the staff of the Infrastructure Development Finance Company Limited. Our thanks are due to Shri Nasser Munjee, Managing Director of IDFC for generously providing such staff resources to the Expert Group. IIS Infotech, under the direction of Shri Saurabh Srivastava also provided staff resources for conducting the work on information technology. The Tata Strategic Management Group, too, was extremely helpful in providing similar resources for the preparation of the strategic approach of the Group.

I would like to place on record a particular word of appreciation to all my colleagues in the National Council of Applied Economic Research for all the assistance they provided during all phases of this lengthy work. Shri S.K.N. Nair of the Industry and Infrastructure Group of NCAER and Member of the Expert Group has generously provided his time, experience and wise counsel throughout the work of the Expert Group far beyond the call of duty. He was ably assisted by Dr. P. Murali Prasad, Ms. Shalini Prakash, Ms. Deepika Jalla and Ms. Vinita Sharma. He received able secretarial assistance from Ms. S. Padmini and Ms. Chitra Narayanan. Dr. Sudarshan V. Seshanna performed the arduous task of drafting many of the relevant boxes that appear throughout this report. Dr. Subir Gokarn, Head of the Industry and Infrastructure Group, did extensive demand modelling for the Group.

This report is an extremely complex document in terms of word processing content. Putting it together has involved the collection of different segments from different sources and has been a very tortuous process along with extensive revision and editing. I would like to express my warmest appreciation for the dedication of my long time assistant Shri A. K. Gupta for accomplishing this task in his usual cheerful and uncomplaining manner through many long weekends throughout the preparation of this report. The final preparation and design has been done by Shri Rakesh Srivastava who has also worked far beyond the call of duty at NCAER in the preparation of this report.

Although the preparation of this report has been a truly cooperative effort I would like to acknowledge special contributions made by many individuals who gave generously of their time.

Shri R. Gopalakrishnan and Shri Anurag Dwivedi provided extensive inputs in the preparation of chapter 1 and Chapter 8. Chapter 2 was contributed by McKinsey & Company and prepared by Shri Sanjeev Agarwal under the direction of Shri Kito De Boer. They received extensive inputs from many colleagues in McKinseys in Europe. Chapter 3 was mainly contributed by Shri Subir Gokarn of NCAER with assistance from his colleagues in the Industry Division of the NCAER. Chapter 4 was prepared by Shri S.K.N. Nair with help from Shri C.M. Khosla, and Shri M. Ravindra along with extensive assistance from many colleagues associated with the Railways: Shri R.C. Srinivasan, Chief Economist, RITES, Ms. Deepali Khanna, former Executive Director, Railway Board, Ms. Meena Aggarwal, Executive Director, Railway Board, Ms. Vijayalakshmi, Financial Adviser, Southern Railway and Shri J.T. Verghese, Consultant. Shri P.V. Vasudevan, former Financial Commissioner, Railways also helped greatly in providing inputs necessary for the preparation of this chapter. The deliberations of the sub group on investment needs provided the main inputs which went into the preparation of this chapter.

The main drafting burden of chapter 5 and 6 fell on Dr. Anupam Rastogi of IDFC. The inputs provided by M/s Rangaraju and Associates formed the original core of chapter 5. I would like to acknowledge the work of Shri Rangaraju and Ms. Geetha Manjunath of Rangaraju and Associates who helped us with the recasting of railway accounts without which it could not have been possible to conduct the financial modelling. Chapters 5 and 6 forming the financial core of the report were worked and re-worked extensively over a number of months. Dr. Omkar Goswami provided valuable guidance throughout. Key inputs were provided by Shri C.M. Khosla and Shri B.N. Puri in arriving at an acceptable framework for projections. My colleagues at IDFC Shri Anupam Rastogi and Athar Shahab did excellent work in financial modelling which forms the basis for finding a feasible financial solution to the railway's future. Shri Janak Talsania of IDFC provided key inputs for some of the innovative financing methods proposed. Inputs from Shri Oliver Blackaby and Shri Ravi Subramaniam of Rothschilds were also very useful. Chapter 7 was contributed by the sub group on information technology with the main drafting burden falling on Shri Sanjeev Aggarwal. Shri D. Dhanbal and Ms. Padmaja Ruparel of IIS Infotech and Shri R.K. Jain, Shri P.K. Goel, Shri R.D. Saklani from the Railways provided inputs to this chapter.

Chapter 8 was contributed by the sub group on strategy under the direction of Shri R.Gopalakrishnan. As might be expected the content of this chapter was subjected to the widest debate in the Expert Group. The main drafting burden fell on Shri Anurag Dwivedi and Shri Kito De Boer. I am also grateful to Shri Cristoph Wolff of McKinseys for taking time off to contribute to this chapter.

We also benefited greatly from various presentations made to the Expert Group as listed below.

List of Presentations made before the Expert Group

- | | |
|--|--|
| 1. Traffic Projections & Perspective Plan for IR | Shri R.K. Jain, Railway Board |
| 2. Computerisation in IR | Shri Kumaran, Railway Board |
| 3. Passenger Business | Shri M.N. Chopra, Railway Board |
| 4. Freight Business | Shri R.N. Verma, Railway Board |
| 5. Accounting Methods in IR | Shri Gopinath, Railway Board |
| 6. Cement Industry | Shri R. Parthasarthy, Cement Manufacturers' Association |
| 7. A Case study on Cement Sector | M/s Ambuja Cements |
| 8. Steel Industry | Shri T. Mukerjee, Tata Iron and Steel Company (TISCO) |
| 9. Fertilizer Association of India | Shri Pratap Narain |
| 10. Technology | Shri Hari Mohan, DG, RDSO, Indian Railways |
| 11. Capital Restructuring | Shri A.V. Poullose, Retired Financial Commissioner, Railways |
| 12. Capital Restructuring | M/s. Rangaraju & Associates |
| 13. Integrated Transport Policy | Shri B.N. Puri, Adviser, Planning Commission |
| 14. Reforms in Chinese Railways | Shri Louis Thompson, Adviser, World Bank |

A very useful interaction also took place with representatives of the labour and officers' Federations in the Expert Group's 10th meeting held on November 19, 1999.

I would like to place on record a personal debt of gratitude to many friends both within and outside the country who have kept me supplied with much written material relating to railways restructuring in India and abroad. I have also had the benefit of receiving many unsolicited materials from railway experts who care deeply about the future of Indian Railways. Noteworthy among these was a detailed blueprint for railways reform received from Shri Ali Sabeti, formerly of the World Bank, who has had a long association with Indian Railways.

I benefited greatly from visits to U.K. and France and through meetings with some of those concerned with railway reforms in those countries. Shri Shankar Dey and Shri Oliver Blackaby of N.M. Rothschild & Sons, Mumbai arranged for my visit to London. Among those who contributed to my understanding of the radical restructuring of British railways were Shri Simon Linnett and Ms. Serena Michie of Rothschilds; Shri Michael Schabas, Director, Railways Group; Shri Michael Beswick of the Office of Rail Regulator; Shri Mike Grant of the Office of Passenger Rail Franchising (OPRAF); Shri Robert Horton, Chairman Railtrack; Shri Anson Jack and Shri Richard Middleton of Railtrack; Shri Adrian Montague, Ms. Kate Cohen and Shri Martin Buck of the Treasury Task Force.

Shri Jean Charles Rouher, Minister Counsellor, Economic & Financial Affairs, of the French Embassy took great interest in my work on the railways and arranged very useful meetings in Paris. Among those I met in Paris were Shri Jean Francois Janin, and Shri Jean Marie Wack of the Surface Transport Directorate, Ministry of Public Works, Housing and Transport; Shri Claude Berliuz, Deputy Director for Strategy, Shri Emmanuel Hau, Senior Executive Vice President, for Economy and Finance, and Shri Hassan Salman, of the Economics Department of SNCF (French Railways). Discussions with Shri R.C.Sharma of UIC (International Union of Railways), Paris were also very useful.

The Expert Group was formed as a judicious mixture of Railways experts along with others who had little prior familiarity with railway issues. The group therefore had to acquire a great degree of education from our railways colleagues in both informal and formal ways. We are grateful for their patience. Our deliberations were helped greatly by the workshop held at the Railway Staff College in Vadodara in September 1999. This was indeed a unique event attended by the full Railway Board under the Chairmanship of Shri V.K. Agarwal, the then Chairman of the Railway Board. Presentations on railway restructuring in other countries including those in Europe, South Africa, Japan and China were ably organised by McKinsey & Company in association with the Railway Board. We were very fortunate to have the participation of the following:

1. Shri Stig Larsson from Sweden
2. Shri S. Yamanouchi of East Japan Railway Company
3. Shri Brian Mellitt of the U.K. Railway Forum
4. Shri A.S. Le Roux of Spoor Net, South Africa
5. Shri Klaus Ebeling of Deutsche Bahn, Germany
6. Shri Paolo Celentani of Italian Railways
7. Shri Wang Xiankui from China.

McKinsey & Company also conducted personal interviews with a large number of railway experts in Europe on video which was presented at the Workshop. The Railway Board also organised the participation of a large number of selected senior executives as well as union representatives in the workshop. I would like to express my deepest appreciation to all those who participated (See Annex P.3 for a brief resume of the Workshop).

This report has taken an extremely long time in its preparation. This mainly reflects the complexity of the task facing Indian Railways at the present time. The financial and other modelling presented in the report proved to be far more complex than expected. A pre-requisite for the modelling was the recasting of railways' accounts in company format. As might be expected, this itself was difficult and time consuming. Finally, the restructuring and re-invention of IR recommended in the Report required extensive discussion, formulation and reformulation.

It is the earnest hope of the Expert Group that the discussion in this report will initiate an extensive debate in the country leading to substantial re-organisation of the Indian Railways so that it can continue to serve the nation as ably as it has in the past.

Rakesh Mohan

ANNEX P.1

Government of India
Ministry of Railways
(Railway Board)

ERB-1/98/23/55

New Delhi, Dated 31.12.98

ORDER

Ministry of Railways (Railway Board) have decided to set up a Railway Expert Group to study the Railway Sector on the pattern of the one that culminated in the India Infrastructure Report. The Expert Group will consist of the following:

1.	Dr. Rakesh Mohan	Director General National Council of Applied Economic Research	Chairman
2.	Shri Nasser Munjee	Deputy Managing Director Infrastructure Development Finance Company	Member
3.	Shri Ananda Mukherjee	General Manager, Industrial Credit & Investment Corporation of India	Member
4.	Shri K.N. Shenoy	Chairman Asea Brown Boveri Limited	Member
5.	Shri R. Gopalakrishnan	Director, Tata Sons Limited	Member
6.	Shri Saurabh Srivastava	Chairman, NASSCOM	Member
7.	Shri S.K.N. Nair	Infrastructure Expert, National Council of Applied Economic Research	Member
8.	Shri M. Ravindra	Member, Telecom Regulatory Authority of India & former Chairman, Railway Board	Member
9.	Shri C.M. Khosla	Retired Member (Traffic) Railway Board	Member
10.	Dr. Omkar Goswami	Senior Consultant, Confederation of Indian Industry	Member
11.	Shri R. Tripathi	Adviser, Infrastructure Ministry of Finance	Member
12.	Shri B.N. Puri	Additional Adviser (Transport) Planning Commission	Member
13.	Shri D.P. Tripathi	Secretary, Railway Board	Member
14.	Shri P. Rajagopalan	Officer on Special Duty (Accounts), Railway Board	Member
15.	Shri S. Suryanayaranan	Additional Member (Planning) Railway Board	Member

2. The terms and reference of the Expert Group are as under:
 - a) To estimate the financing requirements of an expansion and upgrading programme for Indian Railways that would optimise the use of the rail transport mode and support a rate of traffic growth commensurate to the growth rate of the economy.
 - b) To identify the sources of funding of the estimated investments over a fifteen year period, the fiscal and policy measures needed for accessing the fund sources and priorities in investments;
 - c) To study models of structure and ownership of rail transport facilities devised and functioning in developed countries and to recommend on their relevance to Indian Railways' requirements so as to facilitate the objectives mentioned above; and
 - d) To recommend on suitable regulatory arrangements that would facilitate orderly expansion of the system, promote the desired degree of competition and protect the users' right to quality service.
3. The Expert Group will submit its Report to the Ministry of Railways within a period ten months from the date of its constitution.
4. The headquarter of the Expert Group will be at New Delhi.

Sd/-
(A.D. Ramachandran)
Under Secretary (Estt.)
Railway Board

ANNEX P.2

List of Sub Groups

1. Sub Group on Strategy

- Mr. R. Gopalakrishnan
- Mr. S. Suryanaarayanan
- Mr. G. Raghuram
- Mr. R.K. Jain
- Mr. C.M. Khosla
- Mr. M. Ravindra
- Mr. Anurag Diwedi, Tata Strategic Management Group

2. Sub Group on Information Technology

- Mr. Saurabh Srivastava
- Mr. G. Raghuram
- Mr. R.K. Jain
- Mr. S. Suryanaarayanan
- Mr. Sanjeev Agarwal, McKinsey & Company and IIS Infotech

3. Sub Group on Options of financing

- Mr. Nasser Munjee
- Mr. Ananda Mukherjee
- Mr. S. Mukherjee
- Mr. Omkar Goswami
- Mr. C.M. Khosla
- Mr. Anupam Rastogi, IDFC
- Mr. G. Krishnamurthy, ICICI
- Mr. Shekhar Damle, ICICI

4. Sub Group on Railway Restructuring in Foreign Countries

- Mr. Kito De Boer

5. Sub Group on Investment Needs

- Mr. H. Ravindra
- Mr. S.K.N. Nair
- Mr. C.M. Khosla
- Mr. B.N. Puri
- Mr. G. Raghuram
- Mr. R. Srinivasan, RITES

ANNEX P.3

International Workshop on Restructuring Experiences of Railways

1. A Workshop was held from 17th to 19th September, 1999, to learn from the international rail restructuring experiences as a part of the deliberations of Railways Expert Group. The Workshop was held at the Railway Staff College, Vadodara. In all, there were about 60 participants comprising Members of the Railways Expert Group, foreign experts from Sweden, U.K., Germany, South Africa, Japan, China and Italy, members of the staff and officers' federations of Railways, Chairman and Members of the Railway Board and managers drawn from the middle management of Railways. The workshop benefited from major contributions from McKinsey & Company which prepared a video on the "Rail Restructuring in Europe".
2. The restructuring experience was divided into three parts. The first part dealt with the "Legacy of the Past": detailing the prevailing situation before the restructuring took place in the various rail systems of Europe, and giving the need for restructuring. The second part dealt with the change and restructuring process and discussed the various models adopted by different countries. The third part dealt with the "Post-restructuring Scenario" which forecasted a vibrant future for the railways after the restructuring. Shri Christoph Wolff of McKinseys made presentations covering all the three parts of the railway restructuring process. The floor management of the Workshop was done by Shri Sanjeev Agarwal of McKinsey & Co. Presentations were made on restructuring models in Europe in general and Sweden in particular by Shri Stig Larsson of UIC, restructuring in Japan by Shri S. Yamanouchi, CEO of East Japan Railway Company, restructuring in U.K. by Shri Brian Mellitt of U.K. Railway Forum, restructuring in South Africa by Shri Le Roux, CEO of Spoornet, South Africa, restructuring in Germany by Shri Klaus Ebeling, Deutsche Bahn, restructuring in Italy by Shri Paolo Celentani, FS, and restructuring in China by Shri Wang Xiankui.
3. There were two panel discussions which had participation by Members of the Railway Board, Members of the Railways Expert Group and Members of Federations of the Railway Staff. All the participants were divided into 5 break-out groups. A restructuring model for Indian Railways was proposed for the purpose of discussions among the members of the break-out groups. The break-out groups, after discussion on the proposed model, made presentations on the proposed models of restructuring for Indian Railways.
4. This Workshop was unique in many respects. It indicated a very deep commitment on the part of the top management of Indian Railways to the process of reforms. The entire Railways Expert Group and Members of the Railway Board travelled together from Delhi to Vadodara by train and the process of exchange of views and discussion on the various issues began right from the start of the train journey. It was first time in the history of Indian Railways that the entire Railway Board was away from Delhi for three full days in order to participate actively in the Workshop. The process of consultation and discussions continued even during the programmes after the Workshop ended for the day. It also provided an opportunity for a large number of middle managers to be present along with the top management and to air their views in a free and frank manner. Involvement of the top members of the Federations of rail staff and officers and their sharing the platform with the top management was another unique feature of this Workshop. Proceedings of this Workshop have been issued by Ministry of Railways separately. Recommendations in the report on railway restructuring are largely guided by the views expressed by the railway managers in the Workshop.

List of Participants

A. Members of the Railway Board	
Shri V.K. Agarwal Chairman	Shri P.V. Vasudevan Financial Commissioner
Shri S.K. Khanna Member, Electrical	Shri V.K. Agnihotri Member, Engineering
Shri Ashok Kumar Member, Mechanical	Shri K. Balakesari Member, Staff
Shri Shanti Narain Member, Traffic	
B. Members of the Expert Group	
Shri Rakesh Mohan	Shri S.K.N. Nair
Shri R. Gopalakrishnan	Shri C.M. Khosla
Shri Nasser Munjee	Dr. G. Raghuram
Shri P. Rajagopalan	Shri K.N. Shenoy
Shri S. Suryanarayanan	Shri Saurabh Srivastava
Shri Kito De Boer	Shri D.P. Tripathi
Shri M. Ravindra	
C. Railway Officers	
Shri S.P.S. Jain Chief Engineer, South Eastern, Railway	Shri R.K. Singh Chief Engineer, North Eastern Railway
Shri S.C. Nagpal Chief Electrical Engineer, Northern Railway	Shri Ramesh Chander Executive Director, RDSO
Shri A.K. Sanwalkar Executive Director, Research Design and Standards Organisation (RDSO)	Shri P.K. Sharma Chief Personal Officer, Northern Railway
Shri Vinay Mittal Chief Passenger Traffic Member, Central Railway	Shri Vivek Sahai Chief Freight Traffic Member, Western Railway
Ms. Deepali Khanna Executive Director, Railway Board	Shri U.V. Acharya Financial Adviser and Chief Accounts Officer, Central Railway
Shri S.C. Sengupta Chief Mechanical Engineer, Central Railway	Shri Niraj Kumar Executive Director, Railway Board
Shri K.C. Jena, Divisional Railway Manager, Western Railway, Vadodra Division	Shri C.G. Bijlani, Principal Railway Staff College, Vadodra
Shri V.D. Gupta, General Manager, Western Railway, Mumbai	
D. Union Representatives	
Shri K. Hasan General Secretary, Indian Railways Promotee Officers Federation	Shri J.P. Choubey General Secretary, All India Railwaymen's Federation
Shri Guman Singh Joint General Secretary, National Federation of Indian Railways	Shri Indra Ghosh General Secretary, Federation of Railway Officers Association
E. Other Invitees	
Shri K.P. Singh Managing Director, RTTES, New Delhi	Shri A. Ramji Retired General Manager, Southern Eastern Railway
F. Foreign Expert Participants	
Shri Stig Larsson Former Chief Executive of UIC, Sweden	Prof. Brian Mellitt, U.K.
Shri Klaus Ebeling, Member of Executive Board, Deutsche Bank, Germany	Shri S.Yamanouchi, Chairman, East Japan Railways, Japan
Shri A.S. Le Roux, Chief Executive Spoornet, South Africa	Shri Paolo Celentani F.S. Italy
Shri Christoph Wolff, McKinsey & Co.	Shri Wang Xiankui, Senior Adviser, Ministry of Railways, China
Shri Chen Hongnian, Deputy Director General Policy and Regulation Department Ministry of Railways, China	Shri Tian Genzhe, Deputy Director General, Train Operation Bureau, Ministry of Railways, China
Shri Lu Xusheng, Director, International Cooperation Department, Ministry of Railways, China	Shri Li Heming, Deputy Director General, Ministry of Railways, China
Shri Wang Jiayu, Deputy Director, International Cooperation Department, Ministry of Railways, China	Shri Yasumasa Watanable, Deputy Manager, East Japan Railways, Japan
Shri Herman Evert, General Manager, Strategic Marketing, Spoornet, South Africa	

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1. KEY ISSUES FACING INDIAN RAILWAYS

1.1 The Indian Railways : Background

The Indian Railways (IR) has played a crucial role in the social, political and economic life of the country. IR's transportation network has played a key role in weaving India into a nation. This network has not only integrated markets but also people across the length and breadth of this huge country. IR has facilitated the industrial and economic development of the country by transporting materials such as coal, iron-ore, fertilisers and steel. IR's role in times of war or natural calamities has also been commendable and they have always risen to the occasion and transported men and materials in large numbers at short notice. It is because of these reasons that IR is one of the foremost institutions of the country today.

The Indian Railways forms an essential part of the country's transportation infrastructure. As the growth of the country's economy accelerates, the supply of all transportation services will also have to accelerate accordingly. With an increasingly competitive environment in the world the cost incurred in transportation will also have to be increasingly competitive with similar services provided elsewhere, with competitiveness being measured in terms of both costs and quality of services. India being a large continental economy the role of Indian railways in providing such competitive services will be a critical part of the solution to India's infrastructure needs.

The Indian Railways (IR) has a long and proud history along with the Indian armed forces (Box 1.1, 1.2). It is one of the key institutions that is seen to help keep the country together as a united republic. Its health therefore is essential not only for the provision of competitive transportation services but also for strategic and social needs in the country's economic and social fabric.

IR is indeed a unique institution with many constitutional and legal rights. Railways in India are now almost 150 years old and the time is opportune to provide a new thrust in the development of IR to serve the country's needs in the 21st century.

Infrastructure services are generally defined as the physical framework of facilities through which goods and services are provided to the public. The links to the economy are multiple and complex, because they affect production and consumption directly, create positive and negative spillover effects (externalities), and involve large flows of continuous investments. Transportation constitutes one component of infrastructure and the railways are a key component of the transportation infrastructure. Looking at them from the production point of view railway services can be seen as intermediate inputs to production. Any reduction in these input costs raises the profitability of production, thus permitting higher levels of output, income, and employment. Efficient railway services will also raise the productivity of other factors, including labour and capital.

Infrastructure services have long been seen as the domain of the public sector mainly in view of the public goods characteristics of many segments of infrastructure services. It is useful to distinguish different infrastructure

With an increasingly competitive environment in the world the cost incurred in transportation will also have to be increasingly competitive. India being a large continental economy the role of Indian railways in providing such competitive services will be a critical part of the solution to India's infrastructure needs

Box 1.1 : The Indian Railways: A Hundred Years and More of History

The Indian Railways completed one hundred years of operations in 1953. The railways during the nineteenth and most part of the twentieth centuries were the key to the development of the hinterland and the sole means of long distance transport in the sub-continent. The Indian Railways were born on 16th April 1853 when the first fourteen carriage train ran between Mumbai and Thana - a distance of 21 miles. The Indian Railways has since grown from strength to strength with its historical growth and expansion during the first hundred years divided into three broad phases: phase I - 1850 to 1924; phase II - 1924 to 1947 and phase III - 1947 to 1963.

The early lines were almost entirely constructed by private rail operators and the rulers of princely states. The construction of major rail systems (main trunk routes) took place during the first phase and were undertaken by a number of private rail operators under a government interest guarantee on investment (the main extensions took place in the western and central regions of India). The rail companies, together with princely states like Gwalior, Bikaner, Jodhpur etc. and the state constructed railways had by 1922, jointly built up as much as 37,266 miles of open railway trunk lines. The conduct of main line companies started on the government guarantee scheme came under criticism from British Parliament as it was discovered that rail capitalists were taking wrong advantage of a secured return, and had begun charging exorbitant amounts per mile track of construction. The British Indian government assumed control over the companies, following public reaction to the role of private capital in the ownership of main lines. The take over was complete by the early twentieth century but private companies were nevertheless allowed to manage and operate 70 per cent of the rail system under government mandate.

The watershed for the Indian Railways came in 1924 when the entire rail system (construction, financing and operations) came under the British Indian government. The 1920s also witnessed an expansionary cycle for the railways with the British Indian government undertaking the extensions in the western and central segments and adding stations and yards to other trunk lines. The second phase of growth pioneered the construction of railway bridges, tunnels and the introduction of electric traction (the railways had even set up their own captive power station in 1895 for supplying energy to electrified track and stations), and suburban rail systems. Equally important developments included signaling and telecommunications and changes in the composition of rolling stock (locomotives, wagons and coaches) to meet the growing demands of military, freight and passenger traffic. As the number of lines and route mileage increased, the number of passengers travelling by rail also showed a spectacular rise. The passenger figures during the first quarter of the twentieth century were all quite extraordinary - 24 million passengers in 1901, 42 million in 1917 and 72 million in 1927.

The developments of the second phase were consolidated upon during the third phase. It was in the years soon after independence, however, that the Indian Railways made a significant contribution to nation building. The impact of a rail networked country was seen through the further deepening of backward and forward economic linkages, the movement of bulk freight (cotton, jute, tea, sugar, coal etc.), shipments of essential building inputs to sites where multi-purpose infrastructure projects were being built, and through the introduction of railway postal services. Besides its role in nation building, the major landmarks during the third phase could perhaps be listed as improvements in rolling stock (particularly the use of high-powered indigenously built locomotives) and substantial increases in freight traffic. It is interesting to recall that while the railways carried only 27,213 tonnes of freight in 1853, the figure a century later had risen to 98 million tonnes.

The railways in India, had in the hundred years since 1853 influenced the pace of economic progress in a distinctive manner. The network gave a strong push to important social forces like urbanization and migration. Economic activities like internal trade, commerce, agriculture and industry have also received an impetus through the existence of a speedy, and cheap mode of transit. Finally, the railways have emerged as the transportation lifeline of the country by moving ever-growing numbers of passengers, and a variety of goods and merchandise. The first hundred years of the railways saw the phenomenal rise of Indian Railways - from a few hundred-route kilometers of track owned and operated by a bunch of private companies to one of the largest nationalised (if not *the* largest) enterprises in the world. Its development is replete with significant feats of engineering (laying of track over difficult terrain, tunneling through mountains, bridge-building over major rivers etc.) and important innovations in railway infrastructure and technology. The vast number of trains, the world's second largest track network and substantial increases in passenger and freight traffic bear testimony to this progress.

Source: Indian Railways - One Hundred Years 1853 to 1953, Ministry of Railways (Railway Board), Government of India, 1953.

Box 1.2 : The British Indian Railways: A Story of Skill and Human Endeavour

The railways of the British Raj in the nineteenth and the better part of the twentieth century invoke nostalgic memories of colonial splendour, adventure and extravagance. The railways in India have grown to become a legendary symbol of the colonial past with its vivid episodes of the pains and pleasures of travel and amusing accounts of British officials of the sights and sounds of life on the railways.

The history of the railways in India is truly legendary in terms of the extraordinary engineering feats of construction and in terms of the sheer enormity of the enterprise. The pioneering attempts at building a rail system are perhaps best captured through the efforts of the early planners who used much improvisation to accomplish a task which ultimately gave the British Indian government strong political and military control over the entire sub-continent. The construction of the main trunk lines, difficult bridges and mountain tunnels in the face of problems of terrain, climate, sickness and armed attacks by rebellious tribes have been extensively recorded by adventurous railway engineers and British officials.

The railways in India had achieved a high degree of standardisation in rolling stock and track, at a relatively early stage. It is to the credit of British railway engineers and the armies of Indian labour that between 1874 and 1915 the metre gauge and broad gauge tracks quickly proliferated across most of the subcontinent. This extension of level track went hand in hand with the construction of durable and outstanding railway engines. One such example was the British built L-class 4-6-0 tender engine with powerful (for contemporary times) outside cylinders and valve systems. Altogether, as many as 335 of these rugged engines were delivered to the various different railways in India during a short span of 33 years (1880-1913). Special mention need also be made of the British engineered F-class 0-6-0 steam engine of which more than a thousand in number had either been imported or built in India between 1874 and 1922. The strength and stamina of the F-class has stood the test of time and bears testimony to the workmanship of the F-class engine's as some of these are still in use today in India!

If the laying of level track across the subcontinent was any indication of the determination of the early rail engineers, the construction of minor and hill railways (with gauge widths ranging from 5ft 6in to 2ft 6in!) was perhaps a tale of more dramatic engineering. Of particular interest, however, were not so much the lines *per se* but the imported engines built for narrow gauge track on, for example, the Matheran Light Railway, the Nilgiri Railway and the Darjeeling-Himalayan Railway. The engines were specially crafted for lugging heavy loads over severe gradients and curvatures in the hills particularly on routes in the Western Ghats – and the hilly regions of Sri Lanka. The pride of place however goes to the B-class 0-4-0 tank engines of the Darjeeling-Himalayan Railway. These steam engines were introduced in 1879 and are a classic example of a design ideally suited for line conditions in hilly regions, and astonishingly remained in operation for close to a century thereafter.

It is a little known fact that the pioneer of the narrow gauge line in India was none other than the Maharaja of Gaekwad who often used bullock traction to operate the earliest “trains” on his Baroda State Railway!

While notable progress had been made in the hill and light railways which required precision and quality of construction, other rail experiments on narrow gauge track met with failure. A rather amusing contraption invented during the late nineteenth century were the two other short-lived versions of the narrow gauge – the monorail and the Ewing rail system. These were unorthodox, cost-effective but impractical experiments in doing away with the problem of the constant maintenance of the gauge between rails. The monorail in the end was nothing more than a wagon mounted on rail used by railway officials!

Feats of engineering which stretched the talents and improvisational skills of the construction crew the farthest, were the long river bridges, mountain tunnels and other major earth moving work. An extremely difficult engineering task, these civil works had very often to be carried out under hostile conditions (epidemics, floods, naturally hostile terrain etc.) involving as many as 10,000 to 20,000 men at one time. Some idea of the enormity and scale of the operations can be seen from bridges and tunnels built by rail pioneers, most of which have been re-girdered and continue to be in use even today. These include the Sone Bridge and the Curzon Bridge over the Ganges, the Khojak Tunnel (now in Afghanistan) and the various major and minor bridges and tunnels located on the Kalka-Simla rail route. These are noted for their ingenious use of stone, timber and metal plate girders, which combined to provide maximum weight-bearing properties in treacherous terrain. The skills of railway gang men and supervisors are indeed legendary since these men had achieved extraordinary organisation and coordination during maintenance operations: it was common practice to remove, repair or replace a complete span of girders (some measuring more than a hundred feet in length) in a space of a few hours!

Source: Satow, M & Desmond, R. **Railways of the Raj**, Scolar Press, London, 1980; 118 pp.

services according to their characteristics and the nature of their usage:

- **Open Access Services:** Those services from which people cannot be easily excluded such as public lighting, intra-city roads, public water supply and the like.
- **Limited Access Services:** These are typically services which can be provided on an exclusive basis. Such services can be provided on a user-pays principle so that those who cannot pay can be excluded. Such services can, in principle, be self financing through the provision of user charges. Should there be overwhelming social and other reasons for providing these services at less than cost to specific classes of consumers, this could always be done on a transparent subsidy basis.

Railways clearly fall in the latter category of services. Unlike the usage of roads it is easy to exclude both freight users and passengers from the usage of railway services without adequate payment in return. However, a tradition has been built up to see the railways as part of essential public service, the usage of which should not be denied to even those who are unable to pay fully. Freight users have been seen as those classes of users who can easily pay for the railway services they consume, and more. Similarly passengers using higher classes of services are also seen as those who can pay adequately and more. It is the users of lower class passenger services who are seen to have inadequate ability to pay and are therefore charged inadequate tariffs. Consequently, freight services subsidise passenger services as a whole and upper class passengers subsidise others.

These tendencies got accentuated in the 1990s and the economics of IR are now extremely vulnerable. For first time in 17 years, in 2000-2001, IR was not able to pay a dividend to the government on its past investment. It is in financial crisis. Its ability to invest adequately in providing efficient and cost competitive services in the future is seriously in question. Thus IR is in a watershed period in its history today and therefore drastic action needs to be taken in different areas to make this proud organisation the country's pride once again.

Apart from the internal difficulties that IR suffers from today, economic reforms of the 1990s have also subjected it to greater external pressures. With the opening up of the economy in 1991, and trade and tariff reform accompanied by various measures of internal deregulation, Indian firms have become more and more conscious of all their cost elements. In an open economy framework internal prices of goods have to, more or less, follow world prices except as mediated by the existing level of customs tariffs. With the drop in international transport cost the natural protection enjoyed by domestic industries has also fallen. The consequence is that for domestic firms to be competitive in the world, the cost of infrastructure also has to be competitive with that in other countries. Moreover, in a country such as India, which is in the process of opening its economy more and more, the share of trade is also expected to increase over time. Thus demand for transportation of exports and imports will also increase and its supply has to be competitive in terms of both costs and quality. In a continental economy such as India that has many production centres at significant distances away from ports, the efficiency of railways transport becomes that much more critical. Indeed the ability of domestic firms to compete with imports will also be affected significantly by the available costs of transportation services. The railways

The ability of domestic firms to compete with imports will also be affected significantly by the available costs of transportation services. The railways therefore have to invest and reorganise in significant fashion over the next 5 to 10 years in order to meet this new challenge

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If enterprises are unable to receive the benefit of efficient transportation services provided by the railways, they are forced to seek higher cost alternatives that may have unfavourable impacts on profits and production levels. Unreliability of services can lead to under utilisation of existing productive capacity and constraint the short run productive efficiency and output growth. Users are forced to invest in alternative transport modes: buses and air services for passengers, and trucking and air freight for freight users.

It has also been found that transnational corporations consider the quality and cost of infrastructure to be among the primary considerations in their decisions as to where the new investments should be located. In order to compete for foreign direct investment (FDI), and to facilitate exports and imports most fast growing East Asian countries have recognised the urgent need to improve the quality and variety of transportation services. India must do the same and, in our case, this applies to railways in particular. Many countries see greater involvement of the private sector within the competitive environment as a tool to improve efficiency, both of investments and operations since private companies are seen to be better at assessing market needs and managing risks.

Adequate quality and reliability of transportation services are key factors in the ability of countries to compete in international trade. In fact globalisation of world trade has arisen not only from the liberalisation of trade policies but also from advances in communication, transport and storage technologies. These services are increasingly seen together and transportation is no longer seen in isolation. Firms look holistically at managing logistics – combination of purchasing, transportation, production and market functions – to achieve over all cost savings and increasingly responsive services to customers. During the 1980s, order cycle times in OECD countries were found to have reduced by up to 80 per cent. More than 60 per cent of production and sales in these markets are now processed directly to order, and “just in time” (JIT) delivery to customers is projected to increase continuously. This development provides a new challenge to the railways as production centres tend increasingly to be concentrated in clusters and freight leads tend to reduce. With the competitive advantage of railways being in long distance freight traffic these new developments suggest a more integrated approach towards the provision of freight services with other modes of transport. Furthermore, virtually all the improved practices designed to reduce logistics costs, including those of transport, are based on information technologies using telecommunications infrastructure. Cost reductions and the increased speed of freight movements over the past few decades have also been increasingly based on multi-modal transport involving containerisation which requires interactive coordination by shippers across rail, port, air and road freight modes. These developments provide further challenges to IR, calling for a basic change in their approach to freight transportation. It is also for these reasons that we have given specific attention to the information technology requirements of the Indian Railways.

At present the freight rates of container traffic and other domestic freight exceed those of other countries by large margins thereby seriously constraining the ability of Indian firms to compete with imports domestically, and exports internationally.

Cost reductions and the increased speed of freight movements over the past few decades have been increasingly based on multi-modal transport involving containerisation which requires interactive coordination by shippers across rail, port, air and road freight modes. These developments provide yet another challenge to IR, calling for a basic change in their approach to freight transportation

Most government investments in IR come in the form of preference capital in perpetuity with dividends to be given at a fixed rate, at lower than the existing market rate. It is now felt that there is a large backlog of investment that IR needs in addition to major modernisation and capacity expansion

The financing of Indian Railways has had a long and mixed history. To begin with, as in most other countries the initial attempt was to finance railway investment through private capital. In view of the reluctance of private capital to invest in railways in India in the 1850s the then government had to resort to providing government guarantees on rates of return for the private investor. Discussions related to these government guarantees then were not unlike the discussions held today in relation to the provision of similar guarantees to investors in the power sector. Throughout the 19th century and early part of the 20th century the railways consisted of a mosaic of different railways covering different parts of the country. These included some large private companies, some government owned railways, some princely state owned railways and others. They were then nationalised in different ways in the early part of the 20th century and brought under government control. Full consolidation of course took place after independence when all princely state railways were also fully integrated with the rest of the system. Before independence many of the railways were however still run by private companies on management contract. The accounts of the Indian Railways were separated from the government budget after the Acworth Committee Report in 1924. The intention was to separate these accounts so that the Indian Railways can be run on a commercial basis.

Since independence investment in IR has been controlled in a manner similar to all other public investment through the planning process. As demonstrated in later chapters the availability of government finance has varied over time depending on the state of public finance in the country and changing relative priorities. However, most government investments in IR come in the form of preference capital in perpetuity with dividends to be given at a fixed rate, at lower than the existing market rate. It is now felt that there is a large backlog of investment that IR needs in addition to major modernisation and capacity expansion requirements.

Ironically, as the state of public finance has become more difficult in India in the 1990s the efficiency of investment in the railways has probably declined particularly during this period. When infrastructure facilities are developed by the state or state agencies, there is typically little connection between cost of funds and the returns from the investment

The history of other railways in the world has not been too dissimilar in the sense that most of them started with private investment in the 19th century and were nationalised at different points during the 20th century. Many systems were consolidated under the state after the Second World War. Most systems experienced significant traffic decline and deteriorating finances particularly in the 1960s and 1970s. Consequently, after a relatively stable period experienced by the railways around the world since the Second World War, there has been widespread reform in most railways over the last 20 years. Problems experienced by different railways around the world have been typical of the constraints faced by the public sector in managing commercial activities. Whereas there are clearly some well performing public sector transportation entities in some countries, quantity, quality and cost effectiveness of public sector transportation services overall have not kept up with the needs of either the general public or the business community in most countries. The public sector has been unable to keep up with the myriad decisions and managerial challenges associated with the acceleration of investment at a time when the transportation business is becoming more complex.

In most countries, and in particular in India, efficiency of investment has assumed new importance in the context of fiscal stringency. It will be seen that the state of public finance has become more difficult in India in the 1990s and the efficiency of investment in the railways has declined more significantly during this period. There is now greater demand for accountability in public

expenditure. When infrastructure facilities are developed by the state or state agencies, there is typically little connection between cost of funds and the returns from the investment. Consequently there is little accountability. This situation is even worse, as in the Indian Railways, when the enterprise is run along departmental lines rather than as a corporation. Indian Railways has been finding this to its cost, particularly after the introduction of commercial borrowing by Indian Railways Financial Corporation (IRFC) on its behalf for financing new investments. Furthermore, public sector entities are typically not good at responding to consumer needs owing to rigidities in their management structure, the necessity to follow government set rules and regulations and inappropriate incentive structures. This tendency is further accentuated in a supply constrained system such as that experienced by IR particularly in the 1970s and 1980s. In fact, on the freight side IR has increasingly become a carrier for public sector firms to the exclusion of almost all private sector freight which has shifted to road transport. Freight business has therefore come to the railways almost automatically through plan and centralised allocations that were also largely price insensitive. Consequently consumer orientation in the freight business has become minimal. As mentioned, this situation has begun to change in the 1990s as a consequence of all the changes that have taken place in the economic environment. This tendency will only accelerate in the coming years and hence IR has to undergo major structural change in its organisation if it is to serve the emerging needs of the country. We have accordingly given specific consideration to the organisational changes that are required to make the Indian Railways a fully commercial organisation. **We feel, however, that privatisation of its core activities is neither feasible nor desirable at the current time.**

Major issues arise in the consideration of such structural changes since the fixed infrastructure (track signalling etc.) part of the railways constitute an almost natural monopoly. Whoever controls such a natural monopoly can attempt to extract excessive profits (rents), from it. The network owners, consumers and the body politic alike bid for these. A sustainable ownership arrangement requires a rent sharing system that protects consumers, provides owners with incentives to operate the network efficiently, and reduces the temptation of governments to exploit monopoly rents for political advantage. Equally strong are the temptations of governments to eliminate monopoly rents and competitive profits from public sector owned enterprises driving them to financial ruin. The design of appropriate organisational structure of as complex an entity as the Indian Railways is therefore a complex balancing task in itself. This is what we have attempted to achieve in our restructuring recommendations.

1.2 Current Activities

The Indian Railways operates the world's second largest rail network under a single management. It has an established route length of 62,759 km divided into three gauges – broad, metre and narrow. The key activities of Indian Railways are **transportation of freight** and **passengers**. In addition to these activities, the Railways are also engaged in several **allied services and production units**.

1.21 Freight Transport

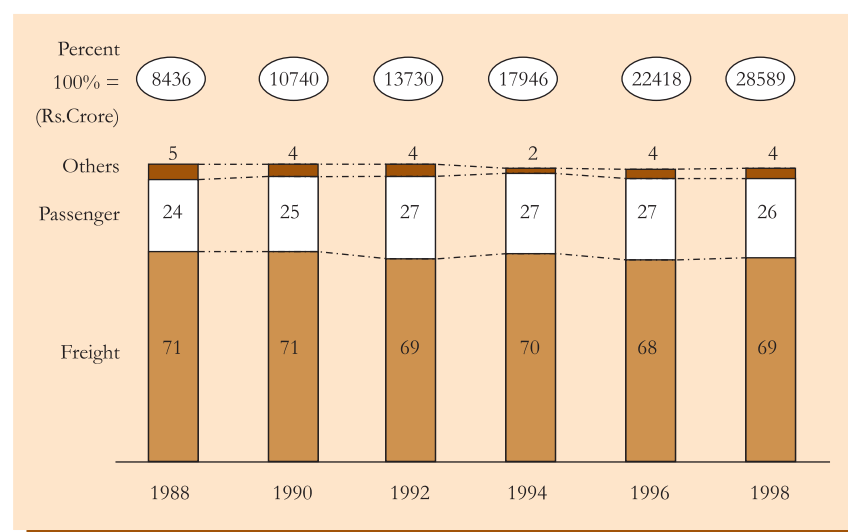
Indian Railways play a critical role in freight transport – moving 1.2 million tons of freight every day. Freight transport is a major business for the

Freight business has therefore come to the railways almost automatically through plan and centralised allocations that were also largely price insensitive. This situation has begun to change in the 1990s as a consequence of all the changes that have taken place in the economic environment. This tendency will only accelerate in the coming years and hence IR has to undergo major structural change in its organisation if it is to serve the emerging needs of the country

Railways and accounts for nearly 70 percent of its revenues (**Exhibit 1.1**). Although accurate figures are not available it is estimated that the Railways meet approximately 40 percent of the nation's freight transport needs, a share that has been falling continuously over the past 50 years. Moreover the growth in freight traffic has been modest in the 1990s.

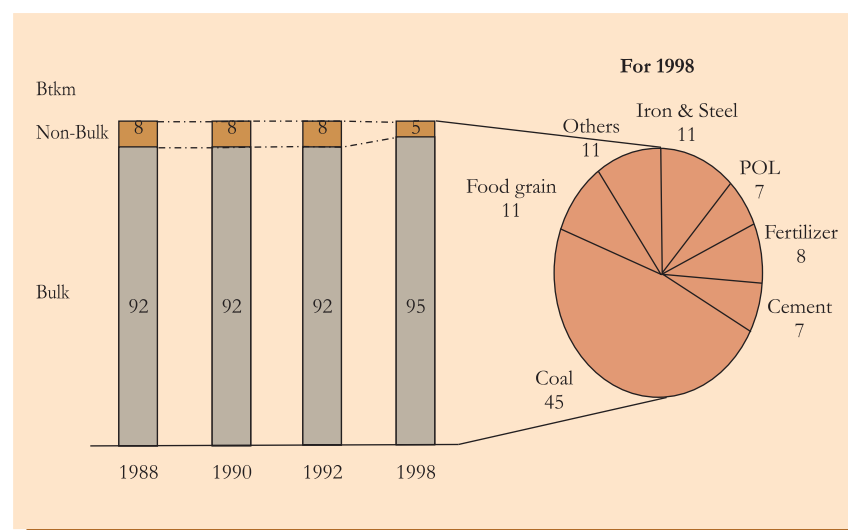
The freight business can be segmented into bulk commodities and other cargo. Bulk commodities typically travel long leads making them ideally suited for rail transportation. The share of these in the Railways' freight business has been increasing in recent times and currently they account for ~95 percent of the freight revenue (refer **Exhibit 1.2**). Coal accounts for approximately half of the bulk traffic carried. In recent years IR has concentrated on commodities that can provide trainloads rather than wagonloads. Consequently the share of bulk commodities has increased. Most of these commodities are shipped by public sector entities: IR has therefore increasingly become the in-house carrier for public sector entities engaged in the transportation of bulk goods.

Exhibit 1.1 : Revenue Break Up



Source: Indian Railways

Exhibit 1.2 : Share of Bulk Cargo (per cent)



Source: Indian Railway Yearbooks

The freight customer is usually an industry or an enterprise that is looking for reliable and cost effective transport of raw material or finished goods between a limited number of origins and destinations. External transport of these commodities by rail and other modes is often integrated in the production or sales process, and is very sensitive to disturbances of any kind.

Customers of freight transport services typically want:

- High reliability of service with an assurance that the goods will be picked up and delivered according to the time frame indicated. In addition they also require that the transport mode be safe and that the cargo being transported is protected against damage, loss or theft. Predictable delivery date and time through consignment position information and arrival time management is also expected.
- Flexibility of solutions implying that the right kind of capacity is available at the right place at the right time.
- Availability at the right time, one stop shopping with intelligible and simple documentation, customer-friendly interface, ease of payment.
- Competitive and stable prices.

With the liberalisation of the economy, the freight customer has become much more demanding in terms of both quality of service and cost. Thus a drastic business reorientation of IR towards its freight customers is overdue, along with rationalisation of its freight tariffs.

1.22 Transportation of Passengers

IR plays an equally important role in the transportation of passengers. It operates around 8000 passenger trains that transport 11 million passengers daily. The growth rate in terms of transportation output in passenger segments has been increasing in the recent past, particularly in the “premium” (higher class) segment. Passenger services can be segmented into **long distance**, **inter-city** and **suburban** transport. They can also be clubbed under two heads: **value** and **premium**, depending on the quality of service provided. Second class and unreserved travel comprise the value segment while all other classes are part of the premium segment. It is estimated that the Railways have a share of ~ 20 percent in the passenger transport market. Approximately 82 percent of the Railways passenger revenues come from suburban and value travel in the year 1998 (**Exhibit 1.3**) but the revenue share of the premium segment has been increasing steadily.

The demand for both value and premium passenger services emanate from different categories of passengers coming from all parts of the country.

Rural Passengers: For the people living in more than seven lakh villages comprising rural India, IR plays a significant role in enabling them to come in to the mainstream of national development. Most of them are unaware of the cost and subsidy implications of passenger transport by rail and have come to expect high levels of subsidy in the form of passenger fares remaining more or less static and not even being adjusted to cover inflation and rise in input costs. However, if fares are to be adjusted for these passengers, the quality of service provided to them will also have to improve.

Urban Commuters: In 1991, 26 per cent of the total India’s population lived in cities. The urban population growth is significantly higher (3.1 per cent) than overall population growth rate (2 per cent). The urban population

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For people living in rural India, IR plays a significant role in enabling them to come in to the mainstream of national development. Most of them are unaware of the cost and subsidy implications of passenger transport by rail and have come to expect high levels of subsidy

is projected to grow by a factor of 3 to some 658 million in 2025 when it is expected to be ~35 per cent of the national population. Well-defined urban centres of production and consumption linked by rail are evolving rapidly. This implies that growth in suburban railway traffic will continue in the medium term. Demand for inter-city travel will also increase, particularly in the premium segments. Thus IR can expect to become more and more passenger oriented. Thus the rationalisation of passenger fares is crucial for its survival.

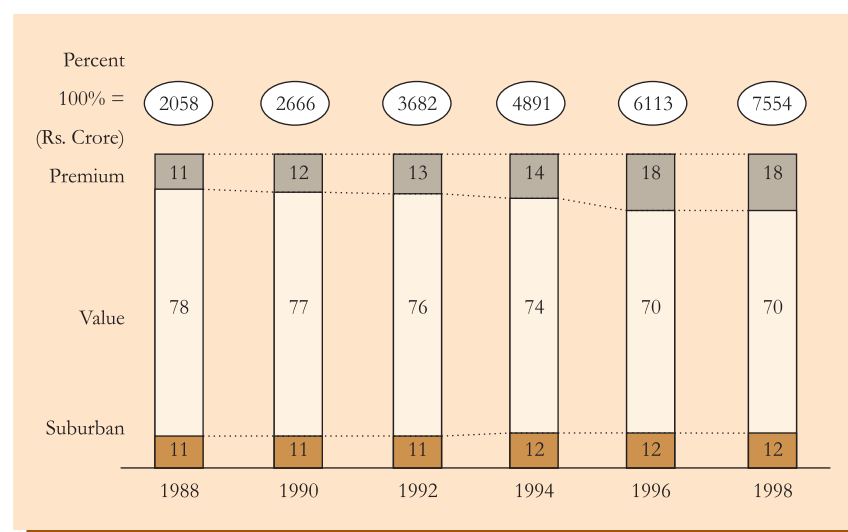
Inter-City Business Traveller: The business traveller does not pay for the ticket out of his pocket. Consequently this segment is relatively price insensitive and is willing to accept a fairly high price for good service and flexible reservation conditions.

The chief requirements of the business traveller are:

- High reliability and regularity/frequency
- Comfortable travel with high service levels
- Accessible ticketing and, in the future, automatic payment (booking, cancellation, rebooking, delivery)
- Safe and convenient waiting areas at stations (with communications facilities)
- Convenient terminal access.

Leisure Traveller: Geographical diversity of the country continues to generate demand for long-distance passenger traffic. With the extension of leave travel concession to almost all sectors and the airlines offering special discounts, this class of traveller is also in the reckoning of the Railways. With increasing incomes, demand for leisure travel can be expected to increase for the indefinite future. Given the long distances in the country, those not able to afford air travel will find the railways the most desirable if quality services are provided at competitive cost. Increase in longevity has seen a growth in the number of retired people who wish to undertake leisure travel. Moderate to low prices and good comfort stand high on the list. Then there are the weekend travellers. Different forms of packages should be designed in which hotels, local transport, etc. should be included.

Exhibit 1.3 : Passenger Transport – Revenue Break-up



Source : Indian Railways Accounts

They also want more accessible, faster, secure, punctual, and large number of services with better amenities at stations and in trains. The urban commuter expects fast, reliable, and regular suburban and intra-urban services at concessional season ticket rates. Despite his being in a better position to meet a greater share of the costs of providing such services than his rural counterpart, and despite his knowledge that such low season ticket fares for suburban and intra-urban travel are not sustainable in the long run, he expects the fares to remain constant. The inevitable growth in urbanisation and the generally greater level of awareness of the urban commuter will only add to the problem.

1.23 Allied Production Units and Services

Historically, IR has been a vertically integrated organisation. During the early stages of IR's development it was difficult for the Railways to find suppliers for many of its core business activities. Many of the areas of infrastructure provision and manufacturing were capital intensive and there were few players in the private sector who could invest in these areas. Due to these reasons IR had to invest in several related activities such as manufacture of rolling stock, its maintenance, construction etc and create an organisation to manage these businesses.

The lack of basic amenities for employees as IR expanded its network and forced the Railways to invest in the provision of many basic amenities whenever the network expanded into new locations. As a pioneering organisation IR laid railway tracks in very inhospitable conditions in many parts of the country. Thus it had to provide all facilities to its employees. Consequently IR also diversified into the provision of schools, hospitals and housing. As a result of this legacy IR finds itself in a variety of businesses today.

Thus a large number of IR's "non-core" businesses were started out of compulsion rather than due to conscious decisions to diversify. Currently, most of these activities are operated as cost centres and account for a significant portion of IR's annual budget in terms of financial resources. Today in addition to the areas pointed out, IR is involved in a number of other activities such as printing presses, technical institutes, and hotels.

1.3 Role of the Railways

The contribution of the Indian Railways to the **development of the nation** has been immense. Given the geographical spread of the country the Indian Railways has had to transport large volumes of traffic (both freight and passenger) over long distances. In terms of contribution to the national economy, the Indian Railways account for ~1 per cent of India's GNP. Apart from this, the Indian Railways is also the largest employer in the world and supports a workforce of 1.6 million constituting six percent of the 27 million people employed in the organised sector. It is estimated that another 0.7 million employees are supported indirectly through establishments servicing IR.

In addition to their commercial role as a provider of transport services, the Railways has also been seen as **a social/national responsibility** to link people and places and facilitate rapid and low cost movement across the country. To meet these objectives and thereby help integrate the country, the Railways provide several services at prices that are below the cost of

During the early stages of IR's development it was difficult for the Railways to find suppliers for many of its core business activities. IR had to invest in several related activities such as manufacture of rolling stock, its maintenance, construction and the like. Today in addition to the areas pointed out, IR is involved in a number of other activities such as printing presses, technical institutes, and hotels

Railways provide several services at prices that are below the cost of provision. The Railways also undertake several projects such as the network expansion to provide connectivity. Railways are still seen as a developmental and modernising force by a large number of people

provision. The Railways also undertake several projects such as the network expansion to provide connectivity. Railway projects evoke considerable public interest and their sanction is pursued by almost all sections of the people including representatives of the people in legislatures as well as by local and state governments. Every Minister of Railways encounters severe pressure from his or her constituents to extend new railway services into areas hitherto uncovered. Railways are still seen as a developmental and modernising force by a large number of people. The consequence of political control in a departmental set up has been the extension of a number of uneconomic lines with every budget. The irony is that many of these schemes remain on paper and people do not get any benefit. Meanwhile a good amount of managerial energy is diverted to these infructuous schemes. This tendency seems to have got exacerbated during the 1990s. The magnitude of the social responsibilities of the Railway can be gauged from the fact that out of a total of Rs. 36,348 crore worth of ongoing infrastructure projects a majority of projects (72 per cent) were in the so-called social sphere. (Refer **Exhibit 1.4**)

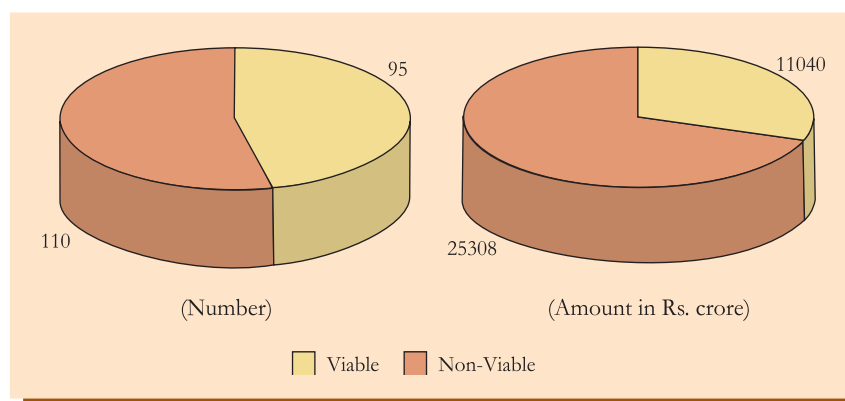
1.4 Organisation

The Union Railways Ministry plays a key role in the **organisation of Indian Railways**. It performs both the regulatory and the operational functions. At the Centre, the Railway Minister and the Railway Board are responsible for policy formulation and for ensuring the effective operation of the Railways. The Railway Board consists of seven members from the different cadres of the Railways and is headed by a Chairman. The entire IR organisation is divided into cadres, which have been carved out based on different functions or skill sets that the Railways require for operation. The regional organisation of the Railways has been divided into nine zones, each of which is headed by a General Manager (GM). The GM is responsible for overall administration of his zone and co-ordination with the Railway Board and other zones.

1.5 Finance

The annual revenue of IR is of the order of Rs. 25,000 crore. Passenger traffic contributes around 30 per cent of total revenues and the rest (70 per cent) comes from the freight traffic. IR's investments are financed through a combination of internal generation, budgetary support from the Government and market borrowings.

Exhibit 1.4 : Comparative Figures for Commercially Viable and Non-Viable Projects



Internal generation of resources refers to the balance of receipts available for utilisation on plan schemes after meeting the working expenses of the IR. Working expenses include pension and the dividend payable on the capital invested by the Central Government in IR. The internal generation of funds has come under severe pressure after the implementation of the recommendations of the Fifth Central Pay Commission.

Support from the Government is in the form of capital from the general exchequer which is used mainly for creating capital assets like purchase of land, construction of new lines, additional rolling stock, electrification, metropolitan transport projects and investments in North Eastern region. The Railways pay an annual dividend on the support from the Government. A parliamentary committee revises the rate of return payable to the Government from time to time. However, this **return to the Government is significantly lower than the cost of market borrowings**. The share of the budgetary support in the plan size has been coming down over the years from 75 per cent during the Fifth five year plan to 23 per cent during the 8th five year plan (refer **Exhibit 1.5**).

As internal generation of resources and budgetary support are not adequate to fully meet the plan requirements, IR has been resorting to market borrowings. The borrowings are routed through the Indian Railways Finance Corporation (IRFC), a subsidiary of the Railways. IRFC was set up in 1986, as the primary borrowing agency on behalf of the Railways. Market rates of interests are payable on borrowings from IRFC. The increasing dependence on the market borrowings has put heavy financial burden on IR by way of substantial lease charges since they have to cover both interest and repayment obligations.

Over the last decade, fundamental changes in government policy have set in motion forces that are likely to have significant impact on the Indian economy. The process of economic liberalisation that started in 1991 has had far reaching consequences that have changed the way most industries were evolving

1.6 The New Economic Context

The economic reforms are bringing about slow but very fundamental changes in other transport segments and the economy. Over the last decade, fundamental changes in government policy have set in motion forces that are likely to have significant impact on the Indian economy. The process of economic liberalisation that started in 1991 has had far reaching consequences that have changed the way most industries were evolving.

1.61 Increasing Competition from Other Modes

Competition has been increasing across all sectors of the economy and the transportation business is no different. Over the years railways have faced stiff competition from the roadways. After trucking was de-regulated in the 1980s road transportation has grown rapidly and has impacted Railway's market share. The greater customer orientation, flexibility and lower cost for short leads is increasing the share of road transportation even in bulk commodities

Exhibit 1.5 : Sources of Plan Funding : Recent Plans

(Percentages)

Source	5 th Plan	6 th Plan	7 th plan	8 th Plan	9 th Plan
Internal Resources	25	42	43	58	40
IRFC	–	–	15	17	30
Other leasing	–	–	–	2	3
Budgetary support from Govt.	75	58	42	23	27

The increasing competition from other modes has strengthened in recent years due to focussed development. Road dominance is likely to increase even further with the measures the Government has already set in motion for the road sector like the 4-laning of the “Golden quadrilateral” and the development of new expressway stretches. In addition more modern, larger trucks are expected to improve the competitiveness of roadways

which have traditionally been a stronghold of the Railways. In the case of coal, for example, while the Railways are holding on to their traditional share in the domestic coal traffic, roads are now catering to short distance movement of this commodity. This competition is likely to be felt more acutely by Railways in regard to imported coal, volumes of which is steadily increasing. Calculations made by the Southern Railway (1999) showed that freight rates offered by road hauliers of coal imported through Chennai port to users for distances in range of 200 to 600 km were lower than the prevailing IR tariffs. It can be seen from **Exhibit 1.6** below that the proportion of the total production of bulk commodities that was transported by Rail has gone down in steel, iron ore and cement. The increasing use of pipelines for the transportation of POL products is likely to further reduce the demand in future.

1.62 Greater Development of Substitute Modes

The increasing competition from other modes has strengthened in recent years due to focussed development in these areas:

Road Development

Road construction has witnessed manifold growth since independence making roads the dominant mode for inland transport. People in India have adopted to private cars, buses and lorries. This dominance is likely to increase even further with the measures the Government has already set in motion for the road sector like the 4-laning of the “Golden quadrilateral” and the development of new expressway stretches. In addition more modern, larger trucks are expected to improve the competitiveness of roadways in future.

Pipelines

Transport of petroleum products (POL) by rail, which is one of the most profitable segments for Indian Railways, has been coming down in the recent years. This is exacerbated by the fact that pipelines for the transport of petroleum products are coming up in a big way. In addition to the approximately 6000 km of such pipeline network already in place, plans are afoot to lay an additional 6000 km of pipelines. Pipelines pose a real threat of almost totally weaning away POL traffic from the rail sector in the years to come.

Coastal Shipping and Inland Waterways

Though the quantum of traffic carried by coastal shipping and inland

Exhibit 1.6 : Share of Railway Freight to Total Production (M/Tonnes)

Commodity	1989-90			1994-95			1997-98		
	L	P	L/P Per cent	L	P	L/P Per cent	L	P	L/P Per cent
Coal	130.1	203.4	<i>64.0</i>	172.4	257.8	<i>66.9</i>	208.8	300.4	<i>69.5</i>
Steel	10.1	9.2	<i>110.1</i>	12.0	13.6	<i>88.2</i>	11.8	24.4	<i>48.3</i>
Iron Ore	41.9	55.4	<i>75.6</i>	41.5	64.5	<i>64.3</i>	50.0	73.5	<i>68.0</i>
Cement	27.5	45.1	<i>60.9</i>	31.4	63.7	<i>49.4</i>	37.4	82.9	<i>45.1</i>
Food Grain	23.7	171.0	<i>13.8</i>	20.7	191.5	<i>10.8</i>	26.3	192.4	<i>13.7</i>
Fertiliser	17.0	9.0	<i>187.6</i>	21.5	11.3	<i>189.5</i>	26.7	13.5	<i>198.2</i>
POL	24.3	48.0	<i>50.7</i>	27.7	53.0	<i>52.3</i>	30.7	61.0	<i>50.4</i>

Abbreviations: L - Railway Loading; P - Total Production; L/P - Share of Railway loading to Production (Percentage in *Italics*).

Note: Loading figures in excess of production denote re-loading from stocking / processing points and import quantities.

waterways is insignificant at present, these modes enjoy advantages in terms of a ready made infrastructure, comparable energy efficiency, and the favorable Government policy for their growth. In recent times coal and cement have started moving in significant volumes through coastal shipping.

Variability in Demand

During the pre-liberalisation period, the economy was supply constrained with licenses being required for the expansion of capacity in the existing business or for any diversification into new products or geographies. However, a controlled environment also made it relatively easier to predict the nature (quality, quantity and geographical spread) of demand, which was reasonably stable. Over the last few years, however, demand for a supplier is increasingly determined by the interplay of a large number of variables including the nature of competitive activity. This has made the management of the supply chain more difficult and complex.

1.63 Expansion of the Market

During the 1990's the Indian economy has been one of the fastest growing economies in the world. Economic growth has led to an increase in household income in both urban and rural India. To providers of goods in the Indian market this has translated into increased purchasing power of their customers accompanied by greater geographical dispersion of their customer base. As the markets expand further into the interiors it has become critical for manufacturers to extend their distribution into these areas.

Change in Growth Drivers

The liberalisation process has also seen a shift in the end-use sectors that are driving the demand for transport services. After introduction of economic reforms, the manufacturing sector in India has undergone a shift towards fast moving consumer goods, consumer durables, drugs and pharmaceuticals and automobiles. These commodities are not predominant in railway freight, which has, since mid 1980s discouraged 'wagon-load' movements in preference to 'rake-loads'. This was done in the mid 1980s to encourage economic growth. While discouraging wagon load traffic IR was not in a position to encourage containerisation to the extent required to capture new freight traffic. Thus IR has seen a slowdown in the rate of growth of freight cargo transportation. The annual growth rate, measured in 'net tonne kilometres', averaged 5.33 per cent between 1984 to 1991 but dropped to 1.86 per cent in the next eight years 1992-99. (refer **Exhibit 1.7**)

1.64 Changes in Customer Needs

As a result of the changes in the economy and the operating environment customer requirements from transport service providers have also changed significantly.

Cost Control: In the pre-liberalisation scenario the bulk customers of railway freight services were other government ministries whose transport costs were paid out of the overall budget and whose products were covered by 'administrative' pricing. These users were not influenced by commercial considerations of either maximising net income or of minimising cost. This situation is now changing rapidly. Firstly, the share of private sector is growing in core industries like iron and steel and petroleum that have been 'de-reserved' through the reform process. Resulting from de-licensing, a similar trend is also evident in industries like cement. Second, public sector agencies themselves

After introduction of economic reforms, the manufacturing sector in India has undergone a shift towards fast moving consumer goods, consumer durables, drugs and pharmaceuticals and automobiles. These commodities are not predominant in railway freight

are being exposed to pressures of price competition (as in the case of steel or steel plants) or regulatory controls (power plants).

In addition to reduction in the share of Government as a purchaser of transport services the private sector has become even more cost conscious. Subsequent to the liberalisation of the economy several international players have entered India and most sectors have witnessed increasing competition. Consequently market forces are increasingly determining the price of a product or service. Companies that were used to a “cost plus” approach to pricing are finding that their bottomlines are under pressure.

The private sector has become even more cost conscious. Subsequent to the liberalisation of the economy several international players have entered India and most sectors have witnessed increasing competition. Companies that were used to a “cost plus” approach to pricing are finding that their bottomlines are under pressure

In the past, manufacturers built inventories and buffer stocks to compensate for lack of reliability of delivery. The pressure on prices has increased the emphasis on cost control and manufacturers are increasingly looking to optimise costs in the logistics operations. Since there is a close linkage between the different activities constituting the logistics chain, decisions taken in one area (say transport service provider) often have implications for other activities (Inventory and warehousing requirement). Shippers are taking cognisance of these linkages and their decisions are aimed at reducing the costs of the logistics chain rather than just the transportation activity *per se*.

Increasing flexibility: Increased variability in demand implies that the supply chains need to be much more flexible to cope with quicker increases or decreases in demand. To manage the uncertainty as well as to gain from focused expertise in the area of logistics, companies are looking at complete outsourcing, and not just the transport activity but the entire gamut of activities that are part of logistics management.

Enhancing reach: In a geographically widespread country such as India centres of production and consumption are often quite distant from each other. As the Indian market expands into the countryside it has become necessary for manufacturers to strengthen their distribution networks by extending them into new geographies. This expansion needs to be supported by a low cost, flexible and reliable distribution system.

To sum up, customers of transport services are becoming more

Exhibit 1.7 : Railway Freight - Growth Rates, 1984-99 (per cent per year)

Commodity	Annual growth rate - 1984-91	Annual growth rate - 1992-99	Annual growth rate - 1984-99
1. Coal	7.20	3.31	5.62
2. Raw Material for Steel Plants	6.91	2.01	6.59
3. Pig Iron and Finished Steel	3.08	(-) 2.97	1.25
4. Export Iron Ore	2.62	0.89	(-) 0.002
5. Cement	9.35	1.48	4.67
6. Food Grain	5.72	(-) 1.79	1.76
7. Fertilizer	4.46	4.47	3.81
8. Petrol, Oil, Lubricants	6.73	4.15	5.02
9. Other Commodities	0.73	(-) 0.39	(-) 0.34
All Commodities	5.33	1.86	3.55

Source: ‘Indian Railways - Annual Statistical Statements’, various years.

Note: Growth rates are for traffic output in ‘net tonne km’.

demanding as they require not just the basic transport services but also value added services such as warehousing, inventory management etc. To facilitate this transition shippers are looking at service providers who can provide a one-stop-shop for all these services. This provides greater convenience for customers and ensures that the service provider can be held accountable for meeting the objectives of lower costs and increased flexibility. The need for a single window solution from transport service providers has also given rise to multi-modal transport operators who take the complete responsibility of door-to-door delivery of shipments across more than one mode of transport. While the pace of change in this direction may vary from industry to industry there can be no denying an overall trend in this direction. If the Indian Railways (IR) is to reverse a trend of sustained decline in market share in the emerging business scenario, they need to enhance customer focus, strengthen existing skills as well as build certain new skills.

1.65 Financial Situation of the Government

In recent years the financial pressures on the Government have increased. In order to understand the current fiscal predicament of the central government it is necessary to examine the pattern of central government expenditure and revenues over at least the last 20 years. As already mentioned above, the key threat to sustainable economic growth and to economic security is the substantial decline in investment expenditures made by the government.

The total expenditure of the central government increased from an average of 16.8 per cent of GDP in 1980-85 to about 20.5 per cent in 1985-90 and has then declined to between 16 to 17.5 per cent in the late 1990s. At the same time non-plan expenditure has increased substantially from about 10 per cent in the early 1980s to about 13 per cent of GDP now. What is most notable is the very significant increase in expenditure that occurred in the second half of the 1980s. These increases took place in almost all categories of non-plan expenditure such as interest payments, defence expenditure, subsidies, pensions, and loans to states. During this period other non-plan expenditures, which consist mostly of salary payments to government servants, remained roughly stationary at about 2.25 per cent of GDP. Plan expenditures were kept high at about 6.5 per cent to 7 per cent of GDP throughout the 1980s. Correspondingly capital expenditures of central government were sustained at levels of 6 per cent to 7 per cent of GDP. However, both **plan expenditures and capital expenditures of the central government have fallen to levels of about 4 per cent of GDP or less now. With the increase in non-plan expenditure, particularly that in interest payments, the government simply has no money to invest in productive activities such as the railways.**

The great improvement in growth in the 1980s was therefore partially bought by high government expenditures: both plan and non-plan and revenue and capital. That this was not a sustainable pattern of growth was demonstrated dramatically in 1991 by the twin balance of payments and fiscal crises, which led to the economic reform programme begun in 1991. The non-sustainability of such fiscal expansion is demonstrated by the sustained increase in interest payments from 2.2 per cent of GDP in the early 1980s to about 4.7 per cent now. **Interest payments now constitute the largest component of expenditure of the central government.** These debt service payments now account for about 70 per cent of all tax revenues of the central government and about half of total revenue receipts. The government therefore has little flexibility or capacity to expand its expenditure

The total cost of government salaries excluding defence and police when expressed as a proportion of GDP, can be seen to be much lower now than it was right throughout the 1980s. In other words, non-plan expenditure on government salaries and wages has not increased as fast as GDP over this period. Interest payments are now at least three times that of non-plan government expenditure

Although the Indian Railways may have justifiable claim on the central government for resources for investment in the public interest, the fiscal situation of the central government is such that it may be simply incapable of providing the volume of resources required by IR to be competitive in the future. It has to be much more careful in the investment it makes so that it obtains returns at least equivalent to the cost of funds in the market regardless of whether they are raised directly by the railways or through central government

for infrastructure investment such as that in the railways. The Fifth Pay Commission is currently regarded as the villain of the peace in causing the current fiscal problems. Analysis of the data suggests that this is not the case at the central government level. The total cost of government salaries excluding defence and police (roughly corresponding to the item “other non plan expenditure”) when expressed as a proportion of GDP, can be seen to be much lower now than it was right throughout the 1980s. In other words, non-plan expenditure on government salaries and wages has not increased as fast as GDP over this period. Interest payments are now at least three times that of non-plan government expenditure excluding the military and the police. However, in the case of IR the problem is caused by the faster increase in wages relative to productivity increases.

The debt service burden of the government would not rise as a proportion of total expenditure if the investments made by the government from borrowings yield it adequate returns either through the generation of non tax revenues or through tax revenues. As the government borrows resources from the public to invest in new assets, tax revenues should rise through additions to public good assets. Improvement in public infrastructure should lead to improvement in efficiency and in aiding new private investment, and hence to buoyancy in tax revenues. Similarly, non-tax revenues should rise through increasing dividends from public enterprise investment in infrastructure and other activities. If, however, resources are borrowed for investment in activities which do not yield adequate returns, debt service payments will rise continuously as a proportion of total revenues. This is what seems to have happened in India in general over the last 20 years, and in the Railways in particular over the last 10 years. The return on net worth in central public sector enterprises, excluding the petroleum companies is not significantly different from zero. Thus investments made in infrastructure or other activities through public sector enterprises have not yielded pecuniary returns to the government. Such returns would occur as increasing dividend payments from the public enterprises to the central government. In the budget they would be shown as “non tax revenues”. Wrong pricing policies, inefficient public enterprise operations and other difficulties have all contributed to this situation of low returns. With the government running a revenue deficit since the early 1980s, all government and public sector investment has come from resources borrowed by the central government. In the presence of no returns from such investments, debt service payments are bound to become an increasing burden.

The central government has thus resorted to a fiscal system of high fiscal deficit on a consistent basis over the last 20 years. With revenue deficit now accounting for more than 50 per cent of the total fiscal deficit, it is clear that every rupee of investment such as that in the railways comes from resources borrowed at market interest rates in the capital market. The capital committed by the central government in the railways at 7 per cent dividend rate therefore results in further loss to the central government. This would not have been a problem if such resources were raised from tax revenues that do not have a repayment liability. Hence, although the Indian Railways may have justifiable claim on the central government for resources for investment in the public interest, the fiscal situation of the central government is such that it may be simply incapable of providing the volume of resources required by IR to be competitive in the future. It has to be much more careful in the investment it makes so that it obtains returns at least equivalent to the cost of funds in

the market regardless of whether they are raised directly by the railways or through the intermediation of the central government.

1.66 New Opportunities

While there are significant threats in the new environment there are also emerging opportunities. Containerised traffic is a high growth area and is also highly rated. It is note-worthy that while the originating Railway freight loading declined in 1998-99 in total and in major commodities like coal, steel and cement – a decline attributed to the industrial slowdown of that year – loading of ‘Other Goods’ improved by 5.5 per cent over the previous year. Tapping the growing containerised traffic will require renewed emphasis on inter-modal co-ordination.

Imports and exports can be expected to increase their share in an economy where the opening to trade is still incomplete. Judging from the change that has taken place in the share of trade in gross domestic product (GDP) in other liberalising economies, India has a long way to go. Thus a new opportunity (and challenge) may be seen in this segment of freight. But the quality of service and cost will have to be particularly competitive in this traffic segment.

Comment has already been made on the increasing share of upper class passengers. IR has shown considerable innovation in expanding the number of intermediate classes of travel (II AC Sleeper 2- tier and 3- tier, II class sleepers, AC Chair Cars) which cater to India’s burgeoning middle class. The expansion of supply in these segments has been greeted enthusiastically by passengers – judging from the growth of passengers in these segments. This provides a great opportunity for IR to make its passenger services commercially viable.

IR sees huge new opportunities to utilise its extensive ‘Right of Way’ for developing an optic fibre infrastructure backbone to the high growth telecom industry, and for developing real estate in prime locations. However, both these areas are beset with uncertainties: speed of entry is a crucial factor in regard to the highly competitive telecom business, and legal issues need to be untangled for full exploitation of real estate assets. Considerable commercial savvy in areas outside the normal field of railway operations is required in order to convert these opportunities into sizeable revenue streams.

The success that IR has had in setting up and managing a complex network despite many constraints in the Indian operating environment offers lessons for other organisations. However its past success has meant that IR has continued with the same business practices even as the operating environment has changed quite significantly. Due to this inability to respond to the changes in economic scenario there are several serious issues currently facing the Indian Railways

1.7 Issues Facing Indian Railways

As has been described in the preceding sections IR is one of the most important institutions in the country. The success that IR has had in setting up and managing a complex network despite many constraints in the Indian operating environment offers lessons for other organisations. However its past success has meant that IR has continued with the same business practices even as the operating environment has changed quite significantly. Due to this inability to respond to the changes in economic scenario there are several serious issues currently facing the Indian Railways.

1.71 Impending Financial Crisis

Today IR is on the verge of a financial crisis. The loss of market share in the profitable freight business, lack of flexibility in pricing, high cost of internally sourced products and services together with investments in unremunerative projects have meant that the **rate of growth in revenues (Exhibit 1.8)** has been outstripped by **the rate of increase in costs**. Revenues have been

growing at the rate of 13 per cent per annum over the last ten years ending March 1998. Costs too have grown at the rate of 13 per cent per annum during this period. However, in the last five years, costs have grown faster than revenues (**Exhibit 1.9**).

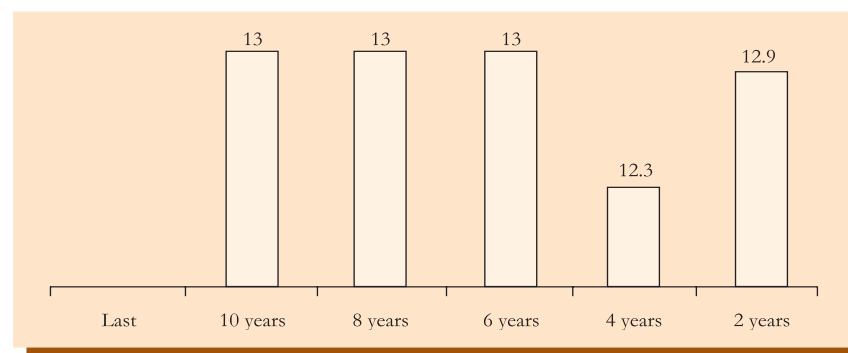
Investment in unremunerative projects has perhaps escalated during the 1990s. The adoption of the unigauge project which has involved large investments during this period has been particularly harmful to the finances of IR. Whereas it is possible that economic returns from this project may be felt over the long term, though many experts even dispute this, it is clear that there have been no short term returns. Second, the temptation to begin a myriad of new lines and unremunerative passenger services for political reasons has been much greater during the politically fractured 1990s. Although progress in actual investment in these new lines is miniscule, this activity does divert engineering and managerial resources to a significant extent, detracting from other serious tasks.

Revenue growth has also probably suffered from the saturation of freight traffic on trunk routes, particularly the golden quadrilateral. This is partly due to the large differential in speed between passenger and freight trains, which severely constrains the freight carrying capacity of trunk routes. Thus expansion of traffic on these routes requires both managerial action and investments on new technology to raise the speed of freight trains significantly.

These problems have essentially resulted from the wrong structure of IR which devalues accountability at every level.

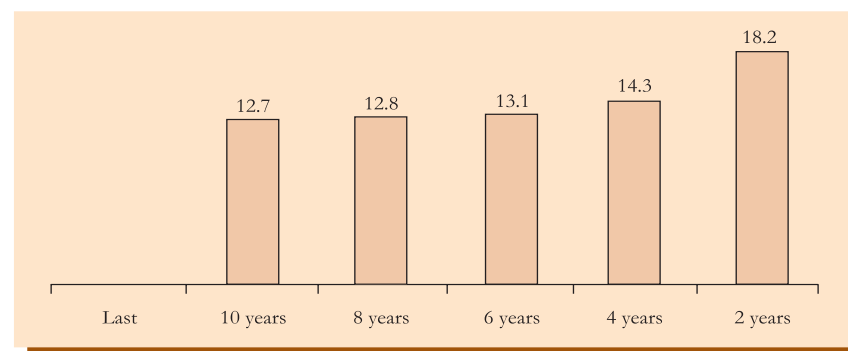
Rising employee costs, poor productivity and declining budgetary support have compounded the problem. Staff costs, which account for about 50 percent of the costs have been growing the fastest (refer **Exhibit 1.10**). The

Exhibit 1.8 : Annual Growth in Revenue



Source : Indian Railway Accounts.

Exhibit 1.9 : Annual Growth in Costs



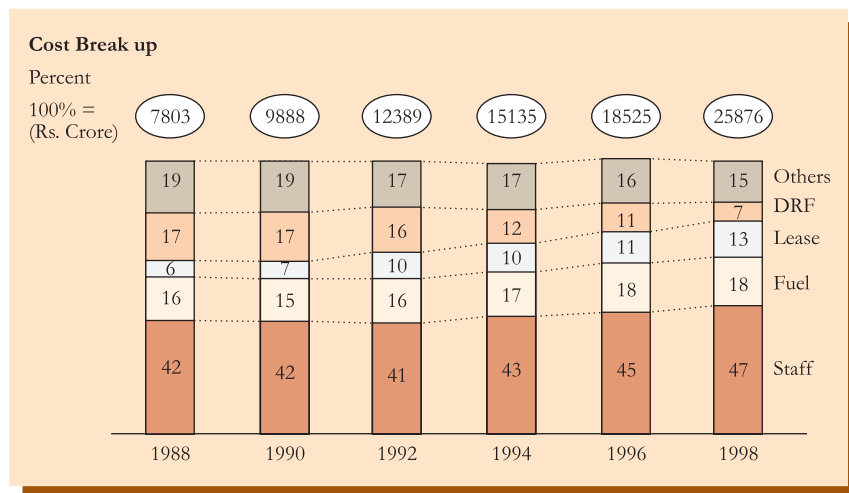
Source : Indian Railway Accounts.

percentage is likely to increase even faster after the implementation of the recommendations of the 5th Pay Commission. The relatively low levels of employee productivity in the Indian Railways (**Exhibit 1.11**) compound the problems of having a large workforce.

In comparison to the late 1980's when budgetary support accounted for ~ 40 per cent of the Railways finances, the figure declined to ~18 per cent in the mid nineties. Currently support from the Government accounts for around 25 per cent of the Railways annual expenditure. It is unlikely to increase beyond these levels in future, given the lack of funds with the Government. To compensate for this decline, the Railways have increased the share of internal resources. As this source has also come under pressure in recent times, dependence on market borrowings through IRFC has grown (**Exhibit 1.12**). While the borrowings have bridged the shortfall in resources, the rate of interest payable on these is high in comparison to the return earned by the Railways. As a result the proportion of interest/lease payments in the overall expenditure has been increasing steadily (**Exhibit 1.10**).

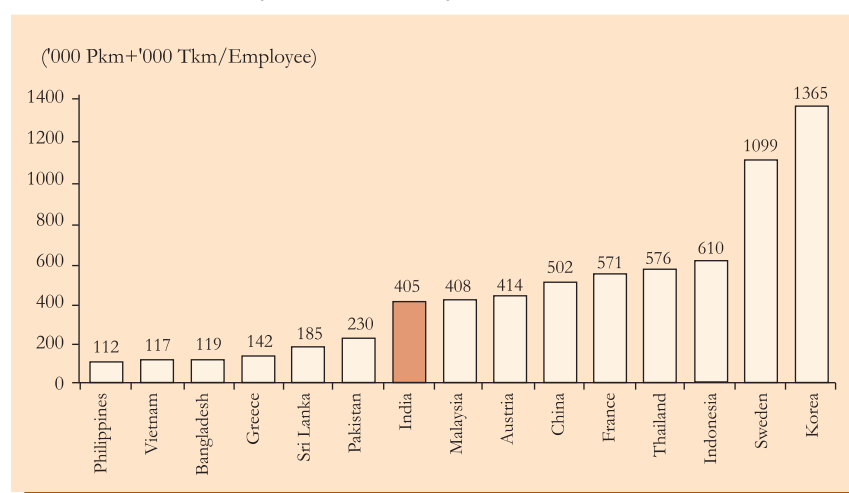
The strain on the Railways resources has also prevented adequate investment in track renewals and other safety related areas. The proportion

Exhibit 1.10 : Cost Break up



Source : Indian Railway Accounts.

Exhibit 1.11 : Employee Productivity



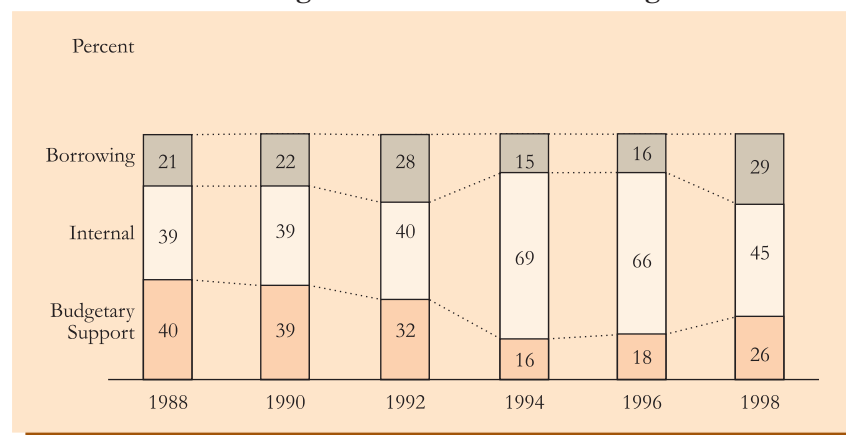
Source: World Bank.

of expenditure on repairs and maintenance has been declining steadily over the years (See trend of ‘others’ and DRF in **Exhibit 1.10**). This is another consequence of the unigauge project. Consequently, the arrears of track renewals have grown from 3,548 km to 12,260 km over the last ten years. Though the overall number of accidents and the number per million train kilometres have shown a declining trend (**Exhibit 1.13**), the absolute numbers are still high with scope for improvement.

In addition to the requirements for new investment for modernisation and remunerative capacity expansion, IR now has considerable backlog of investment for track maintenance and repair. The existing managerial, financial and accounting systems are such that these new financial requirements can not be met in a business as usual scenario.

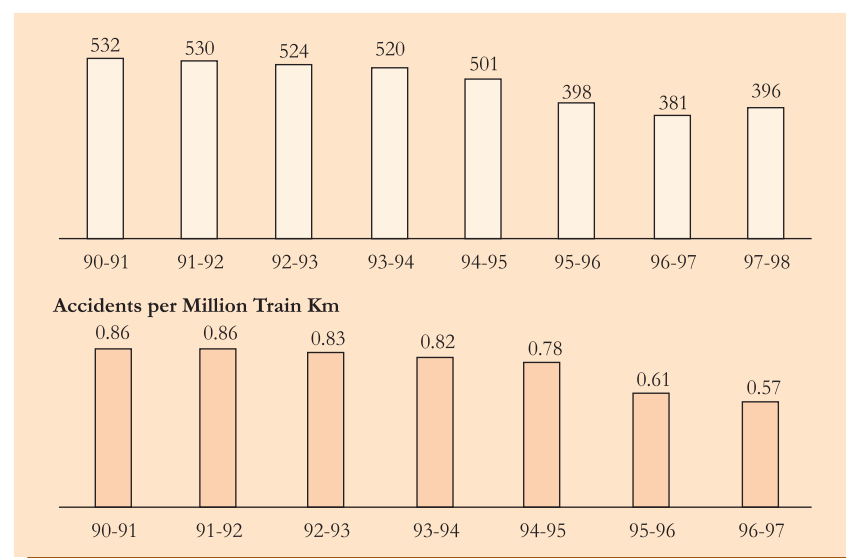
To arrest the steep decline in its share and to improve the quality of its services, the Railways need to increase investments in infrastructure. However, if the existing trends of increase in costs, uneconomical tariff setting and investments in unremunerative projects were to continue, it would be impossible for the Railways to generate funds internally for these investments. An “As-is” scenario constructed by assuming that there are no significant

Exhibit 1.12 : Increasing Share of Market Borrowings



Source : Indian Railways.

Exhibit 1.13 : Number of Accidents



Source : Indian Railways.

changes in performance projects that **by 2003 the Railways would have an operating deficit of ~Rs. 3700 crore.** Recent trends indicate budgetary support is unlikely to account for more than 25 percent of the plan outlay. In this situation, Railways' dependence on borrowings is likely to increase substantially and lease payments are expected to grow from Rs.1974 crore per annum in 1998 to ~Rs. 5000 crore per annum by 2003. **Clearly continuing the current system of Railway operations into the future is not a feasible option.**

1.72 Lack of Clarity Regarding Purpose

IR suffers from a split personality. On the one hand, at least since the separation of accounts in 1924, IR is seen by the government, and by itself as a commercial organisation. It should therefore be financially self-sufficient. On the other hand, as a department of the government it is seen as a social organisation which must be subservient to fulfilling social needs as deemed fit by the government. It is now essential for these roles to be clarified. The social role requires distinct resources and effort, but the accounting system must be enabled to reflect through costs adequately.

In the past IR has found it difficult to reconcile these roles because:

- **Lack of systems to clearly segregate social from commercial**
The several social/national responsibilities of the Indian Railways prevent it from operating on a purely commercial basis. The provision of suburban and other passenger services below cost, transport of essential commodities at a loss, subsidised movement to the North-East, operation of unremunerative branch lines and the like, are all manifestations of this role of the Indian Railways. In addition, the Railways are often used as a tool to catalyse economic development in backward regions. Whereas the necessity of providing these services in a broader national context is not open to question, it is desirable that the Railways clearly delineate and prioritise the commercial and social roles. The existing management and accounting systems are such that the actual costs of operating these services are not really known. Part of the organisational and accounting reform must aim to make these costs explicit. **Segregation of the two roles** would enable the Railways to focus on each one of them separately and hence achieve the desired objectives in each function. While the current systems within IR require that an assessment of the commercial viability of all projects be made, several non-viable projects with limited social utility are also commissioned.

- **Need to revise parameters that measure performance**

Since the objectives for commercial activities are different from those for social activities, **separate parameters to assess performance** need to be identified. Commonly accepted financial parameters like revenues, profits, return on capital employed etc. could be used to assess performance of all commercial projects. For social projects, operational parameters such as an improvement in connectivity, increase in the traffic etc. could be used.

- **Lack of adequate compensation for social responsibilities**

Currently there are no explicit charges paid by the Government of India for the performance of these "public services". The funding for developmental projects also does not come in the form of earmarked dividend free grants. It is estimated that in 1997-98 the subsidy on such social obligations (excluding the subsidy to passenger transport) stood at Rs. 320 crore. The **lack of compensation for public services** is putting a severe strain on the financial

On the one hand, IR is seen by the government, and by itself as a commercial organisation. It should therefore be financially self-sufficient. On the other hand, as a department of the government it is seen as a social organisation which must be subservient to fulfilling social needs as deemed fit by the government. It is now essential for these roles to be clarified. Segregation of the two roles would enable the Railways to focus on each one of them separately and hence achieve the desired objectives in each function

situation of the Indian Railways. **The Railways therefore need to be fully compensated for provision of social services through explicit grants/ subsidies from the Union budget.**

This compensation needs to include not just funds for capital investment but also to support the losses that these projects incur over their lifetime. A clearer accounting of these costs could make it easier to find financing mechanism for such public services. This is critical because currently the Railways claim to incur a financial burden of ~Rs 3800 crore, only on account of the operating losses of these projects said to occur through the carriage of freight and passenger traffic below cost (refer **Exhibit 1.14**). As against this the compensation for operational losses stands at Rs. 200 crore.

A contemporary business structure that is aligned with the organisational strategy is a pre-requisite for success. The structure should allow the organisation to focus on its core strengths / businesses. IR has not been able to customise its offering to suit the changing needs of the customers

1.73 Outdated Business Structure

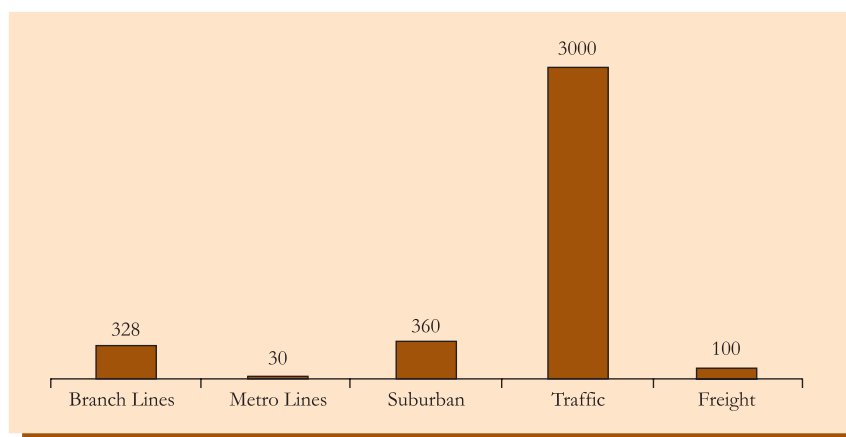
A contemporary business structure that is aligned with the organisational strategy is a pre-requisite for success. The structure should allow the organisation to focus on its core strengths / businesses. It should also empower employees to take quick decisions with the objective of enhancing customer satisfaction. Measured against these criteria, the Railways business structure requires changes. These are basically due to two reasons:

(i) Functioning as a Government Department

- IR currently functions as a Government department. This has limited its flexibility to respond to changes in the market place. The inability to change prices in response to increase in costs or the market scenario highlights the various compulsions under which the Railways operate. In comparison, competing modes of transport (primarily road transport) are far more responsive to market requirements. In an economic scenario where transporters are increasingly competing on customer service, the lack of market focus and flexibility is a serious drawback for the Indian Railways.

IR has not been able to customise its offering to suit the changing needs of the customers. As a result it has steadily lost market share. Instead of focusing on the market, identifying customer needs and tailoring products and services that meet those needs, IR has had more of a “take it or leave it” attitude. The experience with steel traffic highlights

Exhibit 1.14 : Operational Losses on Social Projects (Rs Crore)



Source : Indian Railways.

this point (**Box 1.3**). The lack of customer focus is characteristic of the “government department” attitude of IR and has led to serious dissatisfaction amongst the users of both freight and passenger services:

- **Freight customers:** Today, the freight customer does not see the Indian Railways as being responsive to any of these requirements, and of customers’ needs. A nation-wide survey of users of rail freight services revealed that IR was rated below road transport on ***all fourteen parameters*** considered at the time of deciding on a service provider (refer **Exhibit 1.15**). Not only are the freight rates for rail often higher than those for roadways, the manner and settlement of claims, packing standards, etc. also leave considerable scope for improvement.
- **Passengers:** Similarly in the case of passenger transport there is dissatisfaction with the extent and quality of services provided. Due to its close proximity to the Government and the political establishment there is constant pressure on IR to offer its passenger services to more and more people by expanding into new areas and geographies. As a result while several new projects are being undertaken, the quality of services offered on the existing routes remain far from satisfactory. Most users of passenger services feel that there could be considerable improvement in punctuality, comfort, amenities on the platforms and responsive service. A large proportion of passenger service users is not aware of the extent to which these services are subsidised. Moreover, the lack of revision of fares to even keep pace with inflation has made them used to low fares.

(ii) High degree of vertical integration

The high degree of vertical integration of the Indian Railways has resulted in its diversification from its core business of transportation. Currently IR performs a variety of services ranging from on board catering to manufacturing and design facilities for wagons and locomotives. In addition, the Railways also run several hospitals and schools in the country. As mentioned earlier, the Railways were forced to adopt a vertically integrated business model in the past due to the lack of availability of a capable supplier base for many of their requirements. While it was perfectly necessary to adopt an integrated

Box 1.3 : Steel Movement by Indian Railways

Iron and steel movement by Railways provides an interesting example of how a service provider’s lack of customer focus can result in defection of traditional customers.

Amongst the bulk commodities carried by IR, iron and steel ranks second in generation of highest revenue per tonne kilometre. Pre-liberalisation when the sector was government controlled IR had a virtual monopoly over steel movement. All primary steel producers like SAIL, TISCO, RINL had been designed with extensive rail infrastructure for transportation of both inbound and outbound traffic and these plants accounted for 80% of mild steel and 50% of semi finished or finished steel produced in the country.

Post deregulation in 1991, a number of new units producing value added steel came up. Dispatch of high value finished steel products from these secondary steel producers was effected in smaller lots and hence they required movement of their products in lots that were less than full rake loads. Inflexibility of IR to accept less than a rake load led these new entrants to plan for alternative modes of transport. As a result, though production of pig iron and steel increased by 45% in the period 1992-97, from 23 to 32 million tonnes, IRs share in its movement remained static at 12 million tonnes.

To make matters worse there was a sustained increase in tariffs for steel transport by Rail during the same period. This made road transport far more attractive for the customers. Consequently even traditional customers of IR like TISCO and RINL have gradually switched to road transportation. As a result, IRs share of dispatches from TISCO has fallen from 90% in 1992-94 to 50% in 1997-98. In the case of RINL over 50% of finished products and 93% of semi-finished products are now moved by road.

model in the past, the structure has its limitations in the current context.

Today, there exist capable suppliers in many of the areas that the IR currently performs in-house. In comparison to IR the costs of these suppliers are substantially lower due to lower costs of manpower. In addition since these suppliers are focussed on a narrow sphere of activity, there are efficiency gains that could result from outsourcing these activities. In technology intensive areas, focussed suppliers have made technical advances and created better equipment (e.g. rolling stock). Thus in the current scenario, by being vertically integrated IR has reduced its cost competitiveness and is finding it difficult to keep pace with technology in select areas.

Freight train speeds will have to be ramped up considerably. Facilities for point to point service will have to be provided, assurance of timely service will have to be given, and so on. In brief, IR will have to be in the integrated multi-modal logistics solution business. This requires investment as well as complete organisational re-engineering

Finally, the presence in a variety of peripheral businesses also takes up management time and reduces focus on the core transportation business. At a time when the core transport business of IR is facing serious competition it is imperative that the organisation review its presence in non-core areas.

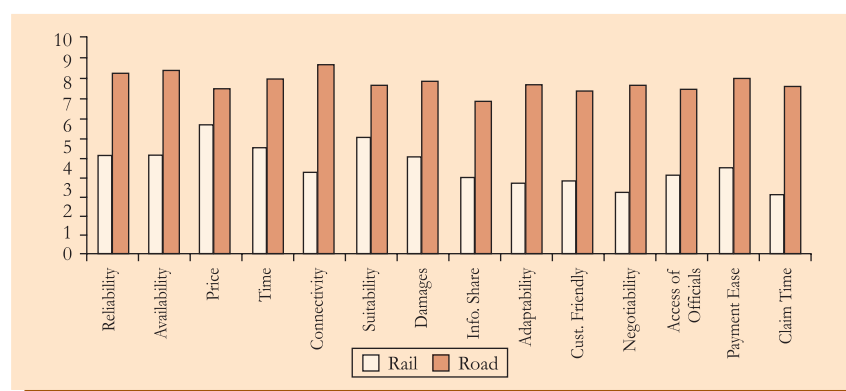
1.74 The Road Challenge

The descent of many railways into bankruptcy in developed countries was particularly accelerated by the advent of four lane limited access highways during the 1960s and 1970s. In the case of these affluent countries, passenger traffic shifted to cars on the one hand and air travel on the other. The flexibility provided by heavy tractor trailers as freight carriers on fast expressways could not be matched by the railways. Thus freight traffic continued to be competitive in the railways only in large continental size countries such as the US, China and Russia.

India falls in a similar category because freight National Highway Development Project linking the 4 metro cities is likely to provide the biggest threat to the Indian Railways, unless it gears itself to meet this challenge. Freight train speeds will have to be ramped up considerably from the current 24 K.P.H. Facilities for point to point service will have to be provided, assurance of timely service will have to be given, and so on. In brief, IR will have to be in the integrated multi-modal logistics solution business. This requires investment as well as complete organisational re-engineering.

In the case of passenger traffic, the vast majority of Indian travellers will not be in the automobile and air travel category for some time to come. Particularly high growth will take place in the middle category of households who will demand economical quality service that is superior to frequent air conditioned buses. The latter will increase tremendously with the availability

Exhibit 1.15 : Customer Satisfaction Index



Source: A.F. Ferguson : Shippers' Survey, 1997.

of fast, quality four lane highways. Once again, to provide such service, IR will need new investment in rolling stock, better communications, better customer orientation and managerial and pricing flexibility: a recipe for major organisational change.

1.75 Lack of Autonomy: Political Control

Given the importance of IR with its vast network covering almost all the regions of the country and its daily operations affecting the lives of millions of citizens, it is inevitable that the organisation would be subject to political interest and pressure. However the fact that IR is run as a Central Government Department overseen by a full-fledged Ministry has exacerbated the extent of problem. The linkage is also reinforced by institutional arrangements like the annual Railway Budget, which brings the annual operating plan of IR under sharp focus.

All over the world, wherever there are democracies it has been observed that political priorities generally follow a short time span. The Indian experience conforms to this world-wide pattern. The extent to which coalition politics prevails in a particular country further reduces the political time horizon. In the emerging political scenario post 1990 there has been a sustained trend against clear Parliamentary majorities and it is expected that India will witness a phase of coalitions made up of a large number of National and Regional parties.

Although the current Railway Board is provided considerable autonomy within the existing framework, the organisation has historically been subject to significant political pressures. As a result, the Railways have often found it difficult to take decisions that may be beneficial from a commercial viewpoint but are perceived to be politically unpopular.

One of the reasons for the decline in Railways' market share, particularly in the freight business has been the **pricing of its services**. Increasing passenger fares is difficult for the Railways. The political sensitivity to such increases has prevented the Railways from changing these in line with the increase in costs or the market situation. Consequently, over the last eight years, the tariffs for passenger transport services have grown at 9 percent per annum while the cost of inputs has increased at 15 percent per annum. In 1997-98, although passenger traffic accounted for 56 percent of the total transportation output (passenger km + freight ton km), it contributed only 28 percent of the revenue. The extent of subsidy provided to passenger services has increased dramatically over the last few years (refer **Exhibit 1.16**)

The Railways have sought to compensate for this by increasing freight tariffs. As a result, the ratio of average passenger fare to the average freight tariff for the Indian Railway is amongst the lowest in the world (refer **Exhibit 1.17**). Within freight, IR operates a differential tariff structure incorporating cross subsidies from the more paying commodities to the less paying commodities such as foodgrain. This policy has made some freight tariffs uncompetitive, in particular steel and cement.

It can therefore be seen that vulnerability to political pressure has caused distortions in the operating model of Railways. Developed countries cope with this problem through well-established conventions and procedures that draw clear boundaries between policy-making and its implementation. Autonomous regulatory and other institutions are also set up to protect the

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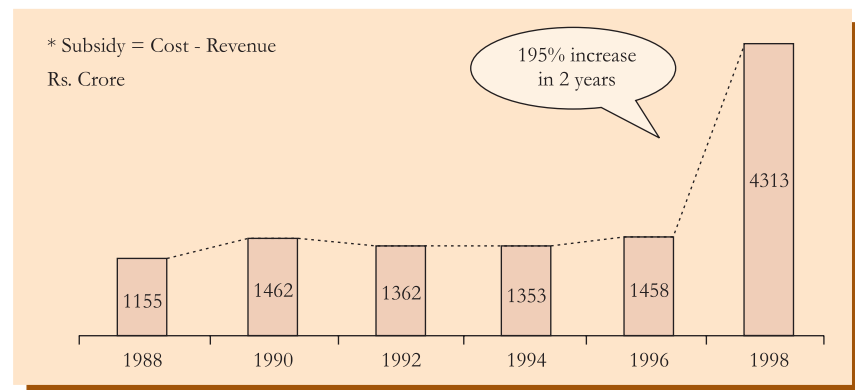
legitimate interests of various stakeholders and to ensure that long term plans of commercial and public undertakings are not jeopardised by short-term political priorities. As is well known, other infrastructure sectors in India (Power, Telecom) have made considerable headway in finding institutional solutions to conflicts of interest of this type.

1.76 Systems

The high degree of centralisation in decision making and the relatively low levels of autonomy highlight the need for a review of the internal systems. Several of the existing systems for goal setting and performance appraisal need to be reviewed in light of IR’s priorities. At an overall level, the HR systems need to ensure that individual goals are aligned with the overall organisational objectives. Similarly the financial reporting systems need to be redesigned. The operating and financial performance of the Indian Railways is published in the form of a yearbook. While a statement reflecting the various elements of revenue and expenditure is included in this document, an accurate assessment of the true financial performance cannot be made through it. This is because the Railways do not adhere to the accounting norms that are widely being used by corporates to report their financial performance. This deviation from the norm leads to distortions in several areas, two of which are described below:

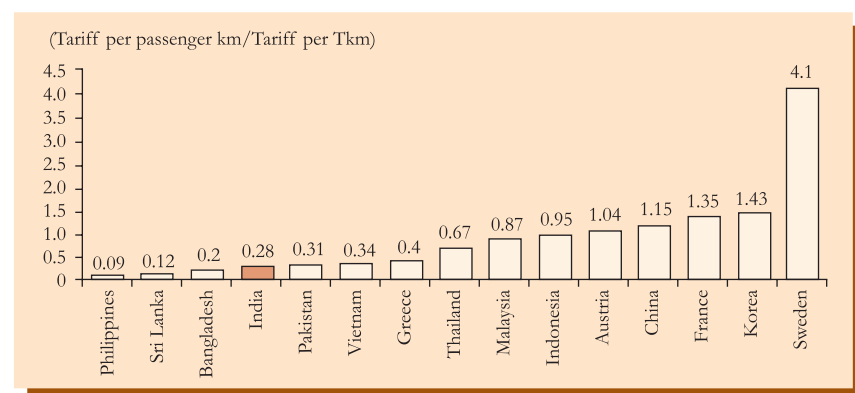
- **Depreciation Reserves:** Unlike the corporate sector, which follows a straight line or a written down value method of depreciation on the existing asset base, there are only broad guidelines for depreciation of the assets for the Indian Railways. Provision for depreciation is therefore

Exhibit 1.16 : Subsidy to Passenger Transport



Source: Indian Railways.

Exhibit 1.17 : Tariff Ratio



Source: World Bank.

based largely on the availability of funds after meeting the operational expenses for the year. The ability to establish some guidelines/norms for depreciation is difficult since the value of the existing assets with the Railways is not known.

- **Pension Liability:** Of the 1.5 million permanent employees with the Railways it is estimated that approximately 2 per cent are due to retire every year for the next 5 years. The liability on account of pension payments is therefore projected to grow during this period. However currently the pension liability is not being provided for and is treated as an expense based on the actual outflow each year. The growing pension liability, which is entirely unfunded, is likely to significantly increase the financial burden on the Railways in the coming years.

1.8 Indian Railways : Purpose

Indian Railways is at crossroads. As has been brought out clearly, IR faces a serious threat due to its inability to adapt to the changing external environment. If IR is to continue its vital role in the future development of the nation, it has to rethink its very purpose of existence.

1.81 Need for a Purpose Statement

Purpose is an organisation's reason for being. It does not just describe the organisation's output or target customers; it captures the soul of the organisation. It is only in light of a well thought out purpose that the Railways can craft a long term strategy that will enable it to live up to its purpose. The purpose should inspire the organisation in times of trouble and act as a guide whenever there is a doubt about the path the organisation needs to take.

By servicing their customers in freight and passenger transportation, the Railways fulfil their commercial objectives and simultaneously play a key role in the economic and social development of the nation. In addition to their role in the provision of transportation service, the Railways provide allied services like design and manufacture of rolling stock, schools, hotels, hospitals etc. To effectively discharge its numerous responsibilities, it is important that the entire IR organisation works in concert towards a common stated purpose. This would help the Railways in directing all its resources – human and financial – towards clearly defined/stated objectives leading to an optimal utilisation of resources. Finally a clearly defined purpose would, over time, enable IR to assess the extent to which their efforts have helped them achieve their overall objective.

1.82 Elements of a Purpose Statement for IR

In the context of the Indian Railways, a good purpose statement should address four basic questions (**Exhibit 1.18**) :

- What do we do (**Role**)?
- For whom do we do this (**Customer segments**)?
- What should we aim at (**Goals**)?
- How does it help society (**Contribution to society**)?
- **Role of the Railways**

Good infrastructure is key for the growth and development of any country, and hence the purpose of the Railways is to play a central role in India's

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Good infrastructure is key for the growth and development of any country, and hence the purpose of the Railways is to play a central role in India's overall economic growth. However, to play this role effectively, it needs to be customer focused and provide cost effective transportation solutions

overall economic growth. However, to play this role effectively, it needs to be customer focused and provide cost effective transportation solutions. By doing this, the Railways can reduce transportation cost and hence the final price to consumers. Reduction in prices is likely to boost overall demand for goods, spurring economic growth. The economic growth in turn results in higher disposable incomes and consequently increases the demand for goods creating a virtuous circle (Exhibit 1.19).

• Target Customer Segments

The core business of Railways is the transportation of goods and passengers. Within this boundary the Railways needs to identify customer segments with distinct well defined needs that it should target. This would help the Railways leverage its understanding of customer requirements to offer superior solutions to each segment. At a broad level, there are three major customer segments of the Railways:

- **Freight**
- **Passenger**
- **Suburban**

• Goals

To meaningfully address its role as an engine of national growth, the Railways needs to offer compelling value to its target segments. To do so on a sustainable basis requires the Railways to be a profit making/financially viable organisation. Profitable growth can be achieved by adopting a three pronged

Exhibit 1.18 : Elements of the Purpose Statement

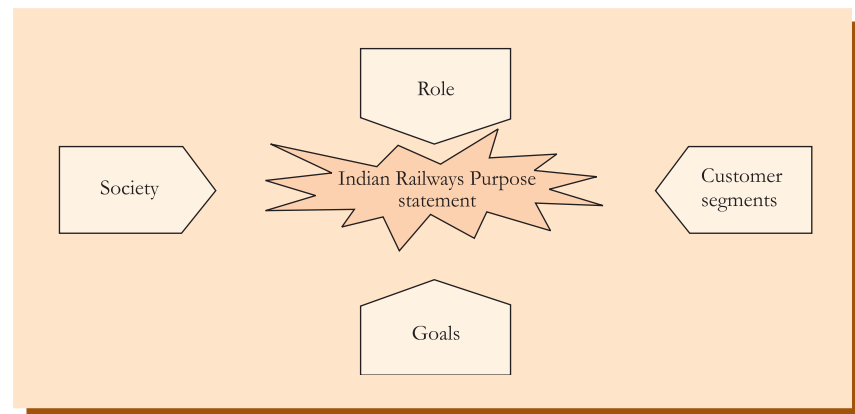
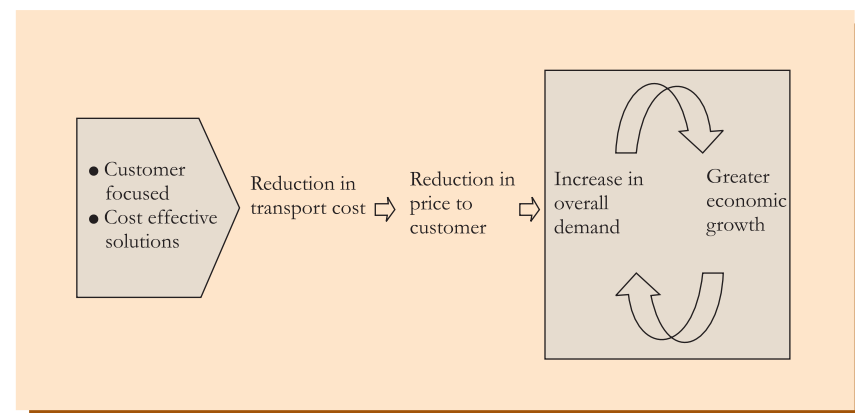


Exhibit 1.19 : Economic Growth Cycle



approach as illustrated in **Exhibit 1.20**. This shows that the objective of **profitable growth** would be met through a combination of **clear strategy** that focuses on **customer orientation** and allows the best value to be delivered to the customer, and **financial discipline** to continuously reduce costs.

- **Contribution to social development**

To fulfil its social responsibilities, the Railways needs to continue to aid the Government in its developmental initiatives by integrating the country through its transport services. IR can use the funds provided by the Government to:

- Expand its operations into new geographies and thus link up distant parts of the country if absolutely necessary
- Subsidise services deemed essential by the Government

1.9 Proposed Purpose Statement

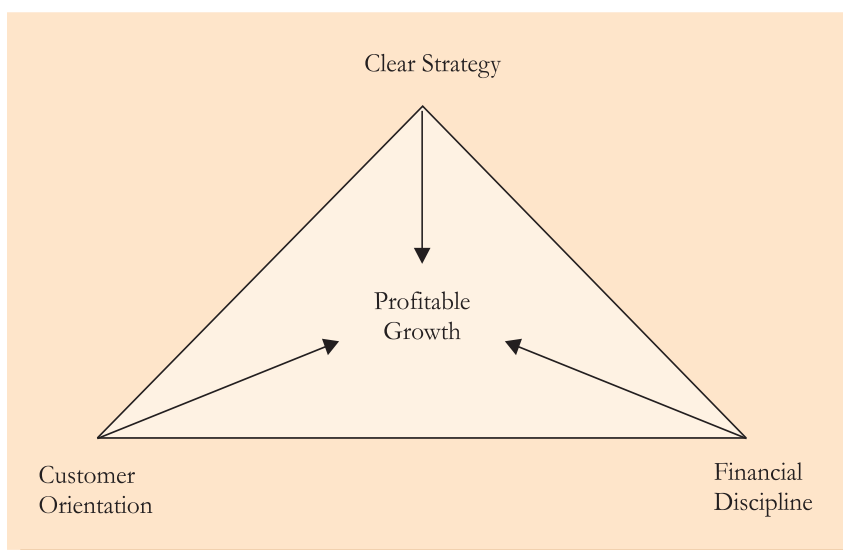
Although its past record has been impressive, today IR finds itself in a new, more competitive, liberalized environment. Today, revenue from the freight business is under increasing pressure, the core customers are demanding superior service levels, there are severe cost pressures, and there is no reduction in the nation's expectation of Indian Railways' social responsibility. More than ever before, in the new millennium, IR is buffeted about by forces that are commercial and market-oriented on the one hand, and social and egalitarian on the other. Reduced capital support from the General Exchequer, falling internal generation of resources and declining market share stare it at its face. The time has come when Indian Railways has to do intensive soul-searching and decide the road to take so that it occupies the position that is legitimately due in the scheme of things, and is not marginalised.

Keeping the various elements of a purpose statement, a draft purpose statement for IR has been proposed by the "Expert Group". The draft is shown in **Exhibit 1.21**.

The proposed purpose statement envisages the Railways as playing a crucial role in the economic development of the nation. The statement defines target segments and stresses the need for providing superior levels of service to these segments. While clearly stating that the Railways should

To meaningfully address its role as an engine of national growth, the Railways needs to offer compelling value to its target segments. To do so on a sustainable basis requires the Railways to be a profit making/ financially viable organisation

Exhibit 1.20 : Triangle of Profitable Growth



aim to achieve **profitable** growth, the statement acknowledges and clearly outlines its developmental role and states that this would be in line with the directives of, and entirely funded by, the Government.

It is hoped that this purpose would enable Indian Railways to anticipate the future and achieve the strategic objectives and goals successfully. It would ensure rational allocation of resources and improved co-ordination among the departments. It would result in a continuing dialogue about the future of the organisation between top and middle management, between the divisions and the zones and between the management and the unions. It is also hoped that the purpose statement would help the management to respond to a dynamic environment and help guide the Railway's out of the present crisis, and put it on a path of sustained growth and profitability.

Exhibit 1.21 : Purpose Statement of the Indian Railways

Our purpose is to play a **central role in India's overall economic growth** by providing **customer focused, cost effective transportation solutions**. We will do this through an integrated transport system, which includes the Railways and other modes of transportation.

Our transportation business will cater to **three target customer segments**

- Freight
- Passenger
- Suburban Passenger

Our multi-modal network should provide the **most compelling value** to target customer segments. We will aim to **profitably grow** our services by providing **superior customer service** to our target segments. We will work towards enhancing our market share by equaling or exceeding the transport industry growth in freight and passenger traffic, subject to the profitability of such growth. We will achieve these objectives through the **integration** of:

- Clear Strategy
- Financial Discipline
- Customer Orientation

We will also aim to **help to integrate the country** through our transport services and aid the Indian Government in its efforts in the social/ developmental sphere by **using the funds provided exclusively and separately by the Government** for:

- **Phased and sustainable** expansion into socially desirable/strategically important routes including operational losses in their lifetime.
- Subsidising services deemed essential by the Government.

2. RAIL RESTRUCTURING : GLOBAL EXPERIENCES AND THEIR IMPLICATIONS FOR INDIAN RAILWAYS

2.1 Introduction

Between 1970 and 1995, railways across the world went through a process of change: once the pride of their countries, they had become liabilities. Unless they restructured, they were bound to lose the ability to shape their own destiny. Different railways adopted different restructuring models to rebuild themselves. The objective of this chapter is to discuss these models and their implications for Indian Railways.

The Expert Group undertook a study of the rail restructuring experiences of railways in Europe and Asia. We interviewed in depth senior leaders of railways from Britain, China, Germany, Italy, Japan, Netherlands, South Africa, Spain and Sweden and conducted detailed discussions with some of them, including senior union leaders. Brief interactions were held with other rail restructuring experts to understand this process in the United States, Canada and Latin America.

The Expert Group also organised a 2 day “International Workshop on Railway Restructuring Experiences”. Many of these senior leaders from different countries participated in this workshop which was attended by all the Members of the Railway Board, Members of the Expert Group, and other selected senior officers of IR. The presentations made by the foreign experts and the associated discussions demonstrated that there are no easy or clear blueprints for railways reforms. The circumstances have been different in each country and a variety of different solutions have been found: some more successful and others less so. Even in Europe where almost all the reform has resulted from a common directive from the European Commission, different countries have chosen different routes to reform. Our attempt in studying the reform experience of other countries has been made with a view to understanding the issues that arose and to learn from the many different experiences that are now available.

Railways in almost all countries have changed radically in the last two decades. Each railway adopted a different approach to change. All of these approaches had their advantages and disadvantages. There was no single “right” approach to restructuring. However, there were several lessons to be learnt. These were:

- The change in most countries was too late. For a long time, railroads were denied the opportunity to change by the governments and incumbent managements. Slowly the governments, typically the finance arm, recognised the imperative to change railways and forced them to improve customer service and become commercial entities.
- It was important for the railways to be run as independent corporations and not as government departments.
- Almost all governments inducted fresh talent and external professionals in the top management of railways.

There are no easy or clear blueprints for railways reforms. The circumstances have been different in each country and a variety of different solutions have been found: some more successful and others less so. All of these approaches had their advantages and disadvantages

- To focus on the core transportation business, most railways spun off their non-core businesses such as manufacturing, catering, telecommunications, and maintenance.
- Post-restructuring, the railways improved their performance on several fronts such as customer service (price, quality), safety, market share, investments, and productivity.

Today, Indian Railways is at crossroads, too. To improve its performance and secure its position, it will need to find new ways and structures to operate. While it can learn from other's experiences, the restructuring approach it finally adopts will have to be tailored to the socio-economic realities of India.

Railways faced pressure from four external sources. The first of these was increasing customer demand for better quality and price of railway services; the second, growing competition from other modes; the third, a public service mind-set leading to weak internal performance; and the fourth, reduction in availability of government funds for investments

2.2 Why Restructure? Reasons for Changing Track

European and Asian railways have adopted radical changes in recent years. In Europe, like in the United States, all railways were originally established as private enterprises, only to be nationalised later due to their strategic role in the World Wars and the Great Depression of the 1920s, a process not dissimilar to that experienced in India. They were the most advanced and developed inland mode of mass transportation of goods and people, and laid the foundation for industrialisation. Railways were the first form of motorised transportation in the world.

However, after several decades, almost a century after their birth, their dominance was challenged by rapid growth in road and air transportation in the second half of the twentieth century. As customers became smarter, and the competition stronger, the railways' hold over the transportation market weakened. Their market share declined and they began to experience financial problems, as road transportation in particular took over the lead role. In 1980s and early 1990s, the economic, social, and political forces specific to each country, pushed the railways to respond to the challenges posed (**Exhibit 2.1**).

This section describes the key motives for change: (1) common to all railways, and (2) specific to some.

2.21 Common Reasons for Change

In the last fifteen years, railways faced pressure from four external sources (**Exhibit 2.2**). The first of these was increasing customer demand for better quality and price of railway services; the second, growing competition from other modes, in particular road; the third, a public service mind-set leading to weak internal performance; and the fourth, reduction in availability of government funds for budget and infrastructure investments.

These four pressures reinforced each other. As a consequence, the railways ran large financial losses and accumulated massive debts, making it imperative for them to change.

(i) Increasing market pressures

The railways witnessed a rapid change in customer requirements. Freight customers had become more efficient and productive, their needs became increasingly sophisticated. They lobbied for higher quality service at cheaper prices. This demand came predominantly from the large freight customers, but applied as well to the public representatives of passengers.

- *Freight customers* were attempting to globalise their operations and become competitive against players in other countries. They had effectively tackled internal cost inefficiencies, and were increasingly trying to reduce external costs in their supply chain. Given that freight was a large component of external cost for basic industries such as steel, cement, and energy (coal, petroleum), they were demanding a more efficient railway system, which would support the national economy and make it competitive at international scale. Increasingly open trade induced by the successive GATT Rounds since the 1960s reduced the protection enjoyed by domestic industries in each country. Declining international transport costs added to competitive pressures.
- *Local governments and city councils* were attempting to improve the environment and quality of life in major cities. Higher quality of life was important, as it attracted new companies and investment, thereby

Exhibit 2.1 : Evolution of Railway Systems

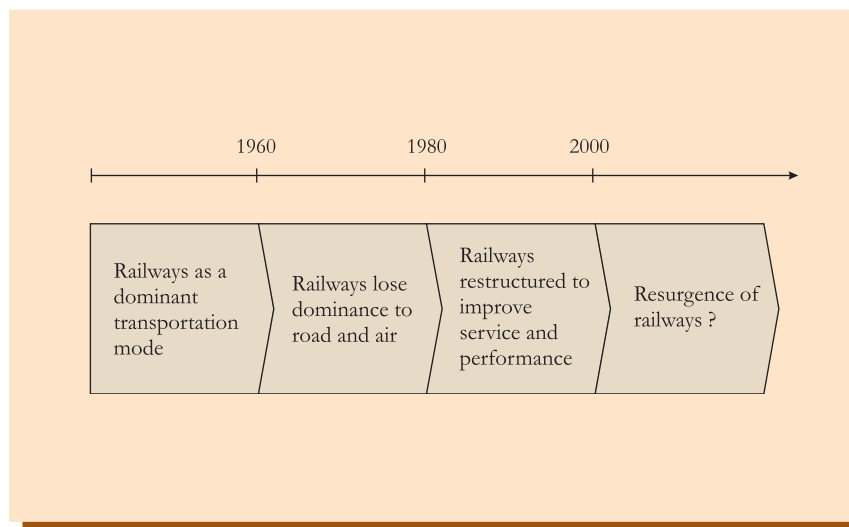
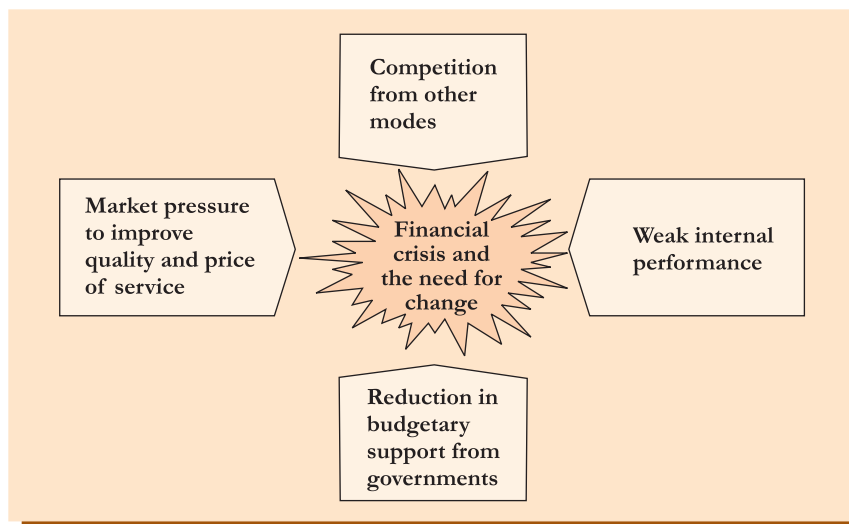


Exhibit 2.2 : Four Major Forces have Pushed the Railways Towards Change



For the freight customers, the expressways offered an alternative to railways. The road costs per ton in US reduced by a third between 1970 and 1995. Investment productivity (investment/ton km) of roads in Europe also improved by 40 per cent between 1970 and 1990. On the other hand, rail costs per traffic unit increased by almost 90 per cent between 1970s and mid 1990s

leading to better economic performance. Local governments needed an efficient and fast commuting transportation mode to improve quality of life in the cities that were increasingly suburbanising. Inefficient railways were not able to provide this service and, instead, represented a burden on the government's funds. Thus the local governments applied pressure on the railways to change.

The freight companies and regional governments lobbied in various forums, individually as well as with the government, for an improvement in the railway system.

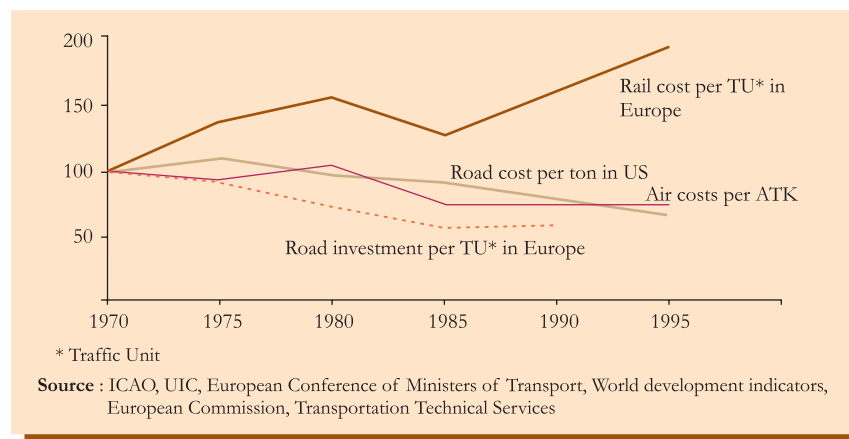
(ii) Growing competition from roads and air

While customers were getting more sophisticated, so was the competition. Technological advancements, legislative changes, and higher investments enabled competing modes of transport to offer better value to customers. Improvements in road technology led to construction of expressways and "autobahns" in the 1960s and 1970s.

This allowed higher speed, higher driving comfort, and lower travel time for passengers. This change was further fuelled by rapid increase in motor ownership. As motorcars became more efficient, both in terms of comfort and fuel consumption, rail passenger traffic was increasingly squeezed. Between 1970 and 1995 car travel increased by 131 per cent, whereas rail passenger travel increased by only 24 per cent in Europe. Technological advances in air travel and subsequent reduction in airline prices led to rapid growth in the number of airline passengers as well. Airline travel in Europe increased by 540 per cent from a small base of 43 billion passenger-Km in 1970 to 274 billion passenger-Km in 1995 (ECMT)¹

For the freight customers, the expressways offered an alternative to railways for the first time. Between 1970 and 1995 the size of road network in Europe increased by 183 per cent (compared to a decline of 10 per cent in the size of rail network). Thus the rapid growth of competition increasingly squeezed railways' market share. Legislative changes further helped the competition. Changes in road regulation increased the load allowed to be carried on trucks. The truckload limits increased to more

Exhibit 2.3 : Rail Productivity has Lagged behind other Transportation Modes



¹Source : European Conference of Ministers of Transport (ECMT).

than 40 tons (across Europe), and are likely to increase still further. Some countries, such as Sweden, have already raised the limit to 54 tons, and are in the process of increasing truckload limits further. The new legislation benefited roadways, as freight customers shifted from railway-wagons to trucks.

Roadways and airways also continuously improved their productivity continuously. The road costs per ton in US reduced by a third between 1970 and 1995. The investment productivity (investment/ton km) of roads in Europe also improved by 40 per cent between 1970 and 1990. Similarly, productivity of airways improved by 25 per cent over the same period. On the other hand, rail costs per traffic unit increased by almost 90 per cent between 1970s and 1995 (**Exhibit 2.3**).

Road transport had another advantage over Rail. Truck and car users did not need to pay infrastructure costs except as taxes embedded in fuel taxes. Governments were keen on investing in road infrastructure. Increasing affluence in Europe led to widespread car ownership. Thus the lobby for highway investment was an almost universal lobby. Year after year, European governments invested more than two thirds of their transportation budgets in roads and less than a quarter in railways (see box on Germany). This phenomenal investment in road infrastructure allowed roadways to achieve the dominant position that railways had commanded for decades. It could now offer not only lower costs, but valuable door-to-door service as well. Increasing containerisation of cargo further enhanced this. Road traffic in Europe increased by over 60 per cent between 1975-90, whereas rail traffic grew by less than 12 per cent over the same period²

Due to market demand and increasing competition, the railways' market shares dropped consistently over the years. The rail market share in Europe halved from 30 per cent in the 1960s to 16 per cent in the late 1980s¹. In Japan, the passenger market share dropped from 50 per cent in 1950s to less than 25 per cent in the 1980s. Rail freight was decimated by road in Japan³ as well.

(iii) Public service focus affecting internal performance

For several decades the key objective of the railways was to offer a public service rather than managing a commercial enterprise. In many railways, the employees acquired civil servant status. This sometimes led to higher overall costs, and often reduced management flexibility.

Moreover, as often happens with government ownership, the large operations of the public service oriented railways slowly became a means to safeguard national employment. Railways became so overstaffed that at the time of restructuring, Swedish cargo operator SJ Cargo could function with just 30 per cent of its previous staff⁴. Labour unions in some countries, e.g., France, Italy, and Austria, became powerful on a national scale and defended privileges of the railways staff. Negotiations for improving productivity proved to be very difficult and achieved only an incremental success.

Phenomenal investment in road infrastructure allowed roadways to achieve the dominant position that railways had commanded for decades. It could now offer not only lower costs, but valuable door-to-door service as well. Increasing containerisation of cargo further enhanced this. In the late 1980s and early 1990s, because of the increasing burden of social security governments wanted to reduce subsidies wherever possible. As a sizeable portion of government budgets was kept for the railways, cutbacks directly affected the funds available to them

²Source : Rail International Journal, 1999

³Source : East Japan Railways

⁴Source : S. J. Cargo

These factors brought about low profitability and productivity, and low responsiveness to changing customer needs. However, the governments continued to subsidise railway systems. A vicious cycle of state funding leading to greater inefficiencies and a higher demand for subsidies was the consequence.

Vast debts led to two problems. First, the stakeholders, such as governments, the public and the customers, all thought that the railways were a declining industry. Second, these debts became a burden on the managers and led to a decline in motivation

(iv) Reduction in government support

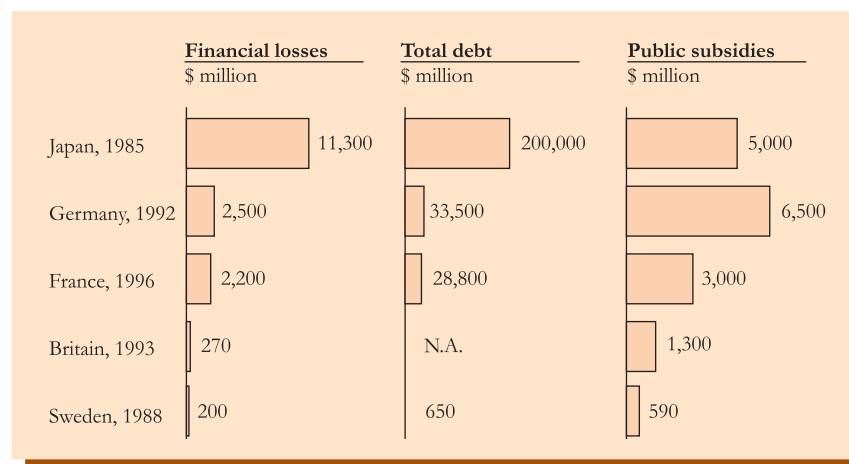
In the late 1980s and early 1990s, governments turned the tide and tried to push back the boundaries of taxation and government support. Partly because of the increasing burden of social security in most developed countries, they wanted to reduce subsidies wherever possible. As a sizeable portion of government budgets was kept for the railways, cutbacks directly affected the funds available to them. Thus the governments reduced investments in rail infrastructure. There were almost no infrastructure investments in Britain (new lines or rolling stock) during the 1970s and 1980s. In the thirty years period before restructuring in Germany, railways accounted for only 11 per cent of the total investments in transportation.

These four reasons led to a financial crisis of growing proportions. The crisis became a threat to the very survival of the railways. Japan National Railway (JNR) lost US \$10 - 15 billion every year in the early 1980s. Cumulatively, the four key railways in Europe — SNCF (France), DB (Germany), SJ (Sweden) and British Rail— were losing more than US \$5 billion every year. The respective governments and the railway management were greatly concerned about these falling figures; so were the unions, as they feared large job losses and a stagnant future for their members.

Continuous financial losses over several years resulted in large debts. In Germany and France alone, railway debts were more than US \$60 billion at the start of the 1990s. Japan National Railways (JNR) owed a staggering \$200 billion (**Exhibit 2.4**) in the early 1980s.

These vast debts led to two problems. First, the stakeholders, such as governments, the public and the customers, all thought that the railways were a declining industry. Second, these debts became a burden on the managers and led to a decline in motivation. Interviews across several railways revealed

Exhibit 2.4 : Several Railways were Burdened by Financial Losses, Debts and Subsidies



Note: Years just before restructuring exercise.

Source: EU, SJ, East Japan Railways, SNCF, Deutsche Bahn, SJ Cargo, Railtrack.

that the financial state of these companies demoralised the managers to undertake any operational improvement. The managers in these railways felt that the high interest costs would overshadow any operational improvement.

2.22 Specific Reasons for Restructuring in Europe

While these forces of change were common to all railways, they differed in the finer details in each country. This was especially true in Europe, where different national events triggered off the change process.

(i) Creation of the European Union

The first change to affect the entire rail system in Europe was the creation of a single European market. This resulted in new legal frameworks that affected not only public utilities, like water supply, electricity, etc., but also the entire transportation system. After the European Union was created, the European Commission (EC) drew up a directive (EEC 91/440) that defined a framework for the uniform deregulation and liberalisation of the railways. As with other public utilities, the European Union's directive aimed to improve efficiency and create a competitive environment for railway operations.

To create competition in the railways, the EC suggested a new industry framework similar to that of other transportation sectors, like roadways and air, and proposed the separation of infrastructure from operations (see **Box 2.1**). This framework provided a basis for the stakeholders of the rail system (large freight customers, politicians, unions, etc.) to lobby for rail restructuring, to further their own interests.

The large industrial companies in steel, energy, and mining etc., wanted better service and lower costs and hence exerted pressure on governments to adopt the changes proposed by the European Union. The freight users lobbied with the government in various forums and often threatened to further reduce rail use. The local governments wanted to improve the quality of life in the cities and wanted to reduce their budgets, and hence they supported large users in creating the pressure to restructure railways. Thus the EU directive acted as a catalyst for the change process.

The EU directive acted as a catalyst for the change process. Change was demanded from almost all quarters – customer lobbies, large and small, the government, and international bodies like the European Commission

Box 2.1 : European Commission Proposals

To make the railroad system more competitive in Europe, the European Commission produced its first proposal in early 1990s (Directive EEC 91/440). The objective of Directive 91/440 (later supplemented by Directives 95/18 and 95/19) was to **“Facilitate the adaptation of Community railroads to the needs of the single market and to increase efficiency.”**

The three main proposals were:

Provide national railroads with legal autonomy, management independence, independent internal control and sound financial structure. The railways were to manage themselves as commercial companies and determine their own business plans, including investment and financing programmes. Railway undertakings were proposed to have freedom in establishing new organisation structure, sales and marketing, pricing, procurement and staffing. The railway companies were also independent to start new activities associated with railway business.

Separate the management of railroad operations and infrastructure from the provision of transport services. It was required that the accounts for business relating to the *transport services* and those for business of *railway infrastructure* be kept separate. The two entities could either be distinct profit centres in one company, or separate entities altogether. The manager of the infrastructure was to charge an access fee for use of the railway infrastructure. The user fee was to be calculated in a way to avoid any discrimination between various transport service providers.

Allow international licensed open access without discrimination. All international, national or private railway operators

Governments and organisations like the European Commission were increasingly concerned about energy costs. They understood the economic importance of carrying certain types of traffic by railways. In addition, alliance mechanisms such as inter-modal transport offered opportunities to create synergies across the various transportation modes

(ii) Country-specific events

Specific events in Britain and Germany triggered the restructuring process and created distinct models.

In the United Kingdom, restructuring efforts began in the early 1980s, when customer-focused units were created in place of regional units, but radical privatisation took place only in 1995. The British Conservative Party's privatisation momentum that had already led to the privatisation of the nation's energy, water, gas, air travel, among others, eventually privatised British Rail.

In Germany, the restructuring process was initiated by several factors. The first was the re-unification of the country. This brought about the need to merge the two railways, east and west, and harmonise the status of employees in the two entities. The second factor was the huge quantum of debt mentioned before. And, finally, with nine neighbouring transit countries acting as potential competitors, Germany considered implementing rail reforms to remain an industry leader. These factors forced the German government to speed up the restructuring process.

Thus, change was demanded from almost all quarters – customer lobbies, large or small, the government, and international bodies like the European Commission.

2.3 How to Restructure : Approaches to Change

As the railways moved closer to disaster, their stakeholders realised that the railways could be crucial both for the economy as well as the environment, if they were given the freedom and the means to reinvent themselves as market driven corporations. While the general direction was clear, the question was – how to revive them? The questions about the approach were by no means trivial, as railroads were huge institutions, with a large legacy from the past.

Governments typically take a three step approach: first, to reassess the value of the railways to the economy, second, to institute structural changes, and third, to manage the transformation process.

Exhibit 2.5 : Railways are Environmentally Superior

Evaluation Methodology							
Air	Passenger Traffic (ECU/1,000 Pkm)			Freight Traffic (ECU/1,000 tkm)			
	Road		Rail	Air	Road	Rail	
	Car	Bus					
Acid*	32.3	9.4	1.9	N.A.	22.2	0.9	N.A.
Noise*	4.5	4.2	3.1	3.0	12.7	4.7	16.5
Air Pollu.**	6.6	4.1	2.0	5.0	13.0	0.7	26.3
Climate**	6.6	2.7	3.0	9.8	10.6	1.1	50.5

Note : Evaluation methodology for cost. * Willingness to pay, ** Prevention costs.

Source : IWW/Infras, External Effects of Transports, November 1994. All figures on external costs refer to the 15 member states of the European Union, plus Switzerland and Norway. The figures were also used by the ECMT and in the EU Green Paper on "Fair and Efficient Pricing".

2.31 Reassessing the Value of Railways – From Sunset to Sunrise

Governments and organisations like the European Commission were increasingly concerned about energy costs and environmental degradation. They looked for ways to address these issues. They concluded that repositioning railways as a business could create both economic and environmental value for economies. They understood the economic importance of carrying certain types of traffic by railways. In addition, alliance mechanisms such as inter-modal transport offered opportunities to create synergies across the various transportation modes.

(i) Railways are cleaner and energy efficient

Trains are both environmentally friendly as well as energy-efficient. The environmental cost of transporting passengers by train in densely populated areas is 50-80 per cent lower than by road. The environmental cost of freight movement by train is eight times lower than by road (Exhibit 2.5), especially in situations when block trains filled to capacity could shuttle between hubs and large distances. In addition, railroads solve the problems of road congestion and the associated social issues of concentrated vehicular pollution, parking problems, traffic congestion, etc. This consideration motivated governments to increase the share of railways in the transportation market.

(ii) Railways are more economical for certain freight and passenger customers

Railways are economically superior to other modes in specific services, such as long haul freight transportation, high-speed trains for medium-distance passengers and local/suburban passengers. For example, bulk freight movement for distances greater than 300-400 miles is cheaper by rail. In addition, high-speed passenger trains offered a competitive alternative to airlines and roadways, in particular for distances between 200 to 600 km. These trains allow similar point-to-point movement times between cities at prices three to five times less than airlines. For example, the cost of travel between Cologne and Paris by a high-speed train is 3.5 times cheaper than by air, although the travel time between the two cities is roughly the same, considering the inner city location of main stations. Commuter trains offer a better alternative to congested roads and traffic jams, and are more economical propositions for cities.

(iii) Inter-modal transport helps capture synergies across transportation modes

Alliance models like inter-modal transport allow railways to synergise with competitor modes, such as roadways and waterways, and to offer point-to-point delivery of freight in accordance with customer requirements. The connection of airports, bus services and railways also offered better service to the passengers.

In the 1990s, the fundamental advantages of railways supported by innovations in railroad technology, encouraged governments to review their vision and growth aspirations for the railways, and set in place a process for restructuring.

2.32 Instituting Structural Changes

Achieving these aspirations, however, was not easy. While each railway adopted a different approach, several of the changes were common across all railways.

Due to the high level of integration between segments, it was difficult to distinguish those parts of the business that were being subsidised from those that were making a profit. This lack of transparency resulted in a lack of accountability, and the railways management found it hard to identify the areas on which to focus

In order to operate like a business, the railways needed to be separated from the government. Railways identified their public service obligations. They then drew up contracts with their governments to ensure state funding of these obligations as well as the efficient use of these funds

(i) Common approaches adopted by all railways

All railways adopted three restructuring principles: (1) creating an arms-length relationship between the railways and the government; (2) inducting management with commercial skills to create customer-focused organisations; and (3) defining the appropriate business focus and spinning off non-core businesses.

- **Creating an arms-length relationship between the railways and the government.** To run the railways profitably and commercially, the railways management needed to take decisions independent of the government. This was necessary to speed up the decision-making process and to ensure that business, rather than political considerations drove it.

It was also imperative for the railways to reorganise and establish clear management accountability supported by a system creating transparency. The prevalent system of blanket subsidies that covered all areas of the railway business did not allow adequate distinction between its commercial and public service segments. In other words, due to the high level of integration between segments, it was difficult to distinguish those parts of the business that were being subsidised from those that were making a profit. This lack of transparency resulted in a lack of accountability, and the railways management found it hard to identify the areas on which to focus. This led to a sub-optimal allocation of resources, and performance suffered. Interviews with the railway experts in Europe and Asia suggested that this lack of clear accountability created a culture of “management by excuse” rather than management by performance.

To resolve these issues, a new structure of financial flows between government and railways was defined. Railways management was given more autonomy on day-to-day decisions within the framework of business plan jointly agreed between railroad and government. The new governance model helped create transparency and management accountability between the government and railways.

In order to operate like a business, the railways needed to be separated from the government. Today, Deutsche Bahn (DB) in Germany, Railtrack among others in Britain, Ferrovie Dello Stato in Italy and all railways in Japan, are autonomous railway companies, distinct from the government. In China, where rail restructuring is currently in progress, the objective of the railways reform is to create a “clear distinction of production and ownership, clear demarcation of ownership and responsibility and separation between governmental and enterprise functions”.

Railways identified their public service obligations. They then drew up contracts with their governments to ensure state funding of these obligations as well as the efficient use of these funds. Distinct performance measures were set up for the commercial and the social service segments of the business. While the yardsticks for the commercial segment were business measures such as Return on Equity and Profitability, those for social service were purely operational, such as Efficiency, Punctuality, Cleanliness, etc. The Swedish government, for example, established Return on Equity as the measure for SJ in early 1990s. Subsequently, in the mid 1990s, the German government put into place similar performance measures for Deutsche Bahn.

While these accountability and transparency measures were being instituted, the railways went ahead and created customer-focused units such as Passenger and Freight units in Sweden, and Long Distance Passenger, Short Distance Passenger and Freight units in Germany.

To support this change, the governments also helped resolve the legacy of large debts and surplus staff. Individual governments evolved different support mechanisms to tackle these problems. The Japanese government created a new organisation called the Japanese National Railway Settlement Corporation. This corporation took over most of the debt of JNR amounting to \$189 billion. The newly created companies paid off JNR's debts by turning over land and other assets to the Settlement Corporation. The government decided to bear the debt remaining after liquidation of assets. The government also took on the responsibility of redeploying almost a third of the total workforce made redundant due to restructuring. In Germany, too, the government created an organisation (BEV), which took over the legacy of debt and redundant staff. This organisation redistributed personnel to the new entities in Deutsche Bahn, based on their requirements.

- **Inducting management with commercial skills to create customer focused organisations.** Given their long history of monopolistic and bureaucratic governance, the railways were mostly focused on their own concerns. To achieve commercialisation, they had to shift their focus from fulfilling their own needs to fulfilling customer needs. In addition, the organisation's culture had to change from slow, bureaucratic methods to faster, professional ones.

To increase customer focus, the railways had to attract talent from outside the industry. This process started at the top with the induction of new senior management. CEOs of more than seven out of the ten large railways in Europe and Japan today have non-railway backgrounds. Outsiders replaced almost 80 per cent of senior management in Sweden. Japan and most other European railroads (Spain, Italy, Austria, Sweden and the Netherlands) followed suit. Fresh talent was recruited also at middle and junior levels. These managers not only brought in commercial expertise and a new perspective, they were also the driving force behind the creation of a commercial and customer focus in the organisation.

- **Defining the appropriate business focus and spinning off non-core businesses:** In the past, due to lack of supplier availability, the railways had undertaken a large number of unrelated activities such as manufacturing, catering, maintenance, telecommunications, etc. themselves, that were not core to the rail operation. Although suppliers gradually became available, the railways still continued to undertake these non-core operations. Over time these new suppliers used improved technologies and created more efficient equipment (e.g., better rolling stock). However, the railways were tied to old technology and old capital investments, and were unable to take advantage of the new and more efficient technologies on offer. In addition, the large set of non-core operations took away valuable senior management time, better spent on the core business.

To become more focused, they decided to spin off these non-core activities and concentrate on the core business. For example, railways in Europe and Japan have long outsourced activities like rolling stock manufacturing. Even the Chinese Railways is in the process of separating

The organisation's culture had to change from slow, bureaucratic methods to faster, professional ones. To increase customer focus, the railways had to attract talent from outside the industry. This process started at the top with the induction of new senior management

Railways had undertaken a large number of unrelated activities such as manufacturing, catering, maintenance, telecommunications, etc. themselves, that were not core to the rail operation. The large set of non-core operations took away valuable senior management time, better spent on the core business

these activities. China has reorganised its rolling stock manufacturing (China Railway Rolling Stock Industrial Corporation) and construction operations (China Civil Engineering Construction Company) as companies separate and independent from the railway transportation industry. It is also in the process of redeploying 1.1 million employees in engineering, construction, rolling stock manufacturing, goods and materials, and communications outside the railway industry.

(ii) Additional restructuring models adopted by a few railways

Most railroads of the world adopted the basic restructuring approaches mentioned above. In addition, political and economic conditions led to specific restructuring paradigms that distinguish European from Asian railroads.

• **Opening up of markets to competition by European deregulation.**

While all railways were restructured in line with the common approaches described earlier, Europe attempted to introduce market competition. To achieve this, the European Commission introduced two important structural changes: (1) it separated the infrastructure and railway operations; and (2) created an independent regulator to oversee contractual relationships between railway operators and the “neutral” infrastructure.

- **Separating infrastructure and operations.** Restructuring in Europe started in 1988, with Sweden separating the infrastructure and operations into two separate companies – BV (the infrastructure service provider) and SJ (the operator). The European Commission promoted this framework for all European railroads. Most European countries adopted this model, with some variations. In this model, the Infrastructure Company is a national monopoly subsidised by the state, undertaking traffic management, slot allocation, signalling, station management, etc. Commercial operators of rolling stock equipment (locomotives, wagons, coaches, etc.) offer passenger and freight transportation services and compete for final customers.

This model is similar to that of airlines, where the operation of airports is separated from running the airline services. It creates competition by allowing new players to compete with the incumbent railway operating company. While all European railroads have adopted this structural model in principle, the degree of separation ranges from separation of accounts in a business unit organisation (Spain) to a complete disaggregation of the railroad into different corporations with independent capital structure (Britain). (**Exhibits 2.6, 2.7**).

- **Creating an independent regulator to oversee contractual relationships.** Along with the separation of infrastructure and operations, most European countries also created a regulator to act as an “umpire” between the new entities (primarily, the operations and infrastructure) and to be responsible for defining standards and ensuring fair competition. However, regulatory role and structure in different countries are different. In Britain, the responsibility of the regulator extends to ensuring security, slot/capacity allocation, and infrastructure planning and financing. The German regulatory body is a large organisation (with over 2000 personnel) and has autonomous units distributed by region/state. These regulatory units also control and monitor the safety and security of the railway operations (**Exhibit 2.8**).

The European Commission introduced two important structural changes: (1) it separated the infrastructure and railway operations; and (2) created an independent regulator

Exhibit 2.6 : Synthesis of the Elements Common to European Rail Deregulation

Separating the infrastructure	<ul style="list-style-type: none"> • Effective separation to facilitate access of other operators • Setting an access fee to finance the infrastructure - at least partially
Opening railroad operation to competition	<ul style="list-style-type: none"> • Gradual competitive bidding of passenger railroad markets, clarifying rules and access mechanisms <ul style="list-style-type: none"> – Stage One: Regional and commuter traffic (state-subsidised) – Stage Two: Long-distance traffic • Liberalisation of freight market with free access to rail network
Active role of the State	<ul style="list-style-type: none"> • Creations of a regulatory body-independent from the operators and infrastructure - to act as an arbitrator for the system • Structural rationalisation of the railroad system (debt and surplus staff) • Driver of the business adaptation of the traditional operator

Exhibit 2.7 : Degree of Separation of Infrastructure in European Countries

Business unit	Independent corporation in a Holding	State-owned company	Independent privately-owned Company
Spain RENFE <ul style="list-style-type: none"> • Infrastructure and operations separated as independent profit centres • Operations further separated as profit centres of long-distance passenger, high speed and freight 	Germany DB Netz AG (1999) <ul style="list-style-type: none"> • Initially created as a business unit within DB AG (1994) • Became an independent company within DB AG holding in 1999 • Future separation from DB AG holding by 2002/2005 	Sweden BV (1988) <ul style="list-style-type: none"> • Created in 1988 and owner of the whole Swedish railway network 	Great Britain Railtrack (1996) <ul style="list-style-type: none"> • Became owner of railway infrastructure after British Rail disintegration • Railtrack initial public offering in 1996
Italy FS <ul style="list-style-type: none"> • Infrastructure and operations separated as independent profit centres • Operations further separated as profit centres of long-distance passenger, high speed and freight 	Netherlands (today) NS Infrastructure; NS Traffic Control; Railned <ul style="list-style-type: none"> • Specialized semi-government agencies (Maintenance, Traffic Control, Slot allocation) • Currently managed in an independent way within NS Group 	Netherlands (year 2000) NS Infrastructure; NS Traffic Control; Railned <ul style="list-style-type: none"> • All three agencies to become absolutely independent from NS • In the future may be merged into one single agency 	
		France RFF (1997) <ul style="list-style-type: none"> • Ownership of the French railway infrastructure • Management and maintenance assigned to SNCF 	

Minimum requirement pursuant to Directive EEC 91/440

Source: McKinsey & Co.

Exhibit 2.8 : Government’s Role in Deregulation

Common elements	Differentiating elements
State as a change facilitator for historical legacy management	<ul style="list-style-type: none"> • Different models for managing the historical legacy <ul style="list-style-type: none"> – Partial and progressive – Total and initial
State’s regulatory role	<ul style="list-style-type: none"> • Regulatory can be performed by a single body (Germany), by two bodies (Britain), or even three (Netherlands) • In some models slot allocation is still performed by the infrastructure manager (Germany)
State ownership of different elements/rights of the models	<ul style="list-style-type: none"> • Articulation through State agencies or entities (BV in Sweden, NS Trust in Netherlands, RFF in France) or through a State-owned corporation (DB Netz AG in Germany) • In some cases, possible transformation of Company structure and possible privatisation (Germany)
State as body responsible for contracting out public services	<ul style="list-style-type: none"> • Participation by Swedish CTAs in planning developing and maintaining local lines

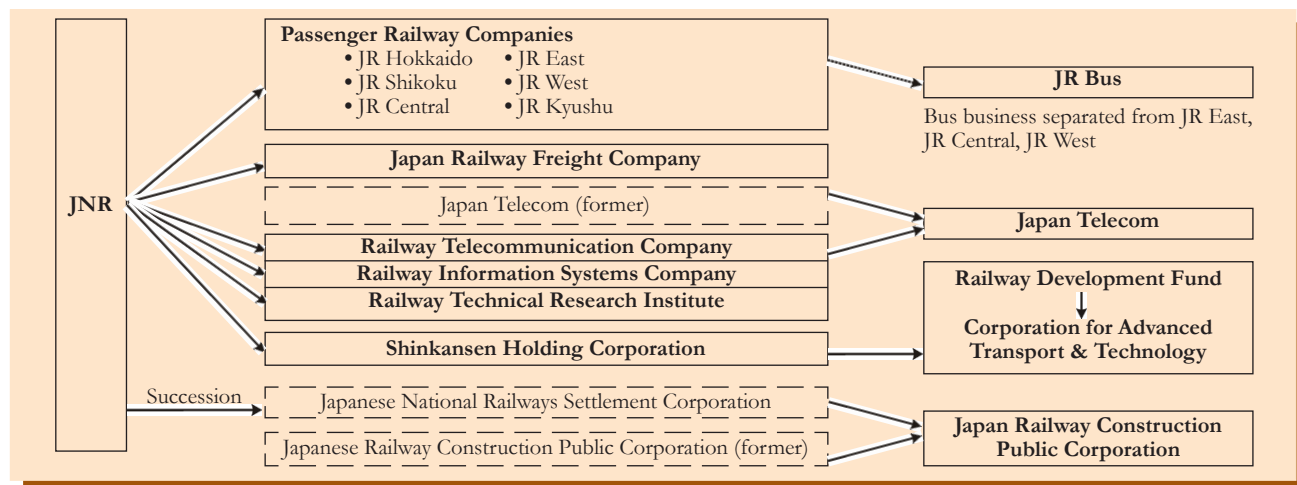
Source : McKinsey & Co.

The reason for separating infrastructure and operations in Europe was driven by the need for competition on the tracks, both within as well as across the borders of various European nations. In addition, the European legislation intended to replace the old system with a new structure, in which a number of pan-European railroads would provide seamless operations between hubs, and compete for customers. It was considered that only the creation of a European rail market would lead to a revival of the rail sector and its competition vis-à-vis road.

European countries also created a regulator to act as an “umpire” between the new entities (primarily, the operations and infrastructure) and to be responsible for defining standards and ensuring fair competition

- **Creation of regional entities in Japan and China:** These two countries have adopted a very different model of restructuring—regionalisation. They created vertically integrated and geographically separated railways within the country. The reasons for adopting such a structure are geographical.
 - **Japan** is made up of several islands and most of the traffic is regional and passenger-focused. Regional entities made the network more focused and manageable, where a national railway would have little synergy. The Japan National Railway was divided into six regional passenger railway companies and one freight company covering the entire country (**Exhibit 2.9**). The Japanese also created the Japanese National Railway Settlement Corporation to help new rail companies manage their large debts and surplus manpower. This trend is similar to the passenger-focused railways in Europe that created several regional operators (e.g., DB Regio, etc.) to manage the needs of local and regional travellers, suburban traffic, etc.
 - In **China**, a regional structure reduced the management complexity associated with long distances and a vast network (See **box 2.2**). Chinese railways separated several parts of the railway business into independent subsidiaries and even private companies. For example, the Dalian Railway Sub-bureau, one of the 100 pilot projects of Chinese Railways, was reorganised and converted into the Dalian Railway Limited Liability Company. Similarly, the Guangzhou-Schenzen Railway Company was reorganised into the Guangzhou-Schenzen Limited Shareholding Company and is now listed on the international market. The Guangzhou Railway bureau has been converted into a group company. This regionalisation has helped Chinese railways decentralise operations and push decision-making to the regions.

Exhibit 2.9 : Japanese Railways was Radically Restructured During the 1970s and



1980s, most railways were either part of the government or were state-owned corporations. As they adopted the restructuring models discussed before, some of them were also privatised. Railways in Britain and Japan have already been privatised, and others, like DB and SJ, are moving in this direction.

- In **Britain**, railways are completely privatised today. Each part of the business such as infrastructure, operations, rolling stock, and maintenance, is private. British restructuring took place in two phases.

The first phase was in early 1980s and second in mid 1990s. In the first phase, the British Rail organisation's structure was changed from a geographical regional structure, in which the country was divided into classic regions like southern region, great western region, midland region, and Scotland, to business units. The new structure contained separate product groups, such as inter-city passenger travel (high-speed service), local/regional railways (around suburbs), suburban services around London, and freight business. There were also some common facilities used by these business groups such as Engineering and Technical services, Signalling, etc.

In the second phase, British Rail was split into almost 100 companies (1 infrastructure, 25 passenger operators, 6 freight operators, 3 leasing companies, 22 engineering companies and more

Box 2.2 : Railway Restructuring in China

The Chinese railway system is a large (58,000 km of standard gauge line, 3.3 million employees), regionally managed (14 geographically-based Administrations) network. It is freight dominated (80 percent freight versus about 40 percent for IR), and has no suburban operations. A central Ministry of Railways oversees it. The MOR Administrations are roughly similar in size and passenger traffic to Indian Railways' Zones, though they carry significantly more freight. In total, MOR China carries about 7 times as many ton-km as IR, though the two systems are almost equal in passenger-km.

Because of its "command and control" legacy vis-à-vis China's new socialist market economy, MOR has recognized that it has a number of serious challenges. The roles of government versus enterprise are confused. Geographic fragmentation causes higher cost and poorer service, duplicates management positions and prevents competition in the rail sector. MOR is organized for production, not markets, and it has no information on which to permit line of business management. Like many survivors of the planned economy, it carries heavy social roles, and has many non-core distractions such as manufacturing companies.

The Government has decided to reform MOR in order to separate government roles from those of the rail enterprise, to restructure the new enterprise in order to better serve the transport market, and to encourage a commercially driven approach to the rail business. MOR is already committed to several initial actions: make non-core activities independent of the railway; transfer social functions to governments; create separate passenger business at the Administration level; improve business management through traffic costing models; and, spin off uneconomic branch lines through localization, explicit public support or concessioning or privatization.

MOR's longer term program will include potential creation of freight enterprises, separation of infrastructure from all operations, merger of some operating companies across Administration lines, formation of specialized companies and separation companies to own and lease rolling stock. These changes will be implemented over a period of years. The changes may well include introduction of private investment in rail operations: in fact, the high speed Guangzhou to Shenzhen railway has already floated some of its stock in foreign stock exchanges.

Rail service is essential to the Chinese economy and a restructured railway will be a critical part of the future market economy in China. Even so, disruptions due to restructuring would be unacceptable. The Government has accordingly decided to proceed at a measured pace with most innovations being tested first by experiment and demonstration before general implementation. In addition, the transitional organization of the railways will almost certainly retain a large measure of centralized control over scheduling and dispatching in order to ensure reduced conflicts among operators.

Note by Louis Thompson, World Bank.

Railways are large employers and there is loud public concern regarding job losses after restructuring or privatisation. In many cases, the railroad lacks a vision how to engineer the railway transformation without creating social hardship

than 40 associated companies), and each entity was independently privatised. The privatisation process helped the government address the problem of huge subsidies and attracted new talent and commercial skills to the railways. It also opened the railroad to private financial resources (equity markets, debt markets). Privatisation was undertaken swiftly (considered hasty by many) and completed within two years (**Box 2.3**).

While the final judgement on the success of British Rail's radical privatisation is still open, several experts opine that the execution was not perfect. As no reference models for assessing value of the assets existed at that time, the break-up went too far, and several assets were sold under their market value. Speculative profits (~ \$2 billion) were generated by a few individuals during the sale of rolling stock companies (ROSCOs). The freight sector reconsolidated in a very short period of time, with only two rail freight companies controlling the total market.

- **Japan** also privatised the railways, and split it into several independent and private regional railroad organisations. Several parts of railways in **China**, such as Guangzhou-Shenzhen and Gwyang Rolling Stock, have also been partly privatised.

Railway operators in Germany and Sweden also plan to attract private investment in the short term.

Even though privatisation of national infrastructure has been gaining ground all over the world, governments are slow in applying this principle to rail. In many countries, railways are still felt to be a part of the national heritage. Railways are also large employers and there is loud public concern regarding job losses after restructuring or privatisation voiced by the national stakeholders. In many cases, the railroad lacks a vision how to engineer the railway transformation without creating social hardship.

2.33 Managing the Transformation Process

In the interviews with railway experts, almost everybody agreed that the transformation process for all railways could have been started sooner. The government and the railway management in each country had denied the railways the opportunity to be a business and not a bureaucracy. This had resulted in enormous financial losses and a public loss of faith in the railways system. Only when the situation became very serious, the government decided to take a firm action and initiated the reform process. A radical change in the railways was vital if the industry was to continue.

Railways restructuring models, both universal as well as specific, were radical, and involved the complete overhaul of these colossal organisations. While governments orchestrated the change, the process required careful management of other stakeholders such as, railways management and unions.

(i) Managing government support

The government took an active role in restructuring. It was the government that imposed the change in most countries. German rail reform was an act of parliament. The Japanese and British governments were responsible for disaggregation and privatisation of the railways. And the Ministry of Railways in China was the main force behind the change process. (**Box 2.4**)

(ii) Managing railways management

Government and the railway management in each country had denied the railways the opportunity to be a business and not a bureaucracy

Box 2.3 A Brief Overview of UK Railway Privatisation

In July 1992, the British Government published a white paper, 'New Opportunities for the Railways'. This set out a new structure for Britain's railways, which was radically different from that of the state-owned monolithic British Railways. Subsequently, in 1993 the legal framework to achieve a privatised railway industry, supported by public subsidy for some services, was put in place, and the disaggregation of British Railways began. In essence the new structure contains 9 types of entities –

1. Infrastructure and network management undertaken by Railtrack.
2. Passenger train operations undertaken through franchise by 25 train operating companies (TOCs). The franchises were bid for by rivals, with the franchise duration varying from 5 to 15 years, with the majority being about 7 years.
3. Rolling stock initially owned by 3 rolling stock companies (ROSCOs) which have long-term leases with TOCs.
4. Rolling stock maintenance undertaken by 6 companies set up to provide contracted services.
5. Maintenance and track renewal works undertaken by companies which bought former BRIS units in competitive trade sales (6 IMC, 7 TRC).
6. A large number of smaller companies set up to provide design, project management, specialised engineering services, computing, training, and research.
7. Freight services to be operated by 5 freight operating companies (FOCs).
8. A Franchise Director appointed by Government to award passenger train franchises and to manage the flow of public funds to subsidise passenger services (OPRAF).
9. An independent Regulator appointed by Government to licence all key activities and to apply regulations through the powers of the 1993 Act.

Track access charges are paid to Railtrack by train operating and freight operating companies. The other entities are tied to each other as customers or suppliers through specific contracts.

As a part of privatisation, train operators were required to confirm minimum levels of public service and to accept real price reductions through formulae on specified services and types of ticket from 1999. Historically British Railways had developed and used criteria for punctuality and reliability through its Customer Charter. Punctuality is measured by arrival time at the terminal station, while reliability is measured by the percentage of operated train services. These criteria have been built into monitoring systems overseen by OPRAF. A new performance regime was introduced. With this system the timeliness of all trains operating throughout the network are continually measured, at about 1000 monitoring points. Any delay of more than 3 minutes must be accounted for, and responsibility for the delay attributed to either the train operator or Railtrack. The delays are aggregated over a 28-day period and the average delays are then compared with benchmark figures, which are derived from a government-led calibration exercise in 1994-95. Depending on the outcome, bonus payments or penalties are handed out to Railtrack, its maintenance contractors or train operating companies. In the first full year of operation, the delays on the network were reduced by 30 per cent with Railtrack-attributed minutes being reduced by 38 per cent. The money flows are significant for all parties and this feature of privatisation was a major motivational factor for the new industry in 1996.

The privatisation of Britain's railways initiated by the previous British Government was successfully achieved within a very short time. While some issues have been judged to be unsatisfactory by the present government, they accepted contractually based private industry structure as the way forward. They proposed modifications to the duties of the Regulator and the formation of the Strategic Rail Authority (SRA) and expect to introduce these through primary legislation.

One can conclude that the overall rail restructuring process in Britain has been successful. Safety performance has been sustained and improved. The market place is confident, as reflected by the appreciation in equity value of listed companies with rail transport interests. Unexpected growth in passenger travel and freight transport has helped identify capacity limits at some locations in the rail network. Railway services can be delivered through formal contract relationships between companies that are separate legal entities. The clarity that this brings from core business has helped improve both financial and operational performance and foster win-win attitudes, to focus on delivering a seamless service to the travelling public. Constructive relationships between the regulators and the railway companies have improved the scope for protecting the public interest for vital rail. Public expectations of the quality of service required from rail travel have increased as a consequence of privatisation. This is both a challenge and an opportunity. The liberation of creative energy from many individuals who worked in the former British Rail has been a significant factor in developing new commercial ideas based upon a sound understanding of railway practice.

The focus upon public transport services, and the move to provide a strategic framework by the current British Government, provides a great opportunity to build upon the achievements of privatisation, for the benefit of the railways' customers and the company's shareholders.

Excerpt from paper "Innovation through Privatisation. The UK experience." by Professor Brian Mellitt, Chairman, UK Railway Forum.

Box 2.4 : The Reform of China's Railways

With the transfer of the planned state economic system to a socialist market economy, China's original railways system was found incompatible with the development of the market economy. The most outstanding problems were: (1) the functions of government administration and those of enterprise management were not separated; (2) the ownership responsibility was not well defined; (3) there were too many management layers and overlapping legal entities; (4) the transportation price system was not rational and the social security system was incomplete. All these problems have become major obstacles restricting railway development and operation. The objective of reform for state-owned enterprises in our country is to establish a modern enterprise system, i.e., new management systems of "clear distinction of production and ownership, clear demarcation of ownership and responsibility, separation between governmental function and enterprise function, scientific management". China's railways have speeded up reform according to these objectives.

Since 1992, Chinese Railways has been aiming to establish a modern enterprise system. Eleven pilot units have been selected throughout the country to start the modern enterprise system experiment. The Dalian Railway Sub-bureau, one of the 100 state pilot enterprises, and has been reorganised and turned into the Dalian Railway Limited Liability Company. The Guangzhou-Shenzhen Railway Corporation has been reorganised the Guangzhou-Shenzhen Limited Share-Holding Company and its stocks have been successfully listed on the international market, collecting a total of 4.5 billion Renminbi Yuan. The Guangzhou Railway Bureau has been changed into a group company, and has been included in the state's 120 large pilot enterprise groups. The China Railway Rolling Stock Industrial Corporation has been reorganised into a holding company; and the China Civil Engineering Construction Company, a group company.

Efforts have been made to reduce management layers, and we have disbanded some railway sub-bureaus. The Nanchang, Hohhot, Liuzhou, and Kunming railway bureaus have made experiments in directly administering stations and sections. Meanwhile, to optimise the allocation of resources, the grassroots stations and sections have been readjusted: 1,230 small railway stations with relatively small business volumes have been closed down; some passenger and freight stations and sections have been merged; and 138 locomotive and car depots have been disbanded.

Efforts have been made to improve the transportation income and the management of costs. This is being done to: a) conduct reforms in labour, personnel, wage distribution, and social insurance systems and raise economic returns; b) relax control over the prices of the railway industrial products; and c) to adopt the bidding system for the procurement of locomotives, passenger and freight cars, and the engineering projects. This will speed up the cultivation of the internal railway market and encourage orderly competition among enterprises.

In accordance with the principle of "overall planning, combining departments with regions, taking responsibility level by level, and co-operative construction," Chinese Railways is promoting the development of the jointly invested railways. At the end of 1998, the railways with joint investments built capacity totalling more than 3,000 km. More than 20 jointly funded limited-liability companies and limited shareholding companies have been organised.

Since 1998 China's railways have begun to deepen the reform. In 1998, the Ministry of Railways put forward an overall reform and development plan of "one objective, two major tasks and three footholds." One objective: Through large-scale development and construction lasting five years, railway transportation and services will reach a new stage, when they will basically meet social needs and the needs of the national economic development. Two tasks: Speeding up the construction of railways so as to live up to our responsibility for promoting national economic development; and making up deficits and increasing surpluses to make contribution to help large and medium-sized enterprises, including those in communications, to extricate themselves from difficult positions. Three footholds: Gaining footholds in deepening reform, in strengthening management, and in progress in science and technology.

To achieve these objectives, the Ministry of Railways enforced structural reform in three aspects in 1998. **First**, simplifying structures and reducing the number of employees. The organs at bureau level were reduced from 23 to 16, a decrease of 30 per cent; organs at department level, from 133 to 74, a decrease of 44 per cent; employees from 809 to 400, a decrease of 51 per cent. The transportation management department has been suitably adjusted, that is to say, the former five departments – transportation, locomotive, rolling stock, permanent way, and the signal & communication bureau – were combined as the transportation control centre (the Transportation Bureau). This department contains four sections — operations, dispatch, equipment and fundamentals department. **Second**, promoting separation of administration from management, strengthening the functions of macro-control management and supervision, weakening the functions of social and micro-control management, and establishing the main market status of the Railways Bureau, the Engineering Bureau and the factories. **Third**, smoothening the responsibilities of different departments and increasing operating efficiency. According to the principle of "letting each department do one thing", the responsibilities and power limits of each department have been ascertained, the functions among departments have been readjusted and those with the same or similar functions have been combined. Continuing to promote the reform in the direction of a modern enterprise system, and engineering bureau No.2 and the No.12 were changed into group limited companies, realising double-stock structure in which both the state and workers hold stocks. After being changed into a listed company, the Dalian Tielong Company and Gwyang Rolling Stock Factory got themselves listed on the stock market. The Qiqiha'er Rolling Stock Factory has been changed into a group limited company. Three rolling stock factories in Qishuyan, Ziyang and Chengdu, respectively, were combined into the Southern Railway Rolling Stock Group.

Today, increase in efficiency is being achieved through personnel reduction. The goal as a whole is to reduce the number of railway workers and transportation enterprise employees to 300,000 by the end of 2000. That is to say, a total of 1.1 million employees from the five companies involved in engineering, construction, rolling stock, goods and materials, and communications subordinated to the Ministry of Railways and organs of industry.

The development of China's railways mainly depends on the railways sector itself, but it is also necessary to bring in investment and technology and learn from foreign experience in railway reform and management. We will be expanding reform and opening up. We will actively bring in foreign investment and key technologies, promote production in the forms of joint ventures, enlarge railway foreign trade, develop the international transportation market, make efforts to establish a new set-up for reforming and opening up in an all-round way, and strive to realise the development goal of China's railways into the new century in a more effective way.

Excerpt from the Speech of Wang Xiankui, Senior Advisor, Ministry of Railways, China.

Most railways supplemented their senior management teams with commercial managers from outside. While the new managers and the government drove many decisions, renewal was required at all levels of the operations, from top management to frontline leadership. As most of these managers were outsiders, they brought in a fresh perspective, and acted as change leaders. At the same time, it was critical to use the knowledge within the railways system to define and create new roles such as the regulator, infrastructure managers, etc. In Austrian Railways (OBB), for example, it is the Human Resource Director, who is responsible for ensuring the implementation of changes across the company and leads the change team.

(iii) Working with trade unions

Effectively working with labour unions and garnering their support was crucial in almost all railways restructuring efforts. The unions had the potential to become a severe roadblock if they opposed the restructuring process, as it was the case in Italy and France. Making successful agreements with unions required continuous dialogue to ensure common understanding of the criticality of the situation and the need for action, between management, the railways, and the unions. (**Box 2.5**)

Whereas the unions generally supported the transformation process in Germany, Sweden, Austria, and Spain, there were several problems in Italy and the United Kingdom. Each country adopted its own approach to strike an accord with the unions. Moreover, several railways developed innovative mechanisms to get union support. Deutsche Bahn (DB) guaranteed a smooth transition by giving job security to its employees, transferring them to the government-owned company (BEV) that would then lease them back to Deutsche Bahn. British operators were obliged to take most of the employees from previous rail operators.

Transformation was a long process. Most restructuring efforts took more than 10 to 15 years and are still ongoing. Swedish restructuring began in 1988 and is still continuing. During the rail restructuring in Britain, the separation into products from regions was time consuming and took more than a decade to complete, while the final privatisation was quick and took only two years. Most rail executives also agree that, with the knowledge acquired during the transformation process, they can now undertake the change much faster. From today's perspective, the overall time span can and should be significantly reduced.

In addition to the length of time taken, restructuring took place in several phases. In Sweden, the infrastructure was separated early in 1988, but traffic control was kept in the hands of the operating company for several years and then transferred to the infrastructure company. Similarly, instead of fully separating infrastructure and operations in one go, the German railways (DB) first created a DB group, with infrastructure and operations as entities, reporting to a holding company. Other details such as management of railway stations, marshalling yards etc., are still being resolved in many European railways (See **Box 2.6**).

The unions had the potential to become a severe roadblock if they opposed the restructuring process. Successful management of unions required continuous dialogue to ensure common understanding of the criticality of the situation and the need for action

Transformation was a long process. Most restructuring efforts took more than 10 to 15 years and are still ongoing. Most rail executives agree that, with the knowledge acquired during the transformation process, they can now undertake the change much faster

Box 2.5 : Interview with Mr. Wilhelm Haberzettl, Chairman of the Railway Worker Union in Austria ¹

Interviewer: Mr. Haberzettl, you are both chairman of the Railway Workers Union in Austria and also a member of the board of the International Federation of Transportation Workers. So you have shaped the transformation of the railroads both at home and internationally. The railroads in Europe have been undergoing the process of transformation / reformation for almost 10 years now. What is your perspective on the process? Why did it begin and where does it stand today?

Haberzettl: The main reason for the reform of the railway system is that policymakers recognized that the railroads can make a major contribution to meeting our future transportation needs if we ensure that they are not only well equipped in technical terms, but also have a strong and efficient structure. Our goal and our vision is for the railroads to make a major - in fact, an even bigger - contribution to handling the volume of freight and passenger traffic in the future - for two reasons: because individual traffic on the road is not going to decrease and because rail transport makes a major contribution to protecting the environment.

Interviewer: In the transformation process, the key objective is to expand rail traffic and increase the market share and the significance of the railways both in the passenger and in the freight segments. Do you believe that you have been able to achieve both objectives at least for the present?

Haberzettl: I think that has to be viewed in stages. The first stage is the creation of the right framework, the right setting and the creation of options for the railway. The second stage is creating the necessary infrastructure and, in that connection, getting the necessary funding for investments. The third stage is then implementation. I think in Europe we are in the middle of the second phase. A lot of money is being invested in the railways, but there also has to be a mental adjustment process at the company and management level in order to overcome the traditional limits and isolation tendencies.

Interviewer: Are there any model approaches for cooperation between management and unions in creating the new structures? What examples or paths should be avoided if a railway, like the Indian Railway, also wants to go this way?

Haberzettl: I'll start with the negative side. Avoid the English approach. The unions were practically excluded before the debate. In terms of approach - I'll leave the results aside - the German approach was very reasonable. They found a broad consensus. The same goes for the northern European countries. I also think that we chose a good approach - including the potential involved.

Interviewer: The transformation of the railways has certainly brought about changes for the individual worker. There are new job profiles, and traditional ways of working have been replaced by new ones? In your opinion, have the necessary steps been taken to ease this process?

Haberzettl: I say emphatically "Yes!" The work of the union consists not only in softening the blow, but also in changing - or creating willingness to change - among the people affected and also a willingness to increase productivity also for the benefit of those affected. Naturally this is never really completely resolved from the union's point of view.

Interviewer: You mean that a part of the productivity gain has to be converted into a pay raise for the workers. Are there different ways of handling this from country to country?

Haberzettl: Partially, yes, but in terms of the basic idea they all choose the same way. Some countries focus on the social-welfare issues, other on the basic pay system - but ultimately a certain share of the efficiency improvement has to be shared with the people affected.

Interviewer: One consequence of the privatization of the railway is that traditional systems for pay and personnel development have been overturned. In many places, demands are made for more performance-based pay systems in place of the traditional seniority-based systems. What is your view of the possibility for the transition from the traditional way to the private enterprise system?

Haberzettl: That is a very thorny question for those of us in the unions, because it affects not only the active pay system, but also the company pension plan. The historical fact that railway workers gained their own pension system in recognition of their hard and demanding job, this in itself makes the transition difficult. It shouldn't be that accepting performance-based pay means having to accept disadvantages in the pension system. It is also hard to reach a fair judgment - how do you define performance-based pay? Opinions here divide along the lines of the corporation and the unions, because the two sides don't always see things the same way.

Interviewer: Do you see any signs of solutions for this issue? Are there approaches or models that are gaining acceptance? Ways that, on the one hand, secure workers' wages for a transition period and, on the other hand, create performance equality that are acceptable in your view?

Haberzettl: At the workshop level, we have started discussing the possibility of making the fringe benefits performance oriented. I think we are close to an agreement. The basic system would be a 60 per cent fixed share and 40 per cent in the benefits would be flexible - with a semi-annual or annual accounting period.

Interviewer: Those are the measures taken by the Austrian Railways. Are you aware of arrangements at the European level that could be regarded as setting an example?

Haberzettl: In those areas where performance-based pay is relatively easy to introduce (in the maintenance shops or construction), most countries have that, but based on different systems. Building on different systems, but when the total amounts involved are considered, the systems are not all that different. It is more difficult in operations. It is difficult to pay an engineer, the driver, in a more performance-oriented way. Should you pay him by speed, by kilometers or some other aspect that he can't influence?

Interviewer: Has the restructuring process had an influence on the unions themselves and how have the unions change in the course of this process?

Haberzettl: This process has influenced the unions everywhere in Europe. I think one has to admit that it wasn't easy for the unions, having to explain all the things that happened to the membership and to help them understand and come to terms with them.

Interviewer: In this structure discussion - are solutions or future models for the unions apparent?

Haberzettl: The general direction will be that we will no longer be so tightly pigeon-holed in our responsibilities. Future union officials will have to think cross-functionally. It will be absolutely necessary in order to gain flexibility in this organization.

Interviewer: In your view, what is the future role of the unions? Are there new elements or a new definition of the role of the union in the overall process?

Haberzettl: The unions' understanding of their role has to change - but I think also on both sides. The unions are at a crossing, either to contribute to the changes (which is no easy matter given the unions' responsibility) or to permanently play the role of the opponent. The dividing line is very thin. But I believe that these issues should not be viewed purely nationally. In the future it will be tremendously important and necessary to make certain strategic decisions for the union across multiple national borders. Here, I think there is a change in attitudes - and actions - in Europe that will probably also unfold in three steps.

Interviewer: Now I have a very last question. If you came upon a union that is more or less at the beginning of such a reform process and is entering unknown territory, knowing that it will experience things very different from the traditional ways - what key experiences would you want to pass along to that union?

Haberzettl: The most important thing - in my view - is to seek contact and discussion with supposed "opponents" or "enemies" of the workers. Regardless of whether they are bankers, consultants, or other institutions; because it is possible to have more reasonable discussions with the direct carriers of the ideas than when managers intervene. Because otherwise management thinking gets in the way and the perspective of the people responsible - that presents a real risk to the unions. That's the most important step in my opinion. The second-most important step is that, when you have this knowledge of the terms of the debate, you can negotiate with management in a much different way. You know that when one party thinks and says something, the intermediary will interpret his views into it, and that is very dangerous in such a change process. One of the greatest dangers for unions at the beginning of such a process, if they're not prepared for it, is that they are pushed into agreements they don't want. In such cases, you have to have the right brakes under your control.

¹ also a board member of the International Federation of Transportation Workers.

Box 2.6 : Reform of the German Railway System

Klaus Ebeling, Deutsche Bahn AG

After the first world war, the ample profits made by German railway system helped the German state not only to pay substantial parts of its reparations to former wartime enemies but also to finance the development of an efficient motorway network. After the second world war, however, the railway posed an increasing burden. The growth of road traffic gradually forced the railway onto the defensive and, ultimately, into a deficit that threatened the national budget. The railway itself had to pay for repairing the damage it had suffered during the war and did not have the financial resources for a proper modernisation. In the period from 1960 to 1992, the state invested DM 450 billion in building roads, but allocated only DM 56 billion to upgrade the rail network. The result for the railway was an accelerating accumulation of debt, ultimately amounting to over DM 60 billion.

In view of the threat to public finances, all sectors of society rallied in support of railway reform. Over the years, these efforts brought forth 16 major proposals. A solution finally emerged from the work of an independent commission with members from trade and industry, politics, science, and the railway workforce. Formed in 1989, the commission devoted more than two years to developing its turnaround program for the railway. In 1993, the resulting legislative proposal was adopted by a large majority of the members of parliament and local representative assemblies. The work in this period was complicated by the unification of the two German states and consequently the merger of the two state railway systems. On 1.1.1994, *Deutsche Bahn Aktiengesellschaft* (DB AG) was established, the sole shareholder of which is, to this day, the Federal Republic of Germany.

The main objective of the reform was to transform the state-owned entity – an organisation that public bodies and political interest groups heavily influenced and often used as a means to achieving public-sector ends – into a private enterprise whose managers would run it in accordance with business principles. The longer-term goal of this transformation was to make the railway competitive and fit for the capital market, with the prospect that it could then go public.

For this purpose, the assets of the (West German) Deutsche Bundesbahn and the (East German) Deutsche Reichsbahn were merged to form a new “Federal Railway Fund” (*Bundeseisenbahnvermögen* or BEV). The operating units were then carved out from the BEV, organised into the DB AG, and completely freed of debt by the state. The new enterprise was subdivided into four units (rail network, short-distance passenger traffic, long-distance passenger traffic, freight traffic) operating on their own responsibility with their own profit and loss statements, to which also a fifth (station installations) was added later.

In 1999, during the second stage of the reform, which was planned to take around 10 years, these units were transformed into independent public limited companies with DB AG as the holding. To ensure the Group’s cohesion, the executive board chairmen of the five companies occupy seats on the holding’s executive board, and the executive board chairman of the holding also serves as the chairman of the supervisory board of each of the companies.

The revitalisation of Germany’s railway also depended on ending the requirement that it provide its services in some cases without a corresponding financial compensation. With the new policy of “Regionalisation of local mass-transit services”, the railway now receives contractually defined compensation for transport services in densely populated areas, which typically cannot be provided without heavy losses. In such cases, public funds are used to purchase the transport services from the railways at cost. While the railway was previously used in a concealed way to meet political objectives, it is now free to negotiate with customers, and public funds used to cover the cost gap are properly declared a public service.

More than half the period planned for implementation of the reform has now passed, and it is possible to report a series of successes. The number of employees has been reduced by approximately half. Thanks to the good co-operation of the management and personnel representatives, these reductions have been achieved without social tension and without compulsory redundancies. In return, productivity within the enterprise has been increased by over 100 per cent. Since the railway’s transformation into a public limited company, DB has reported a positive operating result every year. Both passenger and freight traffic have increased markedly in absolute terms. But the trend in transport services has not yet been reversed in terms of market share. Indeed, road traffic is currently increasing even faster than rail traffic. For mass-transit services (which in Germany are subject to international competitive bidding), DB has nearly always won the contract on the basis of the attractiveness of its service offering.

Internally, it has been a long and difficult road towards transparent cost accounting, which is a prerequisite for efficient management and for the relationship between the Group companies. In the transition from a single, integrated railway to multiple “management companies” operating on their own responsibility under the holding, the various solutions for resource allocation have been the subject of intensive discussion. The challenge of averting “the risk of drifting apart” and of optimising results only on an isolated sector-specific basis necessitates systematic co-ordination by the holding. Initially, it was assumed that the holding could be dissolved one day and that the companies would each go public individually. Recently, however, there has been increasing acceptance of the idea that DB should remain a single entity and go public under the banner of a unified brand. One special aspect in a DB initial public offering is the law that prohibits the Federal Republic of Germany from selling more than 49.9 per cent of its shares in DB Netz.

2.4 Was Restructuring Worth the Effort?

The restructuring models adopted by different railways are similar in some respects and different in others. As the restructuring process continues, several principles emerge as common denominators, but the superiority of one model over another is yet uncertain.

However, the restructuring process has not been a smooth ride. Managing change has been a balancing act. Hindsight shows how important it was to work with the unions and transform the hearts and minds of railways managers.

In this section we will discuss restructuring successes, the lessons learnt from hindsight, and the relative superiority, if any, of one restructuring model over another.

Restructuring in railways led to the creation of standard procedures and transparency, that could not be avoided or shirked by the operators – public or private. Also the performance parameters became public and hence were more rigorously adhered

2.41 Benefits of Restructuring

Restructuring has helped the railways improve customer service (in terms of quality, price, and safety), market share, productivity, and investments, and thereby respond to the forces of change (**Exhibit 2.10**).

(i) Customer service (quality, prices and safety). The customer has clearly benefited in most countries in terms of quality, prices, and safety. The irony, however, is that he does not seem to be fully aware of the extent of improvement! Despite the negative publicity received by Britain's railways, punctuality and hence the quality of service has actually improved. The average delay per passenger fell from 2.5 minutes to 2.2 minutes.⁵ The consumer benefited to a great extent from the efforts made. One of the consequences of privatisation and more regulation is that performance monitoring has become more transparent and the customers more demanding. In Japan, restructuring helped reduce travel time by almost 25 per cent.⁶ There was a similar impact on prices. Post-restructuring price levels for passengers in Sweden fell at almost 5 per cent per annum and freight prices declined at approximately 7 per cent.⁷ Britain witnessed a marginal decline in passenger price levels that had been increasing at 2 per cent a year before restructuring started⁸.

Railways restructuring also helped improve safety levels. The number of accidents in Japan could be reduced by 50 per cent after the restructuring (**Box 2.7**). In Britain, accidents per million train miles declined from 1.0 to 0.3.⁹ Increased safety was also observed in Sweden and Germany. The railway experts considered the increase in safety indicators to be a direct output of accountability. The restructuring in railways led to the creation of standard procedures and transparency, that could not be avoided or shirked by the operators – public or private. Also the performance parameters became public and hence were more rigorously adhered.

(ii) Market share. Although restructuring has not yet helped all railways reverse the downward trend in market share, most have either stopped the decline or are in the process of showing positive growth.

Cumulative rail traffic in the three largest European railways, Sweden,

⁵ Source : Railtrack U.K.

⁶ Source : East Japan Railways

⁷ Source : Mckinsey & Company

⁸ Source : Mckinsey & Company

⁹ Source : Railtrack U.K.

Germany, and Britain, had been declining at 7.5 per cent per annum. Restructuring reversed the trend traffic began to grow at almost 2 per cent per annum. Passenger traffic in Britain, that had fallen from 21.3 billion passenger miles in 1989 to 17.8 billion in 1995, went back to its former level within 2 years of restructuring (**Exhibit 2.11**). The decline in market shares of both passenger and freight slowed down in almost all countries. In fact, rail shares in Britain and Germany are on the rise, even though they are considered to be still below their fair share. In Japan, too, passenger transportation volumes that had been stagnant or falling before restructuring, grew at 4 to 5 per cent¹⁰ every year, post restructuring.

(iii) **Productivity.** Restructuring made the railways more efficient. Employee

Exhibit 2.10 : Impact of Restructuring against the Forces of Change

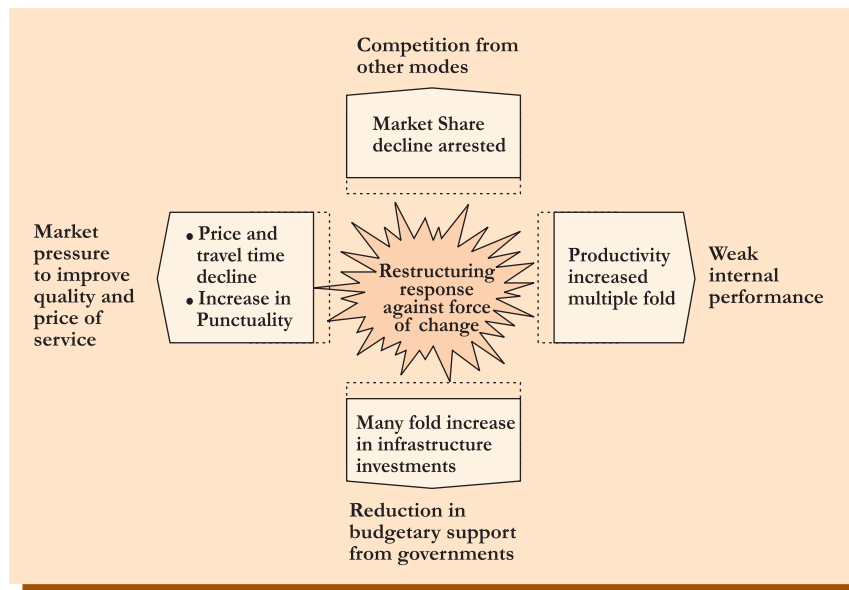
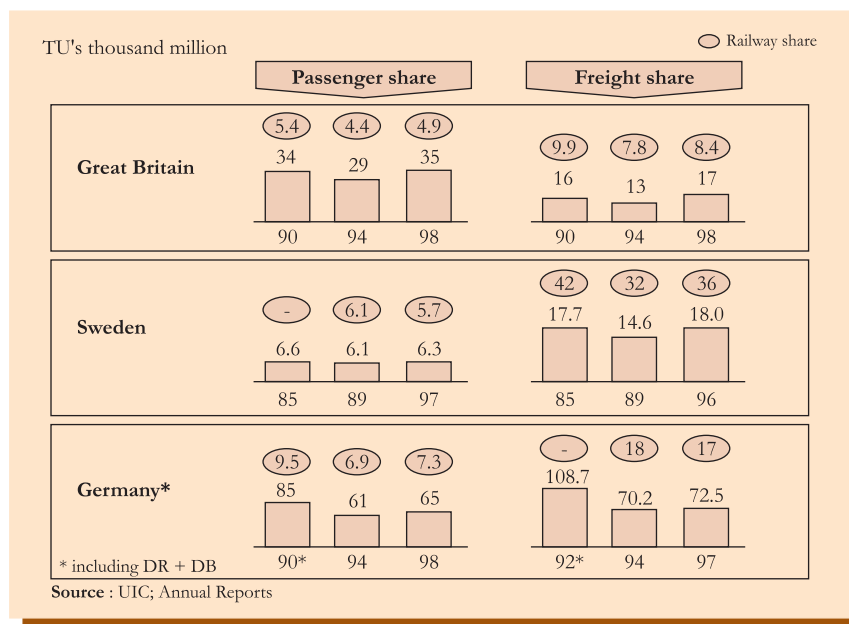


Exhibit 2.11 : Market Shares of Railways Increased after Restructuring



¹⁰Source: East Japan Railways.

Box 2.7: Experience of Railway Privatisation in Japan

Twelve years have already passed since the Japanese National Railways (JNR) was privatized. Today, the same process of railway privatization is being repeated in many countries throughout the world.

Failure of the Japanese National Railways in '70s and '80s

In 1986, the final year of its operation, JNR registered a loss of 11.3 billion dollars. This was equal to 34 per cent of the company's total revenues. Similarly, JNR's cumulative losses amounted to 310 billion dollars, or twice the amount of Brazil's national debt at that time.

The main reason for this dire financial situation was that JNR had postponed and delayed the process of reform. Railways were totally defeated by cheaper truck transportation, which provided just-in-time delivery services.

The problems of the Japanese National Railways were not only financial. The company was reputed to have the lowest quality of customer services in Japan. Take the year 1980.

In that single year, the company experienced 21 strikes and 25 incidents of sabotage.

This led the government to conclude that financial restructuring would not be enough to save the Japanese National Railways, and complete reorganization was necessary. Following this decision the Commission for the Rehabilitation of the Japanese National Railways Reform was established in 1983 and accepted the Commission's recommendations in June 1986.

The government decided to relieve all the top managers of the Japanese National Railways and appointed a new management team. This opened the way to implementing the government's reform plan.

Outline of the Reform of the Japanese National Railways

JNR was divided into six regional passenger railway companies and one freight company covering the entire country. This regional separation was possible because Japan is an island country with three major metropolitan areas, and the fact that the great bulk of passenger transportation is concentrated within each region. However, the high-speed networks were divided along major routes and not on regional base because the majority of these passengers are long distance travelers. Finally, the freight company covered the entire country because regional division was not feasible.

Of 310 billion dollars of JNR's debt, 39 per cent or 121 billion dollars, was assigned to the three major passenger railway companies (equivalent to the value of assets given to them). The remainder of the debt, amounting to 189 billion dollars, was assigned to a newly created organization known as the Japanese National Railway Settlement Corporation. The newly created companies turned over to the Settlement Corporation all land and other assets to be used by the Settlement Corporation to pay off the JNR debts. Any debt remaining after the liquidation of assets was to be "shouldered by the public." The JNR telephone network, its computer facilities, and the JNR technology research center were organized into separate companies.

JNR's new management team took office in June 1986. The new team was able to complete all the preparatory work in just 21 months, and the newly privatized railway companies were able to go smoothly into operation on April 1, 1987.

The Achievements of JNR Reform

Privatization has been far more successful than what we initially expected. The world's most deficit-ridden enterprise has been reborn as one of the most profitable businesses in Japan. In fiscal 1986, the final year under the old regime, JNR lost 11.3 billion dollars. By contrast, in fiscal 1997, the seven JR Group companies registered recurring profits of 1.8 billion dollars. The, together, would rank as the fifth most profitable business among all Japanese corporations listed on the stock exchange. Compared to the original restructuring plan that projected annual fare increases in the 3-6 per cent range, the JR companies have hardly ever raised taxes other than to include taxes during the final ten years of operation. In contrast, JNR (before restructuring) had raised its fares by a total of 76 per cent.

In 1981, JNR received a total of 12.5 billion dollars in loans and subsidies from the government. Today, the JR Group companies receive no subsidies. Instead, they pay 1.7 billion dollars in taxes to the government.

In 1979, JNR employed 420,000 workers. Today, the seven JR companies are operating with a workforce of 185,000. At the same time, the average daily train-kilometers increased by 330,000 km. The public has noticed a conspicuous improvement in the level of services. The JR companies are now being praised for their much better handling of passengers. The train speed has improved as well. Prior to privatization, it took three hours to cover the distance between Tokyo and Osaka. Now, that has been reduced to two hours and thirty minutes.

There has also been a marked improvement in safety standards. In the past twelve years, there have only been two accidents involving passenger fatalities. Similarly, accidents at railway crossings have been cut to one-third the previous level.

The most dramatic improvement has been the corporate culture where employees have embraced commercial approvals. As an example of this new commercial culture, JR companies have reduced the procurement costs of their rolling stocks and other facilities by 20-30 per cent. The volume of materials held in inventory has been reduced by more than 50 per cent.

Lessons to be drawn from the Reform of the Japanese National Railways

The first lesson to be derived from the Japanese experience is that the privatization of railway businesses is an issue that cannot be avoided, and that privatization can bring about a dramatic transformation in the consciousness of the management and of the employees.

A second lesson is to be derived from Japan's failure to act promptly. That is, JNR should have been reorganized as soon as possible and well in advance of its final collapse. In this context, the Japanese experience indicates that drastic measures are most effective than gradual reform.

Members of government and those directly involved in implementation must share a strong conviction in the need to restructure the state-owned railway. This is important, because it is unrealistic to expect all employees to be in favor of reform and restructuring. To succeed, the restructuring must go beyond the mere act of privatization and overall structural changes. What is required, is a fundamental transformation in corporate behavior patterns and values, and a dramatic improvement in employee morale.

Excerpt from speech of Mr. Shuichiro Yamanouchi, Chairman, East Japan Railway Company.

productivity improved dramatically in most countries after the restructuring. Japanese productivity levels tripled from 500-passenger ton km per employee in the early 1980s to more than 1,500 passenger ton km per employee within five years of restructuring. This growth was replicated in other countries, too. In Germany, this figure rose by approximately 95 per cent between 1993 and 1998⁶. Employee productivity more than doubled in Britain and Sweden (**Exhibit 2.12**).

(iv) Infrastructure investments. Restructuring raised infrastructure investments and reduced public subsidies in each country. The capital expenditures of the East Japan Railway Company alone increased from \$500 million before restructuring to almost \$2 billion a year.¹¹ Similarly, in Britain, infrastructure investments doubled from less than \$1.4 billion a year in the late 1980s and early 1990s to more than \$2.8 billion per annum by 1999-2000⁴. In Germany, too, investments increased from \$3.9 billion per annum in the 1980s to \$6.8 billion in the late 1990s.¹²

Public expenditure also improved. The British government has saved \$17.5 billion¹³ following the railway deregulation. The Japanese government eliminated \$12.5 billion¹⁴ of railway subsidies after the restructuring. Subsidies reduced by SEK1.2 billion in Sweden and DF15 billion in Netherlands after restructuring.

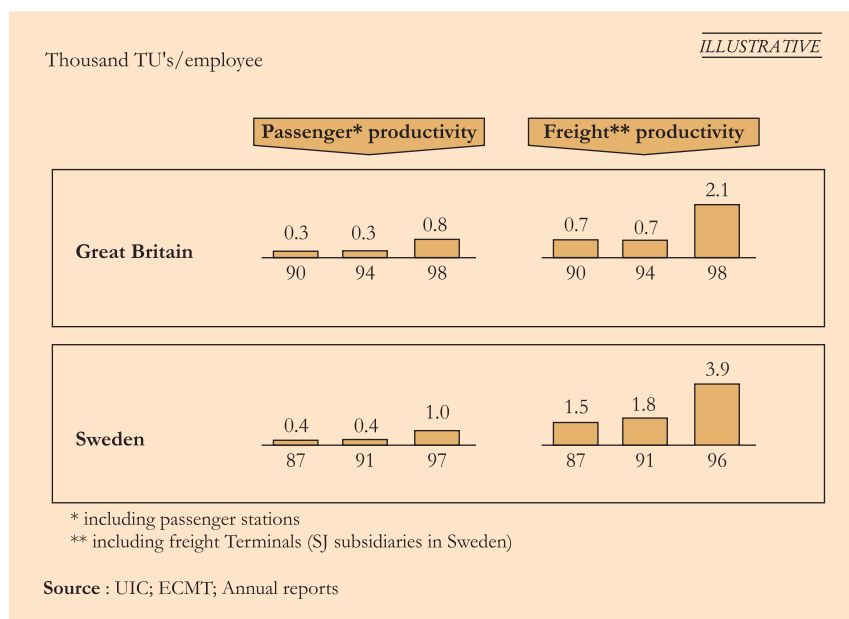
2.42 Lessons Learnt from Restructuring

Several lessons can be learnt from the rail restructuring process. These are:

(i) Involve the unions. While the governments and railway management in Germany, Sweden, and Austria, involved the unions significantly to ensure their commitment to the transformation process, others did not. In Italy (FS), Britain (BR), Spain (RENFE) and France (SNCF) the unions remained unconvinced about the scope and timing of restructuring, and the railways faced several problems on that score. In fact the British and Italian unions staged angry strikes against the reform process.

(ii) Find the right model. While the principles common to all railway-restructuring (arms-length relationship, professional management, and

Exhibit 2.12 : Productivity of Railways Increased after Restructuring



¹¹ Source : East Japan Railways

¹² Source : Deutsche Bank AG

¹³ Source : McKinsey & Company

¹⁴ Source : East Japan Railways

appropriate business focus) should be agreed on quickly, deciding on the detailed organisation model needs careful consideration. The restructuring of British Rail, for example, in which the railroad was split in over 100 companies, was considered a hasty process by many. Several of these companies, such as three of the freight companies, later re-merged. Similarly, countries such as Germany and Sweden adopted a more cautious approach towards privatisation. Hence, understanding and deciding on the future model, as a carefully orchestrated process involving all stakeholders is important.

While the principles common to all railway- restructuring (arms-length relationship, professional management, and appropriate business focus) should be agreed on quickly, deciding on the detailed organisation model needs careful consideration

(iii) Create a well-designed roadmap. A clear roadmap and restructuring plan helps to set aspirations and manage stakeholder expectations. A clear balance between the length of the plan and adherence to it is critical. In Germany, a 10-year plan was created, whereas British privatisation was completed in two years. Ensuring that the plan is managed and continuously challenged by outside stakeholders is just as crucial. Germany used the services of an “expert group”, comprising academicians, industry experts, and rail managers, to develop its 10-year restructuring plan.

(iv) Find the right mix of internal railways managers and external skills.

To create a customer-focused, commercially oriented organisation, during and after restructuring, it is important to blend the operational experience of railways managers with the commercial skills of external managers.

To decide which of these is the best model in detail is difficult and probably a premature exercise. The rail reform process is still underway in most countries. In Europe, different railways are at various stages of their infrastructure-operations separation path. Germany and Sweden are actively considering privatisation of their operating companies. Britain is in the process of redefining rail regulations (**Box 2.8**). In Asia, Chinese Rail is still in the early stages of rail reform and is in the process of creating regional entities. Chinese Rail is conducting pilot experiments in over 100 rail bureaux. All of these national railways have demonstrated success on both efficiency and effectiveness parameters.

More importantly, each country had different political, social, and economic imperatives, pushing for restructuring. The political imperative of privatisation drove restructuring in Britain. Socio-economic requirements to enhance the importance of railways drove restructuring in other European countries, and economic considerations drove Japanese restructuring. Successive steps involving nationalisation of bankrupt railway companies, deregulation of transport sector and partial re-privatisation have transformed the U.S. freight railroads into efficient and viable entities (See **Box 2.9**).

Restructuring benefited most railways and choosing the most successful model would be difficult. Indian Railways will have to choose its own destiny and chart its own path to progress.

2.5 Implications for Indian Railways

Indian Railways has a great tradition of public service. However, due to the many economic and growth challenges it faces, it was unable to match the rapid expansion of Indian industry.

Today, Indian Railways is in a similar position to where European Railways

Box 2.8: Interview with Mike Grant – Franchising Director, Office for Passenger Rail Franchising (OPRAF)* – August 1999

Q. Why were the regulators installed during the rail restructuring in UK?

There were two regulators created — ORR and OPRAF. ORR, as far as Rail Track was concerned, was created to ensure that there wasn't abuse of monopoly. OPRAF was created with a longer term in view, as it was envisioned that there would be long franchises awarded. There were going to be 25 franchises. The two regulators have very different roles. The role of the infrastructure regulator is regulation of competition and ensuring return on investment for rail track. OPRAF's role is to regulate the train operating companies and that's done through contracts.

Q. What is the role of the newly proposed SRA?

The role of the SRA is to lead the rail industry. It has a very broad role. At the moment its power comes from the powers of the Franchising Director and the powers still contained in the British Rail Board. So these two organisations provide the power base for what we call the shadow SRA, which is operating at the moment. As soon as the bill receives royal assent it will operate as SRA.

Q. On a day-to-day basis what are the most important regulatory functions for OPRAF?

Twenty-five train operating companies exist and they all have contracts with various other parties in the railway system. They all have franchise plans. There is a management of contracts taking place on a daily basis. In this system, there are lots of issues that we need to monitor. Looking forward as far as the SRA is concerned, we've said publicly that we're ready to extend some of the franchises provided they come forward with suitable packages.

Q. A very important element of work of regulators is to ensure competition and to offer licences? How does this work?

There are two elements of competition. The regulator, who regulates Rail Track as they have a monopoly position, regulates for competition on an ongoing basis. As far as the Franchising Director (OPRAF) is concerned, competition was important when the sales were taking place. So at the time of selling the 25 operating companies, it was really important to get a competitive at sales process and this was not a big issue post-sales.

Q. During the separation of infrastructure and operations in various European countries, one of the critical issues was establishing the right access-fee and providing a mechanism of slot allocation. How does it work in the British Rail system?

The slots are put in place by Rail Track and then they are sold to the franchises. The slots also come under the regime of the rail regulator. We obviously give evidence and we give our views. Rail Track has to fulfil the reasonable requirements of the train operating companies and investors, and we fall under the category of investor. So our evaluation is important on how slots are allocated and there are a number of examples that are being considered.

Q. In which areas would you see the largest need or the largest potential to refine the regulatory system?

One of the areas that clearly need to be defined more is the track access charges. At present what they cover is not very clearly defined.

Q. Did the regulators mostly rely on managers from within the rail system or outsiders to establish regulation?

It was a mix. Clearly the expertise that was needed as far as the railways was concerned, was only held in one place at that time—British Rail. So the majority of people had been involved in the railways in one form or the other. But the roles of the two parties (regulators) differed. If you take the regulator that regulates Rail Track, its role was economic regulation, so economists were employed. As far as OPRAF is concerned, there was a sale process, so there were investment banks and lawyers involved.

Q. How successful was the separation between infrastructure and operations and privatisation? Where would you see major areas of improvement?

Clearly the subsidies have gone down. That has to be good for the taxpayer. The actual environment is an area of growth. Actual investment in rolling stock has grown considerably. The taxpayer has benefited the most. Passengers received a lot more trains, newer trains. My role is to make sure the passenger gets the best service for the amount of investment we are putting in. One area the taxpayer did lose was the ROSCOs. That sale was a dis-benefit to the taxpayers. They were sold in haste and were subsequently resold at huge profits. Going forward we need to deal with the capacity issue, too. Today we are capacity constrained on many lines. We need to create the capacity for the next 10 years.

Q. Final success of privatisation will be measured by the impact on the end customers. How do you see the impact of privatisation on the market place and end customer?

The criteria are clear. The passengers want cleaner trains and for them to be on time. When privatisation took place, the performance criteria were not demanding. Going forward we will look for stricter performance regimes. We would use carrots and sticks to ensure higher performance—penalties if the train operators don't perform, incentives and payments if they do.

Q. What is the key message you would want to give the person taking charge of this process?

Do not underestimate how complicated the whole process is. There are relationships that are taken for granted in the private industry. Here each one has to be contractualised. It takes a considerable amount of time to do that. British privatisation in terms of contractual set-up seems to have worked well. It could have worked better. Areas I would do differently are the ROSCOs.

* Now Merged with Strategic Rail Authority.

India is currently in a high growth phase. The acceleration of the economy has just begun. The creation of an efficient transportation support system is essential to sustain this growth. In order to achieve this, Indian Railways will have to be transformed into an efficient, customer-focused organisation

were 15 years ago. Indian Railways has been facing sharp market share decline in both freight and passenger segments. Indian Railway's freight share, which was more than 80 per cent in the 1950s, has declined to 40 per cent today. With the significant increase in expressways and 4-lane highways over the next decade, its share is likely to further decline to 25 per cent. The passenger share has declined in the proportion with rapid increase in short-distance bus transportation, increase in car travel and deregulation in the airlines sector. Indian Railways productivity, at 400 Traffic Units per employee, is lower than even in China (with 3.3 million employees) and several other South-Asian countries. Indian Railways financials, recast in a corporate format, show large cash losses.

India, on the other hand, is currently in a high growth phase. The acceleration of the economy has just begun. The creation of an efficient transportation support system is essential to sustain this growth. Indian Railways can play a vital role in this, but it will have to match the rapid acceleration of Indian industry and the demand of freight customers for reliability and service. In order to achieve this, Indian Railways will have to be transformed into an efficient, customer-focused organisation.

Drawing from the experience of others, Indian Railways would need to define the principles behind a successful restructuring and the future organisation that will be required to achieve this.

Box 2.9 : US Railroad Restructuring

As the 1970s began, the US railroad industry was near collapse. Six railroads in the Northeast and two in the Midwest were bankrupt, and no railroad was earning enough to maintain or replace its assets. The rail market share for freight had plunged by 18 percentage points in two decades and the share of the inter-city passenger traffic had nearly vanished. The US faced the threat of losing a vital actor in its transport industry.

After heated debate, consensus emerged that some of the transport changes were natural and positive. Diversification of the US economy caused a shift to higher quality modes such as trucks. The rise of the auto and rapid advances in jet engines gutted the railways' share in long-haul passenger traffic. Transport experts also concluded that the railroads suffered from unnecessarily adverse decisions. Pervasive and invasive regulation limited the railroads' ability to manage their businesses, and rigid safety and labor regulations increased costs without producing any benefits: the "private" railroads were no longer privately managed. Unbalanced Federal programs, especially the Interstate Highway system (for which trucks do not pay their fair share) and domestic waterways (for which barge operators pay nothing), deprived the railroads of profitable traffic. Imposed cross subsidies from freight to passenger services caused deficits that absorbed almost all freight income, and drove freight tariffs further into the non-competitive range.

The first response, creation of Amtrak, was to relieve the private railroads of the public burden of passenger services and to try to regenerate passenger services by putting them under dedicated, "as if for profit" management. Amtrak operates a 40,000 km national rail passenger system and receives Federal and state subsidies for doing so. Amtrak pays the freight railways for the costs of operating over their tracks. The objective of removing freight deficits from freight operations was clearly met: the goal of creating a vibrant and self-sustaining passenger system was not met, as Amtrak has absorbed support of over US\$22 billion to date, with no end in sight.

In the second step, the bankrupt Northeastern railroads were nationalized in 1972, rehabilitated with Federal money, pruned of excess tracks and labor, and eventually re-privatized in 1987. In addition, the Midwest bankrupts were liquidated, with a few tracks sold to other railways and the rest closed. Redundant workers received compensation for their loss of employment in both regions.

The third step was deregulation of railways (1981), trucks (1982) and airlines (1979). With few exceptions, railroads were allowed to set prices and offer services in line with market demand and without interference from government.

Taken together, these three steps have transformed the US freight railroads. Since 1981, ton-km have risen by 51 percent, average tariffs have fallen by over 50 percent in real terms, accident rates have fallen by two-thirds, and earnings have risen to near-record levels. At the end of the century, the US freight railroad system is the largest and most efficient in the world, and despite the highest wages of any rail system, charges the lowest tariffs.

Source: McKinsey & Co.

3. THE DEMAND FOR AND SUPPLY OF RAILWAY SERVICES : TRENDS AND PROSPECTS

3.1 Introduction

The Indian Railways is in financial crisis. If IR is to survive as an ongoing transportation organisation it has to modernize and expand its capacity to serve the emerging needs of a growing economy. This will require substantial investment on a regular basis for the foreseeable future. With the prospect of getting substantial free or subsidised resources from the government being unlikely, new investment will have to be financed on a commercial basis. This is the challenge facing the Indian Railways.

The ability of the Indian Railways (IR) to accelerate the growth rate of its revenues from freight and passenger traffic is central to the success of any effort to restructure the organization and to finance the necessary investments. Higher growth rates will emerge as the outcome of the interaction between “demand” and “supply” forces. The latter are reflected in the enhancement of the system’s capacity to provide a higher volume of services, accompanied by an improvement in quality. These would encompass both an increase in the physical capacity of the system through investment, and an improvement in its operating efficiency achieved through better management of its resources. This is the primary objective of its organizational restructuring. The supply side components of the effort to accelerate revenue are discussed elsewhere in this report. This chapter focuses on the demand aspect. Along with accelerating the growth of railway traffic, consideration will also have to be given to obtaining better revenue per unit of traffic. Thus issues of tariff rebalancing also need to be considered.

All the new investment and organizational restructuring that is envisaged will be of little use if the demand for railway services does not increase apace. In Chapter 5, which presents the results of the financial scenario simulations, it emerges quite clearly that the contribution of restructuring to the financial sustainability of IR depends on its ability to sharply accelerate the growth of revenues. The current mix of revenues, about 70 per cent from freight and the remainder from passenger services, does not allow for the entire burden of improvement to be borne by any one segment. Both will have to show progress for the restructuring to be worthwhile.

Our financial projection exercises show that for IR to be financially viable as a commercial organisation, incremental improvements in traffic growth will not be adequate. For IR to survive over the next 20 years and beyond, it has to adopt a “strategic perspective” where it rekindles high growth in both the passenger and freight segments. It is imperative that IR achieves this “strategic growth”. Although this scenario is ambitious in its goals, it provides an attainable target for IR with respect to growth in revenues. The major objective of this chapter is to assess the possibilities of this ambitious target being realized. Our conclusion is that both large investment programmes and significant organisational restructuring will be necessary.

Higher growth rates will emerge as the outcome of the interaction between “demand” and “supply” forces. The latter are reflected in the enhancement of the system’s capacity to provide a higher volume of services, accompanied by an improvement in quality

It is imperative that IR achieves “strategic growth”. Although this scenario is ambitious in its goals, it provides an attainable target for IR with respect to growth in revenues

In this context, the essential question is this: is the current pattern of economic development of the Indian economy, broadly perceived, capable of sustaining a higher rate of growth for rail transport services? Given the recent trends in traffic patterns, (discussed in detail in a subsequent section) this question can be addressed in terms of two sets of factors.

One relates to the factors that are within the control of IR – for example, the overall quality of services, the prices at which they are offered and so on. The issue here is whether strategic actions by IR to upgrade its service quality or to restructure its tariffs so as to make them more responsive to market conditions will result in higher volumes of freight and passenger traffic. If the potential exists, then there is a case to be made for the restructuring of the system so as to fully exploit the available opportunities. The second set of factors relates to the broad patterns of change in the structure of the economy, and their impact on the demand for transportation services in general, as well as rail services in particular. The activities of IR, given its size and importance in the economy certainly contribute to this pattern of change, but it is only one of a large range of forces at work. In this sense, we can visualize this set of factors to be external to IR, or not within its direct control. The issue with respect to this set of factors is whether the pattern of change is generally favourable to an increase in the use of rail transport services, assuming that such services are provided at the expected levels of price and quality.

This chapter attempts to analyze the prospects for increased usage of rail transport services against the backdrop of past trends, and in terms of these two sets of factors. The chapter is structured in five sections, besides this introduction. The next section presents a detailed picture of traffic patterns, for both freight and passenger movement in terms of volume and revenue. Sections 3.3, 3.4 and 3.5 then offer some explanations for these trends in terms of the two sets of factors referred to above – those which are within the control of the system, and those which reflect broad patterns of economic development. They collectively assess the contribution of each set of factors to the potential for accelerating the growth rate. On the basis of these judgements, each of these sections draws strategic implications for IR in terms of its efforts to realize that potential. Section 3.6 provides a set of forecasts for revenue growth generated by a simulation exercise, which takes into account alternative scenarios of growth in traffic of various commodities and passenger classes. In addition to volume growth that results from the natural momentum generated by various macroeconomic forces, the forecasts also take into account the impact of tariff re-balancing between the various passenger classes. The concluding section highlights the implications of the analysis for actions to be taken by IR.

3.2 Trends in Freight and Passenger Traffic

3.21 Freight

Over the years, IR has predominantly become a bulk freight carrier. It is now the main provider of transportation for eight commodities: coal, raw materials for steel plants, finished steel, iron ore for export, cement, food, fertilizers and POL products. This was not always the case. As recently as 30 years ago, more than 30 per cent of the freight carried by IR consisted of commodities other than these seven (**Exhibit 3.1**). The current pattern of

data reporting by IR provides individual traffic and revenue data for each of these seven commodities, while all other freight traffic is aggregated into the residual category “other commodities”. “Other commodities” were clearly more profitable with 32 per cent of traffic volume generating almost 39 per cent of freight revenue 30 years ago (**Exhibit 3.2**).

The changing structure of freight traffic over the last three decades, as represented by the indicator net tonne kilometres (NTKM), reflecting the physical volume of traffic, and revenues, shows the continuing movement of IR towards bulk commodities. Coal is by far the most important commodity carried by the railways now, accounting for more than 40 per cent of total freight traffic. This high rate of growth has seen the share of coal increase from less than 30 per cent to about 45 per cent over a 30-year period. A striking feature of the changing patterns of IR’s freight traffic is the drop in the share of “other commodities” from about 40 per cent at the end of the 1960s to below 15 per cent by the end of the 1990s.

Focussing a little more closely on the patterns emerging during the last decade and a half, (**Exhibit 3.3**) we present the trend growth rate for the period 1984-1999 and the average annual growth rate for the five-year period 1994-99. Coal shows a relatively high trend rate of growth of around 5.5 per cent per year, but the average growth rate over the last five years, 2.9 per cent, indicates a significant deceleration. Other bulk commodities with relatively high trend rates of growth – cement and POL for example – also show decelerations in the last five years. The residual category “other commodities” recorded a negative 1.4 per cent trend growth, but appears to have accelerated somewhat during the last five years, with an annual average growth rate of about 2.2 per cent.

A striking feature of the changing patterns of IR’s freight traffic is the drop in the share of “other commodities” from around 40 per cent at the end of the 1960s to below 15 per cent by the end of the 1990s

Exhibit 3.1 : Distribution of Freight Traffic (NTKM) by Commodities (1969-1999) (per cent)

	1968-69	1978-79	1983-84	1988-89	1993-94	1998-99
Coal	28.64	26.56	32.41	38.38	41.2	45.66
Steel	6.32	6.87	5.62	5.38	5.1	4.24
Iron ore for export	4.39	5.20	3.11	3.63	2.4	2.55
Cement	3.70	5.23	6.24	7.84	7.8	7.33
Food Grain	10.54	12.92	17.8	15.51	14.0	11.92
Fertilizer	3.16	5.61	5.72	7.54	6.7	8.16
POL	4.67	7.68	6.34	6.56	6.5	7.63
“other commodities”	32.54	24.87	20.51	12.10	10.8	12.47

Source : Computed from data in **Indian Railways, Annual Statistical Statement** - various years.

Exhibit 3.2 : Distribution of Freight Revenue by Commodities (1969-1999) (per cent)

	1968-69	1978-79	1983-84	1988-89	1993-94	1998-99
Coal	19.81	21.82	29.30	37.81	42.48	48.41
Steel	8.83	9.68	9.34	9.05	8.21	6.23
Iron ore for export	3.99	4.91	2.71	2.76	2.23	2.40
Cement	4.12	5.47	7.05	8.20	8.53	7.93
Food Grain	7.21	7.62	9.73	8.84	7.92	6.82
Fertilizer	2.64	4.95	4.49	6.30	4.68	4.67
POL	7.76	11.61	12.37	12.71	11.89	13.79
“other commodities”	38.67	28.92	21.00	12.32	9.85	9.48

Source: Computed from data in **Indian Railways, Annual Statistical Statement** - various years.

Exhibit 3.3 : Growth Rates of Freight Traffic by Commodities (per cent per year)

Category	Trend* 1984-1999	Last five years 1994-1999
Coal	5.51	2.91
Steel	1.51	-2.03
Iron ore for export	-1.96	1.81
Cement	4.43	1.92
Food	0.19	3.68
Fertilizer	2.90	3.02
POL	4.75	2.23
Other Commodities	-1.44	2.63

*Trend line fitted in a log-linear model.

Source: Computed from Indian Railways, Annual Statistical Statement – various years.

Exhibit 3.4 : Distribution of Passenger Traffic (PKM) by Class (per cent)

	1968-69	1978-79	1983-84	1988-89	1993-94	1998-99
A.C. I. class	3.0*	3.6*	0.2	0.1	0.2	0.2
A.C. II. class			0.0	1.1	1.8	2.2
A.C. III tier			0.0	0.0	0.0	1.3
A.C. Chair Car			0.5	0.4	0.9	1.2
I Mail			0.0	0.0	0.0	0.7
I Ordinary	97.0**	96.6**	2.9	2.6	1.9	0.2
Sleeper Mail			0.0	0.0	22.1	27.8
Sleeper Ordinary			0.0	0.0	0.5	0.4
II Mail			61.1	61.1	38.9	35.7
II Ordinary			35.4	34.6	33.6	30.3
Upper Class	3.0	3.6	3.6	4.2	4.8	5.8
Lower Class	97.0	96.6	96.4	95.7	95.1	94.2

* upper class ;** Lower class

Source: Computed from data in Indian Railways, Annual Statistical Statement – various years.

Exhibit 3.5 : Distribution of Passenger Revenue by Class (per cent)

	1968-69	1978-79	1983-84	1988-89	1993-94	1998-99
A.C. I. class	9.6*	12.4*	1.39	1.06	1.55	1.60
A.C. Sleeper			0.00	5.01	8.53	10.24
A.C. III tier			0.00	0.00	0.00	3.60
First Class			5.99	5.11	3.15	2.63
A.C. Chair car			1.03	0.88	1.44	2.58
Sleeper class	90.4**	87.6**	0.00	0.00	28.33	31.88
Second Class			81.59	87.94	57.00	47.46
Upper Class			9.6	12.4	18.4	12.1
Lower Class	90.4	87.6	81.5	87.9	85	79.3

* upper class ;** Lower class

Source: Computed from data in Indian Railways, Annual Statistical Statement - various years.

3.22 Passenger Traffic

Exhibits 3.4 and 3.5 present a picture of the changing pattern of passenger traffic, represented by passenger kilometres (PKM) as an indicator of physical volume and revenues, over the last three decades. The patterns for physical volumes do show a significant increase in the share of the upper classes, particularly after the 1980s, but the overwhelming share of passenger traffic remains in the lower classes. The pattern for revenue is slightly less skewed towards the lower classes, understandably so, because of the fare differentials between the upper and lower classes. Total upper class traffic rose from about

3.6 per cent of total traffic to close to 6 per cent between the late 1970s and the end of the 1990s. The share of upper class revenue during the same period increased from almost 10 per cent to about 20 per cent of the total. A striking feature that comes out in the table is that IR has been introducing new classes during the 1990s. AC III Tier and the Sleeper Class did not exist at the end of the 1980s, but have gained significant shares since their introduction.

Exhibit 3.6 shows the 15 year trend rates of growth of the various passenger classes, as well as the growth rates over the last five years. In contrast with freight, passenger traffic has been growing at a relatively healthy rate. Total passenger kilometres (PKM) grew at a trend rate of about 4.5 per cent over the 15 year period, and the last five years have seen an acceleration to about 5.8 per cent.

3.3 A General Analysis of Underlying Factors

One of the major reasons for the deterioration of the organization's financial condition has been a steady decline in the growth rate of freight traffic in recent years. The growth rates of passenger traffic, in contrast, have been fairly healthy, and there is a significant increase in the share of revenues being realized from the higher classes of passenger services. Despite this trend, however, an overwhelming proportion of passenger revenues is still being raised from the lower classes.

There are well-known factors underlying these patterns. Some of these emerge from the broader political context in which IR operates. Since pricing is an inherently political decision, the organization has to bear the burden of pricing decisions that are not always taken on the basis of commercial viability. In this context, it is widely perceived that freight movement, on the whole, has been subsidizing passenger movement. Passenger fares, specially for the lower classes are set with clear political considerations in mind, which almost inevitably lead to subsidization. Some of this is made up by inflating upper class fares, but despite rapid growth during the last two decades, from 10 per cent of passenger revenues to 20 per cent, this continues to be a relatively small source of revenues. So, the potential for fully compensating for the subsidy for the lower classes from this source has been limited. To maintain some control over IR's financial deficit, the burden of cross-subsidization inevitably falls on freight traffic. IR has been steadily losing its market share of freight to road largely because it has not been able to compete on prices.

With respect to the trends in freight traffic, the observation that "other commodities" have become less important in total traffic volumes as well as revenues, is important. It underscores the fact that in a business line in which IR faces open competition from other modes, it has witnessed a significant

In a business line in which IR faces open competition from other modes, it has witnessed a significant decline in market share, reflecting its competitive weakness

Exhibit 3.6 : Growth Rates of Passenger Traffic by Class (per cent per year)

Classes	Trend*	Last five years
A.C 1st Class	0.05	4.98
A.C. Sleeper Class	1.24	3.09
A.C. 3 Tier	1.30	39.26
First Class	-0.03	-5.33
A.C. Chair Car	0.12	2.64
Sleeper Class	1.74	6.14
Second Class (M)	-0.004	6.31
Second Class (O)	0.02	5.29

*Trend line fitted in a log linear model.

Source: Computed from data in **Indian Railways, Annual Statistical Statement** – various years.

Commodities such as cement and steel, whose production has increased significantly, appear to be using IR services to a lesser and lesser degree. New investment in some of these commodities is taking place in the private sector, which is more cost and quality conscious

decline in market share, reflecting its competitive weakness. Its core strength in the transportation of bulk commodities is also under threat, judging from the fact that many commodities such as cement and steel, whose production and consumption has increased significantly over this period, appear to be using IR services to a lesser and lesser degree. As new investment in some of these commodities is taking place in the private sector, which is more cost and quality conscious, IR is losing even this bulk goods traffic to road transport. For example, data compiled by the Cement Manufacturers' Association indicates that IR's share of total cement transportation has fallen from a virtual monopoly of around 80 per cent three decades ago to about 40 per cent today, with much of that decline coming in the last two decades. The same tendency is presumably at work in some other bulk commodities as well. Not only is IR losing its competitive strength in its traditional bulk transportation activities, it appears to be also losing its traditional cost advantage over long haulage traffic. The Poulouse Committee report, submitted in 1995, indicated that IR's competitiveness with respect to distance had slid from an absolute advantage over road freight for distances over 250 km to an advantage on distances above 750 km. In other words, IR was steadily losing traffic to roads in the range between 250 km and 700 km.

Taking a historical perspective on the evolution of freight traffic patterns on IR, a certain responsibility must be placed on the overall policy of public sector predominance that reached its zenith during the 1960s and 1970s. The share of the public sector in total manufacturing activity was growing, and a large part of its capacity was concentrated in the very bulk commodities that we now see IR's traffic being dominated by. The requirements of transportation of both raw materials and finished goods going into and emerging from public sector plants had to be met by IR, whose services were increasingly drawn away from the rest of the economy. The decline in the share of "other commodities" is the consequence of this withdrawal. Increasingly, over the last three decades, IR became a captive public sector carrier.

This shift was partly induced by technology. IR began to discriminate in favour of rake movement relative to individual wagon movements. This could perhaps have been justified on the basis of costs, but in the context of the overall pattern of production in the economy, it clearly made IR less and less attractive to producers who could not justify full rakes. The only sectors to benefit from this were precisely the ones dominated by the public sector, and who consequently came to dominate IR freight. However, apart from this form of price discrimination, pricing between bulk commodities themselves was subject to significant inter-commodity variation, motivated by a variety of considerations. Looking at Exhibits 3.1 and 3.2 let us suppose that all commodities were priced equally by IR. Ignoring variations in leads, which would not distort the picture too much, the percentages displayed in the two tables would be the same. The actual distributions are quite different, reflecting the significant tariff differentials between commodities. Further, looking at the movement in traffic shares and revenue shares over time, it appears that the growth in traffic has come from commodities that have been priced at below this notional benchmark, while commodities which were priced higher than the benchmark have lost traffic share.

To illustrate this point, let us look at coal and "other commodities". At the beginning of the period, traffic share of coal was higher than its revenue share, indicating that it was priced lower than the benchmark. Over the period, its share of traffic has grown considerably. Conversely, at the beginning of the

period, “other commodities” showed a revenue share higher than their traffic share, indicating that they were, on the average, priced above the benchmark. Over the period, their traffic share declined considerably. In general, this pattern indicates that IR’s freight traffic has been shifting from the relatively high-tariff commodities to the relatively low-tariff ones, and this provides an explanation for the sluggishness of freight revenues.

Looking to the future, the changing structure of production in the economy in the next decade may reinforce this erosion of competitive strength. Firstly, there are clear indications that manufacturing activity, which on the whole is relatively more transport intensive than services, and particularly with respect to bulk transportation, appears to be peaking at somewhat less than 30 per cent of GDP. This is in sharp contrast to historically observed patterns of development, where the share of this sector in GDP would go up to around 50 per cent, before declining as the services sector caught up and became the dominant sector. In India, the service sector is already by far the dominant sector, accounting for about 48 per cent of GDP and also appears to be the fastest growing. The implication of this pattern is that every increase in GDP will require less and less transport services. IR will have to compete even harder with other modes in order to sustain its traffic volumes, let alone accelerate growth.

Second, the share of commodities other than what IR has traditionally been carrying in the country’s production basket is becoming more and more significant. This is at a time when IR’s share of this market has dropped. To the extent that this reflects weak competitive strength in carrying these goods, IR’s share of total freight carried is under further threat. Retaining and then expanding its share of this segment of freight should be a major thrust of the strategy for restructuring.

Third, international trade has increased, and will continue to increase, in its importance relative to GDP. This means that transportation services will become increasingly integrated, with road, rail and sea striving to become part of a seamless chain of goods movement. To the extent that IR lags in developing multimodal capabilities, either in-house or through collaborations, it will not be able to take full advantage of the changing pattern of traffic implied by globalization.

These trends indicate a major revamping of IR’s approach to freight traffic. It has to regain its primacy in bulk freight, and at the same time, it has to increase its competitiveness in the haulage of “other commodities”. This requires a combination of price-based and non-price based strategies. With respect to pricing, tariffs would need to be lowered to lure traffic away from the roads. To exploit the potential in the non-bulk segment, however, mere pricing will not be sufficient. IR can compete for this traffic only if it offers an attractive total logistics package. IR has to develop the capability of picking up small loads, and then aggregating, disaggregating and delivering them. This will require arrangements with road transporters and a host of other related services (**Box 3.1**). Without expanding its service capabilities in this direction, IR stands to lose the opportunity being presented by the evolving structure of the economy.

With respect to passenger traffic, any interpretation of the relative growth rates of traffic in different classes must take into account the fact that several classes were introduced at different times during the last two decades. Starting with the relatively wide gap between premium and basic travel, represented by AC Ist at the top and IInd ordinary at the bottom, IR has steadily been

IR’s freight traffic has been shifting from the relatively high-tariff commodities to the relatively low-tariff ones. Looking to the future, the changing structure of production in the economy in the next decade may reinforce this erosion of competitive strength

operationalizing pricing points in between the extremes. While I class services still exist, they are being phased out as part of IR's long-term strategy to provide air-conditioned services at the upper end of the price ladder. II AC was introduced during the early 1980s, and AC 3 tier during the mid 1990s.

Both of these classes have proved to be enormously popular, and the growth rates of traffic reflect their popularity in two ways. From a demand perspective, whatever capacity is put into service in these classes, is being accepted by the travelling public. From a supply perspective, this reveals some degree of market sensitivity of IR, in terms of its response to the demand at these pricing points. The high growth rates also reflect the rate at which IR has been increasing the capacity of these services, relative to its total passenger capacity. Their popularity reflects the inherent necessity to offer a variety of pricing options to an economically and socially heterogeneous population. It is characteristic of travellers in developing countries to simultaneously use a variety of modes. Traffic patterns in any city, ranging from pedestrians to bicycles to taxis and cars to public and contract buses attest to this. Why should the railways be any different?

It is interesting that IR's approach to passenger services has gone round an almost full circle over the years. Several decades ago, there were classes ranging from AC to III and spanning several points in-between – I, II and Inter. Gradually, these were consolidated and at the beginning of the 1980s, the number of pricing points that passengers could choose from had shrunk considerably. After that, the pendulum swung back, and a number of new classes, mostly with a view to filling the wide gaps in the upper class segments,

Box 3.1 : Helping Railways Regain Freight Lost to Roadways: A Private Sector Proposal

As and when rail services are reformed and restructured in India, rail freight is among the services that will be open to private companies. In response to this anticipated move, one private company has come forward with a business proposal to introduce a special railway vehicle with multiple uses. Back in 1992, Kirloskar Pneumatic Company Limited (KPCL), began a joint venture with a company in the USA to locally manufacture a state-of-the-art railway vehicle. These trains – bi-modal semi trailers or simply, 'Road Railers' (RR) – are designed to run both on rail as well as road without transshipment. These can be a possible option for localized use over certain segments. In other countries such as China, Germany, Thailand and the USA, the RR train has been commercially operational and provides a solution to traditional containerisation and truck transit through its fast door-to-door multimodal freight services across various corridors.

RR trains are unique in that they have the logistical flexibility of roadways and the cost economies of the railways – operational features, which the company argues will go a long way in earning the high value freight traffic needed by the Indian Railways. KPCL claims that the principal gain from the RR train will be a restoration of the share of railway freight traffic lost to roadways. Lost markets for rail freight are to be recovered mainly through a superior advantage of the RR train viz. the elimination of the need for railway sidings for loading and unloading of cargo. RR train terminals are location-friendly and can be set up anywhere on the existing railway line nearby big factories and industrial estates. This way, the RR train can divert freight traffic moving on congested highways, resulting in substantial savings in travel time and distances for cargo. The other key benefits of the Road Railer cited by KPCL are:

- A fast and fuel efficient vehicle – the train can travel at speeds higher than 100 km of hour, savings in fuel amount to as much as Rs. 50 crore (at current prices) by the end of a train's lifecycle.
- Easing congestion in ports, railway terminals and highways by freeing container storage space – bulk loose commodities can quickly be shifted and packed outside the port; perishables can be loaded at the farm instead of the port.
- Prevents the overcrowding of highways by reducing time and distance for shipments.
- More rural perishables can travel longer distances to metros – the door-to-door concept of speedy delivery and transit can develop rural economies through boosting freight markets.
- Cost savings for infrastructure projects – construction inputs like cement and other building materials can be shipped bulk loose to project sites resulting in savings on packing, handling and storage charges.
- Strategic importance for defence; an alternative mode of supplies and storage in cases of natural disasters, accidents etc.

IR initially encouraged the development of the project on a trial basis and prototypes imported by the KPCL were cleared by the concerned authorities for local production, after testing. But, despite the multiple uses of the special rail vehicle proposed by KPCL, there is as yet no apparent market demand in the country for these trains. IR itself has not purchased this vehicle and prefer to ship cargo through containers. So at present, it would appear that the market conditions do not favour the commercial production of the RR train. However, innovative proposals such as this one which attempt to help railways regain freight lost to roadways will need to be explored in the future if they become commercially viable.

Source: "A Brief Note on the Salient Features of the RoadRailer Project", Kirloskar Pneumatic Co. Ltd.

were introduced. The Sleeper Class, introduced as a distinct charging category in the early 1990s, was the first, and eminently successful, attempt to occupy intermediate pricing points in the lower class segments. In one stroke, it answered a gaping need, and allowed IR to raise its effective lower class fare by a significant percentage. The strategy of occupying intermediate pricing points has served IR very well. It has allowed them to mitigate the political compulsions of keeping lower class fares down, and can therefore be viewed as a subtle tariff re-balancing mechanism.

Notwithstanding the success of this strategy, the central problem with respect to the IR's movement of passengers is that more than 90 per cent of the traffic is in the low-price segments. The fares for these segments are perhaps the most politically sensitive of all IR's pricing decisions. A combination of high volumes and fares lower than cost in the low price segments is what puts IR in such a bind with respect to passenger movement. If, for example, fares are so low that IR makes losses on every passenger carried, carrying more passengers can only increase the financial burden. So, increasing the traffic itself cannot be a solution to IR's problems. The challenge is to increase traffic in segments that generate higher net revenues; in other words, the revenue potential from the upper classes needs to be exploited to the maximum extent. This requires a sensitivity to the market for these services and the ability to design the most attractive package comprising both transportation and its associated provisions.

In short, the patterns of passenger traffic over the last 15 years reveal a relatively market sensitive face of IR. As more and more people have shown a willingness to pay more for better services, IR has responded by increasing their capacity to provide these services. It is this market sensitivity that will lie at the core of any strategy to accelerate the growth of revenues from passenger traffic. In fully realizing the potential gains from its marketing strategy, it must pay the closest attention to quality of service, right from the reservation process to the journey and in-train services, to the convenience of boarding and alighting. However, the broader political constraint, the requirement that IR meets the national mass transportation needs at prices that may not be justified by costs, places serious restrictions on how such a strategy can be implemented. The key challenge to IR in this respect is to maintain its obligations on the lower price services, while at the same time increasing both capacity (through investment) and utilization (through innovative pricing and other marketing instruments) of the upper classes.

3.4 GDP Growth, Household Incomes and the Potential for Railway Traffic

Some factors, which have both positive and negative implications for revenue growth, emerge from the overall pattern of economic development. On the positive side, the rate of GDP growth has been relatively high over the last two decades, and more importantly, when we compare decadal averages, it has been accelerating. As a result of the changes in economic policy over the 1990s, there is a high probability that the average growth rate over the next decade may be even higher than during the one just passed. Over a fairly long-term horizon, therefore, higher GDP growth may provide a boost to railway traffic. This assessment has to be tempered by the observation that IR has been losing freight traffic to roads in an environment of relatively rapid growth. This tendency will undoubtedly accelerate with the construction of the planned golden quadrilateral and cross-country highway systems. Thus, economic growth, while providing an opportunity for higher business

Increasing the traffic itself cannot be a solution to IR's problems. The challenge is to increase traffic in segments that generate higher net revenues

Economic growth, while providing an opportunity for higher business volumes, may not be sufficient to generate these. The organization has to have the capacity to go after this business, and once having obtained it, to sustain it

The railways have a virtual monopoly on a large range of travel options in the middle of the transportation price hierarchy. This represents an opportunity to increase the usage of higher class services

volumes, may not be sufficient to generate these. The organization has to have the capacity to go after this business, and once having obtained it, to sustain it.

On the passenger side, economic growth provides perhaps an even greater opportunity. Growth itself will generate a higher demand for transportation. Reinforcing the positive impact of growth is the movement in household income distribution. It is evident from surveys of households carried out by NCAER that the relatively rapid growth of the past decade and a half or so has succeeded in shifting large numbers of households from subsistence levels of income to levels where substantial discretionary disposable income is available. We only have to look at the recent spurt in the sales of passenger cars to appreciate the magnitude of this force. From a total production of around 30,000 vehicles at the beginning of the 1980s, the country now produces and sells more than half a million cars annually. In general, not only does this mean more expenditure on transportation, including leisure travel, but importantly, it implies that the percentage of the population who would be willing to shift out of the lower classes to the higher classes is increasing. Of course, at the top end of the spectrum, IR competes with the airlines, and on many criteria cannot offer the same attributes to the consumer. But the railways have a virtual monopoly on a large range of travel options in the middle of the transportation price hierarchy. This represents an opportunity to increase the usage of higher class services, and thereby increase revenues for a given volume of movement.

The Planning Commission, in making its estimates of the investment needed in the transportation sector, works on the basis of a GDP sensitivity of 1.25. In other words, for every percentage point increase in the growth rate of GDP, total demand for transportation is expected to increase by 1.25 per cent. Of course, the distribution of this response among different modes depends on a number of factors, and there is no guarantee that this increase will be uniformly appropriated by all the major modes. Also, the changing structure of economic activity, as pointed out in an earlier discussion, might cause this sensitivity to decline in the future. In this context it is important to point out that the share of different modes will depend on the kinds of investments that will be made to expand their carrying capacities. For instance, the massive investment programme laid out for the highway system will significantly improve the capacity of the road transport system and therefore make road movement relatively more attractive. The sustainability of IR depends on its ability to make the investments necessary to enhance its capacity, as well as to generate higher revenues from the increased capacity.

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In Exhibit 3.7 we report the sensitivities of railway traffic to Gross Domestic Product (GDP) in India over the 15-year period from 1983-84 to 1998-99. The sensitivity is obtained by regressing the natural logarithms of the relevant traffic series for the 15 year period on the natural logarithms of the GDP series. For freight, the sensitivity of Net Tonne Kilometres with respect to GDP is a relatively low 0.42, indicating that if GDP were to grow at 6 per cent, NTKMs would grow at around 2.5 per cent. For tonnes originating, the sensitivity was estimated to be 0.65. The difference between the two estimates is an indication of what is happening to average leads. They are clearly falling. From a revenue perspective, it is NTKMs that are more important. The relatively low sensitivity emerging from the 15 year pattern of GDP and traffic growth is obviously a source of concern. If the aggregate transport sensitivity of GDP is 1.25, IR's NTKM sensitivity of 0.42 reflects a steadily falling share of total transportation services for IR.

Some possible reasons for this have been addressed earlier in this chapter. In the specific context of capacity constraints, the role of congestion on the main inter-metro lines is very important in reducing the effective capacity of the railway system. Since these lines carry the majority of traffic movement, particularly of the non-bulk commodities, their being clogged results in a significant reduction in the system's capacity, even though other lines may remain relatively underutilized. In addition to this, the speed differential between freight and passenger trains on IR is relatively high by global standards. Both these problems need to be addressed by appropriate investments in capacity enhancements and technology.

Looking at these trends in the context of broader macroeconomic trends gives us a sense of what the potential for growth in IR freight traffic is. **If we anticipate a GDP growth rate of about 6.5 – 7 per cent per year over the next decade, IR can look at a potential growth rate of about 9 to 10 per cent per year if it follows a strategy designed to regain its lost market share.** As was also pointed out earlier, there may be changes going on in the structure of the economy, which would make this an unrealistic target. Nevertheless, this rate of GDP growth offers an opportunity. If IR takes steps to recover its market share, through a combination of tariff re-balancing and quality enhancement measures, and to increase its share of the transportation of “other commodities” (which it seems to have done to a small extent in the last five years), growth rates of 7 per cent per year or more over the decade do not appear to be an infeasible objective.

With reference to passenger traffic, again reflecting the growth rates over the past 15 years, the GDP sensitivity of PKM was estimated at 0.76, while the sensitivity of Passengers Originating was estimated at 0.95. (**Exhibit 3.7**). GDP growth appears to generate demand for travel at an almost proportionate rate, but the average journey seems to have become shorter, which has adverse implications for revenue, given the pricing structure. Based on this estimated relationship, there is far greater room for optimism about growth in passenger traffic keeping pace with GDP growth. **A restructuring plan which visualizes passenger traffic growth at about the GDP growth rate should therefore be viewed as feasible.** However, the problem of the distribution of revenues across passenger classes needs to be dealt with explicitly in any such plan. Volume growth, which is biased towards the lower classes will not generate the kind of revenue buoyancy necessary for the plan to be viable. IR needs to take steps to increase the capacity and utilization of the upper class segments. As the next section demonstrates, the potential to

If IR takes steps to recover its market share, through a combination of tariff re-balancing and quality enhancement measures, and to increase its share of the transportation of “other commodities”, growth rates of 7 per cent per year or more over the decade do not appear to be an infeasible objective

Exhibit 3.7 : Passenger Traffic Sensitivity to GDP

Variables	Log	
	Sensitivity	R Squared
Total Passenger Kilometer	0.76	0.95
Total Passenger Originating	0.94	0.60

*** Log linear model for 15 years*

Freight Traffic Sensitivity to GDP		
Variables	Log	
	Sensitivity	R Squared
Total Net Tonnes	0.42	0.94
Total Tonnes Originating	0.65	0.97

*** Log linear model for 15 years*

Source : Computed from **Indian Railways, Annual Statistical Statement** - various years; RBI Handbook of statistics on Indian Economy 1999.

do this with the use of price changes may be there.

Apart from the importance of price changes in achieving this shift, IR has another window of opportunity to induce a shift in the distribution of traffic towards the upper classes. This emerges from the changing distribution of household incomes. NCAER's Indian Market Demographic Report for various years provides an estimate of the distribution of Indian households across five income slabs: low, lower middle, middle, upper middle and high. **Exhibit 3.8** provides a picture of the changes in this distribution over the last decade, and also presents forecasts on the movement of this distribution in response to GDP growth anticipated over the next decade. As is clear from the past pattern and the forecast based on it, the number of households which will move from the lowest income bracket to brackets where they have a reasonable amount of discretionary income, is very large. This group of upwardly mobile households constitutes a huge potential demand for better quality transportation services.

IR has another window of opportunity to induce a shift in the distribution of traffic towards the upper classes. This emerges from the changing distribution of household incomes

The relative movement in the household income distribution, compared with the shift in traffic towards the upper classes discussed earlier, is far more dramatic. This suggests that the traffic distribution, dramatic as it has been, particularly with respect to the newly positioned price segments, has not kept pace with the upward mobility of households. The revenue potential that the income dynamics represent for the railways has so far not been exploited because of supply constraints. New investments in upper class rolling stock, as well as in increasing average speeds of passenger trains may allow IR to cash in on this untapped potential. This may require IR to begin procuring its rolling stock on an open competitive basis. Its in-house rolling stock manufacturing capacity would then have to compete with other suppliers on price, quality and technology of rolling stock supplied.

3.5 Price Sensitivity of Freight and Passenger Traffic

3.5.1 Price Sensitivities of Individual Commodities

In Exhibit 3.9, we report on the estimates of price sensitivities for the various commodity classifications reported by IR. **Box 3.2** provides some statistical details about how the estimates were arrived at. The essential concern is whether lowering freight tariffs by IR would help them realize larger volumes. Further, the sensitivity estimate for a particular commodity also lets us gauge whether the total revenue will increase or decrease in response to a lowering of prices. This relationship is also explained in the Box 3.2.

Exhibit 3.8 : Distribution of Indian Households by Income (per cent shares)

Income group*	1989-90	1997-98	2006-07**
Low upto 22,500	58.8	42.5	14.8
Lower middle 22,501-45,000	26.9	33.5	36.5
Middle 45,001-70,000	10.1	13.4	23.1
Upper middle 70,001-96,000	2.7	5.8	11.7
High above 96,000	1.4	4.8	13.9
Total	100	100	100

Note: All figures are for rural and urban combined; *Annual Income in Rs. (1994-95-prices); ** Projected.

Source: NCAER.

Four of the commodities show the expected negative sign. Of these, only iron ore for export shows a sensitivity that is statistically significant. Both commodities show price sensitivities less than unity. The revenue implications of these estimates, following from textbook reasoning, are that if the price is to be decreased from current levels, the total revenues from these commodities would fall. All the other negative coefficients are, statistically speaking, no different from zero. Of the four, which show positive sensitivities, an outcome that contradicts theoretical predictions, none are statistically significant. To put these possible revenue implications into perspective, the distribution of revenues across the different commodities is presented in **Exhibit 3.9**. These mirror the traffic patterns discussed in the previous section. In terms of this discussion, a very large proportion of freight revenues comes from commodities, which do not show significant price sensitivity.

These findings, taken at their face value, carry very pessimistic implications for IR's possible strategy options involving a regaining of market share through price revisions. Lowering prices to generate enough traffic growth

Box 3.2 : Price Sensitivity

The interpretation of "Price Sensitivity"

The term "sensitivity" in this context measures the responsiveness of volumes to changes in prices. For most goods and services, it is expected that an increase in prices will induce people to consume smaller quantities, all other things remaining the same. However, the extent to which consumption falls or rises in response to a price change may vary from item to item. The consumption of some goods may show very little reaction to price changes, while others may show a significant variation in consumption to relatively small price changes. The magnitude of the change in quantity in reaction to the change in prices is referred to in economics text-books as "price elasticity of demand". Mathematically, it is defined as the ratio of the percentage change in quantity consumed to the percentage change in price. This indicator has been termed "price sensitivity" in the discussion in this chapter.

From this description, it should be clear that the "elasticity" or "sensitivity" is always negative i.e. price and consumption always move in opposite directions to each other. Once we accept this, the convention is to express the elasticity as an absolute number. Demand for a good is said to be "elastic" when the absolute value of its price elasticity of demand is high (which would imply a low negative number). Conversely, demand for a good is said to be "inelastic" when the absolute value of its price elasticity of demand is low (a high negative number). Because of certain mathematical properties (referred to below), the dividing line between "elastic" and "inelastic" is an elasticity of unity in absolute terms (or, technically speaking, -1).

There are well-known reasons for the price elasticity of a good being high or low. A low elasticity (a low negative number will be high in absolute terms) is characteristic of goods which typically have a large number of substitutes, particular cheaper substitutes, which fulfil the same need for the consumer. For example, with respect to railway services, it would be reasonable to expect that the demand for travel by I AC would be quite sensitive to price (elastic), because the passenger has the choice of travelling by several cheaper classes. However, at the other end of the spectrum, the demand for travel by II Ordinary would be quite insensitive to price (inelastic) because there are no cheaper alternatives. For a person who has to travel, an increase in the price of the cheapest alternative, as long as it is still substantially below the next cheapest one, will in all likelihood not induce a change in plans.

The relationship between price sensitivity and revenue

A negative sensitivity means that volumes will decrease as prices increase and *vice-versa*. However, since revenue is the product of price and volume, the magnitude of the sensitivity determines whether revenues go up or down when the price, say goes down. If the sensitivity is less than 1, revenue and price move in the same direction. If the sensitivity is greater than 1, revenue and price move in opposite directions. If the sensitivity is 1, revenue remains constant, i.e., the fall in volumes exactly compensates for the increase in price.

Some General Caveats for the statistical exercise

Conventional demand estimations and forecasts are based on certain notions of market behaviour. In particular, it is assumed that the market for which demand is being estimated is in a state of equilibrium between demand and supply. Markets in which supply is constrained are difficult to interpret from the observed data on prices and quantities. IR data on traffic are rife with problems when it comes to interpreting them in terms of the standard demand framework. Apart from the problem of supply constraints, which characterizes both freight and passenger data, there is a problem with measuring the exact price the passenger pays.

The Price Sensitivities of Freight Traffic

The estimates are obtained by regressing the natural logarithms of the NTKMs for each commodity on the Average Earnings per **Kilometer** for that commodity. Volume changes are accounted for by introducing the natural logarithm of the total production of the particular commodity into the specification. For the composite category of raw materials for steel plants, the total production of steel was taken as a proxy for production. For the composite category "other commodities", GDP was taken as a proxy for production. The estimation is done for a 15 year period.

The Price Sensitivities of Passenger Traffic

The estimates are obtained by regressing the natural logarithms of the PKMs for each class on the Average Earnings per **Kilometer** for that class. The control variables are a set of fixed effects to take account of the specific factors influencing individual zones and time periods, and a trend variable, which captures, among other things, the effect of growth in volume.

From the freight mover's point of view, it may not just be the freight tariff that determines his decision to ship by rail or road. He is concerned with waiting periods, uncertain delivery schedules, the inconvenience of loading and unloading, and a host of other factors that increase his costs not captured in a tariff that is determined outside a competitive setting

to increase revenue requires a price sensitivity of greater than unity. From the very limited exercise carried out here, it appears that this is not likely to happen at the current price levels. At one level, these findings may be questioned because of the extremely limited, as well as flawed, data that has been used. At another level, however, if these findings have some validity, some strategic implications can be drawn.

From the freight mover's point of view, it may not just be the freight tariff that determines his decision to ship by rail or road. He is concerned with waiting periods, uncertain delivery schedules, the inconvenience of loading and unloading, and a host of other factors that increase his costs of using IR services, but are not captured in a tariff that is determined completely outside a competitive setting. Thus, the "true" cost to the consumer is not reflected in the price. The demand may be sensitive to the "true" cost, but is not particularly sensitive to the observable price, which may only be a fraction of the user cost. If this is indeed the case, then IR's strategy to regain its freight market cannot rely solely on pricing. Price revisions, to the extent that they are considered, can only be one part of a broader package designed to reduce the user cost. Multimodal services, improved loading and unloading logistics, predictable delivery schedules and so on must be made an integral part of IR's restructuring plan (**Box 3.3**)

3.52 Price Sensitivities of Individual Passenger Classes

In **Exhibit 3.10** we present regression estimates of the price sensitivities of different classes of passenger travel, keeping in view the caveats mentioned in **Box 3.2**. The key features of this exercise are the relatively high sensitivities of the two highest classes. AC I shows a sensitivity below -3 , which, in revenue terms, indicates that a ten per cent reduction in price will bring about more than a 20 per cent increase in revenue. The sensitivity for AC II is around unity. This implies that revenue is not sensitive to price, but given the statistical range of the estimate, there is a likelihood of the sensitivity being somewhat higher than unity, and therefore, there is the possibility of some revenue increase from a price reduction. The other classes with statistically significant negative price sensitivities are the Sleeper Class, with -1.46 , indicating that there is a potential for revenue increase from reducing prices. And the II (Mail and Express) with a sensitivity of -1.04 , which can be interpreted to mean that a price increase will not cause a significant fall in revenues. The overall

Exhibit 3.9 : Price Sensitivity for Freight Traffic by Commodity

Commodity	Sensitivity
Coal	0.35
Steel	0.77
Iron ore for export	-0.26
Cement	-0.86
Food	0.03
Fertilizer	-0.22
POL	0.01
"other commodities"	-0.73

Source : Computed from data in **Indian Railways, Annual Statistical Statement**-various years.

Box 3.3 : Quantity Vs Value Added: Meeting Customer Concerns in Freight Rail Transport

Rail freight movements under the 'Planned' economy were measured in quantitative terms only, i.e. the capacity to fulfill bulk shipment targets over long distance routes, and not in terms of better quality of service to customers. Roadways, in contrast to railways, were confined to the movement of non-bulk, value-added commodities (e.g., cotton, fertilizers, textiles, sugar, white goods, machinery, automobiles etc) over short and medium distance routes (less than 500 kilometers). In other words, the logic that governed the movement of rail freight was limited to meeting targets of bulk shipments, to the neglect of non-bulk commodities.

Also, the dictates of planning inevitably forced high-value non-bulk goods to be shipped only in such volumes as was in accordance with market demand and carrying capacity of the railways. This situation created a shortage of a transit mode for non-bulk freight – a gap which was filled by truck companies. What is more, the respective market segmentation for rail and road transport sectors, as it evolved under the planning approach, was not based on any detailed analysis of consumer needs and requirements.

It has now emerged that the compulsions of planning have in fact been highly detrimental to the market share of bulk rail freight. Today, truck operators are making inroads into bulk long distance traffic, as a number of companies - cement, steel fertilizer - are turning to truck transit also for distances beyond 500 kilometers. The market position of bulk rail freight in a newly liberalized economic environment is further threatened by the arrival of pipelines and newer and better trucks capable of carrying heavy loads over long hauls on modern expressways in India.

IR would do well at this point to recall what Theodore Levitt expounded in his celebrated article in the *Harvard Business Review* in 1960. Businesses, according to Levitt, go wrong when they take their eyes off the customer and focus on products instead. He went on to analyze the decline of the great American railroads to the basic error in defining their business. In his words: "they were railroad-oriented, instead of transportation-oriented; they were product-oriented instead of customer-oriented."

For re-capturing a higher market share, the real issue before IR is to move away from setting transit targets, and shift towards benchmarking how consumers rate the performance of rail against road. This should be based on an analysis of the factors that constitute levels of consumer satisfaction and concerns on rail freight transportation in India. There is much ground to be covered. Consumers interviewed over a recently conducted study rate the performance of rail to be as much as 50 percent below that of road in terms of attributes such as price, reliability, transit time, customer service etc. Similarly, several shippers of goods who expressed dissatisfaction with rail services admitted to being compelled to use the railways for want of an option.

The study mentioned above offers an alternative to the policy of concentrating on meeting quantitative targets, and outlines a plan for a new customer oriented marketing strategy for the Indian Railways. Some of the main actionable points of this plan are:

- Railways, should focus on improving the performance of factors where the gap between rail and road are narrower viz. price, reliability, availability, product suitability, transit time, customer-information and adaptability.
- A customer interface system should ensure both reliability and availability of quality freight services, which will facilitate stricter rules of contract on volumes and tariffs; encourage information exchange between shippers and railways on the likely date the shipment is readied for dispatch, the availability of free space, wagon location after unloading and finally, the sharing of information on the development of future freight markets to help the railways plan for long-term investments.
- Railways need to introduce modern customer friendly services viz. lifting "less-than-a rake-load" through truck-to-rail transfers in partnership with truckers in a cost-effective manner for the benefit of small shippers; use of internet based management information systems to track and control loading, unloading and terminal capacity.

These steps will without doubt, contribute to reducing delays in delivery through better transit management. They offer valid benchmarks with modern practices for re-capturing the declining market share of bulk long distance routes.

The customer-oriented approach calls for more than a mere change in top management philosophy. It has implications for several key areas of organizational decision-making. Selection of investment projects is one of them. Marketing strategies can deliver only to the extent capacity is available on the system. The significant change in planning concept is the need to define investment projects in a composite way with the customer-focus, rather than in the prevailing segmented approach. To give a specific illustration, a business strategy aimed at increasing axle-load for the movement of ore to steel plants – a key capacity augmenting project – will involve (a) design and manufacture of wagons with higher axle-loads, and (b) upgrading track on selected sections. Both activities will need to be progressed in close co-ordination, with assured funding, mid-project reviews of implementation and post-project evaluation of benefits.

Likewise, staff training and internal procedures will also need revamping. A project to improve wagon reliability on a very busy trunk route (another area in urgent need of improvement) will yield the desired results only if a few measures are implemented in tandem: (a) upgrading of Maintenance Workshops serving the entire route. (b) re-designing wagons such as will have lower maintenance requirements. (c) Staff Training, and (d) modification in procurement procedures.

Source : Study by Shri Sanjay Srivastava and inputs from Expert Group Members.

impression emerging from this exercise, given all its limitations, is that there is some potential for IR to increase passenger revenues by reducing upper class fares, and perhaps even increasing lower class ones.

To put this into perspective, Exhibit 3.5 provided the distribution of revenues coming from the various classes. It is quite different from the traffic distribution discussed in Section 3.2, because of the fare differences. The upper classes, taken as a group, have increased their share of revenue from about 12 per cent at the beginning of the period, to about 22 per cent at the end of it. So even relatively small changes in upper class revenue realizations will have a large impact on the overall revenue stream.

The recommendations made by the Nanjundappa Committee on the Railway Freight and Fare Structure, which submitted its report in 1993, suggested a top-to-bottom ratio of 9.6 to 1. In fact, the price ratio of top-to-bottom as it exists now is 14.4 to 1. The results of this exercise suggest that there is scope for revenue improvement from passenger traffic if the ratio of top-to-bottom is decreased somewhat, with the top being brought down and the bottom being moved up.

The growth in freight revenues expected from a “business-as-usual” scenario will simply accelerate the descent of IR into financial disaster. On the passenger side, the attainment of financial health will necessitate both higher growth in traffic as well as tariff rebalancing

3.6 Simulations of Revenue Growth

In this section, we report some select results from a simulation exercise, in which future revenues are projected taking into account the combined effects of natural volume growth and tariff re-balancing. The Strategic High Growth Scenario in the financial simulation exercise requires an overall revenue growth of about 7 per cent per year over a fifteen year period if IR is to achieve some semblance of financial viability. As indicated earlier, the growth in freight revenues expected from a “business-as-usual” scenario will simply accelerate the descent of IR into financial disaster. On the passenger side, although there has been some improvement in revenues realised per passenger km. because of the upper classes achieving a higher share in traffic, the attainment of financial health will necessitate both higher growth in traffic as well as tariff rebalancing. The change in shares of upper class traffic has taken place almost fortuitously. Recognition of the changing income distribution in India must now turn this opportunity into a conscious strategy for turning around IR’s financial health.

3.61 Freight Traffic Projections

A medium annual growth rate of 5 per cent for freight traffic can be achieved without major organisational changes provided the physical capacity is made

Exhibit 3.10 : Price Sensitivity for Passenger Traffic by Class

Class	Sensitivity
A.C. Ist Class	-3.46
A.C. Sleeper Class	-0.99
A.C. 3 Tier	-0.50
First Class (O)	0.40
A.C. Chair Car	0.71
Sleeper Class (M)	-0.71
Sleeper Class (O)	-1.46
Second Class (M)	-1.04
Second Class (O)	0.03

Source : Computed from data in Indian Railways, Annual Statistical Statement - various years.

available. But this itself will not be easy to achieve without a significant change in investment strategy. However, there is potential for increasing this rate further through a strategy that involves operational streamlining and some tariff rebalancing, in addition to providing physical capacity. This will require significant organisational restructuring.

For the size of the additional traffic that can be gained, some indication is provided by the loss of traffic by Railways over the last 15 years as estimated from the comparison of Railway Corporate Plan projections and the actual trends. These indicate a shortfall of over 20 per cent of the traffic moved in the year 1999-2000 as compared with IR's own projections. Railways' Second Corporate Plan (1985-2000) contained forecasts of freight traffic in alternative GDP growth scenarios and rail traffic shares. The medium growth projection (average GDP growth of 4.5 per cent and rail traffic share of 65 per cent of total land freight) estimated railway freight traffic output of 387 billion NTKM in year 1999-2000. A broadly similar projection is also contained in the reports of the Rail Tariff Enquiry Committee and the Railway Reforms Committee. In the event, the traffic output actually registered in 1999-00 was 301 billion NTKM, denoting a shortfall of about 22 per cent. As the average GDP growth over this period exceeded 4.5 per cent significantly, it is reasonable to attribute the drop to a decline in rail traffic share vis-à-vis road transport. Capacity constraints, pricing policy problems and poor service quality all contributed to the loss of this traffic.

This inference is strongly supported by the findings of the RITES study on 'Decline in Railway share of Total Land Traffic' (1996). Based on sample surveys of road movement over the main transport routes, the study concluded that about 69 million tonnes of bulk commodity medium to long-lead traffic (defined as exceeding 300 km) moved by roads in 1995-96. This kind of traffic would be clearly amenable to transport by rail if capacity was available and service quality was appropriate. This represented about 18 per cent of the traffic actually moved by rail (390 million tonnes) in that year.

The objective of IR in the strategic growth scenario would be to at least capture this 20 per cent traffic share over a period of phased stepped up growth, and thereafter to hold on to the higher share of total transport output in this category of traffic.

The survey done by RITES estimates that in 1995-1996, the bulk and long lead commodities moved by road amounted to 21 per cent of the traffic moved by the Railways in that year. The projections of freight traffic estimate that this share of traffic lost to road will be captured back by Railways within a reasonable time. In view of the linkage to investments, pricing and other structural changes, the rate of growth will be stepped up gradually.

Two separate projections have been attempted on this basis. The first adopts the same growth rates for all the commodities. In the second projection changes are made according to known factors concerning the commodities. The following are the main features:

- (a) **Coal:** The annual rate of growth in coal transported is capped at 7 per cent. Even this is based on the relatively optimistic expected requirements for power generation investment. As a fuel for power generation, domestic coal is now facing competition from different sources. Other fuels like gas, refinery products and nuclear power will have a growing share of power generation in the future. The expected growth in coal production and transportation may also be threatened because of other

A medium annual growth rate of 5 per cent for freight traffic itself will not be easy to achieve without a significant change in investment strategy. However, there is potential for increasing this rate further through a strategy that has pricing and operational strategy components in addition to providing physical capacity

With the opening of coal imports, there is an increasing tendency for power plants to be located on the coast. IR needs to be aware of the transportation requirements of imported coal and make investments accordingly

One can expect greater degree of food processing to occur and for foodgrains to be transformed into other products before transportation. This provides IR with an opportunity to increase revenue by substituting higher value freight for the expected slow down in freight traffic

constraints. If the current logjam in power policy continues, and power investment continues to be slow, so will be the growth in demand for coal. Second, for coal production itself to grow in the future significant policy reforms in the coal sector will need to be carried out. Third, with the opening of coal imports, there is an increasing tendency for power plants to be located on the coast. Fourth, even inland power plants will make the choice between domestic and imported coal on the basis of relative transportation costs. Thus IR now has to compete in coal transportation also on price and efficiency. It also needs to be aware of the transportation requirements of imported coal and make investments accordingly.

In summary, the assumed rate of 7 per cent growth is on the optimistic side. And IR will have to be vigilant in substituting coal traffic by other freight if this growth is seen not materialising.

- (b) **Iron ore for Export:** The increase in the transportation of this commodity is dependent on the prospects of continued investment in iron ore mining, and associated investments in ports and the like for the purpose of exports. According to current expectations, the maximum level likely to be achieved is 27 million tonnes per annum and hence the growth rate has been moderated suitably.
- (c) **Food grains:** Foodgrains transportation done by the railways is essentially for the Food Corporation of India (FCI) for the Public Distribution System (PDS) and bears subsidised tariffs. The rate of growth has been relatively high in the last 5 years as FCI's stocks of foodgrains have risen over this time. It is unlikely that this rate of traffic growth can be maintained for foodgrains, especially as consumer preferences grow for other kinds of foods. One can expect greater degree of food processing to occur and for foodgrains to be transformed into other products before transportation. Once again, IR will have to observe market trends closely to see how it can substitute for lower growth in foodgrain transportation. In fact, given the low level of tariff, this provides IR with an opportunity to increase revenue by substituting higher value freight for the expected slow down in freight traffic.
- (d) **Raw materials for Steel Plants:** The annual rate of growth projected is limited to 7 per cent. The reason here is that the ratio of finished products to raw materials should be broadly 1.3. This ratio has been distorted in recent years due to the loss of high rated finished steel traffic by IR caused partly by excessively high tariffs. Now that steel is open for both domestic private and foreign investment, new loadings for railways will depend also on their relative competitiveness with competing modes of transport. Here also IR will have to monitor developments in the sector to continue to provide transportation services. New steel plants will mostly be in the private sector and IR will have to bid aggressively for this new traffic and tailor their investment plans accordingly.
- (e) **Other commodities:** The future of IR depends critically on the strategy it adopts to recapture the transportation of other goods which are categorised under this head. With the change in economic policies overall, the diminution of the public sector and expansion of trade, the future of freight transportation by IR will depend on the speed of its adaptation to these new challenges. Given that these goods will be relatively higher valued, these changes also provide IR with new

opportunities for improving its revenue realisation from freight. IR, along with CONCOR, will have to accelerate the growth in container traffic in order to capture back the freight transportation of other manufactured goods. Accordingly, an overall annual growth rate of 10 per cent is projected on a conservative basis. To the extent that some of the growth projected for the bulk commodities does not fructify for some of the reasons indicated, capacity will be freed up for IR to carry this higher valued freight traffic. However, recapture of this traffic and the projected growth cannot take place without a major re-orientation of IR toward customer needs, flexible pricing, and provision of logistics solutions, from being a plain vanilla freight carrier. This will involve crucial investments in new rolling stock and information technology in addition to that required for increasing freight train speeds.

On the basis of the two sets of projections made, an increase of approximately 20 percent over the medium growth is obtained by the year 2011-2012. For the remaining years the average annual rate of increase works out to approximately 7 per cent per annum.

In the projections summarized here, it has been assumed that average leads will decline at the rate of one percent per annum from 668 km in 2000-01 to 574 km in 2015-16. (This is a long-term trend; for comparison, average load of revenue-earning Traffic in 1984-85 was 730 km). This assumption is relevant only to the quantification of originating tonnage.

In the second projection (Exhibit 3.12) also it is assumed that there is no change in average freight rate of any commodity except the composite residual grouping of “other commodities”. In this category of “other commodities” it is assumed that average freight revenue earned will increase at the rate of 3 per cent per annum, owing to targeting of high-rated commodities in the traffic strategy.

The role of “other commodities” – quantum as well as revenue realised – is crucial to the strategy. In 2000-01, this grouping is estimated to account for about 13 per cent of the total traffic output and 9 per cent of goods earnings. In the projections, corresponding shares are expected to be 19 per cent of traffic output and 21 per cent of goods earnings in 2015-16. (Again for comparison, in 1984-85, the average freight earned on “other commodities” at 19.7 paise was almost on par with the average all-revenue traffic freight of 20.1 paise. The share of this commodity grouping in total traffic output in that year was a little over 20 per cent).

The results from the two sets of projections are summarised in **Exhibits 3.11 and 3.12**.

We have not attempted to make major changes on the freight tariffs for the purposes of these projections. The assumption is that with the restructuring required and proposed in this Report, freight pricing will be much more flexible, customer responsive, and market based. It must be emphasised that freight tariff increases in the past have priced out IR from a number of market segments including some bulk commodities. Hence tariff rebalancing in freight will be crucial for IR to achieve the growth rates projected.

3.62 Passenger Traffic Projections

Unlike the tendencies towards stagnation in freight traffic, passenger revenues have been growing at a reasonably healthy rate during the last few years.

With the change in economic policies overall, the diminution of the public sector and expansion of trade, the future of freight transportation by IR will depend on the speed of its adaptation to these new challenges

IR, along with CONCOR, will have to accelerate the growth in container traffic in order to capture back the freight transportation of other manufactured goods

However, it is quite clear that the current rate is not adequate to sustain the financial viability of IR. A significant acceleration in revenues is considered to be possible through the implementation of a combination of measures. One component of the strategy is to improve the overall quality of service across the board, from ticketing to embarkation and disembarkation. This would include streamlining the ticketing procedure, creating large new capacities for reservation by exploiting internet-based franchising opportunities and dramatically improving the quality of services available at railway stations.

Exhibit 3.11 : Freight Traffic and Revenue Projections : Uniform Growth Assumption

<i>Commodities</i>	2000-01				2015-16			
	<i>Tonnes (millions)</i>	<i>NTKM (millions)</i>	<i>Average Rate (Paise)</i>	<i>Total Earnings (Rs Crore)</i>	<i>Tonnes (millions)</i>	<i>NTKM (millions)</i>	<i>Average Rate (Paise)</i>	<i>Total Earnings (Rs Crore)</i>
Coal	222	133731	0.80	10632	702	364749	0.80	28997
Raw Materials for Steel Plants	42	14994	0.72	1082	133	40896	0.72	2950
Finished Materials for Steel Plants	13	13438	1.06	1420	40	36652	1.06	3873
Ore for Export	13	7280	0.70	511	41	19856	0.70	1395
Cement	44	25432	0.79	2007	140	69365	0.79	5474
Food Grains	30	37800	0.43	1620	95	103099	0.43	4418
Fertilizers	31	26195	0.41	1081	98	71446	0.41	2949
Mineral Oil	36	18360	1.50	2761	114	50077	1.50	7531
“other commodities”	45	40050	0.55	2196	143	109236	0.55	5989
Total	476	317280	0.74	23310	1506	865376	0.74	63577
CARG						6.92		6.92

Notes :

1. Figures for 2000-01 from Railway Budget.
2. Growth Rates assume stepped up increase in NTKM to reach 10 per cent by year 2009-10 and taper down to 7% by 2012-13.

Source: Expert Group.

Exhibit 3.12 : Freight Traffic and Revenue Projections : Commodity-specific Rates of Growth

<i>Commodities</i>	2000-01				2015-16			
	<i>Tonnes (millions)</i>	<i>NTKM (millions)</i>	<i>Average Rate (Paise)</i>	<i>Total Earnings (Rs Crore)</i>	<i>Tonnes (millions)</i>	<i>NTKM (millions)</i>	<i>Average Rate (Paise)</i>	<i>Total Earnings (Rs Crore)</i>
Coal	222	133731	0.80	10632	646	335598	0.80	26680
Raw Materials for Steel Plants	42	14994	0.72	1082	123	37627	0.72	2714
Finished Materials for Steel Plants	12.5	13438	1.06	1420	40	36652	1.06	3873
Ore for Export	13	7280	0.70	511	27	12868	0.70	904
Cement	44	25432	0.79	2007	140	69365	0.79	5474
Food Grains	30	37800	0.43	1620	88	50874	0.43	2180
Fertilizers	31	26195	0.41	1081	98	71446	0.41	2949
Mineral Oil	36	18360	1.50	2761	105	46074	1.50	6929
“other commodities”	45	40050	0.55	2196	219	167299	0.85	14291
Total	475.5	317280	0.74	23310	1486	827803	0.78	65995
CARG						6.60		7.18

Notes :

1. Growth Rates same as in first tabulation (“Uniform Rates”) for the finished materials for steel plants, cement and fertilizers.
2. Higher growth rate of 10 per cent p.a. throughout projected here for “other commodities”.
3. Lower projections apply to reworking five categories.
 - 3.1 Raw Material for Steel plants
 - 3.2 Iron Ore for Export.
 - 3.3 Food Grains
 - 3.4 Mineral Oils.

Source: Expert Group.

A second component would take advantage of the favourable shifts in income distribution to increase the availability of upper class services. The significance of higher-priced services has been increasing rapidly over the last decade. IR has responded positively to this by increasing the number of pricing points available, both by the introduction of new classes and the introduction of new types of trains, such as the *Shatabdis*. The strategic objective of trying to identify potential demand for new price-quality combinations and catering to these demands in a cost-effective way must be pursued with complete dedication.

A third, and crucial element of IR's strategy to increase the rate of growth of passenger revenues revolves around pricing. The objective in this case would be to exploit the revenue enhancing potential of reducing fares somewhat for the upper classes, which have relatively high elasticities of demand, while at the same time, increasing the lower class fares gradually. This increase will reflect a determination to charge lower class passengers a fare closer to the actual costs of providing rail transport services. Further, because of the relatively low elasticities of demand for lower class rail services, specially over long distances, raising fares will have a negative impact on traffic, but will contribute to an increase in revenues.

In **Exhibit 3.13**, projections for passenger revenue growth are presented in a scenario in which some efforts are made to accelerate traffic growth, but the structure of fares is unchanged. The growth rates for the individual classes are generally slightly higher than were observed over the recent past, reflecting the contribution of these efforts. The exception is with AC III tier, which grew at close to 40 per cent per year over the last five years, but whose growth rate in these simulations has been moderated down to 15 per cent per year. In this set of simulations, the annual growth rate for passenger revenues is about 7.8 per cent over the 15-year projection period. This rate, while impressive in relation to past performance, is still inadequate to fulfil the revenue growth that would render the Strategic Growth investment scenario financially viable.

IR has little option but to rebalance passenger tariffs in a manner consistent with the elasticities of demand for the various classes. A second set of simulations is carried out by incorporating a new set of tariffs. The simulations envisage the tariff rebalancing – lowering of upper class fares

The strategic objective of trying to identify potential demand for new price-quality combinations and catering to these demands in a cost-effective way must be pursued with complete dedication

Exhibit 3.13 : Passenger Traffic and Revenue Projections: Constant Real Fares Assumption

Classes	2000-01			2015-16			
	PKMs (millions)	Average Rate (Paise)	Total Earnings (Rs Crore)	Annual Growth Rate (%)	PKMs (millions)	Average Rate (Paise)	Total Earnings (Rs Crore)
A.C. I	562	288.3	162	5	1168	288.3	337
A.C. II Tier	7270	126.7	921	7	20058	126.7	2541
A.C. III Tier	3216	73.4	236	15	26168	73.4	1921
First Class	4103	72.6	298	-5	1901	72.6	138
A.C. Chair	3743	57	213	10	15635	57	891
Sleeper M+E	93101	29	2700	10	388906	29	11278
Sleeper Ord	1503	23.6	36	10	6278	23.6	148
II M+E	121715	22.7	2762	6	291697	22.7	6622
II Ordinary	116212	13.8	1604	6	278508	13.8	3843
Total	351425		8933		1030322		27720
CARG					7.43		7.84

Note: Figures for 2000-01 from Railway Budget.

Source: Expert Group.

in real terms, while raising lower class fares in real terms – at some specified rate per year over the five-year period 2000-01 to 2005-06. **Exhibit 3.14** presents the assumptions made about the two main parameters used in the simulation: the elasticities of demand for each class and the rate of change in the fares.

The elasticities broadly follow the pattern observed in the statistical analysis reported earlier in the chapter. However, given the deficiencies in the statistical exercise itself, some judgemental changes have been made in the numerical values. Broadly speaking, the weight of evidence suggests that the more expensive classes have elasticities greater than unity, while the cheaper classes tend to show elasticities below unity. These simulations preserve this ordering. The results would, of course, be sensitive to the precise numerical values of the elasticities, particularly in the lower class simulations, which account for the bulk of revenues. However, the value of 0.7 we have chosen here is, if anything, on the higher side, and to that extent, the revenue impact of raising fares is understated in this calculation¹.

With reference to the rates of change in fares, since the entire exercise assumes an average annual rate of inflation of 6 per cent, the average real fare decrease in the upper classes has been capped at 5 per cent per year. This means that actual fares will never be reduced in absolute terms; they will be increased at a rate of about 1 per cent per year. On the other hand, Sleeper class and II class fares are envisaged to increase at 10 per cent per year and 8 per cent per year respectively in nominal terms. It is understood that such a rebalancing exercise will not be easy to accomplish politically. It will need a communication campaign along with significant improvement in the quality of lower class services.

It is important to point out that this tariff rebalancing is construed as a restructuring of passenger fares *on the average*. This means that IR must exploit every opportunity to discount fares in order to fill vacant seats and berths. It should look at the possibility of off-season discounts, standby discounts and various other ways in which to attract those travellers who are most sensitive to prices, and would be willing to travel if they could pay less than the listed fares, particularly for the upper classes. Price differentiation is a crucial component of any attempt to rebalance tariffs by IR. Flexible market based pricing will have to be the order of the day: yet another reason for the kind of major structural change proposed in this report. (**Box 3.4**)

Exhibit 3.14 : Parameters for Passenger Tariff Rebalancing Simulations (Upto 2005-06)

Class	Price Elasticity	Annual Rate of Change in Real Tariffs (per cent)
A.C I	-2.00	-5
A.C. II Tier	-1.50	-5
A.C. III Tier	-1.25	-5
First Class	0.00	0
A.C. Chair	-1.25	-5
Sleeper M+E	-0.90	+4
Sleeper Ord	-0.90	+4
II M+E	-0.70	+2
II Ord	-0.70	+2

Note: First Class is not considered in this exercise, as it is currently in the process of being phased out.

Source: Expert Group.

¹Tae H Oum, W.G.Waters, II and Jong Say Yong “A Survey of Recent Estimates of Price Elasticities of Demand for Transport”, Infrastructure and Urban Department, The World Bank, January 1990 Working Paper Series No. 359. Washington D.C.

The results of the tariff rebalancing simulations are reported in **Exhibit 3.15**. The traffic and revenue growth for the five year period 2000-01 to 2005-06 are compared with and without the rebalancing indicated in Exhibit 3.14. **There is a significant acceleration in the growth rate of revenues, from 7.45 per cent per year to 8.66 per cent per year.** Traffic volumes drop, which is consistent with the logic of price elasticity, but the fare increase more than makes up for this loss. In this simulation, no further tariff rebalancing has been envisaged after 2005-06. If revenue growth is driven purely by volumes after that year, the CARG from 2005-06 to 2015-16 is estimated to be 8.22 per cent. **An average annual growth rate in passenger revenues of 8.66 per cent in combination with the potential for freight revenue growth of 7.45 per cent, discussed above, generates a viable rate of overall revenue growth from the perspective of the Strategic Growth scenario.**

One feature of the current scenario that has not been taken into account in these simulations is the widespread prevalence of excessive concessional fares. It is a matter of great concern that IR does not even have an accurate estimate of the losses caused by these concessions. A sample survey conducted by railway officials suggests that the proportion of concessional passengers travelling in the upper classes may be as much as 40 per cent of all AC IInd passengers, 33 per cent of First Class passengers and about 15 per cent of AC Ist passengers. The estimated share of concessional travellers

Price differentiation is a crucial component of any attempt to rebalance tariffs by IR. Flexible market based pricing will have to be the order of the day: yet another reason for the kind of major structural change proposed in this report

Box 3.4 : Learning from the US Airline Industry Deregulation: Pricing Fairer Fares

Airline customers are sensitive consumers, they are time-sensitive or price-sensitive or a blend of both. “Pure” leisure customers are mostly sensitive to price. They are willing to trade a departure date or time for a price they want. “Pure” business customers are mostly sensitive to time. They are willing to trade extra money for the departure time they want. And between these two extremes lies a vast gray mix of preferences where most of us fit in.

Deregulated airlines in USA were faced with developing new fares for all potential customers. As can be imagined, this proposition got very complicated, very fast.

Today there are speciality fares for corporate customers, senior citizens, government and military employees, conventions and meetings. Other fares are pegged to how far in advance a flight is booked and the prices increase as departure day approaches—at 21 days, 14 days, seven days and finally in some cases three days out. The steepest fares are for last minute seats, because holding them open means the airline risks departing with them empty. To airlines, an empty seat is lost revenue—lost forever.

If consumers wanted choice and airlines wanted the chance to fine-tune the art of supply and demand, deregulation certainly granted their wishes. A case in point is a round trip fare from Orlando to Washington, D.C. and back, offered by eight different airlines, with a total of 208 different prices ranging from \$ 166 to \$ 1,960. That smorgasbord of fares is meant to produce an optimum mix of leisure and business travelers that, taken as a whole, fills planes as efficiently and profitably as possible. Airline computers spend their days and nights calculating how the customer in 11A is different from the one in 11B. What’s his price sensitivity? What’s her time sensitivity? What are their travel histories?

These computers apply mathematical tools to forecast demand, estimate no-shows and optimize the fare mix all aimed at filling the most seats. Precisely which fares are available at a given moment depends on what the actual demand has been and is expected to be – a dynamic process that’s in a constant flux from the moment the flight is opened for sales until it leaves the gate. To clearly understand the dynamic flux, however, requires this distinction: as seats are sold, both prices and seat availability fluctuate. In other words, a flight opens for sale with a pre-determined number of seats at the prices effective for the dates of travel and those fares may or may not be available when you want to book, depending on how well the flight has sold up to that point. For a human mind, these fluctuations can be baffling. Fares are complex. Customers can call for prices three days in a row and get three different fare quotes. Pricing seems mystifying and beyond their control.

Yet ironically, the exact opposite is true. Competition has granted customers tremendous flexibility, if they choose to exercise it. Recently an industry analyst observed that before deregulation, air travel was for the business traveler and the rich.

Moral of the story: Successful passenger transportation is all about ensuring full occupancy. Every empty seat is a permanent and irrevocable loss of revenue.

Source : Delta Airlines-In-Flight brochure on “How the Airlines Industry works twenty years after de-regulation”.

across all classes is about 15 per cent. About 5 per cent is accounted for by MPs, MLAs, freedom fighters (whose journeys are billed against Parliament and State/Central Government) and students (**Box 3.5**). Focussing on the categories of people who travel on concessional tickets on AC IIInd, about half of these appear to be railway employees making private journeys.

If these estimates are correct, then a serious review of concessional fares is urgently called for. The highest share of these concessional travellers is accounted for by railways employees and their families – both currently employed and retired. This largesse must be controlled. Concessional fares must be given only as exceptions to deserving classes of travellers. **Concessional travel by employees must only be on a stand by basis: they should never displace fare paying passengers.**

Exhibit 3.16 presents the fare structure implications of the proposed rebalancing. The current fare structure is displayed in the first column. The base is II class (mail + express), and all other fares are reported as multiples of this fare. The *effective* fare structure for 2000-01 (as estimated for the Railway Budget, 2000-01) which represents IR's revenues per PKM from each class is reported in the second column. The effective fare structure after rebalancing for 2005-06 is presented in the third column. The inequality between the upper and lower classes is clearly lower. More significantly, it is close to the top-to-bottom ratio, 9.6: 1, recommended by the most recent (1993) Railway Freight and Fare Committee, which based its guidelines on a detailed evaluation of the costs of providing rail transport, as well as a consideration for an element of subsidy being built into the lowest class fares.

Overall Revenue Growth Patterns

Taking the most optimistic scenario for both freight and passenger traffic, the overall revenue growth of IR, and the composition of its revenues emerge as follows. If the tariff rebalancing, in the form in which we have construed it will stop by 2005, **overall revenue is estimated to grow at about 7.5 per cent annually between 2000-01 and 2015-16. Revenue from freight, which accounts for 72.3 per cent of the total in 2000-01, will decline to 69.3 per cent in 2015-16.**

3.7 Strategic Imperatives

An analysis of past trends of IR's traffic reveals many opportunities for IR to increase its revenues, which is at the heart of any restructuring plan that

Exhibit 3.15 : Impact of Tariff Rebalancing on Passenger Traffic and Revenues, 2005-06

Class	Without Tariff Rebalancing		With Tariff Rebalancing	
	PKMs (millions)	Revenue (Rs Crore)	PKMs (millions)	Revenue (Rs Crore)
A.C. I	717	207	1170	261
A.C. II	10197	1292	14791	1450
A.C. III	6469	475	8824	501
FC	3175	231	3175	231
A.C. Chair	6028	344	8243	364
Sleeper M+E	149940	4348	125497	4428
Sleeper Ord	2421	57	2026	58
II M+E	162882	3697	157530	3948
II Ord	155518	2146	150408	2292
Total	497346	12797	471664	13532
CARG	7.19	7.45	6.06	8.66

Source: Expert Group.

Box 3.5 : The Hidden Costs of Concessional Rail Travel

According to data officially put out by IR, the annual losses on Railway passenger services is currently around Rs. 4,514 crore. (1999-2000). At the same time, the Indian Railways continue to extend travel concessions of various types to its own employees and many other categories. The concessions on rail travel on long distance passenger services range from subsidies on fares, to free travel, for as many as 45 categories of beneficiaries. It would appear that the granting of fare concessions are based more on reasons of expediency than on economic rationale.

A sample study conducted on passenger statistics of Northern Railway for a three month period in early 1999 indicates certain trends on the percentage share of travel concessions to total ticket sales. The findings of the study, although limited in scope (the study was based on the analysis of computerized data gathered from the Public Reservation System, Delhi) serve to highlight anomalies in the existing system of concessional travel and is indicative of the scale of costs to the total IR system:

The implications of these findings are:

- In II class AC 40 per cent of all tickets are sold against some concession or the other.
- In I class, the proportion of concessional ticket was 33 per cent.
- Overall about 16 per cent of all tickets were sold on concessional basis.
- The overall level of concessional travel cannot be compensated by any proportionate gains of increases in railway fares.
- The costs of extending the privilege pass facility to railway staff are substantial; the railways neither account for the subsidy nor include it as an item of expenditure in the budget.
- There appears to be widespread abuse of the facility by beneficiaries.
- The adverse financial implications of granting fare subsidies and free travel privileges do not appear to have been studied properly.

Of the 40 per cent tickets sold on a concessional basis in II class A.C., about 20 per cent, or half of the concessions, were accounted for by "privilege passes" for railway employees, current or retired; unlike airline employees who travel on a stand by basis, railway employees pass travel is actually at the expense of revenue paying passengers. For first class the proportion was 16 per cent, again about half of all the concessions. It was found that of the concessional tickets sold to senior citizens also accounted for a significant proportion. The study also stated that if the subsidy on the sale of privilege passes from the Delhi PRS were taken as a sample extended on an all-India basis for the entire year – the outflow from just one type of concession would amount to Rs. 500 crore. Therefore, the expenditure incurred by IR would negate any proportionate gains from periodic increases in rail fares. The system of fare concession is also prone to widespread abuse by some of the beneficiaries.

The various anomalies highlighted by the study serve to focus on the adverse implications of concessional travel for railway finances viz. the hidden cost of fare subsidies and free travel which at present are ignored as items of expenditure in the formulation of budget proposals. This could have a spiralling effect on rail finances – if the results of the study are to be taken as benchmark.

The Indian Railways, could be advised to undertake a proper financial analysis of fare structure along with a correct appraisal based on the actual need for concessionary travel and the economic basis for extending such privileges. The precise cost implications of all types of fare subsidy for railway finances can be ascertained through a financial analysis – a relatively easy exercise given the large database available with reservation centres. With greater analysis and computerisation, preferential fares can indeed be given to different groups of passengers while maximising revenues. This is illustrated in Box 3.4, which describes pricing practices in the US Airline industry.

Source: Thoopal, R.K. Vision 2010 - Indian Railways, Western Central Railway, Jabalpur, February 2000 and Expert Group Members.

Exhibit 3.16 : Passenger Fare Structure in 2005-06 as a Result of Rebalancing

Class	Current Structure of Fares	Current Structure of Average Earnings per PKM	Post Rebalancing Structure of Average Earnings per PKM in 2005-06
A.C. I	14.4	12.7	8.9
A.C. II	7.2	5.6	3.9
A.C. III	4.5	3.2	2.3
FC	5.3	3.2	2.9
A.C. Chair	3.0	2.5	1.8
Sleeper M+E	1.6	1.3	1.4
Sleeper Ord	–	1.0	1.1
II M+E	1.0	1.0	1.0
II Ord	–	0.6	0.6

Note: Second (Mail + Express) = 1

Source: Expert Group.

IR might decide to implement.

On the freight side, simple volume growth, driven by overall economic trends, cannot be expected to provide significant increases in revenue. The fact is that IR has been losing market share in a variety of commodities in which they have a natural competitive advantage, not to mention commodities in which they are subject to competitive threat. Analysis of price sensitivities does not suggest that this lost ground can be made up exclusively by price revisions. This suggests an integrated approach designed to lower the user cost from the customer's viewpoint. Price is one element of this strategy, but it puts a premium on various improvements in the range and quality of support services provided, including the provision of multimodal services which are also important. Acceleration of GDP growth in the coming decade will provide an opportunity to increase freight volumes, although perhaps not as much as in the past. Structural changes taking place in the economy suggest that the demand for transportation, particularly bulk transportation which is IR's core strength, will not be as responsive to GDP growth as it has been. This means that the recovery in market share cannot be taken for granted, nor will it emerge from minor variations in the existing strategy. A radical change in IR's approach to freight transportation must be visualized and a strategic approach adopted (**Box 3.6**)

There are clear signs of opportunity in the economic environment. But this alone is not enough. IR has to take a number of steps to widen the scope of its traffic services, improve their quality and rationalize their prices

Passenger traffic is somewhat less vulnerable. There is natural volume growth, and as households get more prosperous, the demand for higher class passenger services is certain to increase. It is for IR to take advantage of this latent demand by increasing the supply of these types of services. IR has shown itself to be sensitive to this demand over the past decade by increasing the number of pricing points within the upper class segment. As a result, the contribution of these classes to total revenue has almost doubled. This is a trend that should be re-inforced with appropriate investments in rolling stock and other service capabilities. This process can be re-inforced by revisions in the pricing structure, particularly in terms of bringing down the top fares in both absolute and relative terms.

The financial simulation exercise points out clearly that "Business As Usual Low Growth" would result in disaster for IR. It also provides a ray of hope in the "Business As Usual Medium Growth" and "Strategic High Growth" cases that an appropriate mix of revenue enhancement, cost reduction and pointed investments could turn round IR into a commercially viable, even attractive, enterprise. This chapter has tried to demonstrate the prospects for revenue enhancement in the context of both the overall economic environment and the strategic options that IR has at its disposal. There are clear signs of opportunity in the economic environment. But this alone is not enough. IR has to take a number of steps to widen the scope of its traffic services, improve their quality and rationalize their prices.

Box 3.6 : Konkan Railway Corporation: Importance of Proper Understanding of Customer Interest

When conceptualized in 1990, Konkan Railway held out a promise for the industrial and commercial development of the hilly Konkan region. This region of western India has several major industries and mining resources – steel, petrochemicals, petroleum, fertilisers, agro-processing and iron ore. The region is also a centre for international tourism. Difficult mountain terrain requiring significant tunneling, earth cutting and bridging of rivers and waterway had however prevented the laying of this natural link during the 1960s and 1970s when a rail link was considered. The two rail head extremities in Maharashtra and Karnataka were separated by a gap of 738 kilometers of non-rail routes (road and coastal shipping).

The Konkan Railway Corporation (KRC), a public sector company was set up in July 1990 with the financial participation of the four states over which the line traverses and the Indian Railways. The main objective of the KRC was to construct on a Build-Operate-Transfer basis, a single line broad gauge route to bridge the “Konkan gap”. This rail route would reduce the travel distance and times for passenger and freight trains in the region and was expected to attract a large volume of traffic. It was projected that the line would be used as a through route by a large number of goods trains, and savings in time would vary between 6 hours to 37 hours for rake loads passing between Mumbai and Mangalore.

In reality, however, it became clear that the required traffic volumes were not forthcoming since the KRC had seemingly ignored customer interests and the dynamics of freight markets in the region. The more serious flaws in planning were the lack of coordination among the freight traffic departments of the Indian Railways and the absence of an overall marketing strategy, capable of targeting potential consumers of freight transport with a well-defined service offer.

The shortfall in performance is attributed to three main factors:

- Poor internal coordination among transit zones of the Indian Railways which failed to satisfy the market needs of the shippers in the region,
- Strong competition from rival modes of transport, and
- Lack of an overall marketing strategy by rail authorities.

The majority of the users for non-bulk freight preferred shipments by road. Road transport with its advantages of price, convenience of delivery and the speedy settlements of damage claims was the preferred mode of transit for consumer goods. Movers of bulk freight such as steel and fertilizer companies had set up their own infrastructure for transporting by coastal shipping. This was a serious concern for railways since the cost of shipping freight by sea worked out to be relatively lower than other modes of transit.

Added to this, the neighbouring IR rail zones on their part were under pressure not to re-route traffic on or via the KRC for fear that a reduction in rake loads on their respective routes would lead to a sharp drop in earnings. This factor, together with poor internal co-ordination is believed to have caused much loss of potential freight traffic to KRC.

In 1998, the Konkan Railway was no where close to breaking even and the situation was made worse by a daily cash outflow of Rs.1 crore for the company. Urgent measures were needed to be taken for generating surpluses – especially freight, if the corporation was to avoid a collapse under the burden of mounting debt (Rs. 2,575 crore over a 10 year pay-back period).

In what can be seen as a belated response to a crisis, the top management initiated customers’ surveys and began using the feedback from customers’ expectations to design a proper customer plan. The Corporation also put in place a marketing organization to develop its business. The body oversees the loading and unloading at stations and negotiates freight pricing – even offering discounts to customers. They have proactively solicited freight traffic from Rajasthan and Gujarat towards the south and from Kerala towards the north.

The key elements of the KRC marketing strategy to serve the market are listed below:

- Market segmentation: identifying market requirements separately for rake load users and part load users (station-to-station and door-to-door services, as the case may be).
- Deciding on products and realistic pricing: calculation of the costs of freight operations in line with customer expectations and in relation to sources of competition.
- Single window services to the customer for logistics and technical support.
- Public relations and advertising to publicise and communicate the time and distance savings by rail to various destinations on/via KRC.
- Business partnerships with customers, rival modes of transport and the Indian Railways.

KRC has also attempted service innovations like a Ro-Ro (“roll-on roll-off”) service - moderately successful, see below – and are proposing other schemes for revenue generation, like leasing their station area for budget hotels (“Railotel”), catering, parcel traffic in brake vans etc. They have also leveraged their transport project management and tunneling expertise to bid for and construct projects with similar features like tunnel segments in the Mumbai-Pune Expressway.

The KRC experience has not been as successful as it was envisaged. The Konkan Railway Corporation successfully carried out the asset creation. They had autonomy at this stage and funding for a separate entity was easier. However, during the operations phase, they have not been doing well due to lack of traffic. While they were responsible for raising revenues and going after the market, they do not have the authority to set their own prices and do not have access to the major industrial market of Mumbai. This was an ill-structured project because issues of market access were not properly considered, leading to high revenue risks. The project began from the supply (rather than customer) oriented perspective of filling up of what is called the ‘Konkan gap.’

The inflated rates on the KRC segment, which were supposed to help bring in more revenues, have become a liability in that traffic is not being re-routed via KRC. Ofcourse, it is also interesting that the re-routing is partly being denied due to a competitive outlook from the neighbouring railway zones, who wish to keep the revenues to themselves. In the end, the “parent,” namely IR itself would have to come to the rescue of KRC, rather than as a business deal. To that extent, the BOT structure of KRC is at best a “pseudo” BOT.

One significant issue in favour of IR is that a major railway investment to the tune of Rs 3,375 crores was made possible with just an equity investment of Rs 400 crores.

Given the tight financial situation, the many innovative responses of KRC are a railway first. The Ro-Ro service is certainly one of them. (A similar Ro-Ro service proposal between Mumbai and Ahmedabad, taking advantage of the congested NH-8 route, has been at the drawing board stage ever since the mid eighties). However, in the above financial analysis, it comes through clearly that sufficient homework was not done by KRC, given that actual traffic earnings were less than one tenth of what was envisaged. Also, the type of wagons that were hired had to be frequently taken off service during emergencies, there by affecting reliability.

Source: Bibek Banerjee, G. Raghuram, Narayan Rangaraj. “Konkan Railway Corporation Limited”, *Vikalpa*, Vol. 25, No.1, January-March 2000, and Expert Group Members

4. THE FUTURE OF INDIAN RAILWAYS : INVESTMENT REQUIREMENTS 2001-2016

4.1 Introduction

Indian Railways is at crossroads. All the indications are that IR is facing a financial crisis and without a strategic change in direction its future as a viable entity is dim. Yet, at the current stage of India's development railways will remain an essential component of India's transportation infrastructure. As documented in the last chapter it is vital for IR that it accelerates the growth of both freight and passenger traffic and revenues. Apart from the tariff rebalancing that is required to accomplish this there is need for a more focussed investment programme that enhances IR's productivity all round and which expands its capacity to cope with the traffic growth projected. Investment expenditures that do not result in additional revenues must be eschewed. An important cause of IR's current financial predicament is that a good proportion of investments in the 1990s have been un-remunerative.

In this chapter we attempt to sketch three feasible scenarios of investment strategy that IR could follow: a "Business as Usual Low Growth" scenario, a "Business as Usual Medium Growth" scenario and a "Strategic High Growth" scenario. The resource requirements for each of these are estimated and the consequences of each scenario described. The following chapters bring together the traffic and revenue growth estimates, with these investment estimates to explore the financial viability of each of these scenarios. It is no longer possible to bring IR back to any semblance of economic viability by making incremental changes in investment programmes and tariffs. A strategic change is called for involving substantial change in the management structure of IR.

Before estimating the investment requirements for the future, we first review the record of IR's plan strategies and investments in the past in order to achieve an understanding of where IR is today, what deficiencies exist in the current plan process itself, and what its needs are for the future. **The past data are all presented in current nominal prices for each relevant period. Future projections, however, are provided in today's prices (i.e. 2000-2001 prices).**

4.2 Five Decades of Planning in Indian Railways

4.21 System Expansion Since 1950

At the time of the country's independence Indian Railways inherited a system that needed much rehabilitation after the strains of the war and immediate post-war years. At a total route length of about 54,000 km. the network was fairly extensive, although its configuration was shaped largely to meet the commercial and strategic interests of the colonial power. The post-independence additions totalling about 10,000 km form only 17 per cent of the present route km of IR. About a third of the added route length relates to core sector projects to exploit mineral reserves: principally for the transportation of raw materials such as coal and iron ore for producing steel and for exports.

There is need for a more focussed investment programme that enhances IR's productivity all round and which expands its capacity to cope with the traffic growth projected. Investment expenditures that do not result in additional revenues must be eschewed

Expansion of the order achieved was made possible because of the priority that IR was consistently accorded in plan investments. Barring the Fourth and Fifth Five Year Plans, IR has accounted for about half or more of public investments in the transport sector

While additions to the route length have been relatively small in the last five decades, IR has invested heavily in doubling of trunk routes including most sectors of the so-called ‘Golden Quadrilateral’ connecting the four largest metropolises, Delhi, Mumbai, Kolkata and Chennai and its diagonals. Additional third and fourth lines have been provided to serve the busy suburban sectors in Mumbai and Kolkata. A large share of railway plan investments have also gone into adding new rolling stock, setting up captive units for production of locomotives, coaches and their components and electrifying high density sections. In the last decade, considerable amounts have been deployed for converting an extensive metre gauge network and some narrow gauge sections into broad gauge.

Railways’ total transportation output (‘Net tonne Km’ of freight plus ‘Passenger Km’) is now about 6.5 times what it was in 1950 (**Exhibit 4.1**). The fleet of rolling stock (passenger coaches, wagons and tractive effort of locomotives) has, however, grown over a range of only 2.0 to 2.5 times. Transport output has been raised through improved productivity per unit of assets, secured chiefly by newer technology and designs. The phasing out of the steam loco (replaced by vastly superior diesel and electric locomotives), the progressive replacement of four-wheeled wagons by new bogie stock equipped with air brakes and central buffer coupling, and segregation of the old “screw coupling” stock are key to this improvement. Certain operational strategies, viz., ‘point-to-point’ block rake movement, elimination of yards and ‘engine-on-train’ loading/unloading also have paid rich dividends.

4.22 Funding Pattern of Successive Plans

Overall expansion of the order achieved was made possible because of the priority that IR was consistently accorded in plan investments. Barring the Fourth and Fifth Five Year Plans, IR has accounted for about half or more of public investments in the transport sector (See **Exhibit 4.2**). Equally important is that the organization could set apart a large share of internal resources for plan expenditure. General revenues and funds raised from the market also provided significant resources, the latter only from the Seventh Plan onwards.

Until the ‘Capital Fund’ was created in the Eighth Plan, IR’s internal resources for the plan were mainly channelled through the Depreciation Reserve Fund (DRF). This was mainly designed to meet the very considerable requirements for replacing over-aged assets and those prematurely worn-out through intensive use and poor maintenance practices. The DRF has provided

Exhibit 4.1 : System Expansion Since 1950

Item	Unit	1950-51	1998-99	Increase (Per cent)
Route Length	Km	53,596	62,809	17
Route Length – Broad Gauge	Km.	25,259	44,216	75
Route Length – Electrified	Km.	388	13,765	3448
Track Length	Km.	77,609	108,413	40
Locomotives	No.	8,209	7,429	-10
Coaches (Non-Suburban)	No.	13,109	31,574	141
Wagons (in 4-Wheel Units)	No.	205,596	478,778	133
Total Traffic Output Units*	Million	104,082	685,397	559

* Net tonne km. of freight moved + passenger km.

Source: Indian Railways Year Book and Annual Statistical Statements.

about a third of the resources required for plan spending throughout the period. DRF resources are created by crediting it with amounts appropriated out of the 'revenue surplus', the balance of revenues after meeting only the working expenses. The Capital Fund appropriations are made from a net surplus available to IR after paying the "dividend" due to the government.

Internal resources come principally out of railway revenues. Finance raised from sources other than internal generation carry dividend or servicing obligations, again met out of revenue. The relationship of total investment to total revenues is therefore a good index of measuring the scale of investments: this has varied widely between about 20 and 55 per cent (see **Exhibit 4.3**).

There have been two periods of heavy investment in IR when total investment has exceeded 40 per cent of its revenues. The Second and Third Plan periods (late 1950s and early 1960s) were periods of most significant investment with this percentage being over 50 in the heyday of public sector expansion. Similarly, the Seventh Plan period in the late 1980s also saw large

Exhibit 4.2 : Share of Railways in Successive Plans**(Amount: Rs. Crore)**

Plan	Total Public Sector Amount	Transport Sector		Railways Plan		
		Amount	Per Cent to Total	Amount*	As per cent to	
					Total	Transport
First 1951-56	1,960	434	22.1	217	11.1	50.0
Second 1956-61	4,672	1,100	23.5	723	15.5	65.7
Third 1961-66	8,577	1,983	23.1	1,326	15.5	66.9
Annual - 1966-69	6,625	1,032	15.6	589	8.9	57.1
Fourth 1969-74	15,779	2,522	16.0	934	5.9	37.0
Fifth 1974-78	39,426	5,543	14.1	2,063	5.2	37.2
Rolling - 1978-80	N.A.	N.A.	N.A.	1,253	N.A.	N.A.
Sixth 1980-85	109,291	13,961	12.8	6,585	6.0	47.2
Seventh 1985-90	218,729	29,476	13.5	16,541	7.6	56.1
Annual-1990-92	137,034	18,034	13.2	10,217	7.5	56.7
Eighth 1992-97	533,252	64,940	12.2	32,302	6.1	49.7

* **Note:** In this tabulation Railway Plan figures for First Four Plans exclude replacements charged to DRF. Amounts so excluded (Rs. Crore): First – 206, Second – 320, Third – 360, Annual Plan – 173, Fourth – 494.

Source: Planning Commission – Ninth Five Year Plan.

Exhibit 4.3 : Railway Plan Outlay as Percentage of Total Railway Revenues

Plan	Total Outlay	Budget Support	Internal Resources	Leasing (Borrowing)
First (1951-56)	29	10	20	
Second (1956-61)	52	29	23	
Third (1961-66)	55	37	18	
Annual - 1966-69	31	18	13	
Fourth (1969-74)	27	19	7	
Fifth (1974-78)	21	16	5	
'Rolling' (1978-80)		28	21	7
Sixth (1980-85)	32	18	13	
Seventh (1985-90)	44	18	19	7
Annual (1990-92)	40	13	17	10
Eighth (1992-97)	32	7	19	6
Ninth (1997-02)				
1997-98	29	7	12	10
1998-99	30	7	12	11
1999-2000	27	8	10	9
2000-01	30	9	11	10

Source: Computed from Plan and Railway Budget documents.

Outlays on rolling stock have a fairly steady relationship with railway earnings. IR has been able to maintain this stability in outlays devoted to rolling stock through a combination of measures. It has been flexible in finding sources of funds for new rolling stock: alternating between budgetary support, internal resources, leasing and DRF according to availability

investment in this period of heavy infrastructure focus. The highest level of budgetary support was seen during the Second and Third Plan periods, whereas Seventh Plan investments at this high level could only be made through the introduction of borrowing (leasing) through the Indian Railway Finance Corporation (IRFC). A major development of the 1990s has been that budgetary support has been low at less than 10 per cent of IR revenues.

The heavy investments made during the Second and Third Plans were related to the creation of a network of lines required to support the core heavy industries founded during that period. The colonial system of railways was heavily oriented towards defence and export of Indian commodities; investments made in the post independence period served the perceived commercial needs of the then new Indian economy. The lowest levels of investment (at less than 25 per cent of revenues) took place during the Fifth Five Year Plan in the 1970s, following the strains caused by the 1971 Bangladesh war. Serious industrial unrest during that time also affected IR's functioning. The "normal" long term level of investment falls in the range of 27-33 per cent of revenues. Despite the drastic fall in budgetary support during the Eighth and Ninth Plans, IR has struggled to keep up its investment levels within this band during the 1990s. This has been done by resorting to direct borrowing through the IRFC at an increased level of about 10 per cent of its revenues. The generation of internal resources during this period has also been low at only about 10 per cent of revenues.

4.23 Continuity and Change in Plan Priorities

There are two strong elements of continuity marking railway investments over successive plans. These are:

- Pre-eminence of outlays on rolling stock (additions and replacements) as the largest single area of investments in each of the plan periods, and
- The large share of resources used up towards asset replacements (track, machinery and plant, signaling, electrical installations).

Outlays on rolling stock are easily identified because the railway plan structure categorizes all of it under a single plan head. On the other hand, outlays on replacements that are scattered over several plan heads, can be traced through all but the two most recent plans as the financial allocation is to the Depreciation Reserve Fund(DRF). In the Eighth and Ninth Plans, asset replacements have also been funded through the leasing process, details of which are not clearly documented. Also to be noted is that replacements are not always like-by-like. The replaced assets often incorporate improvements in design and technology and hence carry an element of new investment that ought to yield commensurate returns.

Rolling Stock: Plan-wise, investments on rolling stock have ranged from a low 32 per cent of total outlay in the Third and Seventh Plans, to over 50 per cent in First and Fifth; the all-Plans average works out to 41 per cent. However, the low points coincide with large overall plan size and the high points with the opposite. Outlays on rolling stock thus have a fairly steady relationship with railway earnings (**Exhibit 4.4**) especially from the Fourth Plan on.

It seems that IR has been able to maintain this stability in outlays devoted to rolling stock through a combination of measures. It has been flexible in finding sources of funds for new rolling stock: alternating between budgetary support, internal resources, leasing and DRF according to availability. Part

of this stability has also been achieved by the need to keep its captive manufacturing plants for locomotives and coaches occupied at reasonable levels of capacity utilisation. Similarly, wagon plants in both the public and private sectors have kept up supplies at a consistent level. IR seems to have had a relatively clear programme for replacement of rolling stock in order to provide for traffic growth through continuing marginal improvements in technology and design.

This does not imply that investment on rolling stock was not affected by overall resource constraints. Railway operations were always hamstrung by shortage of locomotives and wagons and high proportion of overage coaching stock. The recent Study by RITES on '**Decline in Railways Share in Total Land Traffic**' (1997), identifies inadequate capacity, including that of rolling stock, as one of the main factors contributing to the decline.

Replacements: The effects of resource constraints have been more pronounced in the other main investment area of replacements other than those of rolling stock. The pressures here are of two types:

- Limitation of internally generated resources because of DRF being funded out of moneys appropriated from the operating surplus for the purpose, and
- Priority accorded to other competing investment areas, also funded out of internal resources; in some recent years, for instance, high allocations for gauge conversion and doubling schemes have affected the share of operating surplus allocated to DRF resulting in a lower outlay on replacements, and has adversely affected the health of the system.

This problem arises essentially because IR does not stick to a systematic method of accounting for depreciation: allocations to DRF are made on a rather ad hoc basis depending on availability of funds.

In consequence, arrears in replacements have tended to accumulate at different stages, generally followed by higher allotments in a few succeeding years for making up the arrears. As noted above, the problem is being addressed, partly, by the leasing solution. However, only movable assets are leased (chiefly rolling stock) whereas a good part of replacements relate to the permanent category.

As shown by the data for Eighth and Ninth Plan in **Exhibit 4.5**. IR is currently in one of the low outlay phases in regard to replacements. This has contributed to accumulation of arrears that are assessed at Rs. 12,645 crore in value as of March 1999. Most of this pertains to overdue track renewals.

Other Priority Items: With rolling stock and other replacements together accounting for over two-thirds of railway plan spending, priorities in other

IR does not stick to a systematic method of accounting for depreciation: allocations to DRF are made on a rather ad hoc basis depending on availability of funds

Railway operations were always hamstrung by shortage of locomotives and wagons and high proportion of overage coaching stock

Exhibit 4.4 : Share of Outlays on Rolling Stock

As Share of :	First	Second	Third	Annual	Fourth	Fifth
Plan Outlay	54	36	32	42	41	51
Total Revenue	16	19	18	13	11	11

Share of	Rolling	Sixth	Seventh	Annual	Eighth	Ninth*
Plan Outlay	40	35	32	41	44	43
Total Revenue	11	11	14	16	14	13

* Ninth Plan – For four years only. Actual figures of first two years and latest budgeted for next two.

Source: Computed from Plan and Railway Budget documents.

areas tend to be dwarfed in comparison. However, these investment areas – including replacements of assets other than rolling stock – have moved up or down in relative importance in different plans. The next Exhibit seeks to trace a pattern in these shifting priorities, by arranging chronologically, the investment items other than rolling stock that were prominent in different plans. The method adopted is to work out the all-plans average share for each Plan head and to mark those plans in which the share was well above the average.

- **New Lines:** Large construction projects (ore export lines and rail connections to collieries and mineral deposits needed by core industries and to new Port projects) were commenced in the early plans and peaked during the Third Plan. The emphasis over this period – unlike at present – was on lines with high traffic and commercial potential.
- **Gauge Conversions:** The high point of 16.6 per cent in the Eighth Plan is connected to the major new ‘Unigauge’ project, which is in progress. Much of these investments are not remunerative (see IR’s 1997 White Paper on Projects).
- **Traffic Facilities and Doublings:** The two heads are closely linked.

Exhibit 4.5 : Share of Replacements in Recent Plans

(Rs Crore)

Plan / Year	Seventh Plan 1985-90	Annual Plan 1990-92	Eighth Plan 1992-97	Ninth Plan			
				1997-98	1998-99	1999-2000	2000-01
DRF	6,371	3,814	10,546	1,983	2,034	2,277	2,582
Total	16,549	10,208	32,307	8,239	8,857	8,965	11,000
Per Cent	38.5	37.4	32.6	24.1	22.9	25.4	23.5

Note: Figures for 1999-2000 and 2000-01 are latest budgeted.

Source: Railway Budget documents, various years.

Exhibit 4.6 : Above Average Shares in Plan Outlay

(per cent)

Plan Heads	Average Share	I	II	III	A	IV	V	R	VI	VII	AA	VIII	IX
New Lines	6.4	7.8	7.3	12.6	7.2								
Gauge Conversion	6.0											16.6	8.9
Doubling	4.5									4.98	5.5		5.3
Traffic Facilities	10.4	16.1	16.6	19.0	16.8	15.7	14.7						
Computerization	0.8									1.1			
Track Renewals	15.5	16.1							16.9	21.6	23.9	22.3	21.9
Bridge Works	1.8		3.1		2.2		2.1						
S&T	2.9				4.2	4.3	3.7						3.6
Electrification	4.9		5.1				5.2		6.4	5.8			
Machinery & Plant	1.7	3.3					2.1		3.1				
Workshops	3.2							3.5	6.1	5.6	3.4		
Staff Quarters	1.7		3.6	2.6	2.3	2.2							
Pass Amenities	1.1		1.4		1.4	1.4							1.4
Metro Transport	2.7							2.9	4.3	2.9	3.0	3.1	

Source: Railway Budget documents, various years.

There are two distinct phases here: First to Fifth Plan and post-Fifth Plan. The peak was touched in the Third Plan. With the shift in operating strategy towards running full trainloads that required little marshalling, plan share declined from the 1980s. However, this ought to be an area of renewed emphasis in the coming years, particularly terminals and freight bypasses.

- **Computerization:** This separate plan head was introduced mainly to implement the Passenger Reservation System (PRS) in late 1980s. For significant increases in productivity in the future, there will have to be substantial new investment in this area. We have devoted particular attention to the information technology needs of IR in a subsequent chapter.
- **Track Renewals:** There is a significant increase in plan share from the Sixth Plan onwards (for the reasons please see **Box 4.1**) but arrears have accumulated, nevertheless. The trend points to the need for improved rail-wheel interaction. This calls for review of designs of rolling stock to make them more track friendly, upgradation of track standards so as to promote safe running of trains, and to cope with heavier and faster trains. With increasing traffic volumes there is also need for improvement in maintenance standards through modern mechanized practices.
- **Railway Electrification:** The highest level reached was in the Sixth

Box 4.1 : Track Renewals: Potential to Save on Investments

In terms of standards, life of rail and periodicity of its renewal depend upon the weight of section of the rail, the track structure and the total traffic passed over it in terms of Gross Million Tonnes. On IR, the standard rail life has been fixed as 525 GMT of traffic for track structure having 52-kg rail, and 800 GMT for track having 60-kg rail. These standards are considerably lower than international norms, which are in the range of 1800-2000 GMT. At the same time, the permissible axle load on IR is also lower at 20.52 tonnes while internationally it is in the range of 25 to 30 tonnes. The achievement of International Standards of track life will result in a significant reduction in the requirement of funds on track renewal.

Even the low standards set are not generally being met. In addition to the measure of service life of rail in terms of GMT, rail renewal is taken up on the basis of rail wear, rail fracture and maintainability of track. In practice, the predominant criteria for renewal of rails have been corrosion, rail fractures and maintainability of track. The high incidence of rail/weld fractures is often the main concern.

The Railway Safety Review Committee (Chairman Dr. H.R. Khanna) in its Report has observed that between 31 to 38 per cent of track renewals sanctioned in the three years 1994-95 to 1996-97 had been prematurely earmarked for renewal on the basis of actual 'condition'. Due to this reason and despite spending a much higher share of plan outlay on track renewal (22-23 per cent in the Eighth Plan against all Plan average of 15.5 per cent), IR are carrying a large baggage of arrears of track renewals.

There are many reasons for undertaking premature renewals of track and some of the important ones are:

- Poor quality of track material, specially rail.
- Non-replacement of track components like ballast, resilient pads, elastic clips, etc. all of which have a considerably shorter life span.
- Proliferation of wheel flats.
- Overloading of wagons.
- Under powering of trains.
- Insufficient track maintenance.

Among the measures that could improve rail life considerably are:

- Selection of proper technology and freight wagon bogie design such as would cause reduced vertical and lateral stress,
- introduction of rail grinding to maintain the rail profile,
- ensuring a weld life 'co-terminus' with the life of the rail, and
- extensive monitoring of the condition of the track through use of track monitoring cars.

The benefits of investment in the right technology and maintenance practices will far outweigh the cost of such investment. To cite specific numbers, IR investment projections for next 15 years identifies Rs.3200 crore as the annual requirement of funds for liquidating expected normal current arising of track renewal. It is calculated that by planned measures to increase the life of track, this requirement can be brought down to as low as Rs.1200 crore per annum.

Source: Railway Budget Documents and information obtained from Planning Directorate, Railways Board

Plan (6.4 per cent as compared to average of 4.9 per cent). This is an area where investments have continued on a regular basis in succeeding plans on the broad justification that electric traction is more efficient for coping with high traffic density. However, there is serious doubt about the benefits actually realized from these investments (see **Box 4.2**). Among the factors that dilute the potential gains are: overlapping of traction modes (which prevents the realization of savings in maintenance costs), high administered tariffs for electricity traction supply, stagnation in freight train speeds; and, most importantly, neglect of appropriate traffic threshold levels in selecting the sections for route electrification.

- **Signaling and Telecommunications:** This area got priority in the 1970s in order to implement a largely microwave based Railway communication

Box 4.2 : Railway Electrification

Electrification of Railway traction is capital intensive and IR has rightly laid down the principle of considering electrification of routes only after a threshold level of traffic is reached. The prescribed threshold level – based on the financial analysis of expected cost-savings – is 40 Gross Million Tonnes (GMT) per annum on the section to be electrified. The benefits from Railway electrification – prominently raising maximum speed of freight trains and securing cost savings – are, however, largely not realized. This is because along with electrification, other matching investments like improving the track, removing speed limitation caused by bridges and signaling systems etc., are not covered. The compartmentalization of investments into a narrow ‘Plan head’ based framework is largely responsible for this anomaly, owing to which, the full speed and hauling potential of electric traction are not achieved.

On the other hand, the cost saving in terms of reduced fuel expenses are not realized partly because of the distortions created by the administered pricing of electricity. With the reforms in the electricity sector, there is the likelihood that pricing of electricity will become cost-based in future. However, as long as the Railways’ own pricing policy in regard to the transport of coal does not also reflect efficient costs, the case of the Railways for demanding reduction in electricity prices will remain weak.

A World Bank Study released in 1995 concluded that the Internal Rate of Returns (IRR) of the Jhansi –Itarsi (381 km) Railway Electrification project had dropped from 23 per cent originally projected to only 9 per cent. In the case of a second project (Balarshah-Vijayawada, 454 km) the drop in IRR was even more from 41 per cent projected to only 2 per cent real. Apart from high electricity tariffs, delay in project execution and in the changeover, on completion, from diesel to electric traction were among the factors for this decline.

An added reason for the failure to secure cost savings is the practice of retaining ‘electrified’ sections in multi-traction mode, thus involving duplication of maintenance and operating facilities like loco-sheds and crew-rests for the different tractions.

To compound matters, the prescribed ‘threshold’ level has been overlooked in several recent projects and Railway electrification has been extended to sectors of much lower traffic density. A fairly large number of projects are under execution and/or consideration, which do not satisfy the prescribed criterion. These projects (see following **Table**) would not yield any operational or other benefits to the Railways and may even add to operational losses. The length of these sections aggregate to over a thousand kilometres, involving an outlay of Rs. 1200 crore to 1500 crore which could finance capacity generating projects essential to promote safety, improve technology, enhance productivity and efficiency. (See the separate Box on Projects under Plan head ‘Traffic Facilities’).

Traffic Threshold Ignored in Project Selection

Section	Distance (Km)	Traffic density*	Project Status
• Ambala - Kalka	80	7.2	Under implementation
• Kanpur - Lucknow	67	25.5	
• Jhajha - Patna - Mughal Sarai	389	23.5	Approved
• Ludhiana - Amritsar	136	24.0	
• Patna - Gaya	92	8.0	Under consideration
• Ernakulam - Trivandrum	221	9.0	

*Gross Million Tonnes per annum

Source: IR Budget Documents, World Bank Study Report ‘Implementation Completion Report-India-Indian Railways Electrification and Workshop Modernization Project’ (March 1995) and inputs from Expert Group Members.

network. However, this high-tech area has languished thereafter till the current plan. Renewed emphasis is crucial to harnessing the potential of advanced signaling and communication systems for enhancing safety and improving section capacity at minimum cost.

- **Workshops and Machinery and Plant:** These two inter-related plan heads reached high levels over the Sixth and Seventh Five Year Plans (9.4 per cent and 7.7 per cent). This was linked to setting up of new production units ('Wheel and Axle' Plant, new Rail Coach Factory) and large investments in modern machinery for shops and sheds, financed through multi-lateral funding.
- **Staff Quarters and Passenger Amenities:** These were areas of priority during the early plans, mainly to bring the then inadequate facilities up to minimum desired standards. The latter of the two Plan heads is now getting increased attention in the current plan. (Major improvements to large terminals are charged to the plan head 'Traffic Facilities').
- **Metro Transport:** Work on the Calcutta Metro was in full swing over the 1980s (and is continuing), followed by the mainly elevated system in Chennai, now partly operational.

From the observed priorities, three different phases can be identified. The main priorities in the first phase, spanning broadly the first four plans, was to remove major gaps in the network, rehabilitation of the system and to lay additional tracks on the key sections of the trunk routes. There was also emphasis on rolling stock technology, the setting up of maintenance sheds (for diesel and electric locomotives) and large new traffic yards to cater to new streams of freight traffic linked to basic industries and ports. Overall, this phase was oriented towards the system network. The infrastructure capacity built up in that phase has seen the Railways through – with incremental additions – in the succeeding two phases.

During the second phase, covering the period from mid 1970s to about 1990, the thrust of the planning effort shifted, in broad terms, to rehabilitation of track and upgrading of technology. The latter emphasis covered signaling and telecommunication, machinery and plant and production units, route electrification and computerisation for limited applications. New technology was an important component in regard to rolling stock as well. The BOX-N wagon design currently most in use was introduced in 1980s. The Metro system was another notable initiative of this phase.

Whereas the first and second planning phases were marked, respectively, by concern for augmenting network capacity and for limited upgradation of technology, "socio- political" objectives are the most prominent in the on-going third phase of planning dating from 1990. Along with continued support for metro projects and increase in outlay on track renewals, new areas of priority have emerged in this phase, chiefly gauge conversion through the 'unigauge' project. Even more critical to the investment policy are some crucial changes in emphasis in favour of a larger 'shelf' of projects – especially new line projects – approved for implementation. This has been accompanied by lowering of the standards criteria adopted for project selection in more than one Plan head.

"Socio- political" objectives are the most prominent in the on-going third phase of planning dating from 1990. Even more critical to the investment policy are some crucial changes in emphasis in favour of a larger 'shelf' of projects – especially new line projects – approved for implementation

These negative trends are examined later in this chapter.

4.24 Current Status of Plan Investments

Total plan outlay of the on-going Ninth Plan, now in its fourth year, is likely to be under Rs. 50,000 crore, ('actuals' for first two years, Revised Estimates for 1999-2000 and Budget Estimates for 2000-2001 add up to Rs.37,061 crores) which would denote a real increase of about 20 per cent over the total Eighth Plan investment (Rs. 32,307 crore). On the other hand, the indicated plan size (approx. Rs. 50,000 crore) would fall short of Railways' estimated needs – assessed by the Working Group on the Ninth Plan at Rs.65,000 crore at 1998-99 prices – by about the same margin (20 per cent).

The shortfall reflects, basically, a decline in share of internal resources, which has been the largest component among the four sources of funding in the last two Plans as also the current one (see **Exhibit 4.7**). This source has declined in the Ninth Plan on account of slowing down of freight traffic growth on the one hand (caused, in part by slowdown of industrial growth), and large increase in working expenses on the other. At the same time, budgetary support that dropped sharply in the Eighth Plan compared to the Seventh has not increased significantly in the current plan. The lower share of internal resources is therefore being made up mainly through an increase in that of borrowings through Indian Railway Finance Corporation (IRFC). However, in real terms, the gap in plan funding remains.

Internal Resources mainly represent the funds from revenues and net surplus allocated to Depreciation Reserve Fund (for financing replacements), to the Capital Fund and Development Fund which are utilized on additions of specified nature of capital assets. The total contribution to Ninth Plan through internal resources is likely to be of the same order, nominally, as in the Eighth, leading to the drop in percentage share to the total plan outlay (**Exhibit 4.8**). The drop in share of both budgetary support and internal resources along with increasing market borrowing is leading to increasing financial stress on IR.

Two factors need to be noted with respect to the high share of internal resources in the Eighth Plan. One relates to the money realized as 'credits' for released materials; possibly the conversion of several metre gauge sections has helped to this degree. Credits contributed as much as nine per cent of the total Eighth Plan outlay, as compared to three to four per cent of outlay in earlier plans. (Incidentally, this cushioning factor is present to the same

In the Eighth Plan, 18 per cent of total plan spending was raised by additional resources mobilized through tariff revisions. An unprecedented proportion of this share was from freight tariff revisions and this had other consequences

Exhibit 4.7: Sources of Railway Plan Funds

(per cent)

Category / Plans	Seventh	Annual*	Eighth	Ninth
Internal Resources	43	42	58	40
Market Borrowing - IRFC	15	25	17	30
Other leasing	–	–	2	3
Govt. Budgetary support	42	33	23	27

* 'Annual Plans' denote intervening non-Plan years - 1990-91 and 1991-92.

Notes:

1. Ninth Plan figures are for first four years only and are part 'actuals' and part estimate.
2. 'Other leasing' represents funds raised from Private Sector through the 'Own Your wagon (OYW) and 'Build - Own - Lease - Transfer' (BOLT) schemes. These are not very significant at present.

Source: Computed from Plan and Railway Budget documents.

degree in the Ninth Plan too, and the level of internal resources shown for this plan includes this element). The second factor is far more significant and relates to the share of outlay (18 per cent of total plan spending) raised by additional resources mobilized through tariff revisions. **An unprecedented proportion of this share was from freight tariff revisions and this had other consequences**, as discussed in the previous chapter. While the proportion of resources through tariff revisions to plan outlay has dropped to 11 per cent in the current plan, the bias towards freight tariffs in the matter of revisions has continued into the Ninth Plan.

Effect of Decrease in Resources for Ninth Plan: What would be the effect of the sizeable gap between need-based demand and actual outlay? Replacements financed through DRF would be hit, leading to an increase in arrears of overdue replacements. This has already happened. Leasing arrangements through IRFC are now being drawn not only for additions of rolling stock but also for replacements; hence the effect of the funds shortage will be in regard to track renewals, bridges and other fixed assets. These would have an adverse effect on train operations.

About half of the funds allocated to Capital Fund are currently deployed on gauge conversion projects that are neither financially remunerative nor operationally critical. The remaining allotments from this Fund go towards doubling and other projects that are remunerative but rank lower in productivity gains as compared to the projects funded out of borrowed capital. The long-term impact of spreading resources thin on such projects would be a corresponding reduction of the remunerative components of future plans.

There is a sizeable share of unremunerative investments in the use of funds received as government budget support as well. In general, 20 to 30 per cent of the borrowed capital has been spent, in recent plans, on investments relating to new lines (in this plan head almost all of the current outlay is on 'socially desirable' – and financially unremunerative – schemes) and Metro Transport Projects. The effect of shortfall in budgetary support would thus be severe on a range of essential investments needed to improve capacity, to raise productivity and upgrade safety levels. This would again lead to resources being spread too thin, prolonging the gestation periods of several schemes that could contribute to improved efficiency and output.

About half of the funds allocated to Capital Fund are currently deployed on gauge conversion projects that are neither financially remunerative nor operationally critical

Exhibit 4.8 : Internal Resources used to Finance Railway Plans

(Rs Crore)

Category	Seventh Plan	Annual Plans	Eighth Plan	Ninth Plan				Total
				97-98	98-99	99-00	00-01	
Replacements	6,371	3,814	10,546	1,983	2,034	2,277	2,582	8,876
Additions			6,899	1,089	990	591	590	3,260
Misc. Works	820	411	1,387	380	431	557	869	2,236
Total	7,191	4,225	18,832	3,452	3,455	3,425	4,041	14,373
Total Plan	16,549	10,208	32,307	8,239	8,857	8,965	11,000	37,061
Percent of Plan	43.4	41.4	58.3	41.9	39.0	38.2	36.7	38.8

Notes:

1. Misc. works: Items charged to Open Lines Works Revenue (OLWR), Development Fund
2. Replacements: Works and expenditure charged to Depreciation Reserve Fund (DRF)
3. Additions: Works charged to Capital Fund

Source: Computed from Plan and Railway Budget documents.

Safety: Wiping out the accumulated arrears in replacements is a priority from the safety point of view. Concurrently, there is identified need for large one-time investments to upgrade IR's safety standards. Implementing the main recommendations of the **Railway Safety Review Committee**, ("Khanna Committee") would involve a total outlay of Rs.10, 000 crore, and would need to be spent in a short period – five years at the outermost. The works include train radio communication, track circuiting, train protection and warning devices, block proving with axle counters, manning of level crossings, improvements in fixed infrastructure for examination and maintenance of passenger and freight trains etc.

Role of Lease Finance

The resource limit on Budgetary Support and the squeeze on internal resources would have caused a sharp scaling down of the Ninth Plan. This has been avoided by jacking up the market borrowings to nearly twice the level of the last plan. Rolling stock items – mostly the additional requirements, but in recent years, also part of the replacement category – constitute the main leased asset. The standard lease period is thirty years (corresponding to the Code prescribed life of the assets) of which the primary lease covers fifteen years, and average lease charges – a composite rate that includes interest as well as amortization – over primary lease are currently around 14.5 per cent. In order for this investment to be remunerative, the financial returns (allowing for cost of lease and depreciation) should be around twenty per cent.

The main source of leasing is through the Indian Railway Finance Corporation (IRFC) that is currently borrowing mainly through medium term and long-term private placements. There is a large concessional component in the funds raised by IRFC: low interest tax-free bonds made up almost half of IRFC's total loan portfolio of Rs 11,764 crores as of March 1999. However, the lease charges paid by Railways to IRFC have been increasing steadily as a ratio to total working expenses and in one expert view, Railways are close to the desirable ceiling on fund-raising through this source.

The expert study in question was undertaken by Jawaharlal Nehru University at the instance of Railway Capital Restructuring Committee (RCRC 1995). It concluded that even allowing for the obligation to pay dividend in perpetuity on capital provided by the Government, this funding option was definitely cheaper than the leasing arrangement through IRFC. Based on exponential projections, the study concluded that IR was in danger of falling into a debt trap within 4 to 6 years unless the operating surplus was raised through improved efficiency and tariff adjustments, at a sustained rate of 20 per cent annually. Incidentally, with the sharp decline in IR's operating ratio in the last three years, the danger to which the study drew attention is now quite real.

Leasing through private agencies is a potential source of finance. Its role in IR is as yet very small. Some 14,000 wagons (out of a total holding of about 253,000) are currently financed under the Own-Your-Wagon (OYW) scheme that is designed to encourage private parties to buy wagons from established wagon production units and to lease them for use by IR in 'closed circuit' routes. A second scheme – 'Build-Own-Lease-Transfer' (BOLT) – that envisaged award of projects through open tenders and to guarantee the lease charges of projects executed irrespective of the level of usage has been less successful. The rates of return expected by private promoters under this

The lease charges paid by Railways to IRFC have been increasing steadily as a ratio to total working expenses and in one expert view IR was in danger of falling into a debt trap. With the sharp decline in IR's operating ratio in the last three years, the danger to which the study drew attention is now quite real

scheme were generally found to be too high by IR's standards. The OYW scheme accounted for 1.4 per cent of total railway plan spending in the Eighth Plan and BOLT for less than 0.5 per cent. The total share is expected to be in the range of 2 to 3 per cent in the Ninth Plan.

This review of the current state of plan investments has drawn attention to the great difficulties that IR has faced in the 1990s in keeping up adequate levels of investment. Moreover, it has encountered increasing difficulty in raising the resources required even for these low investment levels: being forced to raise the levels of its public borrowing through IRFC thereby raising its overall level of resource costs. The problem has been compounded by the change in investment priorities where greater attention has been given to unremunerative projects. **The emphasis on gauge conversion has yielded negative returns.** There has also been an increase in the number of unremunerative projects because of political pressures. This problem has also been compounded by the relatively greater frequency in government changes in the 1990s. Because of the diversion of resources to these unremunerative projects, maintenance and timely replacement of assets has suffered and large arrears have built up. Consequently wheel-track interface has deteriorated leading to slower speeds in some segments and safety problems overall. The investment strategy followed in the 1990s has also not contributed to capacity enhancement in the golden quadrilateral, hence leading to traffic saturation in this high revenue segment of IR. The slowdown in revenue growth, particularly in freight, coupled with reduced availability and higher costs of resources has led IR into the financial crisis that it now faces. As we will see nothing short of a strategic change in direction can now salvage the situation.

4.25 Investments and Level of Traffic Handled

Falling Traffic Share: It is generally accepted that freight traffic growth on IR has been well below the desired levels and Railway investment policies have had a decisive influence on this outcome. The basic problem is one of substantial demand-supply gap in rail transport availability. The development of rail capacity has progressively fallen short of requirements. Exacerbated by the inability of IR to utilize existing capacity to the full, the relative share of rail has declined vis-à-vis road transport in the total land freight. As observed in the last section IR now carries practically no short lead traffic. According to the finding of the RITES study referred to earlier, road transport is biting ever deeper into the long-lead traffic segment in which IR's share was down to about 65 per cent in 1995. Road transport thus effectively caters to all the short lead traffic as well as about 35 per cent of the long lead traffic now.

The extent of shortfall is measurable against IR's own forecasts. IR's second 15 year corporate plan (finalized 1987) projected freight traffic of 599 million tonnes and freight transport output of 387 billion NTKM for 1999-2000. The projections were based on a medium growth scenario (average GDP growth rate of 4.5 per cent) which has been more than attained by the economy. The actual freight traffic in the year 1999-2000 is estimated at 450 million tonnes originating and 301.5 billion NTKM, a shortfall of about 25 per cent relative to the corporate plan expectations.

A number of factors have contributed to the steady increase in road transport capacity relative to rail transport over the last four decades. Constraint of resources and investment priorities followed by IR are the main internal causes. Inherent characteristics of road transport, ownership

Because of the diversion of resources to unremunerative projects, maintenance and timely replacement of assets has suffered and large arrears have built up. The investment strategy followed in the 1990s has also not contributed to capacity enhancement in the golden quadrilateral hence leading to traffic saturation in this high revenue segment of IR

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Railways' inability to meet freight transport demand on a timely and sustained basis was aggravated because capacity planning on the railways was tailored to what it could carry on the basis of available infrastructure, with marginal improvements in productivity, rather than in relation to projected economic growth registered in each Plan period

There are two possible approaches for augmenting rail capacity in terms of rolling stock as well as section capacity along major traffic carrying routes. The first is by improving the productivity of available infrastructure and assets and the second is by tapping all possible sources, public as well as private, to raise additional investible funds

pattern of road vehicles and accessibility of finance to road transporters are the main external factors.

Transport demand is a co-efficient of economic growth and expansion has to be oriented towards meeting the transport requirements arising out of growth. Railways' inability to meet freight transport demand on a timely and sustained basis was aggravated because planning of traffic carrying capacity on the railways was tailored to what it could carry on the basis of available infrastructure, with marginal improvements in productivity, rather than in relation to projected economic growth registered in each Plan period. As the RITES Report puts it succinctly: "IR tended to define the incremental tonnage in terms of what they would be in a position to carry at the end of each plan and not the tonnage warranted by the factor of growth envisaged during the plan". Consequently the gap between availability of rail transport capacity and potential demand for rail transport has kept on widening over successive Plans.

While the resource constraints were slowing down railway traffic growth, availability of road vehicles has increased substantially. Capital investment involved in the purchase of trucks is spread very wide with an estimated 89 per cent of the trucks being owned by single owners. There has also been better expansion of State Highways as well as major district and rural roads providing for greater scope for road movement.

Railways' limitations of transport capacity are because of inadequate investments in wagons, locomotives and line capacity and the sub-optimal utilization of assets. The Study by RITES concludes that with the available capacity and the existing pattern of operations, the Railways could not have carried any more traffic than what they actually did in 1994-95. At the same time, analysis of 140 million tonnes of long lead traffic moving over roads showed that about 40 per cent was in bulk commodities like coal, foodgrains, POL, iron & steel, cement, fertilizers, etc. These are the commodities already moving in large quantities by rail and retrieval of this traffic back to rail will involve minimal marketing effort. A second category of traffic that could be targeted by IR related to a limited number of O-D flows that individually generated multi commodity traffic in the range of 2-5 lakh tonnes or more, annually. This component of traffic accounted for a total of about 16 million tonnes.

These traffic streams totaling 68 million tonnes in 1994-95 are equal to 21 per cent of the originating tonnage loaded by Railways in that year. In order to capture these for Railways and to build on these opportunities, marketing efforts alone will not suffice; Railways' capacity also needs to be upgraded through both quantitative and qualitative inputs. There are two possible approaches for augmenting rail capacity in terms of rolling stock as well as section capacity along major traffic carrying routes. The first is by improving the productivity of available infrastructure and assets and the second is by tapping all possible sources, public as well as private, to raise additional investible funds for physical capacity expansion. The second issue concerns financing options and the current structure of the organization itself, which are dealt with in other chapters of this Report.

The first issue will be examined further in this chapter. Correct targeting of investments has a crucial role in order to secure significant improvements in productivity. The link between investments and improved productivity is both obvious and complex. Well-targeted investments bring about large savings

in overall investment needs by improving the asset utilization. The case of rolling stock provides a specific illustration. On average, approximately 60 to 65 per cent of the expenditure on rolling stock goes to meet replacements and the balance for additions. Railways' policy has been to replace older designs and to acquire new stock adequate for the extra traffic moved. There is scope for reducing the large plan share for this head by achieving improved utilization of rolling stock assets. This would in turn involve a whole range of new investments in upgraded design, improved maintenance, efficient rapid-handling terminals and vastly improved freight train speeds. Facilitating these investments would call for a re-appraisal of investment policies and processes.

4.3 Recent Investment Patterns 1985-2000

Significant recent changes in policies relating to plan investments have affected IR's performance adversely in recent years. Socio-political objectives have gained prominence in the current phase of railway planning. The effort here is to quantify the effect of this change.

Till the setting up of the Capital Fund early in the Eighth Plan, Railways' investments that were assessed as remunerative were financed from two sources: capital borrowed in perpetuity from government, or loans raised through IRFC. The cost of servicing the debt arranged through IRFC is high and all investments from this source are by implication supposed to be remunerative. Borrowed capital, on the other hand, finances, apart from remunerative type of investments, also certain projects that need not meet the prescribed criteria of 'Rate of Return'. These relate to all new lines, 'strategic' lines in the Northeast Frontier Railway Zone and Metro Transport Projects (MTP). Special provisions relating to dividend concessions or exemptions govern all these categories. (See **Box 4.3**)

The Capital Fund has introduced a new category of investments that relate to projects normally funded from borrowed capital but which do not meet the rate of return criteria, or cannot be accommodated within the funds received as budgetary support. Railways, all along, had to incur certain types of investments that were necessary but not remunerative. These included small to medium sized schemes to smoothen operations, provide amenities to staff and to rail users etc. The projects were charged either to revenue (up to prescribed cost ceilings) or to the Development Fund for which very limited funds allocations were set apart. Together, these two heads accounted for average Plan share (all Plans) of just 8.8 per cent. The entry of Capital Fund has held out the prospect of a big increase in the share of railway investments that are less than remunerative at the cost of productive investments. This effect is pronounced in the Eighth Plan as evident from the figures tabulated in **Exhibit 4.9**.

The reduction in share of this category of investment in the Ninth Plan seems to be fortuitous rather than deliberate, owing to the sharp drop in Railways' net surplus from 1998-99 onwards.

Inter-connected to this change in mode of financing are the shifts in policy relating to selection of new line and gauge conversion projects, and choice of sections for route electrification.

- Under new lines the levels of outlay were not raised – except in the

The entry of Capital Fund has held out the prospect of a big increase in the share of railway investments that are less than remunerative at the cost of productive investments. This effect is pronounced in the Eighth Plan

Box 4.3 : Dividend Relief on New Lines

The 'dividend' payable in respect of Capital-at-charge in the following areas is claimed back by Railways from Government as 'subsidy'.

- New Lines (on which dividend is deferred)
- Strategic lines
- 28 new lines taken up on or after 01.04.1955 on other than financial consideration if they incur operating losses.
- Jammu-Kathua and Tirunelveli-Kanyakumari-Trivandrum lines ("National Investment Lines") if they incur operating losses.
- Bimlagarh-Kiribiru and Sambalpur-Titlagarh lines (Ore Lines) if they incur operating losses.
- Unremunerative branch lines.
- North-East Frontier Railway (Non-strategic portion).
- Ferries and Welfare Buildings.
- 50 per cent of the capital invested in current year and in two previous years, excluding the capital otherwise qualifying for subsidy.
- Line wires taken over from P&T Department.

Dividend on capital invested on New Lines is calculated at the average borrowing rate (currently 12 per cent), but the payment is 'deferred' during the period of construction and first five years after opening of the line. The deferred payment is recoverable from the sixth year provided the net income of the new line leaves a surplus after payment of current dividend. Unliquidated liability at the end of 20 years from date of opening is extinguished. The current position indicates that very few new lines generate a 'net surplus' even between years six and twenty. A total 110 new lines and unremunerative Branch lines figure in the list of lines on which dividend is deferred in 2000-01. Out of total investment on New Lines of Rs. 5,755 crore (from First Plan till 1999-2000), capital outlay entitled to this deferred arrangement ('moratorium') is Rs. 3,613 crore.

Inclusive of the various other listed dividend reliefs, the 'subsidy' works out, on average, to over one-third of the total 'dividend' due. For the year 2000-01 subsidy was Rs. 795 crore, and Rs. 2,115 crore was the due dividend.

List of New Lines constructed after 1-4-1955 on other than financial consideration on which exemption from the dividend is available

S. No.	Name of New Line	Railway
1.	Khandwa-Hingoli	Central Railway
2.	Bakhtiarpur-Rajgir	Eastern Railway
3.	Barasat-Hasanabad	Eastern Railway
4.	Kalkalighat-Dharmanagar	Northeast Frontier Railway
5.	Pathankot-Madhampur	Northern Railway
6.	Barhan-Etah	Northern Railway
7.	Quilon-Ernakulam (MG)	Southern Railway
8.	Farehpur-Churu	Western Railway
9.	Ramwar-Bhildi	Western Railway
10.	Gandhidham-New Kandla	Western Railway
11.	Sabarmati-Gandhinagar	Western Railway
12.	Dabla-Singhana	Western Railway
13.	Torangallu-Mudukelapenta	South Central Railway
14.	Rail Link to Haldia	South Eastern Railway
15.	Ghaziabad-Tughlakabad including second Yamuna Bridge	Northern Railway
16.	Bangalore-Salem	Southern Railway
17.	Delhi-Avoiding Line	Northern Railway
18.	Singrauli-Katni	Central Railway
19.	Madhopur-Kathua	Northern Railway
20.	Hasan-Mangalore	Southern Railway
21.	Guna-Maksi	Western Railway
22.	Udaipur-Himmatnagar	Western Railway
23.	Barabil-Panposh	South Eastern Railway
24.	Champa-Korba	South Eastern Railway
25.	Champa-Korba Extension	South Eastern Railway
26.	Robertsganj-Garwa Road	Northern Railway
27.	Hatia-Nawagaon	South Eastern Railway
28.	Khojuriaghat-Malda	North Eastern Railway

Source: IR Budget Documents and information collected from Railway Board.

current year 2000-01 – but the selection of projects has favoured large number of ‘socially desirable’ (financially unremunerative) schemes.

- In regard to gauge conversions, with the launch of the Unigauge Scheme in the Eighth Plan, the principle of traffic justification for conversion to broad gauge was dropped and at the same time outlays were stepped up (in part, as noted, by reducing the amount appropriated to DRF).
- In railway electrification projects, the specified threshold limit for taking up a section is 40 gross million tonnes of goods traffic in the section. This has been overlooked in respect of projects undertaken recently (on ‘other than traffic’ considerations).

All these projects involve both financing and recurring operational and maintenance costs. Projects reckoned as not remunerative and charged to borrowed capital are entitled to concessional financing; cost of finance and recurring liabilities in respect of projects funded from internal resources are therefore more significant from the cost and profit point of view.

Internal Resources – Cost of Finance: For projects funded out of internal resources, the cost of finance is the returns on investments thereby foregone. Projects funded thus need to be selected through a rigorous screening process and identified as being of the highest organizational priority on which the limited internal resources should be invested. **The recent changes in investment and financing policies on IR need a complete review from this perspective, if a high traffic growth option is to be followed up with the appropriate investment priorities.**

Along with the lowering of standards, another factor adversely affecting profitability of railway operations and generation of internal resources is inadequate follow-up measures to secure cost savings made possible by the new investments. Typically, gauge conversions should yield cost savings by enabling closing down of maintenance facilities and reduction in staff. Likewise electrification should also generate similar savings by facilitating the elimination of duplicate facilities for different traction modes. In general, follow-up action to secure the saving has been slack. Railways’ internal management and control systems are involved here. **The estimated cost savings should be programmed in the project schedule itself and the project should not be treated as completed until these measures are also implemented.**

For projects funded out of internal resources, the cost of finance is the returns on investments thereby foregone. Projects funded thus need to be selected through a rigorous screening process and identified as being of the highest organizational priority on which the limited internal resources should be invested

Exhibit 4.9 : Shares of Less than Remunerative Investments in Recent Plans (Amount - Rs. Crore)

Funded from :	Project Type	Seventh Plan	Annual Plan	Eighth Plan	Ninth Plan
Capital	New Lines	866	532	1,173*	1,251
	MTP	493	293	987	595
Capital Fund	Gauge Conversions			3,472	1,209
	Doubling			682	445
	Electrification			221	
Other Funds**	Safety, Others	609	290	1,318	2,237
A. Total		1,968	1,115	7,853	5,736
B. Total Plan		16,549	10,208	32,307	37,061
Per cent (A to B)		11.9	10.9	24.3	15.5

*Includes Rs. 137.32 crores shown in Budget Documents as allocated to Capital Fund.

** Represents outlays met out of ‘Open Line works Revenue’ and ‘Development Fund’.

Source: Figures based on Revised Estimates as shown in Railway Budget documents. (Ninth Plan are for first three year only)

4.4 Railways Resources : Trends and Prospects

4.41 Critical Juncture in Railway Finances

With the changes in approach that have taken place in the 1990s railway finances are at a point of grave decline. Signs of distress are several. Internally generated resources have fallen. The railway budget for 2000-01 reflects the following:

- The central index of revenue performance – the operating ratio – has touched a level very close to 100 (98.8), marking the worst financial performance in the last fifty years
- After 17 continuous years of full discharge of its obligatory dividend payment to general revenues, IR has had to take recourse to deferring large part of the amount due (Rs. 1500 crore out of Rs. 2115 crore)
- Railway Fund balances have dropped precipitously from Rs. 3,564 crore in 1997-98 to only Rs. 253 crore at the end of March 2000.
- Loans have been drawn from general revenues to finance plan expenditure that is charged to Railways' Capital Fund and Development Fund.

The most recent Pay Commission awards and resulting downslide in IR's finances are thus not the cause but the reflection of a deep-rooted structural imbalance in the system. In the case of commercial organisations such as IR, wage increases should bear some relationship with sustainable productivity increases

The most worrisome feature is that there is no early prospect of improvement in finances. Reserves available in the Railway Funds have been drawn down over last five years and the ratio of fixed costs – principally regular staff wages and pensions – to total expenses has increased substantially. The proximate reason for this shift is the implementation of the salary and pension revisions through the Fifth Pay Commission. Total employee wages of open line Railways along with pensions accounted for **53 per cent** of the total revenue earned by Railways in 1998-99. The share was 40.8 per cent – in itself a very high ratio – in 1996-97. (See **Exhibit 4.10**).

The Pay Commission exercises should be seen as periodic adjustments of wages and salaries of government employees consistent with the real growth in national income. The real increase in average wages and allowances of railway employees over the period 1981-82 to 1998-99 is calculated at 108 per cent (see Exhibit 4.11). This denotes an annual compound rate of growth of 4.4 per cent, which is only slightly higher than the growth rate of national income per capita. The most recent Pay Commission awards and resulting downslide in IR's finances are thus not the cause but the reflection of a deep-rooted structural imbalance in the system.

In the case of government employees it is difficult to measure productivity. It can only be assumed that their productivity rises in a manner consistent with overall productivity increases in the economy as a whole, i.e. increase in per capita incomes. In the case of commercial organisations such as IR,

Exhibit 4.10 : Share of Staff-related Costs

(Amount - Rs Crore)

Item	1996-97	1997-98	1998-99
Salaries & Wages (S&W) – All Employees*	7,514	10,270	11,544
Gross Traffic Receipts (GTR)	24,319	28,589	29,620
Pension Liabilities* (Outgo)	2,401	3,065	4,144
S&W, as percentage of GTR	31	36	39
Pension, as percentage to GTR	10	11	14

* Amounts pertain to Open Line Staff only

Source: Annual Statistical Statements, relevant years and Explanatory Memorandum to Railway Budget.

wage increases should bear some relationship with sustainable productivity increases. Being run as a government department, however, IR wage increases are also linked to overall government employee wage increases as recommended by successive Pay Commissions. Consequently, management has little control over IR's salary bill, and employees have few incentives for achieving productivity improvements.

Lag in Productivity

The underlying problem is that trends in average productivity per employee have not improved in line with increase in real wages, and the causes for this disparity need to be identified and addressed. One obvious reason is the poor quality of investment decisions. As explained later in this section, the issues concern both the financial projections and the investment programme. Productivity *per employee* has, no doubt, been improving steadily. However, progressive increases in staff-related costs (including those resulting from the Fifth Pay Commission) have had a very negative impact on staff productivity if staff costs are taken into account.

As compared with the increase in real wages (average per railway employee) of 108 per cent, the increase in average productivity measured in terms of output in 'Traffic Units' over the period 1981-82 and 1998-99 works out to 82 per cent only. The disparity would be still more adverse if the component of pensioners' benefits is added to the average staff costs. As shown in **Exhibit 4.10** pension outgo accounted for 14 paise out of every rupee earned by IR in 1998-99 – a steep increase as compared to 1981-82 when it was just 3.4 paise to each railway rupee. **The root of the financial problem confronting IR is therefore found in the lack of adequate productivity increases that are commensurate with the real wage increases over the time.**

Apart from constituting periodic adjustments of income levels of government employees to the real growth in national income, the Pay Commission exercises also represent long-term wage settlements between employer and employees. In a commercial undertaking, such settlements ought to be accompanied, ideally, by agreements with regard to productivity levels. Railway wage revisions have overlooked this aspect and annual 'Productivity Linked Bonus' payments have continued at rates linked to staff numbers alone.

What accounts for the gap of over 26 percentage points between growth of productivity and growth of real wages? As the real growth in average wages cannot be termed as excessive, the gap is an indication of the high level of excess manpower in the system, even though manpower in IR has not increased over 20 years. This is a point to be factored into long-term financial projections. Poor targeting and implementation of investments made under the plans is another factor to be considered.

Excess Manpower: The extent of the lag in productivity per employee has been brought out in Chapter 1 (**Exhibit 1.12**). IR fares very poorly in comparison with other major railway systems recognised for efficient operations. Average employee productivity on Indian Railways is as low as one-fifth of that of Russian Railways, one fourth of that of Japanese Railways and less than half of that of South African railway system.

Railways do have a manpower plan that aims at phased reduction in staff numbers, upgrading skills and re-training/re-deploying personnel.

Productivity per employee has, no doubt, been improving steadily. Progressive increases in staff-related costs have had a very negative impact on staff productivity if staff costs are taken into account.

Average employee productivity on Indian Railways is as low as one-fifth of that of Russian Railways, one fourth of that of Japanese Railways and less than half of that of South African railway system

While the total strength on regular payroll has been kept under close check, the tabulation (**Exhibit 4.11**) shows that there is no reduction in absolute numbers over the *long term*. In fact, efforts at reducing manpower have not been followed consistently or systematically. The numbers kept rising from 1981-82 to 1991-92 (touching 1.654 million) and reduced significantly only in three subsequent years (by 26,000 in 1993-94, 21,000 in 1994-95 and 15,000 in 1995-96). Owing to the policy of regularising railway casual labour, reductions thereafter have been at the nominal rate of two/three thousand per annum.

If Indian Railways is to become a truly modern transportation system offering services that could face up to the emerging competition, the issue of an accelerated reduction in manpower has to be addressed without delay. In the financial situation confronting IR today, this is now an issue of viability and survival.

If Indian Railways is to become a truly modern transportation system offering services that could face up to the emerging competition, the issue of an accelerated reduction in manpower has to be addressed without delay

In any set of financial projections, a substantial net reduction in employee strength (at least twenty per cent of the total) has to be provided for. Retention of current strength would rule out any upturn in IR's performance, even in a high traffic growth scenario. Going by the conclusions of a diagnostic study on this problem carried out by RITES for the Railway Board [**Manpower Planning for Indian Railways: A Diagnostic Study** (Reduction/Redeployment of Manpower in IR) 1991], the excess manpower could be more than 25 per cent of the total. On a very conservative basis, therefore, a reduction of twenty per cent of the present overall strength should be targeted over the next seven years. **This will require, apart from reductions through normal retirements, the spinning off of ancillary activities and also a well-designed VRS scheme to be implemented early, in phases.**

4.42 Trends in Freight Rates and Passenger Fares

In the planning regime, additional resource mobilization (ARM) through tariff adjustments was an accepted means for meeting plan resource requirements. There is a big question mark on the scope that remains for this mode of resource generation. **As for freight traffic, IR cannot count, henceforth, on captive traffic streams but would need to compete on price and quality of service.** As noted, IR share in movement of high rated commodities is declining because of its commodity-linked freight pricing policy and un-competitive tariffs.

However, it is not only the average freight rates that have increased in

Exhibit 4.11 : Employee Remuneration and Productivity

Item	Unit	1981-82	1998-99
Salaries & Wages – all Employees	Rs Crore	1,252	11,544
Total No. of Employees	000	1,507	1,476
Average S&W per employee (p.a.)	Rs	8,311	78,226
Consumer Price Index (Industrial)	Per cent	100	452.6
Inflation-adjusted average wage	Rs	8,311	17,284
'Real' increase in average wage	Per cent		108
Passenger Kilometres	000	220,787	403,884
Net Tonne Kilometres (Goods)	000	164,253	281,513
Total Traffic Units (PKM + NTKM)	000	385,040	685,397
Total Traffic Units/Employee	000	245	464
Per cent increase in output/employee	Per cent		81.8

Source: Annual Statistical Statements; Economic Surveys.

real terms; introduction of new classifications in the 'value' segments, and of faster inter-city services catering largely to these segments have enabled IR to raise the average fare realised from all passenger services significantly. The increase in average passenger fares, measured over the long term, is actually more than the corresponding increase in the Consumer Price Index.

The nominal increase in average freight realised (per net tonne km) was 392 per cent between 1981-82 and 1998-99 as compared to an increase of only 253 per cent in the Wholesale Price Index (WPI) (see **Exhibit 4.12**). The increase in average passenger fares (per passenger km) over the same period was 373 per cent compared with an increase of 345 per cent in the Consumer Price Index (CPI).

Freight rates have therefore increased at a rate substantially higher than overall inflation over the past two decades. It is no wonder then that IR has been losing freight to roads over this period. Passenger fares have kept up with inflation: the increase in second class fares being strikingly close to the increase in consumer price index. If second class fares were substantially under priced twenty years ago, so are they now. The real price of upper class fares may have fallen slightly since there has been some improvement in the quality of service. The compensation has been in terms of faster trains introduced in several sectors, more comfortable travel arrangements (increased share of air conditioned coaches for example), and a modern computerised reservation network linking the more important stations. There is no tangible compensation for the extra value realised from the freight user.

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Exhibit 4.12 : Average Increase in Railway Fares and Freight

PASSENGER TRAFFIC			
	Total Passenger Km (million)	Total Revenue (Rs. crore)	Average Rate per pkm (Rs.)
1981-82	220,787	989	0.0448
Upper	8,117	110	0.1350
Second	212,670	879	0.0413
1998-99	403,884	8,550	0.2117
Upper	23,078	1,457	0.6312
Second	380,806	7,093	0.1863
Percentage increase in average revenue		Overall	373
		Upper	368
		Second	351
Increase in Consumer Price Index			
1981-82	100		
1998-99	445		
Percentage increase in CPI			345
GOODS TRAFFIC			
	Total Net tonne Kms. (million)	Total Revenue (Rs. crore)	Average Rate per ntkm (Rs.)
1981-82	164,253	2,357	0.144
1998-99	281,513	19,960	0.709
Percentage increase in Goods Revenue/tkm			392
Increase in Wholesale Price Index			
1981-82	100		
1998-99	353		
Percentage increase in WPI			253

Source: Computed from Annual Statistical Statements and Railway Budget documents.

The extent of adjustments needed in different tariff segments have been indicated to some extent in the last chapter. Railways also have the benefit of other recent detailed studies conducted into this area. In the light of the real increases in freights as well as average passenger fares, financial projections in normal scenarios cannot provide for further upward adjustments in rates. The feasibility of raising the average realisation – especially under the passenger segment – was discussed in the preceding chapter in the possible scenario of a Strategic Business Plan that aims to provide significant additional value to the user.

Resources Raised

Over the period reviewed here (1985-2000), successive tariff revisions, especially in the freight rates, enabled IR to raise plan resources ranging from 11 to 18 per cent of plan outlay.

Exhibit 4.13 shows the additional revenues raised through freight fare and other tariff revisions in recent plans, as percentage to the total plan outlays of relevant periods.

In the Eighth Plan in particular, the basic freight tariffs were revised in four of the five years (the year of exception was 1994-95) at rates of increase ranging from 7 per cent to 12 per cent. While certain essential categories (which together have little impact on freight earnings) were exempted in two of these revisions, certain exemptions obtaining earlier were also revoked. In the year in which a basic rate increase was spared, the charging classifications were revised – in some commodities by two steps – as also the distance slabs, together yielding extra revenues calculated at no less than 9 per cent of total goods earnings of 1994-95.

On the whole, the recent plans are marked by successive dose of freight tariff hikes. While IR gained significant additional revenues in this process, the competitiveness of rail transport was affected adversely in important high rated commodities like steel and cement in which Railways' share of total traffic declined sharply over this period. With regard to coal, the bulk commodity accounting for the largest volume and revenue share, this is reckoned as a factor encouraging increased coal imports for inland destinations served by Chennai port, and ports on the west coast. The re-classifications and freight revisions have also made road transport cheaper on short as well as medium distances, thus encouraging the movement of imported coal by road in preference to rail. (It is notable that the freight increase on this commodity, and four others, effected through the Railway Budget 2000-01, has been moderated by lowering of the respective classifications for charging of freight). (See **Box 4.4** Railway Freight Tariff Revision).

4.43 Internal Resources for Replacements

Exhibit 4.13 : Resource Mobilization through Tariff Revisions

(per cent to plan outlay)

Category	Rolling (1978-80)	Sixth (1980-85)	Seventh (1985-90)	Annual (1990-92)	Eighth (1992-97)	Ninth* (1997-01)
Pass. & O.C.*	2.1	8.9	3.9	6.1	4.6	2.4
Freight	10.7	13.0	10.6	7.9	13.3	8.4
Total	12.8	21.9	14.5	14.0	17.9	10.8

* Ninth Plan figures for four years only. 'O.C.' – Other Coaching.

Source: Statements compiled in Railway Budget Directorate.

As documented earlier, replacements, have historically been a major component of railway plan investments using up, on average, up to a third of total outlay. In terms of investment share, the main assets replaced are track and rolling stock. Other assets like signaling, overhead traction equipment, bridges and machinery plant are also subject to extensive 'wear and tear' over the years of usage and need to be replaced; but track and rolling stock predominate in financial terms. Feasible reductions in expenditure on Track Renewals were touched upon earlier. In general, there is scope for pruning the currently high levels of outlays on replacements through improved designs and better maintenance practices (**Box 4.5**)

Regarding the future investment needs on replacement account, the basis is fairly reliable. The 'arisings' are known on a year-to-year basis, for rolling stock as well as for track. Outlay needed for wiping out the backlog of arrears is also precisely quantified. Approximate estimates are made for assets for

Box 4.4 : Railway Freight Tariff Revisions

'Cost-based tariffs' are the stated guide to IR's pricing policy, but in actual practice, Railways have neither adopted a concept of cost as the base for setting prices nor identified the objective to be served through the price structure – apart from the very short term need to balance the budget. Economic principles of linking costs, market demand, and price have largely been ignored, although several Expert Groups and Committees have provided detailed recommendations towards a scientific tariff structure.

Across-the-board percentage increases (which are justified on grounds of adjusting for inflation) are the commonest means adopted for tariff revisions. But over the years, distortions have developed even within the freight tariffs themselves, through the practice of selective exemptions from such increases, periodic re-classification of commodities in the scale of charging freight, and revisions of distance slabs and of 'minimum' chargeable distances. The whole exercise tends to be *ad hoc* as illustrated by the sequence of changes in the minimum chargeable distance.

Before 01.06.81, minimum distance for charge was 40 km. The traffic within this distance zone was then 18 million tonnes, mainly consisting of movement of raw coal to washeries, and coal and other raw materials to steel plants. The Rail Tariff Enquiry Committee (1980) recommended it to be raised from 40 km to 50 km; this recommendation was accepted and implemented from 01.06.81. Later on, from 01.06.82, it was raised to 75 km, and with effect from 15.04.85 further raised to 100 km. As noted by the Railway Freight and Fare Committee (1995), "the traffic moving within this distance is mostly trainload captive traffic, and therefore, it provided an easy source of additional revenue. There is nothing to indicate that these enhancements, in such quick succession, were based on any costing principles or rational grounds".

The minimum chargeable distance was lowered to 75 Km in 1994-95 for chargeable distances up to 50 Km only; for distances beyond 50 Km, the minimum charge remains at 100 Km., Along with that change, the other end of the charging scale was tightened by reducing the distance blocks for charge beyond 2400 km from 50 km to 25 km. The response of a major rail user – the Tata Iron and Steel Co. – to this charging system is interesting and illustrates the resultant costs to IR as well as to the economy. TISCO is now moving large supplies of steel plates to a major customer located within short distance of their works by road trailers, causing loss of revenues to IR and regrettable congestion on the roads of Jamshedpur through which the loaded trailers pass.

By this and similar *ad hoc* revisions, Railway pricing has grown into a distorted charging system for the services provided, resulting in one of the most unscientific fare-to-freight ratios (1: 3.5) in the world. According to one inter-country comparison, IR's average passenger fare per pkm stood at 32.4 percent to the average IR freight charged for one tkm making it the lowest even among developing countries including Pakistan, Turkey and Indonesia. The corresponding figure for some developing and most developed countries was well above 100 (China - 151.6, Japan - 191.6, UK - 160.2, Canada 347.6) i.e. the average fare for one passenger km exceeded the average freight for one tonne km in all these countries.

Also not to be overlooked is the equally serious issue concerning the costs that are passed on to the users; these do not reflect the desired or even feasible level of efficiencies.

Sources: Railway Budget Documents of various years, 'Vision 2010 Indian Railways' by R.K. Thoopal, OSD West Central Railway, Report of RFFC and inputs from Expert Group Members.

which the replacement needs can not be accurately forecast (S & T equipment). The projections adopted here correspond to the figures incorporated in IR's Third (Draft) Corporate Plan.

Depreciation Reserve Fund: Drawbacks of Present Arrangement

For the purpose of investment projections, it has to be assumed that sufficient resources will be set apart from revenue each year to meet the depreciation requirements. This is an important departure from the practices actually followed in IR. The replacements are charged to the DRF, which is made up through amounts credited from Railway revenues year to year. The same is the case with the works of additional asset creation, which are charged to revenue itself (OLWR) or to the Development Fund and Capital Fund.

Replacements are crucial for smooth railway operations and one effect of the creation of Capital Fund in 1992-93 has been the diversion of Railway surplus to less remunerative projects, at the same time as outlays on replacements were cut back. The extent to which such diversion has been

Box 4.5 : Investments on Replacements and Renewals

Railways' Depreciation Reserve Fund (DRF) has been in existence ever since the separation of Railway finances from that of Government, effected in 1925. Over these decades a number of committees have examined the subject of contribution to Depreciation Reserve Fund by Railways in their Annual Budget. Notable among them are the Indian Railway Enquiry Committee - 1947, Rail Tariff Enquiry Committee - 1980, RITES Study on Depreciation Policy - 1987, Railway Reforms Committee - 1992, RFFC - 1993, Railway Capital Restructuring Committee - 1996. In these discussions, at times, there has been a tendency to mix up the accounting concept of depreciation with the issue of provision made by Railways to Depreciation Reserve Fund. 'Depreciation' is the charge on revenue for the utilisation of an asset, a principle that does not find reflection in the current structure of IR accounts. DRF represents a fund constituted with a view to replace the asset in future.

Besides through withdrawals out of DRF, replacements are being financed, in recent years, from two other sources: borrowings made through IRFC and credits received by disposal of scrap. (Of late, because of large scale gauge conversions, substantial credits in the range of Rs.800 crore per annum – which equals 40 per cent to 50 per cent of the contributions made by Railways to the DRF - - are realized through disposal of scrap). Separate accounts are not being maintained by IRFC or Railways for the assets acquired through that source and being utilized for replacement and as new acquisitions. It is estimated on the basis of calculations based on average annual replacement needs of the Indian Railways (18,000 four wheel equivalent wagons, 200 locomotives and 1,000 coaches), that Rs. 2,200 crore of replacement needs is being sourced through IRFC. Total plan expenditure incurred by Railways on replacement in recent years has thus been in excess of Rs. 5,000 crore per annum.

RRC (1992) had worked out the replacement needs as 2.6 per cent of the current replacement cost of all replaceable assets. The present investments being made on renewals are about 10 per cent of the Capital-at-charge (including assets created through internal generation), and 14 per cent of the gross revenue. Railways' assets have a long life and in absence of availability of asset registers, it is difficult to assess the true scale of current replacement costs. Assessments by the respective departments of current arising and the needed replacements on current account, point to a shortfall of Rs. 1000 crore annually in the planned replacement outlays if arrears are not to pile up.

Overall, these estimates leave much room for pruning. For one thing, they include 35 per cent to 40 per cent of premature renewals of rail and 25 per cent of the premature condemnation of coaches. Measures that could raise track life to international standards have been noted elsewhere (See Box 4.1 on 'Track Renewals – Potential to Save on Investments'). There is need also to tighten maintenance of rolling stock and improve the quality of material and spare parts being used both in maintenance and production of assets, to reduce the funds requirement for replacement.

Source: Information provided by Planning Directorate, Railway Board and Inputs from Expert group Members.

allowed is highlighted in the Report of the Railway Capital Restructuring Committee (RCRC 1997).

The Report notes specially that despite a marked increase over previous year in gross revenue receipt by about 14 percent, withdrawals from as well as contribution to DRF were cut down substantially in 1993-94. Dividend payments were also lower in that year by about Rs. 218 crore. The Report points out that the lowering of DRF allocations and dividend payments in that year were aimed at putting more money in Capital Fund, used for unproductive investments. If these were decided on the basis of normal procedures, there would be no reason for them to decline. The Report adds that resultant increase in the current surplus cannot, therefore “be taken as an indication of the health or dramatic improvement in the internal efficiency of the Railways. An attempt to make a long-term projection based on this trend is bound to be misleading”.

In more recent years, fund balances under DRF have been drawn down in the effort to present a more acceptable picture of overall financial results. **As appropriations made to DRF reflect on the operating ratio and the size of the net surplus or deficit, there is, in fact, a perverse incentive in the financial structure now obtaining to under-provide DRF.** The usefulness of this kind of classification of revenue surplus needs a review. In commercial practice, depreciation is a permitted charge to revenue and investments are determined according to priority set by the business strategy, rather than the source of funding.

As pointed out in the next chapter, yet another drawback of the existing Railway practice is that in the absence of year by year accounting of depreciation according to commercial norms, the true value of IR's assets and liabilities is not known.

4.44 Pensions

The problem is more serious in regard to pensions, which are again charged to a separate fund (Pension Fund) created out of Railway revenues. The liability towards pension is incurred during the working years of each employee and ought, ideally, to be provided at that time itself and not when the liability is discharged after the employee retires. The failure to do this is another structural defect that has resulted in serious financial problem for the IR. In the absence of a clear assessment of future liabilities of pension, the true financial position of the organization is not known to the decision-makers. Additionally, these liabilities are ballooning owing to factors like increased longevity, more numbers super-annuating each year (temporarily arrested over 1997-98 and 1998-99 through raising of retirement age) and improved average pensionary benefits.

For the financial projections made by the Expert Group it has not been possible to estimate the liabilities in respect of employees who are currently in service. Instead, yearly liabilities have been estimated and provided for, based on the trends of total pension payment and the number of pensioners, and also providing for expected increase in number of pensioners over the period of 15 years. Ideally, the forecasts should be based on standard actuarial calculations that have not been feasible for the present purpose. The estimations are made taking into account:

(a) Recent (1990-91 to 1997-98) trends of annual growth of numbers of

In more recent years, fund balances under DRF have been drawn down in the effort to present a more acceptable picture of overall financial results. As appropriations made to DRF reflect on the Operating Ratio and the size of the Net Surplus or Deficit, there is, in fact, a perverse incentive in the financial structure now obtaining to under-provide DRF

The liability towards pension is incurred during the working years of each employee and ought, ideally, to be provided at that time itself and not when the liability is discharged after the employee retires. The failure to do this is another structural defect that has resulted in serious financial problem for the IR

One clear conclusion that emerges from all the alternative growth projections attempted in this exercise is that railway pension liabilities require special funding arrangements. In view of the failure to make provisions over the productive phase of employment, it is no longer feasible for current revenue operations to support what is in the nature of 'Stranded Costs' for the organisation

Railways have an elaborate and time-tested procedure for appraising projects selected for investment and a demonstrated track record of planning and implementing 'Strategic Initiatives' at different stages of the five decades of planning

pensioners, and

(b) Real growth of average pensionary benefits.

Only one set of projections has been attempted which applies to all three growth scenarios. It is also estimated that the total number of pensioners will stabilise around 1.4 million by the year 2008. Projections for subsequent years of the forecast period therefore provide only for trend-based increase in average pensionary benefits.

In making the projections of pension liabilities, one additional factor has been incorporated and this is the provision for 'accelerated' reduction in staff numbers. This is an essential requirement for improving staff productivity in cost of staff terms (as distinct from productivity per 'unit of staff').

One clear conclusion that emerges from all the alternative growth projections attempted in this exercise is that railway pension liabilities require special funding arrangements. In view of the failure to make provisions over the productive phase of employment and the ratio of employees to pensioners which is likely to touch 1 : 1, it is no longer feasible for current revenue operations to fully support what is in the nature of 'Stranded Costs' for the organisation.

4.5 Planning Systems and Processes

4.51 Existing Plan Procedures

Having documented the difficulties that IR is now facing as a consequence of the faulty investment strategy that has been followed in recent plan periods, it is useful to review the planning system and procedures themselves in order to suggest the changes required for accomplishing a strategic high growth scenario. The Planning Commission plays a key role – in association with Ministry of Finance – in determining the size of the Railway Plan that is financed, in part as noted, through budgetary support from general revenues and through market borrowings. Within the allotted plan size, IR had until 1995, near-complete autonomy (with the exception of projects relating to new lines, gauge conversion, metro transport and railway electrification that had to be cleared by the Planning Commission) in sanctioning specific projects for inclusion in the annual works programme. In other words, unlike other ministries and departments of government, railway investment approvals, regardless of cost did not need to be approved by the Public Investment Board. For the last five years, the procedure for project approvals has been modified and projects individually costing over Rs. 50 crores are placed before an 'Expanded Board' for approval. This Board comprises the full Railway Board and in addition, Member Secretary, Planning Commission, Secretary, Expenditure (Ministry of Finance) and Secretary, Department of Programme Implementation.

Railways have an elaborate and time-tested procedure for appraising projects selected for investment and a demonstrated track record of planning and implementing 'Strategic Initiatives' at different stages of the five decades of planning. Among the initiatives that could count as good models of implementation strategy, (although not of the realisation in each case, of the expected benefits) are:

- the thrust on laying of a network of new lines and industrial sidings to support core industry and mining undertakings between the Second and

Fourth Plans,

- setting up from scratch, later modernising, large functioning Production Units,
- doubling of the heavy traffic sectors commencing in full measure around the Fourth Plan,
- the push given to Route Electrification in the Sixth-Seventh Plans, and
- the efficient, functioning computerised Passenger Reservation System.

Professional capabilities of a high order in carrying out surveys, drawing up “Detailed Project Reports” (DPRs), analysing the expected financial returns and in implementing the projects, more often under traffic conditions, have contributed to this record of success.

It is notable that these achievements were notched up in a plan-funding regime characteristic of a government department, where ‘Project Financing’ as widely understood viz. the identification, before commencing the project, of sources of funding that would enable the project implementation within a set time frame, was not in vogue.

Planning for Rolling Stock: Most of the spending on Rolling Stock which makes up the largest single component of plan outlay involves IR’s own production units that manufacture diesel and electric locomotives, passenger coaches and wagon components. The production units together employ 56,000 railway staff and have a total production budget of Rs 3300 crore (2000- 01). Barring small quantities that are exported from time to time (or sold to domestic industry for use in sidings), the production is wholly for the IR’s needs. One of the factors influencing the number of rolling stock units purchased each year through the Plan is the available in-house manufacturing capacity. There is a backlog in replacement of coaches but in the case of locomotives, shortages that persisted for long have been overtaken. **Steam locomotives have also been phased out completely and the priority now should be to improve the maintenance standards of the rolling stock and their average utilization.**

4.52 Key Issues in Railway Planning

From the analysis of IR’s Planning policy in earlier sections of this Chapter, certain trends are evident. These are:

- Unsustainable shares of investments get allocated to projects of low priority and doubtful remunerativeness.
- Standards of project selection have slackened, especially in recent Plan years, and the investments made have not – and in many cases, could not have – improved traffic output to a corresponding degree.
- Overall, the incremental approach to capacity augmentation is now yielding diminishing returns.

On account of growing resource constraints on two of the main sources of investible funds available to the Railways – internal generation and budgetary support – IR has been encouraged to go in for market borrowing during the last three plan periods, at a high cost of servicing. At the same time, focus of investment policy has shifted away from investments relevant to the system needs towards broader social and political concerns. **Absence of an effective process of setting priorities has led to misallocation of the limited investible surplus and sliding financial fortunes for the organization.**

It is notable that these achievements were notched up in a plan-funding regime characteristic of a government department, where ‘Project Financing’ as widely understood viz. the identification, before commencing the project, of sources of funding that would enable the project implementation within a set time frame, was not in vogue

The RITES study on declining share of railway traffic correctly concludes that the IR's overall approach, conditioned by perennial constraint of resources, was to effect **marginal** improvements in the existing systems and network. **Major new investment initiatives of direct relevance to the traffic growth are rare in the recent history of railway investments.** Investment initiatives that ought to be of high priority for upgrading technology and meeting customer needs are still fewer. An inherent conflict of approach is evident in the promotion of an investment strategy that perpetuates resource constraint.

In the remainder of this section, long-standing systems and process of railway planning will be reviewed to see to what extent these systems have contributed to the trends mentioned above.

4.53 Role of the Process

Changing Environment: Processes that have “stood the test of time” as it were and delivered considerable achievements in the past are generally not subjected to critical scrutiny. As a result, **organizations – and the more successful ones especially – often get trapped in structures, systems and procedures that are out of tune with the needs of a changed and changing environment.** A review of IR's planning processes is necessary here for two reasons. The first flows from the foregoing discussion indicating that projects that should be of high organizational priority are not figuring prominently in investment programme. Second, data relating to productivity trends strongly suggest that Railway investments in the whole are not yielding commensurate productivity gains. One likely reason is that whereas much of the investments in themselves are sound, wrong pricing policies or inadequate check on revenue costs nullify the potential gains. But it is also possible that investments suffer from intrinsic defects. **(See Box 4.6)**

Major new investment initiatives of direct relevance to the traffic growth are rare in the recent history of railway investments

Railway Works Programme: Railways have a long-established system and procedure for drawing up the ‘Annual Works Programme’. To refer to the most basic features, the exercise begins in the field formations, leading to the compilation by each Railway Zone/Production Unit/ Centralised Construction Organisation of a draft Works Programme comprising of:

- Review of progress and financial outlays on each on-going scheme,
- Listing of proposed ‘New Works’ with financial justification where necessary, and
- An ‘Integrated Performance Budget’ for the succeeding Financial Year

These documents are examined and discussed threadbare in structured meetings between the Railway Board and the principal officials of the field formations, generally in October/November. Between then and the presentation of the Railway Budget in February of next year, the Works Programme of each formation is firmed up with such additions/modifications as decided in the Board. The Final Works Programme also contains details of proposed outlays, which are dependent on the financial allocations determined by Planning Commission in consultation with Ministry of Finance.

This system has much demonstrated strength and one serious limitation. The weakness is the incremental approach to investments that the annual review procedure brings to bear on the programme. It would require much

daring, exceptional vision and detailed staff work on the part of a Railway Zone or Field Unit to come up with a scheme in one of the priority areas. It is very likely that both the interval between each programme and average tenures of key officials are too short for such initiatives to take off. By contrast, small increments on on-going programmes are easily handled and with lesser risk.

The incremental approach to the Annual Plan influences the investment policies in direct or subtle ways. One effect is the pressure to keep existing organizational structures going with fresh plan allotments. This applies to railway electrification and also to the production units, whose installed capacity would remain idle if the production programme were curtailed.

Plan Heads: As noted, railway plan expenditure is budgeted under a variety of separate plan heads. There are twenty four such plan heads, each representing a specific type of outlay (New Lines, Rolling Stock, Bridge Works, Track Renewal' etc). This classification is based on the identity of the functional departments with responsibility for each type of project. It thus facilitates the control of expenditure incurred against the budget allotment. It is also well suited to financial control by sources of funding and related reporting requirements.

However the system has two serious drawbacks. First, from the investment aspect, the plan heads are not self-contained. In much of IR's investments, full benefits from one set of investments can be realized only with other matching investments: for example, investment in high cost modern locomotives and in railway electrification. In each of such priority areas of productive investment, coordinated investments spanning several plan heads are required. It is more than probable that the department-oriented plan head structure actually acts as deterrent to the very formulation of such projects.

The incremental approach to the Annual Plan influences the investment policies in direct or subtle ways. One effect is the pressure to keep existing organizational structures going with fresh plan allotments

Box 4.6 : Capital-Output Ratio on Railways

The capital-output ratio indicates the physical performance of a railway organization in terms of capital (investments from borrowed Capital and Capital Fund) employed per NTKM. This is a more appropriate index to measure the productivity of capital employed, than the percentage of net revenue to capital as is being indicated in the Railway's Budget documents. The ratio of the net revenue to capital at charge and investments from the Capital Fund, as indicated in Railway Budget documents during the last 5 years from 1993-94 to 1997-98, was 13.7 per cent, 15.3 per cent, 14.9 per cent, 11.7 per cent and 8.9 per cent. As regards physical performance measured in traffic output, the following Table shows the deterioration of the capital-output ratio measured in NTKM per unit of capital employed for the same period:

More Capital per Unit of Increased Output

As on	Capital at Charge (Rs. in Million)	Goods Traffic (NTKMs)	Passenger Traffic in Million PKMs	Passenger Traffic in Million NTKMs	Total Traffic in NTKMs	Capital at Charge (in Paise) per NTKM
31-3-94	226206	252411	296245	21033	273444	83
31-3-95	249248	249564	319365	22675	272239	92
31-3-96	277129	270489	341999	24282	294771	94
31-3-97	309118	277567	357013	25348	302915	102
31-3-98	338463	284249	379897	26973	311222	109

According to the Railway Reforms Committee (1992), one of the factors which has the debilitating effect of increasing the capital-output ratio is higher cost overruns due to non-completion of projects on time. Other factors listed include the unrealistic subsidisation of Second Class/Sleeper Class services, Catering Services, Parcel/Luggage Services, investments in financially unviable Railway Projects and payment of Lease charges.

Source: Comptroller & Auditor General's Report No. 9, 1999, Government of India.

Average tenures of railway officials in top management positions are too short – a feature that reduces organisational performance in several ways. This point has been stressed in numerous studies. An added concern here is that the short management tenures right up to the top management negate the pursuit – or the very setting – of long-term objectives with regard to railway investments even at the central level.

Short management tenures right up to the top management negate the pursuit – or the very setting – of long-term objectives with regard to railway investments even at the central level

A second serious weakness of the plan head structure is that in conjunction with the incremental approach noted earlier, it promotes the emergence of departmental quotas in apportioning the outlays. This, in turn has two negative effects: (a) priorities tend to be set not for the organization as a whole, but on ‘departmental’ or even wholly extraneous considerations, and (b) investments are spread out too thin. An example of the latter is the manner in which schemes for signaling improvements (‘Panel Interlocking’, Solid State Interlocking) are implemented. In order to get maximum benefits from these type of projects, the whole route or section needs to be covered in the scheme. Ideally, they should be part of a larger scheme designed to effect improved speeds and throughput, enhance safety and realize cost savings over a select section, and the scheme should incorporate all the related works spread over different plan heads.

The question is one of correct project design and definition. Focussing narrowly on the plan head, IR has, instead, been distributing allotments over several zones and sections with the result that in a typical section only a few stations are covered by the schemes. (As may be seen from the Box 4.8 on Railways’ Corporate Plan, the number of stations covered by advanced inter-locking systems increased from 601 to 1908 over the last fifteen years). Consequently operational improvements are not realized to the desired extent. It would seem that the plan head structure indeed acts as a deterrent to the defining of the project optimally.

4.54 Annual Budget

The works programme is part of the annual railway budget. The presentation of railway budget to Parliament each year, two or three days before the general budget (and the only departmental budget to be accorded this distinction) has a decisive impact on railways’ investment, pricing, staffing and organisational policies.

This impact has ceased to be beneficial to the organisation. While the basic principles that guided the separation of Railway finances from the General Revenues as far back as 1924 remain valid, more than one subsequent review has highlighted the limitations of the arrangement as actually practised over the years. The issue now is whether the railway budget in its present form should continue at all.

A universally endorsed principle to safeguard the long-term objectives of large public undertakings is the clear demarcation of policy making and implementation. The most serious problem with the railway budget is that it institutionalises the opposite: it blurs the dividing line between policy-making and implementation

Short term political priorities: A universally endorsed principle to safeguard the long-term objectives of large public undertakings is the clear demarcation of policy making and implementation. In India also, mechanisms have been devised with respect to the important central public sector enterprises (PSEs) to institutionalise this demarcation. The most serious problem with the railway budget is that it institutionalises the opposite: it blurs the dividing line between policy-making and implementation. **Added to that is the very high visibility of the railway budget that generates political compulsions which are best avoided and encourages responses that meet political and localised, rather than organisational or larger public interests.** A healthy railway undertaking is an objective that serves efficient economic growth and hence

the larger public interests.

One illustration of the policy implementation confusion is given here. Recent years are marked by a trend towards increased share of line capacity for passenger services even as the congestion on high-density routes precludes any improvement in freight train speeds. The proportion of total passenger train kilometres (tkm) to freight train kilometres handled by the Indian Railways was virtually unchanged between 1980-81 (1.47) and 1990-91 (1.49) but moved up to 1.76 by 1998-99. Over three-fifths of the railway line capacity is therefore now used up for passenger trains.

As may be seen from the **Exhibit 4.14** freight tkm has remained virtually stationary since 1990-91 (increased output was through heavier wagon and trainloads), while passenger tkm have been rising at annual rate of 2 per cent. These trends are not flowing from deliberate policy but are the outcome of several uncoordinated measures relating to investments, price setting and introduction of new services, announced mainly through the railway budget.

Schemes involving the introduction of new trains or extension of run/ increase in frequency of existing services do not either emanate from, or even fit into, a well-planned and market-focussed business strategy. Piecemeal measures of implementation have added up and determined the policy. The operating decisions that follow from these announcements do not factor in cost-revenue implications.

New Railway Zones: Another example of mixing up of policy and implementation is the abrupt announcement through railway budget 1997-1998 regarding proposed creation of six additional railway zones. Firstly, the decisions of this type which involve additional costs and make large demands on top management towards problems of staff allocation and resolving a host of co-ordination issues ought to have been taken only after the fullest internal preparation, dialogue with employees and managers. It is well known that none of these factors were considered.

Secondly, for an organization like IR, which is already over-exposed to political pressures, it should be a priority not to open up new areas of political interface. The scheme for creation of new zones was a patently political one and as expected created new controversies with political overtones. Third and most damaging for the long-term are the problems arising in re-location of senior personnel, complications in evaluating performance on the basis of

Schemes involving the introduction of new trains or extension of run/ increase in frequency of existing services do not either emanate from, or even fit into, a well-planned and market-focussed business strategy. Piecemeal measures of implementation have added up and determined the policy

Exhibit 4.14 : Railway Capacity Utilisation - Passenger and Freight, 1980-98

Year	Passenger tkm (millions)	Freight tkm (millions)	Ratio of tkm; passenger to tkm freight
1980-81	293	199	1.47
1990-91	364	245	1.49
1991-92	372	250	1.49
1992-93	377	248	1.52
1993-94	383	244	1.57
1994-95	394	241	1.63
1995-96	404	246	1.64
1996-97	409	250	1.64
1997-98	419	250	1.68
1998-99	434	246	1.76

tkm : train kilometers

Source: Indian Railways Yearbook 1998-99.

past data, etc. In the three years that have passed after this announcement – and possibly owing in part to the diversion of attention of management to such extraneous issues – Railway finances have registered sharp decline. All attention now needs to be focussed on plans for financial recovery through targeted investments and rapid growth. This is hardly the appropriate time to open up new fronts like re-organization of zones that has no relevance to any of the immediate or long-term objectives of the organization.

4.55 Implications for the Organisation

From the point of view of investment strategy, **the most undesirable feature of the annual budget exercise is the very short-term focus it imparts to all investment initiatives.** Even for the larger projects that ought to rank high in importance, absence of ‘project finance’ approach makes project completion uncertain and subject to the varying priorities that make themselves evident over the stretched out implementation period. There is yet another unwelcome effect on investment. As the limitation of funding is removed, the doors are left wide open to any number of fresh entries. This is precisely what has happened (**Box 4.7**)

How serious is the problem highlighted in the White Paper, and what factors have contributed? The next table summarizes the position of number of projects (new and on going) as obtaining in 1990-91, and in 2000-01 (Budget). The project numbers have grown way out of proportion to the increase in outlays, especially under the two most visible Plan heads: New Lines and Gauge Conversions.

The forthright inference is that a large shelf of on-going projects is politically more acceptable – preferred in fact – than fewer numbers of quickly executed ones. This explanation dovetails with the universally short time span of political priorities on the one hand, and the political trends – dating from 1990 – of delicately balanced coalitions with strongly represented regional interests on the other. That the two Railway Budgets presented after the release of the White Paper have added another nine new line projects to the shelf reinforces this conclusion. (Incidentally, the new project approval procedure involving the ‘Expanded Board’ does not seem to have made any difference to the system). It would also seem that the Unigauge scheme sponsored in the early 1990s gained strong, instant, political support, chiefly because it presented a ready-made shelf of projects spread, besides, over several regions of the country.

Tangible Costs: How serious are the implications of this trend for the organization? Two questions have to be considered here. First, what scale

Exhibit 4.15 : Shift of Focus to ‘Shelf’ of Projects

Category	No. of Projects		Total Outlay (Rs. Crore)	
	1990-91	2000-01	1990-91	2000-01
New Lines	35	77	356	790
Gauge Conversion	13	74	121	623
Doubling	68	84	327	646
Electrification (RE)	16	18	235	325
Traffic Facilities	196	227	154	227

Note: The category of ‘Traffic Facilities’ – Yard Remodeling and others, is added to this table to illustrate that for this category (unlike new Lines, gauge conversions and doublings) the total outlays have not even kept pace with inflation.

Source: Annual Statistical Statements and Railway Budget documents.

of recurring liabilities and costs do the projects involve? Second, what more prudent and necessary investments are shut out in the process? The latter costs are generally overlooked but are liable to be far more onerous than the future recurring liabilities that these projects entail.

As for recurring costs, new lines fall under a special category. These are funded entirely out of budgetary support under a deferred dividend regime that virtually implies capital free-of-cost for period of execution and twenty years after opening of line for schemes not generating enough returns. 'Dividend Drawbacks' are allowed for the long list of identified investments of this type. But operating losses on these lines as also on those funded out of internal resources will impair the 'internal resources' generation itself to a like degree.

At the same time, amounts spent on unremunerative Railway lines will impose a growing burden on general revenues. As many as **thirty two out**

It would seem that the Unigauge scheme sponsored in the early 1990s gained strong, instant, political support, chiefly because it presented a ready-made shelf of projects, spread, besides, over several regions of the country

Box 4.7 : White Paper on Railway Projects

The mismatch between the annual budget allotments and the total value of sanctioned schemes on IR has grown steadily over recent years. It has also been obvious for some time that the sanctioned schemes in some plan heads – especially New Lines and Gauge Conversions – will involve in total, commitments too large and disproportionate to the resources available. In 1998, Railways considered it necessary through its well-known 'White Paper' on projects to share with the public its helplessness in coping with this trend.

The 'White Paper' detailed the number of projects that were included in the budget from year to year and remained unimplemented because of shortage of fund allocations. The unavoidable demands of priority for IR plan funds were as below:

- Nearly 40 per cent to 45 per cent of Railway plan outlays go towards the rolling stock programme, to provide additional transport capacity as also for replacement/renewal or rehabilitation of locomotives, capital spares, track machines, cranes, etc.
- Track renewals is another vital area impinging on safety which has to be given adequate funds to clear accumulated arrears and to meet annual arisings.
- Signaling/telecommunication works including safety-related works such as Auxiliary Warning Systems, track-circuiting, etc. are other priority areas.

By comparison, Plan heads that attract maximum public attention viz. New Lines, Gauge Conversions, Doublings, Railway Electrification and Metropolitan Transport Projects receive barely 20 per cent of the total Plan funds. Out of the proposed total Plan outlay of Rs. 65,000 crore during the Ninth Five Year Plan, only Rs. 11,850 crore could be earmarked for such infrastructure projects, leading to resources being thinly distributed over unviable number of projects.

With regard to New Line Projects, the concerns are time and cost over runs for want of resources and too many unremunerative New Lines being added to the system. These factors, especially the latter, will reduce the Railways' capacity to generate internal resources which are required to replace the assets at the end of their useful service life, and will affect the very health of the system.

As with New Lines, the shelf of gauge conversion projects has also gone beyond the availability of resources for their completion within a reasonable time. The throw-forward on this category of projects (1998) is Rs. 9104 crore, which will mean that with the existing level of funding at Rs. 803 crore every year, these projects will need 10 to 11 years for their completion (not counting cost escalation which is inevitable in a fund-rationed scenario). Additionally, not all these projects are remunerative and some of them have been included in the Railway Budget without Survey and without the requisite prior clearances.

The White Paper attributes these trends to "rising aspirations of the people and rail users", which are seen as conflicting with "the growth needs of the network". Shorn of euphemistic language, the reference is to the conflict between political priorities and long term organizational priorities. The stated concern for "rising aspirations of the people" also sounds hollow as all these projects will not reach fruition for the next decade or two. By that time, given the projected rate of economic growth and changes in technology, present concerns of social equity would have become outdated. The inclusion of these projects in the IR Plan thus serve only very short-term political interests and not long-term social ones.

Experience over the last decade has shown that this practice can cause considerable damage to the viability of the organization itself; the conflict between organizational and political interests is engendered by the current process associated with the Railway Plan and Budget. It cannot be eliminated except by modifying these basic structures.

Source: Indian Railways: White Paper on Railway Projects and inputs from Expert Group Members

of total 65 new lines constructed since Independence are totally dividend free (listed in Box 4.3) and the annual dividend relief is approximately Rs.700 crore. The exemptions are granted on the recommendation of the Railway Convention Committee. There is a strong likelihood that over half of the 70 new lines now sanctioned and on which work has not got into full swing because of funds constraint will also add to the same category.

4.56 Missing: A Link to Organizational Objectives

The hardheaded conclusion is that the Railway Works Programme has lost focus over the last decade and is on the way to becoming an autonomous process with little connection to organizational aims or resource limitations. The prevailing structure has served well in a captive market and the planning needs associated with it. In a changing scenario brought about by the economic reforms, IR is now in a competitive environment where there is need to bring in customer orientation at the project framing stage itself.

Major investment initiatives by Railways in the past that were relevant to organizational objectives were all directed either towards

- easing operational constraints by increasing the capacity, or
- catering to new captive traffic streams, or
- making the organization self-sufficient.

In the new economic environment, self-sufficiency is no longer a priority. New initiatives will need to have a different focus. Along with solving internal problems, they will also need to look at the requirements of users not only in terms of quantities moved but also the quality of delivery of services which includes the speed and the dependability of movement, prevention of damage in transit and handling of claim settlement, etc.

As pointed out earlier in this Report (Box 3.3 on “Quantity vs Value Added: Meeting Customer Concerns in Freight Rail Transport) **new styles of defining the project, comprehensive coverage, customer focus, prioritisation of investments, improved co-ordination and highest standards of project cost control are all crucial elements to revamping of the plan-investment regime.**

Above all, a project finance approach is required; assured funding that is tied up in advance for full implementation within a pre-set time frame is the crucial element. The plan-head based structure together with the annual budget on the other hand, goes well with the open-ended funding approach which is the opposite of project financing.

For correct prioritization of investments in a commercial undertaking, the measure is how well the investment fits in with business objectives. Business objectives have to be laid down over a long term, whereas in IR both the investment policies and price setting are determined on a very short-term basis. By normal practice, large organizations frame corporate plans that bring out long term business objectives and strategies for achieving the objectives. IR too has a corporate plan, **but there is no mechanism that links the objectives spelt out in this plan to the annual investment programme or even the policies followed regarding operational priorities.**

Railways’ Corporate Plan: The first corporate plan was prepared in 1976 and the third corporate plan is under finalization now. (The investment figures for the different projections made in this report are largely drawn from the

The Railway Works Programme has lost focus over the last decade and is on the way to becoming an autonomous process with little connection to organizational aims or resource limitations. In a changing scenario brought about by the economic reforms, there is need to bring in customer orientation at the project framing stage itself

detailed draft corporate plan forecast for the year upto 2012). **IR's corporate plan lacks integration with the annual or five-year plans. It identifies operational targets and the improvements to be aimed at, but there is no follow-up to convert these objectives into detailed implementation plans.** The plan is not debated widely enough within the organization and is not considered as a guide to policy and planning. This is largely because the annual plan determines not only the amount available for investments but also the priorities to be followed in that year. The corporate plan does not thus amount to much more than a wish list of desirable aims. (Box 4.8)

4.57 The Need for a New Approach

Railways urgently need a compact list of financable projects that are relevant to a central organizational strategy, and not a shelf of ongoing schemes progressed through open-ended funding from year to year in accordance with moving priorities. To summarise, IR's established investment programming process suffers from several weaknesses:

- Incremental approach to planning and consequent backward focus.

Box 4.8 : Railways' Second Corporate Plan

IR's second Corporate Plan covering the period 1985-2000 was finalised in July 1987. Among the corporate objectives listed in this Plan were providing of capacity to carry (by year 2000) (a) 370 to 400 billion Net Tonne Kilo Metres (NTKM) of freight and (b) 310 to 330 billion Passenger Kilo Metres (PKM) of non-suburban passenger traffic. Securing of 15 per cent reduction in cost of transport in real terms was another priority aim. Of these, the objective with respect to passenger traffic alone has been actually realized. Rather than a significant reduction, the cost of transport in fact increased in 'real' terms and freight transport output has lagged behind by 20 to 25 per cent of the volumes aimed.

The omission to devise and implement consistently, appropriate strategies (identified in the Corporate Plan itself) in order to realize the stated objectives account for the failure in achieving the corporate plan. The following were among the strategies identified for the Plan:

- Increase potential of the existing network by using modern signaling technology.
- Give priority to investments in improving productivity.
- Accelerate the pace of technology upgradation.
- Re-organize maintenance in well-equipped and organized workshops.
- Adopt a cost based tariff structure.
- Reduce speed differential by raising maximum speed of freight trains.
- Separate passenger and freight traffic by constructing high-speed passenger lines.

Investment areas for improving productivity were also identified and included : among others, signaling and communication facilities and running of heavier freight trains. Achievements in both respects have been modest. In regard to the former, Automatic Block Signaling (ABS), Centralized Traffic Control (CTC) and Panel Interlocking (latest: Solid State Interlocking) are the advanced systems in vogue. The following tabulation comparing the positions in 1984-85 and 1998-99 shows the very limited progress registered in this respect.

Improved Signaling – the Score Card		
System	1984-85	1998-99
Automatic Block Signaling	1,693 Km	2,936 Km
Centralized Traffic Control	187 Km	No change
Panel Interlocking	601 Stations	1,908 Stations

(Source: Indian Railways Yearbook, relevant years)

The average load of freight trains on the Broad Gauge increased during this period from 922 tonnes to 1180 tonnes. The average speed of freight trains improved over the same period from 21.9 km to 23.8 km only, which hardly makes a dent into the problem of speed differentials, reducing which was listed as a Corporate Plan priority. There has been no progress whatsoever with regard to the separation of passenger and freight traffic through high speed lines. (Regarding 'Cost based Tariffs' please see Box 4.4)

It is evident that the Corporate Plan is not really a serious guide to Railway investment and operational strategies. Just how limited is the relevance of this document is best illustrated by the policy with regard to gauge conversions. According to the Second Corporate Plan, future gauge conversions were to be planned selectively only on heavy traffic sections, and that too after the potential capacity of MG has been fully exploited. However, as noted in this Chapter, within five years of the endorsing of the 15-year Corporate Plan, this strategy was totally replaced, for doing which there was no operational or traffic development of significance, in the interim.

Source: Indian Railways – Corporate Plan 1985-2000 and inputs from Expert Group Members.

- Emergence of departmental fund quotas and low flexibility in fund re-allocation for new strategic initiatives, thinly spread investments
- Lack of integration with business objectives
- Uncertainty of finance, shifting priorities leading to time and cost over-runs
- No review of results of projects implemented vis-à-vis aims
- Large shelf of projects; shrinking ratio of completed projects to the shelf
- Huge imbalance between the annual outlays and the total commitments generating cynicism regarding the whole planning process.

Certain traditional strengths like capabilities in project appraisal are getting diluted in the pressure to add to the project shelf. At the same time, organisational shortcomings and the political compulsions flowing from the present structure of the enterprise have precluded the full potential gains of the system being realised

The positive features are the close involvement of the operating and plan implementing agencies in the planning process and the highlighting of the replacement needs. These strengths, along with inherent organisational capabilities have contributed to a high funds utilisation ratio. However, certain traditional strengths like capabilities in project appraisal are getting diluted in the pressure to add to the project shelf. At the same time, organisational shortcomings (over-departmentalised structure, short tenures of top personnel and others) and the political compulsions flowing from the present structure of the enterprise have precluded the full potential gains of the system being realised.

It is therefore clear that the traditional plan process for programming railway investments will not suffice in the future. It is notable that considerable success was achieved in earlier periods when the planning process as a whole was influential in determining the future course of the economy and, in particular, in determining commodity flows across space. The integrated planning of steel plants and the like with railways investment programming was then effective. The availability of budgetary resources also helped in this process.

Just as successes were achieved when overall planning was effective, the most significant difficulties have been encountered in the 1990s when the role of plan or public sector investments in overall investment in the economy has declined. The economic environment has become more uncertain and competitive. IR can no longer rely on freight loading determined by public sector investments and government diktats. It will have to compete for traffic with alternative modes on both price and quality of service. As the ongoing road programme succeeds and higher quality and heavier trucks come in the market, this competition will become even more severe. Similarly, on the passenger side, availability of better buses on better roads at one end, and more frequent air services on the other will provide new competition as well.

Whereas competition is becoming more challenging, the availability of budgetary resources has become more scarce and is likely to remain that way for the foreseeable future. Thus the effective cost of funds has become higher than it was when a higher proportion of budgetary resources was available. **Unless new investments that are made result in returns that exceed the cost of funds, the financial predicament of IR will only get worse.** The traditional process of plan investment programming that is heavily influenced politically and determined bureaucratically in a hidebound departmental framework in IR will no longer do.

The new approach to investment as outlined in the rest of this chapter will therefore have to be much more commercial than it has been in the recent past. This will require comprehensive organisational restructuring as outlined in subsequent chapters.

4.6 Investing for Growth

4.61 Railway Investments in a Competitive Environment

All of India's economic infrastructure suffers from serious constraints of capacity and resources to meet the growing requirements of the economy. Railways are no exception. Private capital is being sought in a big way to fill the resources gap. Among infrastructure sectors, power and telecom lead in the share of private investment. But even sectors that were not oriented to commercial functioning in the past are finding ways to bring in private investment. Several experiments and models have been developed for this purpose in other countries. In India itself a good example is the progress being made in the road sector where arrangements like 'capital grant', developing ancillary business activities, etc. have been devised to supplement revenues through tolls and make private investment remunerative.

The process of reforms has set the economy on the path of accelerated growth and the investment in railways ought to have been given an impetus. However, government finances have been under considerable strain, and enlarged budgetary support is ruled out. Emanating from IR's structure as a department of government, heavy financial implications devolved on the organization resulting from across-the-board wage revisions and unfunded pension liabilities, draining the internal resources that could be set apart for investment. At the same time, private capital into railway projects – that require large and lumpy investments – could not flow in.

In such a situation of severe financial scarcity, as noted, it is imperative that the limited funds available are put to the most productive use. This has not happened in IR because of three failings of a structural nature:

- limitations inherent in the prevailing investment and planning/budgeting processes that were continued without modification,
- the absence of an all-emcompassing business plan and strategy, and
- the politicization of the investment process emanating from the prevailing Government-to-railways relationship.

A corporate business strategy needs wide debate within the organisation and formulation of an implementable investment plan. It cannot be overlooked here that the main post-reform investment initiative by IR (the unigauge policy) cannot have been farther removed from any relevant business strategies for the immediate future; it was, if anything, a plain investment initiative. If a fully debated and officially endorsed business plan were in place, investments more relevant to organisational objectives would have gained priority. **Shortcomings in the investment policy have been compounded by railway pricing policy rooted again in structural flaws of the system explained earlier.**

Reinventing Investment Programming in IR: The following problems require attention in order to get maximum results out of the railway investments.

Even sectors that were not oriented to commercial functioning in the past are finding ways to bring in private investment. Several experiments and models have been developed for this purpose in other countries. In India itself a good example is the progress being made in the road sector

The main post-reform investment initiative by IR (the unigauge policy) cannot have been farther removed from any relevant business strategies for the immediate future. If a fully debated and officially endorsed business plan were in place, investments more relevant to organisational objectives would have gained priority

It is imperative that all on-going projects are thoroughly screened once a business strategy is finalized and those projects of little relevance to the objectives are frozen and deleted from the funding programme

- **Prioritization** – A rigorous process of screening and prioritization should be enforced in which a select pool of major projects should compete for the limited corpus of funds for investment. A fully debated, officially endorsed business plan is necessary to set up correct priority in allocation of investments, section and route-wise.
- **Quick Implementation** – Essential for getting the best results from the large amounts that are invested through Railway plans. For this purpose, identification of the source of funds for each selected remunerative project till its completion is an essential requirement.
- **Coordinated Investments** – Implement projects in a manner that will result in maximum operational or cost saving. Much of the Railway investments have gone into areas that do not bring any improvements in revenues. Also, matching investment in related areas does not support revenue-improving investments in one area. The best example is the failure to bring about the increase in average speed of goods train in spite of large investments in route electrification, deployment of modern electric and diesel locomotive, etc.
- **Scrap the incremental plan heads' based approach to allotments** – The incremental approach shuts out new initiatives by using up the funds on the large body of on-going projects selected without rigorous screening. Special organizations under Railways have a similar effect on the investment programme. The existence of separate organization for railway electrification influences the priority for taking up electrification projects in order to provide continuing work for the organization. In the near future this could become true also for Production Units. A complete change of approach is needed here to replace the incremental annual investment by a project-oriented investment programme centered on a few all-encompassing business objectives.

It is imperative that all on-going projects are thoroughly screened once a business strategy is finalized and those projects of little relevance to the objectives are frozen and deleted from the funding programme.

A change of approach is also necessary regarding investments currently arranged through IRFC. Firstly IRFC is being utilized to make up shortfalls in the plan allocations, which results in very large liabilities of lease charges. Secondly, the details of investments separately on additions and on replacements are not maintained satisfactorily. The recommendations to replace the leasing arrangements and convert IRFC into a full fledged financing institution need to be implemented.

All existing structures associated with the railway planning process are in need of review and much of it will require to be replaced. This review should be guided by three basic principles:

- Making an informed choice of projects dependent on the priority of investment.
- Defining the projects in such a way that the expected benefits are realized and measurable.
- Project financing approach.

The directional change in investment programming will call for modification

not only in internal procedures but also in IR's relationship with government. In internal procedures, it will be necessary to have a category of high priority projects that will be financed in time bound form. It will not be possible for this discipline to be brought about within the normal government budgeting procedure; commercial corporate systems outside of that procedure will therefore need to be devised. There is also a strong case for dispensing with the annual budget and introducing alternative procedures to obtain Parliament's approval to long term policy, and changing the focus of reviews and reporting the progress actually achieved in implementing the policy. As far as projects are concerned, considering the normal gestation period of large schemes, the reporting could be at intervals of 3 or 4 years.

Role of Railways' Financial Structure: There can be little doubt that investment policy and failures to gain adequate returns from investments have contributed to IR's financial problems, along with two factors noted earlier, viz.,

- Pricing policies and loss of high rated traffic on account of defective pricing.
- Excess manpower in the system and policies of employee remuneration.

The weaknesses of the investment policies have been discussed above. It was also seen that part of the failure to get adequate returns on investment is the deliberate choice of unremunerative investment areas. One should note here that **government accounting and financial systems have also contributed to (or failed to prevent) the deterioration in IR's performance which a different, more commercially oriented financial structure and accounting procedure could have checked.**

Important decision-makers in IR are, no doubt, aware of these weaknesses in its finances. But this has not been adequate to check unhealthy practices in allocation of resources and presentation of financial results. This is not surprising because in a politicised environment decisions are taken not entirely on information and knowledge available to the top decision-makers. The level of the information available to other stakeholders, i.e., employees and middle management levels, rail users, the media and the public at large also contribute to the process. This occurs through (a) creating public opinion that will make difficult and unpleasant decisions more acceptable and (b) by acting to check a purely short term focus on decision-makers. The shortcomings of the current financial and accounting structures which do not 'disclose' important financial information and in effect mislead key stakeholders as to the true state of the organisation's finances need to be addressed with this perception.

Parallel with Global Trends

Railway systems in developed countries went through a long phase of financial decline mainly on account of competition from road, both for passenger and for freight services. Loss of traffic share led to high costs of operation, making operations still more unviable. However, there were a few significant exceptions – notably US freight systems, and Russian Railways. There were also instances of railways that coped with stiff competition for bulk freight traffic by adopting operating strategies and technology to maximize railways' natural advantages. Railway systems of Australia, South Africa could withstand road competition for bulk freight traffic by adopting innovative operational

The directional change in investment programming will call for modification not only in internal procedures but also in IR's relationship with government

There is also a strong case for dispensing with the annual budget and introducing alternative procedures to obtain Parliament's approval to long term policy, and changing the focus of reviews and reporting the progress actually achieved in implementing the policy

practices.

In the very recent past, even those Railway systems that went through financial decline are experiencing renewed growth. This has been achieved invariably through re-structuring of the business and financial restructuring, with or without privatization. Increasing awareness of environmental problems and of high social costs of motor transport has also helped railways in this renewed phase of growth. The reforms carried out in recent years in other railways has been reviewed extensively in **Chapter 2**.

Is the declining phase through which Indian Railways passing similar to that of railway systems in advanced countries? This does not seem to be the case for the following reasons:

- It is clear that Indian Railways' projected financial deficits are the hangovers of past policies connected with manpower, investment priorities and pricing.
- The country's geographical dimensions (common feature with railways that have not suffered decline) strongly favour long distance rail operations both in freight and passengers.
- The country is entering a period of high economic growth resulting in increased disposable incomes in both rural and urban areas. This will again ensure high growth of long distance passenger traffic; increased demand for consumer goods will spur high growth of containerized traffic.
- Railways' loss to road in freight traffic share on account of investment and pricing policies can be arrested and possibly reversed by re-ordering investment priorities, rational pricing, improved customer focus and effecting cost savings.
- Road competition for bulk freight is still in its early stages and at current levels of growth, Railways can still expect a good 15 to 20 years of high growth rate in that area through the principle of logistics and supply chain management.
- High growth rates can also be sustained in medium and long distance passenger traffic provided the quality of service, especially in terms of speed and reliability, is improved.
- Improvements taking place in the roads sector can be harnessed for rail traffic growth by joining hands with road sector entities for planned promotion of inter-modal transport policies concentrating on high growth of containerized freight.

Railways are the only high capacity transport mode that can meet the long-term needs of the economy and a country of such bypass dimensions. Given bold new policy inputs and planned intervention to correct the structural flaws in the system, Railways in India have the opportunity to bypass the phase of historic railway decline and enter a renewed growth phase. This calls for a vision that rises above short-term considerations and looks instead at the huge gains to the system as well as to the economy that renewed efficient Railway growth can bring about.

4.62 The Imperatives for a Strategic High Growth Approach

Railways' loss to road in freight traffic share on account of investment and pricing policies can be arrested and possibly reversed by re-ordering investment priorities, rational pricing, improved customer focus and effecting cost savings

Indian Railways' traffic and financial prospects in a 'Business as Usual' presented in **Chapters 5 and 6** show that the low growth option is totally unviable and will lead to IR turning financially sick. Even the 'Medium Growth Scenario' does not promise satisfactory results and will require extended financial support from the government. At the same time, the growth patterns envisaged in this option are basically in the traditional investment mould and not such as would facilitate access to private capital, except in the manner now obtaining i.e., borrowing through IRFC and very limited private role in other leasing schemes.

The only viable option among the three scenarios is one of "Strategic High Growth" that makes a clean break from the 'Business as usual' approach. It is in that context that the world-wide trends of renewed railway growth and the experience of systems that have coped with competition are relevant to Indian Railways.

There are two commercial components of a strategy aimed at very high growth. These are:

- Arresting and reversing the low growth trends in freight traffic that set in over the last decade, and
- Improving the quality of passenger services in order to realize better revenues in exchange for the value for money provided to the customer.

Scientifically evolved pricing policies and marketing approaches are crucial for implementing such a commercial strategy.

Two recent consultants' studies point to the scope and scale of additional freight traffic that can be targeted by Railways. Reference was made earlier to the RITES Study estimates (1995) of capturing back 69 million tonnes of bulk and non-bulk long-lead traffic. The bulk traffic relates to commodities that are already moving in fair volumes on the Railways. In regard to non-bulk items, the effort needed is to convert this traffic into trainloads by inducting intermediate agencies in the business.

The second study by Swede Rail and McKinsey & Company (1997) stresses that a high growth strategy is economically feasible as well as sensible and will act as a catalyst for much needed change for the organization. It identifies specific projects and investments to expand rail traffic volumes in select freight streams. The Report also deals with need for a customer-tailored approach to pricing.

A railway traffic strategy aiming to boost current prevailing growth rates under freight and passenger would be built around the following:

- Increased average goods train speeds that will on the one hand reduce the speed differential between goods and passenger, and on the other, generate added capacity in the existing network.
- High speed, modern passenger services especially over intermediate and long distances to tap the upper and 'premium' segments of passenger traffic and charge them appropriately for better quality of service.
- Commodity-specific freight strategies to win back high-rated traffic that is progressively shifting to road.
- Introduction of new technology with regard to wagon stock that would

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Emerging competitive pressures in the passenger segment point to the need for flexibility in fixing fares by factors like season, convenience of time of departure/arrival, etc., in addition to factors like class of travel and train speed

increase the capacity, and corresponding improvements in track standards.

- Harnessing information technology for freight operations, and
- Increase in fixed infrastructure capacity utilisation through advanced signalling and communication systems.

Emerging competitive pressures in the passenger segment point to the need for flexibility in fixing fares by factors like season, convenience of time of departure/arrival, etc., in addition to factors like class of travel and train speed. Induction of private management for commercial operations of specialized services is an option that needs serious consideration. New management skills are also needed in handling freight customer needs – especially information-related.

Components of Modernization: As noted earlier in this chapter, there is need for a critical appraisal of the present technologies and the options available in core areas. These include designs of fixed installations and rolling stock; maintenance, inspection and monitoring systems; production technologies and information and communication systems. New technology is a key input to enhance safety standards. Along with the upgrading of technology, it is also important to raise human skills.

In the Indian conditions, Railways have to select technologies that are cost effective, energy efficient, that ensure reliability under operation, enhance productivity and promote safety. New technologies have necessarily to be compatible with the existing system to the maximum extent: where this is not feasible, the period of transition should be of minimal duration and cause the least distress.

The most important step towards modernization is the renewal and replacement of IR's aging and obsolete infrastructure of track and rolling stock. The main task is to carry and handle much larger number of passengers and much higher volumes of freight – safely and speedily. Operational strategies like longer passenger trains, heavier freight trains, rapid handling terminals, etc. should thus be brought under the purview of upgradation of technology. The implications of the strategies for running longer passenger trains and heavier freight trains on designs, braking and signaling systems, etc. should be accommodated in the technology programmes. This also calls for institutional arrangements for constantly monitoring, evaluating and implementing new and/or updated technologies.

There are two basic parameters of the railway system that have to be radically changed to meet the emerging challenges. These are:

- **Speeds of trains** – Speeds of passenger trains have started influencing the choice of the mode of transport for travel. To start with, average speeds of 100 to 120 kmphs should be aimed at and achieved in the cases of long distance and inter-city passenger trains. However, to ensure laminar flow of passenger and freight trains and capacity utilisation, the speed differential between these two sets of trains will have to be reduced by increasing the average speeds of freight trains to 80 to 85 kmph.
- **Rail-wheel interaction** – this calls for serious and sustained attention on priority in the interest of speeds, better riding comfort, and, safety. Railways have had over 3000 mid-section derailments in the last ten years or so, at the rate of over one mid-section derailment per day, which can

There is need for a critical appraisal of the present technologies and the options available in core areas. Along with the upgrading of technology, it is also important to raise human skills

be largely attributed to poor rail-wheel interaction.

The issue of investments for upgrading safety through checking and control devices is to be tackled through the special Safety Package that figures in all three investments scenarios. Improvements in regard to breakdown levels and the two other areas of improved maximum and average speeds will be addressed mainly in the third scenario.

Owing to the characteristics of freight and passenger movement in India, most of the potential traffic that will contribute to a high growth rate will move on the major trunk routes. The broad gauge network accounted for 95 per cent of the freight output (NTKMS) and 89 per cent of the passenger output (PKMS). The share of metre gauge was 5 per cent of freight output and 11 per cent of passenger output. Route-wise studies need to be undertaken, and investment programmes drawn up on the basis of full analysis of costs and expected benefits. Broad estimations of the needed scale of investments have been attempted elsewhere.

4.63 Review of Investment Priorities

Investment needs to be channeled into priority areas that generate additional capacity through improved operational efficiencies, better speeds and modernization. Passenger as well as freight terminals need to be redesigned to handle larger volumes of traffic effectively and efficiently. Replacement of overaged assets should not suffer through diversion of funds to areas of low priority. Investments should target improving reliability and performance of equipment, achieving higher standards of service and safety, adequate maintenance facilities and better practices, upgrading track standards, inducting more productive and specialized wagons, extensive coverage of system by information technology, running longer passenger trains – in short operational and technological ‘leap-frogging’.

A few such areas of high priority may be noted here:

- Improving standards of maintenance, reducing recurring costs,
- Raising average loads and speeds of goods trains thereby reducing the speed differential between goods and passenger trains;
- Optimum use of capacity in the busiest corridors,
- Raising freight throughput by improved wagon design and tare-to-payload ratio,
- Improving operations of terminals.

Shortcomings of Indian Railways in each of the areas mentioned are too well known. The essential points are discussed below:

- **Maintenance Standards:** Train detentions and loss of capacity owing to breakdowns are unacceptably high and improvement, if any, has been negligible. **According to a study on some sample sections carried out by the Railway Board’s cell for Long Range Decision Support System (LRDSS), the loss of capacity on this account ranges from 18 to 22 per cent.** The problem needs to be addressed in a coordinated way by upgrading maintenance facilities and practices, raising staff skills and improving designs of rolling stock as well as track and structures. New technology needs to be inducted to enhance the life of assets under

Owing to the characteristics of freight and passenger movement in India, most of the potential traffic that will contribute to a high growth rate will move on the major trunk routes

Investment needs to be channeled into priority areas that generate additional capacity through improved operational efficiencies, better speeds and modernization. Investments should target operational and technological ‘leap-frogging’

The urgent task is to reduce the differential between maximum speeds of goods and passenger trains which would involve a slew of investments ranging from strengthened infrastructure to better communications, modern operating control systems and use of information technology

Near-stagnant speeds of freight trains represent sub-optimal returns from investments made. Railways are acquiring advanced electric locomotives designed for heavier tractive effort at much higher speeds, each costing around Rs. 13.5 crore as against the price of older design freight locomotives of about Rs. 4 crores only

usage conditions and thus reduce the share of outlay needed on routine replacements.

- **Freight Train Loads and Speeds:** The urgent task here is to reduce the differential between maximum speeds of goods and passenger trains which would involve a slew of investments ranging from strengthened infrastructure (both track and maintenance) to better communications, modern operating control systems and use of information technology.

Limitations of haulage capacity of locomotives is one of the factors that inhibits achievement of desired trainloads and speeds, particularly on graded sections. Heavy 4,500 tonne freight trains are now being run selectively between collieries and power houses, but average train load continues to be low – only 1180 tonnes on the BG in 1998-99 as compared to 1079 tonnes in 1990-91. The marginal improvement registered in regard to average trainload is also not so much due to new technology or efficient design as to lesser share of ‘empty’ running. Improvements in average goods train speed is negligible (23.7 kmph on BG in 1998-99 as compared to 22.9 in 1990-91), reflecting the impact of both the limitations of locomotive haulage capacity and constraints of passage.

Here one should also bear in mind that near-stagnant speeds of freight trains represent sub-optimal returns from investments made. Railways are acquiring advanced electric locomotives designed for heavier tractive effort at much higher speeds, each costing around Rs. 13.5 crore as against the price of older design freight locomotives of about Rs. 4 crores only. (Price quoted in current year’s production programme of Chittaranjan Locomotive Works is as much as Rs. 20 crore per locomotive). To realize adequate returns from the additional investment of up to Rs. 10 to 16 crore per locomotive, the rest of the system should be upgraded such that the locomotive should be able to run at its maximum permissible speed for as much of the usage as possible. Maintenance standards of other assets namely track and wagons should also be upgraded correspondingly.

- **Trains Run per Day:** This is an area where Indian Railways compares very unfavourably with systems elsewhere. Maximum numbers run even in the busiest double line sectors are 50-60 per day (either direction) as against up to 85 to 100 trains either way, which is the international norm. Even in India there are a (very) few sectors where more trains run by adopting advanced signaling and operational practices, but there is little effort so far to replicate this in many other sectors which are saturated. An increase in freight train speeds leading to a reduction in speed differentials will be the best and most economical strategy for expanding the freight haulage capacity of the system.

The RITES study notes that about half of the 822 sections, into which the Railways’ BG network is classified, have crossed saturation levels in terms of capacity utilization. Schemes to add to capacity that are in progress are poorly funded and again adopt on ‘incremental’ approach. The need, instead, is to draw up and implement whole section-wise schemes to secure dramatic improvement in throughput and fund the schemes to early completion.

- **Tare-to-Payload Ratio:** To carry larger volume and weight per wagon, the ‘tare to payload’ ratio needs to be improved and as with the standards of utilization of section capacity, there is much room for improving the

present standards. For example, while the tare-payload ratio of IR's wagon is 1: 2.3, South Africa is working with a ratio of 1: 5 on a smaller gauge. This again involves redesigning of wagons, track standards and fixtures.

- **Terminals and Sidings:** Working of freight terminals and sidings require special attention, considering that nearly 80 per cent of all Railway freight traffic either originates or terminates at sidings. Sidings and terminals also account for detentions to stock which offers scope for significant improvement. The RITES Report identifies the following priorities in this context:

Concentrated thrust towards improving the infrastructure available at major terminals. The objective should be to identify and remove causes for detentions taking place at terminals.

Draw up and implement a programme of renovation of terminals and sidings. At major sidings, an integrated operating system will have to be put in place by which the train engine waits while the rake is unloaded/loaded. RITES Study recommends the systematic dismantling of the exchange yard system, which is the cause of much avoidable detention to stock.

- **Mechanized Handling:** Install mechanized handling arrangements at major freight terminals for ensuring timely release of rakes. In order to facilitate this, the cost-sharing principles applicable to private sidings will probably need review. (In this context, the rules governing permissible detentions at terminals/ sidings also need to be reviewed. As the time taken for loading/unloading is conditioned by the standard of handling and other facilities at each terminal, there is need for decisions in these matters to be decentralized).
- **Haulage Capacity:** Upgrading of haulage capacity available on Railways is a priority; this programme is already under way and needs to be accelerated. By increasing the locomotive holdings and upgrading the capacity of locomotives, as many spheres of operation as possible have to be set up for rakes with dedicated locomotives to operate in closed circuit arrangement. By combining the 'engine on train' concept (and providing either single or twin locos of requisite hauling power) with streamlined terminal operations, wagon and locomotive availability should improve significantly.

As noted in the analysis of on going 'Traffic Facilities' projects, **(Box 4.9)** the areas crucial to marked improvement in asset usage are barely addressed. It is mainly the very large passenger terminals in metros that are being tackled – which is important – and very few freight terminals. Because of thinly spread outlays, even such projects as are initiated will take excessive time to implement and yield benefits. In an investment regime that is regulated by clearly laid priorities, all these items and others of this type would be prioritized after evaluation of cost benefits and funded to the exclusion of other unimportant items, to a time bound programme.

Technology and Modernization

Indian Railways have lagged behind in the matter of new technology and experts are of the view that a gap of nearly 20 years now separates the technology in use in Indian Railways and that of advanced systems **(Box 4.10)**. India has gone in for advanced designs of electric and diesel locomotives (both imported technologies) but the design of the main wagon in use is twenty

An increase in freight train speeds leading to a reduction in speed differentials will be the best and most economical strategy for expanding the freight haulage capacity of the system

years old. It is also generally felt that this design is in need of improvement to make the bogies more track-friendly and reduce the maintenance costs and expenditure on track renewals that are very high at present. Track technology also needs improvement.

Apart from contributing to excessive maintenance expenditure, the gap in technology has cost implications also owing to low average speeds and low

Box 4.9 : Projects for Improvement of Traffic Facilities

In the present structure of the Railway Plan, 'Traffic Facilities' is an important Plan head through which investments critical for improving operating efficiency are routed. Investments in this category, both in quantum and in the qualitative selection of the projects that are taken up, will have a crucial bearing on the efficiencies in regard to rail traffic growth in the emerging competitive economy.

Apart from operational facilities like Terminals, Yards, Maintenance Sheds etc., Doubling and Gauge Conversion works were also included under this Plan head in the earlier Plans. In recent years, selection of projects under Doubling and Gauge Conversions, which now form separate Plan heads, is guided more often by non-operational considerations. This was not the case in the early plans under the composite 'Traffic Facilities' Plan head. At the same time, from the 1980s, there has been sharp decrease in the money allotted to the residual 'Traffic Facilities' head, owing in part also to the policy change that discouraged less than full trainloads.

In the new economic environment, this approach will need review. It is important to increase the investments for improving terminal facilities – both passenger and goods – so as to reduce detention of trains and improve the attention to specific customer needs. Investments are also badly needed to improve average speeds, modernize communications and maintenance practices etc. This change in focus has yet to come about.

Railway Budget (2000-01) contains 68 on-going and new projects of Traffic Facilities, which may be reckoned as major investments (costing over Rs. Five crore each). These may be broken up as:

Works for Operational Purposes	: 34
Passenger Oriented	: 22
Freight Oriented	: 07
Safety Related	: 02
Common – more than one category	: 03
Total - All Categories	: 68

The works for operational purposes that form half the total number and relate to yard re-modeling of major stations, providing crossing stations, automatic block signaling and providing additional running / bypass / loop lines. Passenger oriented projects are chiefly for the extension of the platform length for handling longer main line and suburban trains. The largest schemes in this grouping are for expansion of terminals – important stations like New Delhi, Mumbai (CST) Bangalore and Vadodra figure here. Freight oriented projects which are much smaller in number relate to terminal facilities and goods yard re-modeling or additional loop lines for goods trains. Safety-related projects envisage provision of 'Train Descriptor System' and replacing of signals.

New technologies and initiatives for upgrading throughput over entire sections are barely addressed in this programme. Only three of the projects can be classified as representing significantly upgraded technology. These relate to one project for Centralized Traffic Control (CTC) on the Western Railway and two projects for Automatic Block Signaling.

A depressing feature is the ratio of estimated total cost of projects listed in the programme and the outlay for the current year. The budget outlay (Rs. 227 crore) forms just one sixth of the total estimated cost of all projects listed (Rs. 1,385 crore), indicating the thin distribution of resources and the excessive time that the execution of these projects would involve. Considering the value of individual projects, none of them should spill beyond two financial years for completion.

Source: IR Budget 2000-01 and Inputs from Expert Group Members.

section capacity utilization. Critical areas of technology are under study in the Railway research organization, some of them still in early stages. Broadly, six different areas of technology are covered in on-going work at Railways' R & D organization – the RDSO.

- Related to safety.
- Related to infrastructure.
- Traction and Rolling Stock.
- Related to improved reliability of equipment.

Box 4.10 : New Technology for Railways

Critical appraisal of the technology options available and being developed in core areas like designs of fixed installations and rolling stock, maintenance, inspection and monitoring systems, production technologies and new materials, information and communication technology should be of the highest priority to any modern Railway system. In Indian conditions, Railways have to select technologies that are cost effective, energy efficient, that ensure reliability under operation, enhance productivity and promote safety. New technologies have necessarily to be compatible with the existing system to the maximum extent; where this is not feasible, the period of transition should be of minimal duration and cause the least distress.

There are certain basic parameters of IR that have to be radically changed to meet the emerging challenges. Most notably, these include improving the speeds of trains – especially of goods trains – improving of safety standards, and improved rail-wheel interaction. Among other areas in urgent need of new technology are:

- Tare-to-Payload Ratio: this ratio needs to be improved to carry larger volume and weight per wagon. For example, while the tare-payload ratio of a standard IR wagon in 1:2.3, South Africa is working with a ratio of 1:5 on a smaller gauge.
- Axle loads: in order to improve the efficiency of freight operation, axle loads should be increased from the present 20.30 tonnes to 22.50 tonnes and more.
- Schedule of Dimensions: while the international track structure permits moving dimensions of 4,725 mm (height) and 3,660 mm (width) – the track structure of IR works out to 4,265 mm and 3,200 mm. In order to adopt designs for more spacious coaches and larger wagons, IR should move towards the maximum permissible dimensions in two or three stages - the first stage can aim at 4,470 mm and 3,500 mm.

The extent to which IR is lagging behind in technology may be seen from the following tabulation of technologies already in use in other railway systems and others that are being developed:

Technology Frontiers for Advanced Rail Systems

System	Technology Already in use in Developed Countries	Emerging Horizons of Technology
Freight System	20000t train with 'Locotrol' controls	Inter-modal trains with facilities for quick and efficient adoption for mode conversion.
Communication & Control	CTC, Solid-State Interlocking Systems, Microprocessor-based Train control, Fibre Optics	Satellite based communication system completely eliminating landlines and trains controlled through Microprocessors; Communicating through satellites.
Basic Steel Wheel on Steel Rail	Self Steering Systems	Special types of high speed bogies with wheel sets uncoupled in the rotary sense.
Inspection and Control Systems	Microelectronic based, utilizing computer aids	Online conditions monitoring with Decision Support Systems built in with increased micro electronic-based intelligence.

Excepting for very limited use of Solid State Interlocking Systems and one section on which Centralised Traffic Control is under implementation, IR is yet to adopt any of the advanced technologies already in use internationally.

Source: Report of Planning Group on Technology for Railways, 1986 and Inputs from Expert Group Members.

Concerted plans to develop a high-speed system suited to Indian condition are yet to be taken up. This is a major weak link in any effort to increase railways throughput levels significantly

- Environment-related.
- Related to high-speed operations.

In regard to safety, the items mentioned in the context of the ‘safety-package’ are covered. In Infrastructure, research on wagon and track design to improve the output (through heavier axle-loads) is in preliminary stages. These include lighter wagon design to raise the ‘tare to payload’ ratios. With regard to rolling stock, the emphasis is on imported new designs (diesel and electric locos, and modern coaches) to be taken up for manufacture in India. Reliability related research projects currently cover a few types of signaling and electrical equipment. In High-speed operation, technical gaps in regard to track, bridges, coaches, overhead equipment, telecommunication system, etc. have been identified. Concerted plans to develop a high-speed system suited to Indian condition are yet to be taken up. This is a major weak link in any effort to increase railways throughput levels significantly at minimum cost.

As in many areas of the economy, very little attention has been paid to R&D and technology investments in IR. The Research and Development and Standards Organisation (RDSO) needs to be strengthened considerably. Being one of the largest rail systems in the world, IR must have R&D facilities that can be counted among the best in the world. This would need a different kind of specialist staff and high class facilities.: a great deal of productivity improvement can take place through small changes in operational procedures and through small technical changes in the existing framework. Although we should not hesitate to import technology or equipment according to need, their best utilisation will occur only if appropriate adaptation is done for local conditions and requirements.

Although we should not hesitate to import technology or equipment according to need, their best utilisation will occur only if appropriate adaptation is done for local conditions and requirements

For example, the highest standards of rail speeds now being achieved in Europe and elsewhere are far in excess of what can be achieved in India over the foreseeable future. Here speed enhancement of fastest trains is unlikely to exceed 200 km. Thus much of the research and technology development taking place in those countries may not be relevant for our purposes. The design of appropriate equipment, both locomotives and coaches will need to be adapted for our needs here. Similar is the case for track, signaling and other improvements.

A major new initiative in upgrading R&D facilities and staff is a key requirement for higher productivity in IR.

4.7 Scenarios for Indian Railways 2001-2016

4.71 The Business as Usual Approach

We have used all the current information available from IR to construct three possible investment strategies for IR over the next 15 years. The first two scenarios, “Low Growth” and “Medium Growth” are constructed in a “Business as Usual” framework, whereas the third scenario, “Strategic High Growth” will require substantial organisational restructuring of IR internally and in its relationship with government, including corporatisation.

A major new initiative in upgrading R&D facilities and staff is a key requirement for higher productivity in IR

The Low Growth case assumes no organisational restructuring, whereas the Medium Growth case assumes significantly improved functioning of IR within the current organisational framework, but with higher investment

levels and higher revenue growth.

In a strictly ‘Business as Usual’ scenario, not only will the growth rates be sluggish but the investment programme will also be sub-optimal. On the pattern evident in the last decade, the investments will include a significant un-remunerative component representing thinly spread investments on a number of on-going ‘socially desirable’ schemes (together using up 15 to 25 per cent of all investments – as in Exhibit 4.9). It requires special note that **this component has been taken out of reckoning in all the three scenarios outlined here.** This has been done so as to present the relationship of investments to growth rates on a comparable ‘like by like’ basis.

As is shown in subsequent chapters, even with these optimistic assumptions, neither of these two cases is financially viable without excessive levels of budgetary support which does not seem to be feasible. The only feasible, but difficult scenario, is the strategic High Growth one, which is outlined in the next section.

The following are the parameters adopted for making the ‘Business as Usual’ ‘Low Growth’ and ‘Medium Growth’ investment projections:

- Additional capacity for passenger and freight at the respective rates of growth for the two scenarios
- Providing for all accumulated arrears of replacement
- Latest technology obtaining in the system in regard to rolling stock
- No change in track standards and technology
- Conventional safety – ensuring technologies to be implemented through a special programme

Concentrated investments in the select areas have been the aim rather than an incremental approach applying to all on-going investment areas. Hence the provision for overtaking arrears in replacements and implementing a safety package. Within this framework, the following investment priorities will be followed:

- Renewal of assets (strictly as the replacements fall due)
- Safety works not covered under other categories
- Capacity building projects
- Rolling Stock
- Passenger interface improvement projects
- Research & Development
- Improving human skills

In the Medium Growth scenario, there is increase in proposed outlay only with regard to two items, viz., capacity works and additional rolling stock. In the former, the total additional requirement over 15 years is Rs. 4000 crore. For rolling stock, the needed extra investments are in the region of Rs. 28,000 crore.

Infrastructure Capacity: The investment projections for Capacity works are based on studies made by Railway Board’s ‘Long Range Decision Support System’ (LRDSS) that identifies fund requirement on remunerative doubling, new lines and gauge conversion projects. The fund requirement for capacity works is directly linked with the traffic demand and covers also augmentation of shed capacity and maintenance facilities, capacity augmentation in

The first two scenarios, “Low Growth” and “Medium Growth” are constructed in a “Business as Usual” framework. Neither of these two cases is financially viable without excessive levels of budgetary support which does not seem to be feasible

workshops, new traction sub-stations, machinery and plant etc. Significant increase in number of goods trains is needed to realize the growth projected in the 'medium growth' alternative. This will necessitate an improvement in average goods train speeds, which have registered only marginal improvement over last 50 years. There are four main impediments with regard to average goods train speeds:

- Limitations imposed by permanent way standards
- Standard of maintenance of rolling stock that causes an unacceptable level of break-downs *en route* and consequent delays
- Operating practices that need to be modernised
- Poor reliability of equipment

This issue has been addressed to a limited degree only with regard to the Medium Growth Scenario. The LRDS estimate identifies a fund requirement up to the year 2006-07 of Rs. 6500 crore. Another estimate of fund requirement for capacity generation including passenger and freight terminals is Rs. 2000 crore/annum for the next 10 years. These estimations have been fitted into the two alternative investment projections based on assumed traffic growth.

Additional Rolling Stock: Requirement of rolling stock has been calculated on year-to-year basis, taking into account the total traffic to be moved in NTKMs and PKMs. Improvement in the productivity of the stock has been taken into account while arriving at these figures. The source of productivity is increased through better use of current technology.

Accelerated condemnation of four wheeler and vacuum brake stock would result in higher wagon utilization. Eight per cent overall average improvement in wagon utilization (NTKM/wagon/day) has been taken upto 2005 (3000 NTKM/wagon day by 2005). Thereafter a lower rate of improvement at 3.5 per cent per annum in NTKM/Wagon day has been assumed.

As regards passenger coaches needed for growth projected for Passenger Services, it has been assumed that the productivity of the coaches will remain at the level of 1997-98. Limited improvement has been assumed, since upper class, lower class and EMU coaches are already being used at more than full capacity. Any improvement in productivity will therefore go towards making travel more comfortable than it is today.

Common Items: Brief explanations for the important categories are given in the following paragraphs.

At present, about 70 new Rail line projects are included in the Railway budget, work on which is yet to begin. The total estimated cost of these projects is approximately Rs.23,000 crore. For the investment plan, the outlay on these projects has been limited to Rs.1000 crore in total, needed for completing on going remunerative new line schemes.

As for MTP projects sources of funds from state governments, local authorities and municipal corporations will need to be found for completing current schemes and to take up new MTP Projects. The project in progress in Mumbai is an example of this type of cost -sharing.

Normal and Arrears Replacements: These together account for as much as 62 per cent of the total investments in Low Growth and 49.5 per cent in

At present, about 70 new Rail line projects are included in the Railway budget, work on which is yet to begin. For the investment plan, the outlay on these projects has been limited to Rs.500 crore per annum

the Medium Growth scenarios.

Special Safety Package: These include train radio, track circuiting, train protection and warning devices, block proving with axle counters, upgrading safety standards of level crossings, improvements in fixed infrastructure for examination and maintenance of passenger and freight trains. etc. Total outlay of Rs. 10,000 crore has been considered for implementing this programme. The programme has been drawn up as recommended by Railway Safety Review Committee and is to be executed over five years.

Other Items: The basis for estimation of outlay required on all other common items is listed in Annex 4.1

The main categories of outlay that are proposed in the first two growth options are the same as figuring in IR's on going programme. The differences are only with regard to priorities, volumes of proposed outlay and the exclusion of unproductive investments. In regard to new capacity envisaged in these two options, it is expected that schemes identified through LRDSS studies as of high priority will be taken up so that the investments are fully productive.

Productivity Projections: The financial projections are based on an overall reduction in Staff strength by 20 per cent to be effected over 7 years. This is a critical factor; if reduction is not effected, the financial results will be much worse, and the Medium Growth scenario will also be running deficits through out. The combined effect of the staff reductions together with the growth projections in the average productivity per employee are reflected in the two scenarios presented in **Exhibit 4.16**.

4.72 Risk Factors

The risk factors in the assumed growth rate should also be noted. In the case of passenger traffic, competition from road as well as air services can threaten the projected high growth rate. In the case of long distance, air services can be a serious competitor if IR's performance in terms of journey time is not significantly improved. For medium distances, the competition will be from road services (private motor vehicles as well as efficient luxury bus services) if the standards of railway traffic are not upgraded and the fare structure regulated efficiently.

In the case of freight, adequate supply of rolling stock and the additions to capacity through 'traffic facilities' with matching improvements in operations

Exhibit 4.16 : Projected Staff Productivity

Item (All Units in '000s)	2000-2001	2015-2016	
		Low Growth	Medium Growth
No. of Employees	1,495	1,196	1,196
Traffic Output (Passenger KM)	449,138	639,056	812,757
Traffic Output (Net tonne KM)	317,280	459,516	640,876
Total Traffic Units	766,418	1,098,572	1,453,633
Average Traffic Units per Employee	513	919	1,216

Note: In this Tabulation only the employee strength charged to railway revenues is taken into account. Staff employed in production units, construction organisations and training, research, etc. establishments are excluded.

Source: Expert Group.

will enable the growth rate projected. However, tariffs will be crucial and ‘real’ increases in the same cannot be sustained at all.

Structural Risk: In the preceding sections on Railways’ Plan investment and finances, important structural problems were noted. The high proportion of staff cost was one of these and as mentioned, all the investment and financial projections assume that this problem will be addressed satisfactorily within next seven years. The question regarding other structural problems needs to be considered. As mentioned above, the investment projections exclude outlays for unremunerative projects and expect that priority will be given to eliminate over-due replacements and to invest in capacity adding schemes on the traffic side. The question is whether this discipline can be adopted without making the needed structural changes, namely the annual budget and the relationship of the IR to Government.

As noted earlier, investments of less than remunerative nature took up 25 per cent of Eighth Plan outlay and 15 per cent of the Ninth Plan. In a totally “Business as Usual” framework remunerative investments included in this scenario would be crowded out by the continuing unremunerative investment programmes. If the volume of continued sub-optimal investments is quantified at the level budgeted by IR for 2001-02 (approx. Rs. 1950 crore), the “Business as Usual Medium Growth” investment plan (investments totaling Rs. 161,000 crore over 15 years) would actually generate the “Low Growth” traffic and revenue output. Similarly, projected “Medium Growth” traffic in a fully “Business as Usual” framework, would actually need investment levels similar to those projected in the “Strategic High Growth” scenario in the presence of continued unremunerative investments.

A Business as Usual investment regime will therefore lead to very high deficits and, in the current structure of IR and its relationship with Government, would generate a vicious cycle of pressures –

- (a) to effect upward revision of real fares and freights (i.e., increase higher than needed to neutralize inflation) for which goods traffic could be the preferred target, and
- (b) to curtail investments possibly targeting principally the replacement component.

These options have not been considered in the projections offered here. Upward revision of real freight tariffs will be counter-productive and will certainly lead to diversion of more medium distance traffic share to road. In the case of a commodity like coal (which accounts for 45 per cent of the goods earnings at present), freight increases will make indigenous coal more un-competitive and encourage higher share of imports. Since imports will mainly feed demand closer to the coast (short and medium lead), this will mean more diversion of that traffic to road.

Importance of Upgraded Quality: In order to meet the potential risk to passenger traffic, significant improvements in standards of service will need to be planned. Railways already have a programme of running longer passenger trains of 24/26 coaches; this is a quantitative response to the challenge of increased volumes. However, with the distinct changes in user preferences that are evident, and in order to tap the market in a manner that would yield higher revenues, qualitative improvements need to be targeted. This is an important component of the third Strategic High Growth scenario that is

The investment projections exclude outlays for unremunerative projects. The question is whether this discipline can be adopted without making the needed structural changes, namely the Annual budget and the relationship of the Railways to Government

presented as the recommended option.

4.73 The Strategic High Growth Approach

The two alternative projections of growth rates (low and medium) are the two outer limits of IR's range of growth prospects in the prevailing organizational structure and relationship with government (Business-as-usual), and incremental approach to planning investments. These two growth rates are based on short term and long term trends of past growth of rail traffic. At the same time, the economy has entered a new stage of high economic growth well above what has been achieved in the long term. The Strategic High Growth option is designed to take advantage of these exciting growth prospects of the economy and notching up a correspondingly high rate of railway traffic growth.

The principal strategy for achieving a very high growth lies in aiming at a growth rate of goods traffic that has not been reached in the past. The second part of a plan for Strategic High Growth will be to ensure that such high rates of growth are not at the cost of passenger traffic, especially long distance. The third important requirement will be to make the needed structural changes to make the high simultaneous growth of freight and passenger traffic possible, as outlined in subsequent chapters.

Freight Strategy: Freight is the key profit earner for Railways. The long-term strategy of increasing freight rates regularly – too frequently over the Eighth Plan – to protect railway profitability has been counterproductive, driving freight customers to other modes of transport, or even resulting in structural changes in their industries to reduce transportation costs. There is urgent need for a new viable, long-term strategy to profitably grow the freight business.

This strategy will have three main components:

- Goods transit time, especially for premium segments of freight will need to be reduced significantly, which will mean bringing about planned improvement in average goods train speeds.
- Ensuring that there is no real increase in freight rates which is uncompensated by added value to customer, and that present rate structure is rationalized to remove distortions that have crept in, and
- Special focus to customer needs of commodities that are drifting away from railways.

The freight and passenger components will be addressed through investments on the following lines:

Strategy for Passenger Segment: Emerging competitive pressures in the passenger segment point to the need for flexibility in fixing fares by factors like season, convenience of time of departure/arrival, etc., in addition to factors like class of travel and train speed. Induction of private management for commercial operations of specialized services is an option that needs serious consideration. New management skills are also needed in handling freight customer needs – especially information-related.

Meeting Competition: The Strategic High Growth rates can be achieved only through carefully planned and targeted investments. There is no possibility that this change in approach can be effected within the existing planning

To meet the potential risk to passenger traffic, significant improvements in standards of service will need to be planned

The economy has entered a new stage of high economic growth well above what has been achieved in the long term. The 'very high growth' option is designed to take advantage of these exciting growth prospects

The very high growth rates can be achieved only through carefully planned and targeted investments. There is no possibility that this change in approach can be effected within the existing planning and budget structure

In Strategic High Growth projection, a market-sensitive approach to pricing will have to be developed and for this purpose improved organizational skills will be essential

The Strategic High Growth option is marked by a signal departure from recent investment practices. The new element is an investment package making up a total business plan mainly targeting the needs of the railways users

and budget structure. A totally new approach to planning will require to be adopted starting with a comprehensive Strategic Business Plan. This will be possible only if the present government-railway relationship is modified and clear distinction between policy making and implementation is enforced.

In the medium growth projections, the importance of correct pricing policy by IR was stressed. In Strategic High Growth projection, a qualitative improvement in pricing of freight particularly, will need to be adopted. A market-sensitive approach to pricing will have to be developed and for this purpose improved organizational skills will be essential. The previous chapter provided some idea of the kind of tariff rebalancing that will be required.

Likewise, the large scope for road cum rail movement will require to be exploited. In this case, not only will new commercial skills be needed but also the controlled entry of competition in providing these services will have to be considered.

As compared to the Medium Growth scenario, the additional investments in these projections are on account of additional rolling stock and business plan. The extra rolling stock requirements are kept to the minimum on the expectation that the assets can be put to more intensive use through planned investments in modernising supporting areas.

The Strategic High Growth option is marked by a signal departure from recent investment practices. The new element is an investment package making up a total business plan mainly targeting the needs of the railways users. The five main parts of this business plan are the following:

- **Strategy to improve speed of freight trains:** A significant improvement in freight train speeds will need to be brought about for which it is necessary to eliminate obstacles to fast trains movement. This will include grade separation of all road crossings starting with the most congested sections and eventually covering all busy corridors, upgrading track infrastructure of selected routes.
- **Upgrading rolling stock:** The present wagon design will need to be improved in order to make for a smooth interface between bogie and track and thereby reduce cost of maintenance as well as number of break-downs.
- **Upgrading track:** Track standards will need to be upgraded for the same purpose.
- **Specific commodity related investments:** Certain commodities, particularly types of finished steels, cement movement in bulk, require special types of wagons and handling arrangements. This will need to be planned over selected sections that cater to the commodities mentioned. Similar targeted investments in new rolling stock and handling arrangements can be adopted to increase throughput of designated coal and ore traffic streams. The investments will cover rolling stock, terminals and handling arrangements and also upgrading of track of selected sections for heavier loads. The total investment required is estimated as Rs. 1,400 crore.
- **Improved signaling and communications:** The elimination of road crossings together with the planned introduction of higher capacity locomotives and wagons of improved designs will create conditions for reducing the speed differential between freight and passenger. The

optimum use of the capacity will mean the running of more trains either way in the very busy sections without having to lay new dedicated lines in the 'saturated' sections. For realizing this improvement, large investments will be needed in signaling and communication. Proposed outlay of Rs 4,000 crore is expected to cover busy sections totaling approximately 4,000 KM.

- **Container terminals:** It has been recommended earlier that new operators should be permitted to enter the field for container traffic, which is a very high growth area. To fully exploit the demand and arrange for co-ordinated growth between road and railways, there is a need to set up additional two or three container depots each in the large industrially advanced states, and at least one container depot in all other states. An outlay of Rs 1,200 crore has been provided for this purpose.

All the areas mentioned above (aggregating to additional investments of Rs. 34,000 crore) are suitable for new forms of financing either through fully privately owned undertakings or through joint ventures, or fully government sources. Private investments could be of the following types:

- Financing of rolling stock and leasing of wagons
- Joint ventures between IR and private parties in acquiring latest design passenger coaches and operating high speed passenger trains between select pairs of stations; financing of the related rolling stock requirements, and
- Similar arrangements with respect to freight services in select commodities.
- Financing of freight bypasses on busy stations through BLT model (slight variations of financing of bypasses on BOT terms on roads); this should be a promising area because the traffic levels can be forecast and monitored with reasonable accuracy.
- Financing of container terminals by promoting fully or partly private-owned undertakings that would supplement/ compete with Concor (the Railway-owned Container Corporation).
- Financing of improved communication infrastructure through joint venture arrangements for select section. (Maximum number of trains on the section run daily could be substantially increased by modernized train operations that rely on electronic inter-locking systems, continuous track circuiting and automatic block signals. There is no way a very high rate of freight traffic growth can be achieved except through running more trains on dense-traffic sections by adopting latest technology; the alternative of laying whole new tracks would be prohibitively costly).

The details of the financing options are examined in the separate Chapter 6.

Exhibit 4.17 summarizes the main areas of investment needs in the three options. (See Annexes 4.2, 4.3, 4.4 for detailed statement on all investment scenarios).

Exhibit 4.18 presents the likely investment needs of the two, Business as Usual Low Growth and Medium Growth scenarios in a fully Business as Usual environment, where investments also follow the currently prevailing patterns, including continuing unremunerative investment programme. Exhibit 4.19 summarizes the investment plans in the three scenarios in blocks of five years (**Exhibit 4.19**).

In summary, the basic differences between three investment options are the following:

Maximum number of trains on the section run daily could be substantially increased by modernized train operations that rely on electronic inter-locking systems, continuous track circuiting and automatic block signals

- **Low Growth:** Limitations on resources, both internal and extra budgetary. Therefore investment on additional capacity is kept to the minimum. However, provision made for unavoidable investments in safety, normal replacements and overdue replacements.
- **Medium Growth:** Approach to investments same as in current internal railway planning processes, namely emphasis on rolling stock and incremental improvements to infrastructure. Limitations on funds relaxed

Exhibit 4.17 : Comparison of Investment Shares : Alternative Scenarios 2001-2016

(Amounts in Rs Crore)

Investment Category	Business as Usual				Strategic High Growth	
	Low Growth		Medium Growth		Amount	Per Cent
	Amount	Per Cent	Amount	Per Cent		
A. Infrastructure						
Network Expansion	1,000	0.8	1,000	0.6	1,000	0.5
Railway Electrification	2,000	1.5	2,000	1.3	2,000	1.0
Capacity adding schemes*	16,000	12.4	20,000	12.4	24,000	12.0
Technological Upgradation					30,000	15.0
Sub-Total Infrastructure	19,000	14.7	23,000	14.3	57,000	28.5
B. Other investments						
Additional Rolling stock	12,000	9.3	40,000	24.8	44,630	22.4
Replacements including Arrears	80,000	62.0	80,000	49.7	80,000	40.1
Safety Works	10,000	7.8	10,000	6.2	10,000	5.0
Other items	8,000	6.2	8,000	5.0	8,000	4.0
Sub-Total 'B'	110,000	85.3	138,000	85.7	142,630	71.5
Total	129,000		161,000		199,630	

* Schemes to generate additional capacity including terminals, maintenance facilities.

Source: Expert Group.

Exhibit 4.18 : Investments in Fully Business as Usual Scenarios 2001-2016

(Amounts in Rs Crore)

Investment Category	Business as Usual	
	Low Growth	Medium Growth
A. Infrastructure		
Network Expansion	1,000	1,000
Railway Electrification	2,000	2,000
Capacity adding schemes*	16,000	20,000
Sub-Total Infrastructure	19,000	23,000
B. Other investments		
Additional Rolling stock	12,000	40,000
Replacements including Arrears	80,000	80,000
Safety Works	10,000	10,000
Other items	8,000	8,000
Sub-Total 'B'	110,000	138,000
C. Less than remunerative schemes #	29,250	29,250
Total	158,250	190,250

*Schemes to generate additional capacity including terminals, maintenance facilities.

Investments on New Lines, MTP, Gauge Conversions and un-remunerative Doubling and other projects averaged Rs. 1254 crore per annum over Eighth and Ninth Plans. Railway Budget 2001-02 provides approximately Rs. 1950 crore for such schemes, which is the basis for the estimate here.

Source: Expert Group.

and all unavoidable investments allowed as in low growth.

- **Strategic High Growth:** This involves a break with railways' long term planning approach. Emphasis is shifted to:
 - Improving the infrastructure along with additions to rolling stock.
 - Harnessing technology in a way to improve capacity utilization.
 - Completely modernize the railway system in terms of speed and quality of service over 15 years.
 - Structural Change in IR's organisation and relationship to government.

4.74 Looking Ahead: High Speed Lines

Railway operations are characterized by conflicting demands due to shared right of way for passenger and freight trains. These trains have different speeds and load characteristics, which bring down the utilization of capacity. As of now, Indian Railway trunk routes which comprise of 21 per cent of

Exhibit 4.19 : The Investment Plans in the Three Scenarios in Blocks of Five Years

Capital Outlay Items	First 5 Years	Next 5 Years	Last 5 Years
BUSINESS AS USUAL – LOW GROWTH			
Network Expansions	1000	0	0
Railway Electrification	2000	0	0
Capacity Adding Schemes	5070	5329	5601
Additional Rolling Stock	3802	3996	4200
Replacement Including Arrears	31000	26500	22500
Safety works	10000	0	0
Others	2049	2615	3337
Total	54921	38440	35638
BUSINESS AS USUAL – MEDIUM GROWTH			
Network Expansions	1000	0	0
Railway Electrification	2000	0	0
Additional Rolling Stock	10243	13073	16683
Replacement Including Arrears	31000	26500	22500
Safety works	10000	0	0
Others	2049	2615	3337
Total	61414	48724	50862
STRATEGIC HIGH GROWTH			
Network Expansions	1000	0	0
Railway Electrification	2000	0	0
Capacity Adding Schemes	7606	7995	8401
Technology Ungradation	5339	10835	13827
Additional Rolling Stock	11149	14707	18770
Replacement Including Arrears	31000	26500	22500
Safety works	10000	0	0
Others	2049	2615	3337
Total	70143	62652	66835

Source: Expert Group.

the route length and which carry around 40 per cent of passengers and 60 per cent of freight traffic are saturated. While freight operations are commercially remunerative as compared to passenger services, Railways have over the years, experienced the unenviable position of having to introduce increased number of passenger trains on social compulsions. One of the options to be considered is the segregation of passenger and freight services into separate dedicated tracks, on the very high-density routes. However, as noted earlier in this section, other cost-effective measures of increasing the capacity need to be considered first.

Box 4.11 : High Speed Lines - Global Scene

High Speed Ground (Rail) Transportation (HSGT) started in Japan and France in the 1960s. This revolutionary concept caught on in several European countries in the 1980s. In the last four decades, there has been spectacular technological progress allowing speeds to be raised while at the same time ensuring near total safety and acceptable levels of comfort. Journey times have been halved, and even cut by two-thirds in some sectors. The indisputable success of high-speed rail transportation in these countries is also manifest through customer comfort and high quality of service.

World wide, at present, HSGT operations cover a total distance of 4,900 km; work on another 6,800 km. is in progress or is in planning stages in various countries. China, Korea, Australia and Taiwan are likely entrants to this very exclusive club in the very near future. (See Table)

HSGT Projects, Operational and Planned

Country	Length (KM)			
	Total	Operational	On Works	In Project
WORLD	11,699	4,901	2,209	4,589
EUROPE	6,618	2,726	1,936	1,956
Belgium	221	88	100	33
Denmark	15	15	000	000
Denmark-Sweden	18	000	18	000
France	2,798	1,246	295	1,257
France-UK	52	52	000	000
Germany	1,072	577	495	000
Italy	906	246	297	363
Netherlands	120	000	000	120
Spain	1,216	471	600	145
Sweden	31	31	000	000
Switzerland	57	000	57	000
UK	112	000	74	38
ASIA	4,811	2,175	273	2,363
China	1,300	000	1,300	000
Japan	2,739	2,175	215	349
S. Korea	432	000	58	374
Taiwan	340	000	000	340
OCEANIA	270	000	000	270
Australia	270	000	000	270

High speed rail systems (High Speed Ground Transport – HSGT), although undefined, have by convention assumed qualifying speeds of 200 Kmph and above. These systems can broadly be categorised into three speed ranges, viz. those in the ranges of 200-250 Kmph and 250-350 Kmph and those operating at speeds beyond 350 Kmph; the types of trains presently operating grouped into these categories comprise of :

- (i) 200-250 Kmph Speeds
 - Diesel electric trains (including British HST)
 - Electrified tilt-body trains (including Swedish X2000, Italian Pendolino, Spanish Talgo)
 - Electrified non-tilting trains (including US Metroliner)
- (ii) 250-350 Kmph Speeds
 - Electrified non-tilting trains (including Japanese Shinkansen, French TGV, German ICE)
- (iii) Beyond 350 Kmph Speeds
 - Maglev systems being developed in Japan and Germany for speeds upto 500 Kmph.

Thus, with the spectrum of technologies that are presently available, HSGT could easily serve inter-city corridors in the speed range of 200-500 Kmph.

For the developing countries, scope for upgrading of Railway technology to international levels and opportunities to export railway hardware and software may be reckoned as additional potential benefits.

The setting up of HSGT link between important cities would require resources at levels higher than required for conventional rail facilities. Based on international experience, the cost of HSGT operations could be about Rs.50 crore (1998-99 prices) per km on an average (inclusive of the cost of land and the corresponding requirements of rolling stock for operations).

Internationally such projects are executed as joint ventures through federal, state and city governments/international & bilateral funding/private funding. The Govt. share could be upto 30 per cent of the total costs for the equity portion. The introduction of the concept of classic concession model with the infrastructure provider and train operator would provide for public private partnership. The relevant issues such as the level of fares charged, sharing of fare box collection as access charges, etc. as well as the regulation of the HSGT operations would require a proper institutional mechanism.

Source: High Speed Division, UIC Paris.

Passenger business need not also be unviable for all times to come. The passenger travel market catered to by rail operations consist of suburban/metropolitan segment, long distance as well as short/medium distance inter-city travel. While the advantage of rail is clearly established for long distance budget travelers vis-à-vis road movement, the relatively affluent sections of the population travel by air for long and medium distances. Also, railways face competition from road sector for short distance movement of passengers and to a limited extent in the medium distance ranges from personalized modes of road transport. The positioning of rail services in the market has to take into account these factors. The successful experience of the recent past in the running of fast inter-city trains for passengers such as Shatabdi/Rajdhani Express trains indicates that passengers would pay higher fares for comfortable and fast services which also assure quality and punctuality. Therefore, introduction of high-speed trains between pairs of important cities with commercially profitable fare structure could be considered. This is also consistent with the experience of Japan, Europe and other developed nations in the post war period, when they introduced powerful high speed rail systems capable of speeds in excess of 200 kmph providing mobility to people and which at the same time witnessed profitable operations (**Box 4.11**)

Viewing the global trends on the one hand and the likely challenges for the Indian railway operations in the future years, it would be appropriate to consider introduction of high-speed trains in the country. Indian Railways which is the second largest Railway system in the world already lags behind the developed Railway systems by forty years in this respect.

Introduction of high speed services at 250 to 300 kmph on grade-separated dedicated corridors connecting important city centres or across a string of cities could be an agenda for the future which could not only facilitate in making passenger rail movement commercially profitable, but also induct technological upgradation. Some of the benefits associated with introduction of high speed trains are as under:

- No interference from other transport modes
- Highest safety level – world over no fatalities have been reported
- Savings in travel time
- Separation of fast passenger trains shall permit harmony in slow passenger and freight trains resulting in
 - Increased line capacity
 - Reduced turn round time of freight trains
 - Lower freight rates
- Commercial use of right of way
- Boost to tourism
- Upgradation of IR's technology to international level
- Opportunities to export railway hardware and software

The setting up of HSGT link between important cities would require resources at levels an order of magnitude higher than required for conventional rail facilities. Based on international experience, the cost of HSGT operations

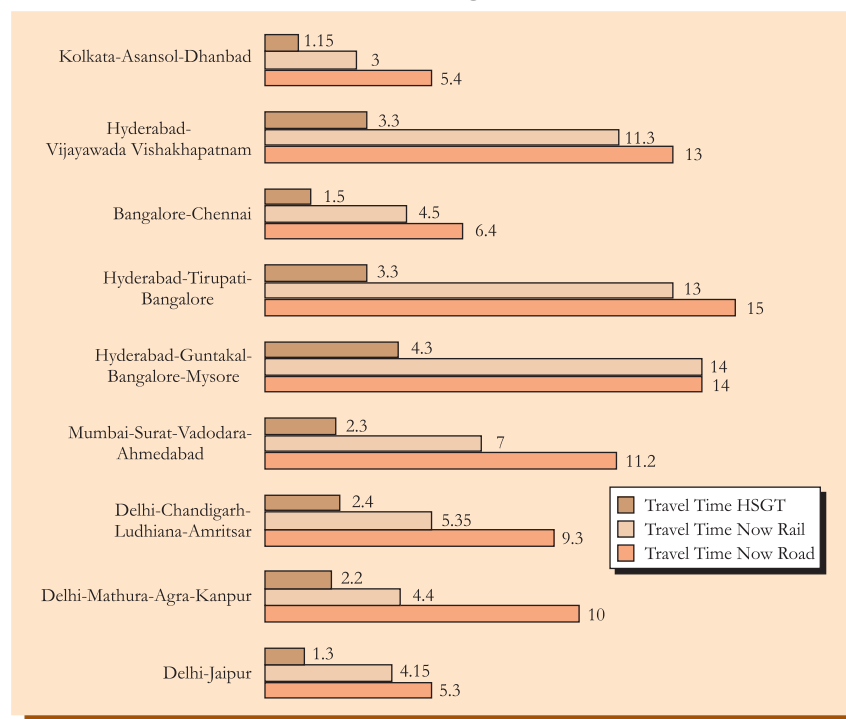
Railway operations are characterized by conflicting demands due to shared right of way for passenger and freight trains. These trains have different speeds and load characteristics, which bring down the utilization of capacity

One of the options to be considered is the segregation of passenger and freight services into separate dedicated tracks, on the very high-density routes. However, other cost-effective measures of increasing the capacity need to be considered first

could be about Rs.50 crore (1998-99 prices) per km on an average (inclusive of the cost of land and the corresponding requirements of rolling stock for operations). A quick preliminary study by RITES for HSGT link between Mumbai and Ahmedabad was presented at an international seminar organized by the Ministry of Railways and UIC, Paris. The study estimated that the project would have an economic rate of return of around 19-20 per cent. As the financial requirements would be large, financing structure of the project was considered through separate investments on infrastructure provision and the train operations as two distinct streams of activity with a concession model assuring returns to both. It was concluded that adequate returns would accrue both to the infrastructure provider and the train operator. It may also be noted that, IR has already committed to go in for high speed trains as proposed by Minister of Railways in the Railway Budget for 2000-2001. **Exhibit 4.20** shows the possible savings in travel time in select corridors.

While looking ahead at the future, it may be worthwhile at some point to consider linking the dense traffic corridors along the main trunk routes connecting important cities of Delhi-Kolkata-Chennai-Mumbai-Delhi through HSGT, though resource availability of the magnitude required does not seem within sight for creating such a high-speed corridor along the Golden Quadrilateral. This issue could be examined once again after 5 years or so, depending on the condition of the economy and the success, or otherwise of IR's own restructuring. To make a beginning, IR could then consider introduction of these trains on some of the routes linking important city centers over the next 15 years or so which could ultimately form part of a modern high speed rail network in the country. Typically, in each sector, the saving in travel time would be a minimum of fifty percent of the present transit time by rail, and in several cases could be as much as two-thirds of it. For example, the Mumbai-Surat-Ahmedabad route can be covered in 2½

Exhibit 4.20 : HSGT - Possible Savings in Travel Time



Source: RITES.

hours as compared to seven hours at present.

HSGT connectivity that will cover the golden quadrilateral (approx. 9500 kms), along with spurs would cost roughly Rs. 475,000 crore (at 2000-2001 prices) financed by debt and equity. Internationally such projects are executed as joint ventures through federal, state and city governments/international & bilateral funding/private funding.

The introduction of the concept of classic concession model with the Infrastructure provider and train operator would provide for public-private partnership. The relevant issues such as the level of fares charged, sharing of fare box collection as access charges, etc. as well as the regulation of the HSGT operations would require a proper Institutional mechanism.

In view of the current state of Indian Railways, the possibility of investing in high speed training appears remote at present. A rational strategy would be to first implement the strategic high growth programme recommended in this report along with the major structural changes proposed in the organisation of IR. Once success has been achieved in implementing this approach, consideration can be given to investing in high speed trains. If the economy achieves a very high rate of growth over the next decade, only then will it become possible to make the kind of investments required for a high speed network.

While looking ahead for the future, it may be worthwhile at some point to consider linking the dense traffic corridors along the main trunk routes connecting important cities through HSGT

4.8 Summary and Conclusions

Changes in Operating Environment

The economic reforms introduced in 1991 are bringing about important changes in the transport sector and the total environment in which railways carry on their operations. The main changes are:

- The virtual end of a captive market in key high-rated bulk commodities.
- Competition from road services because of improvements taking place in the road sector and from air carriers in upper class long distance passenger services, and
- New opportunities for rail-road co-ordination, especially in containerized non-bulk traffic and for a due share in passenger and freight transport from a fast growing economy.

Changes in the IR's operating environment have been accompanied by severe deterioration in its finances, especially after the implementation of Fifth Pay Commission recommendations. The deterioration is to be traced to the serious problem of excess manpower that has not been addressed satisfactorily for long. This has reduced the funds available for railway investments. At the same time, government finances are also under pressure because of which significant increase in government support to the railway plan is not to be expected. In view of the constraint on funds, there is utmost need for setting of correct priorities for all railways investments. However, IR has cited certain factors related to "public expectations" as setting severe limits on the choice that could be exercised regarding investments. As a matter of fact, in recent years, large numbers of new projects, which are not financially justified, have been commenced, at least on paper, and these could involve very large long-term liabilities.

A rational strategy would be to first implement the strategic high growth programme recommended in this report along with the major structural changes. Once success has been achieved in implementing this approach, consideration can be given to investing in high speed trains

Weaknesses of the Process

A review of the current railway planning process shows that public and parliamentary pressures are only some of the factors adversely affecting railway investments and that even in areas where these pressures do not apply, the investments do not follow proper priorities. The results are evident in the declining trends in productivity.

The railway planning process and the whole investment programme suffer from inherent weaknesses and are not suited for the new situation arising from economic reforms. The most important weakness is that railway planning is not guided by a long term business strategy. Railways' planning procedures are attuned to very short-term priorities and are marked by absence of project financing. The Railway budget adds to the problem by generating confusion between policy and implementation, the areas which ought to be clearly demarcated. For adopting proper priorities in investments, a complete review of the investment programming process is therefore necessary.

A successful corporate planning approach to investment programming is only likely to succeed in a corporate commercial frame-work, where investment programmes and their implementation are closely linked to the returns to be achieved and the financing structure. Very clearly, where financing sources are increasingly commercial sources, planning approaches in a governmental framework will not succeed. Long term corporate planning has to be combined with short term flexibility linked to customer requirements and changing market demands. This is simply not possible in the current framework.

Public and parliamentary pressures are only some of the factors adversely affecting railway investments. Even in areas where these pressures do not apply, the investments do not follow proper priorities

Correct investment priorities can be set only on the basis of a fully debated and officially endorsed long term corporate plan. This is a significant gap. IR has also been remiss in not paying adequate attention to the adoption of new technologies; there is a wide technology gap as compared to advanced railway systems.

Recommended Investment Package

In this background, the investment needs of IR have been considered under three alternative growth options of which the first two are envisaged in the "Business-as-usual" scenario and the third as a "Strategic High Growth" scenario. The three alternatives represent a low growth, medium growth and very high growth options. The corresponding financial projections show revenue deficits for several years in the two "Business-as-usual" scenarios, even with a major adjustment in staff strength to reduce surplus manpower.

The deficits are to be traced to the hangover of erroneous policies (including investments) and inadequate provisioning of liabilities in the past. Railways are now faced with burdens of the nature of unprovided stranded costs for which special financing dispensation will be needed. Planned reductions in manpower notwithstanding, prevailing low productivity levels will take several years to improve and reach acceptable standards.

At the same time, there are several risks, which require immediate attention. These include emerging competition for bulk freight and long distance passenger traffic and structural risks connected with IR's relationship with government. Failure to bring about cost efficiencies and to adopt a market-sensitive pricing policy will put paid to all ambitious growth plans.

Link-up with Policy Package

It is significant that in the 'Business-as-usual' scenario, even the medium growth option is not yielding a satisfactory financial picture. This would leave the IR with the following options:

- Continuing the present structural arrangement and depending on an increasing government support and progressively lower share of traffic, or
- Effecting a complete planned change in structure and aim at a very high rate of growth by exploiting railways' natural advantages.

By adopting the second course of option, IR has the opportunity to bypass the long phase of historic decline through which railway systems of several (but not all) developed countries passed.

It is very necessary that the severe constraints of line capacity affecting most of the important traffic carrying routes on the network is effectively tackled. Private participation in certain types of projects – bypasses and terminals for example – is one option to be pursued. At the same time, it is most important that IR set apart a specific proportion of the available investible funds exclusively for line capacity augmentation works.

While replacements continue to be the largest component of the proposed Strategic Investment Plan, its high share of 40 per cent to total (Table 14) includes the element of arrears. The most significant features of this Investment Plan are:

- about 23 per cent of the investment is earmarked to adding to infrastructure capacity, as distinct from rolling stock,
- nearly half of this investment component will be towards inducting new technology to improve and modernize the system, or towards meeting specific consumer needs, and
- the improvements in designs and standards will contribute to savings in the share of replacements and costs of maintenance in the future.

Railways are now faced with burdens of the nature of unprovided stranded costs for which special financing dispensation will be needed. Prevailing low productivity levels will take several years to improve and reach acceptable standards

It is very necessary that IR set apart a specific proportion of the available investible funds exclusively for line capacity augmentation works

Annex 4.1 : Basis for Assessment of Common Items in all Three Investment Scenarios

System expansion – remunerative lines: Two sanctioned schemes: Banspani - Daitari (Rs 600 crores) and Hubli - Ankola (Rs 1000 crores) have been provided.

Normal track renewals: At average rate of Rs. 3275 crore p.a, based on annual accrual pattern.

Rolling stock renewals: Based on year-by-year actual replacements falling due. In regard to coaching stock, 1000 coaches and 100 locomotives have been considered for replacement every year.

Other Asset Replacements: at the rate of Rs. 750 crore p.a, includes complete optic fibre network to replace over-aged Line wires.

OHE: Rs.100 crores per annum are required for replacing the assets including DC to AC conversion.

Railway electrification (throw forward): On-going and approved schemes are to be executed over five years. Question of new routes not considered in these projections.

User amenities: at the rate of Rs.300 crore p.a; includes passenger reservation, freight information system.

Staff amenities: at the rate of Rs.100 crore p.a, lump sum.

Others: Includes R&D, 'Other Specified Works' etc.

Replacement Arrears: Track, Bridges, and Signaling equipment are included in this category, on the basis of data of assets overdue replacement.

Track: 12,260 km of track were in arrears of renewal as on April 1, 1999 requiring Rs. 9,500 crore. Fresh arisings of track renewal are at 3400 km per annum. Need for MG/NG renewals, etc. has been catered for, especially with a reduced tempo of gauge conversion in future years. The annual requirement of fresh accrual track renewals on the above basis will be Rs.3275 crore. Arrears to be wiped out over six years; annual outlay increasing at 5 per cent per annum.

Bridges: Distressed bridges and other bridges requiring rehabilitation/rebuilding as on April 1, 1999 will require Rs.2500 crore. Annual requirements of bridge rehabilitation on account of fresh accrual would be Rs.100 crore. A provision of Rs. 250 crore per annum is provided for replacement of level crossings by road over/under bridges. Arrears to be wiped out over six years.

Signaling: Overaged signaling assets need Rs. 645 crore for their rehabilitation. Fresh arising for renewal is Rs.150 crore per annum. Arrears to be wiped out over six years.

Annex 4.2 : Investments Scenario : Business as Usual Low Growth

(Rs Crore)

Year ending 31st March	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	Total
CAPEX ASSUMPTIONS																
Network Expansions	196	198	200	202	204	0	0	0	0	0	0	0	0	0	0	1,000
Railway Electrification	362	380	399	419	440	0	0	0	0	0	0	0	0	0	0	2,000
Capacity Adding schemes	994	1,004	1,014	1,024	1,034	1,045	1,055	1,066	1,076	1,087	1,098	1,109	1,120	1,131	1,143	16,000
Technological Ungradation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Rolling Stock	745	753	760	768	776	784	791	799	807	815	823	832	840	848	859	12,000
Replacement Including Arrears	5,000	6,500	6,500	6,500	6,500	6,500	5,000	5,000	5,000	5,000	4,500	4,500	4,500	4,500	4,500	80,000
Safety works	1,960	1,980	2,000	2,020	2,040											10,000
Business Plan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
High speed Network	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	371	389	409	429	451	473	497	522	548	575	604	634	666	699	733	8,000
TOTAL	9,628	11,204	11,282	11,362	11,445	8,802	7,343	7,387	7,431	7,477	7,025	7,075	7,126	7,178	7,234	128,999

Source : Expert Group.

Annex 4.3 : Investment Scenario : Business as Usual Medium Growth

(Rs Crore)

Year ending 31st March	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	Total
CAPEX ASSUMPTIONS																
Network Expansions	196	198	200	202	204	0	0	0	0	0	0	0	0	0	0	1,000
Railway Electrification	362	380	399	419	440	0	0	0	0	0	0	0	0	0	0	2,000
Capacity Adding schemes	927	973	1,022	1,073	1,127	1,183	1,242	1,304	1,369	1,438	1,510	1,585	1,664	1,748	1,835	20,000
Technological Upgradation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Rolling Stock	1,854	1,946	2,044	2,146	2,253	2,366	2,484	2,608	2,739	2,876	3,019	3,170	3,329	3,495	3,671	40,000
Replacement Including Arrears	5,000	6,500	6,500	6,500	6,500	6,500	5,000	5,000	5,000	5,000	4,500	4,500	4,500	4,500	4,500	80,000
Safety works	1,960	1,980	2,000	2,020	2,040											10,000
Business Plan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
High speed Network	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	371	389	409	429	451	473	497	522	548	575	604	634	666	699	733	800
TOTAL	10,670	12,366	12,574	12,789	13,015	10,522	9,223	9,434	9,656	9,889	9,633	9,889	10,159	10,442	10,739	161,000

Annex 4.4 : Investment Scenario : Strategic High Growth

(Rs Crore)

Year ending 31st March	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	Total
CAPEX ASSUMPTIONS																
Network Expansions	196	198	200	202	204	0	0	0	0	0	0	0	0	0	0	1,000
Railway Electrification	362	380	399	419	440	0	0	0	0	0	0	0	0	0	0	2,000
Capacity Adding schemes	1,491	1,506	1,521	1,536	1,552	1,567	1,583	1,599	1,615	1,631	1,647	1,663	1,680	1,697	1,714	24,002
Technological Upgradation	0	0	1,694	1,778	1,867	1,961	2,059	2,162	2,270	2,383	2,502	2,627	2,759	2,897	3,042	30,001
Additional Rolling Stock	1,711	2,190	2,299	2,414	2,535	2,662	2,795	2,934	3,081	3,235	3,397	3,567	3,745	3,932	4,129	44,626
Replacement Including Arrears	5,000	6,500	6,500	6,500	6,500	6,500	5,000	5,000	5,000	5,000	4,500	4,500	4,500	4,500	4,500	80,000
Safety works	1,960	1,980	2,000	2,020	2,040											10,000
Business Plan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
High speed Network	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	371	389	409	429	451	473	497	522	548	575	604	634	666	699	734	8,001
TOTAL	11,091	13,143	15,022	15,298	15,589	13,163	11,934	12,217	12,514	12,824	12,650	12,991	13,350	13,725	14,119	199,630



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Policy Imperatives for Reinvention and Growth

Volume 2
The Main Report
PART II

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New Delhi

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5. FINANCING INDIAN RAILWAYS : 2001-2016

5.1 Introduction

“We do not think that the Indian Railways can be modernised, improved and enlarged, so as to give India the service of which it is in crying need at the moment, nor that the railways can yield to the Indian public the financial return which they are entitled to expect from so valuable a property, until the whole financial methods are radically reformed” [Acworth Committee, 1924]

Ever since the first railway line was laid in India between Mumbai and Thane in 1853, the issue of financing of railways has remained a live issue. Different methods of financing have been used at different times along with corresponding changes in the organisational structure of Indian Railways. As outlined in earlier chapters, we have come to the conclusion that, once again, **the time has come to reorganise railway finances along with the corresponding organisational restructuring.**

Over its long history, the financing of Indian Railways has been done in many different ways. Thus a recommendation for significant change in view of the current circumstances will be quite in keeping with the evolution of financing that IR has experienced in its almost 150-year old history.

As shown in chapter 3, at the current stage of India’s development, it is clear that there is a great scope for accelerating the growth of both freight and passenger traffic on Indian Railways. However, as demonstrated in chapter 4, such growth can only come about with significant new strategic investment that would then enable the necessary capacity and service expansion. The kind of growth in investment that is necessary and envisaged will require new modes of financing and management of IR.

In this chapter we present a review of the current state of finances of IR and project three different scenarios of growth and investment. Of the three scenarios only the “Strategic High Growth” scenario is feasible from the financing viewpoint. The financial and organisational restructuring recommended in this report will be essential for the achievement of this scenario. Before turning to the projections, however, it is useful to recount briefly the history of financing of the Indian Railways.

Evolution of the Financial Structure of Indian Railways

The first railways in India were financed through private British capital that was provided guaranteed return by the East India Company or Secretary of State for India. The rate was fixed at 5, 4 ³/₄ and 4 ¹/₂ per cent according to market rates prevailing at the time. Land was also provided free to the railway companies operating under the early forms of Build, Operate and Transfer (BOT) arrangements. The original contracts were for 99 years, at the end of which the railway assets were to be transferred to the Government of India. Of course none of these contracts lasted out the course and the government had to take over most of these railways before the end of the century. It is notable that the system of guaranteed interest was heavily criticised at the time as an example of public extravagance, something that needs to be borne in mind in the context of demands seen today for sovereign counter

There is a great scope for accelerating the growth of both freight and passenger traffic on Indian Railways. Such growth can only come about with significant new strategic investment that would then enable the necessary capacity and service expansion. The kind of growth in investment necessary and envisaged will require new modes of financing and management of IR

The system of guaranteed interest was heavily criticised at the time as an example of public extravagance, something that needs to be borne in mind in the context of demands seen today for sovereign counter guarantees in the power sector

guarantees in the power sector. As quoted in the report of the Railway Capital Restructuring Committee, 1994 (RCRC 1994), according to a witness deposing before a British Parliamentary Committee,

“The guarantee system has not served any purpose whatsoever, which might not have served without it..... the undertakers of the railway, the company, are deprived of one of the great inducements to economy. They know that whatever blunders they make, those blunders will not prevent their getting full current interest on their expenditure”.

Even an official report of the House of Commons in 1872-73 opined that “the early railway lines were built in India as private enterprise at public risk”. The cost per mile of the first 5,872 miles of railways built was about £16,356 compared to £12,000 in Australia and £8,500 in Canada during the same period. Nonetheless, overall, it was perhaps the case that if railways were to be introduced in India at that time, there was no choice available but to use this route of guaranteed returns. Nobody seemed to be willing to invest without such guaranteed returns. After the initial lines were built through this financing arrangement during the 1850s and 1860s, different experiments were attempted throughout the rest of the century. The government invested its own funds and constructed railway lines through its own agencies during the 1870s; and company lines were built side by side with state lines during the 1880s and beyond. During the same period between 1879-1907 the agreements with various guaranteed companies were terminated and the management entrusted to working companies. Many different methods of funding, construction and operation followed until 1925. Private sector companies were encouraged to invest in branch or feeder lines, as were District Boards and Princely States. In many of these cases the government provided supplementary funding, guaranteed interest rates or gave additional guarantees in different ways.

Nonetheless, overall, it was perhaps the case that if railways were to be introduced in India at that time, there was no choice available but to use this route of guaranteed returns. Nobody seemed to be willing to invest without such guaranteed returns

The result of this evolution over almost 70 years was that by 1925, the Indian Railway system consisted of ten different kind of lines:

1. State owned lines worked by private companies
2. State owned and state worked lines
3. Lines owned and worked by private companies
4. Lines owned and worked by private companies guaranteed under new contracts
5. District Board lines (short local lines within a district and paid for by local cesses)
6. Assisted companies' lines (government assistance of various sorts, but no guarantee)
7. Princely State lines, worked by private companies but owned by the Princely States
8. Princely State lines worked by the State Railway Agency, but owned by the Princely States
9. Lines owned and worked by Princely States
10. Lines in French and Portuguese territories

Thus there has been a long history of alternate ownership and working

between the state and private companies. There was a great deal of public ownership with private operation. In fact, before all the railways were nationalised, private companies owned only about 10 per cent but operated about 67 per cent of total route mileage. After the Acworth Committee recommended consolidation and nationalisation in 1924, it took about 20 years to consolidate the widely disparate 42 railway systems into six zones under the umbrella of a government department. The final consolidation took place in 1950 with the addition of the remaining state railways. Organisational and financial restructuring in a system as complex as Indian Railways is always difficult and time consuming.

Railway accounts have evolved through this long history of changes and

Box 5.1 : The Acworth Committee, 1924: Separation of Railway Finances

“ We do not think that the Indian Railways can be modernized, improved and enlarged, so as to give India the service of which it is in crying need at the moment, nor the railways can yield to the Indian public the financial return which they are entitled to expect from so valuable a property, until the whole financial methods are radically reformed and the essence of this reform is contained in two things (1) the complete separation of the Railway Budget from the General Budget of the country, and its reconstruction in a form which frees a great commercial business from the trammels of a system which assumes that the concern goes out of business each 31st March/ and recommences denovo, the 1st April, and (2) the emancipation the railway management from the control of the Finance Department.”

“We assume that in future the Railway Commission will be responsible for its own administration; will itself fix scales of pay and conditions of service of its own staff, and be free to engage and dismiss them as its budget, as approved by the Government of India and the Secretary of State and accepted by the Legislative Assembly, will carry into effect; that, in a word remaining an integral part of the Government machine and subject to control on broad questions of finance on which policy must depend, it will be an independent Administration.”

The above quotations are from the Report of the Acworth Committee, which recommended the separation of Railway Finances from the General finances of government.

The actual separation was effected through a Resolution adopted by the Central Legislative Assembly on the 20th September 1924 recommending to the Governor General in Council that railway finances-

“...shall be separated from general finances of the country and the general revenues shall receive a definite annual contribution from railways which shall be the first charge on the net receipts of railways”.

This Resolution had included specific recommendations regarding the annual contribution to be made, the manner in which interest on capital-at-charge and the loss in working of strategic lines should be dealt with, the sharing of surplus profit, the setting up of a railway reserve and so on. The railway reserve, apart from being utilized for securing payment of the annual contribution to General Revenues, was to be employed for clearing arrears of depreciation, for writing off capital and -

“ to strengthen the financial position of Railways in order that the services rendered to the public may be improved and rates may be reduced.”

What was intended to be achieved through this separation and creation of an in-house accounting machinery was to make the Chief Executives of the railways totally responsible for the administration, running, and financial results of the individual railways in their charge on commercial lines, and to enable the railways to carry out a continuous policy designed to discharge the obligations to make a definite return to General Revenues on the capital provided by the state.

The creation of the post of Financial Commissioner, Railways, followed a few years later by the separation of the entire accounting machinery from the Accountant General, Public Works Department, and providing for only an independent audit by an organization under the then Auditor General of India were intended to complete the process of providing an in-house machinery to exercise financial control from within the railway organization instead of from without. (Acworth Committee's reference to the “emancipation of railway management” was from the control of the Finance Department of the Government of India).

It would seem that over the succeeding decades, while the form of ‘separation’ of the Railway finance has been carefully preserved, even strengthened, the objective of this ‘separation’ has been negated in the practice. In its financial structure, Railways have got more ‘governmentalised’ and the autonomy envisaged by the ‘separation’ willingly surrendered and subordinated to criteria of little relevance to the organization.

Source: Railway Capital Restructuring Committee (1996) and Inputs from Members of the Expert Group.

restructuring of both ownership and management over almost a hundred years from 1853. The post independence period has, in that sense, been remarkable in the stability it has brought to railways ownership, management and financing.

Since 1924, most of the capital required for creation of assets has been funded by the railways themselves through their own internal resources supplemented by the general revenues in the form of perpetual interest bearing loans, known as “budgetary support”. This system has continued till today, with the addition, since the late 1980s, of borrowing through the Indian Railways Financing Corporation (IRFC).

Railway finances have been separated from general finances of the country since 1924, resulting from the recommendation of the Acworth Committee. As reported by the Railway Capital Restructuring Committee (RCRC 1994), quoting the Railway Fare and Freight Committee (RFFC, 1993), the 1924 Legislative Assembly Resolution separating railway finances from general finances had included a “specific recommendation regarding the annual contribution to be made, the manner in which interest on capital-at-charge and how the loss in working of strategic lines should be dealt with, the sharing of surplus profit, the setting up of a railway reserve and so on. The railway reserve, apart from being utilised for securing payment of the annual contribution to general revenues, was to be employed for clearing arrears of depreciation, for writing off capital and to strengthen the financial position of Railways in order that the services reserved to the public may be improved and rates may be reduced. What was intended to be achieved through this separation and creation of an in-house accounting machinery was to make the chief executives of the railways totally responsible for the administration, operation, and financial results of the individual railways in their charge on commercial lines, and to enable the railways to carry out a continuous policy designed to discharge the obligations to make a definite return to General Revenues on the capital provided by the State”.

What was intended to be achieved through separation and creation of an in-house accounting machinery was to make the chief executives of the railways totally responsible for the administration, operation, and financial results of the individual railways in their charge on commercial lines

The working of the Separation Convention for nearly two decades did not yield the desired results and therefore it was subjected to a review in March 1943. The revised arrangements provided for a specified sum being paid to general revenues, abolition of the portions pertaining to contribution and allocation of surplus from April 1943, the utilisation of the surplus on commercial lines to repay any outstanding loans from the Depreciation Fund and, thereafter, the balance being divided on 25 per cent: 75 per cent basis between railway reserve and general revenue, with loss on strategic lines being recovered from general revenue and the allocation for subsequent years being decided on a year to year basis.

All these conventions introduced in 1924 and amended twenty years later were intended to ensure flexibility in the financial administration of the railways as a commercial undertaking. **As noted by the RFFC 1993, neither of these objectives were realised over 25 years of experience after 1924.** Consequently, another review of the convention was done in 1949. The 1949 resolution provided for full control of the Railways over its surplus:

“Railway Finance has also been assured that if the administration of the Railways does bring into existence a surplus, it can have full control over that surplus for the purpose of overtaking heavy arrears of maintenance and improvements. It will also be enabled to find money for expansion in various

directions”.

The RFFC 1993 felt that the arrangements under the 1924 Resolution, and under the 1943 Resolution were not related to any acceptable principle of sound financing applicable either to Railway or General Finance. These unsatisfactory arrangements were reviewed by the First Railway Convention Committee set up after independence in 1949. The recommendations of that Convention implemented on April 1, 1950 have continued to hold, with minor changes in the scope of concessions on dividend, rules of allocation, reserve funds and so on. The basic structure recommended by that Convention has continued so far. Various Railway Convention Committees have been appointed since then, in 1968, 1973, 1980, 1985 and 1989. It is quite remarkable that, in each case, they have been rendered infructuous with the dissolution of the respective Lok Sabhas in 1970, 1977, 1984, 1989, and 1991 before they could make their final recommendations.

The RFFC 1993 reviewed the whole evolution of the system and felt that the original objectives of separating railway finances from general finances have not been achieved. As reported by RCRC 1994 they quoted Lord Curzon’s observations of 1900 that

“The system under which our railways are now financed seems to be a faulty system, and to be fatal to development at the very time when development may be most needed. As long as the system continues, the Finance Department has no alternative..... **But neither the orthodoxy nor the compulsion of immediate facts make me any more in love with a system which reveals our railway policy wholly subordinate to the exigencies of our general financial position”.**

The RFFC 1993 was very critical of the control exercised by both the Finance Ministry and Planning Commission over railway finances, particularly that over the internal resources generated by the IR. Clearly, the original objectives of the 1924 Acworth recommendations have never been realised, and IR does not have complete control over its finances, which in turn crucially affects its ability to function as a commercial organisation. The findings of various parliamentary and official reviews over the financial arrangements of the railways throughout the last 50 year period suggests continuing reservations over the financial system within which IR operates. This unease has been common between parliamentarians, railway officials and outside expert groups.

RCRC 1994 concluded, “For the railways own survival against competition from other modes of transport it is essential that the financial arrangements are appropriate as for a commercial venture. The purpose of any review of the existing financial arrangements should be to facilitate functioning of Indian Railways as a commercial venture with appropriate freedom for raising resources, resorting to direct borrowings, rationalising the capital structure and so on. A review at this juncture is therefore, critical and crucial”.

We concur

Being a ministry of the Government of India (GoI) the IR does not follow accounting standards as prescribed in the Companies Act 1956. One purpose of this chapter is to understand IR’s operation as a going concern and assess viability of IR as a commercial organisation in the long term. This will also help in assessing financial health of IR. To do this we require a comparable

The original objectives of the 1924 Acworth recommendations have never been realised, and IR does not have complete control over its finances, which in turn crucially affects its ability to function as a commercial organisation

To understand IR’s operation as a going concern and assess viability of IR as a commercial organisation in the long term, we require a comparable IR balance sheet, profit and loss account, and capital structure as per the principles laid down by ICAI

IR balance sheet, profit and loss account, and capital structure as per the principles laid down by ICAI. Hence, it is imperative to recast the accounts of the IR and suggest an appropriate capital structure. The objective of capital restructuring is three fold. First, it is to show upfront risk capital sunk in by promoters which helps in determining debt-equity ratio of a going concern. Second, it will help in evaluating the investment required for different scenarios on commercial criteria followed in financial community worldwide. Third, to suggest and to evaluate a financing strategy for Strategic Growth plan outlined in the next chapter.

The standard presentation of IR's financial results made to Parliament and for public information includes a Statement of Revenue Receipts and Expenditure (Profit and Loss account) and a Balance Sheet. But the contents of both these standard commercial documents depart substantially from accepted commercial accounting practice

In the next section we briefly explain IR accounts as they are maintained now. Section 5.3 explains the need to recast accounts. Section 5.4 presents the restructured Railway Balance Sheet (1999-2000) and compares the profitability as being depicted now with that in recast accounts. Assumptions made to arrive at the capital structure and salient features of the structure are also explained in the same section. Using the restructured accounts, Section 5.5 describes three scenarios: (i) Business as Usual – Low Growth, (ii) Business as Usual – Medium Growth and (iii) Strategic High Growth. The assumptions and results of each scenario are explained. This is followed in Section 5.6 by comparison of the three scenarios and how much budgetary support from the government is required in each. Sensitivity analysis of the Strategic High Growth Scenario is given in Section 5.7.

5.2 IR's Financial Structure and Accounts

The standard presentation of IR's financial results made to Parliament and for public information includes a Statement of Revenue Receipts and Expenditure (Profit and Loss account) and a Balance Sheet. But the contents of both these standard commercial documents depart substantially from accepted commercial accounting practice.

Profit and Loss Account

The Profit and Loss account gives the financial data under four main categories as shown in the summary tabulation in **Exhibit 5.1**.

Exhibit 5.1 : Consolidated Profit and Loss Account: 1998-99 and 1999-2000

(Rs Crore)

Main Items	1998-99	1999-00
Gross Traffic Receipts	29,620	32,939
Ordinary Working Expenses (including Payment to Worked Lines)	23,254	25,645
Contribution to Reserve Funds (Depreciation Reserve Fund and Pension Fund)	4,580	5,199
Total Working Expenses	27,835	30,844
Net Traffic Receipts (Operating Profit)	1,785	2,095
Miscellaneous Transactions (Net)	356	641
Net Revenue (Gross Profit)	2,141	2,736
Less		
(a) Dividend and other payments to General Revenues	1,742	1,890
(b) Payment to Deferred Dividend Liability (Excess+)/Shortfall(-) (The excess was appropriated to Development and Capital Funds)	(+) 399	(+) 846

Source: Railways Budget documents.

Brief explanations on the items figuring in the P & L account are as follows:

(a) Gross Traffic Receipts include

- Passenger (sub-divisions of Upper classes and Second class),
- Other Coaching (parcels, luggage, others),
- Goods (earnings – Bulk goods, General merchandise, Other goods and Wharfage & Demurrage less Refunds) and
- Sundry (miscellaneous earnings from catering, advertising on trains, etc.).

The net accretion or reduction to Bills Receivable is shown as ‘Suspense’.

(b) Ordinary Working Expenses: details are given under eleven (ten) separate heads, each corresponding to a “Demand for Grant” obtained by vote of Parliament

- General superintendence,
- Repairs and maintenance (four categories, one each for track, locomotives, carriages & wagons and plant & equipment),
- Operating expenses (separately for rolling stock, expenditure on traffic staff and on fuel) and
- Miscellaneous staff expenses (broken up into two categories – welfare and amenities and provident fund).
- Other Miscellaneous expenses

(c) Contributions to two Reserve Funds: The two funds are operated to meet cost of asset replacements (Depreciation Reserve Fund) and pension payments (Pension Fund).

(d) Miscellaneous transactions: These are shown net of expenses and receipts. The main items on the expenditure side are costs of Railway Board establishment, Research, Design and Standards Organization and the IR training establishments and certain types of small value works charged to revenues. On the receipt side are shown incomes from Railway PSUs, certain dividend ‘drawbacks’ from general revenues on IR investments that are identified as unremunerative, and other miscellaneous items.

(e) Net Revenue: The residual of traffic receipts after meeting working expenses and allocation to the two funds is termed “net traffic receipts” and the sum of this figure and the miscellaneous transactions is called “net revenue”. In a manner of speaking the “net revenue” corresponds to IR’s gross profit.

Limitations of the Profit and Loss: As noted, the expenditure categories grouped under item (b) above conform to the constitutional obligation of central government ministries and departments for regulating expenditure in conformity with Parliament authorisations. But from the point of view of commercial and financial reporting requirements of a service-cum-manufacturing company as normally understood, these heads of account do not provide important information that the enterprise owner, potential investor or stakeholder would seek. For example, the accounts do not provide a clear segregation of costs of staff, the value of opening and closing stocks and consumption of stores and spares. In order to get these details, one has to delve much deeper into the detailed classifications of the “Demands for

The accounts do not provide a clear segregation of costs of staff, the value of opening and closing stocks and consumption of stores and spares

Grants” and a mass of Railway statistical statements that are compiled and published separately every year.

IR also engages in manufacturing operations through its major production units and by virtue of a large number of engineering and repair facilities where substantial production effort is carried out. But there is no adequate disclosure in respect of the in-house manufacturing effort. The P&L Account does not disclose the value of the manufactured goods, the disposal on completion of production or internal capitalization.

The amounts allotted to DRF tend to be fixed in an ad-hoc manner and are not determined by financial principles that would withstand close scrutiny. Also, the reduction in the value of total assets post-depreciation is not shown

Another limitation of the financial and accounting structure concerns the amounts allocated to the Reserve Funds. In regard to depreciation with which one of the two funds (DRF) is identified, it may be briefly noted that the manner of the Fund's operation does not fit into any of the standard depreciation norms laid down in the Company's Act. In fact, long prevailing IR practices concerning the accounting of asset wastage through use and their replacements run counter to all transparent rules of accounting.

Equally serious is that, as noted in the previous chapter, the amounts allotted to DRF tend to be fixed in an ad-hoc manner and are not determined by financial principles that would withstand close scrutiny. Also, the reduction in the value of total assets post-depreciation is not shown. This aspect is considered further in the succeeding discussion on the IR Balance Sheet.

The shortcomings with regard to pensions have also been touched upon in the earlier chapter. The procedure adopted by IR is what is normally termed as “pay as you go”, a system that no commercial enterprise operating in a market environment can sustain for long. For an organization such as IR that currently spends over half of its revenues on staff related expenses, the practice precludes reliable long-term financial projections and prudent financial management itself (See Annex 6.3 Railways Pension Fund in Chapter 6).

This analysis of IR's P&L account may be concluded with a reference to the policies concerning utilization of the gross profit (“net revenue” in IR terminology). This sum is allocated as below:

- For payment of the interest on loan capital to GoI, representing the servicing cost for IR's *capital-at-charge* (termed “dividend” in Railway accounts).
- Anything that remains after payment of ‘dividend’ is transferred to two other Railway funds that are used for IR's plan expenditure.

The larger of these two funds (in terms of scale of annual transactions) is the Capital Fund set up in 1992 with the original objective of financing schemes like gauge conversions, doublings and route electrification which were insufficiently funded by amounts received as ‘Budgetary Support’. In practice, as noted in the preceding chapter, much of this investment has gone to finance projects that are not remunerative. The second fund (termed as the Development Fund) has been in existence since 1946 and caters to relatively minor projects of operating improvements, and certain types of staff and passenger amenities.

The Capital Fund was set up in 1992 with the original objective of financing schemes like gauge conversions, doublings and route electrification which were insufficiently funded by amounts received as ‘Budgetary Support’. In practice, much of this investment has gone to finance projects that are not remunerative

IR does not operate any other ‘reserves’; a ‘Revenue Reserve Fund’ that was extant previously has been discontinued. In fact the allocation of Rs. 594 crore to the Capital Fund in the budget for the year 2000-01 – a significant drop compared to the preceding years – was itself made possible by deferring

‘dividend’ payments to the extent of Rs. 1,500 crore and taking a loan, in addition, from the GOI of Rs. 249 crore.

Balance Sheet

The lack of sufficient financial transparency and proper accounting procedures is even more pronounced in IR’s balance sheet. In the source of funds, IR has a term called ‘loan capital’, which is the *capital-at-charge* loaned in perpetuity by GoI. There is no shareholder’s equity. What IR calls ‘reserves’ consists of current balances in the funds already referred to, viz., Depreciation Reserve Fund, Development Fund, Pension Fund and Railway’s Capital Fund. These heads do not conform to the interpretation of reserves given in part III of Schedule VI of the Companies Act. Moreover, the cumulative investments financed out of the funds – and from revenues and miscellaneous sources – are shown separately on the liabilities side. In this category relating to investments from DRF, only the improvement element of replaced assets is taken, the manner of valuation of which is not at all transparent. In sum, the value of liabilities as reported by IR does not present a true picture of what this term conventionally denotes.

The manner of reporting by IR of its application of funds is not adequate. IR’s estimate of capital stock is not reliable. **IR does not maintain a register of assets.** The balance sheet does not separately show gross block, depreciation and net block. All assets are shown at original costs, and further capital expenditure incurred from year to year is capitalized. The leased assets are not shown separately. Fixed assets are not classified in terms of opening balance and additions/deletions for the year.

It is highly unsatisfactory that the sum of the amounts that are appropriated annually to the Depreciation Reserve Fund are not shown in the balance sheet but only the so called ‘improvement element’ is reported. Because of this, there is no depreciation provision in the application of funds and, hence, no net block. This has two implications. First, on the profit and loss side, IR overstates its profit by under-provisioning for the amounts earmarked for the Depreciation Reserve Fund. Second, and much more serious, IR has grossly over-capitalized itself. The latter has implications for capital restructuring, which is discussed in the next section.

The section of the Companies Act, which deals with declaration of dividend, lays down that no dividend shall be declared until provision is made for depreciation on the fixed assets of the company. IR, being governed by separate provisions, has been paying out dividend to the government on the *capital-at-charge* without observing this requirement. The Railway Fare and Freight Committee (RFFC - 1993) had worked out the arrears of overaged assets on IR as on March 31, 1993 to be nearly Rs. 7900 crore. Assuming that this accumulation had occurred steadily over the preceding 43 years, it is calculated that IR’s total declared surpluses over this period (Rs. 13,795 crore) were grossly over-stated because of insufficient provisioning of depreciation.

This and several other such distortions would need to be corrected for a meaningful appreciation of IR’s financial performance to be attempted.

There are other lacunae on the asset side of the balance sheet. Capital work-in-progress is not shown separately, although this is quite substantial for IR. Inventories are neither properly classified as required by the Companies Act, nor is there any indication of how stocks are valued. There is neither a

The balance sheet does not separately show gross block, depreciation and net block. All assets are shown at original costs, and further capital expenditure incurred from year to year is capitalized. The leased assets are not shown separately

Companies Act lays down that no dividend shall be declared until provision is made for depreciation on the fixed assets of the company. IR, being governed by separate provisions, has been paying out dividend to the government on the capital-at-charge without observing this requirement

proper classification of sundry debtors, nor any provision for bad or doubtful debts. Unlike a company's accounts, debts are not broken up into secured and unsecured assets. The list of deviations goes on. Thus, it is fair to say that IR's accounts do not conform to the disclosure standards that are expected of going concern entities registered under the Companies Act. They are far from Indian GAAP or, for that matter, any canon prescribed by any international accounting body.

Full details of the latest IR Balance Sheet and P&L accounts as presented in the Railways' own documents are reproduced in Appendix 5.1 and 5.2.

5.3 The Need for Recasting Accounts

The methodology used by IR to do its accounts has served well as a government entity so long as government earned sufficient tax revenue to provide for a socially desirable service such as railways, especially to passengers, under a monopolistic transportation market. The accounting procedures were well understood within the organisation but translucent to the outside world. Lenders and investors from whom IR has to raise funds now and in the future require financial statements in line with standard procedures laid down by ICAI.

Railways all over the world have been considered an important element of infrastructure, and governments of the day have played important roles in the organisation of railways. In recent times competitive forces from other modes of transport have diminished their distinctiveness but not their importance as essential modes of transport. If government had enough money, it could continue to run railways in the same way as it has done in the past 50 years i.e. providing grants and subsidised loans from the Consolidated Fund of India. But today, the problem faced by IR is two fold. First, the government itself is in a financial bind. Second, IR needs a large amount of investment urgently to keep going because it has lived on borrowed time in the last decade by under-providing for capital stock. Misallocation of investment in the second half of the 1990s as described in the last chapter is hampering operations, which makes it imperative for IR to source funds from other than government sources. If railways have to attract funds from external sources, accounts need to be in the format that is understood by lenders and investors. Moreover, advantages of a standard set of accounts are that they serve as tools: (a) for monitoring by management, (b) for the owner to ensure that his investment is performing and (c) for outside capital providers to evaluate efficiency of capital. The key for all stakeholders is to provide a time tested mechanism which will allow them to compare IR with other enterprises i.e. the same standards that the rest of the world uses.

Apart from this, other reasons to recast IR's accounts according to the provisions of Indian GAAP are:

- First, the existing system of accounts does not give a true and fair financial picture of IR: one that could be easily understood by a trained chartered accountant or a financial analyst. To give an obvious example: in the absence of depreciation provisions in the balance sheet, nobody can ascertain the net block of IR. Similarly, the data are not presented in a way in which one can ascertain labour productivity or employee cost. Equally, there is no clear separation between revenue and capital,

The methodology used by IR to do its accounts has served well as a government entity so long as government earned sufficient tax revenue to provide for a socially desirable service such as railways under a monopolistic transportation market. The accounting procedures were well understood within the organisation but translucent to outside world, lenders and investors from whom IR has to raise funds now, and in the future

or between top of the line and below the line. These and many other reasons make IR's accounts unintelligible to anyone other than those in the IR and in the ministry.

- Second, for any organisation of the size of IR, there has to be tight financial discipline and targeting. The present accounting system precludes that. For instance, the accounts do not allow managers to set revenue and other operational targets whose returns can then be measured against the corresponding cost of capital. In this system it is difficult to set up cost and profit centres that would then communicate the right incentives down the line.
- Third, it is important for IR and the Railway Board to know how the organisation would fare if its accounts were presented as per the Indian GAAP followed by companies incorporated under the Companies Act.
- **Finally, IR's survival as a provider of transport services to the growing Indian economy depends upon substantial infusion of investments. These cannot be financed out of the organisation's surplus. Moreover, they are far greater than what the fiscally hamstrung GoI can provide as annual additions to 'capital-at-charge' year-after-year in perpetuity.** Hence, it is imperative for IR to source funds in addition to the annual allocations from the central budget. Unfortunately, no outside investor will be willing to commit funds on the

Box 5.2 : Rail Link to Pipavav Port – A New Model of Infrastructure Development

Gujarat Pipavav Port Ltd. (GPPL) is a joint venture port between the State Government through the Gujarat Maritime Board (GMB), private domestic shipping operators and a foreign player – the Port of Singapore Authority. In the current phase, the planned capacity is 12 mmt, a part of the capacity is already operational. A major issue is with respect to the evacuation infrastructure, for which in January 2000, a joint venture memorandum was signed between GPPL and the Indian Railways (IR) to form a Special Purpose Vehicle (SPV) to execute the infrastructure project. This project is pioneering in the sense that an operating segment of IR – the existing metre gauge link – is being 'handed over' to an SPV for upgradation and commercial management.

The project cost of Rs 270 crore involves establishing a 295 km broad gauge link to the port by a 281 km gauge conversion project and a 14 km laying of a new line. The project will be funded with a debt equity ratio of 1:2. The IR, and GPPL and its associates will have 50 per cent equity each. Recent investments made by IR towards upgradation of this route would form its equity contribution. The ownership of assets so created will remain with the SPV. The project is expected to be completed within 18 months. It is reported that the Container Corporation of India (CONCOR), Maersk (an international shipping line) and the Central Warehousing Corporation Ltd. (CWCL) would be associates to GPPL in the new SPV.

The demand risk and the project construction risk are to be borne by the SPV. A traffic guarantee as already offered by the GPPL (1 mmt in the first year, 2 mmt in second year and 3 mmt from the third year onwards) would now be given to the SPV. Revenues will be collected by IR as per IR determined rates. IR will first take a certain percentage of revenues as a charge for operating and maintaining the line, including the hire charges for wagons, locomotives and coaches. The remaining will be apportioned to the SPV as per agreed terms and would form the revenues of the SPV. A lease rental is payable to the IR for the use of the existing assets to be valued at historical cost. Other costs would be interest, marketing and administration, and depreciation.

IR would have the option of running passenger and freight trains other than those to the port. This would be done in consultation with the SPV and a due share of earnings would accrue to the SPV. IR would also be free to provide rail connections with the project line. The SPV would be managed by a board with equal representation from IR and GPPL. The chairman would be from IR while the chief executive would be from GPPL. IR has signed a concession agreement with the SPV which has a detailed terms of agreement.

A major strength of the JV is that the partner is a key stakeholder, and has commercial interests to make the port viable. Issues that would need further attention are whether the JV is sufficiently 'balanced' or one-sided in IR's favour. It is important to clarify the issue of the correct determination of costs of operation and maintenance, especially since it is not subject to market forces. From the perspective of other such ventures, it is crucial that this pioneering model does not fail on account of lack of sufficiently balanced mutual terms.

Source: G. Raghuram, "Regulation and Privatisation: A Comparative Case Study of Gujarat Maritime Board and Jawaharlal Nehru Port Trust", Indian Institute of Management, Ahmedabad 2000.

It is imperative for IR to source funds in addition to the annual allocations from the central budget. Unfortunately, no outside investor will be willing to commit funds on the strength of IR's balance sheet without knowing the expected return on capital. For that, investors will insist on a transparent, readily interpretable set of accounts

strength of IR's balance sheet without knowing the expected return on capital. For that, investors will insist on a transparent, readily interpretable set of accounts. Even to access capital in the medium-term future, when IR has to borrow funds from outside, it must have accounts that lenders can understand.

It is worth emphasising that none of these reasons has anything to do with privatisation. Nor is it being claimed that recasting accounts according to Indian or international GAAP is a prelude to privatisation. The rationale for recasting is quite different. IR operates entirely in the nature of commercial going concern. Therefore, its accounts should reflect that reality in a manner which is readily understandable by the financial and investing community. Recasting is driven by the need for greater financial transparency, for the shareholder to know how efficiently money is being spent, and for being used as a dynamic managerial tool. This indeed has been the objective of various reviews of IR finances since at least 1924. The existing system has been found deficient by all official review committees. Whether IR is privatised or remains perpetually in the hands of GoI is irrelevant to the need for injecting transparency in the way in which financial statements of IR are exhibited.

5.4 The Capital Restructuring Exercise

The Expert Group entrusted the capital restructuring exercise of IR to M/S Rangaraju and Associates, a firm of chartered accountants located in Bangalore. This firm had carried out a similar exercise for the RCRC, 1994 which provided them with the necessary insights for undertaking this complex exercise within a reasonable time.

Considering that IR's financial and accounting structures, with all the limitations noted, have been in practice for several decades, the complexity of undertaking a thoroughgoing restructuring based on the data extracted from the current accounts are obvious. The restructuring exercise had therefore to improvise certain solutions and make a number of assumptions.

Recasting is driven by the need for greater financial transparency, for the shareholder to know how efficiently money is being spent, and for being used as a dynamic managerial tool. Whether IR is privatised or remains perpetually in the hands of GoI is irrelevant to the need for injecting transparency in the way in which financial statements of IR are exhibited

The restructuring of IR's capital required two exercises. First, it was necessary to get a realistic figure for IR's net block, which required getting an estimate of the accumulated depreciation and bringing this on to the books. Second, based on this capital stock, the liability side needed to be split between debt and equity. As railways do not maintain a register of assets it is difficult to arrive at the value of IR's present net block. In the absence of factual data not readily available, the restructuring exercise adopted certain commercial norms. The asset restructuring should be at book value and for this purpose the figures relating to capital liabilities as reported in IR accounts for year ending March 1998 (inclusive of investments financed from IR's Funds) was taken as the starting point. To this, expected accretions to the gross block for the next two years as extracted from the Budget documents have been added. This amount (gross block as on March 31, 2000) works out to be Rs. 63,740 crore (**Exhibit 5.2**).

For determining the cumulative depreciation, the book value of the assets as on April 1, 1951 is taken as the base value. The yearly depreciation has been computed upto the year 1999-2000 using the estimated life of assets as given in RFFC using the straight-line-method of depreciation. The value of assets on account of disposals as provided in the accounts were also taken into account.

Depreciation accumulated over a period of 49 years starting from 1951-52 to 1999-2000 is deducted from the book value to arrive at the written down value as on March 31,2000. The years for which the plan head details are not available (for years earlier to 1979-80), the proportion in which the assets were held as on April 1, 1979 has been adopted and extrapolated accordingly for earlier years.

The accumulated depreciation which represents the diminution in the value of the assets over the said period of 49 years from April 1, 1951 to March 31, 2000 works out to be Rs. 28,353 crore. It may be noted that these values do not represent the replacement value of the assets.

Obsolete/ redundant assets have been written off from the gross block. In the absence of documented data regarding value and extent of obsolete assets for all of IR, extrapolation of available data pertaining to one Railway Zone (Western Railway) and one IR Production Unit (Chittaranjan Locomotive Works) has been done for other zones and production units. The total value of redundant assets has been worked out at Rs. 695 crore.

Gross capital as on 31.3.2000	63,740
Less : Accumulated Depreciation	28,353
Welfare Assets (Written Down Value)	144
Obsolete/redundant Assets (estimated)	695
	29,192
Net Capital	34,548

It should be noted that the capital at charge moves from Rs 27,627 crore as reported in Railways Accounts for 1997-98 to Rs 63,740 crore as on 31.3.2000. After deducting accumulated depreciation amounting to Rs 28,353 crore and certain other adjustments, it stands reduced to Rs 34,548. The capital-at-charge as per the above adjustments is taken as basis for determining the debt and equity structure of IR.

Asset Restructuring

The assets of IR are categorized under five major heads, so as to identify

Exhibit 5.2 : Gross Block Determination

(Rs Crore)

Particulars	Gross Capital as on 31.3.98			Total	Additions		Gross capital as on 31.3.2000
	Capital at charge	DRF + DF	RCF+ Others		1998-99	99-2000	
Infrastructure	18,582	11,634	7,666	37,882	4,318	5,440	47,640
Rolling stock	3,335	1,493	923	5,750	630	530	6,883
> Passenger Traffic							
> Freight Traffic	2,804	1,057	965	4,826	507	675	5,708
Urban Suburban Transport	2,307			2,307	198	300	2,804
Welfare Assets	600			600	49	55	703
Total	27,627	14,814	9,553	51,365*	5,675	6,700	63,740

* Excludes 'Reserve Fund Balances' (See Exhibit 5.4).

Note: This restructuring exercise was taken up in early 2000 and is based on the actuals for 1997-98, revised estimates for 1998-99 and budget estimates for 1999-2000.

Source: Report by Rangaraju and Associates for the Expert Group.

Higher debt-equity structure would lead to higher amortization and hence, would reduce the internal resources available for capital expenditure. Keeping this in mind, in the base year, a conservative debt to equity ratio was chosen while restructuring the accounts

the function of the assets, which would then form the basis for the capital restructuring. To ascertain the useful life of productive and non-productive assets, it is essential that the value of the assets at a cut off date are categorized under the following major heads which then form the basis for capital restructuring :

- Infrastructure (track and equipment including signaling)
- Assets that can be identified with passenger traffic
- Assets that can be identified with freight traffic
- Assets that can be identified with urban and suburban passenger traffic
- Welfare assets

The Debt-Equity Ratio is worked out based on: (i) the ability to repay from revenues from the segment (assessed from relevant observations in the RFFC Report), (ii) the term structure of the debt, and (iii) likely market appetite for IR paper.

The debt-equity ratio for a capital-intensive industry such as railways is between 1.5:1 and 2:1. But, in a capital restructuring exercise the debt-equity structure has to take into account the present financial status, the capability to amortise debts over a reasonable period, the nature of investment and future financial strategy. Higher debt equity structure would lead to higher amortization and hence, would reduce the internal resources available for capital expenditure. Keeping this in mind, in the base year, a conservative debt to equity ratio was chosen while restructuring the accounts. For infrastructure, rolling stock and suburban transport, assets have been equally divided into debt and equity; freight traffic assets have been divided into debt and equity in 1.5:1 proportion (See **Exhibit 5.3**).

A large part of assets in use in IR at present are funded through the lease arrangement with IRFC, a shell company, that was created out of necessity

Exhibit 5.3 : Restructured Debt-Equity Ratio for IR's Assets

Particulars	Net as on March 31, 2000 Rs. Crore	Debt:Equity	Amount Rs. Crore
Infrastructure	30692	1:1	
Debt		50%	15346
Equity		50%	15346
Ordinary		50%	7673
Preference		50%	7673
Rolling Stock			
Passenger Traffic	987	1:1	
Debt		50%	493
Equity		50%	493
Ordinary		50%	247
Preference		50%	247
Freight Traffic	818	1.5:1	
Debt		60%	491
Equity		40%	327
Ordinary		50%	164
Preference		50%	164
Urban Suburban Transport	2051	1:1	
Debt		50%	1026
Equity		50%	1026
Ordinary		50%	513
Preference		50%	513
Total	34548		34548

Source: Report by Rangaraju and Associates for the Expert Group.

because IR constituted as a government department could not borrow on its own from the financial market. Accordingly, the assets and liabilities of IRFC as of March 31, 2000 have been merged with the recast balance sheet of IR. This presented no special problem as IRFC accounts are being maintained in the company account format. (Exhibit 5.4)

A summary of the main assumptions and the salient features of the exercise

Exhibit 5.4 : Restructuring of IR Balance Sheet 1999-2000

PARTICULARS	1997-98	1998-99	1999-00	RESTRUCTURING		1999-00 Restructured	1999-00 IRFC	1999-00 Merged
				Amount	Remarks			
SOURCES OF FUNDS								
SHAREHOLDERS' FUNDS								
a. Share Capital								
> Ordinary Shares of Rs. 10/- each Issued at Par				8596		8596		8596
> Preference Shares of Rs. 10/- each Issued at Par				8596		8596		8596
> 23,20,000 Ordinary Shares of Rs. 100 each Issued at Par							232	
> Capital - At - Charge	27627	29827	32367	(32367)	Transfer to debt and equity			
b. Reserves and Surplus*								
> Capital Reserve : (Unit)								
>> Development Fund	3364	3760	4360	(4360)	} Transfer to debt and equity			
>> Railway Capital Fund	8526	9559	10724	(10724)				
>> Capital Reserve								
> General Reserves : (Unit)								
>> Reserve Fund								
>> Miscellaneous	356	428	473	(473)				
>> Depreciation Reserve Fund	10820	12795	15145	(15145)				
>> Revenue	671	671	671	(671)				
> Reserves Fund Balances :								
>> Development Fund	0	0	0			0		
>> Railway Capital Fund	1200	225	25			26		26
>> Depreciation Reserve Fund	1434	703	3			3		3
>> General Reserve Fund							320	1778
>> Capital Reserve				144	Welfare assets converted to grant	144		144
>> Bond Redemption Reserve							1226	
LOAN FUNDS								
(a) Secured Loans				17356	Net Capital at charge being transferred to loans	17356	11517	28873
(b) Unsecured Loans							444	444
(c) Outside India							1629	1629
TOTAL SOURCES	53999	57969	63770			34721	15368	50089
APPLICATION OF FUNDS								
FIXED ASSETS								
> Gross Block	49466	55141	61821	(695)	Obsolete assets written off	61126	18396	78294
> Less : Depreciation				28353	Depreciation being provided	28353	4470	32823
> Net Block	49466	55141	61821			32773	13926	45471
> Less : Lease Adjustment Reserve							1228	
> Net Value of Assets							12698	45471
Capital Work in Progress								
INVESTMENTS								
(a) In Road Transport Undertakings								
(b) Other Government Undertakings	735	754	774			774	342	1116
(c) Reserve Fund Investment								

Contd... to next page

Exhibit 5.4 : Restructuring of IR Balance Sheet 1999-2000 (Contd...)

PARTICULARS	1997-98	1998-99	1999-00	RESTRUCTURING		1999-00 Restructured	1999-00 IRFC	1999-00 Merged
				Amount	Remarks			
CURRENT ASSETS & LOANS & ADVANCES								
> Current Assets								
(a) Inventories								
Inventory	595	620	692			692		692
W-I-P (w'shop M'fature)	159	166	185			185		185
(b) Sundry Debtors	232	242	269			269		269
(c) Cash and Bank Balances	423	680	626			626	1194	1821
(d) Other Current Assets :								
>> Demand Receivable	97	101	112			112	978	1090
>> Outstanding Traffic Earning	1174	1323	1476			1476		1476
>> Accounts With								
State & Central Government	100	116	130			130		130
Pakistan								
Bangladesh								
Adjustment-defence								
Post and Telegrams								
>> Funds with Central Government	10694	9013	8584			8584		8584
(e) Loans & Advances								
Miscellaneous	409	426	475			475	994	1468
LESS :								
Current Liab. & Provisions								
>> Pension Fund	930	577	267			267		267
>> Accident Compensation, Safety and Passenger Amenities Fund								
>> Railway & Other Provident Fund	4962	5258	5759			5759		5759
>> Passenger Amenities Res. Fund								
>> O/S Dues to Other Departments	1451	1932	2154			2154		2154
>> Advances Received :								
Department Advances	197	206	229			229		229
Central Government								
Port Authorities								
Demands Payable	575	599	667			667	717	1384
>> Deposits With :								
Government Companies								
Miscellaneous Departments	1969	2943	2299			2299		2299
> Provisions							121	121
> Net Current Assets	3799	2074	1173			1173	2328	3502
Miscellaneous expenditure to the extent Not Written Off or Adjusted								
TOTAL	53999	57969	63770			34721	15368	50089

* Reserve Fund Balances (Development Fund, Railway Capital Fund and Depreciation Reserve Fund) appearing under 'Sources of Funds' are not taken in determining the 'Gross Block' (Exhibit 5.2).

Source: Expert Group.

are given below. (Full details of the exercise can be found in "Indian Railways – Capital Restructuring" by Rangaraju and Associates, January 2000).

Assumptions

- The capital-at-charge and other funds have been categorized into debt and equity.
- GoI's contributions have been split into preference and equity share capital.
- GoI's funds spent on welfare schemes have been converted into grants.
- Obsolete/redundant assets have been written off.
- Accumulated depreciation upto March 31, 2000 from the year 1951-52 has been calculated and shown in the balance sheet. The cut-off date for capital restructuring is also taken as March 31, 2000.
- All equity has been equally divided into ordinary and preference capital.

Salient Features

- Restructuring is effected for year 1999-2000 by combining balance sheet of restructured IR and IRFC accounts.
- Asset restructuring has been done at book value and the original value of the assets as on April 1, 1951 is taken as the base value. The depreciation rates correspond to the estimated life of assets as given in the RFFC.
- Assets were classified as productive and non-productive. In the absence of detailed accounts of all the production units, the prevailing position of the Chittaranjan Locomotive works (CLW) is taken as the basis. Similarly, for Zonal Railways the prevailing position of the Western Railway, derived from a detailed exercise, is taken as the basis to determine non-productive/redundant assets.

On the basis of restructured capital stock, depreciation etc., recasting of the IRs balance sheet and P&L account in line with the Indian GAAP was carried out. Exhibit 5.4 and 5.5 show comparison of restructured balance sheet and P&L account of IR with the published financial statements of the railways for the year 1999-2000 respectively. Capital structure of IR in line with the Rangaraju Study as of March 31, 2000 is as follows:

Ordinary Equity	: Rs. 8,596 crore
Preference Capital	: Rs. 8,596 crore
Debt	: Rs. 17,356 crore

This gives approximately (equity + preference capital): debt in the ratio of 1:1. In the combined balance sheet of IR and IRFC, debt increases by Rs. 13,590 crore to Rs. 30,946 crore. In the year 2000-01, it was estimated that debt will increase by another Rs. 1,050 crore to Rs 31,996 crore (**Exhibit 5.5**). The combined balance sheet will have (equity + preference capital): debt in the approximate ratio of 1:2. This makes the combined entity highly leveraged. To ensure debt-equity ratio is in line with the Rangaraju study the following readjustment in capital structure as of March 31, 2001 is proposed.

Ordinary Equity	: Rs. 8,198 crore
Preference capital	: Rs. 16,396 crore
Debt	: Rs. 24,594 crore

Exhibit 5.5 : Restructured Capital Structure of IR and IRFC

	As on March 31, 2000	As on March 31, 2001	Readjustment of Capital Structure as on March 31, 2001
Ordinary Equity	8,596	8,596	8,198
Preference Capital	8,596	8,596	16,396
Debt	30,946	31,936	24,594
(Equity+Preference Capital) : Debt Ratio	≈ 1:2	≈ 1:2	1:1
Equity : Debt Ratio	≈ 1:4	≈ 1:4	1:3

Note: IR has received additions to capital at charge in financial year 2000-01. These have not been allocated to ordinary equity, preference capital and debt as for previous years, because of lack of detailed information on the composition of the added capital, and the calculations needed regarding depreciation accruing. Adjustment has been made only for the addition of debt. This will not make any significant difference to the projections made in this exercise.

Source: Railway Budget documents and Expert Group.

This structure has (equity + preference capital) : debt in the ratio of 1:1 and equity: preference capital: debt in the ratio of 1:2:3. This structure has two advantages. First, gearing of combined entity gets reduced entailing lower debt service burden. Second, railway's liability to government of India – sole owner of IRs – in terms of servicing of debt and preference capital is approximately the same as servicing of capital-at-charge as of March 31, 2000. This will enable the new entity to have substantial internal cash generation which it requires to finance its capital expenditure programme. Exhibit 5.5 captures the restructured capital structure of the merged IR and IRFC organisation.

In the next **Exhibit 5.6**, a comparison is given of profitability as presented in Railway accounts now, and as will be depicted in restructured commercial accounts. This comparison is based on the restructured capital for the year 1999-2000, readjusted to 2000-01 as in Exhibit 5.5.

Exhibit 5.6 : Comparison of Railway Profitability (2000-2001)**(Rs Crore)**

As presented by Railway		In Commercial Practice		Remarks
Particulars	Amount	Amount	Particulars	
Capital Investment	43,198			Total of Capital at Charge (32,500) and Investment from Capital Fund (10,698)
		49,188	Capital Employed	Total of Equity Capital (8,198), Preference Capital (16,396) and Long Term Debt (24,594) in restructured Railway Capital
Gross Traffic Receipts	36,529	35,112	Traffic Earnings	'Sundry Other Income' (1417) included in Railway presentation but shown separately (below) in Commercial format
			Other Income	
		717	Sundry Income	Breakup of 'Sundry Other Income' shown in the Commercial format
		700	From Non-conventional Sources	
		815	Miscellaneous Receipts	This item appears as 'Net Misc. Receipts' in the Railway presentation (see below)
		37,344	Total Income	
Ordinary Working Expense	28,115	25,051	Total Expenses	Lease Charges to IRFC (3064) excluded in the Commercial format, this item is adjusted against 'Interest Charges' on total debt
Appropriation to Funds		12,293	Operating Surplus	Total Income less Total Expenses
Depreciation Reserve Fund	2,441			'Depreciation' as actually 'accrued' taken as deduction from Earnings in the Commercial format (see below)
Pension Fund	4,996	5,314	Pension Outgo	Actual Outgo as budgeted shown in the Commercial format
Net Traffic Receipts	977	6,979	Earnings Before Interest Tax & Depreciation (EBITDA)	Net of Ordinary Working Expenses and appropriation to Funds in Railway presentation; Operating Surplus less Pension Outgo in Commercial format
		4,190	Depreciation	As 'accrued' on restructured capital
Net Miscellaneous Receipts	815			Includes Dividend Rebate; already taken as part of 'Total Income' in Commercial format
		2,789	Earnings Before Interest and Tax (EBIT)	EBITDA less Depreciation
		2,951	Interest & Finance charges	Calculated liability for 2000-01 in restructured accounts
Net Revenue	1,792	(162)	Profit Before Tax (PBT)	Net Traffic Receipts plus Net Miscellaneous Receipts in Railway presentation; EBIT less Interest & Finance charges in Commercial format
		0	Tax	No tax liability for Railway; 'zero' tax assumed in restructured model.
		(162)	Profit After Tax (PAT)	Same as PBT because 'zero' tax assumed.
Total Dividend Payable	2,115			Dividend as accrued in present Railway : Government arrangements
Surplus (Deficit) after paying Dividend	(323)			Loan on dividend account (1500) ignored in this presentation
Ratio of 'Net Revenue' to 'Capital at Charge' and investment from Capital Fund (Percent)	4.1			Ratio to 'Capital Investment' as defined in Railway presentation
		5.7	Return on Capital Employed (Percent)	Ratio of EBIT to 'Capital Employed' in Commercial presentation

Note: Common figures as in Railway Budget Estimate 2000-01.

Source: Railway Budget documents and Expert Group.

5.5 Building IR's Future : Three Growth Scenarios

Now that we have obtained a restructured capital base of IR and have transformed its accounts into a company format, it is possible to simulate different growth scenarios to assess the financial feasibility of different strategies. We have reported the kind of traffic growth that can be seen to be possible in chapter 3. We have also provided three possible investment scenarios in chapter 4. These different revenue and investment projections can now be brought together within the framework of a consistent financial model that can be projected into the future. The model framework allows us to assess the different financing strategies implied by the different scenarios projected. Each investment scenario implies the raising of corresponding resources and their servicing over the time from revenues. We examine the feasibility of three different scenarios.

Among many ways to evaluate viability of an on-going concern, we have chosen a broad definition of 'viability' as used in project financing. The rationale behind that is the immediate investment need of railways that it needs to finance. Hence, **in this report the net present value (NPV) technique is used to evaluate different financial scenarios. The NPV of cashflows before financing of existing liabilities is computed for each scenario.** After deducting the NPV of existing liabilities (which is the book value of liabilities in the base year) the amount, in present value terms, is utilized to finance investments (capital expenditure plus working capital). **The difference between the NPV of cashflows after financing of existing liabilities and the NPV of investment flows is the figure which reflects the first stage of viability or unviability of the business.** A negative figure implies a funding gap which needs to be financed. A non-negative NPV would mean that the business is viable – in the sense that the future cashflows generated by the business can support the existing liabilities and the projected investments. **The advantage in using this approach lies in the fact that the viability is established without any reference to financing. If the NPV analysis indicates viability the financing could be tailor-made to suit the cashflow profile.** Any number of financing strategies can then be used to do the actual financing.

Therefore, in this report, a 'viable' scenario implies that it is workable. The viability is evaluated on the following three ascending stages.

1. Given the assumptions embedded in the simulation, is Net Present Value (NPV) of the enterprise (IR) positive or negative?
2. Is there any liquidity risk for a lender: is cashflow sufficiently strong to meet current liabilities?
3. Will it provide sufficient comfort to government who is giving large amount of subsidies, directly or indirectly, and implicit guarantees on market borrowing?

Choice of the discount rate determines the viability of the NPV method. The discount rate used for the financial model is the weighted average cost of capital for IR in line with our assumptions of cost of capital IR is to pay on government and market borrowings, and of general rate of increase in prices. In building the financial model of IR, it was decided to use nominal prices for future projections but report the results in today's money. All the results have been converted into money of today where the effect of inflation is removed

We have provided three possible investment scenarios. The model framework allows us to assess the different financing strategies implied by the different scenarios projected. Each investment scenario implies the raising of corresponding resources and their servicing over the time from revenues

from nominal forecast numbers. **The rationale behind this working is to give decision-makers a sense of what the IR would cost, and the benefits it would bring over the fifteen-year horizon in today's prices (Appendix 5.3 gives further explanation of this method of working).**

Grid search

In building a model of IR there are three critical parameters – government support, capital expenditure and provision for unfunded liabilities i.e. pensions. For building scenarios some estimates of these parameters were taken, but before arriving at these estimates the Expert Group had extensive discussions – at times energetic ones – on these issues and it is our endeavor to encapsulate these discussions and quantify these in a grid search (**Exhibit 5.7**).

Railways have clearly defined user groups and user charges. But politicisation of setting of user charges and spreading of services has led to delinking of user charges with the cost of providing the services and inefficient investments. During the restructuring process, as railways finances are put back in order it will neither be politically feasible to increase user charges to reflect economic cost immediately, nor would the customers be willing to pay. Moreover, a substantial increase in user charges will lead to substitution of transportation modes which may not be optimal for the economy as a whole. Keeping this in view the Expert Group has proposed a gradual tariff rebalancing exercise (see chapter 3). Keeping such difficulties in mind and central government budget constraints the Expert Group decided that the government should provide a part of financing gap as preference capital at the same cost as the government provides assistance to railways today. The Expert Group decided that 40 per cent of the financing gap would be an appropriate support for the following reasons. First, it would show the commitment of the government to the railways and second, it would help in keeping the debt service under control. The latter is essential if railways are to achieve turn-around from a loss making organisation into a profit-making one.

Government should provide a part of financing gap as preference capital at the same cost as the government provides assistance to railways today. The Expert Group decided that 40 per cent of the financing gap would be an appropriate support

For the other two critical parameters namely, capital expenditure and devolvement of pension liability, a grid search was carried out. For capital expenditure two alternatives were suggested – first, capital expenditure with unremunerative investments and second, without the unremunerative investments. The unremunerative investments include money spent on new lines, gauge conversion, Metropolitan Transport Projects and a proportion of investments on doubling of lines and Railway Electrification. In the latest IR budget (2001-02) nearly Rs 1,950 crore have been provided under these heads. Assuming that investments under these heads will remain at the same level over the model horizon, as much as 23 per cent of total investments under Business as Usual Low Growth scenario (total investments Rs 129,000 crore) and 18 per cent of total investments under Business as Usual Medium Growth scenario (total investments Rs 161,000 crore) could get crowded out by the outlays on unremunerative projects. Under the Strategic High Growth Scenario it is assumed that unremunerative investments, if any, will be provided for from the central or state government budget.

For devolvement of pension liability three alternatives were chosen. These projections of pension liabilities are based on the base year (2000-2001) level of withdrawals from the Railway Pension Fund. The Expert Group has reasons to believe that this figure includes significant element of one-time

arrears payments. Because of several revisions in pension entitlements over the last three years and the added factor of freeze on retirement, owing to raising of retirement age to 60 years, exact quantum of arrears could not be worked out. The Group noted that there was a large gap of Rs. 800 to Rs. 1000 crore in the last two financial years, between current pension liabilities as reported in the IR annual statistics and the amounts actually withdrawn from the Pension Fund. The latter figure is the higher which is indicative of arrears payments rather than recurring pension expenses. The numbers adopted here therefore err on the safe side in estimating likely future liabilities.

Of the three alternatives the first alternative was zero devolvement i.e. the railways continue to meet pension liability as they do now from their internal accrual. A diametrically opposite view to this was that 60 per cent of all pension liability devolves on the government in perpetuity. The reason put forward is that in the next 30-40 years approximately 60 per cent of the pension outgo will be due to unfunded but contingent liability of the present organisation and this is the maximum amount government can be asked to provide for. The third alternative is between these two extremes, and the number chosen is 20 per cent of the pension liability. **Exhibit 5.7** gives NPV values of the model under the different scenarios.

Given the reality of overall fiscal situation of the country, we discarded the scenarios where capital expenditure included unremunerative investments in all the scenarios. Under the Business as Usual Low Growth scenario, the alternative with zero devolvement of pension was taken for further analysis, the reason being that under the Business as Usual case government cannot shy away from this contingent liability. In the Business as Usual Medium Growth case 60 per cent of pension devolvement on government was chosen as this is the only alternative which has positive NPV, implying that the project with generous government support and large cuts in capital expenditure can be viable. In the Strategic High Growth case 20 per cent of pension devolvement on government was taken as this alternative is not too burdensome on the exchequer and yet the model remains viable. (See Exhibit 5A.2 for details of government subsidy).

We examine the three scenarios: (i) Business as Usual - Low Growth, (ii) Business as Usual - Medium Growth, and (iii) Strategic High Growth under plausible assumptions regarding revenue streams, operating costs and capital expenditure. The base year is the year ending 31 March 2001 and the time profile is for fifteen years excluding the base year.

Given the reality of overall fiscal situation of the country, we discarded the scenarios where capital expenditure included unremunerative investments

Exhibit 5.7 : Grid Search for Capital Expenditure and Pension

	NPV of Net Funding Gap in Rs Crore	Business as Usual Low Growth			Business as Usual Medium Growth			Strategic High Growth		
		Devolvement of pension on Government								
		0%	20%	60%	0%	20%	60%	0%	20%	60%
Capex expenditure Assumptions	With unremunerative investments	-90,227	-72,530	-37,136	-74,298	-56,601	-21,207	-	-	-
	Without unremunerative investments	-70,151	-52,494	-17,061	-52,365	-34,668	726	-11,300	5,482	39,047

Source: Expert Group.

5.51 Scenario 1 : Business As Usual Low Growth

The basic premise of the 'Business As Usual - Low Growth' scenario is that IR will not do anything that is different from its current way of doing things. In other words, despite capital restructuring and large reduction in capital expenditure, IR will continue operating in more or less the same way as before.

Assumptions

- Revenue from freight will increase at a constant annual rate of 2.5 per cent after adjusting for inflation, which is more or less in line with the past growth rate. Revenue from passenger traffic will increase at 3 per cent per year. The two other minor revenue heads are other coaching (which is targeted to grow at the historical rate of 3 per cent), and other revenue (at 2.5 per cent). These translate to an overall revenue growth rate of 2.66 per cent per year (at constant prices).
- Staff salaries will increase at 5 per cent real. However, this will affect the wage bill in different ways. For the first three years (2001-02 to 2004-05), attrition is expected at the rate of approximately 2 per cent per year, rising to about 3 per cent in the fourth and fifth years and 4.5 per cent in the sixth and seventh years (See Exhibit 6A.6). Staff cost increases in the first seven years will accordingly be tempered by these staff reductions. Thereafter, fresh intake will exactly equal retirement, and real staff costs will rise by approximately 5 per cent in real terms.
- Reasonably detailed data have been obtained for the existing number of pensioners in the base year (2000-01) and the number by which their ranks will increase over the period. The number rises from 1.1 million in the base year to approximately 1.48 million in 2008-09, and is expected to stabilise thereafter. These estimates multiplied by the average pension benefits give the amounts that have to be annually provided for out of revenues. In future, pension benefits increase at the rate of 2.3 per cent every year in real terms.
- Other operating costs — such as fuel, repairs and maintenance and others — are assumed to grow at the same rate as revenue.
- The railways remain a non-tax paying entity.
- Capital expenditure has been estimated on a year-to-year basis. In this scenario, it has been pegged at amounts that just about cover the basic operating needs, full maintenance, replacement and safety expenses to keep IR in the same state as it is today.
- **The government will continue to infuse preference capital into railways as long as Profit-before-Tax (PBT) is negative.** Debt and future market borrowings are assumed to cost 6 per cent per annum after adjusting for inflation.
- The preference capital from the government will be available at 7 per cent nominal rate and long term rate of inflation is assumed to be 6 per cent; market borrowing will be available at 12 per cent nominal rate of interest.
- **Dividend on the preference capital will be paid by the railways so long it has undistributed profits available on the books.** Preference capital is to be redeemed before paying dividends on ordinary capital.

The basic premise of the 'Business As Usual - Low Growth' scenario is that IR will not do anything that is different from its current way of doing things. In other words, despite capital restructuring and large reduction in capital expenditure, IR will continue operating in more or less the same way as before

Ordinary shares will be eligible for payment of dividends from year-to-year in accordance with Indian GAAP.

- The financing gap is split 40:60 between the issue of preference shares to IR by the Government of India, and market borrowings.

Ordinary equity of a commercial organisation carries a cost. In the model, however, no cost is prescribed. The ordinary equity (i.e. one-sixth of the restructured capital) is available free to IR. But, ordinary share capital, in line with Indian GAAP, is serviced out of residual income after discharging all pre-committed, contractual obligations, including the cost of preference capital. **Therefore, the acid test of whether a scenario is financially feasible or not is to evaluate the net present value of the model’s residual cash flow, discounted at the weighted average real cost of capital. If this residual is positive, then the scenario is financially viable.** Otherwise, it can never attract equity, except from someone with an altruistic predisposition. This is a stricter condition than the definition of viability mentioned earlier.

The Results

It should not come as a surprise that the **Business-as-Usual - Low Growth model is not viable.** Here are the synopsised results:

- Earning before interest and taxes (EBIT) steadily falls from Rs. 1,185 crore in the first year to (-) Rs.144 crore in the tenth year and recovers in the later period.
- Profits after tax (PAT) fall even more precipitously from (-) Rs. 1,994 crore

Exhibit 5.8 : Business as Usual – Low Growth Profits, Rs crore

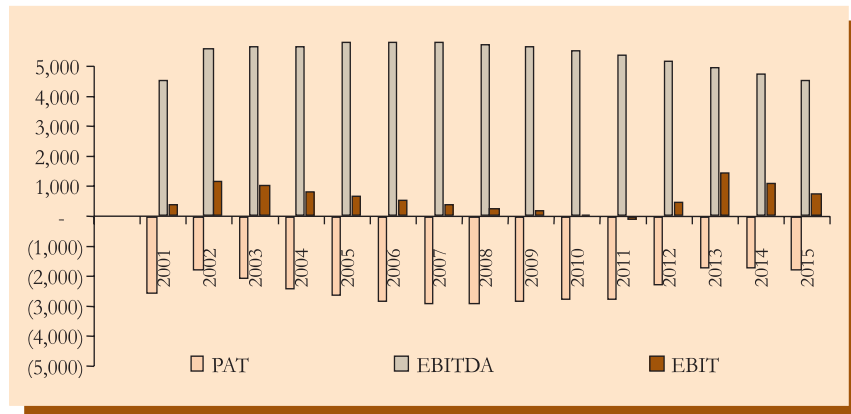
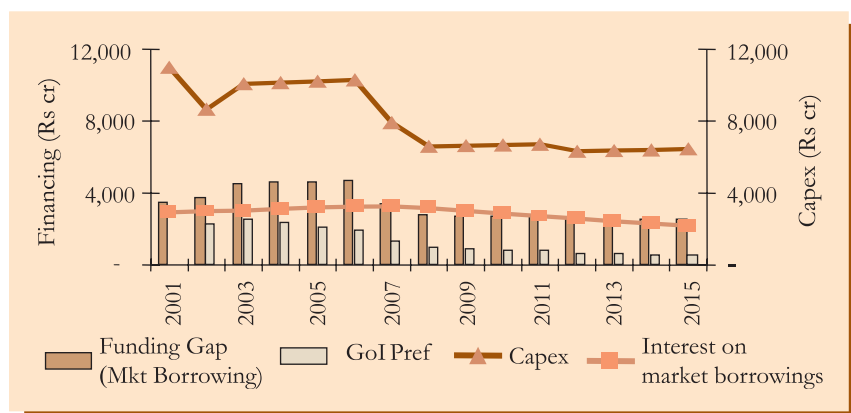


Exhibit 5.9 : Business as Usual – Low Growth Financing and Capex



to (-) Rs.4,980 crore in the terminal year. The bankruptcy looming over IR is best captured by the net present values of the cash flow statement. (Exhibit 5.10).

The Exhibit shows in no uncertain terms that Business-as-Usual - Low Growth is totally unviable. The net present value of IR's cash flow before financing existing or future liabilities is nothing other than gross cash accruals, plus interest and finance charges payable on new preference capital and market borrowing i.e. Rs.60,075 crore. After financing existing liabilities on account of the preference capital and debt of the base year, **the system has only Rs.19,085 crore in NPV terms to finance its capital expenditure programme. The NPV of the capital expenditure stream and its concomitant increment in working capital requirements is Rs.89,236 crore over the fifteen-year period.** Therefore, it falls short by Rs.70,151 crore. The analysis of year-on-year capital expenditure, market borrowings, GOI borrowing and interest on market borrowings shows a rising trend in market borrowings and deterioration in earnings, resulting in **no internal generation of resources for investment which is only 2/3rd of the base year (2000-2001) capital expenditure.** The model suggests that railways are not able to pay dividend on preference capital even once to the government over the next 15 years (as was the case in 2000-01 and expected in 2001-02). This result is being obtained even when unremunerative investments are taken to be zero during the whole period.

Business-as-Usual - Low Growth is totally unviable. The model suggests that railways are not able to pay dividend on preference capital even once to the government over the next 15 years. This result is being obtained even when unremunerative investments are taken to be zero during the whole period

The kink in capital expenditure after 5 years is due to arrears of engineering and safety works that need to be carried out in the first five years. To implement the main recommendations of the Justice Khanna Committee on rail safety, the railways are required to invest Rs. 10,000 crore over the next five years to meet the stipulated safety requirements (Chapter 4 – IR Investments). In simple terms, under the Business as Usual Low Growth scenario, **IR simply cannot generate the kind of internal resources needed to give market rate of returns on additional debt and additional preference capital which are 6 per cent and 1 per cent after adjusting for inflation.** Indeed, as the Exhibit shows, IR is financially non-viable even if it chose to ignore existing base year debt and preference capital. The NPV of the funding gap would still be a huge Rs.29,161 crore. **To put it bluntly, the Business As Usual Low Growth will rapidly drive IR to fatal bankruptcy, and in fifteen years GoI will be saddled with an additional financial liability of over Rs. 61,000 crore.**

Incidentally, no realistic simulation in the neighbourhood of the Business

Exhibit 5.10 : NPV of the Cash Flow of the Business as Usual – Low Growth Scenario

Elements	Rs. crore
NPV of cash flow before financing existing liabilities over fifteen years	60,075
Existing liabilities :	
• NPV of existing preference capital as on base year	16,396
• NPV of existing debt as on base year	24,594
NPV of cash flow after financing existing liabilities	19,085
NPV of investment flows (capital expenditure plus additional working capital requirement)	(-)89,236
NPV of the funding gap	(-)70,151

Source: Expert Group.

As Usual Low Growth scenario can make the IR viable. As an example, a simulation was run with the following assumption over and above the ones made earlier:

- 0.5 percentage point reduction in fuel, repairs and maintenance and other costs;
- 0.5 percent point increase in revenues every year; and
- 60 per cent of the pension expenditure devolving to GoI.

Even with these assumptions the scenario could not have a positive NPV. The NPV of the funding gap is Rs.(-)4,144 crore. The key point to note about this scenario is that it cannot be rendered viable by any government support. **On a pure operational level IR is in a terminal debt trap and can only be preserved by continuing and ever increasing subsidies, year-on-year, from the central government.** As is well known, such subsidies are not available¹.

5.52 Scenario 2: Business As Usual Medium Growth

The basic premises of the Business-as-Usual Medium Growth scenario are that IR will try to recapture the lost market share of the freight, and that passenger business will keep pace with GDP growth (by providing better amenities to passengers). However, the basic organisation of IR continues to be as it is now. The following assumptions were incorporated in the model.

Assumptions

- Real growth in revenue from freight will gradually increase from 3 per cent to 5 per cent in three years time and maintain this growth rate thereafter. Growth in revenue from passenger traffic will increase from 3 per cent to 6 per cent in four years time and keep growing at this rate thereafter. The other coaching revenue grows in line with passenger revenue growth rate. These translate to an overall revenue growth rate expanding from 3 per cent in 2001-02 to 5.3 per cent per year from 2004-05 onwards.²
- Staff salaries and pension have been assumed to be same as the Business As Usual Low Growth case.
- Other operating costs — fuel, repairs and maintenance and others — are assumed to grow at the same rate as real revenue.
- The railways remain a non-tax paying entity.
- Capital expenditure has been estimated on a year-to-year basis. In this scenario, it has been pegged at amounts that cover the basic maintenance, replacement and safety expenses. **Apart from the first five years when the capital expenditure rises by 12 per cent only to meet arrears and safety related investments, in the remaining ten years capital expenditure is pruned on average by 10 per cent of the base year capital expenditure.**
- Capital structure is assumed to be same as in the Business As Usual Low Growth case scenario.

The basic premises of the Business-as-Usual Medium Growth scenario are that IR will try to recapture the lost market share of the freight, and that passenger business will keep pace with GDP growth. However, the basic organisation of IR continues to be as it is now

¹ In France, the government continues to provide large amount of subsidies to SNCF. However, even if GOI considers IR to be run as it is due to high public interest, it cannot do it because of its own deteriorating fiscal situation.

² Mention was made in Chapter 3 of the need for tariff rebalancing both for passenger and for freight. In the financial projections made in this Chapter 5, however, no provision has been made for such rebalancing. This is because while the need for rebalancing is obvious enough, the Expert Group has not gone into the tariff structure in sufficient detail to determine the exact range of the rebalancing exercise.

- Similar to the Business As Usual Low Growth case the financing gap is split 40:60 between issue of fresh preference shares by IR to GOI and market borrowings. Preference capital from the government will be available at 7 per cent nominal rate and market borrowings at 12 per cent, with long term inflation being assumed to be 6 per cent per annum.

The results

The Business As Usual Medium Growth Scenario on its own does not turn out to be viable. The NPV of the funding gap comes to (-)Rs.52,365 crore which is much smaller than the NPV of funding gap of the Low Growth’ case of (-)Rs 70,151 crore, because revenue growth is fairly good after four years and, from then on, it is possible for IR to generate sufficient internal resources needed to give market rate of returns on additional debt and additional preference capital.

We take the viable scenario – one in which 60 per cent of the pension expenditure devolves to GoI (Exhibit 5.7) for analysis. The synopsised results are as follows:

- Earning before interest and taxes (EBIT) steadily rises from Rs.4,718 crore in the first year to Rs.17,211 crore in the fifteenth year.
- Profits after tax (PAT) steadily rises from Rs. 1,543 crore to Rs.15,689 crore in the terminal year.

Exhibit 5.11 : Business as Usual – Medium Growth Financing and

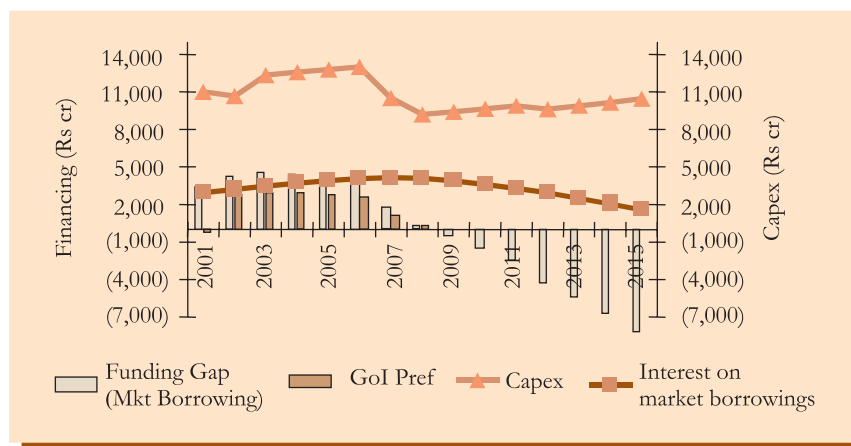
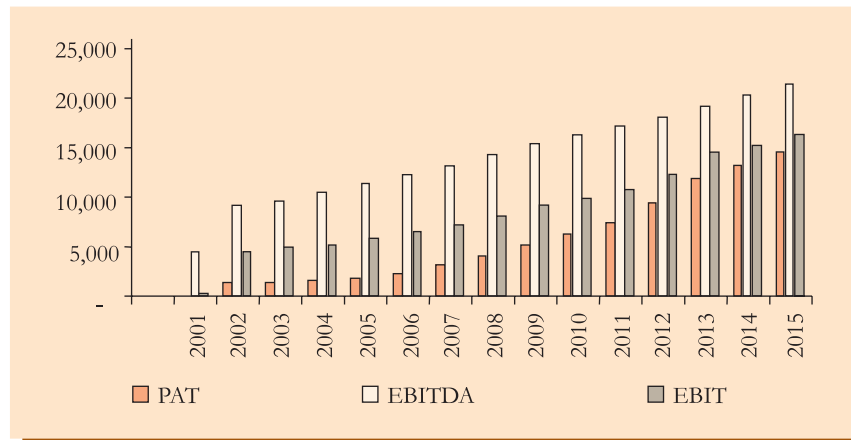


Exhibit 5.12 : Business as Usual – Medium Growth Profits, Rs crore



- The net present values of the cash flow are given in Exhibit 5.13

Exhibit 5.13 shows that this variant of the Medium Growth is just viable. The net present value of IR's cash flow is small, but this scenario suggests that with help from the government during the restructuring phase IRs can be financially viable. As government help is crucial in making the scenario financially viable, it is worth pondering over the opportunity cost of funds provided by the government under two scenarios (**Exhibit 5.14**). From now on we refer to this variant as the Business as Usual Medium Growth scenario.

The Low Growth case scenario entails slightly smaller cost to government but leaves IR in a debt trap. The Medium Growth scenario requires higher government subsidy; IR remains a going concern but on the crutches of perennial devolvement of 60 per cent of pension liability to GoI. The higher revenue flow assumed results from the higher levels of investments assumed for this scenario.

5.53 Scenario 3: Strategic High Growth

The underlying assumption of the Strategic High Growth case is to transform railways into a commercially viable organisation. The Expert Group is of the firm belief that in a growing economy like India, if railways respond to changing needs of its customers as suggested in Chapter 1, not only would it convert itself into a thriving business, it would also be able to pay a large part of its liabilities over the 15 year horizon.

The specific assumptions while carrying out the simulations are:

The Low Growth case scenario entails slightly smaller cost to government but leaves IR in a debt trap. The Medium Growth scenario requires higher government subsidy; IR remains a going concern but on the crutches of perennial devolvement of 60 per cent of pension liability to GoI

Exhibit 5.13 : NPV of the Cash Flow of the Business as Usual Medium Growth Scenario

Elements	Rs. crore
NPV of cash flow before financing existing liabilities	1,63,755
Existing liabilities :	
• NPV of existing preference capital as on base year	16,396
• NPV of existing debt as on base year	24,594
NPV of cash flow after financing existing liabilities	1,22,876
NPV of investment flows (capital expenditure plus additional working capital requirement)	-1,22,040
NPV of the funding gap	726

Source: Expert Group.

Exhibit 5.14 : Comparison of the Business as Usual Low Growth and the Medium Growth Scenarios (in Rs Crore)

	Business as Usual – Low Growth	Business as Usual – Medium Growth
NPV of Preference capital provided	21,371	13,683
NPV of Pension subsidy	0	53,091
NPV of Preference Dividend (due to government (-), net payment to government (+))	-23,434	15,227
NPV of cash-flow to IR from the government	55,384	56,737

Source: Expert Group.

Over the fifteen year period, the Strategic High Growth case on its own is also not viable due to high capital expenditure on safety works and renewal arrears in the first five years, and the expenditure on front-loaded capacity expansion. However, as revenue growth is fairly robust after three years, it is possible for IR to generate internal resources needed to give market rate of returns on additional debt and on additional preference capital

Assumptions

- Real revenue from freight will gradually increase from 3 per cent to 7 per cent in the first five years and then settle down to 6 per cent from 11th year onwards. Revenue from passenger traffic will increase from 7 per cent to 9 per cent in three years time and keep growing at this rate thereafter. The growth in other coaching revenue increases at a moderate rate of 3.5 per cent and stays at 8 per cent rate from third year onwards. These translate to an overall revenue growth rate expanding from 4.2 per cent in 2001-02 to 7.7 per cent in 2005-06, and then tapering off to 7.1 per cent in the last five years.¹
- Staff salaries and pension have been assumed to be same as the Business As Usual Low Growth case.
- Other operating costs — fuel, repairs and maintenance and others — are assumed to grow at the rate of total revenue growth.
- Capital expenditure has been estimated on a year-to-year basis. In this scenario, it has been pegged at amounts that cover the basic maintenance, replacement and safety expenses. A large amount of money is spent on capacity expansion to meet traffic demand and on replacement as utilisation of assets increases substantially compared to the Business As Usual Low Growth case scenario.
- IR continues to be a non-tax paying entity.
- Capital structure is assumed to be the same as in the Business As Usual Low Growth case scenario.
- Similar to the Business As Usual Low Growth case the financing gap is split 40:60 between issue of fresh preference shares by IR to GoI and market borrowings. Cost of the latter is 6 per cent per annum, while the cost of servicing preference capital is pegged at 1 per cent per year after adjusting for inflation.

The results

The NPV of cash flow suggests that, over the fifteen year period, the Strategic High Growth case on its own is also not viable due to high capital expenditure on safety works and renewal arrears in the first five years, and the expenditure on front-loaded capacity expansion which will generate revenue only after a few years. The NPV of the funding gap comes to (-) Rs.22,750 crore which is much smaller than the NPV of funding gap of the Business As Usual Medium Growth of (-) Rs 52,365 crore and the Business as Usual Low Growth case of (-) Rs 70,151 crore. However, as revenue growth is fairly robust after three years, it is possible for IR to generate internal resources needed to give market rate of returns on additional debt and on additional preference capital. In fact, NPV of the funding gap is smaller than that of existing liabilities of preference capital and debt (Rs 40,990 crore).

A realistic simulation in the neighbourhood of the Strategic High Growth case yields a commercially viable scenario. The initial results show marked improvement in operating margin. Effecting further increase in revenue from operational efficiency would be quite difficult, but there is ample room for cutting costs. Cost cutting can be achieved by improving operational efficiency and by using technologically advanced rolling stock. As we are

¹The financial projections here have moderated the average growth rate of revenue over the 15 years period at about 1 percentage point below the feasible levels indicated in chapter 3. This has been done to accommodate the concerns of some Members of the Expert Group related to difficulties that could crop up in actually realising the growth potential projected in full.

assuming that in the first few years railways will have an accelerated program of introduction of technologically superior rolling stock, it should help in improving average speed of passenger as well as freight trains. The new prime-movers and rolling stock being technologically superior will have less down-time, and with regular maintenance can achieve higher operational efficiency. Avoidance of wastage can also reduce cost substantially. As tare-to-weight ratio will improve, fuel consumption per tonne Km should reduce. Hence, a simulation was run with:

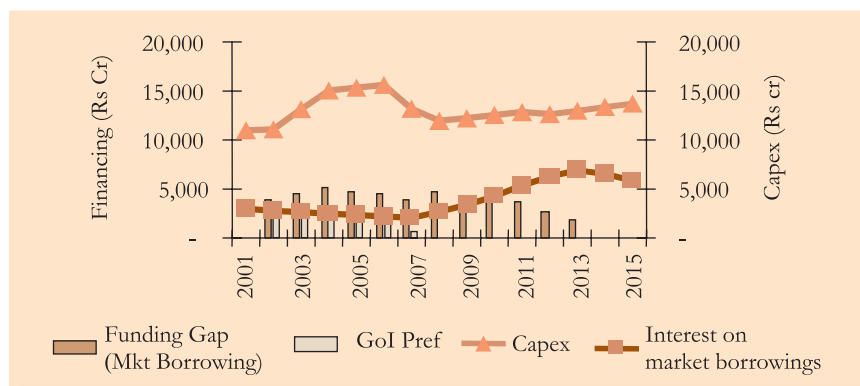
- 0.5 percentage point reduction in fuel, repairs and maintenance and other costs from year 5 to 15 i.e. savings being realised only after introduction of new rolling stock is complete. This implies that there will be one-half percentage point step decrease in these costs as shown in **Exhibit 5.15**. The simulation results given in Appendix 5.9 use these growth numbers.
- 20 per cent of the pension expenditure devolving to GoI. This devolvement of pension liability is much smaller than Business As Usual Medium Growth where it was 60 per cent.
- IR is able to generate revenue from non-conventional sources to the extent of Rs 500 crore every year. The non-conventional sources include revenue

Exhibit 5.15 : Change in Growth Rate of Fuel, Repairs and Maintenance

Year	Revenue growth rate (%)	Fuel expenditure growth rate (%)	Repairs & maintenance expenditure growth rate (%)
2002	4.18	4.18	4.18
2003	5.22	5.22	5.22
2004	6.27	6.27	6.27
2005	6.98	6.98	6.98
2006	7.64	7.64	7.64
2007	7.65	7.15	7.15
2008	7.65	7.15	7.15
2009	7.66	7.16	7.16
2010	7.67	7.17	7.17
2011	7.68	7.18	7.18
2012	7.07	6.57	6.57
2013	7.09	5.59	5.59
2014	7.11	6.61	6.61
2015	7.13	6.63	6.63
2016	7.15	6.65	6.65

Source : Expert Group.

Exhibit 5.16 : Strategic High Growth Scenario Financing & Capital Expenditure



generated from leasing or selling of right of way, land lease, dividend from equity participations from various ventures, advertisements etc.

- IR is also able to generate revenue from divestment to the extent of Rs. 500 crore each for five years, beginning from the second year of the plan. The simulation assumes that divestment proceeds will remain with railways to meet its capital expenditure.

These assumptions make the strategic case viable, giving rise to NPV of Rs 5,482 crore which is the gain for government as it is the sole owner of IR. Here are the synopsised results:

- Earning before interest and taxes (EBIT) steadily rise from Rs. 3,401 crore in the first year to Rs.26,891 crore in the fifteenth year.
- Profits after tax (PAT) rises steadily from Rs. 617 crore in the first year to Rs 23,192 crore in the terminal year.
- The net present values of the cash flow is given in **Exhibit 5.18**.

Exhibit 5.18 shows that Strategic High Growth case is viable even though railways output is expected to be two times that of base case scenario by the end of fifteenth year. The net present value of IR's cash flow fall short of its

Exhibit 5.17 : Strategic High Growth Scenario Profits, Rs crore

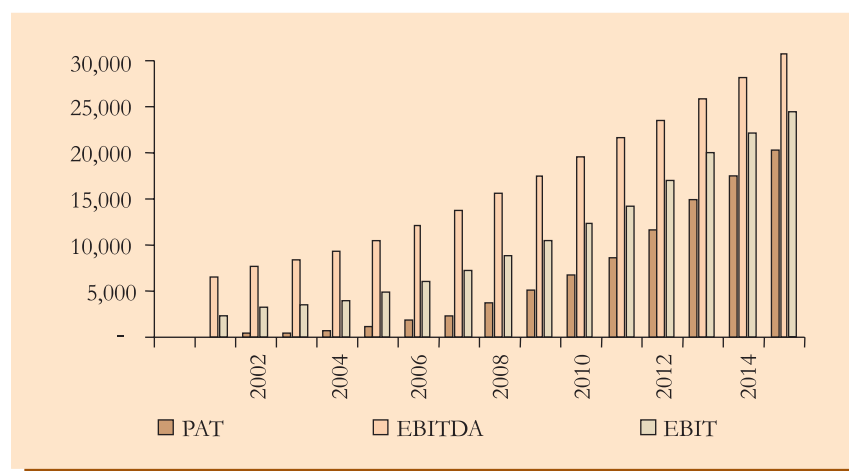


Exhibit 5.18 : NPV of the Cash Flow of the Strategic High Growth Scenario

Elements	Rs. crore
NPV of cash flow before financing existing liabilities	1,94,310
Existing liabilities :	
• NPV of existing preference capital as on base year	16,396
• NPV of existing debt as on base year	24,594
NPV of cash flow after financing existing liabilities	1,53,320
NPV of investment flows (capital expenditure plus additional working capital requirement)	-1,49,978
NPV of divestment proceeds	2,140
NPV of the funding gap	5,482

Source: Expert Group.

investment requirements, but with additional support from the government in the form of preference capital during the first six years of restructuring phase IR can be financially viable. **Railways would be able to service their preference capital, restructured debt including IRFC's debt, and redeem part of the preference capital injected by the government in the first six years and at the time of restructuring of capital structure¹.** We compare NPV of economic cost to government of this case with other two scenarios (See **Exhibit 5.19**).

Quite clearly, the Strategic High Growth scenario is the best option for the government. The Strategic High Growth Scenario entails the NPV of cash-flow from government to railways to be Rs 43,626 crore lower compared to the Business as Usual Medium Growth, and Rs 42,273 crore lower than the Business as Usual Low Growth. Additionally, the strategic case will build a financially strong organisation. **In fact this is the only scenario which meets the third criteria of viability defined earlier.**

There are a few points which should be kept in mind while comparing these figures. First, the Business As Usual Low Growth case will lead IR into a debt trap. Second, under the Business as Usual Medium Growth 60 per cent of pension liability devolves on the GoI compared to the Strategic case where the burden is only 20 per cent. As this sum is given to the railways as grant, it is assumed that railways will continue to receive this grant from the government budgetary resources every year. Third, part of the existing preference capital (Rs 16,396 crore) and existing debt (Rs 24,594 crore) are redeemed by the end of 15 years in the Medium Growth and the High Growth Scenario.

The Strategic High Growth scenario is the best option for the government. The strategic case will build a financially strong organisation

5.6 Comparison of the Three Scenarios : Value Drivers

Exhibit 5.19 : Comparison of NPV of the Cash Flow of the Three Scenarios (in Rs Crore)

	Business As Usual		Strategic High Case
	Low Growth case	Medium Growth	
NPV of Preference capital provided	21,371	13,683	3,428
NPV of Pension subsidy	0	53,091	16,783
NPV of Preference Dividend (due to government (-), net payment to government (+))	-23,434	15,227	18,608
NPV of cash-flow to IR from the government	55,384	56,737	13,111
Perpetual Liabilities	Funding of Interest cost and continuous injection of capital to keep railways going	60 per cent of pension liabilities	20 per cent of pension liabilities

Source: Expert Group.

¹ As NPV is positive it is possible to build an aggressive scenario where all the debt and preference capital gets repaid over the model horizon. We have refrained from this in order to keep debt servicing under control.

Box 5.3 : Funding the Public Transport Network in the Ile-de-France Region: Effective Burden-Sharing Initiatives

In France, as in all countries of the developed world, revenues from fare-paying passengers using urban public transport do not help to cover the operating costs of passenger rail service providers. The compulsions of urban public transport have therefore forced the French government to take measures that would generate the operating costs and further revenues through sharing the burden of financing transport networks between three economic agents – the users, the employers, the local authorities and the national government.

The revenues from fares represent, on average, only about 54 per cent of total network operating costs (with the Ile-de-France region alone contributing as much as 48 per cent). This often does not include other costs such as capital investment and depreciation. The revenues from passenger fares are largely insufficient to fund important activities like the renewal of rolling stock and other equipment. This has meant that users cannot alone bear the entire cost of the urban public transport network, which has led the Paris transport region to initiate viable burden-sharing measures for funding the operating costs of the RATP (the metro rail service provider) and the suburban SNCF Rail network. This move is not just the result of financial expediency but also the desire to improve the effectiveness of the overall industrial and commercial system, of which the road network and public transport form a part. In fact, public transport systems have become the transportation lifelines of urban populations, with governments actively encouraging the use of public transport instead of the private car, in densely populated areas.

The revenues raised from various sources for both the Paris transport region and the rest of France are marked by great variety: receipts from fares, a transportation tax levied on employers, special surtaxes on fuels, income from parking fines and levies by local authorities. The SNCF and the RATP alone accounted for as much as 74.4 per cent of transport tax allocations in the Paris transport region. The Paris Transport Authority (STP) has spread the cost of operations for the two rail companies over four sources, in order to support substantial passenger rail subsidization in the Ile-de-France region. A break-up of burden sharing arrangement is shown below:

- Home-to-work travel – employers pay as much as 50 per cent of the price of weekly, monthly or annual pass purchased by their employees for home to work journeys using the public system.
- Passenger fares contributed the largest share – 39 per cent, followed by 25 per cent and 20 per cent by the operators of the Paris transport region and the State.
- Equipment subsidies for extension projects – passengers do not contribute, State and the STP give loans to fund civil works and equipment of the RATP and SNCFs' network (25 per cent of total capital cost investment).
- Rolling stock for network extensions and renewal are financed entirely by the two operators through respective funds (39.3 per cent of total cost of capital investment; regional loans contribute the maximum funding – 39 per cent).
- Capital subsidies for road carriers – total regional subsidies from various departments finance upto 90 per cent of APTR (the Road Carriers' Association) and ADATRIF (The Association for Development and Improvement of the Ile-de-France Regional Transport System) purchases of new bus fleets.

A unique feature of public transport funding in the Paris transport region remains however, the payment of a transportation tax by employers. This tax takes the form of financing one way journeys (home to work) of staff using public transport. In other words, employers of rail service users in the Paris region make a compulsory payment to the State viz. the equivalent of upto 50 per cent of the costs of one-way travel of their staff. Rail users under the scheme are, in turn, issued travel tickets/passes purchased at subsidised rates.

The basis for calculation of the employers tax is the total salary paid to the employees and the payment is collected by the State from all employers hiring more than nine employees. The contribution of the transport tax is significant: within the Paris transport region, in the early 1990s, employers alone contributed 26 per cent of operation costs of the RATP and the SNCF. This is aimed to serve as a major incentive for effecting the transfer from passenger cars to public transport, and in doing so, the transport tax, it is stated, has contributed the most to the development of urban public transport in France by encouraging persons to shift over to the use of public transport.

Well-defined financial procedures, tailored to the requirements of the public transport authorities and rail service operators has allowed the organizing authority to better plan, design and manage a whole range of policy choices and burden-sharing options. The skill with which the transport authority can manage these arrangements in partnership with other stakeholders, will to a large extent determine the future financial durability of the public transport network in the Paris region.

Source: Amsler, Yves. "Urban Public Transport in France", Land Transport Directorate, Paris (France), December 1997.

The three scenarios that we have developed are based on three different paths of development of IR over the time as reflected by differing growth rates in the various revenue, opex and capex headings. The differing growth rates mean that as we move from the Business As Usual Low Growth scenario to Business as Usual Medium Growth to Strategic High Growth scenario, we are forecasting significant improvement in operational efficiency, capital productivity and labour productivity which, together, mean that IR is able to provide a better service to more customers (freight and passenger) than today. Together with improvement in services and overall cost to government under the three scenarios, we reach the conclusion on the path railways should choose.

5.61 Comparison of NPVs of Different Scenarios

Before making the comparison of operational details, it will be in order to make a comment on NPV of various revenue, cost and subsidy streams. The NPV values in Exhibit 5.19 suggest that Business As Usual Low Growth has the lowest amount of GOI contribution as preference capital and pension grant. It is only Rs 1,430 crore/year on average excluding government subsidy on non-remunerative services and reimbursement of diesel subsidy, compared to net present subsidy of approximately Rs. 1,800 crores per year now. But, as noted earlier, this scenario is unviable because of rising trend of GoI contribution arising from preference capital injected into Railways (Exhibit 5.19). This is also clear from the operating ratio which deteriorates from 93 to 102 over the model horizon (Exhibit – 5.22). Moreover, under this scenario the NPV of unpaid preference dividend is Rs 23,434 crore.

The viable Business As Usual Medium Growth calls for, on average, Rs 4,150 crore of contribution from GoI over the model horizon, but it requires nearly Rs 6,000 crore subsidy after the year 2016. It should be noted that contribution from government includes subsidy through preference capital, pension subsidy, government subsidy on non-remunerative services and return of diesel cess. This scenario assumes that the GoI will continue to bear 60 per cent of the pension liability of the Railways which is Rs 5,996 crore in the year 2016. Operating ratio improves from 84 to 70 in this case (Exhibit 5.23). The operating ratio in the base year is different from the Business as Usual Low Growth scenario because pension outgoes are different.

The Strategic High Growth case requires, on average, only Rs 1,827 crore/year contribution from the government. No preference capital contribution

As we move from the Business As Usual Low Growth scenario to Business as Usual Medium Growth to Strategic High Growth scenario, we are forecasting significant improvement in operational efficiency, capital productivity and labour productivity which, together, mean that IR is able to provide a better service to more customers than today

Exhibit 5.20 : Operating Expenses

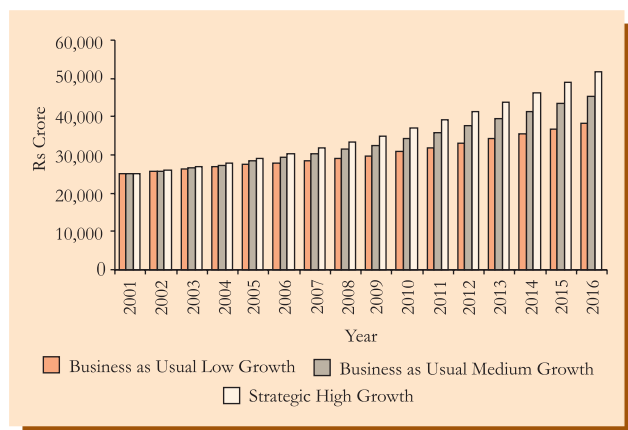
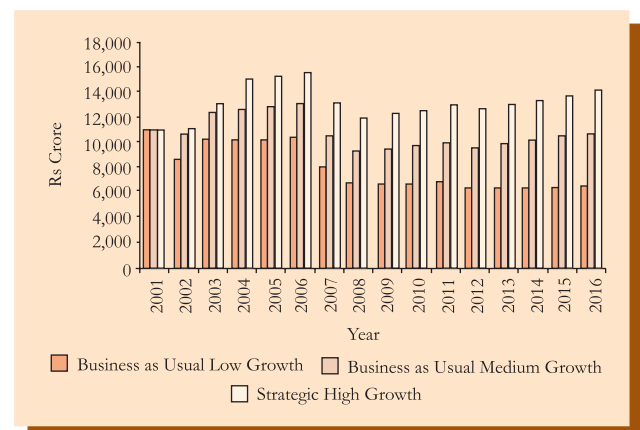


Exhibit 5.21 : Capital Expenditure



after the year 2007, and only Rs 1,902 crore continued devolvement of pension liability on GoI after 2016 are the hallmarks of this scenario. But higher revenue growth assumption assumes that railways, after the restructuring process becomes a lean and profitable venture and run on commercial principles. Operating ratio improves substantially from 87 to 68 in this case.

5.62 Comparison of Operating and Capital Expenditure

The restructuring of railways envisages a large sum of money is to be spent over a long period of time on capacity building to meet growing transportation demand and it is hoped that, gradually, railways will achieve operational efficiency comparable to any world class railways.

Operating expenses of the strategic high growth scenario increase faster as variable cost increases in proportion to volume of business (**Exhibit 5.20**). It should be noted that capital expenditure of the Strategic High Growth scenario is substantially more than the Low Growth and the Medium Growth scenario (**Exhibit 5.21**). It is not important that more money is being spent on capital expenditure, but whether the money spent is giving rise to higher productivity. Operating ratios of the three-scenarios show that under the Business as Usual case the operating ratio deteriorates quite rapidly from 93 to 102, which implies that railways spend more than one rupee to earn one rupee. Though it is not explicitly modelled, deterioration in operating ratio is indicative that capital expenditure under the Low Growth scenario is nothing but fire-fighting on the operational front on a day-to-day basis. Railways under this scenario slides down day-by-day and becomes more inefficient as years pass by.

Under the Medium Growth scenario there is good improvement in

Exhibit 5.22 : Operating Ratio of Railways

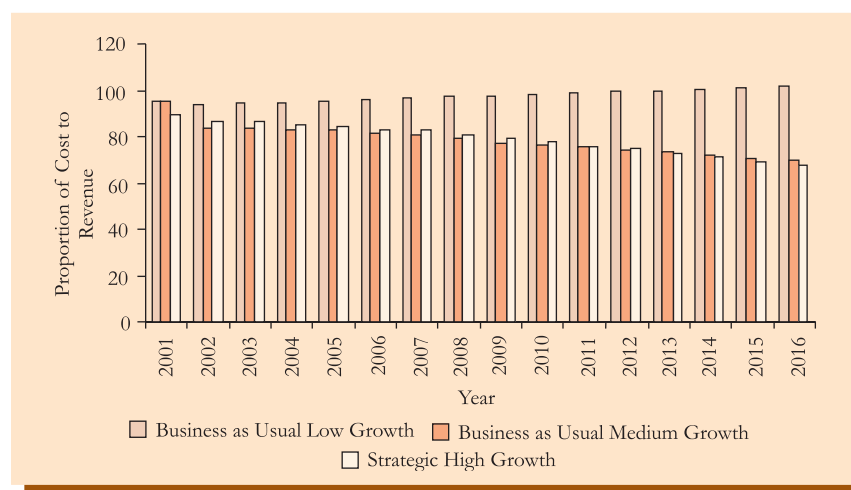


Exhibit 5.23 : Operating Ratio (Opex*/Earnings)

	Business as Usual – Low Growth	Viable Business as Usual – Medium Growth	Viable Strategic High Growth Case
Operating Ratio	93 - 102	84 - 70	87 - 68

* - Opex includes pension outgo as worked out in the model.

Source: Expert Group.

5.63 Labour productivity

What drives the three different scenarios is change in labour productivity. Business As Usual Low Growth gives rise to increase in labour productivity from 4.6 per cent to 7.6 per cent as a result of rationalisation of labour force, and it settles down to less than 2.5 per cent from the year 2009 onwards. In the viable Business as Usual Medium Growth labour productivity shows the same trend but it rises from 5 per cent to 10 per cent and then settles down to a little less than 5 per cent. In the Strategic High Growth case, labour productivity rises from 6 per cent to 13 per cent and then settles down to a little less than 7 per cent (**Exhibit 5.25**).

In terms of output per person the Strategic High Growth wins hands down. The investment in new technology, capacity expansion and reorganisation of labour in the first five years bears fruits over the rest of the model horizon (**Exhibit 5.26**). The increase in labour productivity ensures that the increase in real wages assumed to grow @5 per cent per year in the last six years of the model horizon – which is significantly higher than the long-term average – can be easily met from railways increased earnings.

In the Strategic High Growth, investment in new technology, capacity expansion and reorganisation of labour in the first five years bears fruits over the rest of the model horizon

5.64 Comparative Cost to Government

In the three scenarios government injects funds in the system through five channels. First, government provides preference capital to railways as the sole owner of the entity at 7 per cent interest rate. Second, a portion of pension liability of railways is given to it as grant in perpetuity. Third, government compensates railways for running train services on non-remunerative routes and fourth, in line with the Expert Group's recommendation, the diesel cess which railways contributes to the Central Road Fund is returned to railways. Finally, government receives from railways dividend and redemption, if any, of the preference capital only when it makes cash profit. **Exhibit 5.27** gives year-by-year cash disbursement required from government under different scenarios. The numbers demonstrate that GOI will have to provide the lowest sums of money for the Strategic High Growth scenario in the initial years compared to the Business As Usual Low Growth scenario and the Medium Growth scenario. In the strategic High Growth Case railways will be a net contributor to the GOI after six years as they start redeeming preference

Exhibit 5.25 : Increase in Labour Productivity

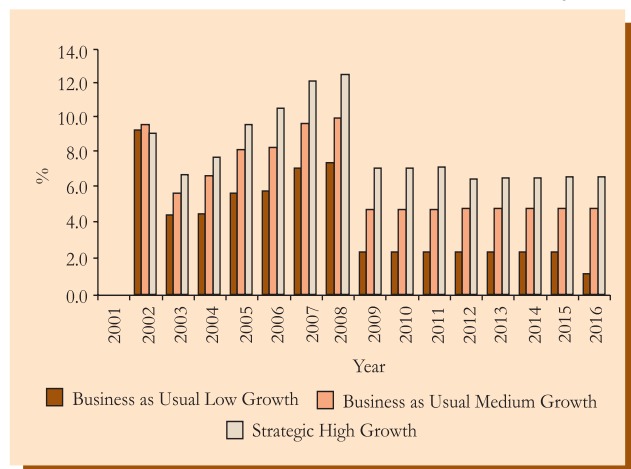
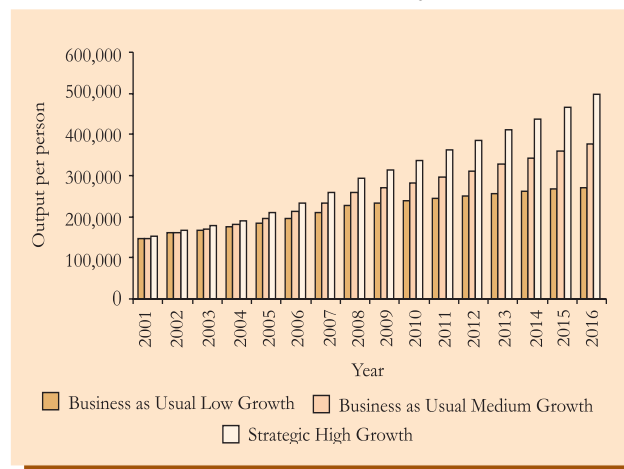


Exhibit 5.26 : Labour Productivity



capital and pay dividend on the balance preference capital. In Business As Usual Low Growth case, however, GOI has to continuously inject money as it makes cash losses.

In the Business as Usual Low Growth scenario it is the implicit cost of preference capital which makes this case inefficient and untenable in the long run. The Medium Growth scenario is financially tenable only on the condition that government would continue to provide 60 per cent of pension outgo on an indefinite basis.

The Business As Usual Medium Growth compared to the Strategic Case requires larger cash injection from the GOI and continues to receive net cash from the GOI. The implication of this analysis is that Business As Usual Low Growth case is unsustainable right from the beginning and the Business as Usual Medium Growth is also not sustainable in the long run as the incentive structure does not change within the railways to derive higher capital efficiency from their assets. **From the GOI point of view, the best option is to put in place an organisational structure, management and culture that aims at building the railways business to achieve the Strategic High Growth**

Exhibit 5.27 : GoI Cash-Flow to IR

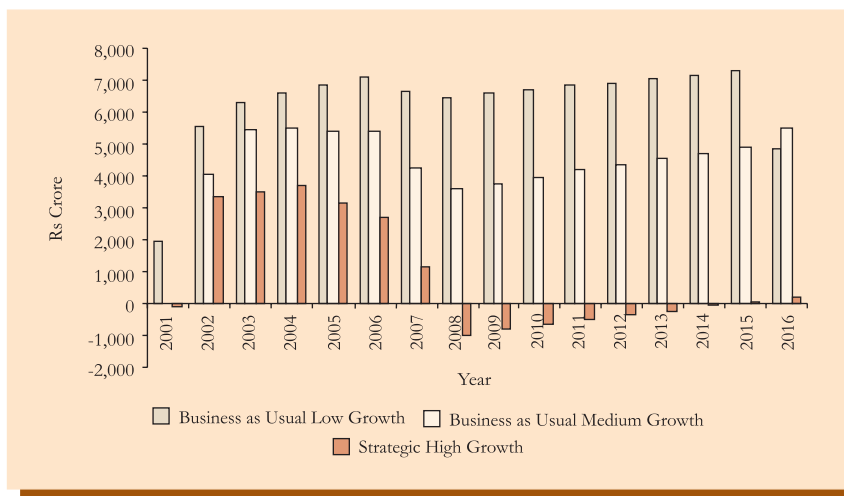
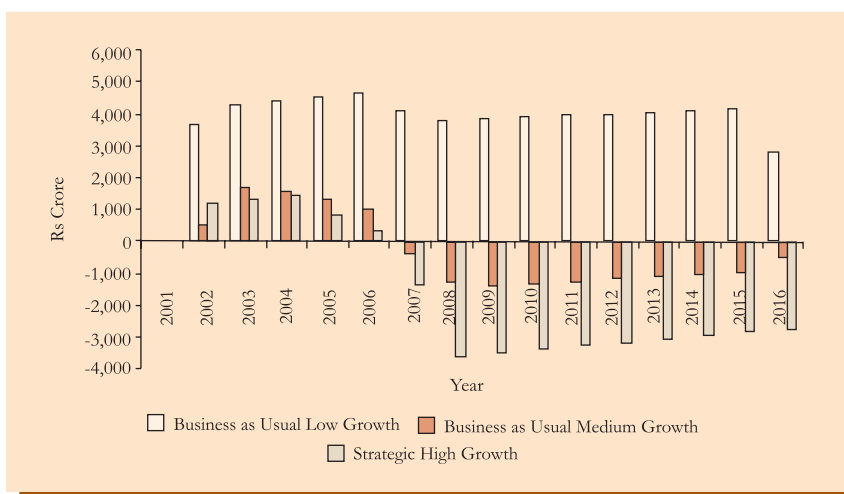


Exhibit 5.28 : Cost of Preference Capital to Government



scenario. It must provide requisite funds in the initial years for the scenario to be successful and reap benefits of their investment after six years to build social infrastructure. Under the Strategic Growth case, subsequent to the initial years of restructuring – organisational and financial – IR tells a turn-around story and becomes a fully commercial entity (Exhibit 5.29 and 5.30).

The comparison of operational expenditure, investment expenditure, preference capital injection and pension show that Strategic Growth scenario is unambiguously more efficient than the other scenarios. The Business as Usual scenario Low Growth is not tenable. The Medium Growth scenario does not look bad but its lifeline rests on government's continuous bearing of 60% pension outgo. Only the Strategic High Growth scenario achieves

Exhibit 5.29 : Net Cash Disbursed by the Government in the three Scenarios

(in Rs Crore)

	Avg. first five years	Avg. next five years	Avg. the last five years	Total (15 years)
BUSINESS AS USUAL LOW GROWTH				
Pref Capital Provided / redeemed (-)	2678	1544	1258	27,398
Pension Subsidy	0	0	0	0
Subsidy on non-remunerative services	800	800	800	12,000
Return of diesel cess @Rs.1/litre	226	226	226	3,388
Dividend Due (+)/Dividend paid (-) by railways	1610	2371	2539	32,602
Total Cash Disbursal/received (-)	5314	4940	4823	75,388
BUSINESS AS USUAL MEDIUM GROWTH				
Pref Capital Provided / redeemed (-)	2817	284	0	15,504
Pension Subsidy	3921	5056	5750	73,635
Subsidy on non-remunerative services	800	800	800	12,000
Return of diesel subsidy @Rs.1/litre	230	232	232	3,467
Dividend Due (+)/Dividend paid (-) by railways*	-1652	-2220	-2010	-29,408
Total Cash Disbursal/received (-)	6116	4152	4772	75,198
STRATEGIC HIGH GROWTH CASE				
Pref Capital Provided / redeemed (-)	2636	-1063	-1516	281
Pension Subsidy	1232	1602	1824	23,292
Subsidy on non-remunerative services	800	800	800	12,000
Return of diesel subsidy @Rs.1/litre	233	237	236	3,529
Dividend Due (+)/Dividend paid (-) by railways	-1615	-1947	-1433	-24,975
Total Cash Disbursal/received (-)	3287	-372	-89	14,127

(* - In case of Strategic High Growth an additional constraint was placed that railways continue to pay dividend on preference capital. Negative number means net payment to the government from the Railways)

Source: Exhibit 5A.3.

Exhibit 5.30 : Funding of Capital Expenditure for the Three Scenarios

BUSINESS AS USUAL LOW GROWTH				
		Avg. first five years	Avg. next five years	Avg. the last five years
Capex		9886	6919	6415
Sources :				
Internal				
	Depreciation	4861	5487	3932
	Cash Profits	-2917	-4635	-4191
External				
	Preference capital provided by GOI	2678	1544	1258
	GOI subs on non-remunerative service	800	800	800
	Reimbursement of Diesel Cess @Re 1/litre	226	226	226
	Market Borrowing	4238	3499	4393
BUSINESS AS USUAL MEDIUM GROWTH				
Capex		12283	9745	10172
Sources :				
Internal				
	Depreciation	5120	6251	5216
	Cash Profits	1843	5280	13092
External				
	Preference capital provided by GOI	2817	284	0
	Govt. Subsidy on non-remunerative services	800	800	800
	Reimbursement of Diesel Subsidy @Re 1/litre	230	232	232
	Market Borrowing	1474	-3102	-9166
STRATEGIC HIGH GROWTH CASE				
Capex		14029	12530	13367
Sources :				
Internal				
	Depreciation	5244	6829	6294
	Cash Profits	-853	105	4402
	Asset Sale	400	100	0
External				
	Preference Capital provided by GOI	2636	149	0
	Govt. Subsidy on non-remunerative services	800	800	800
	Reimbursement of Diesel Subsidy @Re 1/litre	233	237	236
	Multi-Lateral Funds	1000	0	0
	Market Borrowing	4568	4310	1635

Source: Appendix 5A.4.

The comparison of operational expenditure, investment expenditure, preference capital injection and pension show that only the Strategic High Growth scenario achieves operational and investment efficiency which turns around railways from a loss making organisation into a healthy and profit making organisation

operational and investment efficiency which turns around railways from a loss making organisation into a healthy and profit making organisation.

5.7 Strategic High Growth : Sensitivity Analysis

There are a series of key variables which need to be looked at before committing to a financing plan; these variables are what the prospective lenders and investors will look at and, if they are not satisfied with the results and risks, they will not lend (or, more relevantly here, they will lend less and at a higher rate of interest after adjusting for risk).

The variables that we propose to consider for evaluating the upside and downside risks are:

- Interest rates (real interest rates increase by 100, 200 and 300 basis points)
- Revenue (minus 5 per cent and 10 per cent of the Strategic High Growth Case)
- Costs (plus 1 percentage and 5 percentage point of the Strategic High Growth Case)
- Capital Expenditure (plus 5 per cent and 10 per cent of the Strategic High Growth Case)

Box 5.4 : China to Invest US \$ 12 billion on Beijing-Shanghai Bullet Train Organization

China is to invest 100 billion yuan (US \$ 12 billion) to construct a high-speed railway line linking Beijing and Shanghai. The project is a part of the country's 10th five-year plan (2001-2005), according to the Ministry of Railways. The budget represents some 40 per cent of the total amount spent by China on railway construction under the ninth five year plans (1996-2000). Proposed construction of the railway has provoked lively debate among experts over which technology should be utilised for the line linking the country's two largest cities. Beijing has held talks on using German Transrapid high-speed magnetic suspension railway technology to build an experimental line in Shanghai between the airport and the city centre. German Finance Minister Hans Eichel has not yet decided whether Berlin would provide loans to finance the project. Some experts say China should use the most advanced maglev system, which many believe is safe, comfortable, stable and fast, for the 1,300 kilometre (812 mile) Beijing-Shanghai line. But opponents argue that it is unwise for China, still a developing country, to use the 'immature and extravagant' maglev technology. The Transrapid consortium (TRI), which comprises ThyssenKrupp, Siemens and Adtranz (which wishes to leave the consortium), has yet to put the technology into commercial use, even in Germany, where a line linking Berlin and Hamburg was cancelled at the start of the year for financial reasons. Japan's Shinkansen and the European Eurotrain consortium, which bring together France's Alstom and Germany's Siemens, are also candidates to construct a conventional high-speed line between the capital and Shanghai, a project which has been on the cards since 1994. Experts have also not ruled out the possibility that Beijing will do without a foreign partner and launch the project with Chinese technology based on foreign trains.

Source: China Daily

The results of this sensitivity analysis (for the Strategic High Growth case) are shown in **Exhibit 5.31**.

The sensitivity analysis estimates suggest that poor materials management, inefficient execution of capital projects and increase in wastage are more expensive to IR than external factors such as increase in interest rates and reduction in revenue.

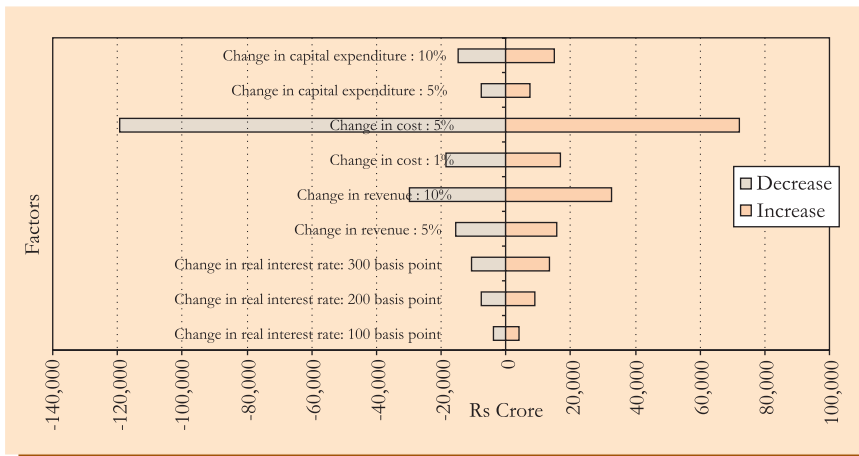
Choice emanating from different scenarios is unambiguous. **IR would serve the interest of all its stakeholders, namely, its customers, employees and the government, if it whole-heartedly pursues the Strategic High Growth plan. The rationale to adopt the plan is that it is the least expensive plan of action for the railways, and in terms of NPV, it calls for the least amount of subsidies from the government and provides services to customers in the most efficient way, improves operational and investment efficiency and transform railways into a commercial enterprise with strong balance sheet capable of looking after its future investment needs and liabilities.**

Exhibit 5.31 : Sensitivity Analysis

Factor	Decrease in NPV of Financing Gap Downside (Rs Crore)	Increase in NPV of Financing Gap Upside (Rs Crore)
Change in real interest rate		
100 basis point	-3,860	4,184
200 basis point	-7,423	8,902
300 basis point	-10,713	13,645
Change in revenue		
5 per cent	-15,437	15,908
10 per cent	-26,694	32,750
Change in cost		
1 percentage point	-18,551	17,028
5 percentage point	-119,437	72,324
Change in capital expenditure		
5 per cent	-7,402	7,401
10 per cent	-14,803	14,803

Source: Expert Group.

Exhibit 5.32 : Increase or Decrease in NPV of Financing Gap



5.8 Summary

The history of the financing of Indian Railways from its inception in 1853 is characterised by a continuous concern for what should be the appropriate methodology for financing it. For a full century after railways entered India the system went through a process of continuous restructuring. Since the financing of different railways was a mixture of public and private initiatives throughout the period, a very varied pattern of financing was followed across the country. The original arrangements between the Government of India and private investors in mid nineteenth century look very much like the modern Build Operate and Transfer (BOT) model that is currently in vogue. However, the transfer from the private sector to the government took place much earlier than expected, and most of railways were effectively nationalised by the early part of the 20th century. Until 1924 the railway budget formed a part of the Government of India budget. Since the railway budget formed a significant portion of the total budget there was considerable unease in keeping the railways budget as an integral part of the overall budget. As a result, a high level committee, the Acworth Committee was formed to provide recommendations for the appropriate treatment of the finances of Indian railways. The Acworth Committee report of 1924 recommended the separation of the railway budget from the government budget. As can be seen from the report of that committee the intention was to fully commercialise railways accounts and to induce the railways to operate like a commercial entity. Since then a number of reviews have been done, each one of them expressing its unhappiness with the existing system where, although the railway budget is separate from the normal budget, the original intention of commercialisation has not been achieved.

Indian Railways has continued to be run like a government department rather than as a commercially oriented independent public sector corporation. Consequently its accounts have continued to be framed in a departmental manner and do not reflect the conventions that would normally be used in a commercial enterprise

Indian Railways has continued to be run like a government department rather than a commercially oriented independent public sector corporation. Consequently its accounts have continued to be framed in a departmental manner and do not reflect the conventions that would normally be used in a commercial enterprise. The Expert Group has therefore felt it important to recast the existing railway accounts into a company account format in line with Indian GAAP in order to evaluate the true current state of IR's finances. The Expert Group was able to do this since a similar exercise was conducted by the Railways Capital Restructuring Committee of 1994. The accounting firm of Rangaraju & Associates had then done a detailed exercise in re-casting railways accounts and in restructuring the capital according to company format. It is found that because of inadequate provision for depreciation, IR is significantly over capitalised and hence the capital structure needs substantial restructuring. The Expert Group has suggested such a restructuring.

The recasting of accounts in company format makes it easier to assess the viability of any programme of investment and revenue growth from the point of view of investors or lenders. A company accounting format would also make it easier to unbundle public activities of IR thereby providing for appropriate incentive structures for the sub-units at a cost or profit centre basis. It would also be easy to hive off peripheral activities as and when such decisions are made.

Having achieved this broad re-casting of accounts the Expert Group was able to make projections of IR's financial performance under different assumptions of both revenue and investment growth, along with different

projections of productivity and cost savings. Whereas it is possible to conduct any number of model projections, the Expert Group projected three kinds of possible scenarios. The first scenario is characterised as a Business as Usual Low Growth Scenario. The assumption here is that there would be no organisational changes in IR and that it would continue investment levels and traffic growth in a manner not too dissimilar from the 1990s. This scenario is found to be totally unviable while placing great demands on government finances to shore up the railways on a continued basis even after the fifteenth year. The second scenario also assumes a Business as Usual approach calling for no significant organisational changes while attempting to accelerate investment growth in order to yield higher revenues. This scenario is also found to be unviable, with financial viability being achieved only if the government undertakes the financial liability of bearing the cost of at least 60 per cent of pension on a continued basis which amounts to approximately Rs. 6,000 crore in year fifteen.

The Strategic High Growth scenario assumes an accelerated investment programme to yield higher traffic growth in both passenger and freight traffic. This kind of growth is not feasible to be achieved without a significant restructuring of Indian Railways towards a much greater commercial and customer orientation. The higher levels of investment required can also not be achieved from pure government support and require an injection of external funds on a significant basis. It is deemed unlikely that such funds would be available, even with a government guarantee, unless investors and lenders can see commercial viability in the long run.

Such commercial viability cannot be achieved and seen without an explicit ex-ante commitment to substantial organisational restructuring in the long run. The projections made suggest that the government would have to provide significant financial support in the first 7 years of such a programme but would be able to recoup almost all such investments within the 15 year period. However, railways would require approximately Rs. 1,900 crore per year as pension subsidy after year fifteen but will be able to honour all its commercial commitments. Thus, although the government does have to make some financial sacrifices in the initial period, such a programme would enable it to recoup its investments over the programme period. Such government commitments to both financial support and organisational restructuring of the kind proposed in chapter 8 would then provide adequate confidence to external investors and lenders to provide the funds needed to rejuvenate Indian railways.

Whereas the Expert Group has provided only one feasible Strategic High Growth Scenario, in principle other such scenarios are also possible. Our aim is to demonstrate that there is at least one growth path that is indeed financially viable entailing a minimum level of support from the government. Once such a viable financial plan is available there can be many ways for financing the programme. Such a programme can also include the privatisation of peripheral activities over the period of the programme. It can also include greater attention to the funding of pension liabilities in a more creative manner than the sharing formula that we have assumed.

It is worth repeating that our work has demonstrated in no uncertain terms that Indian Railways is in deep financial crisis. This has already been shown by the railway budgets of 2000-01 and 2001-02 in which IR has not been able to pay

The Strategic High Growth scenario assumes an accelerated investment programme to yield higher traffic growth in both passenger and freight traffic. This kind of growth is not feasible to be achieved without a significant restructuring of Indian Railways towards a much greater commercial and customer orientation. The higher levels of investment required can also not be achieved from pure government support and require an injection of external funds on a significant basis. It is unlikely that such funds would be available, unless investors and lenders can see commercial viability in the long run

the full dividend due to the government during these years. In fact for 2000-01 it has not been able to pay even the reduced dividend that was expected. **Thus no change and Business as Usual is not a viable alternative for IR.** Our projections suggest that IR is indeed heading into financial bankruptcy. **Continuation of the current situation suggests that it will not be able to pay any dividends to the government for the foreseeable future while requiring increasing levels of support indefinitely.**

The only feasible alternative that provides for return to financial health is

Box 5.5 : Catering Contracts

As a part of the passenger business, Indian Railways (IR) provide catering/vending services at stations and in selected long and medium distance Mail/Express trains. Catering facilities are available at more than 3200 stations and in 170 pairs of trains. Catering services at 68 stations and in 48 pairs of Mail/Express trains are managed through departmental staff whereas at more than 3100 stations and 120 pairs of Mail/Express trains, catering services are being managed by private operators.

IR recovers a percentage of sales turnovers towards licensee fee in addition to rent on building/space, electricity/water charges etc. from the licensees. So far, 3-5 per cent of sales turnover in case of static units and 5-8 per cent of sales turnover in case of mobile units was being charged as licensee fees. In the direction of IR's efforts to raise resources through unconventional sources, it has now been decided to increase the license fee in all cases of catering/vending units to 15 per cent of sales turnover in case of Rajdhani/Shatabdi Express trains at 12 per cent of sales turnover in case of other Mail/Express trains and static units. The revised license fee has come into effect from July 1999.

In the year 1998-99, IR has realised approximately Rs. 8.80 crore as license fee from the licensee operated catering/vending units on IR. It is likely that there would be substantial increase in this regard for the year 1999-2000 for which details are being collected from Zonal Railways.

Today, licensees are managing the catering/vending units under 5 year agreements, which are renewed every 5 years, subject to performance being satisfactory. However, there has been no proper arrangement of assessment of sales. As such, there has been significant under-reporting of sales affecting the in-flow of revenue to the IR adversely. Keeping this in mind, the Ministry of Railways has decided to enhance the license fee across the board with effect from July 1999.

So far catering/vending services are being provided on IR where there is a regulation of price and the menu. In order to provide branded products from reputed manufacturing companies, it has been proposed that IR should provide food marts/food plazas at 25 nominated stations through private participation. A beginning has been made on Western Railway (WR) in this regard, where 2 fast food outlets are being operated at Ahmedabad by a reputed brand company. WR is getting Rs. 3.11 lakh as license fee from these 2 units per month which is more than the total license fee collected all over Vadodara division. In their arrangement, the party has to pay a minimum amount specified or a percentage on sales turnover whichever is higher. In this way, IR has been sharing revenue with the catering licensee. Besides, there has been tremendous improvement in the quality of standard and hygiene level.

It is also under the consideration of Ministry of Railways that exclusive supply of food items is obtained from reputed manufacturers in case of New Delhi-Howrah and New Delhi-Mumbai Rajdhani Express trains. Food manufacturing companies will be given advertisement space in trains. The railway is expecting a significant amount besides getting a good discount on supply of catering items. If found successful, IR may consider extension of this scheme on other trains also.

While the contracting out to private parties for catering is welcome, three issues remain:

- (i) Monitoring of revenues under revenue sharing arrangements (which has been raised above)
- (ii) The role of the newly set up Catering Corporation (presumably for the kitchens under IR ownership) and
- (iii) Since food is a key complementary element of travel, the responsibility of IR for quality of service will always remain.

Source: Communication from Railway Board, New Delhi 2000 and inputs from Expert Group Members.

the Strategic High Growth Scenario. Other similar scenarios can of course be constructed. Each of such scenarios would be based on assumptions of the kind of high traffic growth in both passenger and freight that has been assumed for this scenario. Some members of the Expert Group have indeed felt that the revenue growth implied by the Strategic High Growth is unrealistic. However, our work in chapter 3 suggests that appropriate changes in the functioning of railways would make such growth feasible. It must be admitted that such high growth is indeed not feasible without the kind of structural changes recommended in this report.

To achieve this growth there is an imperative need for a major step up in investment of the order of about 50 per cent above the current levels, for at least the next five years. Such a step up is essential to cover the backlog of neglected investments from the past and for expansion of necessary capacity and improvement in productivity. **The investment programme envisaged in the Strategic High Growth Scenario requires an annual investment of about Rs. 14,000 to 15,000 crore per year from 2002 to 2006, about Rs. 12,500 crore per year from 2007 to 2011 and about Rs. 13,500 crore per year from 2012 to 2016.** In five year tranches, this investment programme amounts to Rs. 70,000 crore or US \$ 14 billion from 2002 – 2006, Rs. 62,500 crore or US \$ 12.5 billion from 2007 to 2011, and Rs. 67,500 crore or US \$ 13.5 billion from 2012 to 2016, making for a total of about Rs. 200,000 crore or US \$ 40 billion over 15 years. Internal resources are expected to provide for just over a third of the requirements in the first five years and little over half in subsequent years. Market borrowing would finance about 40 per cent of requirements in the first five years and about 30 per cent in subsequent years. **Government support for this investment programme in the first five years would finance about a quarter of the investment programme, but less than 10 per cent in subsequent years.** Thus it is only in the first 5 to 7 years that exceptional government support is needed in this programme. Greater levels of government support would of course make the task of railways restructuring somewhat easier, and would be welcome.

The Strategic High Growth Scenario is designed with a view to phase out government support between the 5th and 10th years of the programme such that Indian Railways becomes a viable commercial entity that would be able to run on a commercial basis in the future. Within this programme however it is expected that the government would provide annual subsidies equivalent to about Rs. 800 crore for unremunerative services that IR currently provides, and will continue to do so in the future. It is also expected that if similar services are required by the government in the future they would be financed by the government both for investment and current expenditures. This scenario also envisages the devolvement of about 20 per cent of the railways pension liability on the government which would increase from an annual average of Rs. 1200 crore in the first five years, to Rs. 1600 crore in the second five years, and Rs. 1800 crore in the third five year period of this programme. Such devolvement on the government would continue indefinitely. It is found that the redemption of preference capital, and the dividends to be paid by IR to the government on preference capital, would be such that there would be no net disbursement from the government to the railways after year 2007. Throughout the period, however, no dividends are paid by IR on the ordinary equity held by the government. If any operations of IR were privatised over the period dividends on such private equity would

In the Strategic High Growth Scenario internal resources are expected to provide for just over a third of the requirements in the first five years and little over half in subsequent years. Market borrowing would finance about 40 per cent of requirements in the first five years and about 30 per cent in subsequent years. Government support for this investment programme in the first five years would finance about a quarter of the investment programme, but less than 10 per cent in subsequent years

of course have to be paid.

It is evident therefore that the strategic high growth scenario envisages a major turn-around in the finances of Indian railways. Such a turn around would be beneficial to the country at large and therefore actions required from the government to make this scenario possible must be given the highest priority. **Just as the road scenario in the country has been fully transformed through the levy of the fuel cess and the highest importance given to the National Highway Development Programme by the Prime Minister, Indian Railways can also be similarly transformed if such importance is given to this programme by the highest authority in the country.** As stressed throughout this report this will not be feasible unless IR is substantially restructured in order to run on a commercial basis. Tariff rebalancing of the kind suggested in chapter 3 would be an essential component of this restructuring programme.

At the current state of India's development it is indeed quite possible for the Indian railways to become a financially viable entity. It needs to go for a strategic high growth programme. It is our considered view that such a bold approach will restore the Indian Railways to financial health in a feasible growth and restructuring framework

The Expert Group has concluded that at the current state of India's development it is indeed quite possible for the Indian railways to become a financially viable entity. It needs to go for a strategic high growth programme that re-gains some of the freight traffic it has lost and to generate faster passenger revenue growth by taking advantage of the rapidly changing income distribution of the population as outlined in Chapter 3. It would also have to undertake significant tariff re-balancing in both the passenger and freight service segments. It is our considered view that such a bold approach will restore the Indian Railways to financial health in a feasible growth and restructuring framework.

Box 5.6 : Financing of Indian Railways: Key Messages

- The **first message** is that IR can not survive if it adopts the Business-as-Usual Low Growth Scenario. This should not be surprising to anyone familiar with the recent working of IR, but it nevertheless needs to be emphasised in no uncertain terms. In such a scenario, the NPV of the funding gap after 15 years – the difference between the NPV of cash flow after financing existing liabilities and the NPV of investment flows – is a staggering Rs 70,151 crore. Virtually all interest cost will need to be funded by government, and there will have to be a continuous injection of capital from the Central exchequer just to keep IR alive. The NPV of cash flows from the Central Government to IR will amount to an unsustainable Rs 55,384 crore. Simply put, this is a recipe for a debt trap and the financing of perpetual and ever worsening bankruptcy.

The **second message** is that the Medium Growth Path, though better than the Low Growth variant, is also not good enough. The only way for this scenario to make sense is for the Central Government to take up 60 per cent of IR's pension liabilities in perpetuity – something that is unrealistic to expect from a severely fiscally constrained exchequer.

It has been argued by some that the Medium Growth Path should not result in the Central Government having to pick up 60 per cent of IR's pension liabilities in perpetuity if the subsidies due to IR are properly estimated. The argument is that the Rs. 800 crore annual subsidy to be provided for by government to IR for unremunerative services is an underestimate. If all unremunerative and socially dictated services are taken into account – as envisaged by the Purpose Statement – the subsidy ought to be significantly higher. And, if IR were to be reimbursed the full cost of subsidy every year, the required pension support from the Central Government would be lower – which might make the Medium Growth Path more attractive than before. In either case, the relevant fact is that the government will have to inject an average amount of about Rs. 8,000 crore on a sustained, indefinite annual basis.

This is an argument about fungibility: if government could give greater budget support for unremunerative activities, such inflows would enter IR's revenue stream and, thus, reduce the quantum of pension support. However, the issue here is not fungibility but fiscal reality. Given the state of the central exchequer and the assumption that it will not improve dramatically over the next decade, it is unrealistic to assume that either the government will bear the full cost of subsidy, or will be able to shoulder the burden of 60 per cent of IR's pension liabilities. It is precisely because of this reason that the Committee was constrained to reject the Medium Growth Path.

The **third message** is that salvation for IR can only be through the Strategic High Growth Scenario, coupled with relentless cost cutting. Here, the NPV of the cash flow to IR from the government is Rs. 13,111 crore (versus Rs. 55,384 crore in the Low Growth, and Rs. 56,737 crore in the Medium Growth Scenarios). Unlike the Medium Growth Path, this variant is viable with government taking up only 20 per cent of IR's pension liabilities. In this situation, IR will be able to service its preference capital, restructured debt (including IRFC's liabilities), and also redeem a part of the preference capital that has to be injected by government in the first six years. Moreover, the Strategic High Growth case helps rebuild IR as a financially viable organisation.

Are the revenue assumptions governing the Strategic High Growth variant too optimistic? The Committee believes otherwise. Even without tariff rebalancing, revenue is assumed to grow from 4.2 per cent in 2001-02 to 7.7 per cent in 2005-06, and then taper off to 7.1 per cent in the last five years. Assuming an income elasticity of unity, this is akin to expecting an average GDP growth of about 7.3 per cent per year over the next 15 years. The Committee believes that such a target is achievable for the economy and IR.

The **fourth message** is that the entire exercise has been carried out without any assumptions regarding tariff rebalancing. Chapter 3 (Exhibit 3.15) shows that by 2005-06, proper tariff re-balancing alone can result in an annual revenue gain of Rs. 735 crore. If this is taken into account, the Strategic High Growth scenario will become even more attractive, and shall significantly reduce the government's 20 per cent pension liability. Indeed, the unstated message in this chapter is that revenue growth must be pushed up further by sustained tariff re-balancing.

One of the main recommendations of this report is that through a process of tariff rebalancing, the subsidies to second ordinary class should be phased out. Explicit subsidies calculated on efficient costs should be reimbursed by the government/local administration. The closing down of totally unviable branch lines and services will further bring down this burden on railways. As regards suburban services, there will have to be a move towards more rational tariff setting, along with a search for more creative means of alternative financing. As illustrated elsewhere in this report (Box 5.3 and Box 8.10) the bulk of this burden can be distributed among employers and local governments, leaving a manageable share for the transport system.

The **fifth** and final message is simple. Business-as-usual will not do, for it will lead to massive bankruptcy. Although tempting, the middle path, too, will not do, for it implies that the government must take up a financial burden that it realistically can not afford. The only salvation lies in the Strategic High Growth scenario. To be sure, this variant will require some managerial 'stretch'. But the Expert Group believes that the targets are not unrealistic and that IR has the depth and width of human resources and an *esprit de corps* to meet these stretch targets. It has to be done. Because, as the chapter shows, the alternative could be oblivion.

Appendix 5.1 : Indian Railways Balance Sheet

	LIABILITIES	As on March 31, 1999	As on March 31, 2000
		(Rs crore)	(Rs crore)
A.	Loan Capital (Advanced by General Exchequer)		
	(Supporting statement V (a))	27,313	29,655
B.	Investment Financed from		
	Railway Capital Fund	9,516	10,117
	Depreciation Reserve Fund	11,957	13,074
	Development Fund	3,759	4,253
	Revenue	706	737
	Miscellaneous other sources	407	517
		26,345	28,698
C.	Reserves		
	Depreciation Reserve Fund	677	51
	Revenue Reserve Fund	–	–
	Development Fund	–	–
	Pension Fund	313	76
	Railway Capital Fund	263	21
		1,253	149
D.	Deposits		
	(i) State Railway Provident Fund	6,074	7,261
	(ii) Miscellaneous Deposits	1,650	1,958
	(iii) F. Loan & Advances	271	360
		7,994	9,579
E.	Current Liabilities		
	(i) Undischarged (Demands payable)	654	723
	(ii) Balance of amount in Account with Government etc.	1,800	1,799
		2,454	2,522
	Grand Total	65,359	70,603

(Contd... next page)

Appendix 5.1 : Indian Railways Balance Sheet (Contd...)

	ASSETS	As on March 31, 1999 (Rs crore)	As on March 31, 2000 (Rs crore)
F.	Block Assets		
(i)	Fixed Assets		
	Land	733	831
	Buildings and track	29,893	32,732
	Rolling Stock	11,526	11,776
	Plant and equipments	9,520	10,490
	Miscellaneous Assets	—	
		51,671	55,829
(ii)	Investment		
	Inventory	566	706
	Works in progress (Workshops manufacture)	244	323
	Miscellaneous Advance (Capital)	451	769
		1,260	1,798
(iii)	Investment in other Undertakings		
	Shares in Road Transport Undertaking	—	—
	Other Government Undertakings	726	726
	Total Block Assets	53,658	58,353
G.	Fund lying with Central Government		
	(Contra-items C and D)	9,248	9,728
H.	Current Assets		
	Sundry debtors	308	311
	Outstanding dues from other Government Department	82	90
	Outstanding traffic earnings	1,390	1,582
	Cash in hand	587	459
	Demands recoverable	87	80
	Grand Total	65,359	70,603

Source: Railways Budget documents.

Appendix 5.2 : IR Profit and Loss Account

(Rs Crore)

Gross Traffic Receipts	1998-99	1999-2000
Coaching Earnings		
Passenger Traffic		
Full fares	7,558.16	9,581.07
Less than full fares	991.80	
Parcels and other Coaching Traffic		
Parcels	349.37	395.79
Luggage	64.30	62.89
Others	235.33	366.63
Goods Earnings		
Coal, Coke etc.	10,996.05	11,772.31
General Merchandise	8,652.50	10,006.95
Other Traffic	194.99	188.20
Wharfage and Demurrage	194.30	191.58
Less refunds	(-) 77.45	(-) 98.05
Miscellaneous (Sundry) Other earnings	665.51	657.34
Total Gross Earnings	29,824.86	33,124.71
Suspense (Bills receivable)	(-) 205.40	(-) 185.90
Gross Traffic Receipts	29,619.46	32,938.81
Ordinary Working Expenses		
(i) General Superintendence and Services on Railways	1,273.43	1,384.93
(ii) Repairs and Maintenance of Permanent way & Works	2,453.52	2,741.44
(iii) Repairs & Maintenance of Motive Power	1,390.61	1,524.10
(iv) Repairs and Maintenance of Carriages and wagons	2,575.07	2,833.10
(v) Repairs and Maintenance of Plant and Equipment	1,327.72	1,487.08
(vi) Operating Expenses - Rolling Stock & Equipment	2,371.18	2,453.07
(vii) Operating Expenses - Traffic	4,991.59	5,377.03
(viii) Operating Expenses - Fuel	4,854.25	5,629.67
(ix) Staff welfare & Amenities	977.26	1,102.50
(x) Miscellaneous Working - Expenses	1,031.74	1,163.63
(xi) Provident Fund, Pension and other retirement benefits	11.73	14.31
Gross Expenditure	23,258.10	25,710.86
Suspense (Bills payable)	(-) 3.50	(-) 65.93
Total - Ordinary Working Expenses (Actually disbursed)	23,254.60	25,644.93

Appendix 5.2 : IR Profit and Loss Account (Contd...)

(Rs Crore)

Appropriation to Funds:	1998-99	1999-2000
Appropriation to Depreciation Reserve Fund	1,155.00	1670.00
Appropriation to Pension Fund	<u>3,425.00</u>	<u>3529.06</u>
	<u>4,580.00</u>	<u>5,199.06</u>
Net Miscellaneous Receipts	356.30	640.85
Net Revenues	2,141.16	2735.67
Dividend and other Payments to General Revenues		
Dividend Paid (current)	1,716.15	1,863.89
Other payments to General Revenues in lieu of tax on Passenger Fares	23.12	23.12
On account of assistance of States For Safety Works	2.81	2.77
Total Dividend Payable	1,742.08	1,889.78
Excess	399.08	845.89

Source: Railways Budget documents.

Appendix 5.3 : Nominal prices and Price-of-Today

Project finance requires funding of capital expenditure over a long period of time using borrowed funds, and benefits of capacity expansion and enhanced services start accruing with a lag of few years. Interest costs continue unabated and needed cash flows come later. Servicing of the borrowed funds start much before enhancement of revenue streams; hence, it is important to assume a realistic rate of interest rate while calculating viability of a project. A market rate of interest has two components, namely, real rate of interest which is fairly stable in a given economy, and rate of inflation, which is assumed to remain stable but fluctuates year-to-year in practice. A realistic assumption of interest rate is important for financial planning but inflation rate assumption can inflate financial projections so much that farther away year-to-year numbers may seem exaggerated. To remove the effect of inflation, it is a standard practice to deflate projected numbers by the assumed rate of inflation. The deflated numbers are referred to as 'today's prices'. One advantage of using this series is that the burden of financial obligations and cost of borrowed money are fully factored in the model. Second, it provides full information to lenders of the project to appraise the loan which is to be serviced from the cash flows generated from the revenue projections. With this information lenders are in a better position to assume commercial risk of the project.

Appendix 5.4 : Financial Model of IR

A financial model of the Railways was built using the restructured capital structure, and profit and loss accounts of the Railways as described in this chapter. The model is a combined model of the Railways and IRFC. The model has macroeconomic assumptions such as real interest rate and rate of inflation; revenue growth assumptions of freight, passenger and other coaching services; operational expenditure growth assumptions of staff cost, average pension benefits, fuel, repair and maintenance and others; financing assumptions about interest rate on market borrowings, preference coupon rate and proportion of funding requirement by GoI preference capital; and capital expenditure assumptions on system expansion, new capacity building, user and staff amenities, safety works etc. Depreciation rate in the model is assumed to be 5 per cent for capital expenditure. Based on these input parameters the model produces revenue estimates for freight, passenger and other coaching services, operating expenses consisting of staff cost, fuel cost, R&M costs and others. Pension liabilities are given separately and are not clubbed with the staff cost. Operating expenses do not include lease charges which are paid to IRFC. The model calculates preference dividend and it is paid in line with assumptions of the scenario. All financing flows, investment flows and sources of funds are calculated by the model. The model computes funding gap which is to be borrowed from the market.

It works out weighted average cost of capital and net present value of funding gap over the model horizon. It is a fifteen-year model as it was felt that most of the railways have taken 10-15 years in restructuring and IR too will need ten years of time to streamline its operations and prove investment efficiency. As railways investments are lumpy in nature, payout period starts only after a few years. It has been assumed that the support from the government would be a crucial factor in determining the amount of funds to be raised from market sources. A higher degree, and a better quality of support from the government would help in terms of improving the credit standing of the Railways in the market and thereby reducing the cost of funds. A support from the government in the form of preference capital is built in the model. The model assumes that 40 per cent of investment gap will be funded using preference capital from the government which will attract 1 per cent rate of interest after adjusting for inflation.

Complete listing of the Business As Usual Low Growth case, Business as Usual - Medium Growth and Strategic High Growth case are given below (Appendix 5A.5, 5A.6, 5A.7) and Exhibit 5A.1 tabulates main assumptions underlying the three scenarios.

Exhibit 5A.1 : Assumptions Underlying different Scenarios

	CAGR (2002-2016)	CAGR (2002-2016)	CAGR (2002-2016)
Item	Business as Usual Low Growth case	Business as Usual Medium Growth	Strategic High Growth case
Traffic volume growth rate (p.a.) for:			
i) Freight	2.20%	4.33%	5.46%
ii) Passenger	2.64%	5.08%	7.84%
iii) Other Coaching	2.64%	5.08%	6.74%
Other income	2.20%	4.33%	5.21%
Operating expenses - growth rate (p.a.):			
i) Staff expenses	2.94%	2.94%	2.94%
ii) Pension benefits	3.52%	3.52%	3.52%
iii) Fuel	2.34%	4.57%	5.95%
iv) Repairs & maintenance	2.34%	4.57%	5.95%
v) Other expenses	2.34%	4.57%	5.97%
Capital Expenditure - growth rate p.a.:			
i) Gross Fixed assets	-1.89%	0.04%	1.62%

Source: Expert Group.

Exhibit 5A.2 : Yearwise GOI Gross Subsidy in the Three Scenarios (Rs Crore)

Year ending 31st March	NPV	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
GOI Subsidy in Business as Usual Low Growth																	
Prof Cap subsidy	16,739	0	880	1,010	1,150	1,288	1,423	1,537	1,623	1,697	1,769	1,840	1,907	1,971	2,033	2,095	1,063
Pension subsidy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subsidy on non-remunerative services	8,895	0	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of Diesel Cess @ Re 1/litre	2,511	0	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226
Total Govt. Subsidy	28,144	0	1,906	2,036	2,176	2,314	2,448	2,563	2,649	2,723	2,795	2,866	2,933	2,997	3,059	3,121	2,089
GOI Subsidy in Business as Usual Medium Growth																	
Prof Cap subsidy	15,357	0	891	1,037	1,185	1,327	1,460	1,554	1,590	1,595	1,595	1,595	1,595	1,595	1,595	1,595	798
Pension subsidy	53,091	0	3,511	3,718	3,933	4,108	4,337	4,573	4,866	5,169	5,280	5,393	5,508	5,626	5,747	5,870	5,996
Subsidy on non-remunerative services	8,895	0	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of Diesel Cess @ Re 1/litre	2,501	0	227	229	231	232	232	232	232	232	232	232	232	232	232	232	232
Total Govt. Subsidy	79,910	0	5,428	5,784	6,149	6,467	6,828	7,159	7,487	7,796	7,907	8,020	8,135	8,253	8,374	8,497	7,825
GOI Subsidy in Strategic High Growth Case																	
Prof Cap subsidy	13,291	0	881	1,011	1,156	1,298	1,421	1,497	1,478	1,402	1,327	1,251	1,175	1,099	1,023	948	872
Pension subsidy	16,783	1,033	1,099	1,166	1,236	1,293	1,368	1,445	1,540	1,640	1,675	1,711	1,748	1,785	1,823	1,862	1,902
Subsidy on non-remunerative services	8,895	0	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of Diesel Cess @ Re 1/litre	2,613	0	229	231	234	235	237	237	237	237	237	237	236	236	236	236	236
Total Govt Subsidy	41,582	0	3,009	3,208	3,426	3,627	3,826	3,979	4,056	4,079	4,038	3,999	3,958	3,920	3,882	3,845	3,810

Source: Expert Group.

Exhibit 5A.3 : Yearwise Cash Disbursal by the Government in the Three Scenarios (Rs Crore)

Year ending 31st March	NPV	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Business As Usual Low Growth																	
Pref Cap	21,371	0	2,396	2,823	2,786	2,718	2,667	1,917	1,509	1,460	1,430	1,403	1,283	1,261	1,241	1,223	1,281
Pension Subs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Govt. Subsidy on non-remu. Fixed infra	8,895	0	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of Diesel Cess @ Re 1/litre	2,511	0	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226
Dividends on Prefs not paid	23,434	0	1,232	1,414	1,611	1,803	1,992	2,152	2,272	2,376	2,477	2,576	2,670	2,759	2,847	2,933	1,488
Total	55,384	0	4,654	5,263	5,423	5,547	5,684	5,095	4,806	4,861	4,933	5,005	4,979	5,046	5,114	5,182	2,307
Business as Usual Medium Growth																	
Pref Cap	13,683	0	2,842	2,996	2,924	2,762	2,559	1,204	217	0	0	0	0	0	0	0	0
Pension Subs	53,091	0	3,511	3,718	3,933	4,108	4,337	4,573	4,866	5,169	5,280	5,393	5,508	5,626	5,747	5,870	5,996
Govt. Subsidy on non-remu. Fixed infra	8,895	0	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of Diesel Cess @ Re 1/litre	2,568	0	227	229	231	232	232	232	232	232	232	232	232	232	232	232	232
Dividends on Prefs	21,500	0	1,247	1,452	1,659	1,858	2,044	2,176	2,225	2,233	2,233	2,233	2,233	2,233	2,233	2,233	1,117
Total	56,737	0	6,132	6,292	6,229	6,044	5,883	4,633	3,889	3,968	4,079	4,192	4,307	4,425	4,546	4,669	5,911
Strategic High Growth Case																	
Pref Cap	3,428	0	2,451	2,738	3,063	2,627	2,299	747	-1,516	-1,516	-1,516	-1,516	-1,516	-1,516	-1,516	-1,516	-1,516
Pension Subs	16,783	0	1,099	1,166	1,236	1,293	1,368	1,445	1,540	1,640	1,675	1,711	1,748	1,785	1,823	1,862	1,902
Govt. Subsidy on non-remu. Fixed infra	8,895	0	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of Diesel Subsidy @ Re 1/litre	2,613	0	229	231	234	235	237	237	237	237	237	237	236	236	236	236	236
Dividends on Prefs	18,608	0	1,234	1,415	1,618	1,817	1,990	2,096	2,069	1,963	1,857	1,751	1,645	1,539	1,433	1,327	1,220
Total	13,111	0	3,346	3,521	3,715	3,138	2,713	1,132	-1,008	-803	-661	-519	-378	-234	-90	55	201

(Negative number means net payment to the government from the Railways)

Source: Expert Group.

Exhibit 5.A.4 : Year-by-year Funding of Capital Expenditure for the Three Scenarios (Rs Crore)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BUSINESS AS USUAL LOW GROWTH																
Capital Expenditure cash-flow																
Capex	11,000	8,665	10,084	10,154	10,226	10,301	7,922	6,609	6,648	6,688	6,729	6,323	6,368	6,413	6,460	6,511
Sources:																
Internal																
Depreciation	0	4,429	4,634	4,864	5,084	5,294	5,436	5,480	5,492	5,505	5,520	4,731	3,574	3,682	3,787	3,887
Cash Profits	0	-1,994	-2,417	-2,943	-3,374	-3,856	-4,257	-4,487	-4,606	-4,806	-5,021	-4,448	-3,503	-3,842	-4,197	-4,980
External																
GOI Pref	0	2,396	2,823	2,786	2,718	2,667	1,917	1,509	1,460	1,430	1,403	1,283	1,261	1,241	1,223	1,281
GOI subs on non-remu. Lines	0	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of diesel cess @ Re 1/litre	0	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226
Mkt Borr	0	2,808	4,017	4,421	4,773	5,170	3,800	3,081	3,277	3,533	3,802	3,731	4,010	4,306	4,622	5,297
BUSINESS AS USUAL MEDIUM GROWTH																
Capital Expenditure cash-flow																
Capex	11,000	10,670	12,366	12,574	12,789	13,015	10,522	9,223	9,434	9,656	9,889	9,633	9,889	10,159	10,442	10,739
Sources:																
Internal																
Depreciation	0	4,479	4,786	5,121	5,448	5,766	6,010	6,148	6,254	6,364	6,478	5,793	4,742	4,961	5,181	5,402
Cash Profits	0	1,539	1,479	1,655	2,035	2,504	3,160	4,135	5,319	6,337	7,447	9,453	11,946	13,259	14,658	16,141
External																
GOI Pref	0	2,842	2,996	2,924	2,762	2,559	1,204	217	0	0	0	0	0	0	0	0
GOI subs on non-remu. Lines	0	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of diesel cess @ Re 1/litre	0	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232
Mkt Borr	0	783	2,075	1,843	1,513	1,154	-883	-2,309	-3,171	-4,077	-5,068	-6,644	-7,831	-9,093	-10,428	-11,836
STRATEGIC HIGH GROWTH CASE																
Capital Expenditure cash-flow																
Capex	11,000	11,091	13,143	15,022	15,298	15,589	13,163	11,934	12,217	12,514	12,824	12,650	12,991	13,350	13,725	14,119
Sources:																
Internal																
Depreciation	0	4,489	4,825	5,217	5,638	6,051	6,388	6,618	6,831	7,045	7,262	6,676	5,724	6,040	6,357	6,673
Cash Profits	0	-1,789	-1,474	-1,005	-261	265	556	-521	-33	242	283	1,237	2,988	5,042	6,333	6,410
Asset Sale	0	0	500	500	500	500	500	0	0	0	0	0	0	0	0	0
External																
GOI Pref	0	2,451	2,738	3,063	2,627	2,299	747	0	0	0	0	0	0	0	0	0
Multi-Lateral Funds	0	1,000	1,000	1,000	1,000	1,000	0	0	0	0	0	0	0	0	0	0
GOI subs on nonremu. Lines	0	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of diesel cess @ Re 1/litre	0	237	237	237	236	236	236	236	237	237	237	237	236	236	236	236
Mkt Borrowing	0	3,910	4,522	5,213	4,758	4,438	3,936	4,800	4,383	4,190	3,739	2,750	1,962	0	0	0

Source: Expert Group.

Exhibit 5A.5 : Business-as-Usual Low Growth Scenario (Rs Crore)

Year ending 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Revenues																
Freight	23,608	24,165	24,735	25,318	25,915	26,526	27,152	27,792	28,448	29,119	29,806	30,509	31,228	31,965	32,719	33,490
Passenger	10,148	10,435	10,731	11,034	11,347	11,668	11,998	12,337	12,687	13,046	13,415	13,795	14,185	14,586	14,999	15,424
Other Coaching	856	880	905	931	957	984	1,012	1,041	1,070	1,100	1,132	1,164	1,197	1,230	1,265	1,301
Revenue (Traffic)	34,612	35,480	36,370	37,283	38,219	39,178	40,162	41,171	42,205	43,265	44,352	45,467	46,610	47,781	48,983	50,215
Revenue (Other)	700	717	733	751	768	787	805	824	844	863	884	905	926	948	970	993
Govt. Subsidy on non-remu. Fixed infra	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of diesel cess @ Re1/litre	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226	226
Total Revenues	35,312	37,223	38,130	39,060	40,013	40,991	41,993	43,020	44,074	45,154	46,262	47,397	48,561	49,755	50,979	52,234
Staff Costs	11,885	12,076	12,269	12,466	12,666	12,869	13,075	13,285	13,498	14,135	14,802	15,500	16,231	16,997	17,798	18,638
Fuel Costs	5,112	5,240	5,371	5,506	5,644	5,785	5,931	6,079	6,232	6,388	6,548	6,712	6,880	7,053	7,230	7,820
Repairs and Maintenance	2,787	2,857	2,928	3,002	3,077	3,154	3,233	3,314	3,397	3,482	3,570	3,659	3,751	3,845	3,941	4,040
Others	5,448	5,584	5,724	5,868	6,015	6,166	6,320	6,479	6,641	6,808	6,978	7,153	7,333	7,516	7,705	7,898
Operating Expenses	25,232	25,757	26,293	26,842	27,402	27,975	28,560	29,157	29,768	30,813	31,898	33,025	34,195	35,411	36,674	38,396
Pension	5,518	5,852	6,197	6,555	6,847	7,228	7,621	8,110	8,615	8,800	8,988	9,181	9,377	9,578	9,783	9,993
EBITDA	4,562	5,614	5,639	5,663	5,764	5,788	5,812	5,753	5,690	5,541	5,375	5,192	4,989	4,766	4,521	3,845
Interest & Finance Charges	2,951	3,179	3,421	3,742	4,054	4,350	4,633	4,760	4,804	4,842	4,877	4,909	4,918	4,925	4,932	4,938
Operating Ratio	95	93	94	95	96	96	97	98	98	98	99	99	100	100	101	102
Depreciation	4,190	4,429	4,634	4,864	5,084	5,294	5,436	5,480	5,492	5,505	5,520	4,731	3,574	3,682	3,787	3,887
EBIT	372	1,185	1,005	800	680	494	376	273	198	36	-144	461	1,415	1,084	735	-43
PBT	(2,579)	(1,994)	(2,417)	(2,943)	(3,374)	(3,856)	(4,257)	(4,487)	(4,606)	(4,806)	(5,021)	(4,448)	(3,503)	(3,842)	(4,197)	(4,980)
PAT	(2,579)	(1,994)	(2,417)	(2,943)	(3,374)	(3,856)	(4,257)	(4,487)	(4,606)	(4,806)	(5,021)	(4,448)	(3,503)	(3,842)	(4,197)	(4,980)
Cumulative Book Profits	(2,579)	(4,572)	(6,989)	(9,932)	(13,306)	(17,162)	(21,419)	(25,906)	(30,512)	(35,318)	(40,339)	(44,787)	(48,290)	(52,131)	(56,328)	(61,309)
Pref Dividends																
Pref. Dividend (due)	1,148	1,162	1,259	1,352	1,428	1,488	1,517	1,511	1,491	1,466	1,439	1,407	1,371	1,335	1,297	1,260
Pref. Dividend (paid)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref. Dividend due but not paid - cumulative	1,148	2,310	3,568	4,921	6,349	7,837	9,354	10,865	12,356	13,822	15,261	16,667	18,039	19,373	20,671	21,931
Transfers to Reserves	(2,579)	(4,572)	(6,989)	(9,932)	(13,306)	(17,162)	(21,419)	(25,906)	(30,512)	(35,318)	(40,339)	(44,787)	(48,290)	(52,131)	(56,328)	(61,309)
Indian Railways : Cashflow Analysis																
Gross Cash Accruals	1,611	2,435	2,218	1,921	1,709	1,438	1,179	993	886	699	499	283	71	(159)	(411)	(1,093)
Add: Interest & Fin. Chgs Paid	2,951	3,179	3,421	3,742	4,054	4,350	4,633	4,760	4,804	4,842	4,877	4,909	4,918	4,925	4,932	4,938

Exhibit 5A.5 : Business-as-usual Low Growth Scenario (Contd...)

(Rs Crore)

Year ending 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Cashflow before Financing	4,562	5,614	5,639	5,663	5,764	5,788	5,812	5,753	5,690	5,541	5,375	5,192	4,989	4,766	4,521	3,845
Financing Flows																
Interest & Fin. Chgs Payable	2,951	3,179	3,421	3,742	4,054	4,350	4,633	4,760	4,804	4,842	4,877	4,909	4,918	4,925	4,932	4,938
Pref. Dividend Paid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Principal Repayment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Redemption of Pref. Cap	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,951	3,179	3,421	3,742	4,054	4,350	4,633	4,760	4,804	4,842	4,877	4,909	4,918	4,925	4,932	4,938
Cashflow after Financing	1,611	2,435	2,218	1,921	1,709	1,438	1,179	993	886	699	499	283	71	-159	-411	-1,093
Investment Flows																
Capex	11,000	8,665	10,084	10,154	10,226	10,301	7,922	6,609	6,648	6,688	6,729	6,323	6,368	6,413	6,460	6,511
Changes in Working Capital	223	120	65	63	61	59	57	55	53	51	50	48	47	45	44	73
Total	11,223	8,785	10,149	10,217	10,287	10,359	7,979	6,664	6,702	6,739	6,779	6,371	6,414	6,458	6,504	6,583
Requirement of Funds	(9,609)	(6,347)	(7,927)	(8,292)	(8,574)	(8,918)	(6,796)	(5,667)	(5,812)	(6,036)	(6,277)	(6,084)	(6,339)	(6,615)	(6,911)	(7,676)
Sources of Funds																
GoI Prefs	0	2,247	2,681	2,651	2,589	2,545	1,802	1,400	1,357	1,334	1,313	1,198	1,182	1,168	1,155	1,281
Asset Sales	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	0	2,247	2,681	2,651	2,589	2,545	1,802	1,400	1,357	1,334	1,313	1,198	1,182	1,168	1,155	1,281
Funding Gap (Mkt Borrowings)	0	(3,708)	(4,851)	(5,243)	(5,583)	(5,970)	(4,590)	(3,863)	(4,051)	(4,300)	(4,564)	(4,489)	(4,764)	(5,058)	(5,372)	(6,395)
PV of Extg Pref Cap	16396															
PV of Existing Debt	24,594															
Cashflow after fin. Extg liab.	19,085															
Investment Flows	(89,236)															
Funding Gap	(70,151)															
Net Funding Gap	(70,151)															

Source: Expert Group.

Exhibit 5A.6 : Business-as-Usual – Medium Growth Scenario (Contd...)

(Rs Crore)

Year ending 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Indian Railways : Cashflow Analysis																
Financing Flows																
Interest & Fin. Chgs Payable	0	3,179	3,454	3,712	3,919	4,068	4,163	4,071	3,865	3,603	3,291	2,936	2,513	2,057	1,574	1,070
Pref. Dividend Due	0	2,324	1,292	1,393	1,472	1,527	1,534	1,480	1,401	1,322	1,247	1,176	1,110	1,047	988	932
Principal Repayment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Redemption of Pref Cap	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	5,503	4,746	5,104	5,390	5,596	5,696	5,551	5,266	4,924	4,538	4,113	3,622	3,104	2,562	2,002
Cashflow after Financing	4,562	3,694	4,974	5,383	6,011	6,743	7,636	8,803	10,172	11,379	12,679	14,069	15,579	17,173	18,851	20,611
Investment Flows																
Capex	11,000	10,670	12,366	12,574	12,789	13,015	10,522	9,223	9,434	9,656	9,889	9,633	9,889	10,159	10,442	10,739
Changes in Working Capital	223	129	98	120	126	125	124	123	122	121	119	118	117	116	115	114
Total	11,223	10,799	12,464	12,694	12,915	13,140	10,646	9,346	9,556	9,777	10,008	9,751	10,006	10,275	10,557	10,853
Sources of Funds																
GoI Prefs	0	2842	2996	2924	2762	2559	1204	217	0	0	0	0	0	0	0	0
Asset Sales	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	0	2,842	2,996	2,924	2,762	2,559	1,204	217	0	0	0	0	0	0	0	0
Funding Gap (Mkt Borrowings)	(6,661)	(4,263)	(4,495)	(4,387)	(4,142)	(3,838)	(1,806)	(326)	616	1,602	2,670	4,318	5,572	6,898	8,294	9,758
PV of Extg Pref Cap	16396															
PV of Existing Debt	24,594															
Cashflow after fin. Extg liab.	122,765															
Investment Flows	(122,040)															
Funding Gap	726															
Net Funding Gap	726															

Source: Expert Group.

Exhibit 5A.7 : Strategic High Growth Scenario (Rs Crore)

Year ending 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Revenues																
Freight	23,608	24,276	25,192	26,381	27,874	29,715	31,677	33,769	35,999	38,376	40,910	43,226	45,673	48,258	50,989	53,876
Passenger	10,148	10,818	11,635	12,622	13,694	14,857	16,118	17,487	18,972	20,582	22,330	24,226	26,283	28,514	30,935	33,562
Other Coaching	856	884	926	983	1,057	1,137	1,222	1,315	1,414	1,521	1,635	1,759	1,892	2,034	2,188	2,353
Revenue (Traffic)	34,612	35,979	37,753	39,986	42,625	45,708	49,018	52,570	56,384	60,479	64,876	69,211	73,847	78,807	84,113	89,791
Revenue (Other)	700	726	761	804	849	897	948	1,002	1,058	1,118	1,182	1,249	1,319	1,394	1,473	1,556
Add: Revenue from non-conventional sources	800	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Govt. Subsidy on non-remu. Fixed infra	0	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of diesel cess @ Re 1/litre	0	229	231	234	235	237	237	237	237	237	237	236	236	236	236	236
Total Revenues	36,112	38,234	40,045	42,323	45,009	48,142	51,502	55,109	58,980	63,134	67,594	71,995	76,702	81,736	87,121	92,883
Staff Costs	11,885	12,076	12,269	12,466	12,666	12,869	13,075	13,285	13,498	14,135	14,802	15,500	16,231	16,997	17,798	18,638
Fuel Costs	5,112	5,314	5,575	5,905	6,294	6,747	7,201	7,687	8,206	8,761	9,354	9,934	10,550	11,207	11,907	12,652
Repairs and Maintenance	2,787	2,897	3,040	3,219	3,431	3,678	3,926	4,191	4,474	4,776	5,100	5,416	5,752	6,110	6,491	6,898
Others	5,448	5,663	5,942	6,293	6,707	7,149	7,619	8,121	8,655	9,225	9,832	10,479	11,169	11,904	12,687	13,522
Operating Expenses	25,232	25,949	26,826	27,883	29,098	30,443	31,822	33,284	34,834	36,898	39,088	41,328	43,702	46,218	48,884	51,710
Pension	4,134	4,394	4,665	4,944	5,172	5,470	5,778	6,162	6,560	6,700	6,844	6,990	7,140	7,293	7,449	7,608
EBITDA	6,747	7,891	8,554	9,496	10,739	12,229	13,902	15,663	17,586	19,537	21,663	23,677	25,860	28,226	30,789	33,564
Interest & Finance Charges	2,951	2,784	3,044	3,375	3,781	4,157	4,912	5,146	5,370	5,482	5,489	5,321	5,041	4,649	4,164	3,698
Operating Ratio	89	87	86	86	85	83	83	81	79	78	76	75	73	71	69	68
Depreciation	4,190	4,489	4,825	5,217	5,638	6,051	6,388	6,618	6,831	7,045	7,262	6,676	5,724	6,040	6,357	6,673
EBIT	0	3,401	3,729	4,279	5,101	6,178	7,514	9,044	10,756	12,492	14,401	17,000	20,136	22,185	24,432	26,891
PBT	0	617	685	904	1,320	2,021	2,602	3,899	5,386	7,010	8,912	11,679	15,095	17,536	20,268	23,192
PAT	0	617	685	904	1,320	2,021	2,602	3,899	5,386	7,010	8,912	11,679	15,095	17,536	20,268	23,192
Pref Dividends	-	1,164	1,259	1,359	1,440	1,487	1,478	1,376	1,232	1,099	978	867	765	672	587	509
Equity Distributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,565
Transfers to Reserves	0	(546)	(575)	(455)	(119)	534	1,124	2,522	4,154	5,910	7,935	10,812	14,330	16,865	19,156	21,118

Exhibit 5A.7 : Strategic High Growth Scenario (Contd...)

	(Rs Crore)															
Year ending 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MLA Borrowings																
BOP balance	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Additions	0	1000	1000	1000	1000	1000	5000	4900	4800	4700	4600	4450	4300	4150	4000	3850
Interest	0	0	0	0	0	0	619	606	594	581	566	547	528	509	491	469
Repayment	-	-	-	-	-	-	100	100	100	100	150	150	150	150	150	200
EOP Balance	0	1000	2000	3000	4000	5000	4900	4800	4700	4600	4450	4300	4150	4000	3850	3650
Rate of interest	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%
% of Loan Repaid	-	-	-	-	-	-	2%	2%	2%	2%	3%	3%	3%	3%	3%	4%
Surplus (Deficit) Post MLA Funding	(10,424)	(3,910)	(4,522)	(5,213)	(4,758)	(4,438)	(3,936)	(3,507)	(1,594)	323	2,348	4,805	6,895	9,142	11,563	14,124
Additional Market Borrowings	10,424	3,910	4,522	5,213	4,758	4,438	3,936	3,507	1,594	-	-	-	-	-	-	-
PV of Extg Pref Cap	16396															
PV of Existing Debt	24,594															
Cashflow after fin. Extg liab.	153,320															
Investment Flows	(149,978)															
Disinvestment proceed	2,140															
Net Funding Gap / Surplus	5,482															

Source: Expert Group.

6. FINANCING PLAN FOR THE STRATEGIC HIGH GROWTH SCENARIO

6.1 Introduction

Previous chapters have built up a case for a scenario that demonstrates feasibility and sustainability and yet provides an option that carries the Railways forward on a path towards greater investment and restructuring. Given the present precarious financial condition of railways it is difficult for IR, without implicit guarantee from Government of India, to raise any funds for its huge investment requirements. The Expert Group thus opted for a path that it has termed as the Strategic High Growth Scenario. This scenario accepts the need for substantial fresh investments in the Railways and also tries to ensure that financial obligations of the Railways to its stakeholders – employees, lenders and the Government – are met in full over a horizon of fifteen years. So long as the programme's net present value is positive over the lifetime of the project, a number of financing options become available. Many of the detailed financial options would depend on the mechanisms adopted for restructuring. What we have done is to provide one financing option in detail to illustrate that the strategic high growth option is feasible.

The kind of financial engineering required to raise the resources for the Strategic High Growth Scenario is discussed in section 6.2. The underlying principles of the funding plan are also described briefly in this section. Thereafter, schema of different financial instruments with their rollout plan consistent with investment requirement to achieve requisite growth rates is explained. The financial plan is based on careful analysis of the potential sources of funds in relation to railways' year-to-year fund requirements, available cash flow, and availability of credit support mechanisms to support the project debt. Sources and uses of funds, financial ratios and analysis are also given in brief in this section. Section 6.3 describes the perspective of the High Growth scenario. Section 6.4 summarises important economic features of the financing plan and the way forward.

6.2 Strategic High Growth Financing Plan

Unlike other infrastructure services, IR is primarily a commercial activity and users are always charged for the service provided. The demographic changes and rising income of railway users will continue to provide a stream of revenue that can finance the cost of service. The renewal arrears and safety works have to be funded upfront, before railways reach the stage where decisions to add new capacity and extension of network are based purely on demand and commercial viability of projects.

6.2.1 Guiding Principles and Constraints to the Funding Plan

The guiding principle of a probable rollout plan has been to minimise cost of funds to IR. The Expert Group also recognises that funds are required for capital investments not only to achieve requisite growth of an on-going concern, but also to achieve turn-around from a financially distressed condition of IR into a vibrant commercial organisation capable of raising funds on its own on the strength of its balance sheet.

Unlike other infrastructure services, railways is primarily a commercial activity and users are always charged for the service provided. The demographic changes and rising income of railway users will continue to provide a stream of revenue

Funds are required for capital investments not only to achieve requisite growth of an on-going concern but also to achieve turn-around from a financially distressed condition into a vibrant commercial organisation

Any commercial organisation including railways will have a dynamic business plan to derisk its balance sheet and maximise benefits for its stakeholders. For funding such a large capital expenditure, especially in the first five years, it is advisable to follow financial conservatism and orthodox methods

To achieve this task, it was decided that the rollout plan must meet all financial obligations. The capital restructuring of IR (Section 5.4) has played an important role here. It has been assumed that the government as sole creditor of the restructured preference capital and debt can afford repayment over a long period of time. The redefined financial obligations and liabilities are to be paid over a longer period than the model time horizon since IR is expected to continue operating indefinitely. The merger of IR with IRFC is bound to swell debt obligations of the balance sheet of the combined entity. None-the-less, all market obligations must be honoured. The rationale behind this is that the financial condition of the government will not permit it to write-off all or part of the debt. Moreover, as IR demonstrates that it is able to honour all its financial obligations, confidence among lenders and investors will grow.

The second principle followed is to redeem existing debt as soon as the railways turn the corner and start retiring preference capital soon after internal cash generation is sufficient to meet capital expenditure and other financial obligations. There would then be no need to have further injection of preference capital from the government. The rationale behind this is to reduce dependence on government funding and to illustrate that preference capital is required for the medium term only. This is to demonstrate that in the post-turn-around phase IR's financial structure is comparable to that of any large infrastructure organisation that is capable of attracting equity capital from private investors.

The third principle which was adhered to was to follow a conservative but prudent approach of not taking credit of any money which may accrue from complex restructuring deals or innovative financing options. This is because there are both revenue and operational expenditure implications with such options. This also underlines the fact that these options are more in the nature of improving functional efficiency of IR rather than construed as finance raising options. Undoubtedly, any commercial organisation including railways will have a dynamic business plan to derisk its balance sheet and maximise benefits for its stakeholders. The Group has not attempted to anticipate the details of such financing options. By choosing plain debt financing to fund IR's restructuring plan our estimates of funds requirement are set at the extreme. In the Expert Group's view, it is advisable to follow financial conservatism and orthodox methods for funding such a large capital expenditure, especially in the first five years.

The roll-out plan exhibited can be seen to be a schematic demonstration of one feasible financing plan. Fund requirements broadly match in-flow and out-flow of funds to demonstrate that investment requirements can be met within existing institutional and market constraints. The adherence of these principles has limited the options available to raising funds from the domestic debt market, which itself has many instruments for raising funds. However, investment needs of IR are so large that they cannot be met through one debt instrument alone as the market for each instrument is shallow. The IR's own supply of debt instruments can be an influencing factor in pricing of the instrument. Hence, the rollout plan has used many instruments available in the market in addition to matching revenue growth expected from the capital investments after a few years.

In a financing plan for any business (including IR), there are two critical issues to be considered:

- The ability of the business to service debt – IR has very limited cash available for the first seven years (in fact, it generates none itself and receives subsidy from GOI). So, a zero coupon bond would be logical.
- The depth of the market to which an instrument is addressed – there is a great deal of capacity in the Indian debt market for plain vanilla 5, 7, or 10 year PSU bonds. By contrast, there is only a small market for more sophisticated bond structures. But, both markets exist and to maintain price competition and cost diversity, IR (like any other business) should endeavour to utilise each market to some extent.

The current state of the debt market in India and IR requirements is described briefly in Annex 6.1. A note on possible alternative means of raising finance is attached as Annex 6.2.

6.22 Annual Fund Requirements of IR

On an average, in the last three years, revenue from passenger and freight services achieved growth rates in real terms of 8.2 per cent and 6.2 per cent respectively. In the financing model we have assumed that revenue from passenger services will increase from 7 per cent to 9 per cent in three years time and keep growing at this rate thereafter. Main components of this growth rate will be expansion in capacity, especially in higher classes, natural increase in demand for passenger services on the existing ‘golden quadrilateral’, and connectivity with other rapidly developing metropolitan cities as explained in Chapter 3.

Freight services are already priced at high levels and railways have been losing some valued customers. The restructuring plan aims to reverse this trend. Hence, in line with the economic rationale given in Chapter 3 we have assumed that growth in freight revenue in real terms, will gradually increase from 3 per cent to 7 per cent in the first five years. As railways transform their freight business on the lines of a logistics and supply chain management company that is responsive to consumer needs, the revenue growth will continue at the rate of 7 per cent per annum from the fifth year. After the tenth year it will stabilise at the rate of 6 per cent per annum. This is net revenue growth from freight business without tariff rebalancing. This is almost double the long-run rate of growth but less than the expected freight growth rate of 9 per cent assumed by the Planning Commission [Draft Integrated Transport Policy by Planning Commission (2000)].

Revenue from other coaching, though proportionately small, will rise faster than the freight revenue as majority of this revenue comes from small quantity of freight carried in brake-vans of all passenger trains. As these coaches have to be attached to all passenger-carrying trains as safety measures, this capacity can be profitably utilised through private operators. Overall revenue growth in the first two years increases marginally, but accelerates in the next three years as renewal arrears and safety works get completed.

Yearwise breakup of revenue growth and growth assumptions from different sectors are given in Exhibits 6.1 and 6.2 respectively.

6.23 Scheme of the Financing Plan

The schematic plan elaborates on the Expert Group’s conviction that implementing the vision statement outlined in chapter 1 and the restructuring

There is a great deal of capacity in the Indian debt market for plain vanilla 5, 7, or 10 year PSU bonds. By contrast, there is only a small market for more sophisticated bond structures

We have assumed that growth in freight revenue in real terms will gradually increase from 3 per cent to 7 per cent in the first five years. As railways transform their freight business on the lines of a logistics and supply chain management company that is responsive to consumer needs, the revenue growth will continue at the rate of 7 per cent per annum from the fifth year

Exhibit 6.1 : Revenue Growth Assumptions

Year ending 31st March	2001* (Base)	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Freight	0.70%	3.00%	4.00%	5.00%	6.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	6.00%	6.00%	6.00%	6.00%	6.00%
Passenger	3.30%	7.00%	8.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%
Other Coaching	-11.1%	3.50%	5.00%	6.50%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
Revenue (Traffic)	3.26%	4.19%	5.23%	6.27%	7.00%	7.67%	7.68%	7.69%	7.69%	7.70%	7.71%	7.09%	7.11%	7.13%	7.15%	7.17%
Revenue (Other)	16.0%	4.00%	5.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%
Revenue (Total)	1.41%	4.18%	5.22%	6.26%	6.98%	7.63%	7.64%	7.65%	7.66%	7.67%	7.67%	7.06%	7.08%	7.10%	7.12%	7.14%

(* on the basis of revised 2000-01 Budget Estimates) Source: Expert Group.

Exhibit 6.2 : Revenue Estimates – Based on Growth Assumptions**(Rs Crore)**

Year ending 31st March	2001* (Base)	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Freight	23,608	24,276	25,192	26,381	27,874	29,715	31,677	33,769	35,999	38,376	40,910	43,226	45,673	48,258	50,989	53,876
Passenger	10,148	10,818	11,635	12,622	13,694	14,857	16,118	17,487	18,972	20,582	22,330	24,226	26,283	28,514	30,935	33,562
Other Coaching	856	884	926	983	1,057	1,137	1,222	1,315	1,414	1,521	1,635	1,759	1,892	2,034	2,188	2,353
Revenue (Traffic)	34,612	35,979	37,753	39,986	42,625	45,708	49,018	52,570	56,384	60,479	64,876	69,211	73,847	78,807	84,113	89,791
Revenue (Other)	700	726	761	804	849	897	948	1,002	1,058	1,118	1,182	1,249	1,319	1,394	1,473	1,556
Revenue from non-conventional sources	717	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Govt. Subsidy on non-remu. Fixed infra	0	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of diesel cess @Rs1/litre	0	229	231	234	235	237	237	237	237	237	237	236	236	236	236	236
Total Revenues	36,029	38,234	40,045	42,323	45,009	48,142	51,502	55,109	58,980	63,134	67,594	71,995	76,702	81,736	87,121	92,883

Source: Expert Group.

Box 6.1 : “PALACE ON WHEELS”

The Palace on Wheels is a joint venture between the Indian Railways (IR) and Rajasthan Tourism Development Corporation (RTDC). It was introduced with the objectives of (i) increasing foreign exchange earnings, (ii) significantly adding to overall flow of tourists to India (contributing to India's image abroad) and (iii) generating opportunities for employment by promoting potential of RTDC. It was also the aim to offer a unique rail travel experience. First started as a meter gauge service in 1982, using the erstwhile royal saloons of the various princely states of Rajasthan, the average occupancy ranged from 41 per cent to 58 per cent in the first five years. Initially the fare was arrived at on a cost plus basis, with 50 % occupancy assumption. With the service growing in popularity over the years, the entire train was replaced by a newly manufactured meter gauge train set.

With conversion to broad gauge of the various routes in Rajasthan, the broad gauge Palace on Wheels train was introduced during 1995-96 as a 50-50 joint venture between IR and RTDC. The single rake of the Palace on wheels (comprising of 21 coaches) runs on the tourist circuit touching Delhi, Jaipur, Chittorgarh & Udaipur, Sawai Madhopur, Jaisalmer, Jodhpur, and Bharatpur & Agra.

The financial and management arrangements of the Palace on Wheels between IR and RTDC are currently as under:

- 1) IR and RTDC have invested equal share in the capital cost of the rake. The actual cost of the rake as worked out by ICF came to Rs 22.48 crore.
- 2) Railways are responsible for operation and maintenance of the train and to provide the entire infrastructure needed for the operation of the train including security of the rake, safety and security of the train during its run.
- 3) RTDC is responsible for house keeping, catering on-board as well as on ground, local sight seeing, entertainment of guests at all the destinations at the desired standard.
- 4) RTDC is responsible for the maintenance of interiors and furnishing and décor etc. by the RTDC either through the Railways on payment or form the outside sources.
- 5) There is still some disagreement on sharing of the earnings between IR and RTDC. While the Railway Board has “decided” to share the earnings in the ratio of 67:33 between IR and RTDC, the management of RTDC is insisting that the earnings of the should be shared at 50: 50 since they have made equal investment in the capital.

The popularity of this circuit is beyond doubt. It has also proved to be commercially viable. However, while the revenues are transparent, the costs are not. This venture has so far been managed as an “arrangement” between IR and RTDC, with each bearing its own costs. As is obvious, both parties, presumably depending on internal cost assessments, are seeking an appropriate revenue share. The solution would appear to be to convert the venture into a Special Purpose Vehicle (SPV), with an appropriate understanding of investments, and cost and revenue transparency. The SPV would pay the IR and RTDC for services rendered. The net profits could then be shared as dividends or used for further investments in this or even other circuits, depending on the SPV's business plans.

Source: Railway Board and inputs from Prof. G. Raghuram - Member, Expert Group.

programme of chapter 8 will transform railways into a commercially viable organisation. In order to continue to enjoy confidence with its only shareholder, the government, and prospective private sector investors and lenders, the Expert Group has imposed the following constraints on the viable scenarios of the Strategic High Growth plan of IR while drawing the roll-out plan:

- IR should redeem principal and accrued interest on the stock of existing debt in eleven years in equal installments to ensure that funds are available to meet IRFC's market obligations.
- IR should pay dividend to the government on preference capital right from the beginning.
- The government support should get phased out and railways should start borrowing right from the first year of restructuring plan what its balance sheet can sustain.
- The first charge on the cash profit of railways will be that of the government and hence railways should commit to redeem preference capital over twenty years commencing from 2007-08 in twenty equal installments.
- In the year 15, IR's balance sheet should be comparable to that of a profitable infrastructure service provider company.

The importance of these constraints is as follows. First, If IR adopts the Strategic High Growth path its balance sheet year after year should be able to demonstrate that it has transformed itself into a business-like organisation. The annual financial report of IR should mirror that. A phasing out of government backed debt will build up confidence with investors as it demonstrates that enough cash is being generated to redeem debt. Second, the returns on capital employed will demonstrate that railways has moved into higher value added transport logistics business which earns higher revenue per employee. Thus, labour and capital productivity are comparable with other companies. It can then potentially attract private equity investors who are ready to share risk and reward offered by a competitive rail company in a growing economy. Third, as an on-going business it can attract funds at market rate for its future modernisation and expansion plans.

The turn-around of IR will transform it into an efficient and wealth-creating organisation. However, before IR achieves this, government would have to demonstrate its commitment to IR by backing the proposed programme which is financially viable, and by setting in motion the reforms proposed. **The funding support provided by the government should be linked to a restructuring plan.** A contingent funding plan will incentivise IR to achieve pre-committed milestones. Markets will welcome such a plan as it will demonstrate that the government is financing reforms and not just bailing out continuing railways' deficits. The purpose behind this should be to irreversibly commit IR to reform which will lead to enhancing the certainty of cashflows. **In the view of the Expert Group, it is essential to get the reforms moving on a firm path within the first 3 years in order to kickstart the change program.** The primary thrust of the conditionalities is to guard against the possibility of a reversal in the restructuring process and to reduce uncertainty. At the same time, these conditionalities will commit the government to fund long-term capital requirements of IR to facilitate reform and also to fulfill its promises regarding subsidies through preference capital.

If IR adopts the High Growth plan its balance sheet year after year should be able to demonstrate that it has transformed itself into a business-like organisation

Government funding support could be linked to a restructuring plan. A contingent funding plan will incentivise IR to achieve pre-committed milestones

Box 6.2 : Container Corporation of India (CONCOR)

The management objectives of CONCOR (a Public Sector Undertaking under the Ministry of Railways incorporated in March 1988) are:

- To provide transportation logistics services for export-import as well as domestic cargo in containers.
- To expand the container terminal network in the country and to enhance market share of container business.
- To regain less-than-trainload general goods cargo from road to rail in containers through extensive marketing efforts.

CONCOR is a profit making company (it has been granted 'Mini Ratna' status) that has been recording impressive rates of growth, as evidenced by some key statistics tabulated below:

	1994-95	1998-99	CAGR (%)
Sales (Rs Crore)	217	684	33
Profit (Rs Crore)	23	140	56
TEU's (Lakhs)	4	8	19

Through the policy of PSU disinvestment, Government of India's shareholding in CONCOR has been brought down to 63 per cent. Stakeholders with substantial financial strength – FIIs, domestic financial institutions, mutual funds and banks, hold the remaining 37 per cent. In view of the present cash surplus position of the company it does not contemplate to raise resources through issue of fresh equity in near future.

While a substantial portion of its container traffic is transported through the Indian Railways, door-to-door services and transportation of containers from some of the CONCOR facilities that are not connected by rail are also undertaken. The road transportation and ancillary activities including handling of containers in most of the facilities are out-sourced from private contractors. Business tie-ups with state-owned warehousing enterprises are promoted.

CONCOR is now gearing up to provide cost-effective and efficient logistics services in both export-import and domestic areas to corporates in sectors such as tea, jute, FMCG ('fast moving consumer goods') products, aluminium and steel. The plan is to effectively integrate speed, bulk movement and cost effectiveness of long distance rail transportation with the flexibility of short haul road transportation for offering door-to-door service to customers.

CONCOR's aim is to provide customised solutions, and their mission now is to provide what the customers want. CONCOR intends to employ the 'hub-and-spoke' system to serve customers at their doorstep and optimise its own logistics arrangements. It will also create large warehousing capacities for transit, bonded, air cargo and hazardous cargo handling at various locations. The warehousing facilities will be put in place for customers who need minor assembly plants, packaging and/or palletisation, and any other viable small value addition based activities.

CONCOR's success in South India in particular, provides a good example to prove that door-to-door handling of utilized cargo is economical to run and can match, even better, the reliability and safety offered by road transport. It is economical to use containers to transport goods inland as a 20-foot container can load around 21.5 tonnes compared to only 10 tonnes in a nine-tonne truck. The maximum cost (October 2000) of transporting a container from Chennai to Delhi is around Rs. 30,000, against around Rs. 22,000 for nine tonne truck.

CONCOR began operations in the South by converting two railway goods sheds in Bangalore Contonment and Coimbatore into Container Terminals in 1989. Today it has a substantial market share, and to some extent, has gained an edge over private sector road transport operators in the region. Volume of business has grown 300 percent between 1996-97 and 1999-2000 over the preceding year.

In a major policy shift CONCOR which, so far, has handled only fully-loaded containers, has taken a conscious decision to market the piecemeal segment of cargo transportation by offering competitive rates and good transit time, compared to road transport. Some of the piecemeal cargoes include rubber, PVC resin, scrap, furniture, mango pulp, motor parts, turmeric, paper, China-clay, medicines, lube oil, dead burn magnesite, starch, sago and white cement.

Among Concor's ambitious future plans is the running of Rajdhani Freight Trains on the domestic circuit. In the eastern region, it has already launched the Calcutta-Chennai Contrack service in co-operation with South-Eastern Railway, South Central and Southern Railway. This is the first ever such freight train which runs as per a time-table just like a mail/express train. It plans to introduce more such services subject to demand from industry. It has already launched a series of scheduled contract trains on trunk routes between major cities.

What lies behind CONCOR's success is managerial freedom and responsiveness to market needs. These attributes which could exploit the fast-growing market in container cargo were bolstered by the monopoly position of the company and 'in-house' pricing arrangements for use of IR track and other facilities – a key input cost for CONCOR. The undertaking will be put to the test when a few more multimodal logistics companies are allowed to compete with it. On the other hand, such competition is necessary if CONCOR is not to derail from its 'mission' for the consumers to get improved service. Railways, in turn, stand to gain from expanded operations, which will utilize IR's fixed infrastructure in the best possible way. At that point, the pricing for the usage of IR track capacity will call for full transparency.

Sources: Information from Railway Board, CONCOR - Annual Report, 1998-99, and inputs from Prof. G. Raghuram, Member, Expert Group.

6.24 Roll-out of the Financing Plan

While designing the financing plan, due care has been taken of the constraints faced by Indian Railways and the government. It has also been kept in mind that the plan must fulfill the objective of transforming railways into a commercial organization responsive to its customers' needs while fulfilling all its contractual obligation and meet expectations of investors.

Financing by GOI Preference Capital

The underlying salient feature of the vision statement, as explained in Chapter 1, is to transform railways into a commercial entity. It is envisaged that GOI will be the sole equity holder of the restructured corporation for some time. The Expert Group is convinced that IR requires a large amount of investment upfront to finance renewal arrears and safety works – essentially those investments which railways should have done in the last few years but have not done – if it is to continue to play a leading role in the transportation sector.

As stressed earlier, the future of restructured railways is promising but at present it is in financial distress. It cannot raise funds from the market on the strength of its own balance sheet without paying a substantial payment risk premium. On the other hand, if Rs 6,600 crore (approximately 20 per cent of budgeted market borrowing of the central government for the FY 2001-02) is to be raised for IR by GOI every year for first five years, it will have an adverse impact on the finances of GOI itself. Hence, the Expert Group felt that a certain proportion of the cashflow shortfall should be financed by the GOI through preference capital. Using the financial model iteratively, we arrived at the figure of 40 per cent which will be able to generate cashflows to meet all the three ascending stages of financial viability mentioned in section 5.5. This action on the part of GOI will send a positive signal to the market that the 'sole equity holder' is convinced about the long-term viability of IR. Moreover, it will also give a signal to the markets that GOI is fully committed to ensuring that IR sticks with the investment plan. Almost all preference capital provided during restructuring phase, as per our schema, will be redeemed by the fifteenth year. **Exhibit 6.3** gives the net funds account of GOI preference capital. The Exhibit shows dividend payable to GOI on restructured and new preference capital as well as redemption of preference capital from seventh year onwards and a detailed schedule of preference capital from GoI.

Multilateral Funding

As discussed above, the financing plan has been developed by looking at what level of 'market' debt the business can support over the plan horizon, then filling the gap from two sources which by their nature, are lower cost (i.e. GOI

The Expert Group is convinced that IR requires a large amount of investment upfront to finance renewal arrears and safety works – essentially those investments which railways should have done in the last few years but have not done – if it is to continue to play a leading role in the transportation sector

A certain proportion of the cashflow shortfall should be financed by the GOI through preference capital. This action on the part of GOI will send a positive signal to the market that the 'sole equity holder' is convinced about the long-term viability of IR

Exhibit 6.3 : Net Funds Account of GOI Preference Capital*

(Rs Crore)

Year ending 31st March	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Beginning of period stock of GOI Prefs	16,396	18,847	21,585	24,649	27,276	29,575	30,322	28,806	27,289	25,773	24,257	22,741	21,225	19,709	18,193
Financing by GOI Prefs	2,451	2,738	3,063	2,627	2,299	747	–	–	–	–	–	–	–	–	–
Pref Dividend	1,234	1,415	1,618	1,817	1,990	2,096	2,069	1,963	1,857	1,751	1,645	1,539	1,433	1,327	1,220
Redemption of Pref Cap							1,516	1,516	1,516	1,516	1,516	1,516	1,516	1,516	1,516
End of period Pref Cap from Govt.	18,847	21,585	24,649	27,276	29,575	30,322	28,806	27,289	25,773	24,257	22,741	21,225	19,709	18,193	16,677

* Funds are in today's money with zero inflation.

Source: Expert Group.

preferential shares) or 'easier' to service than market debt. Thus, accessing multilateral funding through GOI falls under the latter category. The reason that it is easier for IR to service it is that it offers a long moratorium and a very long repayment period.

After meeting 40 per cent of the funds from GOI preference capital, the funds required by railways are still large compared to the absorption capacity of the domestic capital and institutional market. Such large funds, if raised by railways, with implicit backing of sovereign guarantee may adversely impact the spread between government securities and IR bonds of the same maturity. Hence, it has been suggested that IR seek a multilateral loan of little over US \$ 1 billion. Advantages of such a loan in financial terms are many. Such a loan has a five year moratorium and a twenty-five year repayment period. For IR, it will be easier to pay the loan from the future revenue streams. The Government of India normally charges 12.5 per cent (6.5 per cent after adjusting for inflation) from the borrowing agency on such loans as it provides a sovereign guarantee and foreign exchange risk.

It has been suggested that IR seek a multilateral loan of little over US \$ 1 billion. Advantages of such a loan in financial terms are many. Such a loan has a five year moratorium and a twenty-five year repayment period. An indirect benefit from such a loan will be that it unequivocally ties the borrower with performance criteria

An indirect benefit from such a loan will be that it unequivocally ties the borrower with performance criteria. Generally a multi-lateral agency loan is tied to a reorganisation plan, and tough decisions required to be undertaken during initial phase of reforms will get implemented in a time bound manner as further lending will stop if there is a wavering on the part of management or government¹. It would be clear, however, that this is a restructuring programme designed and proposed by the government itself and not one thrust on it by an external agency. According to a World Bank Policy Research Report, the primary benefit of conditionality-linked loans is that they provide a means by which reform-minded governments can publicly commit to policy measures and send a signal to the private sector that the reform programme is credible. Typical terms of such a loan are shown in **Exhibit 6.4**.

The year-on-year details of the plan are given in Appendix 6.3. The counterpart funds have not been given a separate treatment in the rollout plan as for the borrowing agency (i.e. IR) same conditions would apply for the loan and the counterpart funds.

Additional Market Borrowing : DDBs, ZCBs and MTNs

The funds required by IR in the first five years of the restructuring process, after infusion of preference capital and multilateral loans, are of the order of Rs 4,600 crore per year. This amounts to approximately 9 to 10 per cent of the privately placed debt market at present. This money can be raised by IR from the market with some marketing efforts.

The instruments used to raise these funds are in line with the long-term strategy of the financing plan as outlined earlier. We have used 6-year deep

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discount bonds with a 9 year flat amortisation schedule (6 tranches), zero coupon bonds and medium term notes to raise the required debt. The reason behind using different debt instruments is to match debt service capacity of IR and to ensure that all potential lenders are tapped to maximise the number of lenders. **Exhibit 6.5** gives year-wise breakup of market borrowings through different debt instruments, total interest accrued and paid and repayment schedule by the end of the programme.

A year-wise detailed break up of market borrowings through the deep discount bonds, zero coupon bonds and medium term notes is given in Appendix 6.4.

6.25 Sources and Uses of Funds

The Strategic High Growth plan envisages capital expenditure of comparatively large sums of money over the fifteen years. **Exhibit 6.6** presents a broad picture of the sources and uses of the funds. A close examination of the financial numbers shows that, in the first half of the plan, IR requires resources to build assets. According to this plan, exceptional support during the first six years will enable a turn around of railway finances. The year 2006-07 will then be a watershed year beyond which railways will not need subsidy from GoI in the form of preference capital. Capital expenditure requirements of the organization would henceforth be met from internal cash generation.

Box 6.3 : What the World Bank has done to Support Railway Restructuring

The World Bank's traditional role in lending to railways has changed as the understanding of how to approach the "railways problem" has evolved. In recent years, the Bank has shifted its focus to support of railway restructuring, with lending programs developed largely in order to support the restructuring process. Bank lending is of course tailored to the individual circumstances of each country. The following areas have received support to some degree in many programs though, of course, the mix and the emphasis was different in each case.

Restructuring Analyses. These analyses help to define the appropriate role of the railway in the future transport sector and to identify the best structure of the railway for filling that role. For example, the Bank supported the urban transport plan for Mamba that supports the need to improved rail service.

Asset rehabilitation to support the new structure. When the new role of the railway is agreed, the Bank has supported rehabilitation of assets to be used in the future operation, and even the construction of new facilities when the new structure will justify it. For example, the Bank loaned Brazil nearly US\$ 50 million for locomotive rehabilitation so that the new operators would have some locomotives with which to start concessioned operation.

Labor transitions and retraining. Restructured railways often have quite different demands for labor than their predecessors. The Bank has supported redundancy, resettlement and retraining schemes when needed to support restructuring. The Bank loaned Argentina US\$ 300 million to assist in the social impact of reducing the railway labor force from about 90,000 to around 20,000 employees.

Environmental cleanup is often needed because state-owned railways have been allowed to pollute the environment in ways that will not be acceptable in the new structure. The Bank has financed the environmental cleanup needed in Brazil, for example.

Changes in structure. Restructuring often requires difficult organizational changes, which are based on changes in management and accounting systems. The Bank has supported the design and implementation of new Management Information Systems and of analytical tools needed to complete analyses of structural change. For example, implementation of the MRVC in Mumbai will require changes in accounting information that the Bank could finance.

Risk Guarantees are often needed if the private sector's role is to be increased. The Bank has provided guarantees of continuity in the essential regulatory or legal framework, and the Bank has provided guarantees that permit extension of loan periods.

Transaction Management. Once decisions are made to carry out a change, e.g. concessioning, the Bank has the capability to manage the change process itself. This entails market analyses, discussions with potential bidders, contract formulation, bid analysis, and many other steps of implementing restructuring. The Bank provided transaction management services for Line 4 of the Sao Paulo Metro's BOT concessioning.

Investment in private operators. In at least 5 cases, the Bank's private sector arm, the IFC, has made direct investments in concessionaires operating formerly public railways.

Note by Louis Thompson, World Bank

Railways will need to borrow from the market for a further 6-7 years to fund distributed repayments of the six-year Deep Discount Bonds with flat repayments. The second half of the plan shows substantial increase in internal revenue generation which is used to meet financial obligations arising from restructuring of capital and reducing overall debt burden. In line with the additional restrictions placed on the Strategic High Growth Scenario, interest on existing debt as well as preference dividends are paid every year.

The Strategic High Growth plan envisages capital expenditure of comparatively large sums of money over the fifteen years. The second half of the plan shows substantial increase in internal revenue generation which is used to meet financial obligations arising from restructuring of capital and reducing overall debt burden

On the asset side, compared to approximately Rs 11,000 crore per year of capital expenditure at present, the restructuring plan envisages a capital expenditure of one-and-half times of this amount per year in each of the first five years, and then sustaining a level of about Rs. 12,500 to 13,500 crore over the following ten years. **Exhibit 6.6** shows a strong turn-around story in financial numbers as envisaged under the Strategic High Growth scenario with point of inflection in the year 2007.

We have not taken issuance of tax-free bonds by Railways as a source of raising funds from the market, but if government is to give permission to railways to issue upto Rs 1,000 crore worth of tax-free bonds for five years IR can bring down their interest liability by Rs 400-500 crore per year in the later part of the reorganisation phase. The government had given permission to IRFC earlier to raise funds through tax-free bonds and has given permission to other infrastructure organisations such as NHAI and HUDCO recently. Additionally, this suggestion is in line with the Expert Group's guiding principle of minimising cost of funds to railways (Section 6.21). A simulation on the Strategic Growth Plan was run to ascertain reduction in cost of funds if railways were to raise Rs 1,000 crore each year through tax-free bonds for the first five years of the reorganisation phase. Sources and uses of funds show that interest liability reduces as it is assumed that railways will pay interest to bond holders as they accrue and redeem these bonds in the ninth year (**Exhibit 6.7**).

6.26 Financial Ratios

Using the High Growth scenario we calculate various ratios which indicate financial health of the IR, over the time horizon of re-organization. The interpretation of financial ratios can be broadly categorized under the following heads:

- Ratios which indicate sustained increase in the operational efficiency.
- Ratios which show capacity of discharging debt service obligation.
- Ratios which indicate generation of cash from internal sources to meet substantial portion of its capital expenditure requirements.

Operational efficiency of IR

As may be seen from Appendix 6.6, EBIDTA/ Total Revenue increases from

Exhibit 6.5 : Summary of Market Borrowings

(Rs Crore)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Beginning of Period Balance	–	–	3,910	8,902	15,183	21,763	28,813	36,206	44,058	50,938	56,728	60,095	61,550	58,798	55,715	52,263
Additions	–	3,910	4,522	5,213	4,758	4,438	3,936	4,800	4,383	4,190	3,739	2,750	1,962	–	–	–
Interest Accrued	–	–	469	1,068	1,822	2,612	3,458	3,518	3,560	3,410	2,813	2,141	1,566	1,754	1,965	2,200
Interest Paid	–	–	–	–	–	–	–	827	1,727	2,702	3,994	5,070	5,820	5,537	4,957	4,307
Repayment	–	–	–	–	–	–	–	466	1,062	1,811	2,596	3,437	4,318	4,837	5,417	6,607
End of Period Balance	–	3,910	8,902	15,183	21,763	28,813	36,206	44,058	50,938	56,728	60,095	61,550	60,759	57,677	54,224	50,358

Source: Expert Group.

Exhibit 6.6 : Sources and Uses of Funds

(Rs Crore)

Year ending 31st March	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Sources															
EBITDA	7,891	8,554	9,496	10,739	12,229	13,902	15,663	17,586	19,537	21,663	23,677	25,860	28,226	30,789	33,564
Asset Sale	-	500	500	500	500	500	-	-	-	-	-	-	-	-	-
GOI Prefs	2,451	2,738	3,063	2,627	2,299	747	-	-	-	-	-	-	-	-	-
MLA Borrowings	1,000	1,000	1,000	1,000	1,000	-	-	-	-	-	-	-	-	-	-
Additional Borrowings	3,910	4,522	5,213	4,758	4,438	3,936	4,800	4,383	4,190	3,739	2,750	1,962	-	-	-
Short Term Borrowings	-	-	-	-	-	-	-	-	-	503	952	1,282	1,232	-	-
	15,252	17,315	19,272	19,624	20,466	19,085	20,463	21,969	23,727	25,905	27,378	29,104	29,458	30,789	33,564
Uses															
Int on Extg Debt	2,784	2,627	2,478	2,338	2,205	2,039	1,853	1,680	1,520	1,372	1,234	1,108	992	885	788
Repayment of extg Debt	-	-	-	-	493	881	902	918	932	941	948	950	950	947	941
Int on MLA Borrowings	-	-	-	-	-	619	606	594	581	566	547	528	509	491	469
Repayment of MLA Borrowings	-	-	-	-	-	100	100	100	100	150	150	150	150	150	200
Int on New Debt	-	-	-	-	-	-	827	1,727	2,702	3,994	5,070	5,820	5,537	4,957	4,307
Repayment of New Debt	-	-	-	-	-	-	466	1,062	1,811	2,596	3,437	4,318	4,837	5,417	6,067
Pref Div	1,234	1,415	1,618	1,817	1,990	2,096	2,069	1,963	1,857	1,751	1,645	1,539	1,433	1,327	1,220
Redemption of Pref Cap	-	-	-	-	-	-	1,516	1,516	1,516	1,516	1,516	1,516	1,516	1,516	1,516
Distribution to Equity	-	-	-	-	-	-	-	-	-	-	-	-	-	1,189	-
Capex	11,091	13,143	15,022	15,298	15,589	13,163	11,934	12,217	12,514	12,824	12,650	12,991	13,350	13,725	14,119
Increase in NWC	144	130	154	171	189	187	189	191	193	195	181	183	184	186	187
	15,252	17,315	19,272	19,624	20,466	19,085	20,463	21,969	23,727	25,905	27,378	29,104	29,458	30,789	33,564

Source: Expert Group.

Exhibit 6.7 : Sources and Uses of Funds with Tax-free Bonds

(Rs Crore)

Year ending 31st March	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Sources															
EBITDA	7,891	8,554	9,496	10,739	12,229	13,902	15,663	17,586	19,537	21,663	23,677	25,860	28,226	30,789	33,564
Asset Sale	-	500	500	500	500	500	-	-	-	-	-	-	-	-	-
GOI Prefs	2,451	2,738	3,063	2,627	2,299	747	-	-	-	-	-	-	-	-	-
MLA Borrowings	1,000	1,000	1,000	1,000	1,000	-	-	-	-	-	-	-	-	-	-
Additional Borrowings	3,910	4,607	5,383	5,013	4,778	4,361	4,894	4,175	3,707	4,010	2,680	1,945	-	-	-
Short Term Borrowings	-	-	-	-	-	-	-	-	-	445	963	1,287	1,134	-	-
	15,252	17,400	19,442	19,879	20,806	19,510	20,557	21,761	23,244	26,118	27,320	29,093	29,360	30,789	33,564
Uses															
Int on Extg Debt	2,784	2,627	2,478	2,338	2,205	2,039	1,853	1,680	1,520	1,372	1,234	1,108	992	885	788
Repayment of extg Debt	-	-	-	-	493	881	902	918	932	941	948	950	950	947	941
Int on MLA Borrowings	-	-	-	-	-	619	606	594	581	566	547	528	509	491	469
Repayment of MLA Borrowings	-	-	-	-	-	100	100	100	100	150	150	150	150	150	200
Int on New Debt	-	85	170	255	340	425	1,040	1,762	2,590	3,711	4,655	5,479	5,190	4,614	3,980
Repayment of New Debt	-	-	-	-	-	-	347	819	1,440	3,092	3,793	4,648	5,086	5,577	5,126
Pref Div	1,234	1,415	1,618	1,817	1,990	2,096	2,069	1,963	1,857	1,751	1,645	1,539	1,433	1,327	1,220
Redemption of Pref Cap	-	-	-	-	-	-	1,516	1,516	1,516	1,516	1,516	1,516	1,516	1,516	1,516
Distribution to Equity	-	-	-	-	-	-	-	-	-	-	-	-	-	1,372	5,019
Capex	11,091	13,143	15,022	15,298	15,589	13,163	11,934	12,217	12,514	12,824	12,650	12,991	13,350	13,725	14,119
Increase in NWC	144	130	154	171	189	187	189	191	193	195	181	183	184	186	187
	15,252	17,400	19,442	19,879	20,806	19,510	20,557	21,761	23,244	26,118	27,320	29,093	29,360	30,789	33,564

Source: Expert Group.

Box 6.4 : Build-Operate-Lease-Transfer (BOLT) Schemes

Under IR's BOLT scheme, bids are invited from private parties for financing and executing a whole project and not for executions only separate sub-components (earthwork, rails, sleepers, signaling, etc.) as is the case in the conventional method. The bids follow the 'two packet' process. In this system, bidders are first shortlisted on their technical/managerial and financing capabilities. Packet 1 is used to find out the eligible bidders. After that Packet 2 is opened to find out the most cost effective financial bid for Indian Railways. The successful contractor is awarded the project and he has to sign the various agreements with the Indian Railways.

Packet 1 contains the following details:

- Details of the plant and machinery with the contractor.
- Track record of projects handled by the contractor previously.
- Managerial expertise of the contractor in handling such projects with supporting evidence.
- Financial plan for the project together with the cash flows over the project's life. He has to specify the sources from where he will get the funds and the way he would manage the cash payments to be made over the project's life.
- The complete financial statements of the contractor or the company have to be provided so as to reflect their financial health.

Packet 2 contains a proposal of lease payments the company expects under different scenarios. The different scenarios are a function of:

- With/without tax benefits
- With/without depreciation benefits
- For a period of 8/10/12 years

Thus each bidder has to quote 12 different acceptable lease amounts that would be paid to the Railways, and should also specify the final transfer payment to be made at the end of the lease period in each case.

During project execution, constant monitoring and evaluation is to be done by the engineers from the Indian Railways to ascertain quality and timely progress of the project.

The BOLT scheme is innovative in certain respects. It can help in lowering the administrative costs for IR as the main construction work is taken over by the private contractor. It clubs the relative strengths in project management of the private partner and in rail operations of the IR. It was assumed that this form of privatization would - apart from raising additional resources, - bring in efficiency through better project management and reduced time and cost overruns.

Unfortunately, however, no BOLT scheme has been successful. At one time three 'Gauge Conversion' projects were offered under BOLT. One of the offers was withdrawn by IR on grounds of the need for urgency to implement the project, another got caught in litigation and is currently as good as a closed issue, while the third is still "alive," but proceeding at a very slow pace. Some of the technical features of the BOLT scheme are noteworthy.

Risks under the BOLT Scheme

The respective risks under the BOLT scheme (as compared to the conventional projects), for the IR and for the private contractors are given below:

Risks for Indian Railways

- Funding risks are transferred from IR to the private contractor; thus there are very few chances of the project languishing during implementation for lack of budgetary support or because of diversion of funds for other urgent or important projects.
- Previously the project used to be broken up and given to many contractors. Thus the risks were spread among different parties but now it is dependent on a single contractor; the contractor selection is thus a crucial variable in the whole scheme.
- Insulation from project completion risks. The agreement covers virtually all probabilities of delay or hold up in the project construction.

Risks for private contractors

- Project completion risks are high as the BOLT contractor has the sole responsibility for the whole project. There are also heavy penalties in case of time overruns.
- Increase in raw material supply risk the contractor has to arrange for the full supply. As most of the materials like rails, sleepers are specific to the railways and have few supply sources, the risk of increased costs due to inflation or adverse demand-supply position is high.
- Information uncertainties faced by the contractor increase the risks, as he is unaware of the exact details of the project as appraised by the railways and the project cost that he should take in his calculations while making a competitive bid.
- Risks on cash flows are guaranteed under the authority of President of India. The risks on return are thus the same as those of a sovereign bond, i.e., it is as good as return free of risk. However problems can be on contractual issues which could affect either the cash flows or the perception of investors.

Project Selection

(This is common to both the conventional method and the BOLT scheme.)

- Reconnaissance survey- This survey comprises a preliminary project feasibility study.
- Detailed engineering survey- as the name indicates it is a detailed study for finalizing the alignment and includes final location of stations, bridges, tunnels and any other important landmark. At this stage, detailed cost estimates for the project are also prepared.
- Traffic survey- this survey is made to estimate the expected traffic, both goods and passenger, and the additional revenues generated to make an assessment of cash inflows.

On the recommendations of ICICI in a Report commissioned by IR, the conditions applicable to BOLT Schemes have been completely overhauled recently. The main features of the new Scheme are given below:

- Design, Build, Finance, Own and Transfer concession (BOT)
- Net Present value of future periodic access charges during the concession period to be the only bid parameter
- Railways to provide detailed project report to pre-qualified bidders.
- Detailed design of bridges and structures to be done by the developer and approved by railways in time bound manner.
- To give sufficient comfort to lenders, railways to enter into tripartite agreement.
- Incentive to the developer for early completion to advance receipt of access charges.
- An independent engineer for project management and dispute resolution to be engaged by the Railways.
- Developer to be responsible for insurable force majeure only
- Railways to bear responsibility for all others including direct/indirect political force majeure.
- Developer to be indemnified against consequential losses.

Source: "Alternate Means of Financing Railways" by G Raghuram and M Ravi Babu, published in "Infrastructure Development and Financing: Towards a Public-Private Partnership", G Raghuram et al (editors), Macmillan India Limited, Delhi, 1999.

20.6 per cent in FY 2002 to 30.9 per cent in 2010, an increase in operational efficiency by approximately 12 per cent over the period. This is achieved by increase in total revenue from Rs. 38,234 crore in FY 2002 to Rs 63,134 crore in FY 2010 (an increase of 65 per cent) with an increase in expenditure from Rs 25,949 crore in FY 2002 to Rs 36,898 crore in FY 2010 (an increase of only 42 per cent). A similar trend is observed in other ratios such as EBIT/Total Revenue and PBT/Total Revenue. As the margins show marked improvement, ROCE indicates rising trend in capital productivity. ROCE in the year 2016 has a sharp increase as all debts are paid off in line with the financial plan assumptions.

The financial ratio analysis of successive year averages shows that the High Growth plan will transform IR into a commercially viable organization. It may be reiterated that the key to the entire transformation is higher operational efficiency

This sustained increase in operational efficiency generates additional internal resources to fulfil the debt obligations (both interest and repayments) and capital expenditure requirements.

Debt Service Requirements

In order to assess the ability of IR to meet its interest obligations and total debt servicing obligation, the analysis of interest coverage ratio (ICR) and the debt servicing coverage ratio (DSCR) is presented in Appendix 6.6. It may be observed that the interest coverage (EBIT/Interest Expense) improves from 1.22 to 2 over the eight periods whereas the DSCR is always above 2.8 during this period. In the High Growth Scenario the average DSCR is 4.2 with minimum DSCR being 2.81 in the years 2003 and 2004.

Capital Expenditure Requirement

The Financial and Credit Ratio statement (Appendix 6.6) brings out the fact that from the sixth year of re-organization, the annual yearly capital expenditure requirements of Railways is funded by its internal accruals (EBITDA/Capex is 1.06 in the sixth year). This indicates a healthy financial situation of IR, which again is a direct consequence of its operational efficiency.

Analysis of the Cash Flow Statement

The sources and uses of funds reflect the total cash inflow into the organization as well as the cash outflow due to its various obligations like capital expenditure, debt obligations etc. (Exhibit 6.6). It is evident from the cash flow statement that the IR is able to fulfil all its obligations viz. capital expenditure requirements, debt service obligations and returns to preference capital. This is reflected in continuous improvement in Return on Capital Employed (Appendix 6.6) which increases from 5 per cent in the first year of re-organization to 11.4 per cent in the 10th year.

The financial ratio analysis of successive year averages (**Exhibit 6.7**) shows that the High Growth plan will transform IR into a commercially viable

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organization. It may be reiterated that the key to the entire transformation is higher operational efficiency. The improvement in the ratios year-after-year (Appendix 6.6) provide advance signals to IR management and the outside world of its success in achieving the goals of re-organisation, thus fulfilling one of the needs of restructuring IR's accounts cited in Chapter 5.

Financial Analysis in Short and Medium Term

Institutional investors keenly observe comparative shifts in financial ratios in the short-term as well as medium or long-term. The best way to analyse this will be by comparing the ICR and the DSCR over the successive five years span (Exhibit 6.9).

The improvement in the ICR and the DSCR over successive periods suggests that creditworthiness of railways improves substantially after the first five years. One can infer from the results, that the strong cash-flow situation

Exhibit 6.9 : Financial Analysis in Short and Long Term

	First Five years			5-10 years			10-15 years		
	Min.	Max	Avg.	Min.	Max	Avg.	Min.	Max	Avg.
Interest Coverage Ratio	1.2	1.5	1.3	1.5	2.6	2.0	3.2	7.2	5.0
Debt Service Coverage Ratio	2.8	3.0	2.8	2.8	3.9	3.3	4.4	9.0	6.3

Source: Expert Group.

Box 6.5 : Own Your Wagon Scheme

This scheme was started in the early 1990s to get private investments for building up modern wagon stock. Under the scheme, the wagons could either be procured directly from a wagon builder or from the IR. In the former case, the wagon buyer has to pay a design fee and an inspection charge of one and a half per cent and in the latter case, the buyer has to pay a service charge of three per cent of the price. The utilization of the wagons, which could either be under a general pool or a closed circuit, would be mutually decided.

The parties eligible to enter the scheme are:

- Individuals as producers
- Corporate entities as producers
- Association or group of companies
- Thermal plants and other bulk consumers
- Leasing companies

Three possible arrangements are envisaged for the wagon owners, as given below:

- *Pure lease* : As a pure lease, the wagon is used by the railways as a general wagon and it pays lease charges at the rate of 16 per cent per annum, on quarterly basis for a period of ten years, followed by a rate of one per cent for the next ten years. The lease charge will be calculated on the current price of similar wagons owned by the Indian Railways. After the expiry of further ten years the lease is continued on mutually agreed terms. Owner however also has freedom to dispose of the wagon. Maintenance will be done by IR at its own cost.
- *Lease cum guaranteed clearance with general service wagons* : Under this arrangement, in addition to paying the lease as specified before railways would assure the lessor to clear a minimum volume of traffic during a specific period. The movement of traffic would however be subject to rules, legal and administrative provisions like the Railway Act, preferential traffic schedule, central or state government restrictions/bans on movement of goods etc. There would be no further freight concession. Maintenance of the wagons would be done by railways at its own cost.
- *Guaranteed Clearance* : In this category, lease charges will not be paid to the wagons moving in dedicated routes. Instead, Railways would give a concession in the freight rates depending on the movement patterns of the wagons. The freight concession would vary with changes in budget provisions. Maintenance would be done by the railways and the rates would be charged to owners at mutually agreed rates.

One drawback of the scheme is that it has many one-sided contract clauses, like the termination of guarantees in case of damage of wagons in accidents by paying the book value (which due to depreciation provisions of Income Tax law would be much lower than the market value of the asset). Similarly, in case there are any change of rules, which are unacceptable to the owner, the wagons would revert to railways at the book value.

In spite of certain changes in the modalities of the scheme, it has not picked up as expected.

While availability of wagons to participants could increase due to supply guarantees, the non-participants could also benefit due to increased wagon stock.

IR's ability in delivering service level guarantees is a significant issue. Conceptually, there would be a question as to whether such a scheme can be successful at all in a pooled wagon system. There is greater scope where wagons could be dedicated to a customer like in iron ore circuits, coal merry go round etc.

Source: "Alternate Means of Financing Railways" by G Raghuram and M Ravi Babu, published in "Infrastructure Development and Financing: Towards a Public-Private Partnership", G Raghuram et al (editors), Macmillan India Limited, Delhi, 1999.

after the first five years would provide IR adequate cushion to withstand any shortfall in cash flow during the implementation period.

6.3 Perspective of the Strategic High Growth Plan

The investment required for the High Growth scenario is large compared to yearly investment made by railways at present. Compared to the investment envisaged for the National Highways in the next seven years, investment for the High Growth scenario is approximately 60 per cent higher. But, it must be emphasised that whereas the National Highway Development Programme (NHDP) is only for the capacity expansion of National Highways, investment under the Strategic High Growth scenario includes all the capital investments required for railways. This includes investment in rolling stock in addition to replacement costs, including renewal arrears and safety works of Rs 90,000 crore over fifteen years (Chapter 4). During the first seven years investments for replacement, arrears and safety works put together will account for 58 per cent of this sum.

After initial investment and commercialisation of railways, the organisation has the wherewithal not only to meet infrastructure needs of the growing economy but also to repay all the concessional loans and preference capital. Therefore, it is incumbent on the government to accord priority to railways during its restructuring phase as it has given to the roads sector

Similar to the NHDP, which envisages upgradation of road infrastructure in the country, the Strategic High Growth plan should also be accorded equally high priority to provide an efficient rail network and rolling stock. Compared to the highly concessional multilateral loan provided to the National Highway Authority of India (NHAI), the recommended injection of preference capital for five years to meet capital expenditure of railways is not exorbitant. After initial investment and commercialisation of railways, the organisation has the wherewithal not only to meet infrastructure needs of the growing economy but also to repay all the concessional loans and preference capital. The financial plan shows that without concessional loans also, the railways' capital expenditure is viable through market borrowings. Therefore, it is incumbent on the government to accord priority to railways during its restructuring phase as it has given to the roads sector. Such a priority would be in line with the evolving integrated transport policy of the government. Moreover, competitive railway services for short- and medium-distance shall be beneficial for the country since a competitive transport sector will contribute to the overall competitiveness of the economy in the rapidly globalising scenario.

Undoubtedly, capacity expansion of major arterial routes provides immense choice to people in a flexible manner as the road network is an open access network. Yet, as **Exhibit 6.11** shows, a rail network – organised on

Exhibit 6.10 : Comparison of Capital Expenditure Requirement for the National Highway Development

Period	The NHDP	Period	Strategic High Growth Indian Railways
2001-2007	Rs. 58,000 Crore	2002-2008	Rs. 95,240 Crore
2008-20016	N.A.	2009-2016	Rs. 104,390 Crore

Source: Expert Group.

Exhibit 6.11 : Comparison of Transportation Cost and Energy Consumption

	Roads	Railways
Energy Consumption (BTU/Tonnes-Km)	1700	320
Transportation Cost (Rs/Tonne/Km)	2.44	1.55

Source: EIA Report of Bombay - Manmad Project (1993).

Box 6.6: Railway Sidings

In the early years of railway development in India and until the seventies, IR took it up on themselves to construct railway sidings to various factories on the paradigm that this would bring in rail traffic. There were norms of what traffic levels would justify a siding, depending on the costs. The entire cost was borne by IR, except the rail related assets within the factory premises. This was paid for by the factory owners, more to retain “ownership” of such assets.

The policy towards sidings began changing soon after, primarily driven by the fact IR was in a sellers market and were not really “soliciting” traffic. Today, siding costs, right from the survey stage, are expected to be borne by the customer. The IR does make exceptions in sidings with high traffic potential. The issue gets a little more complicated when the adjoining main line is electrified or converted. IR has been issuing a variety of notifications to deal with such issues and arrive at cost sharing terms. There is an apparent non-mutuality about such terms.

Non Mutuality of Relationship

- *Gauge conversion of sidings:* The policy circular for gauge conversion of sidings has become more complicated and involved over the years. A 1994 circular had four conditions in one page while the revised 1997 circular had 16 conditions in four pages. More importantly, the 1997 circular introduced a concept of guaranteed traffic being supplied by the industry over and above the maximum traffic of the past eight years, to qualify for IR spending on the siding conversion. However, though expected by the industry, there was no mutuality in that the IR could have guaranteed in the same circular that their freight rate would remain frozen for eight years.
- *Electrification of sidings:* IR are going ahead with railway electrification as a cost saving strategy. The IR are putting conditions on the owners of the sidings for sharing of the cost of electrification. The industry views that traction therefore remains the choice of the carrier and not of the customer. The user is offering traffic from one place to another and the carrier, in a market driven economy, should carry it. The IR, therefore, cannot impose the conditions of sharing of cost etc on the user. (If the IR have already taken the total traffic of the section without electrifying the siding, it is not relevant to ask for the cost from the owner. Alternatively, they have to reduce the traffic originating from the siding and justify the conversion of the section. Neither is happening).
- *Time and motion study:* There are IR rules providing for time and motion studies to be done for all the sidings to calculate reasonable loading/unloading times and consequent demurrage charges. These studies always exclude the times on IR account like that for cleaning of the wagons, riveting etc. A specific example is that of Gujarat Ambuja’s siding at Kodinar, commissioned in December ’86. The time and motion study was done in 1998. This resulted in benefits to Gujarat Ambuja. The implementation, however, took place in 1994, ie after 8 years of opening of the siding. The IR did not extend the benefits retrospectively. The Ropar siding of Gujarat Ambuja was commissioned in 1995 and the time and motion study was done in 1997. Again implementation was not done retrospectively. The IR, however, reserve the right to open all money matters retrospectively.
- *Wagon load vs train load rates:* Coal normally moves to the siding in train load rates. However, when a wagon gets disconnected (due to IR’s operations) and is placed into the siding, the higher wagon load rate is charged.
- *Enhanced carrying capacity rate:* Certain varieties of coal cannot be loaded upto the enhanced capacity of wagon. It is open to the IR to conduct a joint trial alongwith the industry and Coal India in a transparent manner and demonstrate how the enhanced carrying capacity can be achieved. Once they have done it they can charge the freight on enhanced carrying capacity. However, there are collieries where the IR officers, Coal India and the consumers feel that loading cannot be done upto the defined carrying capacity, but the IR continue to charge freight at the enhanced capacity.
- *Penal charges due to overloading:* Section 73 did not exist in the 1890 IR Act. It was incorporated in the 1989 Act and is reproduced below:
 Section 73 – *Where a person loads goods in a wagon beyond its permissible carrying capacity as exhibited under sub-section (2) or sub-section (3), or notified under sub-section (4), of section 72, a railway administration may, in addition to the freight and other charges, recover from the consignor, the consignee or the endorsee, as the case may be, charges by way of penalty at such rates, as may be prescribed, before the delivery of the goods.*
Provided that it shall be lawful for the railway administration to unload the goods loaded beyond the capacity of the wagons, if detected at the forwarding station or at any place before the destination station and to recover the cost of such unloading and any charge for the detention of any wagon on this account.

This Act now states that if coal is loaded beyond the permissible capacity, punitive charges can be recovered from the consignee or the endorsee. In other words, even if Coal India violates the carrying capacity, the punitive charges can be recovered from the cement siding owner. The 1962 Goods Tariff did not levy any penal charges if overloading was detected at the destination. The 1965 Tariff had the same provision.

This Act now permits the unloading of the excess quantity, if detected, at the forwarding station or any place before the destination station. Even when the excess is detected at the forwarding station (as per railway receipt), the IR are not taking any steps to take out the excess quantity, since operationally they find it difficult. The IR therefore carry this excess coal until the destination and then reserve the right to penalise the siding owner.

Customer Orientation

Siding owners, as key customers of the IR, often put forth the following requirements from railway operations.

- *Supply of wagons:* IR should supply the stock asked for with little or no delay. Open wagons should not be supplied against request for covered wagons. The supplies should be arranged with little or no bunching.
- *Transit time guarantee:* “Just In Time” approach is becoming important to the cement industry to eliminate inventory costs. This requires transit time guarantees and even containerisation.
- *No restrictions on free flow of goods:* The traffic must move freely, determined by market forces and not by IR. For example, if food grain loading picks up from Firzopur division, loading of covered wagons towards Mughalsarai runs into difficulties. Similarly, frequent restrictions are imposed on movement to individual railway destinations where a quota is applicable. If it is a capacity problem, what have the IR done to remove the bottlenecks? If it is a problem of terminals, what can the IR and industry do?
- *Rail connections to minor ports:* Traffic will start moving in a big manner to the interiors from the ports, especially coastal traffic from and to the minor ports. Therefore, transport infrastructure planning not only for the major ports but also the minor ports is important.
- *Claims settlement:* IR’s record for claim settlement is poor. For example, when wagons are involved in accidents due to suspected sabotage, IR are not willing to refund the freight and also not willing to prove that the unloaded goods were taken care of as required by law. The result is that the industry is fighting cases in the claims tribunal and adding to the workload on the both sides.

From the experiences of sidings, it is clear that customer orientation is no part of the management ethos of the IR. As quoted by an ex-railway officer turned senior executives of an industry association, “This (lack of customer orientation) permeates the whole process of definition of rules, procedures, interpretation and policies of IR. Customer centered policies on the part of IR would be imperative, if more freight traffic has to be attracted. Sidings should be viewed as a proactive measure to invest in and make the customer “captive” to IR.

Apart from the marketing angle, investment in sidings is also an important issue for wagon utilisation. As per the IR Year Book 1998-99, out of a wagon turn-round of 8.2 days, only 28 hours was the revenue earning run over an average lead of 669 kms. Most of the wagon turn-round time is spent in terminals, due to inadequate infrastructure or lack of co-ordination.

It may be best to think of SPVs in which IR and the concerned factory/factories have an equity share in owning and operating the siding. This would bring in stake holding in making the siding commercially viable. (A recent example is the siding to the GAPL port at Mundra, in which IR and GAPL share 50% of the infrastructure costs. This is however not structured as an SPV).

Source: Communication from Gujarat Ambuja Cements Limited, New Delhi, 1999 and Expert Group Members.

a closed access basis – is more environmental friendly, energy efficient and cost effective to meet nation's growing transportation demand.

As in the NHDP for capacity expansion of the road network, the High Growth scenario envisages capacity expansion of the rail network. After the year 2007, the reorganised railways would however be able to undertake this programme through internal resource generation just as the fuel cess is providing resources for roads through an effective user charge. During the first seven years, the cash outlay to the NHDP programme by GoI will be comparable to that of the Strategic High Growth programme of IR. It is understood that eighty percent of the World Bank loan given to NHDP will be serviced from the Consolidated Fund of India. In fact, money spent by GoI on railway restructuring will build quality assets for the government, for which it can find private investors without compromising transport needs of the economy provided by railways. Money realised through this route can be used by the government in creating social infrastructure of the country.

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Apart from IR being an environmental friendly mode of transport, there are certain inherent advantages in funding front loaded investment. First, the amortisation obligations are expected to be met by increase in revenue growth. Second, the financing plan indicates that increase in cost will be partly pass-through to passenger business, and the rest would be recouped from growth in volume of both, passenger and freight businesses (as explained in Chapter 3), thus providing a natural hedge. Third, with depoliticisation of tariff setting and the restructuring of IR as recommended in chapter 8 the commercial viability of railways is highly probable.

6.4 Summary

The programme for restructuring of IR which requires approximately Rs 200,000 crore or US \$ 40 billion of investment over a fifteen year period is a viable programme. It is a hot-seat restructuring plan without disturbing IRs current services and financial obligations. Moreover, within fifteen years all 'new' preference capital injected by GOI is redeemed and market obligations are met in full. The financing plan of the Strategic High Growth Scenario shows that it is viable and fulfils the three ascending conditions of viability referred to in Chapter 5. Whereas financing of restructuring of railways, in the initial period, rests heavily on preference capital supplied by the GOI and a loan available from multilateral institutions at commercial rates, its main purpose is to build confidence among other lenders through

Exhibit 6.12 : Capital Expenditure and its Financing (Rs Crore)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Capex	11,091	13,143	15,022	15,298	15,589	13,163	11,934	12,217	12,514	12,824	12,650	12,991	13,350	13,725	14,119
Sources :															
Internal															
Depreciation	4,489	4,825	5,217	5,638	6,051	6,388	6,618	6,831	7,045	7,262	6,676	5,724	6,040	6,357	6,673
Cash Profits	-1,784	-1,469	-1,000	-256	270	421	-631	-99	243	365	1,445	3,178	5,254	6,333	6,410
Asset Sales	0	500	500	500	500	500	0	0	0	0	0	0	0	0	0
External															
GOI Pref	2,451	2,738	3,063	2,627	2,299	747	0	0	0	0	0	0	0	0	0
Multi-Lateral Funds	1,000	1,000	1,000	1,000	1,000	0	0	0	0	0	0	0	0	0	0
Govt. Subsidy on non-remu. Fixed infra	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Return of diesel cess @Rs.1/litre	229	231	234	235	237	237	237	237	237	237	236	236	236	236	236
Mkt Borr	3,910	4,522	5,213	4,758	4,438	3,936	4,800	4,383	4,190	4,242	3,701	3,243	1,232	0	0

Source: Expert Group.

the GOI's commitment to the restructuring plan. It must be emphasised that government support is absolutely necessary during the initial phase of restructuring. Without such support, the Strategic High Growth Scenario will derail as no other source of support is available. Injection of a long-term loan from any multilateral institution would be subject to IR achieving pre-announced and agreed milestones and will help to ensure that government maintains its commitment through thick and thin. The objective of these conditionalities is to guard against the possibility of a reversal in the restructuring plan and to reduce market uncertainties.

Some alternative means of raising finances may be used to support investments envisaged in the Strategic Growth plan. We have taken credit for Rs. 500 crore/year over the programme period under the heading of non-conventional means of raising finances, and sale of assets worth Rs 2500 crore over the first five years. Some of the means to unlock potential value of assets will affect the asset as well as the liability sides of the balance sheet and, perforce, we have not used many of the instruments while drawing up the roll-out plan. Some of structured financial instruments can also be profitably used by the railways. The focus of these instruments is on inflation-indexed securities, leasing and securitization of receivables. The core idea embedded in all these innovative instruments is to reduce the cost of funds to IR and yet provide either guaranteed 'risk-free' returns or 'service' to investors. Some legal changes will be required to make these instruments attractive to investors, to facilitate issuance of these instruments, and to promote their liquidity (See Annex 6.2).

We have provided a relatively simple but robust financing plan using instruments that are currently available in the Indian capital market. It is a conservative plan and uses plain vanilla debt instruments. However, in view of the heavy borrowing requirements of the first seven years extensive use is made of zero coupon bonds, deep discount bonds and multilateral borrowings. These instruments are suggested in order to shift the debt-servicing burden of IR to later years when its financial position is projected to become much healthier. As the Indian capital market becomes more sophisticated it would be possible to use a greater diversity of financial instruments to raise resources for the investments required. IR would then be able to develop the market for innovative instruments and use them to further reduce the cost of capital, de-risk its balance sheet and improve its bottomline.

The financial plan outlined demonstrates financial viability of the Strategic High Growth Scenario sketched out in chapter 5. This demonstration of financial viability hinges crucially on exceptional government support during the first five years. Once such financial viability is demonstrated it should be understood that there are many possibilities of financing options that can be used to fund the kind of programme envisaged. What is provided in this financing plan is only one such option. As investors and lenders are convinced of the commercial and financial viability of IR many different project financing techniques become available. Annex 6.2 outlines some of these possibilities, including options such as leasing of equipment which are widely used in other railways, joint ventures with both public entities such as state governments as well as with private enterprises, BOT projects and the like. The exploitation of such new financing techniques would require the induction of market responsive financial managers into IR.

We have also treated the Indian Railways as a monolithic organisation

We have provided a relatively simple but robust financing plan using instruments that are currently available in the Indian capital market. As the Indian capital market becomes more sophisticated it would be possible to use a greater diversity of financial instruments to raise resources for the investments required

The financial plan demonstrates financial viability of the Strategic High Growth Scenario. Financial viability hinges crucially on exceptional government support during the first five years. Once financial viability is demonstrated there are many possibilities of financing options that can be used to fund the kind of programme envisaged

The bulk of the investment will be towards removing serious bottlenecks in the high density corridors, and in improving capacity through higher average speeds. Thus the Expert Group does not envisage serious traffic related risks to the programme

in this financing plan. As IR becomes commercially viable in a 5-7 years framework it could also be unbundled into different corporations accomplishing different functions. Each of such subsidiaries or privatised corporations could raise funds in the commercial market in different ways. We have not looked into such a possibility since our main aim is to demonstrate the financial viability of the Strategic High Growth programme that has been projected. The financial analysis in the short and medium term indicates that as a large infrastructure service provider, Indian Railways will be an attractive avenue of investment for equity investors, pension funds and insurance companies and the like. Its debt servicing capacity is well within the prudent norms for infrastructure projects. A sensitivity analysis has also been carried out, which shows that the viability of this programme is not sensitive to small changes in cost. The bulk of the investment will be towards removing serious bottlenecks in the high density corridors, and in improving capacity through higher average speeds. Thus the Expert Group does not envisage serious traffic related risks to the programme. Lack of sustained support from the government for implementation of the restructuring programme will, however, constitute serious institutional risk.

Underlying the success of the roll-out plan for financing the restructuring programme is the improvement in operational and investment efficiency. This can only be achieved if there is a compatible incentive structure and there is improvement in the 'software' side of IR operations. A coherent approach to railways reform must differentiate between a desire to improve rail services and a desire to attract private capital to remedy lack of public funds. The latter, which retains investment decisions within the public sector, and merely seeks to access private money, is unlikely to deliver what rail users need, as the decisions are not driven by market incentives. The first task of railways reorganisation must therefore be to transfer these decisions to the commercialised entity, whose incentives to cater to the consumer are much stronger. At the same time it is important to note that a commercial entity also delivers the goods only when it is faced with competition. To transform itself into a commercially viable organisation ready to compete with other modes of transport in passenger as well as freight business, IR must restructure itself to provide an incentive structure responsive to the needs of its customers. This imperative is well recognised within the members of the Railway Board. A former member of the Railway Board has said,

A coherent approach to railways reform must differentiate between a desire to improve rail services and a desire to attract private capital to remedy lack of public funds. The latter, which retains investment decisions within the public sector, and merely seeks to access private money, is unlikely to deliver what rail users need, as the decisions are not driven by market incentives

"Railway employees have been used to a situation where people used to come to them with requests to carry their goods. The trucker on the other hand goes to the doorstep of the customer. Our employees need to change their attitude in view of the changed situation where we no longer enjoy a monopoly situation".

(Business Standard – September 6, 2000)

Whereas it is essential that IR is reorganised into the kind of commercial viable enterprise that is proposed, the government could provide various sweeteners in the financing options available during the first 5 to 7 years. It is now generally accepted that essential infrastructure in the country could be financed partially through the issue of tax-free bonds of different descriptions. As mentioned, such bonds have been authorised to organisations such as the National Highway Authority of India (NHAI) for the financing of National Highway Development Projects (NHDP), and HUDCO for financing of urban infrastructure. The availability of such tax-free bonds to IR would

reduce the debt burden that it has to assume particularly during the first 5 to 7 years. Similarly the government has agreed to pass on even hard multi lateral lending to the NHAI on soft terms. Similar considerations can be given for the transfer of multi-lateral loans that can be obtained for the financing of the Indian Railways restructuring programme. In exchange for such sweeteners from the government IR would have to demonstrate its commitment to the kind of restructuring proposed in the report. It would have to demonstrate much greater customer orientation and its willingness to become a truly commercial organisation. This would also include significant tariff rebalancing, the reduction of many travel concessions that are currently given, and also perhaps more aggressive sale of assets that are currently not necessary for IR's core operations.

The success of the financing programme proposed for the strategic high growth scenario is crucially dependent on the credibility of the commitment shown by the government to undertake the kind of organisational restructuring proposed in chapter 8. It would be necessary to draw up a coherent programme of review which inspires confidence among lenders such as multilateral agencies and other lenders and investors. This would require a widespread consensus and constant monitoring of the reform programme. It would also mean that infructuous investments are no longer proposed nor made, and an explicit focus on growth and efficiency is demonstrated. Hence, organisational restructuring is the lynchpin of the Strategic High Growth scenario, to which we turn in chapter 8.

The success of the financing programme proposed for the strategic high growth scenario is crucially dependent on the credibility of the commitment shown by the government. It would also mean that infructuous investments are no longer proposed nor made, and an explicit focus on growth and efficiency is demonstrated. Hence, organisational restructuring is the lynchpin of the Strategic High Growth scenario

Appendix 6.1 : Glossary of Financial Terms

Net Present Value

The net present value of a project is the difference between what the project costs and what it is worth. The best one can do in advance is to estimate a project's NPV as its true market value, or what it is really worth, will not be known until the project is completed and the returns are collected.

Internal Rate of Return

It is the capital investment project's expected rate of return. If the cost of capital (required rate of return) equals the IRR (expected rate of return), the NPV would equal zero. As there is uncertainty attached with risky cash flows, the realised rate of return is generally different from the IRR.

Interest Coverage Ratio

The Interest Coverage Ratio expressed as EBIT/Interest measures the project's ability to cover interest charges. It equals earnings before interest and taxes, or the amount of funds available to pay interest, divided by interest charges. Interest charges represent interest that must be paid in cash, whether or not it is capitalised for accounting purposes.

Debt Servicing Coverage Ratio

The debt service coverage ratio accounts for all debt service payment obligations. In the absence of rentals and taxes it is equal to EBITDA/(Interest+ Principal repayments). When DSCR falls below 1.00, the project cannot fully service its debt out of project cash flow and will have to borrow funds or seek equity contributions to obtain funds to cover the short-fall.

Appendix 6.2 : Schedule of Preference Capital from Gol

(Rs Crore)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Beginning of Period Balance	16,396	16,396	18,847	21,585	24,649	27,276	29,575	30,322	28,806	27,289	25,773	24,257	22,741	21,225	19,709	18,193
Additions	-	2,451	2,738	3,063	2,627	2,299	747	-	-	-	-	-	-	-	-	-
Pref Dividend	1,148	1,234	1,415	1,618	1,817	1,990	2,096	2,069	1,963	1,857	1,751	1,645	1,539	1,433	1,327	1,220
Redemption								1,516	1,516	1,516	1,516	1,516	1,516	1,516	1,516	1,516
Cumulative Redemption	-	-	-	-	-	-	-	1,516	3,032	4,548	6,064	7,580	9,096	10,613	12,129	13,645
End of Period Balance	16,396	18,847	21,585	24,649	27,276	29,575	30,322	28,806	27,289	25,773	24,257	22,741	21,225	19,709	18,193	16,677
Pref Coupon	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Rate of interest	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%

Source: Expert Group.

Appendix 6.3 : Multilateral Financing Plan

(Rs Crore)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Beginning of Period balance	0	-	1,000	2,000	3,000	4,000	5,000	4,900	4,800	4,700	4,600	4,450	4,300	4,150	4,000	3,850
Additions	0	1000	1000	1000	1000	1000										
Interest	0	0	0	0	0	0	619	606	594	581	566	547	528	509	491	469
Repayment	-	-	-	-	-	-	100	100	100	100	150	150	150	150	150	200
End of Period Balance	0	1000	2000	3000	4000	5000	4900	4800	4700	4600	4450	4300	4150	4000	3850	3650
Rate of interest	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%
% of Loan Repaid	-	-	-	-	-	-	2%	2%	2%	2%	3%	3%	3%	3%	3%	4%

Source: Expert Group.

Appendix 6.4 : Break up of market borrowings into Deep Discount Bonds, Zero-coupon Bonds and Medium Term Notes
(Rs Crore)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
5-YEAR MEDIUM TERM NOTES																
Tranche 1																
BOP balance	0	0	0	0	0	0	0	0	0	0	4190	4190	4190	4190	4190	4190
Additions										4190						
Interest Paid	0	0	0	0	0	0	0	0	0	0	503	503	503	503	503	503
Repayment											0	0	0	0	0	0
EOP Balance	0	0	0	0	0	0	0	0	0	4190	4190	4190	4190	4190	4190	4190
Rate of interest	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
Tranche 2																
BOP balance	0	0	0	0	0	0	0	0	0	0	0	3739	3739	3739	3739	3739
Additions											3739					
Interest Paid	0	0	0	0	0	0	0	0	0	0	449	449	449	449	449	449
Repayment											0	0	0	0	0	0
EOP Balance	0	0	0	0	0	0	0	0	0	3739	3739	3739	3739	3739	3739	3739
Rate of interest	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
Tranche 3																
BOP balance	0	0	0	0	0	0	0	0	0	0	0	0	2750	2750	2750	2750
Additions												2,750				
Interest Paid	0	0	0	0	0	0	0	0	0	0	0	0	330	330	330	330
Repayment													0	0	0	0
EOP Balance	0	0	0	0	0	0	0	0	0	0	0	2750	2750	2750	2750	2750
Rate of interest	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
Tranche 4																
BOP balance	0	0	0	0	0	0	0	0	0	0	0	0	0	1962	1962	1962
Additions												1,962				
Interest Paid	0	0	0	0	0	0	0	0	0	0	0	0	0	235	235	235
Repayment														0	0	0
EOP Balance	0	0	0	0	0	0	0	0	0	0	0	1962	1962	1962	1962	1962
Rate of interest	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
Tranche 5																
BOP balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additions																
Interest Paid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Repayment																
EOP Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rate of interest	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
DDBs																
BOP Balance	0	0	3910	8902	15183	21763	28813	36206	39257	41179	41607	40513	37820	33501	28665	23247
Additions	0	3910	4522	5213	4758	4438	3936	0	0	0	0	0	0	0	0	0
Interest Accrued	0	0	469	1068	1822	2612	3458	3518	2984	2239	1501	743	0	0	0	0
Repayment	0	0	0	0	0	0	0	466	1062	1811	2596	3437	4318	4837	5417	6067
EOP Balance	0	3910	8902	15183	21763	28813	36206	39257	41179	41607	40513	37820	33501	28665	23247	17180

Appendix 6.4 : Break up of market borrowings into Deep Discount Bonds, Zero-coupon Bonds and Medium Term Notes
(Contd...)

(Rs Crore)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
ZCBs																
BOP Balance	-	-	-	-	-	-	-	-	4,800	9,759	10,930	11,653	13,051	14,617	16,371	18,336
Additions	-	-	-	-	-	-	-	4,800	4,383	-	-	-	-	-	-	-
Interest Accrued	-	-	-	-	-	-	-	-	576	1,171	1,312	1,398	1,566	1,754	1,965	2,200
Repayment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20,536
EOP Balance	-	-	-	-	-	-	-	4,800	9,759	10,930	11,653	13,051	14,617	16,371	18,336	-
MTNs																
BOP balance	-	-	-	-	-	-	-	-	-	-	4,190	7,930	10,679	10,679	10,679	10,679
Additions	-	-	-	-	-	-	-	-	-	4,190	3,739	2,750	1,962	-	-	-
Interest Paid	-	-	-	-	-	-	-	-	-	-	503	952	1,282	1,517	1,517	1,517
Repayment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EOP Balance	-	-	-	-	-	-	-	-	-	4,190	7,930	10,679	12,641	12,641	12,641	12,641
Total for All New Debt Instruments																
BOP Balance	-	-	3,910	8,902	15,183	21,763	28,813	36,206	44,058	50,938	56,728	60,095	61,550	58,798	55,715	52,263
Additions	-	3,910	4,522	5,213	4,758	4,438	3,936	4,800	4,383	4,190	3,739	2,750	1,962	-	-	-
Interest Accrued	-	-	469	1,068	1,822	2,612	3,458	3,518	3,560	3,410	2,813	2,141	1,566	1,754	1,965	2,200
Interest Paid	-	-	-	-	-	-	-	827	1,727	2,702	3,994	5,070	5,820	5,537	4,957	4,307
Repayment	-	-	-	-	-	-	-	466	1,062	1,811	2,596	3,437	4,318	4,837	5,417	6,067
EOP Balance	-	3,910	8,902	15,183	21,763	28,813	36,206	44,058	50,938	56,728	60,095	61,550	60,759	57,677	54,224	50,358

Source : Expert Group.

Appendix 6.5 : Balance Sheet of Reorganised IR

(Rs Crore)

Year ending 31st March	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
ASSETS															
Cash on hand	6,781	6,976	6,538	5,750	4,660	4,604	5,220	5,867	6,490	6,413	6,370	4,620	2,070	-883	-5,730
Gross Fixed Assets	101,050	115,318	132,709	151,523	171,884	190,056	208,001	227,473	248,615	271,581	295,594	321,735	350,209	381,240	415,077
Less: Accumulated depreciation	41,771	47,193	53,406	60,525	68,622	77,683	87,635	98,521	110,424	123,429	136,103	147,621	160,505	174,876	190,870
Net Fixed Assets	59,279	68,125	79,303	90,998	103,262	112,373	120,366	128,951	138,191	148,152	159,492	174,114	189,704	206,364	224,207
Funds with Govt. of India	8,584	8,584	8,584	8,584	8,584	8,584	8,584	8,584	8,584	8,584	8,584	8,584	8,584	8,584	8,584
Inventory	946	993	1,052	1,121	1,201	1,282	1,369	1,461	1,560	1,666	1,769	1,879	1,996	2,120	2,253
Sundry debtors	2,095	2,194	2,319	2,466	2,638	2,822	3,020	3,232	3,459	3,704	3,945	4,203	4,479	4,774	5,089
Miscellaneous items	3,804	3,804	3,804	3,804	3,804	3,804	3,804	3,804	3,804	3,804	3,804	3,804	3,804	3,804	3,804
Total Assets	81,490	90,676	101,600	112,723	124,149	133,470	142,363	151,900	162,089	172,323	183,963	197,203	210,637	224,763	238,208
LIABILITIES															
Equity capital	8,198	8,198	8,198	8,198	8,198	8,198	8,198	8,198	8,198	8,198	8,198	8,198	8,198	8,198	8,198
Pref. Share Capital	18,847	21,585	24,649	27,276	29,575	30,322	28,806	27,289	25,773	24,257	22,741	21,225	19,709	18,193	16,677
Retained Earnings	-546	-1,121	-1,576	-1,695	-1,161	-37	2,485	6,639	12,550	20,484	31,297	45,626	62,491	81,647	104,330
Long Term Debt	39,928	45,919	53,201	60,781	68,337	74,750	81,599	87,462	92,219	94,496	94,853	92,962	88,779	84,230	58,687
Short Term Borrowings	-	-	-	-	-	-	-	-	-	503	1,454	2,736	3,968	3,968	20,753
Other Liabilities (Non-interest bearing)															
Reserve Funds	1,821	1,821	1,821	1,821	1,821	1,821	1,821	1,821	1,821	1,821	1,821	1,821	1,821	1,821	1,821
Others' funds held	6,026	6,026	6,026	6,026	6,026	6,026	6,026	6,026	6,026	6,026	6,026	6,026	6,026	6,026	6,026
Payables	1,505	1,505	1,505	1,505	1,505	1,505	1,505	1,505	1,505	1,505	1,505	1,505	1,505	1,505	1,505
Dues to other depts.	4,682	4,682	4,682	4,682	4,682	4,682	4,682	4,682	4,682	4,682	4,682	4,682	4,682	4,682	4,682
Grants	1,029	2,061	3,094	4,130	5,167	6,203	7,240	8,277	9,314	10,351	11,386	12,422	13,458	14,493	15,529
Total Liabilities	81,490	90,676	101,600	112,723	124,149	133,470	142,363	151,900	162,089	172,323	183,963	197,203	210,637	224,763	238,208

Source: Expert Group.

Appendix 6.6 : Financial and Credit Ratios

(Rs Crore)

Year ending 31st March	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
EBITDA/Total Revenues	20.6%	21.4%	22.4%	23.9%	25.4%	27.0%	28.4%	29.8%	30.9%	32.0%	32.9%	33.7%	34.5%	35.3%	36.1%
EBIT/Total Revenues	8.9%	9.3%	10.1%	11.3%	12.8%	14.6%	16.4%	18.2%	19.8%	21.3%	23.6%	26.3%	27.1%	28.0%	29.0%
PBT/Total Revenues	1.6%	1.7%	2.1%	2.9%	4.2%	5.1%	7.1%	9.1%	11.1%	13.2%	16.2%	19.7%	21.5%	23.3%	25.0%
ROCE	5.1%	4.9%	5.0%	5.3%	5.8%	6.6%	7.6%	8.7%	9.9%	11.3%	13.5%	16.5%	19.0%	22.1%	32.2%
EBIT / Interest Expense	1.22	1.22	1.27	1.35	1.49	1.53	1.76	2.00	2.28	2.62	3.19	3.99	4.77	5.87	7.27
EBITDA / Interest Expense (DSCR)	2.83	2.81	2.81	2.84	2.94	2.83	3.04	3.27	3.56	3.95	4.45	5.13	6.07	7.39	9.08
(EBITDA - Capex) / Int. Expense	-1.15	-1.51	-1.64	-1.21	-0.81	0.15	0.72	1.00	1.28	1.61	2.07	2.55	3.20	4.10	5.26
EBITDA / Capex	0.71	0.65	0.63	0.70	0.78	1.06	1.31	1.44	1.56	1.69	1.87	1.99	2.11	2.24	2.38
Total Debt / EBITDA	5.06	5.37	5.60	5.66	5.59	5.38	5.21	4.97	4.72	4.36	4.01	3.59	3.15	2.74	1.75
Total Debt / (Equity + Pref. Capital)	148%	154%	162%	171%	181%	194%	221%	246%	271%	291%	307%	316%	318%	319%	236%

Source: Expert Group.

Annex 6.1 : Present Domestic Debt Market

The debt requirement estimated for IR in the plan is, on average, Rs 3,200 crore per year in the first nine years (**Exhibit 6A.1**). Given the large quantum of borrowing it is necessary to analyse the present domestic capital and institutional market for debt raising. The total debt raised from domestic capital market through capital issues for the year 1999-2000 was about Rs 55,000 crore. (**Exhibit 6A.2**) Additionally total corporate debt in the first six months of 2000-01 was Rs. 22,853 crore (**Exhibit 6A.3**). **Exhibit 6A.4** gives liquidity of each debt instrument on the National Stock Exchange. If we assume that all the money is going to be raised from the domestic capital and institutional market, it would be necessary to invoke government guarantees. The existing prudent exposure norms applicable for financial institutions will constrain institutions to lend to railways. Moreover, the duration of some of the instruments will be such that raising debt backed by government guarantee would go against the guiding principles of the funding plan.

Exhibit 6A.1 : IR's Fund Requirements

(Rs crore)

Year	GOI Pref Capital	Raising revenue through non-conventional means	Additional Market Borrowings
2001 (Base Year)		800	
2002	2451	500	3910
2003	2738	500	4522
2004	3063	500	5213
2005	2627	500	4758
2006	2299	500	4438
2007	747	500	3936
2008	(1516)	500	4800
2009	(1516)	500	4383
2010	(1516)	500	4190
2011	(1516)	500	4242
2012	(1516)	500	3702
2013	(1516)	500	3244
2014	(1516)	500	(1232)
2015	(1516)	500	–
2016	(1516)	500	(16785)

Source: Strategic High Growth Case: Chapter V.

Exhibit 6A.2 : Growth of Debt Raising through Private Placements

(Rs crore)

Year	Funds
1995-1996	10,000
1996-1997	18,000
1997-1998	31,000
1998-1999	38,000
1999-2000	55,000

Source – Prime Database.

Many of the debt instruments depend on the market conditions at the time of raising funds. Exhibits 6A.3 and 6A.4 indicate market breadth and depth of debt market. Keeping in mind IR requirements, the present debt market may not be sufficiently deep and liquid to absorb IR requirements. Hence, it will be necessary to look for alternative sources of funds.

Exhibit 6A.3 : Amount Raised from Debt Markets**(Rs Crore)**

Financial Year	1999-2000	2000-01 (six months)
Corporate Debt		
Public Issues	4,698	505
Pvt. Placement	54,701	22,348
Government securities	113,336	77,183
Total	172,735	100,036

Source : RBI and Prime Database.

Exhibit 6A.4 : Turnover of Debt Markets on National Stock Exchange**(Rs Crore)**

Financial Year	1999-2000	2000-01 (six months)
Govt. Securities	282,800	136,112
PSU Bonds	1,528	1,696
Institutional Bonds	3,345	1,291
Treasury Bills	11,007	8,348
Bank Bonds and CDs	805	944
Corporate Bonds	4,615	2,196
Others	36	46
Total	304,215	150,673

Source: Yearly review of Capital markets by National Stock Exchange, September 2000.

Clearly, IR's requirements through private placement will require some marketing efforts. IR will have to go for various types of debt instruments and raise funds from the capital market. However, fund requirements in the first few years are quite large in spite of the disposal of some assets, cost cutting and savings through operational efficiency, and railways will have to tap almost all the avenues to raise resources.

Annex 6.2 : Alternative Means of Raising Finances

We outline alternative means of raising finances which may be used to support investments envisaged in the Strategic Growth plan. We have taken credit for Rs. 500 crore/year over the whole period under the heading of non-conventional means of raising finances. Some of the means to unlock potential value of assets will affect the asset as well as the liability sides of the balance sheet and, perforce, we have not used many of the instruments while drawing up the roll-out plan given in Section 6.2.

A6.21 New Financial Instruments

Long Term Funds from Insurance Companies

As insurance market is being opened up in India and these companies have long-term funds available with them, they seek long-term borrowers of funds. IR can raise funds from these organizations at PLR and, probably, below PLR if backed by a letter of comfort from the GOI.

Securitisation of Certain Receivables

The Railway Ministry can raise money directly from financial institutions (FIs) and banks through the securitisation route to part finance its annual requirements. Under this method certain receivables, including anticipated realisations of dues to the Railways can be securitised. One of the streams of future receivables could be the part of the Central Road Fund earmarked for railways as reimbursement of diesel levy paid by railways.

Income tax-free bonds

Though the Government has taken an in-principle decision to phase out income-tax-free bonds, there is a market for tax-free bonds which Railways can tap to raise certain amount of money. This instrument is especially attractive to high income group earners. Just like NHAI, the railways should also be allowed to raise money from the market using these bonds.

Capital gains tax-free bonds

Apart from income tax free bonds, capital gain tax free bonds is another instrument which is a deep discount bond but as holder does not have to pay capital gains tax, the cost of borrowing for the issuer i.e. railways will be lower. Railways should be allowed to raise funds from the market using this instrument also.

A6.22 Financing of rolling stock

Leveraging of Unencumbered Assets (Leasing)

Most of the railways in other countries do not have monolithic organisations which design, build, operate and maintain assets themselves. Instead, there are specialised companies such as General American Transport Corporation (GATX) and GE Capital which have expertise and long experience in leasing different types of equipments such as wagons, inspection cars, motive powers etc.

The Railways can set up a leasing company with GATX or GE Capital or any other large company having sufficiently long experience in leasing railway rolling stock and equipments as equity partner who would bring models of leasing suitable for railway equipment, costing and designing of such equipment in line with future developments. As a lessor they supervise functioning of their equipment to improve productivity of their assets. One advantage of this arrangement is that there is no cherry picking and hence, the leasing company would ensure that productivity of all assets improve. In short, management, know-how and software expertise of these leasing companies as an equity holder shall improve productivity of the existing assets as well as help in producing equipment which can meet future needs.

Under this option the railways sell unencumbered rolling stock to a company, say, Raillease Co., which in turn, leases the rolling stock to the railways. Money which the IR gets by selling its rolling stock go into rehabilitation, upgradation and expansion of fixed infrastructure. Lease payment to Raillease Co. by the railways goes in servicing debt etc. of the Raillease. This option provides one time payment to railways but increases the operating cost as railways have to pay lease charges to the Raillease. Money which railways can garner by selling rolling stock depends on market conditions. This option is very much in line with the spirit of the restructuring process. There are legal implications

of leasing/selling of assets which railways should go into and request the government to enact enabling legislation to unlock asset value.

Operating lease is a variant of a normal lease. Under operating lease the Railways could even sell its fixed assets such as housing stock, hospitals etc to a leasing company and have a back-to-back leasing arrangement with the company¹.

There are two advantages to railways to go for a joint venture with leasing companies and go for operating leasing arrangements. First, the Railways will be able to leverage their existing unencumbered assets which can be invested in improving and strengthening the rail network, as fixed network is generally owned by railways. Second, in an uncertain demand scenario, equipment leasing will be beneficial to railways as they will be paying for the usage of equipment as and when they use it. The risk of technological obsolescence and lower utilisation of rolling stock due to fall in demand is borne by the leasing company.

Financing of rolling stock – OYW and BOLT

Cost of private investment in the form of the Build-Operate-Lease-Transfer (BOLT) and Own-Your-Wagon (OYW) schemes can generate investments to the tune of Rs 1,000 crore for a few years. In the past the Build-Own-Lease-Transfer (BOLT) scheme received a lukewarm response from investors because of weak structuring of the scheme. Now the Railways has prepared a new model concession agreement which does away with leasing and offers to bear the risk of traffic on lines of the annuity system proposed for the roads sector. The new model concession agreement document provides for a tri-partite agreement between the Railways, the project developer and the financial institution. Under the new scheme the Railways will pay an annuity to the developer who builds the asset. That would protect the builder from traffic risks, as the Railways would pay the charges irrespective of whether they generate that much revenue from the asset or not.

The OYW scheme too with certain revisions in terms of contract and improvement in 'extra' services provided to 'OYW' holder can be utilised to reduce investment required in replacing old wagons and to introduce wagons incorporating new technology.

Supplier's Credit

A large portion of the rolling stock requirements of IR is met from its own production units. If the railways or lessor import some of the rolling stock, it can get as much as 85 per cent of the finance from suppliers or export-import institutions. Usually, the term of the loan is 10-15 years and is available at competitive rate of interest linked to the LIBOR rate.

A6.23 Financing of fixed infrastructure to increase capacity and expand the network

SPV for Commercially Viable Projects with private sector participation

It may be worthwhile to look at viable projects, more specifically short and medium haulage projects close to ports having dedicated traffic. These SPVs, if structured appropriately, could reduce investments requirement for railways and enable it to gradually move toward re-structuring. For example, IR has signed an MOU with Pipavav Port Limited, Gujarat, a private company, to form a joint venture for conversion of Pipavav-Surendranagar metre gauge line into a broad gauge line. The Kandla Port Trust has also evinced interest in converting the 330 Km long railway line from Gandhidham to Palanpur from meter gauge to broad gauge at the estimated cost of Rs 250 crore. Kandla and Mundra port projects are the first private projects in port and rail connectivity. Such SPVs can also be formed on 'Golden Quadrilateral' to expand aggregate capacity of highly used routes.

SPV with State Governments

The Railways can form a 'Special Purpose Vehicle' (SPV) with state governments for taking up railway development schemes, with equal participation by the ministry of railways and the state government. The railways has already signed a MoU with Karnataka and Delhi and Mumbai has similar arrangements to develop urban transport network.

Construction of Sidings

¹ Such an arrangement was carried out by the KAT Industry of Mexico with GATX, who paid \$400 million for all their assets.

The Railways can also invest funds with public and private sector companies for construction of sidings, in order to recapture market share as well as to bring the rail network to the doorstep of large customers. Sidings are rail tracks that branch off from the railway line to factory gates, thereby providing door-to-door connectivity to the customers. The system of “assisted sidings,” can wean away traffic from the road sector. Currently, the entire investment for building the sidings are borne by the companies themselves and the railways only runs the wagons and charges a specified amount. The costs for developing sidings are high, which deters companies from constructing them. Additionally the reduction in the service and inspection charges would go a long way in attracting new private investors.

A6.24 Generation of revenue stream from private participation to utilise existing assets

Air space

Commercial exploitation of air space especially from commercial publicity in urban areas can bring substantial revenue. Using air space for billboards, hoarding etc. is already prevalent in metropolitan cities. This should be extended to other urban areas. Another potential avenue to raise revenue is from utilization of air space of railway stations. As railway stations are usually situated at the center of urban areas, commercial shopping complexes can be built to exploit the full value of land in such areas. Coupled with this the Rail Tel franchisee operated ‘Information Kiosks’ at many of the railway stations are also feasible².

Space on rolling stock

Commercial exploitation of space available on rolling stock especially for commercial advertisement has been a runaway success on local trains in Mumbai. This can be extended to metro/local trains of other metropolitan areas as well as to shuttle services of class A cities. Moreover, some space on through trains for small advertisements can be used.

Surplus Land

Surplus railway land at stations and unutilised Goods Sheds at roadside stations can be offered for development of warehousing capacity and, thereby generate additional traffic on the railways on the one hand, and supplement revenues on the other. In order that land assets are most efficiently utilised, a Land Development Authority in railways may be constituted.

In metropolitan and Class A cities, which have large commuter population, food court plazas can be built in partnership with leading food and beverage companies. Such food plazas can provide multiple cuisine, snacks and beverages, including take-away food packets of high standards of taste, quality, ambience and hygiene. It is understood that on certain stations some of the leading food chain operators are to start operating shortly. To unlock full potential of real estate near stations one has to think of shopping malls which provide convenience of shopping at competitive rates, as is the case on airports, to meet the immediate consumption needs of passengers.

JV with Cargo Operators

For containerised cargo to move seamlessly, railways need to have intermodal cargo terminals to provide quick access to the rail network. These terminals will be required at ports, airports and truck-terminals in major cities. These terminals can be developed on BOT basis by major domestic and international freight operators such as P&O, Mersk, Indian Transport Corporation etc. First advantage to railways in building this capacity on BOT basis is that demand risk will get mitigated as freight operators will ensure that these terminals, just like privately operated ports, are used extensively to move cargo³. Second, documentation required for multi-modal transportation gets standardised. Third, software skills required to attract freight customers towards multi-modal transport, which railways do not have readily available, will be available through these joint ventures.

Asset sales (Right of way, development of real estate etc.)

One of the most promising avenues to raise external resources is by sale of assets which are not getting fully utilised and are unlikely to be required for further expansion of the Railways. Under this, the Railways may sell ‘Right of

² The Railways have built multi-storied commercial complexes at Chennai Central Station and at Borivili, Andheri, Kalyan and Thane stations in Mumbai. Land along the tracks in Mumbai had been leased to railway employees to grow vegetables, but this was merely to prevent encroachments. In the year 2000-01, railways garnered Rs 100 crore from commercial utilisation of railways’ land and air space.

³ A BOT contract on the basis of revenue sharing will incentivise the operator to maximise utilisation of the railway’s fixed infrastructure capacity.

Use/Way' to telecom companies for laying optical fibre cable and even allow land in towns and cities, near stations, to be developed by private developers.

The Indian Railways' optical fibre cable (OFC) assets and exclusive right of way (ROW) across its entire network have been valued at Rs 375 crore by McKinsey & Co, the consultant for the broadband venture of the organisation. The railways already has about 4,600 km of OFC network along railway lines and should finish laying OFC in other areas, otherwise, it may be too late to garner any money from this venture as huge broadband capacity is being built by many private sector companies across the length and breadth of the country.

Though the Railways do not have unlimited supply of estate to be sold which can substantially fund new investments for the next 10-15 years, the existing properties can be profitably utilised by railways⁴.

An innovative variant of asset sale is based on unlocking of potential value of existing real estate. In many metropolitan areas, the Railways have maintenance workshops, railway-sidings etc., which in the past, were considered out of town locations. However, the expansion of cities has placed these properties in the heart of the town. The value of such properties can be unlocked, if the IR contracts with private property developers to develop for IR the similar facilities elsewhere. As soon as the new facilities are made available to IR, it could vacate the old facility, and the title of the land would then be transferred to the developer. Such a system has been tried out in Thailand. Under this financing option the main benefit to the IR is that it will get a technologically advanced facility which can also take care of future needs and solve the problem of constrained space which the old facilities presently face in many towns. The gains to the private developer come from the development of the land for commercial usage in a highly populated area and realise full value of the land⁵.

Palace on Wheel type facilities for tourism and pilgrimage tourism

In India immense tourism potential exists on many routes. In collaboration with state governments IR should develop the Palace on Wheels type facilities for other routes. Generally the Railways provide the facilities for operation of the train, which include the shells of the coaches, track and signaling, parking premises, telecom facilities and crew, while the responsibility to furnish the coaches, marketing the package to tourists and operation of services on board should be given to state government or a private tour operator.

JV of Existing Production Units – Equity Sale⁶

As part of the restructuring process the production units of the railways are to be corporatised and they should function as independent business units⁷. All the production units, namely, Diesel Locomotive Works (Varanasi), Chittaranjan Locomotive Works (Chittranjan), Integrated Coach Factory (Perambur), Diesel Components Works (Patiala), Indian Railway Wheel & Axle Plant (Bangalore) are specialised production units whose whole output is used by the Railways. It is a case of monospony : single producer having one customer only. But these production units require continuous technical improvements in design, materials and production technology and there are very few technology suppliers in the world. All the production units use patented and licensed technologies and production techniques most of which have not been updated. The injection of new technology in rolling stock is necessary to improve the traffic throughput of the system by raising freight car speeds to at least 100km/hr and to increase payload-to-tare ratio.

⁴ In the year 2000-01, railways raised Rs 100 crore from commercial advertising on trains and Rs 100 crore through estate. The railways have already entered into a memorandum of understanding with Housing and Urban Development Corporation Ltd. for developing properties over unutilised railway land and would use part of the property itself. The railways have identified 56 potential sites all over the country which can be developed for commercial use.

⁵ There are some legal restrictions on sale of real estate at present. We expect the government to amend the law to facilitate unlocking of market value of real estate under the control of Railways at present.

⁶ The Diesel Locomotive Works, Varanasi, was set up in collaboration with ALCO, USA and the Chittaranjan Locomotive Works was set up in collaboration with MAK, Federal Republic of Germany etc. Since the acquisition of designs and technology, considerable improvements and innovations have taken place in traction technology, which have resulted in reduced manufacturing, operation and maintenance costs, and improved operating performance. These improvements have yet to be incorporated into locomotives manufactured by IR.

⁷ The Ministry of Railways has agreed to spin-off its six captive manufacturing units into separate cost and profit centres. The six units will have separate accounting systems under a cost and profit approach. These units will be reimbursed the actual expenses incurred by them at the end of the year instead of the existing system of having funds allocated to them at the beginning of every year out of the Railway budget.

It is quite possible for IR to sell part or whole of the equity to the technology supplier who would then provide continuous upgradation in technology and help in exporting a part of the production as well. Railways, under this method benefit from technology upgradation and also share in higher return on their equity. The six manufacturing units' output in the year 2000-01 is estimated to be Rs. 3,300 crore. This is estimated on the basis of the transfer price which under-reports market price of the products. Heavy engineering companies such as BHEL and L&T have price-to-output ratio between 0.7 and 0.8. Assuming that the Railways manufacturing may have lower discount factor and higher market value of estimated output, it would be fair to assume that the Railway's production units will have 0.75 price-to-output ratio. This will give net present value of all the production units to be about Rs 2,500 crore.

A6.25 Leveraging of existing revenue streams

Construction of Rail Over/Under Bridges

When the traffic density reaches one lakh or more Train Vehicle Units (TVUs) at a level crossing, it is considered for replacement with road over/under bridges. On this consideration, there are 1108 level crossings on Indian Railways which require replacement. Construction of road over/under bridges is a joint venture (JV) of the Railways with the State Government/Local Authorities where the cost is shared by both. Construction of bridges across railway tracks is normally done by the Railways and approaches are constructed normally by the State Government/Local Authorities.

As the revenue stream from part of the diesel cess is already earmarked for such facilities, railways could adopt annuity or shadow toll procedures for getting such facilities constructed through private sector participation. This would help railways in improving its operations, and safety. Funds earmarked from the Central Road Fund could then be leveraged through securitisation. With annuity payment, the maintenance of the facility would also be passed on to the builder and his annuity payments would be linked to performance based indicators, thus ensuring that the facility is maintained over a long period of time.

A6.26 Innovative Financial Instruments for Raising Resources

We describe briefly some of structured financial instruments for the Indian Railways financing programme focusing on inflation-indexed securities, leasing and securitization of receivables. The core idea embedded in all these instruments is to reduce cost of funds to IR and yet provide either guaranteed 'risk-free' returns or 'service' to investors. Some legal changes will be required to make these instruments attractive to investors.

(i) Inflation-indexed securities

Though all investments are designed to generate returns that, at a minimum, preserve the purchasing power of the investment, inflation-indexed securities explicitly link the return on the investment to levels of inflation with the objective of preserving the real value of the investment and providing an additional real return to the investor. The objective of inflation-indexed securities is to provide real returns for investors and savings for the railways.

Inflation-indexed securities provide inflation protection by indexing the future cash flows of the security through an adjustment mechanism that creates a specific linkage to changes in a prescribed price index. The key feature of inflation-indexed securities is the positive dependence between the level of inflation and the cash flows under the security.

There are close similarities between conventional fixed and floating interest rate securities and inflation indexed structures. For example, a fixed interest security will carry a coupon that is designed to provide investors with compensation for both *expected inflation* and a real rate of return. Similarly, a floating rate security will carry a margin over an interest rate that is reset periodically. The movements in the underlying interest rate will reflect changes in inflationary expectations, providing the investor with both a real rate of return and compensation for inflation. In contrast, the inflation-linked security has a real rate that is fixed for the life of the transaction and inflation compensation explicitly linked to, and determined by, the *actual inflation* level over the life of the security. Thus, the key difference between inflation-indexed securities and conventional securities is the explicit adjustment for actual (as distinct from expected) price inflation and a pre-agreed and fixed real rate of return in the case of inflation-indexed securities.

Since railway fares are or at least should be linked to inflation, it would be appropriate that most, if not all, expenses of IR, including interest, are also inflation-indexed. In other words, if the general inflation regime in India were low, Railways would have lower revenues than if the general inflation regime were high; thus, it would be of advantage

to the Railways if the interest burden of the railways were lower during periods of low inflation. Moreover, since investors will probably accept a lower real yield in return for insurance against unexpectedly high inflation, indexing may significantly reduce the borrowing costs of IR in real terms.

Most economists believe that the real risk-free rate in India should be in the region of 3-4 per cent. However, the projected real rate for conventional fixed income securities in this report is 6 per cent. Thus, *ceteris paribus*, there is a potential saving of 2-3 per cent per annum on inflation indexed securities since the investor is protected against unexpectedly high inflation and there is a floor real rate of zero if there is an unexpected period of deflation. If railways use this instrument, the funding cost of funds to IR could get reduced by the premium currently required by investors to compensate for inflation risk to which railways have natural hedge as cost of its services are indexed to inflation. IR would acquire this benefit at the cost of assuming future inflation risk.

Based on a recent NCAER study, there is a large class of investors, particularly middle-class retail investors, that is very risk-averse. We believe that aversion to inflation risk is a significant component of risk-aversion, hence the preference for short-term bank deposits and gold amongst this class of investors, despite the average real return on bank deposits and gold being low. It appears that in the future there may be a significant appetite for inflation-indexed bonds by both insurance and pension companies as well as retail investors for securities insured by entities with explicit or implicit government support. Moreover, it should be noted that IR would also benefit from a liability portfolio perspective. Most of its long-term liabilities would be nominal fixed-rate liabilities (that would be more expensive in real terms during a period of unexpected disinflation) whereas the inflation indexed securities, that would form a small portion of its total liabilities, would be comparatively less expensive for IR during such a period. This would help in creating an internal hedge rather than betting solely on unexpected high inflation in the future. The capacity of inflation-indexed securities to provide protection against inflation is subject to certain practical limitations such as identification of an appropriate index (most inflation-indexed securities in the U.S., Canada, U.K., Australia and several emerging markets such as Brazil, Chile, Mexico, Poland, Turkey and Israel are indexed to a Consumer Price Index), index calculation including one-time adjustments, indexation lag (most countries have a 3-6 month lag linked to CPI) and the tax treatment of the returns on the inflation-indexed securities.

The following are some of alternative structures based on this premise.

- **Inflation-indexed coupon bond**

This structure is a conventional bond with a bullet maturity with a coupon paid either quarterly or semi-annually. Each coupon consists of a fixed real rate component as well as an inflation component for the relevant period. The fixed real rate coupon is pre-agreed at the time of the issue. The inflation component is calculated periodically over the life of the security and the nominal coupon payment is accordingly determined.

- **Capital-indexed bond**

This structure is a conventional fixed rate bond with a bullet maturity. The coupon paid on the bond is a pre-agreed real rate of return. On each coupon payment date, an indexation adjustment is made as follows:

1. The bond principal is indexed; that is, the principal value is adjusted by the inflation level applicable (“the capital adjustment”). This accretion to the principal is not paid to the bondholder at the time of calculation.
2. The real rate of interest is then used to calculate an additional interest amount based on capital adjustment (“the interest indexation amount”). This interest indexation amount is paid to the bondholder as part of the periodic interest payment.
3. The accumulated capital adjustment is paid to the bondholder at maturity.

The capital-indexed bond is in effect a normal coupon bond paying the real rate of interest with the cash flows (both principal and interest) being indexed to inflation.

- **Indexed annuity bond**

This structure consists of an amortizing bond where the principal and interest (calculated as the real rate of interest) is repaid by level installments. The periodic payments (both principal and interest) are adjusted for inflation. The capital adjustment and the interest adjustment are paid to the bondholder at each interest payment date.

All these variants incorporate a zero-floor element whereby if the periodic inflation falls below zero (deflation) the

bond value does not increase but there is an adjustment as of a future period.

(ii) Leasing

In a lease, the benefit of the depreciation on capital assets (and thereby, the tax shelter thereon) goes to the lessor, though the lessee operates and uses the assets. Since the cashflows to the lessor include the lower tax payable due to higher depreciation, to get the same return on investment, the lessor would charge the lessee lower financial costs. In other words, the lessee's cost of funds becomes lower as he passes on the depreciation benefits to the lessor.

The Railways is a non-tax paying entity, and hence has no use of the depreciation benefit. Nevertheless, railways is an ideal lessee, and financing its capital expenditure through leases will substantially lower its cost of funds.

(iii) Securitization of proceeds

An innovative way of raising much needed resources for the Railways could be through securitization of railway receivables, where the investors to the bonds are the users themselves. Bonds for retail investors may be floated whereby there is no interest payable, but the detachable coupons might be used for purchase of railway tickets at a discount of, say, 25 per cent. The retail investors may monetize unused coupons (or part of the value of the coupon that is not used). IR could immediately invest the amounts received and benefit from the float till the coupons are used.

This concept may be extended to the large corporate users of railways also (say, the thermal power generating companies, the oil sector PSUs and the Food Corporation of India). For buying these bonds, these large clients of Railways may be given a discount to regular freight rates over the life of the bond.

Annex 6.3 : Railways Pension Fund

The Railways established the Railway Pension Fund in 1964. The underlying intentions of the creators of this fund were good:

- it was to be funded out of railway revenues;
- it would meet current payments to railway pensioners;
- it would build up a fund to meet liabilities for future pension benefits;
- it would be financed on the basis of independent actuarial calculations such that it would have a sufficient balance to meet its liabilities.

The reality has been quite different – in the absence of an actuarial assessment and faced with competing demands for funds, IR has been unable to build up a funded scheme. Even today, IR is only managing to pay into the fund what the fund has to pay out to meet its current liabilities; even though some balances were accumulated in the Fund, they have been almost completely depleted to meet the commitments made on the basis of the Fifth Central Pay Commission (FCPC).

To summarise, the Railways Pension Fund has no funds available to meet its liabilities. The questions thus arise – how should that liability be considered and how can it be met?

Railway Staff Strength and Pensioners Today

Indian Railways today has approximately 1.5 million serving employees and almost 1.1 million pensioners. While the Railways staff strength has remained constant around 1.5 – 1.6 million since 1975, the number of pensioners has been increasing consistently over the same period - from 100,000 in 1975 to 700,000 in 1990 and approximately 1.1 million today.

Railway Pensioners In the Future

One can look at a pensions liability as being a cost which the current employees have to bear (or, better, as a cost which has to be met by revenue earned by those current employees). This allows one to consider two interesting statistics; the pensioners per current employee ratio, and the total pension cost as a proportion of total operating cost. This does not mean that the Expert Group believes that this is a problem which should be borne by the current employees – far from it. Rather, these statistics are useful to understand the nature of the problem facing Railways and its owner.

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Focusing on the Issues

What do all of these numbers tell us? The view of the Expert Group is that they indicate the scale of the problem – but, as noted above, they do not help in suggesting a solution. We, therefore, turn to the next question – why can't Railways just continue to bear these costs on the same basis?

It could, in much the same way as it is going to have to bear the various other costs associated with running a railway business – like the third party debt it inherits, wages, capital expenditure etc. In other words, IR could treat the pension liability as just another debt.

However, the Expert Group questions whether that is the right approach, for a number of reasons:

- 'Pay-as-you-go' systems such as that in place in IR are universally acknowledged to be highly flawed. They fail the fundamental principle of prudence which all businesses should adopt (accruing funds to meet future liabilities as these liabilities accrue), they provide no security to employees, they hinder employee choice and they are particularly dangerous in business where efficiencies are improving dramatically. In essence, such systems are not sustainable in commercial concerns;
- At a practical level, and as discussed in section 5.8, Railways is utterly reliant on GoI to meet operating and capital shortfalls i.e. IR can not serve its liabilities on its own. So there is no point in just 'leaving' the liability with IR – it will come straight back to GoI anyway;
- One of the key objectives of the Expert Group is to recommend a structure which, going forward, allows IR to be run as a going concern on commercial terms. Saddling it with a vast liability built up over the past 60 or 70 years imposes an unnecessary burden which its competitors in India and its comparators and peers around the world do not have to carry; and
- The employees of IR are entitled to some measure of security as to their pension benefits – with IR emerging into a riskier world, it may be preferable to insulate those benefits from the business.

Is There a Solution?

Yes, in fact there are many. This is an issue which has been faced by numerous businesses all over the world. It has been seen most frequently in government owned businesses (which, traditionally, treat business employees like civil servants and pay pensions on a PAYG basis out of the exchequer) as they move towards more commercial structures (and, in many cases, towards partial or complete private sector ownership).

So, how should IR deal with this? Step 1 is to assess the problem. This is most easily done if one can separate the liabilities into three categories:

- A. Liabilities to past employees;
- B. Future liabilities to current employees in respect of their pension entitlements accrued for past service; and
- C. Liabilities which will accrue in the future to employees (current and future) in respect of future employment.

Category C liabilities are the easiest to deal with – these are 'normal' costs of employment which any employer bears and which should therefore be allocated to IR (albeit that GoI may be paying or contributing to them for a few years via its subsidy).

Category A and B liabilities are rather different. These are liabilities which have already been run up, but for which no cash fund is available. These liabilities have been estimated, as at April 30, 2000 at about Rs 40,000 crore. This does not mean that Rs 40,000 crore is needed immediately – rather that this is the cash sum which, if invested today, would be sufficient (using its opening corpus and future investment income) to meet those accrued liabilities as they fall due.

How can such a fund be built up? That is a political question. The Expert Group's recommendation is that it be built up over a relatively short period (say in five years) by contributions from GoI, either direct or via Railways.

A final question needs to be answered : what form should such a fund take?

As mentioned above, there are numerous precedents. Our recommendation is as follows:

1. GoI and IR should aim to create a fully-funded scheme;
2. The fund should be independent of IR with an independent board of trustees and a clear set of rules governing, inter alia, investment principles and employee entitlements;
3. IR should pay contributions into the fund on an on-going basis to build up the corpus to meet Category C liabilities. It may be worthwhile (given point (8) below) to treat these liabilities differently – in that employees' benefits derived from future employment could be tied to actual performance of the invested funds rather than to the existing index-linked basis;
4. The sum required to meet the Category A and B liabilities should be contributed by GoI (ideally directly, rather than via Railways) over a limited period (say five years) from the exchequer/general reserve;
5. The fund should be sufficiently flexible to allow changes (particularly to allow transfer of pension rights) as the pension industry matures in India;
6. GoI should take over this liability from IR as part of the restructuring and corporatisation process (a normal route being for GoI to receive equity to the same value);
7. GoI and IR should ensure that employees and pensioners understand the changes and understand their impact on each of them;
8. It may be sensible for GoI and IR to ensure that Category A and B benefits available under the new scheme cannot fall below those which would have been available under the old scheme.

Exhibit 6A.7 : Railway Pension Estimates and Actual Payments

Year	Pension outgoes (Rs crores)			Discrepancies (per cent)	
	BE	RE	Actuals	RE/BE	Actuals/RE
1991-92	963	1000	1040	3.84	4.00
1992-93	1144	1268	1251	10.84	-1.34
1993-94	1516	1516	1488	0.00	-1.85
1994-95	1700	1750	1686	2.94	-3.66
1995-96	1970	2080	2117	5.58	1.78
1996-97	2350	2485	2509	5.74	0.97
1997-98	2500	3667	3509	46.68	-4.31
1998-99	2300	3830	4144	66.52	8.20
1999-00	3300	4094		24.06	

Note :

The estimation at the beginning of the year is reassessed at the Revised Estimates stage to take into account any fresh development during the year. The Budget and Revised estimates of pension liabilities since 1991-92 are given in Exhibit 6A.7. An average discrepancy of 4.8 per cent between the Budget and Revised Estimates during 1991-92 and 1996-97 shot up to 46.7 per cent and 45.8 per cent during 1997-2000. This is mainly due to the uncertainties involved in implementation of the FCPC recommendations and the issuance of a number of orders in this regard at different times causing delay in their implementation.

7. RAILWAYS RESTRUCTURING : USING INFORMATION TECHNOLOGY FOR GREATER EFFICIENCY

7.1 The Need for IT in Indian Railways

A large complex infrastructure system such as the Indian Railways can benefit greatly from the intelligent use of information technology (IT). India is emerging as a global power in this area. Despite the fact that IR was one of the earliest undertakings in the country to adopt computer based applications in the 1960s, the capabilities provided by IT have not been exploited adequately by Railways. The previous chapters have demonstrated the urgent need for both enhancing IR's revenues on a consistent and sustainable basis, and for achieving significant cost savings. Use of IT can aid in these activities greatly. Similarly, a key requirement for the transformation of IR is a major reorientation of the system toward focussed concern for customer needs. IT can greatly aid in improving the customer interface with IR. Putting in appropriate profit and cost centres for providing the right incentive structure for improving efficiency will also require the use of IT in management accounting, internal business process as well as financial accounting. Better utilisation of existing assets such as rolling stock can also be achieved by the use of IT in tracking these assets. Thus the kind of investment and revenue growth that is indicated in previous chapters cannot be achieved without very explicit attention being given to the use of IT in Indian Railways. The potential for the extensive use of IT in IR is indicated by such use in other large infrastructure networks, such as the large international airlines and even the large car rental systems in the United States. Indeed, the survival of railways will be determined by the capability of IR to live up to the challenge of merging their historical heavy engineering technology base with modern day information technology in order to become a profitable, logistical solution provider.

Given the size and breadth of Indian Railways, use of information technology for efficient management is critical. In the context of overall strategy and restructuring, it is imperative that information technology be used effectively to integrate roles across the traditional functional groups and to help accelerate the efficiency and productivity improvements needed to generate necessary financial resources.

In view of these considerations of the importance of IT for Indian Railways, the Expert Group decided to give explicit attention to this issue.

The basic guiding principles for developing and sustaining IT successful applications within the context of business strategy would be:

- **Create customer involvement and connect to the customer domain (e.g., Internet):** Applications, especially of the front office nature, should transcend boundaries of the railway organization and go into the domain of the customer. For example, the reservation system or enquiry system could be designed so as to be made available at any customer computer location. The scope to leverage the interface information for better customer service and for increasing value of "portals" is enormous and

Despite the fact that IR was one of the earliest undertakings in the country to adopt computer based applications in the 1960s, the capabilities provided by IT have not been exploited adequately by Railways

must be fully exploited.

- **Implement decision support systems:** This is a significant application area, both for service level improvement and better asset utilization. For example, the enormous volume of transaction data generated by the passenger reservation could be used for decision support systems aimed at:
 - a. Better planning of train services (where to start and terminate a train, frequency and timing)
 - b. Better planning of reservation facilities (number of counters over different time periods of the day, services to be provided at a counter and customer segmentation).

Similarly asset utilization can be improved by decision support systems aimed at facilities scheduling including wagons, coaching stock, platforms and tracks.

- **Initiate integration with communication systems and other technologies:** With instantaneous collection and distribution across the IR network being possible, new and enhanced applications can be considered. For example, electronic pagers, mobile phones, hand-held computers, universal product code readers, television, satellite communication, etc. would enable better coordination and quicker decision making based on precise information. Enquiry systems, train scheduling, resource scheduling, etc. can be made far more user friendly and efficient. Consider the value enhancement possible by making available information on unutilised berths and seats to stations ahead even during the run of a train. In this specific context of communication technology, the IR has scope to leverage their right of way to build communication capacity for “selling” to other users.

An example of integration with other technologies is the use of geographic information systems (GIS). Being a geographically dispersed organisation, IR freight and passenger business can benefit significantly through applications using GIS. This would help in future investment planning. Alternate routings for train services can be evaluated along various criteria like population/ demand coverage, distance travelled, time taken etc. Integrating GIS with decision support systems could further enhance the effectiveness of an application. For example, an itinerary planning system, to enable a tourist to choose an appropriate travel plan, would be enhanced significantly with geographic information system providing information on various tourist centers, locations of facilities, maps, local travel times, etc. Another important use for GIS could be in training of key personnel like drivers (through simulators). On a similar line, one can even think of providing an advance view of the track ahead to train drivers. Extending the logic, automatic train control with manual override would also be possible.

- **Initiate “Reengineering” – both at the monitoring and planning levels:** For effective management by the use of IT, often, existing systems for monitoring and planning need be completely modified (“reengineering”). For example, train service performance is today primarily measured by terminal punctuality. There is an attendant (and serious) issue of conflict of interest, since the control for providing

Electronic pagers, mobile phones, hand-held computers, universal product code readers, television, satellite communication, etc. would enable better coordination and quicker decision making based on precise information. Enquiry systems, train scheduling, resource scheduling, etc. can be made far more user friendly and efficient

terminal slack while time tabling rests with the monitoring authority. Ideally train service should be measured:

- Against an independently established standard and
 - At all the intermediate stations (at least the major ones) where there is traffic using the train. While this may not have been possible under the manual system, the same can be achieved with the appropriate use of IT.
- **Manage continuous improvement in technology:** While a variety of IT applications can be identified and developed, no application can aim to address all possible requirements in the first attempt. A culture of continuous improvement is essential, not only to make the applications better, but also to keep identifying new applications. Towards this, appropriate training for the managers (who would be the users) is essential. The organizational structure and functional reporting systems at the divisional, zonal and Railway Board level need to be examined from the criteria of providing an appropriate organizational climate for application identification, development, use and improvement.

The Expert Group focused on the issues mentioned above and analysed how these guiding principles were being managed in the three key areas – freight, passenger and overall decision making.

This chapter attempts to link the overall strategy of Indian Railways with required IT initiatives, and is organised in following sections:

- Using information technology to increase efficiency and support organisational changes
- Current state of key IT systems in Indian Railway
- Information technology initiatives needed
- Recommended organisational changes for managing IT initiatives, investments and expected gains.

7.2 Using Information Technology to Increase Efficiency and Support Organisational Changes

Analysis of the present Indian Railways services results in the realisation that customer expects more, and there is a scope for improvement in productivity of assets. There is an urgent need for railways to guarantee flexibility to their customers if railways want to improve their competitive position.

Indian Railways needs to use information technology to help the restructuring effort in creating an independent, corporatised and customer focused Railways as indicated in chapter 8, and thereby increase efficiency and productivity. To achieve this overall restructuring objective, Indian Railways needs to clearly articulate its IT objectives. A summary of these objectives is as follows:

- **Increased revenue from freight business by giving higher level of information services to freight clients**

Various customer surveys have confirmed that one of the critical reasons for loss in freight market share is lack of reliability and information on the tracking of freight goods. This clearly affects the clients' production and inventory management cycles and hence is one of the key reasons for

The customer expects more, and there is a scope for improvement in productivity of assets. There is an urgent need for railways to guarantee flexibility to their customers if railways want to improve their competitive position. Indian Railways needs to use information technology to help the restructuring effort and thereby increase efficiency and productivity

One of the critical reasons for loss in freight market share is lack of reliability and information on the tracking of freight goods. This clearly affects the clients' production and inventory management cycles

Information technology can be used to optimise the scheduling and deployment of various resources thereby increasing resource utilisation on a day-to-day basis and reducing operational costs.

the continuous reduction in freight share of railways. Freight customers need services such as:

- Consignment arrival at destination on the promised date and time
 - Placement of the required empty wagons at the origin at the promised day and time
 - Competitive rates that are negotiable
 - Communication of consignment progress.
- **Improvement in public image and upper class passenger revenue**

While the passenger market is often considered as a supply constrained market there is great potential to increase profitability by increasing the volumes in upper classes, as shown in chapter 3. This can be achieved only if the sales and distribution of passenger tickets can be simplified by using appropriate technology, such as larger number of distribution outlets, and using internet. In addition dissemination of information such as seat availability, arrival-departure information, fare information, etc. can be done on internet. A beginning has already been made in this direction but progress in this area needs to be speeded up. Passengers need:

- Efficient reservation and ticketing systems
 - Information and advice of schedules, fares, arrivals, departures, etc.
 - Efficient management of crew, on-time departures, etc.
- **Reduction in operational costs by improved management of rakes, wagons, locomotives, crew, etc.**

Information technology can be used to optimise the scheduling and deployment of various resources (more importantly for the freight business as the schedule of freight trains is flexible compared to the passenger trains which have fixed schedule), thereby increasing resource utilisation on a day-to-day basis and reducing operational costs. This would contribute greatly to the growth in productivity that is essential if IR is to survive as a viable organisation.

- **Improving Decision Making**

Information technology also needs to be used to manage and analyse large quantities of demand information (across customer types), and arrive at optimal decisions for network, rolling stock and maintenance investments. Long range investment planning as well as short/medium term decision making can be aided by the use of IT in analysing information on a continuous real-time basis.

7.3 Current State of Key IT Systems in Indian Railways

Various initiatives have been taken by IR in computerization of many areas of the operations and decision support systems. Their current status is discussed below. Given the focus on three areas – freight, passenger, and overall decision-making, this subsection is structured accordingly in three parts. Each subsection is further organised to highlight the operational, technological and

Box 7.1 : Examples of Information Technology Systems used by International Railways

PASSENGER ORIENTED SYSTEMS

New technologies are being used very effectively to increase the efficiency and customer service worldwide. There are broadly three technology based advances on the passenger side

1. Better, more thorough and more rapid information

Increasingly the railways are providing a large amount of information on Internet sites: timetables, prices, sales conditions, availability, arrival, departure, etc. This information is being updated constantly so that customers always have up-to-date information.

Several railways are also developing software using data banks giving the shortest route between two rail travel points – inside or across multiple countries. Use of voice recognition software is also becoming reality for telephone information services.

2. Easier purchase of travel and reservation of tickets, as well as ticket inspections

Railways around the world are moving towards automated reservation and ticketing systems either at the terminals or on the Internet. In recent past, many railways have recently modernised their distribution system with new technology, integrating timetable and fare information in the same architecture together with automated ticket issuing. This is also integrated with Yield management (also called Revenue Management) of train seats as well as accounting and statistics applications. New technologies are also being used to combat fraud and ticket-less travel. Automatic ticket gate turnstiles checked tickets and contactless smart card systems are also being introduced.

3. Integration between distribution systems and information systems

European railways in particular are integrating all their systems within the country and across Europe based on an International protocol (EDIFACT). Despite the complexity involved, railway systems of reservation/distribution, revenue management, MIS are getting integrated and are also being linked to the longer term capacity planning and decision making tools.

SYSTEMS FOR INTEGRATING RAIL FREIGHT WITH OTHER MODES AND WITH OTHER SYSTEMS

Given that customers are increasingly expecting transportation services and not “rail freight services”, international railways are developing systems that not only provide on-line freight information to their customers, but are also integrating their systems with the information on other modes.

Freight information

The Railways are using two types of systems –

- (a) Those that integrate basic operational functions – such as transport organisation (e.g., crew management), wagon management, capacity management, scheduling, etc. These systems are being created on a variety of rapidly changing technologies such as GPI and AVI systems.
- (b) Those that use Internet and computer –based transmission technologies to provide information to customers

These systems span across fields such as optimal train path, optimal scheduling, wagon tracking (through GPS), transport orders, invoicing, real-time goods tracking, etc. These systems also need to be integrated with each other to maximise their impact on efficiency and customer service.

Inter-modal and inter-operator integration

Customers require integrated information and integrated logistics. To meet these requirements, the railways are developing systems that are able to at least dialogue (if not integrate) with the systems developed by other transport modes. Thus the technology standards being defined are becoming common norm across the transportation industry, and not just the Railways.

Source: Excerpts from Rail International Conference, Stockholm.

implementation background of the existing systems.

7.31 Freight Business Operations

Operational background: To improve customer focus and efficiency, Indian Railways launched two initiatives – the first one was in 1985 and second in 1998. TRACS was the first holistic system for freight management that was attempted in 1985 and retried in modified form in 1990. Unfortunately, this system was unsuccessful due to several reasons such as:

- The development unit, CRIS, worked independently without involvement and ownership of the users.
- User requirement specifications were not prepared.
- Budgets were not controlled and the timeframe was not enforced.

The Indian Institute of Technology studied and evaluated TRACS and helped Indian Railways initiate a new system called Freight Operations Information System (FOIS) in 1998, now under implementation.

The objective of FOIS is to develop an integrated system to improve control and monitoring of operations and allied commercial, mechanical, traction and accounting functions to optimise the utilization of assets. This system has two basic modules to begin with – Rake Management System (RMS) and Terminal Management System (TMS). RMS and TMS will form core of FOIS. Other applications like wagon repair, loco shed, crew management etc. are stand-alone applications to be interfaced with RMS/TMS.

Technological Background: The technology used is Visual Basic and Oracle and it is a GUI based application. The technology is being managed by CRIS, which has outsourced the development to CMC. System architecture has the following components:

- Intelligent Terminal at the field locations for data capture connected to the application servers at the zonal level. All the application servers are networked among themselves along with a central global server.
- Central global server provides Board level MIS reports.
- The application is completely network centric.

Implementation: The implementation strategy initially approved by the Railway Board was trial implementation of RMS/TMS, followed by fully functional RMS/TMS over an extended corridor. Later, this strategy has been changed to implementation of RMS on a global basis followed by phased implementation of TMS. A user group from Northern Railway is working with CRIS, under strong leadership with involvement of all entities. The prototype was field tested on Allahabad and Delhi Division of Northern Railway (NR). The application was implemented on all divisions of Northern Railway by March 2000. Some divisions of Western Railway, Central Railway and North Eastern Railway have used the application in the divisional/Area control offices as well as major yards. Besides this, wagon based application (RMS phase-II) has been implemented in Shakurbasti, Bhaoli and Bhatinda yards of Northern Railways. The Terminal Management System has been implemented in Northern Railway at Bhatinda and Bhaoli POL loading points. Implementation planned in four phases includes the following:

- In 1999-2000 all locations of Northern Railway to implement RMS.

The objective of FOIS is to develop an integrated system to improve control and monitoring of operations and allied commercial, mechanical, traction and accounting functions to optimise the utilization of assets

- In 2000-2001 RMS on IR
- In 2001-2002 RMS phase - II
- In 2002-2003 Major goods sheds of all railways.

As noted, the freight application development/implementation has been going on since 1985. Despite the experience of failure of the old TRACS system, the new FOIS system development/implementation is still facing delays.

7.32 Passenger Business Operations

In Passenger Business area, Passenger Reservation System (PRS) has been implemented and is being maintained by CRIS. In addition to the PRS, Indian Railways has developed and implemented several other systems for increasing customer service and efficiency in the Passenger business, such as National Trains Enquiry system, Grievance and Complaints Handling System, etc.

Passenger Reservation System (PRS)

Operational Background: PRS is the world's largest integrated reservation system and connects close to 2500 terminals in different cities to allow them to simultaneously reserve passenger seats and issue tickets. The project was started around January 1984, and the first implementation was completed in November 1985. The system is on-line for 12 hours and the remaining time is used for batch processing. Five systems are implemented at Delhi, Mumbai, Chennai, Calcutta and Hyderabad.

Technical Background: Historically, development of PRS software was initially done by CMC with the implementation of their IMPRESS software at all five PRSs. Subsequently, it was phased out by CRIS' CONCERT (Country-wide Network for Computerised Enhanced Reservation and Ticketing software) which was based on client-server architecture designed to network the five PRSs. Currently, all five PRSs have been inter-networked and the PRS network is being maintained by CRIS. The operating system currently used is open VMS. There are three types of terminals: inquiry terminals, transaction terminals (booking, charting) and administration terminals (console, database, accounting/MIS reports). Significant number of MIS reports are also available for analysis, such as,

- Status report
- First transaction report
- Statistics on concession tickets
- Operator-wise daily/hourly summary and login and logouts
- Days availability report
- Details of damaged coaches
- Details of lost tickets
- Details of changes in name/age/sex/boarding points and cancellations
- No of PNRs generated and cancelled site-wise
- Reports on earnings/refunds/booked passengers/refunds
- Reports on remote location quota, board side quota etc.
- Reports on trains, terminals covered in PRS
- Report on max earnings – source station-wise and destination station-wise

Implementation Background: Owing to close interactions between the

PRS is the world's largest integrated reservation system and connects close to 2500 terminals in different cities. In addition to the PRS, Indian Railways has developed and implemented several other systems for increasing customer service and efficiency in the Passenger business

user groups and the technical team, the implementation and training has been smooth. PRS has large number of terminals now, and covers close to 1 million out of the 5 million long distance passengers travelling every day. PRS has been very successful in implementation and has improved the image of Indian Railways considerably.

Some of the reasons for the success of PRS are:

- Dedicated and trained user group representing all levels
- Project ownership –Team working among CMC and users
- No change in the team till first implementation
- Preparation of appropriate user requirement documents.

Other Information Systems: Several other systems have also been created in the Passenger business area. These are:

- **National Trains Enquiry system** implemented in 62 control offices. This is a mainframe based train/passenger information system
- **Grievance & Complaints Handling System** using RailNet e-mail services to handle complaints. It is already used internally and likely to be notified soon.
- **Self-printing ticketing machines for unreserved ticket issue.** 1000 such machines are already installed.
- **Tele-booking and IVRS based booking.**
- **Internet Enabling of PRS Enquiries.** CRIS has now implemented and hosted IR's own web-site, namely www.indianrail.gov.in and offers the following PRS related enquiries on the internet :
 - Accommodation availability enquiry
 - PNR status enquiry
 - Train schedule enquiry
 - Fare related enquiry
 - Trains between a pair of stations

The site also provides information about the rules and regulations for passenger booking, refunds, and other services available in general. In the next phase, with e-commerce getting more matured and with effective cyber laws in place, the system would be enhanced to provide reservations through the Internet.

Planned Information Systems: Indian Railways is also planning to implement several other IT initiatives, such as:

- Internet based reservation
- Touch screen terminals
- Dataware housing system
- Unreserved ticketing system
- Smart cards
- Elimination of card tickets in the next 3-5 years
- Introduction of hand-held terminals to issue tickets
- Modernization of printing press

7.33 Overall Decision-Making

Given the size and geographical dispersion of Indian Railways, a robust decision making system is critical. The speed of information collection and

Owing to close interactions between the user groups and the technical team, the PRS has been very successful in implementation and has improved the image of Indian Railways considerably

analysis would not only reduce decision-making time, but would also increase flexibility of operations. Indian Railways have attempted to create systems for this purpose. For the longer-term decision-making, Indian Railways have created a Long Range Decision Support System (LRDSS), and have several Management Information System (MIS) in position for the shorter-term decision support.

Long Range Decision Support System (LRDSS)

Operational background: LRDSS is one of the world's most advanced and complex tools for investment and strategic planning for the railway network. The system collects information on past and expected demand, calculates likely flow of the traffic on the railway network, and plans for optimising investments to meet projected demand. The system is critical, as it not only identifies the bottlenecks in the operations, but also proposes optimal solutions for minimizing investments and costs, while meeting demand projections.

LRDSS currently focuses on the Freight traffic movement, but is relatively less advanced on the simulations of passenger traffic and Terminal handling. Despite this gap, the system provides a robust instrument for Indian Railways to base their investment planning on. Given the vast number of extraneous variables that affect investment planning, most Railways in the world are still struggling to create such a system.

Technological Background: LRDSS has been developed in-house with help from an external consultant. The system has been implemented on high performing workstations. LRDSS uses Geographical Information System (GIS) extensively. Apart from GIS, LRDSS extracts static data from several other sources, including demand surveys.

Implementation: The first phase of LRDSS system is technically complete, and the system is undertaking investment planning. While the system is being used well for decision-making purposes, its connectivity to the internal planning processes, as well as other information systems is yet not seamless.

Management Information System (MIS)

Operational Background: So far, there are many small and independent MIS systems developed by different departments of different zones and divisions to meet their own requirements; these are not integrated with overall MIS requirements of Indian Railways. Functions relating mainly to Payroll, FMIS, Inventory and some operating statistics have been addressed in MIS so far, with full coverage at zonal level and limited coverage at divisional level. Now efforts are in place to develop a comprehensive MIS making use of the efforts of System Development Team (SDT) of four Railway Zones. These efforts were started a year back and the system study is almost complete.

Technological Background: The System Development Teams are working on the following systems:

- Personnel Management Information System (PMIS) by NR
- Financial Management Information System (FMIS) and Payroll by SR
- Material Management Information System (MMIS) by CR
- Passenger Accounting System & Freight Accounting System and Operating statistics by SE
- Development is planned to be outsourced.

Implementation : In Phase-I of the newly set-up MIS project, pilot projects

LRDSS currently focuses on the Freight traffic movement but is relatively less advanced on the simulations of passenger traffic and Terminal handling. Despite this gap, the system provides a robust instrument for Indian Railways

In using Information Technology IR would need to link technology to focus on business/strategic issues and improve efficiency. It is critical to ensure that the IT systems implemented or in the process of implementation are linked to the business objectives of IR

will be implemented on the Headquarters of three Railways namely NR, SR, and CR and in one division of each of these Railways. The implementation includes the above SDT applications and also other functional areas relating to civil, mechanical, electrical, signalling & telecommunications, operating, commercial, medical, security and vigilance functions..

In phase II, the complete functional modules being developed in phase I will be implemented at all the other divisions of the three Railways.

To sum up, Indian Railways has systems in Freight business, Passenger business as well as for decision-making. IR is also in process of creating and using Information Technology for meeting its business objectives. While some of its attempts are more successful than others, going forward it would need to link technology to focus on business/strategic issues and improve efficiency. This review of the status of IT also suggests a strong need of implementation focus for these systems.

7.4 Information Technology Initiatives Needed

It is critical to ensure that the IT systems implemented or in the process of implementation are linked to the business objectives of IR. Broadly, the initiatives can be classified into four areas based on their IT objectives—freight revenue enhancement, passenger revenue enhancement, operational cost reduction, and investment optimisation. Broad overview of the recommendations is shown in **Exhibit 7.1**.

7.41 Freight Revenue Enhancement Initiative

Communication of freight information to the customers including tracking and status update is critical, as this information directly impacts customers' decisions to use freight services of Indian Railways in preference to road transportation. Indian Railways is in the process of implementing a key system – Freight Operations Information System (FOIS) for making freight information available to its customers.

As already documented, FOIS has faced several implementation delays in the past. In its current form, FOIS is developing an integrated system to improve control and monitoring of operations and to offer appropriate information to the customers. The two key module of FOIS are Rake Management System (RMS) and Terminal Management System (TMS).

In addition to the above systems, Indian Railways should actively consider introducing yield management systems with variable pricing for customers based on dynamic demand situation. While the process of such a system is not defined in detail in this report, it is to be noted that several mechanisms exist and are being used by international railroads. One such mechanism is creating an open freight exchange where Indian Railways could participate as a customer. Brief outline of such a system is provided in the box.

The key issues facing the FOIS system are discussed next. These are:

- **Change in implementation strategy.** The implementation strategy has not been firm. While the change may be justified, early identification would have been more helpful. After having failed on TRACS system, such a setback in the beginning of the project is a major concern on effectiveness of the issues considered in the original implementation strategy.
- The **networking requirement is very high** on this application as this

Communication of freight information to the customers including tracking and status update is critical, as this information directly impacts customers' decisions to use freight services of Indian Railways

is a GUI and Oracle based.

- It is not clear if the cost benefit analysis of **high bandwidth requirement** due to application architecture was well evaluated and understood.

Considering the above issues, the following initiatives are required:

- **Constitute a project performance review team** with a participation from a consultancy organisation for monthly or bi-monthly review. This would ensure that the project timelines are met strictly and any implementation issues are immediately ironed out.
- **Review the project implementation plan** with involvement of all parties. The review should cover:
 - all parties involved and their role and responsibilities,
 - detailed activities still to be completed and their schedules
 - responsibilities for these activities,

Indian Railways should actively consider introducing yield management systems with variable pricing for customers based on dynamic demand situation. One such mechanism is creating an open freight exchange

Exhibit 7.1 : Overview of Recommendations on Information Technology

	Freight revenue enhancement	Passenger revenue enhancement	Operational cost reduction	Investment optimization
Current status	<ul style="list-style-type: none"> • Freight Operations Information System (FOIS) containing Rake and Terminal management modules implementation started (after unsuccessful attempt of TRACS with implementation delays) 	<ul style="list-style-type: none"> • Passenger Reservation System (PRS) successfully implemented along with other information systems such as NTES, CGHS implemented • Distribution depth still limited and number of reserved tickets limited to 20% of long distance passengers • Passenger information not integrated with other internal systems 	<ul style="list-style-type: none"> • Rake management and Terminal management systems likely to offer some solutions for cost reduction • Large scale introduction of IT systems for stramlinging operations currently not implemented • Introduce Wagon, 	<ul style="list-style-type: none"> • Highly advanced decision support tool called Long Range Decision Support System (LRDSS) developed internally that simulates future demand scenarios and helps optimize future investment • Integrate LRDSS
Recommendations	<ul style="list-style-type: none"> • Institute project review mechanism for implementation of FOIS (Freight Operations Information System) • Implement FOIS 	<ul style="list-style-type: none"> • Expand distribution depth through Internet and larger number of outlets • Introduce Revenue Management System • Integrate PRS information with MIS and other Decision Support Systems • Integrated Passenger 	<ul style="list-style-type: none"> • crew, parcel, and inland traffic management systems • Integrate these systems with FOIS • Introduce and implement integrated MIS with online data accessible across the organization • Integrated cost 	<ul style="list-style-type: none"> • with the investment decision making processes as well as the planning of Indian Railways • World class investment
Final Status	<ul style="list-style-type: none"> • completely in all locations • Ensure the FOIS information is fully accessible to all key customers and helps them improve their inventory and production management, leading to higher customer satisfaction and revenue 	<ul style="list-style-type: none"> • Information, reservation and distribution systems, with information and reservation facilities close to customers, leading to higher passenger revenues 	<ul style="list-style-type: none"> • management systems to ensure significant increase in productivity and efficiency. This would enable annual reduction in overall manpower estimated 	<ul style="list-style-type: none"> • optimization system integrated with all decision making processes within the organization

Source: Expert Group.

Box 7.2 : Outline of a Freight Exchange

One of the innovative ways to create a market and introduce revenue management (also called yield management) for the various freight customers, and suppliers, especially Indian Railways, could be a freight exchange.

The exchange could work as any other equity or commodity market, where the customer offers to buy the transportation supplies with clear specifications in terms of type of goods, date of transportation, expected time of delivery, and also offer the price at which they are willing to buy the services. The Suppliers could evaluate this online, and either accept the offer, or bid their prices.

Such a mechanism can be implemented electronically using the Internet technology. Implementation of such a system is technically simple. However would require agreement from customers as well as the suppliers.

While several freight exchanges currently exist in the world, (www.cargofinder.com, www.intermodalex.com, www.gf-x.com), Indian Railways can be a pioneer by actively promoting and participating in such a system. By using such a system, Indian Railways would be able to lower or raise prices based on the demand in the market and its own capacity situation, thereby maximising its own revenues.

Source: Expert Group Discussion, Internet research.

Box 7.3 : Key Freight and Intermodal Systems being Implemented by Railways

SJ Cargo (Swedish Rail)

- INFOLOG – A central feature of this freight system is a Train Chain management System (TCMS). This system links up the Consignee, Cargo owner, Freight Operator, and the Terminal operator through the Internet and ensures that all requirements are controlled, managed and warehoused at one location. This integrates all the key parties involved in the operation.
- The INFOLOG system is connected to the other modes – road, and sea through another system called TRIM (Transport Reference Information Model) which is an object oriented approach developed to cross connect multiple modes.

Spoornet (South Africa)

- Created an integrated solution for freight management that addresses solutions for Channel management, Clearing and Forwarding, Flow of consignments across various modes, Capacity reservations across modes, and Warehousing.
- These systems are structured in four mega systems – Customer service design systems (which is exposed to the customer), Service Planning System (that is used for internal planning), Service execution systems (that gives orders for specific activities), and finally freight logistics solutions system (which captures market intelligence, undertakes macro logistics planning, and offers macro flows and information to the customers through Internet and Electronic Data Interchange)

SBB Cargo Ag (Swiss Rail)

- CIS-1 (Cargo Information System-1) is an IT system that provides information to the customer on transportation movements through Internet and EDIFACT, eliminates consignment notes from transport formalities, provides on-screen display of schedule, and also exchanges data with other railways.
- Linked to CIS-1 is the parallel system, CIS-2. This is the execution system that evaluates transport operations, automatically generates invoices for the customers, warehouses all customer information and orders, and provides information on all international tariffs and movement systems. This system also acts as the input for statistics for future planning.
- SBB links the information generated in CIS-1 and CIS-2 to the customers through CIS-online (www.sbbcargo.ch/gm) and gives customer direct access to their transport data.

Source: Expert Group Discussion, Internet Research.

- budgeted effort and cost for these activities,
- list of deliverables and milestones,
- acceptance criteria of all deliverables.

Full and successful implementation of this system is likely to significantly upgrade the freight information to the customers and would help Indian Railway regain, or at least stem the decline in its freight market share.

Other freight systems

In addition to FOIS, Indian Railways should also consider implementing other freight related systems used elsewhere in the world such as Wagon and Crew Management system, Parcel Management System, and Inland traffic management system, among which the first system is the most critical (see para 7.43). In addition to these systems, Indian Railways can also introduce systems for scheduling freight trains, and also managing the claims of various customers. While these systems are relatively small, they are important for improving efficiency and quality of customer service.

7.42 Passenger Revenue Enhancement Initiative

The critical issues with passenger business are customer service, enhancing revenues, and managing image. Given that Indian Railways is the largest passenger railway in the world, efficient management of IT is critical to support customer service. Moreover, Information Technology can be used as an effective means to improve Indian Railway's public perception. In addition, improvement in the passenger related systems could help improve the interaction of general public with IR. Access to quick information, shorter queues at the ticket counters, speedy closure of a transaction, convenient payment modes, automatic ticket vending, etc. affect the daily life of a huge mass of Indian population. Thus any improvement in these systems would impact 12 million individuals every day.

In the passenger business area, PRS is the world's largest integrated rail reservation system and connects close to 3000 terminals in different cities to allow them to simultaneously reserve passenger seats and issue tickets. In addition to the PRS, Indian Railways has developed and implemented some other systems for increasing customer service and efficiency in the Passenger business, such as National Trains Enquiry system, Grievance and Complaints Handling System, etc.

However, several areas still exist where Indian Railways can significantly improve its information and customer service to the passengers as well as enhancing revenue through Revenue Management techniques. These areas are

- While there are 12 Million passengers daily, only 1 Million passengers are being addressed by PRS. The other 11 are not covered with a good ticketing system. Out of these 12 million, roughly 5 million are the long distance passengers, and a large chunk of unreserved passengers.
- Wait time for ticketing is high. With PRS, while the wait time has drastically reduced, there is still scope for improvement. Un-reserved ticketing segment requires major considerations. High cost of ticket printing, logistics, issue, management and control should be areas of focus.

Indian Railways can significantly improve its information and customer service to the passengers as well as enhance revenue through Revenue Management techniques

Box 7.4 : Enhancing Customer Service by Creating a No-Cost Internet Based Distribution System

While The Passenger Reservation System (PRS) has been a great success, the number of distribution outlets is relatively limited leading to high waiting times, and often long queues. The Passenger Reservation Systems in other modes, such as airlines are more customer-friendly as they are distributed through a much larger number of outlets (travel agents), and home delivery is also available (through travel agents or through the Internet).

Indian Railways can expand this distribution by introducing booking through the Internet and connecting travel agents/ticketing outlets across the country using secure internet technology.

By implementing such a system, Indian Railways would be able to improve customer service dramatically. This would impact both the higher end population as well as the masses. The masses located in remote areas would get access to reservation much more easily. On the other hand, passengers in the urban centres would be able to get access to railway tickets within a few Kilometres from their homes.

In addition, Indian Railways would save on costs and create revenue enhancement opportunities. Indian Railways would no longer require infrastructure and staff within urban cities, as the agents/outlets would offer service at large number of multiple locations. Moreover, reduction of crowds at the railway station would offer more space for renting to retail outlets.

The question is, will Indian Railways need to undertake any investments in creating this technology and set up? Discussions with several travel technology companies suggest that Indian Railways can actually undertake this without spending a single Rupee. The travel technology vendors suggest that they can create this entire system at ZERO cost to Indian Railways. They would link up to the PRS of Indian Railways and are willing to sell Indian Railway tickets through massive (3000-5000) outlets in return for a nominal service fee charged to the customer.

Thus an IT initiative like this can enhance customer service, reduce costs, and offer revenue enhancement opportunities at zero investment from Indian Railways.

Source: Expert Group Discussion.

Box 7.5 : Brief Description of a Revenue Management System in Airlines

Most International Airlines have 5-10 booking classes, and all of them for the economy class alone. The reason why multiple booking classes exist for the same set of seats is Revenue Management.

The airlines want to maximise revenues by selling different price tickets to different customers, thereby attempting to capture maximum value from the customer.

They track the demand for each flight, and based on the past history of the flight, project the number of passengers expected for the flight. Armed with this information, the Revenue Manager takes a decision on increasing or decreasing the price on the plane. The mechanism used to implement this decision is also simple. A fixed price is linked to each of the booking classes mentioned above. The price differential is also substantial between the various booking classes, and the difference between classes at times can be as high as 4-5 times. To increase the price, the Revenue Manager increases the seats available in the higher priced classes, and closes booking in the lower priced classes, thereby forcing customers to purchase tickets at a higher price. Alternatively to decrease the price, the Manager, opens up lower priced classes, and increases seats available in these classes, thus allowing passengers to buy cheaper tickets.

The technology used for such systems is complex as well as highly dynamic. Complex algorithms are used for flight demand projections, and huge amount of data is captured for detailed analysis. The individuals monitoring these systems are professional, highly analytical individuals who balance the risk-reward decisions necessary to operate these systems.

Source: Introduction to Revenue Management, McKinsey Transportation Practice.

- The MIS reports of PRS are not effectively used by the decision support systems within the organisation
- Finally, Indian Railways does not use any Revenue Management System to dynamically manage capacity versus prices, i.e., when capacity is a constraint higher prices can be charged to customers (so as to increase revenue per passenger), and when capacity is abundant discounts can be offered to induce customers to travel, and increase capacity utilisation. Such kind of systems are actively used by almost all airlines in the world and several international railways

Considering the above issues, the following initiatives are recommended for Passenger Reservation System:

- Identify means to **increase the coverage of Passenger Reservation System** from 20% to a higher number of long distance passengers. One effective means to enhance this number, without increasing the investment cost, is by using the Internet, and using one or more service providers to manage the distribution system.
- **Outsourcing of distribution** can also help Indian Railways reduce the

Box 7.6 : Passenger Oriented IT Systems Created by International Railways

SNCF (French Railway)

- Implemented portable terminal for reservation and issuing of tickets. Also connected to banks and payment gateways
- Terminal is able to access all information regarding train timings, schedules, arrival, departure, etc.

JR East (East Japan Railway)

- Large amount of content and information for rail travelers through the Internet – travel packages, discount tickets, train schedules, seasonal information, services in and around stations, etc.
- Implementation of such information display in train terminals, with additional up-to-minute information on trains.
- Sales of tickets with seat reservation, integrated with airline tickets, hotel vouchers, etc.
- Introduction of Automatic gate systems and Contact-less smart cards
- Automatic reservation and ticket vending machines
- Reservation and settlement for train seats through the Internet
- Onboard information to customers such as news, text information, radio transmissions, etc.
- Automation of ticket checking at the rail doors. (Planned)

FS (Italian Railway)

- SIPAX IT System that has integrated Information, Ticket sales, Seat reservations, accounting and statistics, yield management, and MIS
 - This system also provides market prices, “open” reservation system, and a real-time control of reservations for appropriate yield management
 - This system is also connected to the travel agencies in Italy
- FS-INFORMA is an information system that has interactive automated Answering machine, Automatic Call Distributor, and an Automatic operator module that acts as a highly efficient call center for information as well as reservation. FS INFORMA is also planning to upgrade to a voice recognition software that will substantially improve the navigation for the customers.

Deutsche Bahn AG (German Railway)

- LIMA, a data bank system that is a passenger train-planning tool containing information on 28,000 trains and their assignment to 3,200 lines.
- EVA and FIRE systems for sale and reservation of tickets, including implementation of various fare schemes within DB and jointly with other European Railways.
- INKAS is the integrated customer information system that incorporates train information, services available and safety information.

Source : Expert Group Discussion and Internet Research.

Indian Railways should also consider introducing flexible pricing. A seat being a perishable commodity, every rupee earned on the empty seat directly increases profits. Creating such a mechanism requires a strong technology system

high cost of ticketing and distribution. The outsourcing can be done by inviting private service providers for distribution (as most airlines and many bus operators currently do).

- **Integrate output of PRS** into MIS and LRDSS systems. Integration of this information would be the key to take faster decisions as would be needed to run the new corporate entity.
- **Introduce Revenue Management System:** Indian Railways should also consider introducing flexible pricing through a Revenue Management System. In such a system, the Railway should increase the price of certain number of seats (e.g., *tatkal* scheme), when demand is very high, and when the train is going empty reduce the price to increase demand, and thereby fill the train. A seat being a perishable commodity, every rupee earned on the empty seat directly increases profits. Creating such a mechanism requires a strong technology system. The systems should track the current demand, use past history to project expected demand, and then help the decision maker decide on increasing or decreasing the price. While several legal and operational issues exist for implementing such a system, the potential to use such a system to increase resource utilization is very high.

Initiatives required for improving image

Information Technology can be used effectively for improving Indian Railways' image among the various stakeholders, especially the passenger customers. IT can be used to offer high speed and easily accessible information about timing, rules, seat availability, booking information, etc. to the customers. More importantly, IT can be used to make each interaction with the customer efficient and fast.

While several mechanisms for implementing this may exist, one high impact initiative would be to make reservations, ticketing, and all railway information available through Internet and large number of Internet based disbursement outlets (at least 2000-5000 outlets need to be targeted). To implement this, Indian Railways need to implement an IT based solution (directly or through an external IT service provider), where customers should be able to purchase tickets, and reserve seats from home, or through an Internet kiosk. This system would not only reduce Indian Railways' distribution cost, but also show-case the high level of technology within Indian Railways.

7.43 Operational Cost Reduction Initiative

Railways in almost all countries have changed radically in the past two decades and this change has included computerisation of their freight operations information system, to improve the productivity of their manpower and rolling stock. IR is, however, still dependent upon collection and dissemination of data manually, which is not always reliable or available in time to take correct decisions. Indian Railways have, therefore, decided to introduce a new system of information and monitoring based on the application state-of-the-art computer and communications technology.

Given that the transportation industry requires the matching of several different types of resource allocations (such as rolling stock on the network, wagon movement, crew management, maintenance scheduling), optimisation by using information technology offers clear benefits in terms of cost

Box 7.7 : Wagon Management & Crew Management Systems

The objective of this article is to discuss the need for IT enabled Wagon and Crew management systems and describes the WCMS and how it could help meet these needs. It also describes the benefits likely to accrue from the WCMS.

OBJECTIVES OF THE WAGON/CREW MANAGEMENT SYSTEM

Wagon management and crew management functions should broadly achieve the following objectives:

- (i) Enhance the accuracy, reliability and timeliness of basic operating data pertaining to events in the field, and also act as an input to MIS.
- (ii) Provide a wide range of information updated in 'real-time' to assist operating management and field supervisors. To provide general freight situation snap-shots to the senior and top management for review, co-ordination and monitoring.
- (iii) Improve maintenance of freight rolling stock by deciding optimal preventive and breakdown schedules.
- (iv) Help the commercial management improve customer services by effective routing of trains to cater to the throughput requirement in terms of passenger and freight traffic.
- (v) Assist in formulation of realistic long term plans for creation of facilities based on an accurate estimate of the capacity requirements and timing, acquisition of rolling stock, manpower planning etc.

The main benefit that is estimated to accrue from the Wagon and Crew Management System would be an improvement in resource/capacity utilization. It is estimated that this would result in a reduction in wagon requirement, which would reduce the need for purchase of new wagons in future. This estimate has been validated by the experience of Canadian National Railways who has introduced a similar system and achieved an improvement of 31% in wagon cycle. Similarly, it is estimated that there may be an improvement in the utilization of motive power in goods services, savings in expenses on maintenance consequent to reduced fleet of wagons as also other savings such as reduced handling of wagons in marshalling yards, empty haulage and less light engine running. Other possible benefits also exist, such as : possible staff re-deployment or improved productivity, deferment of yard and terminal capacity increases, heavier trailing loads, better crew utilisation, and better fuel management.

INFORMATION PROVIDED BY THE WCMS

The main information needs to be met by the wagon management system on an on-line basis are:

- i) Wagon Status:
 - The system should indicate whether the wagon is loaded or empty; its origin and destination and whether it is in a yard or at a station or on a train.
 - If the wagon is in a yard or at a station, how long it has been there, when the wagon arrived and by what train; whether it is sick or fit
 - If the wagon is on a train, train number, its origin and destination; the location of the train, expected time of arrival at the destination, the next reporting point of the train, expected time of arrival at the next reporting point.
 - The maintenance particulars should include information on date of manufacture, number of preventive maintenance programmes done since commissioning, oiling date, other scheduled examination dates, the particulars of last repair done to the wagon.
- ii) Wagon Description:
 - The physical characteristics should include wagon number, owning railway, type of wagon, date of manufacture, tare weight, carrying capacity, its other characteristics, commodities that can be loaded, the grading and its physical dimensions.
- iii) Payload details:
 - The way bill number, origin and destination station, consignor, consignee, commodity loaded, total weight, tonnes loaded, route of the wagon, paid or to pay, freight charges, whether to be weighed enroute or at destination are the particulars that should be available for loaded wagons.
 - The release particulars should indicate in the case of unloading, the wagon number, commodity, time of placement, time of release, the type of wagon, empty assignment particulars, particulars of demurrage incurred. In case of loading, all particulars of loading, the wagon number, commodity, type of wagon, the time of placement, time of loading, particulars of demurrage incurred, and destination station should be furnished.
- iv) Schedule of wagon movement
 - Advance information or insight on the flow of loaded and empty wagons for stations, goods sheds and sidings should be available.
 - Information regarding diversion and rebookings of wagons should be maintained destination wise, list of delayed wagons with reasons for delay, list of wagons requiring weighment should also be available on the system.
 - In case of transferred wagons all transshipment particulars along with particulars about previous wagons from which the contents were trans-shipped should be furnished.

The information needs to be met by the crew management system on an on-line basis are:

- (i) Statement of likely availability of crew vis-à-vis the expected train running highlighting shortages, if any for home station as well as outstation depots.
- (ii) Actual crew assignment for the next 8 hours on a schedule/rolling basis giving names of the crew, time availability, time of train call along with the stand by crew
- (iii) Current location and status of each crew
- (iv) Non-compliance with mandatory and other regulations such as medical examination, rest and duty hours, with warning messages.
- (v) Bio-data related information such as grade, knowledge of section(s) capability for handling the various types of locomotives and competency over traction(s).
- (vi) Information on number of trips made, kilometres earned and hours of duty completed from the beginning of a specified time cycle.

Source: Expert Group Research.

Indian Railways own nearly 3.0 lakh wagons and 7000 locomotives. There is a considerable scope for improving the utilization of these costly assets as capacity can be freed by improving the management of these resources. A wagon and crew management system (WCMS) is likely to be beneficial in this context

reduction. Since the scheduling of such operations for passenger business is relatively fixed, most of these cost reduction opportunities exist in freight operations. Thus Indian Railways should consider implementing freight related management and information systems, such as Wagon and Crew Management system, Parcel Management System, and Inland traffic management system, among which the first system is the most critical.

In addition to these systems, Indian Railways can also introduce systems for scheduling freight trains, and also for managing the claims of various customers. While these systems are relatively small, they are important for increasing efficiency and customer service.

Indian Railways own nearly 300,000 wagons and 7000 locomotives for transportation of freight traffic on the broad gauge. On an average, a wagon is on the move only for 3 hours during the day and spends most of its time in marshalling yards and terminals. Hence, there is considerable scope for improving the utilization of these costly assets as capacity can be freed by improving the management of these resources.

FOIS has made a beginning by implementing the wagons based system on some stations of Northern Railways. The Crew Management System is also being developed by CRIS and is in the first stages of development.

Thus Indian Railways can improve its freight business by ensuring appropriate implementation of FOIS and implementing CMS and other systems. It is difficult to quantify the immediate productivity improvements accruing out of these systems. However, if the productivity improvements mentioned in the investments chapter are to be achieved, or even if current operations need to be maintained with 2 per cent annual reduction in manpower, implementation of these systems will be critical.

7.44 Initiatives to Improve Decision Making

Long Term Decisions

Given the complexities of Indian Railway's network, it is essential to use Information Technology for taking optimal investment decisions. In this context Indian Railways has already created **Long Range Decision Support System (LRDSS)** project. However, this system is not fully embedded in the decision making process of Indian Railways. Moreover, the system needs to be expanded to include modules on passenger traffic, and the terminal simulations.

While the expansion of the system to include passenger and terminal simulations can progress in parallel, it is essential that LRDSS be a permanent component of all investment related decision processes of Indian Railways. In addition consultation of LRDSS for key long-term operational decisions is also critical.

LRDSS is likely to be a key source of capital efficiency improvements suggested in the investment and financial chapters of this report. While it is difficult to quantify the exact impact of this system, successful examples of such systems in **German and Austrian Railways have shown improvements of up to 30% of capital efficiency.** Thus successful implementation, and integration with decision processes would be critical for Indian Railways to address its capital efficiency improvements.

It is essential that LRDSS be a permanent component of all investment related decision processes of Indian Railways. In addition consultation of LRDSS for key long-term operational decisions is also critical

MIS (Short/Medium term decisions)

Several issues in management of MIS exist:

- Clearly defined document for meeting the MIS requirements of different functions are typically not present
- Prioritisation of MIS data is typically not done. The MIS tends to be vertically segmented
- Data from multiple sources do not match
- There is a potential for duplication of some part of the work with PRS, FOIS and LRDSS. Thus it is critical to have proper interfaces and integration with FOIS, PRS, and LRDSS.
- Integrated view of the whole MIS is essential.

Considering the above issues, the following initiatives are recommended:

- **MIS structure and organization** should be derived using a **top down approach** to meet the requirements at all senior levels. MIS reporting should aid the management to take meaningful and correct business decisions based on facts and figures. MIS data should also help in improving the processes as well as the services with minimal cost. **The structure and contents of MIS reports should be developed accordingly.**
- **Inputs for MIS coming from all applications should be consistent.** All sources of inputs to MIS functions should be clearly defined with responsibilities.
- Based on the MIS reporting needs, **appropriate organization should be built** at all necessary locations
- **A project should be initiated to define MIS** covering all the above to meet these requirements.

While the initiatives required to implement IT systems in the area of decision-making may appear simple, experience in other transportation companies suggest that these have the highest long term impact. Such IT projects have led to overall cost and capital efficiency improvements of 10-30% in several companies.

7.45 Additional Technology Based Initiatives for Enhancing Revenues

Indian Railways can potentially create significant value also by using its technology based assets. One of the prominent ones is the Right of Way. The Telecom Right of Way is a time bound asset for Indian Railways, and can help generate significant revenues, and simultaneously reduce its investments in the telecom area.

However to realise these revenues efficiently, it would be critical to act quickly to capture this potential. The value of Right of Way (RoW) is decreasing rapidly, as Railway's RoW is facing competition with RoWs being offered by competing transportation companies, be it roads, or pipelines. Moreover, as the first mover advantage is key in the telecom infrastructure area, private companies are using other means to build their infrastructure.

Thus, if Indian Railways is to capture value from RoW, it needs to move quickly. Thus it may be much more valuable to auction RoW to one large player quickly rather than to slowly contract with multiple players. Moreover

As the first mover advantage is key in the telecom infrastructure area, private companies are using other means to build their infrastructure. Thus, if Indian Railways is to capture value from RoW, it needs to move quickly

one single player would also value the inter-connectivity between regions, and value the RoW higher.

Such kind of an arrangement would not only offer Indian Railways some revenues, but would also free up all telecom investments, and transfer the investment as well as management costs to an outsourced party.

7.5 Organising for Managing New Initiatives

To achieve the level of information technology that Indian Railways needs today is no mean task. At the same time, as has been seen in the last several years, managing the existing systems, and creating new ones is going to be increasingly difficult. Thus Indian Railways need to seriously re-evaluate two structural areas – what should be its outsourcing strategy and how should it organise itself to manage these initiatives. This section first evaluates the key organisational issues of Indian Railway and attempts to resolve these by defining recommendations on organisation, and outsourcing.

7.51 Key Organisational Issues

The discussions within Indian Railways suggested three organisational issues:

Accountability: In general for any computerization, there is a general lack of ownership and adherence to scope of the project with defined management procedure. These result in delays and overruns. In addition, there are no measures of effectiveness of any system implemented or being proposed. Performance measures of systems being developed are also not defined.

Skill levels: Indian Railways' ability to attract, manage, develop, and retain top class IT talent of the country seems to be a constraint, as such talent requires flexible HR policies, and a different working environment, which IR may not be able to provide in the near future. IT awareness of all concerned staff with appropriate skill level seems to be lacking in many areas. There seems to be enough scope for maximization of the available resources.

Planning Budgeting and Project Management: The budgets as approved by the Railway Board are based on abstract estimates. The actual funds are allocated later, based on detailed estimates. However, it is not clear how the costs and times are tracked against budget. On a large project involving many functions like information technology, networking, infrastructure etc. overall project management and commitment to get the project completed on time seems to be lacking. As a result, failure of any one function leads to cost over-run on the other functions, finally ending up with no one being accountable for the complete delivery and implementation of the project.

Given this context, Indian Railways would need to substantially increase its priority towards information technology, and simultaneously consider how it can best use the immense technological skills available in India today.

7.52 Recommendations for Organisational Change

Following organisation characteristics are recommended:

A. Create a Chief Information Officer (CIO) reporting to the CEO:

The CIO of appropriate hierarchical level is critical to first integrate the IT activities spread across the zones, and second, increase IT's importance in the overall decision making process.

B. Create Dedicated Task Force Reporting to CIO:

In the current set-up

Managing the existing systems, and creating new ones is going to be increasingly difficult. Indian Railways need to seriously re-evaluate two structural areas – what should be its outsourcing strategy and how should it organise itself to manage these initiatives

Indian Railways' ability to attract, manage, develop, and retain top class IT talent of the country seems to be a constraint, as such talent requires flexible HR policies, and a different working environment, which IR may not be able to provide in the near future

large projects are conceived at Board level, and the smaller systems – individual initiatives – are not usually replicated. C&IS directorate controls the budget on computerisation. At the Zonal Railway levels, the organisation is set up to implement specific systems in some big projects.

While the current C&IS department has helped achieve great success in several areas and some zonal railways have also achieved success in several IT systems, a much larger effort would be required to implement the initiatives discussed earlier. To enable these initiatives, a dedicated Task Force is necessary, which will work in close coordination with the rest of C&IS directorate.

This task force would be responsible for

- enterprise wide integration of IT systems,
- reducing manpower,
- improving customer interface,
- knowledge management,
- providing value added services.

The Task Force will lay down the technical standards to ensure compatibility and uniformity. The Task Force should be enabled to take help of outside experts on contract basis.

C. Create Implementation Teams for Specific Projects: The task force mentioned above should create a dedicated project implementation team for each project. Each project will be implemented by a dedicated organisation as a pilot project on one Zonal Railway. It will thereafter be replicated in other zones. This will ensure consistency across the organisation. In addition to the project team, following systems need to be implemented:

- A project review team needs to be constituted for each segment of the business. The review team should consist of members with proven project management skills with participation from external consultants from software/consultancy organizations.
- Each project should have well defined cost benefit analysis. This should also include the service levels promised as a result of implementing such projects.
- Any change in scope/schedule of the project should be reviewed and accepted by the Project Review Team with updated cost benefit analysis. These changes should be tracked with proper configuration management processes.
- The ownership of the project in the project phase will be joint – between user and the project team. Only if both parties are fully convinced will the project be undertaken. Ownership of the project after implementation will remain with the user.

7.53 Recommendations on Outsourcing

While identification of IT applications will still be core to IR, developing and in some instances managing them would be better outsourced.

The software industry is very mature and has capabilities and specialization far greater than IR can probably achieve. This feature is linked to special IT skills, and changing technology. To attract, train, and retain high quality

On a large project involving many functions like information technology, networking, infrastructure etc. overall project management and commitment to get the project completed on time seems to be lacking

The software industry is very mature and has capabilities and specialization far greater than IR can probably achieve. This feature is linked to special IT skills, and changing technology

Indian Railways should attempt to outsource high technology areas as much as possible. Implementation of these outsourcing and organisational change would be critical for not just the success of the IT initiatives, but also for the smooth organisational restructuring process, and for achieving efficiency improvements

IT professionals is a very difficult task, and even the best of IT companies in India face this difficult issue every day. The impact of “brain-drain” is especially felt by the industrial or service companies such as Indian Railways. IT companies have developed special skills and organisations to attract and retain this talent. Given that this talent would be difficult to “stick” within Indian Railways (even CRIS), it would be better to outsource development to companies who have this talent. Secondly, in information technology change is extremely rapid and obsolescence rate is as high as a few months. Thus creating and managing new and changing technology in-house would continue to be an arduous task for Indian Railways. Therefore Indian Railways should attempt to outsource high technology areas as much as possible.

This outsourcing is more applicable to certain areas such as sales and marketing through the internet, using right of way for communication capacity, etc. In such cases, Indian Railways should seek a partner such that the external party has technology as well as the domain knowledge of this business. Indian Railways itself should retain broad control through its role as a supplier and (if possible) financial stake holding. In addition, Indian Railways should ensure that the outsourced projects have:

- Well defined scope
- Time scales
- Deliverables
- Acceptance criteria
- Responsibilities of all concerned
- Implementation responsibilities
- Measures of performance
- Penalty for non-performance etc.

Implementation of these outsourcing and organisational change would be critical for not just the success of the IT initiatives, but also for the smooth organisational restructuring process, and for achieving efficiency improvements.

7.54 Expected Gains and Investments Required

Implementation of the above initiatives is critical for Indian Railways. To meet the objectives of restructuring and improvement in resource management, the role of various IT systems would be crucial. Their importance is so high that unless many of the IT systems such as freight revenue enhancement and investment optimisation systems are fully implemented, gains from the restructuring exercise would be difficult to come by. While it is not possible to quantify the exact gains of the system implementation, one can unequivocally emphasise that implementation of these systems is essential for garnering the cost and capital efficiency improvements discussed earlier in the report.

The typical total information technology budget in most industrial or transportation companies is one to three per cent (including man-power) of the total expenditure. Our discussions with Railways in other countries, especially Europe, also suggest a similar figure. **Thus Indian Railways should undertake Rs 350-500 crores of operational (working expenses) expenditure on IT, and Rs 100-300 crores of capital expenditure on**

technology annually. While these IT expenditure and investment figures are higher than those seen in last several years, these would be more than justified if the IT systems are able to reduce even two per cent of the operational costs and capital investments envisaged. Given that well implemented IT systems are likely to give returns beyond 1-2 per cent, the capital and operational costs on IT are more than justified.

IT expenditure and investment would be more than justified if the IT systems are able to reduce even two per cent of the operational costs and capital investments envisaged

8. REINVENTING INDIAN RAILWAYS

“World’s largest commercial and utility employer is Indian Railways. In 1997 it had a record 1,583,614 regular employees”

– Guinness Book of World Records 2001

8.1 Situation Assessment : A Great Institution in a Great Industry

8.11 Indian Railways is an Institution India can be Proud of

Indian Railways is not big, it is huge. Not only is IR’s revenue large (approximately Rs.35,000 crore), it is the world’s largest employer and operates the world’s second largest rail network with a track length of 107,360 km. Every day it moves 1.2 million tons of freight – about 40 per cent of the nation’s freight traffic – and 11 million passengers – approximately 20 per cent of the total passenger transport market.

Indian Railways is not just huge, it is also successful. Despite operating under severe socio-political constraints, it is one of the few public institutions to have operated profitably most of the time. Unlike many railways around the world it has managed to be consistently profitable, until recently, despite the increasing social burden it has had to carry in terms of discounted passenger fares and unremunerative track routes. This financial performance is particularly remarkable against a backdrop of Government subsidies that are modest by world standards.

Indian Railways is an important contributor to India’s economic development. It accounts for about 1 per cent of GNP. Out of the 27 million people employed in the organised sector, Indian Railways employs 6 per cent directly and a further 2.5 per cent through IR dependent organisations.

Indian Railways has a great legacy as a nation builder. IR has invested significantly in health, education, housing and sanitation. It accounts for nearly 1.6 per cent of the country’s hospital beds and 1.5 per cent of houses with civic amenities. With its vast network of schools, and its investment in training, IR is a major engine of human resource development in India. It has had to invest in all these facilities ever since its inception, since none existed in most places where it operated.

Indian Railways is and will remain strategically important for the foreseeable future. In contrast to the developed world where railways are a small portion of total transport needs, railways in India are the bedrock of the nation’s infrastructure. The fact that 95 per cent of IR’s freight traffic originates from the core sector is significant, but equally significant is that IR is vital in times of emergency, for national security, in binding together the far flung corners of an immense nation and bringing its people into the mainstream of national life.

Indian Railways is and will remain strategically important for the foreseeable future. In contrast to the developed world where railways are a small portion of total transport needs, railways in India are the bedrock of the nation’s infrastructure

Indian Railways has a distinctive role to play in a distinctive country. Any recommendations to change an institution of the scale, complexity and achievement of IR must be based on compelling evidence that suggests a way forward without bringing turmoil to the lifeline of the nation

Railways in many parts of the world are resurging based on new ideas, new appreciation about the environmental and safety benefits, new customer oriented services (e.g. multimodal), new attitudes amongst management and labour and new investment

In short, Indian Railways has a long history of achievements and is an effective institution that delivers. It is a truly unique institution that cannot be compared lightly with that of any other country. It has a distinctive role to play in a distinctive country. Any recommendations to change an institution of the scale, complexity and achievement of IR must be based on compelling evidence that suggests a way forward without bringing turmoil to the lifeline of the nation.

We recapitulate these basic characteristics of IR in its crucial role in India's development at the outset, since it is this recognition that has guided our approach to the reinvention of Indian Railways.

8.12 A Great Industry

Railways is a sunrise industry – not just in India but in many parts of the world. Railways went out of fashion in the West from the 1960s to 1990s because rail was unable to respond to competition from road and air. Railways seemed like dinosaurs, too big, cumbersome and unable to adapt. For decades the only news about rail systems was about decline, strikes and retrenchment.

Recently the decline has been halted and reversed. Railways in many parts of the world are resurging based on new ideas (e.g. high speed trains), new appreciation about the environmental and safety benefits, new customer oriented services (e.g. multimodal freight transportation), new attitudes amongst management and labour and new investment. All at a time when there is increasing strain on capacity on the roads and in the air which highlights the strategic value of a thriving rail system.

The underlying conditions in India – if responded to with intelligence and flexibility – appear particularly positive for three reasons: underlying economic growth is forecast to be amongst the fastest in the world; roads will likely remain underdeveloped relative to most industrialised economies; and the environmental and safety case is strong. However, these conditions may not last forever. There is a new thrust on road building as a national policy and ten years from now the road threat may well be considerable.

Economic growth in India has responded positively to first generation reforms and is expected to receive a further boost as a result of second generation reforms. It is not unreasonable to assume 6-7 per cent compound growth for the next 15 years. The good news is that research by the Planning Commission indicates that the demand for transportation increases 1.25 times faster than underlying economic growth. This means that the transportation output should grow between 8-9 per cent every year. The more sobering news is that railways historically have under performed GDP growth. Freight has shown a sensitivity of 0.42 and passenger 0.76. This equates to an underlying growth of 3 per cent for freight and over 5 per cent for passenger traffic.

These historical figures are not viewed by the Expert Group as relevant predictors of future performance. The Expert Group accepts that industrial growth rather than overall growth is the primary market for freight traffic and that industrial growth has lagged – and may continue to lag overall growth. Ample evidence, however, indicates that Indian Railway's low historic growth is a function of a lack of performance, not a lack of

potential.

The Expert Group believes that future growth can and should exceed historical rates based on a number of pieces of evidence. For example, as detailed earlier, two internal IR documents indicate that at least 20 per cent of the freight market that should belong to rail has been lost to road. The Railways Second Corporate Plan (1985 – 2000) forecast that freight traffic in 1999-2000 should be 387 billion NTKM. Actual performance was 301 billion NTKM (a 22 percent shortfall) despite economic growth being faster than the 4.5 per cent assumed. A similar figure was generated in a 1996 RITES report titled “Decline in Railways share of total land traffic”. This report concluded that some 70 million tons of bulk commodity on medium to long routes (above 300km) had been lost to roads (about 18 per cent of the total). We have noted that the main reason for this was a lack of capacity due to saturation on the main arterial routes. The RITES report is clear that IR is capacity-constrained stating that: “IR defines incremental tonnage in terms of what they would be in a position to carry at the end of each plan and not the tonnage warranted by the factor of growth envisaged during the plan”.

In summary, the Expert Group concluded that ‘momentum growth’ (i.e. the underlying growth in Indian Railway’s natural market) was at least 20 per cent above historic performance. Add to this the potential to develop new opportunities in adjacent markets, coupled with ‘catch up’ in market share lost in the recent past, and a reasonable growth aspiration for the next decade should be in line with GDP growth.

The reason for this confidence is that India is better suited than almost any other nation on earth to the underlying economics of rail travel. Only a few countries have the same geographic scale: the former Soviet Union, China, Canada and the USA. Today only China has a similar combination of economic development and population mass. It is notable that all the four countries mentioned have vibrant rail systems, with China in particular investing massively in reinventing its system. As documented, achievement of strategic high growth will also need massive investment in and reinvention of IR. The simple fact is that IR is a high fixed cost relatively low marginal cost business. Most of the system – track, trains and people – is already in place. It merely needs to be pushed harder.

In addition to purely economic advantages, the rail sector is vastly superior to roads both in terms of safety and environmental impact. The railways have less than one hundredth the number of fatalities and consume one sixth of the energy per unit travelled compared to roads.

In short, the view of the Expert Group is that the potential exists to double the underlying rate of growth in IR. Accepting anything less would be a loss to the nation. The rail system is too important to permit the withering of IR. The decline of the Railways is not an immutable law of economics particularly at this stage of India’s development. The future of India’s primary infrastructure asset needs to be a choice. This choice must be based on facts and sound analysis as we have attempted to do.

Future growth can and should exceed historical rates. At least 20 per cent of the freight market that should belong to rail has been foregone to road. The main reason for this was a lack of capacity due to saturation on the main arterial routes

The decline of the Railways is not an immutable law of economics particularly at this stage of India’s development. The future of India’s primary infrastructure asset needs to be a choice. This choice must be based on facts and sound analysis as we have attempted to do

8.2 The Choice : To Repair or to Reinvent

8.21 Repair: “If it ain’t broke don’t fix it”

In its wide ranging consultations the Expert Group came across no one who suggested that all was well with Indian Railways and that nothing needed to change. There was universal agreement about the symptoms of distress. There was greater debate about root causes and a wider spectrum of opinion about which solutions were appropriate given both the distinctive conditions of IR’s scale and complexity and also the unique socio-economic compulsions and constraints facing India today.

Universal agreement exists both around the symptoms of distress and also the need for urgent and purposeful action. No one denied that IR over the past decade has fallen into a vicious cycle of under investment, mis-allocation of scarce resources, increasing indebtedness, poor customer service and rapidly deteriorating economics. No one doubts that financial crises will rapidly follow the absence of forthright action.

The focus of the debate centres on the root causes and therefore the cure. The spectrum of opinion can be usefully polarised into two clusters: the ‘Repairists’ and the ‘Reinventers’.

The ‘Repairists’ can be characterised as conservative, erring on the side of more cautious incremental improvements. Their arguments comprise two strands of thought: first that the majority of improvements can be realised by reverting to the conditions that made IR successful in the past (i.e. pre 1990); second that there was no alternative that can be proven to be better.

The first stream of thought – the ‘ex ante’ reversion to the conditions of success prior to 1990 – makes the point that a model that worked well for more than a century should not be discarded owing to a decade of distress. Their case is based heavily on an assumption that IR is fundamentally sound and that if current management were given the autonomy to operate free of political interference then all would be well – perhaps not perfect but basically fine.

The root cause of the decade of decline is laid at the door of an unstable political system increasingly driven by short term political compulsions. Prices could not be adjusted because of political compulsions. Costs could not be cut because of political compulsions. Investment decisions were increasingly distorted because of political compulsions. In short, the new populist political reality effectively tied the hands of management. There exists ample evidence to support this view and everyone agrees that increasing the freedom of management to run IR is an essential prerequisite to survival.

The second stream of thought is the absence of an alternative solution with a proven track record of success either internationally or domestically. The general theme is that it is not worth losing the good in the pursuit of the perfect.

Internationally the Repairists are genuinely alarmed – rightly so – about the traumas faced by many railways undergoing radical restructuring. They point to Europe in general and the UK in particular as a warning. There is no doubt in the minds of the Expert Group that restructuring any railway – particularly one as large, complex and sensitive as Indian Railways – is one of the most difficult tasks that exists in the business world. There is no doubt that many of the compulsions that drove Europe do not apply to

Indian Railways over the past decade has fallen into a vicious cycle of under investment, mis-allocation of scarce resources, increasing indebtedness, poor customer service and rapidly deteriorating economics. Financial crises will rapidly follow the absence of forthright action

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India. It appears that the wholesale privatisation pursued in some countries is premature in India. There is an increasing perception that the UK experience reflects a hasty and ill-considered experiment driven by political expediency and is not a model to be followed.

Domestically the ‘Repairists’ point out that the IR model is probably the best in the public sector. They will argue that the problems facing IR are fewer than most of the ‘navratnas’ and ‘mini navratnas’. They would argue that the key issue is how decisions are taken by India’s political structure, not how the railway is structured. They fear that changes to the overall structure and relationship with Parliament will only make a bad situation worse. The last thing to do in turbulent seas is to rock the boat.

The apparent absence of a credible alternative model creates uncertainty. Indian Railways is simply too important to experiment with, they would argue. Four billion passengers, 1.5 million employees and 40 per cent of the nation’s freight cannot be used as guinea pigs. “Fools rush in where angels fear to tread” underpins this stream of thought.

8.22 Reinvent : “But it is broke : So fix it.”

The view that the IR model is the best in the public sector is an assertion passionately held by some – but not on a statement of fact. Many would argue that the facts indicate the reverse. The lack of change in IR over the past decade is in stark contrast to the intention to reinvent major national institutions such as VSNL, SAIL, Maruti, Air India, Indian Airlines, public sector banks and State Electricity Boards. Indeed almost every single public sector entity is undergoing fundamental restructuring in the face of the dual forces of increased competition and imminent privatisation. Indeed IR’s inertia in the face of impending financial crisis is precisely why IR needs to undergo deep structural change particularly in the governance arrangement between management and Parliament. The argument that the central issue is executional not structural –that it is about letting the experts regain control, not about changing the structure of the way that IR is governed and managed – is not perceived by many to be valid. Why, they would ask, should IR avoid fundamental restructuring when the rest of India Inc has been wrestling with the profound changes shaping the Indian economy?

It is also argued that the difficult law and order situation that obtains in some parts of India and the effect that it invariably has on the functioning of the Railways will have to be kept in mind. At present, IR also operates its own protection force to supplement the government forces of law and order. The responsibility of maintaining law and order falls squarely on the government: that is its core function and must remain so. No re-invention of IR would be successful if this is not understood. However, many commercial organisations employ their own security personnel (or sub contract) to supplement the government forces of law and order.

The central argument of the ‘Repairists’ is that the experts should be given the autonomy to run the railways and that Parliament should provide support and guidance. Their argument is clear and appears compelling. There is little doubt that if the experts were given greater autonomy matters could improve dramatically – at least in the short to medium run.

There is no doubt in the minds of the Expert Group that greater autonomy is necessary. The issue is whether this alone is sufficient to secure the long-term success of railways in India. The answer is probably yes if

Almost every single public sector entity is undergoing fundamental restructuring in the face of the dual forces of increased competition and imminent privatisation. IR’s inertia in the face of impending financial crisis is precisely why IR needs to undergo deep structural change

Until 1990, IR operated in a centrally planned environment. IR was the logistics arm of the Government in which key variables such as volume, price and priorities were administered by the Centre, not set by the market. In this situation close links with the Centre were essential

The balance of payments crisis brought home the unsustainability of 'easy money' in which the country borrowed at market rates and lent at subsidised rates for unremunerative projects. What might seem to IR to have been the halcyon days of government support in reality sowed the seeds of fiscal crisis that it is reaping today

performance aspirations are modest. The answer is certainly no if the railways are to remain the cornerstone of transport infrastructure that they can and should be.

The 'Reinvention' argument is also based on two streams of thought: the first is that turning the clock back defies the new reality of a liberalised India; the second is that the existing expertise may not be adequate and that new kinds of expertise are needed to tackle the managerial problems that cannot be wished away onto third parties.

The clock cannot be turned back

The first stream of thought is that turning the clock back defies the new reality of a post-liberalised India. One of the distinctive features of IR is that it is a largely self contained world. This is both a strength and ultimately a fatal weakness.

The world of Railwaymen is a good world populated by good people with good intentions. But it is a world that is shielded from many of the realities India is currently facing. One consequence of this is that IR is highly resistant to change. Although it has itself commissioned a plethora of reports over the years, it has been loath to accept any restructuring recommendations of note. Its management seems to believe that they know best and outsiders have little to offer.

The Reinventers hold the view that the ex ante argument – turning the clock back – is a denial of the profound structural change that has and is taking place in India. This new reality has created a structural change in three dimensions that affects IR: first, the demise of central planning and rise of market forces; second, the decline of subsidised funding; third, the increase in performance standards expected by customers.

Until 1990, IR operated in a centrally planned environment. We have seen that the overwhelming majority of freight customers were public sector utilities protected from international competition. Passengers had to be transported but they had little choice in an era when car ownership and air travel were not realistic options. In short, IR was the logistics arm of the Government in which key variables such as volume, price and priorities were administered by the Centre, not set by the market. In this situation close links with the Centre were essential. The notion of separating policy, regulatory and executive roles was merely an academic exercise.

The structural change that has taken place is that in future the market rather than the Centre will determine success or failure. Indian Railways is one of the last major institutions to realise that the Centre no longer has a monopoly on the answers. The challenge is for IR to adapt its structure and culture to listen more to market makers than policy makers.

The decline of subsidised funding is the second structural change that IR is struggling to accept as a fact of life. 1991 was a watershed because the balance of payments crisis brought home the unsustainability of 'easy money' in which the country borrowed at market rates and lent at subsidised rates for unremunerative projects. What might seem to IR to have been the halcyon days of government support in reality sowed the seeds of fiscal crisis that it is reaping today. The economic reality IR must come to grips with is one in which Central Government interest payments constitute the largest component of expenditure, consuming about 70 per cent of all tax

revenues. In short, the Government of India is not in a position to bail IR out of financial problems.

IR is facing diminishing subsidy levels. IR has to come to terms with a step change increase in the cost of capital (unfortunately at the same time as it has to digest a step change increase in the cost of labour).

The third structural change is that customers are becoming more demanding. There are two inter-related reasons for this, choice and pressure. First, choice has increased. Big consumers can choose to import directly thus bypassing IR altogether (a common feature in the power generating industry). Big customers can choose to go by road, a trend that will accelerate with the advent of better roads and trucks. Second, competitive pressure has increased. Liberalisation is pulling down the barriers of protection and all IR's main customers are seeking to cut costs in cut-throat commodity businesses. Now that customers realise that it costs less to ship one ton of coal from Australia than it does to move it by rail from the coalfields of Bihar to the markets of Maharashtra, questions get asked, alternatives get analysed. The fact for many large customers is that IR's freight costs are too high and its value added is too low. It is these customers who are voting with their feet, voting silently but with increasing momentum. Market pressures will only increase with second generation liberalisation. IR will have to respond creatively to these pressures. But its current structure is not equipped to do so.

The Experts have inadequate expertise

The second stream of thought that informs the perspectives of the Reinventors is that, although IR has largely been run by experts, it requires new kinds of expertise for the future. Reinventors argue that an objective analysis of the performance of the current system highlights major and sustained shortfalls in performance. This analysis of the facts indicates structural flaws requiring structural solutions.

A balanced scorecard of key performance indicators would typically include measures along three dimensions: governance structure and systems; financial; and operational. The Reinventors argue that the balance of evidence shows performance shortfalls that cannot always be explained – entirely or even partially – by third party or other 'environmental' reasons. The Reinventors base the case for more deep seated structural change on the evidence of each of the three elements of the balanced scorecard of performance.

First, governance structure and systems. Evidence in three areas is suggested to support the view that the time for reinvention is overdue: strategy formulation, tenure, and structure.

An organisation that does not know or cannot express what it wants, is vulnerable to the tugs and pulls of third parties. Despite the fact that IR is one of the most planned and studied institutions, its ability to create a coherent vision for the future, coupled with a clear set of priorities, is weak.

As argued in chapter 4 the planning process currently used by IR is effectively a bottom up incremental process, although in terms of formal structure plan funds are spent according to the strategic priorities set by the Railway Board in consultation with other parts of the government. This is a worthy exercise that involves mobilising a massive amount of resources to identify investment opportunities. The net result, however, is neither truly strategic nor visionary. Inadvertently this process acts as a powerful

The fact for many large customers is that IR's freight costs are too high and its value added is too low. Market pressures will only increase with second generation liberalisation. IR will have to respond creatively to these pressures. But its current structure is not equipped to do so

An organisation that does not know or cannot express what it wants, is vulnerable to the tugs and pulls of third parties. Despite the fact that IR is one of the most planned and studied institutions, its ability to create a coherent vision for the future, coupled with a clear set of priorities, is weak

mechanism to perpetuate the status quo. Leaders need to change the status quo, in contrast to managers, who merely optimise it. The planning process works against leadership.

Leadership can be assessed by asking two related questions. First, are the important decisions taken correct? Second, were there important decisions that were not taken that should have been taken?

Plan funds are spent according to the strategic priorities set by the Railway Board in consultation with other parts of the government. Inadvertently this process acts as a powerful mechanism to perpetuate the status quo. Leaders need to change the status quo, in contrast to managers, who merely optimise it

The recent track record of leadership relating to the quality of decision taken is clear. The single most important business issue for IR is improving throughput on capacity constrained routes such as the Golden Quadrilateral. Has this happened? No.

Major new investments of direct relevance to improving throughput have been rare in recent years. In contrast, the primary thrust of investment in the 1990s has been in three unrelated and largely unremunerative areas. The most significant recent investment programme of IR was gauge conversion which has absorbed about half of the Capital Fund but with no discernible improvement in performance. New lines is the second major area of investment (which has absorbed 20 – 30 per cent of borrowed capital). The main impact of these line extensions has been to increase IR's reach to areas where there is little or no business at a time when its main arteries are clogged with traffic. Unfortunately, plans for the future will compound the problem of unremunerative track extensions. At present there are about 70 new rail line projects included in the railway budget work on which work has yet to begin with a total estimated cost of approximately Rs. 23,000 crore. The third area where investment continues well past the point of diminishing returns is electrification.

The track record of decisions that should have been taken but were not appears to be no better than for those decisions that were taken. The real test of leadership is that it knows when to change the status quo. Effective institutional stewardship knows when and how to raise and resolve thorny issues that the rest of the organisation wants to brush under the carpet.

The failure to take important decisions can rarely be blamed on third parties. For example, why does Electrical remain a separate cadre? Why is IR in the business of hospitals, schooling, catering, and manufacturing? Why, in an organisation of 1.6 million people, in which 70 per cent of income derives from serving a handful of large organisations, is there no institutional mechanism devoted to providing better service to key customers?

Over many years the collective leadership of IR, both managerial and political, systemically made sub-optimal decisions. But not all these were related to political exigencies

The temptation to point the finger of responsibility at third parties misses the point. The point is that over many years the collective leadership of IR, both managerial and political, systemically made sub-optimal decisions. But not all these were related to political exigencies. The Reinventors conclude that it is time to fix the system, not blame the players.

Closely linked to the issue of leadership is tenure. The current system in which board appointments are based on tenure is long overdue for overhaul. The main problem caused is the short duration in positions of leadership. Board members with an average transit time measured in months have little opportunity to exert the leadership necessary during periods of rapid change. Board members need at least 3-5 years or more, preferably to drive the structural changes necessary. A lesson can be learnt from the leadership of leading multi-national corporations in the world such as General Electric, which is a universally admired multinational conglomerate of vast size. Its current chairman, Jack Welch has been the chairman for over 20 years. His

chosen successor is only 44 years old; has been selected more than a year in advance, and can also look forward to a similar tenure if he performs well.

Structure has remained largely unchanged for decades. The only blip was the abrupt announcement in 1997 to add six additional zones. This was a suggestion of dubious merit that would have added substantial cost but little value. **Indian Railways remains an integrated, functionally oriented institution that is organised around its cadres instead of around its businesses or customers.**

The 'Reinventers' argue that a combination of inadequate leadership, weak strategy processes, short tenures and inward focused structures cry out for structural reinvention, not merely incremental repair.

The second element of a balanced scorecard of performance measures the financials – and the financial performance indicators are alarming. Indian Railways is displaying all the warning signs of inherent financial collapse. Margins are wafer thin. IR's main financial performance indicator – the operating ratio – is close to 100 (98.8) which is the worst performance in 50 years.

Costs are racing ahead of revenues. Over the past 4 years annual costs rose 14.3 per cent whereas revenues rose 12.3 per cent. In the past two years the situation has deteriorated with costs accelerating to 18.3 per cent with revenues stable at 12.9 per cent. Resources are being depleted. Railway Fund Balances have dropped 93 per cent in less than three years from Rs. 3564 crore in 1997-98 to Rs. 253 crore in March 2000. Creditors are not being paid. For the first time in 17 years, in 2000-2001, Indian Railways has had to defer 70 per cent of its obligatory dividend payment (Rs. 1500 crore out of Rs. 2115 crore). Essential investment is being delayed. The proportion of expenditure spent on repair and maintenance has been declining with arrears in track renewals tripling in 10 years (from 3,548 km to 12,260 km). Internal funding has declined from 70 per cent of requirements in 1994 to 45 per cent in 1998.

If IR were a commercial company, shareholders would be worried about bankruptcy. They would be seeking a fundamental restructuring of the business, its strategy and leadership team. Faced with such a precipitous decline in financial performance, the worst thing is to do too little too late. The Indian public as a whole are IR's shareholders. They should demand no less.

The third element of balanced scorecard of performance measure relates to operations. The failure of IR to meet its prime operational objectives raises questions about its ability of the system to repair itself. Its key objective has been to increase the throughput of volume on its existing networks. Throughput can be increased through some combination of raising the average train speed, reducing breakdowns, increasing the train load, or increasing the number of trains a day.

While there **has** been improvement in throughput of traffic, progress in respect of most productivity parameters has generally been inadequate or poor. Average freight train speeds have increased by 3.5 percent in 10 years to 23.7 kmph. Average train loads have increased by 10 per cent in 10 years to 1180 tons. The average tare load of wagons is currently less than half that of South Africa: a ratio of 1:2.3 compared to 1:5.

Maintenance remains poor and shows little improvement. Internal reports conducted by the LRDSS indicate that overall capacity loss of some 18-22

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per cent is due to train detentions through breakdowns.

The logic of the Reinventors is that an organisation that is unable to keep its own house in adequate order warrants a shake up.

To conclude. The Reinventors case for structural change is based on two streams of thought: first that the clock cannot be turned back and second that new injection of expertise is vital. As evidence they would turn to a balanced scorecard of performance indicators which highlights poor and often declining performance in the 3 key areas of strategic leadership, finance and operations. Collectively these point to a failure of the system and call for a reinvention of Indian Railways.

The Expert Group is overwhelmingly in the Reinventors corner, though a few of us would like to be Repairers if it were feasible.

The choice to be made between Repair and Reinvent is not a stark choice between black and white. The areas of overlap are significant. The real difference between the two groups is that the Repairists believe that the system can be improved while the Reinventors believe that the system itself needs to be changed

8.23 Making the Choice to Reinvent

The choice to be made between Repair and Reinvent is not a stark choice between black and white – between ‘do nothing’ and revolution. The areas of overlap are significant. Both parties agree on four important issues: the need to focus on core activities and spin off the rest; the need to organise IR along business lines viz. passenger, suburban and freight; the desirability in theory of inducting new skills from outside the railways (although in practice the Repairists, including some in the Expert Group, are sceptical about the practicability of this, given the pay differentials with the private sector as well as cultural assimilation issues); and finally the need to bring greater clarity and sense of purpose to the institution so that it can be in greater control of its destiny. They are also rightly concerned that the move to induct outside skills will inevitably bring in generalist civil servants. We would also be concerned at this turn of events.

The real difference between the two groups is that the Repairists believe that the system can be improved while the Reinventors believe that the system itself needs to be changed. Three points of difference between the two groups stand out; governance; government support and talent.

Governance relates to the relationship between policy, regulation and execution. Reinventors believe that a clear structural separation between these roles is as necessary in Railways as it is elsewhere (for example in telecom, or power). Reinventors push harder for commercialisation. A separate Railways Budget has become counterproductive in the government departmental framework. Various government committees have repeatedly documented that the original objective of commercialisation of Railways has not been met by the mere separation of the Railways budget in the current departmental framework.

The need for continued government support is agreed by both groups. The difference is that the Repairists hope that more money will be forthcoming if a strong case is made. The Reinventors, on the other hand, not only doubt that more money will ever be forthcoming but also that the case for further funding in the absence of structural reform is weak.

Talent relates to the need to induct fresh ideas and skills from outside the Railways. The point of difference is between heart and mind. The Repairists have great faith in the ability of Railwaymen to get their house in order, their abilities being thwarted only by “political interference”. Their minds accept a limited need to inject specific talent but their hearts fear an invasion of new members to the club. Reinventors point out that fresh leadership is most

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common in business restructuring all over the world. Indeed nearly every major restructuring of Railroads was initiated by fresh leadership willing to dispel the myth that only Railwaymen are capable of running railroads.

On balance the Expert Group leaned towards the ‘Reinvent’ approach, as will become evident from the recommendations. There are three reasons for this.

First and foremost, what tipped the balance for most members was an acknowledgement of the task ahead. It became increasingly clear over the time and as we have painstakingly documented in previous chapters, the only route to success lay in the Strategic High Growth scenario. Strategic High Growth will demand a commitment to commercial discipline and customer orientation that is patently not well understood by those who believe that they can themselves make the necessary changes despite compelling evidence to the contrary. Strategic High Growth is necessary not only for IR to survive as an organisation but for the country’s transportation infrastructure as a whole.

Second, it became increasingly clear that proponents of the ‘Repair’ approach tend to ignore the fact that the current system provides no incentive to take the risks necessary to reverse the decline in performance. Intelligent people understand that to take greater risks without commensurate reward is both illogical and also foolhardy. It is precisely this lack of incentive that has led to the steady decline in performance and is one of the root causes of the current crises.

Third, it became clear that the days of cheap capital were numbered. The future of the Railways will be increasingly dependent upon market-based capital. Providers of capital will need to be convinced that a sufficiently profound change has taken place in IR for them to believe that the vicious cycle of financial crises can be reversed into a virtuous circle of high performance. Simply trying harder is unlikely to be sufficient to win the support of the market. However, the current financial state of IR is such that the government will have to provide exceptional support in initial years. But with the restructuring and consequent growth projected, it will be able to recoup its investment while ensuring that IR is made commercially viable.

8.3 International Lessons Learned : Their Relevance to IR

In light of the international experience with railway restructuring there are several options to restructure the Indian Railways. The lessons from the restructuring experiences of several railways around the world provide clues as to how the important issues faced by the Indian Railway (detailed in Chapter 2) today could be addressed:

8.31 Demarcation of Commercial and Social Obligations

Clear demarcation between social and commercial operations is a prerequisite for effective restructuring. This demarcation has served as the starting point in the restructuring of several railways internationally. The European Union commenced its restructuring with a clarification regarding the extent of public service obligations of the EU Railways. Once the obligations were identified the railways entered into contracts with the respective governments to ensure state funding of these activities. All activities not included in the social obligations were thereafter treated as commercial businesses and

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The future of the Railways will be increasingly dependent upon market-based capital. Providers of capital will need to be convinced that a sufficiently profound change has taken place in IR. Simply trying harder is unlikely to be sufficient to win the support of the market. However, the government will have to provide exceptional support in initial years

were required to meet targets in terms of growth rates, market shares and profitability. In South Africa (Spoornet) too the commercial and “corporate citizenship” objectives were clearly segregated. The commercial focus was clearly defined as freight logistics and the policy formulated spelt out the need for the operations to be customer focussed and to create shareholder value.

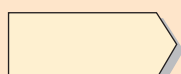
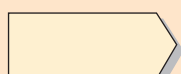
The necessity of defining the social/developmental/strategic obligations of the Indian Railways cannot be overemphasised. Not only would this provide clarity in terms of the business purpose but also it would enable IR to estimate the funding required to support “social” obligations. As has been brought out in the chapter on problem definition, the requirement would include not just funds for capital investment but the funds that would support the losses that these projects incur over their lifetime. The IR would therefore require that the Government agrees to provide the capital subsidy for these projects and fund the operating losses incurred. The Government on its part could mandate that IR operate these services at some benchmark levels of operating efficiency. Once the social activities are defined exhaustively, all other projects undertaken by IR can be subjected to stringent scrutiny to assess their financial viability. However, the current accounting system makes it difficult to isolate clearly the burdens imposed by these social obligations.

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8.32 Autonomy and Commercial Focus

IR is expected to function on commercial principles, its management needs to be allowed a degree of autonomy that is comparable to any other commercial organisation. To grant the railways autonomy by creating an arms length relationship with government is one of the *salient features* of railway restructuring around the world. In Europe several countries have separated the railway operations from that of the government’s and have introduced independent regulators for the sector. China had stated an aim to ensure complete separation of government and enterprise functions within the railway operations.

It is often argued that the current IR organization that combines the policy-making, regulatory and the executive functions actually makes



Box 8.1 : Office of the Rail Regulator in the United Kingdom: Functions and Achievements

Railways in the U.K continue to be regarded as a public service even after privatization and regulation, it has come to be believed, is needed to ensure improved performance, higher investments, and better customer satisfaction. The Office of Rail Regulator (ORR) – the national rail regulatory authority for passenger and freight railways – has, following the recent privatization of railways in Britain, identified key areas of intervention through regulation for the protection of passenger rights. ORR has a wide operating agenda for private rail regulation in the U.K. These can be classified into three principal areas of work viz. promotion of consumer interest, regulation and competition policy. The key elements of its functioning are listed as below:

- Promoting consumer interest through improving service standards – setting best practices and regulations.
- Protecting passenger's rights through a review of safety standards, inspection and through compliance procedures.
- Promoting rail freight by setting rules for improved and simplified access to the rail network.
- Framing competition policy through an Act and reviewing the performance commitments of Rail Track.
- Promoting track access through licenses and retaining the prerogative to approve access to networks, customers and decisions related to access.

ORR is clearly the watchdog for rail consumer protection in the U.K. The task before the organisation is to monitor and regulate the performance commitments of private rail operators, which it accomplishes through the following specific initiatives and procedures:

- Improving passenger accessibility standards through a code of practice to ensure that rail is the preferred mode of transport by the user.
- Besides improvements in the availability of trains and routes, accurate time-tabling and information (12 months in advance) to enable passengers to plan their journeys are enforced.
- Customer interests are further secured through an independent audit of telephonic rail enquiry services and the monitoring of the response time of the rail operator in handling customer complaints.
- Exercising power and influence to protect passenger rights through travel safety, third party liability insurance, settlements of claims and compensation against closures (withdrawal or alteration of services).
- Promotion and regulation of the rail freight network and the rail infrastructure company, Railtrack, with the objective of improving and simplifying access for freight users to rail freight markets.
- Initiate special options to improve flexibility in operational and administrative arrangements of Railtrack viz. open access rights to freight rail franchisees on certain train paths, site leases, reservation of paths for spot bidding etc.
- Conduct a periodic review of the Railtrack's access charges levied on franchised passenger rail operators through a network management programme that benchmarks access charges against network outputs (measured as punctuality, track quality and time requirements of train operators and clients).
- Work jointly with Railtrack on possible charging options to improve fare structure for achieving remunerative investment on network capacity.
- Promote through a Competition Act the development of competitive freight markets by instituting appropriate safeguards against destructive competition by new entrants.
- Further protect passenger interests through a competition policy that evaluates the approval of proposals for new passenger services by Railtrack against ORR criteria to prevent the introduction of services potentially harmful to network benefits.

The effectiveness of a regulator needs to be viewed against a background of a list of achievements. The ORR has met with success in three principal areas of rail consumer protection. The first area is the periodic review of Railtrack's access charges, which focuses on a better alignment between commercial interests of rail companies and public interest. The second area of success is the acquisition of new powers of enforcement, which extends also to other players like industry suppliers. The third and final area of success is the creation of a Strategic Rail Authority (SRA) to foster special public sector-private sector partnerships between stakeholders – passengers, freight users and the tax paying public.

The experience of ORR demonstrates that regulating railways in public interest is indeed a very complex task involving a series of checks and control over diverse interests in the U.K rail system. The broad range of the functions of the rail regulator shows how much coordination, effort, planning and initiative is in fact needed to ensure openness and transparency of almost every aspect of passenger and freight rail operations in the United Kingdom.

Source: Office of the Rail Regulator, Annual Report 1998-99.

decision- making in the railway faster and more effective. Nothing could be farther from the truth. The current structure, wherein IR is a Government department, subjects the organisation to numerous (political and other) pressures that impede its functioning along commercial lines. Rather than speeding up decision-making through closer and more cohesive functioning, which is often cited as the major benefit of a monolithic organisation, a lot of time is wasted in warding off pressures to take decisions that are not commercially viable. As long as policy making and execution are part of the same organization, IR will find it extremely difficult to have arms length negotiations with the Government on issues such as compensation for social obligations. It is therefore imperative that the restructuring plan addresses the issue of operational autonomy and insulates IR from political/governmental interference.

Exhibit 8.2 : Lessons from International Experience (2)

AUTONOMY AND COMMERCIAL FOCUS
 Railways across the world have made significant changes to their business structure to achieve their objectives. These changes typically involve breaking-up an integrated structure into smaller more manageable units

Country	Actions taken
Germany	Railways split up into five subsidiaries under one holding company <ul style="list-style-type: none"> • Long distance passenger • Short distance passenger • Freight • Track infrastructure • Service and stations } <ul style="list-style-type: none"> • Receive charges from users • Pay to track and service companies
Sweden	Railway split into two companies <ul style="list-style-type: none"> • BU ▲ infrastructure provider • SJ ▲ operator SJ further split into <ul style="list-style-type: none"> • Passenger division • Freight division • Subsidiaries • Real estate division BV paid usage charges by SJ

Source: Chapter 2 and McKinsey and Co.

Exhibit 8.3 : Lessons from International Experience (3)

AUTONOMY AND COMMERCIAL FOCUS

Country	Actions taken
China	<ul style="list-style-type: none"> ⊗ Non core activities separated <ul style="list-style-type: none"> • Construction • Rolling stock manufacture ⊗ Rail business separated into integrated regional companies ⊗ Passenger business separated from freight in each region
Britain	<ul style="list-style-type: none"> ⊗ Infrastructure and operations completely separated into different companies ⊗ Multiple rail service provider + single infrastructure company <ul style="list-style-type: none"> - Passenger (25) - Freight (6) - Infrastructure (1) - 50 + other companies - Rolling stock (3) - Renewal (6) - Maintenance (7) ⊗ All companies privately owned ⊗ Support operations split into number of companies
Japan	<ul style="list-style-type: none"> ⊗ Japanese National Railway Split into a number of companies ⊗ Passenger business divided into six companies based on geography ⊗ Japanese national railways Settlement Corporation set-up to take care of surplus labour ⊗ Separate companies for <ul style="list-style-type: none"> • Telecommunications • Research • Construction

Source: Chapter 2 and McKinsey and Co.

The functioning of IR as a Government monopoly for a long period makes it necessary to induct new managers who would act as change agents in the restructuring process. These managers would be accustomed to working in competitive situations and meeting the needs of demanding customers. They would therefore bring with them valuable experience and insights that would allow the Railways to increase customer focus, improve service and enhance productivity while cutting costs simultaneously.

8.33 Commercial Systems

The efforts of railways around the world to redefine their business purpose and to provide the necessary managerial autonomy to achieve the purpose could not have yielded results unless it was accompanied by a revamp of internal systems. The new systems complement and support the move towards differentiating between social and commercial enterprise and aim to introduce greater customer and commercial orientation into the organisation. A large part of the revamp of internal systems relates to the introduction of standard accounting principles for reporting of financial information, and this is made much easier by the extensive use of information technology (IT) as outlined in Chapter 7. For example The British Railways adhered to the British Companies Act 1985 before commencement of restructuring. Deutsche Bahn accounts comply with the German Commercial Code and the German Stock Corporation. In Sweden the recommendations of Sweden Financial Accounting Standards Council are used in preparation of Annual reports.

The need to revamp systems is critical in the Indian context. We have shown in chapter 5 that the non-adherence to commonly accepted corporate accounting standards has made it difficult to comprehend and assess the financial performance of IR and led to under-provisioning in areas like depreciation. The restructuring plans would therefore need to include a complete recast of the financial accounts of IR and also redesign of the decision-making systems. The systems for the management of human resources would also need to be redesigned to bring in greater performance orientation. The emphasis would need to be on speeding up decision-making by delegating authority to frontline managers.

8.34 Business Oriented Structure

Railways across the world have made significant changes to their business

As long as policy making and execution are part of the same organization, IR will find it extremely difficult to have arms length negotiations with the Government on issues such as compensation for social obligations. It is therefore imperative that the restructuring plan addresses the issue of operational autonomy and insulates IR from political/governmental interference

Exhibit 8.4 : Lessons from International Experience (4)

SYSTEMS
 Several Railways around the world have introduced standard accounting principles for reporting of financial information

Britain	British Railways adhered to the British Companies Act 1985 (even before restructuring)
Germany	Deutsche Bahn accounts comply with the German Commercial Code and German Stock Corporation Act
Sweden	Recommendations of Sweden Financial Accounting Standards Council used in preparation of Annual reports

Source: Chapter 2 and McKinsey and Co.

structure to achieve their objectives. These changes typically involve breaking-up the integrated structure into smaller more manageable units. The first step in this separation follows from the definition of purpose wherein all activities unrelated to the basic transportation business are separated from the core business. When China restructured its railways the rolling stock manufacturing units were separated from the main railway organisation. Japan too separated the construction, research and telecommunications wings of the Japanese National Railway (JNR) into separate units. European Railways have for long been outsourcing activities such as rolling stock manufacturing.

The focus of business restructuring needs to be on structuring the organisation along business lines and into smaller more manageable units with clear accountability for each part. All non-core businesses need to be separated from the main operations. The core transportation business must be broken down into customer oriented business groups

Once non-core activities have been spun off, the second step in restructuring is to redefine the way the core business of rail transportation is organized. While the Chinese and the Japanese have restructured by creating integrated regional railways, the Europeans have restructured by separating the infrastructure provision from the service provision operation. Within Europe the extent of subdivision of the service provision operations has also varied. Countries like Sweden have restructured to form one company each for service and infrastructure provision, with the service provision company having passenger and freight as two divisions. On the other hand there are examples like Great Britain where the service provision itself was sub-divided into more than 30 privately held companies for freight and passenger transport services. In addition, one infrastructure company and several support services companies were also created.

International experience indicates that the current business should be simplified. The focus of business restructuring needs to be on structuring the organisation along business lines and into smaller, more manageable units with clear accountability for each part. All non-core businesses need to be separated from the main operations. The emphasis should be on ensuring that these are made competitive. The core transportation business must be broken down into customer oriented business groups. This implies that the current cadre system in which the entire organisation is based on functional disciplines like civil engineering, mechanical engineering etc. needs to be recast.

8.4 Design Principles

The detailed recommendations formulated by the Expert Group are based on 3 design principles: focus on root causes not symptoms; develop an Indian solution to reflect the unique Indian context; commercialisation must precede privatisation. These principles emerged organically after examining international experience and listening to management, labour, public servants

Exhibit 8.5 : Lessons from International Experience (5)

SYSTEMS

Measurement of performance along key financial and operating parameters

Sweden/
Germany

Financial parameters like ROE used to measure performance of commercial functions

Operational parameters like efficiency, punctuality used for social service functions

Source: Chapter 2 and McKinsey and Co.

and customers.

In combination, these principles endeavour to strike a balance between the urgent need for deep seated reform and the practical reality that IR is an immense and complex organisation that is, and must remain functional day in, day out.

8.41 Focus on Root Causes not Symptoms

Indian Railways is one of the most studied institutions on the planet. For almost every conceivable question that can be asked there already exists a comprehensive and rigorous report that lays out the facts and indicates the answers. What is striking, however, is that the institution is either unwilling or unable to act on most of the good advice it has itself commissioned.

The conclusion drawn by the Expert Group was that it was more important to focus on ‘why’ than ‘what’. For example, it was more important to answer why the relative cross subsidisation between freight and passenger has become worse over the past decade rather than to suggest what the appropriate pricing policy should be.

The root cause of most of IR’s problems identified by the majority of the Expert Group lay in the model of corporate governance in general, and the relationship between Parliament and management in particular. In other words, the problems start at the top.

The Expert Group’s focus on root causes highlighted three priority areas: institutional separation of roles; clear differentiation between social obligations and performance imperatives; and the need to create a leadership team committed to and capable of redefining the status quo.

First, is the issue of institutional separation of roles, into policy, regulatory and management functions. Currently these roles are blurred which causes confusion about the underlying vision and mission of IR. Until such time as the fundamental purpose and governance of railways in India is made clear, the root cause of most of IR’s problems will not have been addressed.

The need to provide greater clarity and institutional separation will increase rapidly in the future. Ten years ago the topic was largely academic because the government was effectively the sole owner, manager, funder and customer of all rail related businesses. Today the system is under pressure because the government will no longer be the sole funder and its role as compliant customer is diminishing. Ten years from now there will be multiple

The Expert Group’s focus on root causes highlighted three priority areas: institutional separation of roles; clear differentiation between social obligations and performance imperatives; and the need to create a leadership team committed to and capable of redefining the status quo

Exhibit 8.6 : Lessons from International Experience (6)

LEADERSHIP CHANGES

Changes in business structure have been accompanied by induction of fresh managerial talent CEO’s of 7 out of 10 large railways in Europe and Japan are from a non rail background*

In Sweden outsiders have replaced almost 80 percent of senior management

These managers have

- brought a new perspective
- been the driving force behind generating greater customer focus

* However some of these Railways have been inducting outside managers even before the commencement of the restructuring.

Source: Chapter 2 and McKinsey and Co.

The institutional separation of roles will mean that policy makers are limited to setting policy (and paying for what they ask for); regulators fix competition rules in general and pricing in particular; managements manage and are measured against clear performance indicators

owners, multiple funders, multiple customers and multiple managers. The governance of the many railway related businesses in India needs to be designed in much the same way that airlines, telecommunications and utilities are managed and regulated.

The institutional separation of roles will mean that policy makers are limited to setting policy (and paying for what they ask for); regulators fix competition rules in general and pricing in particular; managements manage and are measured against clear performance indicators. The Expert Group recommends that these roles be clearly separated.

Second is the clear differentiation between social obligations and performance imperatives. In a vibrant democracy such as India, it is not the role of an Expert Group to call into question the objectives of Parliament. It is clear that an institution such as IR is a key asset of the nation and must carry its full weight of social obligations. It is however, the role of the Expert Group to comment on how best to manage the social obligation issue. For example, the Expert Group has concluded that the problem with the Railways Budget is that it blurs the dividing line between policy making and implementation. To make matters worse, the extreme ‘visibility’ of the Railways Budget accentuates political compulsions. It impairs the autonomy of IR management to take commercial decisions.

There is not a shadow of doubt that the ‘social obligations’ pressure has increased substantially in the past decade (e.g. according to IR, over 70 per cent of the nearly Rs.40,000 crore of ongoing projects are in the so-called social sphere). This situation would be perfectly acceptable if these obligations had clear objectives and means of funding. The problem is that increased pressure is inversely related to support. In other words, Parliament is demanding more and giving less (e.g. IR calculates that the annual ‘social obligation’ cost is approximately Rs. 4,000 crore for which it receives Rs. 800 crore compensation). The situation is wholly unsustainable and risks draining the livelihood from the heart of the business.

Third is the need to create a leadership team committed and capable of redefining the status quo. Wars are not won by managers. Independence was not won by managers. Great victories require great leaders. Indian Railways needs a leadership team committed to changing the status quo. **The current structure simply does not permit such a team to evolve.**

The current system has two flaws that the Expert Group believes must be corrected: tenure and skills.

Tenure is an old chestnut but remains a key issue. Tenure based promotion may have many advantages but forming a powerful team of leaders is not one of them. Short tenures do not allow the incumbents to undertake strategic planning or formulate and see through the implementation of operational strategies; neither do they encourage accountability, as the incumbents do not have to live with the consequence of their actions. A system that effectively rewards those favoured by seniority and age rather than merit with a position on the Board for a few months prior to retirement is not the mechanism to breed leaders.

Skills in the leadership team need to be broadened and deepened. The current bias towards home grown technocrats is necessary but insufficient. **IR urgently requires an injection of fresh ideas and fresh skills to**

Great victories require great leaders. Indian Railways needs a leadership team committed to changing the status quo. A system that effectively rewards those who do not make mistakes with a position on the Board for a few months prior to retirement is not the mechanism to breed leaders

accelerate its development into a commercially savvy market oriented set of businesses.

In summary, the leadership of an organisation of the scale and complexity of IR cannot be expected to emerge by default. Leadership must be differentiated from management. The leadership team needs to be selected from the best, rewarded for success, measured against performance targets and be in place long enough to do the job properly.

We summarise this section on root causes. It is clear that IR has many important problems to deal with – safety, cost reduction, pricing, investments, customer retention – but most of these problems are symptoms with a deeper root cause. To get to the source, the Expert Group concluded that it is essential to start at the top.

8.42 Develop an Indian Solution to Reflect the Unique Indian Context

The Expert Group was eager to learn from the experiences of other rail systems but reluctant to adopt international models of reform. There are two reasons for this caution. First, international experiences are diverse and have yet to define a widely accepted model for success. Second, India is different in many key respects.

International models are diverse with each region reflecting solutions tailored to the specific needs of their geography (e.g. Japan versus Canada), politics (e.g. Europe versus China), ideology (e.g. UK versus France) and industrial development (e.g. South Africa versus USA). Added to this diversity is the uncertainty of which models are likely to be the most successful. In most cases it is simply too early to tell which models will emerge as winners. Perhaps the turbulence and pain some systems are going through is necessary. Perhaps the gentler approach will turn out to be wiser. The jury is still out.

Even if an international model for success emerged, the Expert Group would continue to urge caution because India is different from most other countries in four important aspects.

First IR is not in crisis (yet) though about to get there. Reform in other countries was driven in many cases by the catastrophic economic failure of their financial models. Annual losses amounting to billions of dollars forced the speed and direction of change.

Second, rail in India is a relatively more important element of infrastructure than anywhere else on earth. In most other comparable countries, rail has been reduced to an ‘optional extra’ (e.g. Europe and USA) or for reasons of history was never fully developed (e.g. China). Only in India does the railway system play such an important role.

Third, the social obligations associated with nation building in a large democratic industrialising country such as India, place practical constraints on the pace, substance and style of change.

Fourth, as we have documented in chapter 3, IR has great potential for traffic growth – both freight and passengers. This has not been the case for other railways, except for China.

In summary, the Expert Group looked outward to the experiences of others for inspiration and ideas. When it came to framing the question and defining the answers however, the committee looked inwards to ensure that

The leadership of an organisation of the scale and complexity of IR cannot be expected to emerge by default. Leadership must be differentiated from management. The leadership team needs to be selected from the best, rewarded for success, measured against performance targets and be in place long enough to do the job properly

International models are diverse with each region reflecting solutions tailored to the specific needs of their geography, politics, ideology and industrial development. It is simply too early to tell which models will emerge as winners. Even if an international model for success emerged, the Expert Group would continue to urge caution because India is different from most other countries

It is clear from international experience that privatising railways is not only exceedingly difficult and controversial but also that no approach has yet proven to be satisfactory. In contrast, the verdict on commercialisation is clear. This involves restructuring the rail system into its component parts, along business lines and adopting commercial accounting and management systems

Complex conglomerates such as IR are best run by being disaggregated into their constituent business parts. Each business should have its own dedicated leadership team with clear performance measures. It is up to the leadership team of each business unit to determine how best to organise

recommendations were grounded in an Indian reality.

8.43 Commercialisation, Not Privatisation

It has become clear that – with few exceptions at the margin – the focus should be on commercialisation rather than privatisation. There was no serious discussion about privatisation in the Expert Group because those who believe that the private sector is best at owning and managing commercial businesses such as railways recognise that discussion about privatising IR is premature. The practical reality is that IR is unsaleable at present. Who would want to buy into one of the world's largest, most complex and politically dependent businesses, particularly at a time of incipient financial crises? If international experience tells us anything, it is that at the best of times, privatising railways is about as difficult as privatisation gets.

A secondary reason for adopting the commercialisation not privatisation strategy is global experience. It is clear from international experience that privatising railways is not only exceedingly difficult and controversial but also that no approach has yet proven to be satisfactory. In other words, the jury is out on the subject of which model of privatisation is best. In contrast, the verdict on commercialisation is clear. This involves restructuring the rail system into its component parts, spinning off non-core activities, restructuring what remains along business lines and adopting commercial accounting and management systems.

Disaggregation into business units is the first step towards commercialisation. IR currently consists of many different businesses. Historically, IR was forced to be an integrator of activities – in order to be successful it had both to provide cradle-to-grave care for its employees, and also to produce everything from meals to wheels in order to operate.

Indian Railways today is a complex conglomerate. It runs major businesses as diverse as hospitals, schools, catering, manufacturing, real estate and maintenance. To manage these diverse businesses, however, it has created a monolithic organisational structure based on function first and geography second. This makes life more complex than it should be. It makes it hard to answer important questions and it makes unimportant issues very important.

For example IR finds it hard to deal effectively with matters related to important subjects such as customers because it is not organised accordingly. There is simply no one senior person clearly in charge and empowered to respond effectively to the rapidly changing needs of key customers. For example IR lacks a senior "Account Manager" with the authority to solve problems and capitalise on opportunities presented by a major customer such as TISCO. It would be this person who would be responsible for working out how to reverse the decline (from 90 percent to 50 percent) over the past 5 years in TISCO's rail based despatches. In contrast, the current management structure encourages excessive departmentalism unrelated to business objectives.

Complex conglomerates such as IR are best run by being disaggregated into their constituent business parts. Each business should have its own dedicated leadership team with clear performance measures. It is up to the leadership team of each business unit to determine how best to organise. Some may be functional, others may be oriented by customer group or geography. Each business unit should be designed as if it were a stand alone commercial enterprise with clear responsibility, accountability and

Box 8.2 : Railway Production Units – Should they remain ‘Captive’?

Railways’ existing production units were setup to develop indigenous manufacturing capacity at a time when self-reliance was the guiding policy. Five Production Units (PU’s) – Chittaranjan Locomotive Works (1950), Integral Coach Factory, Madras (1955), Diesel Locomotive Works, Varanasi (1961), Wheel & Axle Plant, Yelahanka (1985), Rail Coach Factory, Kapurthala (1985) – have so far been set up in the country. These are managed as departmental undertakings of the Ministry of Railways.

The products manufactured at PUs are supplied to the Indian Railways at the ‘transfer price’. It does not include the cost of capital, any profit element and share of administrative charges. Production units do not also extend any warranties. The quality of the product in most of the older PU’s is affected by the use of over-aged machinery and plant. According to a recent study, 49 per cent of the Integral Coach Factory’s plant and machinery has outlived its economic life. It is, therefore, not surprising that ICF has deployed 2631 maintenance staff as against 476 deployed in Rail Coach Factory, Kapurthala which turns out a comparable physical output.

The key performance parameters of the four larger PU’s for the year 1999-2000 are given below:

Railway Production Units – Key Performance Data

Performance Parameters	Chittaranjan Locomotive Works (CLW)	Diesel Locomotive Works (DLW)	Integral Coach Factory (ICF)	Rail Coach Factory (RCF)
Capital at charge (Rs.Crores)	Rs. 211.57	Rs. 84.14	Rs. 114.53	Rs. 431.82
Production Output (Units)	165 Electric Locomotives	161 Diesel Locomotives	1057 Coaches	1087 Coaches
Staff Strength	16,517	7,441	14,681	7,111
Turnover (Rs. Crores)	Rs. 862	Rs. 466.08	Rs. 516.17	Rs. 370.40
Annual Wage Bill (Rs. Crores)	Rs. 134.11	Rs. 69.14	Rs. 142.40	Rs. 60.90

The older plants continue to produce components needed for the manufacture, which could well be out-sourced now at competitive rates. This results in high costs of production and low levels of productivity. For best production results, technology needs to be updated from time to time. In practice, even when the need for technology upgradation is recognized, inherent delays in government procedures make it difficult to achieve this objective and prolongs the whole process.

Two examples will illustrate this point. It was recognized about two decades ago that the design of diesel locomotives manufactured at Diesel Locomotive Works had become obsolete and import of technology was essential. Notwithstanding the fact that there are only two choices available globally, it took twenty years (!) to start the process of technology transfer with the result that the first locomotive of the new design is yet to come out of the factory. Again, more than two decades back, it was recognized that the design of ICF coaches was obsolete, but the decision on the upgradation of design through transfer of technology was taken only recently, and the first new coaches are only being produced now at RCF, Kapurthala.

The PU’s have to follow the policies laid down by the Railway Board in the matter of procurement of materials, plant and machinery leaving them with no autonomy in decision-making. Procurement of many materials which are required in bulk is being done by the Railway Board which often leads to delays in placement of orders/supply of materials, thus affecting the production process adversely. When other countries have already moved to ‘just in time’ stock inventories, IR’s procurement policies lag behind by decades.

In short, the availability of capital without a price tag has blurred the PU’s cost consciousness and financial accountability. So long as there was a shortage of rolling stock and a backlog of overdue replacements, ‘self-sufficiency’ as a policy could be supported and justified, financially. The shortage regime will soon end, if it has not already ended. The production units should now be exposed to the competitive environment, which alone will bring about the required efficiencies and cost savings to IR. The separation of these units from the Indian Railways (IR) organisation should now be a priority.

Source: Review Report on Railway Production Units by the Asian Institute of Transport Development and Inputs from Expert Group Members.

Box 8.3 : A Strategy for Unbundling Production Units and Railway Workshops

A scheme for converting the Production Units and the string of IR Repair and Maintenance Workshops into viable unbundled undertakings has been outlined by a senior IR Executive. In essence, the plan envisages the collaboration of the Production Units and Workshops with global marketing, business and development service providers. Information and communication technologies now accessible would enable this form of public private partnership and the results could be very beneficial to all stakeholders. Essentially, economies of scope need to be marketed initially. Production Units can continue to service the Indian Railways internal market. This allows linking with global markets and know-how and raising quality and productivity gradually to international levels. The existing production units and workshops have large infrastructure in the form of sheds and other facilities, which are no longer needed, because modern rolling stock requires lesser maintenance. The solution is to find markets for what this manpower and plant can produce.

In fact, because large part of the infrastructure is already available, establishing a new-line of production would require low capital inputs. It is possible for the incremental capital output ratio to be around one or even less. The marketing partner can bring in the capital, which can be offset against purchases. Another possibility is to sell the existing machinery and plant and lease it back. The money so obtained could finance modernization.

Production Units

They have excess manpower, a rundown manufacturing infrastructure, and technology for a single product. Moreover, from the point of view of the private entrepreneur most serious is the reliance on a single customer—namely Indian Railways. These problems have to be addressed even for the existing arrangements.

Manufacturing facilities for locomotives and passenger coaches have high fixed costs in plant and machinery, hence larger the production, lower the cost per unit of the fixed inputs. Therefore, the large and stable internal market of the Indian Railways can provide the sheet anchor of the Production Units for achieving economies of scale. Without this assured load, it is doubtful if these production units can survive. Mere corporatisation will most likely lead to sickness of these units and their eventual closure. The solution is to enable these units to diversify into new production areas.

Because of slack and excess manpower available, new income streams can be generated with little additional investment. This increased income or revenue would assist servicing investments and increased productivity, and act as an accelerator for growth.

The stable internal railway market of the production units will assist in creating public-private arrangements that link the manufacturing facilities with global markets, designs and developments. The internal market of the Indian Railways provides to the production units the ability to harvest benefits from economies of scale. In addition, the flexibility of the plant to produce a range of related products provides for economies of scope.

By piggy – backing economies of scope on the economies of scale, enabled by the internal market of the Indian Railways, Production Units can use it as the competitive advantage for becoming global manufacturing service providers. This loosening of dependence on the single customer will also go towards making them attractive investments.

Globally, the trend for manufacturing business is to use service providers (as partners, if that is the more sufficient arrangement) for marketing, designs and developments. On similar lines, Production Units can bring in existence public-private arrangements for non-manufacturing services.

Repair and Maintenance Workshops

In addition to production units, Indian Railways have forty-four repair and maintenance workshops for the existing rolling stock. These workshops were established mainly in the late 19th and earlier 20th centuries for maintenance of the design of that era or because of inadequate industrial infrastructure within the country. The changeover to new designs of rolling stock has decreased maintenance requirements making many of these workshops redundant. It is difficult to close these workshops without retrenchment of labour. However, once again there is a solution, one that generates additional income streams by converting excess labour and facilities into new businesses.

If unbundling is the new mantra, then outsourcing is another. No longer do manufacturers find it economical to deal with hundreds of suppliers or thousands of individual components, which go into a product. They cut costs when they purchase complete assemblies, which they can then integrate into a product. Hence, supply chain management has become a new discipline. Suppliers are divided into three tiers. The top most tier supplies complete assemblies to the producer. Workshops, which are no longer required by the Indian Railways, can be easily converted into first-tier suppliers for production units and maintenance workshops and sheds. Here also the base load from the production unit will provide economies of scale, and inherent flexibility of the plant economies of scope, which can be marketed globally. These units will also need strategic partners or service providers for designs and developments and marketing.

If this arrangement is successful, and the size of the non-railway market becomes substantial, complete privatization could become a possibility.

A Win - Win Solution

By this strategy, Indian Railways would be able to reduce manpower for existing activities hence raising productivities and generating additional resources. In fact converting excess manpower into generators of new income streams – leading to capital formation.

Secondly, manufacturing infrastructure would get linked to global marketing, developments and designs inducing modernization, improvements in quality, efficiency – eventually leading to world class manufacturing by production units and workshops.

Source: Paper prepared by Sarabjit A. Singh, Chief Administrative Officer and C.S. Rao, Financial Advisor and Chief Accounts Officer, Central Organization for Modernisation of Workshops of Indian Railways.

transparency.

Adopting commercial accounting practices follows from disaggregation into business units. The current practice of applying government accounting principles makes it hard to measure performance. An effective system must take into account the cost of future liabilities (e.g. pensions), the consumption of assets (e.g. depreciation) and the average cost of capital for the institution. In the absence of meaningful information each business unit will be ‘flying blind’. In a capital intensive business such as the railways, it is vital to have an accurate picture of the return on assets of each business unit. These systems do not exist in IR at present which makes it hard to know if it is achieving success or facing financial crises. **The introduction of commercial accounting is therefore a must.**

Spinning off non-core activities may involve a degree of privatisation at the margin. The model to be followed is that of CONCOR. Once businesses have been disaggregated into their component parts and operated on the basis of commercial disciplines, they could be spun off into independent entities with an arms length relationship to IR. For example, businesses such as manufacturing and maintenance could all be turned into stand alone legal entities constituted as companies. These could be wholly owned by government, partly sold to the public, placed in joint ventures with the private sector, or fully privatised, if feasible.

8.44 Features of Success

In addition to these three principles, the Expert Group recognised three features to be important in developing a successful change programme: momentum and “early wins”; participation and communication; outside management.

Momentum and early wins: For an institution as large as Indian Railways, it has to be expected that the restructuring process will take five to ten years to be completed. Nevertheless, it is crucial to build in “early wins” to provide momentum and inspiration at a time when the destination of the journey still seems unclear for many. Once IR embarks on the journey for change, it is inevitable that the institution will go through hardship and difficult times. This makes it all the more important to show “early indications” of what success can look like, e.g. how a successful turnaround in a cargo segment, a regional passenger operation, or a maintenance unit can be engineered.

Participation and communication: The restructuring process needs to be designed as a careful balance of top down decision making and bottom up change initiatives. The wealth of IR lies in the hearts and minds of its people. The Expert Group has been impressed by the loyalty and devotion to the organisation of IR personnel at all levels. This value must not be lost and must be capitalised in the change process. Managers and employees need to design and detail their business units, commercial processes, regional areas. Co-ordinated communication needs to link and broadcast those initiatives to keep a continued stream of change messages running as encouragement for those who work hard to create IR’s future. Our experience in conducting the international workshop at the Vadodara Staff College was a very positive one. We found railways personnel to be receptive to change but they do have to be convinced. **The Expert Group therefore recommends a widespread consultation process at all levels including labour. It is likely that such a consultation will generate new ideas on how best to implement the**

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change process required.

Outside management: Examples from railroad transformation around the world show that an influx of experienced commercial managers was required to build critical mass for change. The right blend between competence in rail and commercial experience is crucial for the success of the transformation. Management teams need to be created that combine both qualities. The right mix of rail and change experience needs to be found. Our emphasis on inclusion of outside talent is on commercial managers. Induction of government civil servants steeped in governmental non commercial activities will only exacerbate matters.

We conclude this section on commercialisation. One of the key design principles of the Expert Group is to commercialise IR. One of the major challenges of the modernisation of IR is to shift the culture and mindset from that of a government bureaucracy into a market savvy, customer oriented profit driven business. IR must achieve self-sufficiency if it is to survive the onslaught of proportionately lower subsidy levels.

8.5 A Sharner Vision

Box 8.4 : Short Line Freight Trains of Rural America: Money-Losers to Money-Spinners

“Short line” freight trains in rural America, well into decline about two decades ago, were revived and made into viable businesses as a result of three factors - the de-regulation of the rail industry, the economic burden of running un-profitable routes in remote areas by big railroad companies and the emergence of new entrepreneurship which re-built the business along track segments sold to them. The first American railroads, established in the 1830s were all “short lines” - feeder routes of short distances varying from five to thirty kilometers (with freight trains travelling at a maximum speed of 16 kilometers per hour) transporting freight to and from rural areas in America. By the early 1900s, the US rail network had reached maximum length- hauling almost everything produced by rural areas (farm produce, molasses, tobacco, coal, stone, mail etc.) to nearby rural towns and distant cities. Over time, these smaller freight lines into the more remote areas of America were amalgamated with bigger railroad companies. However, as the road transport system underwent improvement with the introduction of asphalt paved roads and trailer trucks, short line freight trains became almost totally outdated. Much of the commodity volume carried on these freight feeder routes was now taken by trucks which were faster and more efficient. Short lines had become more or less redundant in most parts of America by the 1950s with just a few remaining shippers (both private individuals and companies) operating a handful of trains in the rural locations in America - Virginia, North Carolina, Missouri, Georgia etc. By the 1980s, the big railroads that had controlled these routes were ready to abandon these short lines as a business loss and put them up for sale. The government at the very same time moved to de-regulate the railroad industry. This allowed large railroad companies to sell feeder routes, along with the rolling stock and stations on it, to new entrepreneurs - typically shippers with long experience in railways as managers or track contractors. The economics of transport decided the issue in favour of the small operator. The small shipper has lower overhead costs, smaller wages, used recycled equipment and employed non-unionized employees who performed different repairs jobs. These advantages helped these entrepreneurs to revive the short line freight trains and halt their further decline by keeping the routes active. Shippers moving stone, lumber, ore and grain purchased several of these lines. These operators mainly concentrated on re-building the business by arranging for bank finance, repair of worn out tracks and hiring of trained personnel for running of trains. Once sold, the railroad become the shippers property and the entrepreneur gets full proprietary rights through a title over the track segment, the station, the locomotive and freight cars. Besides shippers, steel mills, grain elevators and paper plants who depended on these line also bought specific railroad segments.

The sale of rural feeder routes to private operators, once the transportation lifeline of the American railway system, have saved the short line system from complete redundancy; and at the same time served several other useful purposes:

- Main lines are regularly supplied with goods shipped by local railroads - despite competition from trucks, more than 40 per cent of inter city freight tonnage (measured in tonnes per kilometer) moves on rail.
- The goods moved by short lines mainly comprise farm produce and bulk commodities such as coal, grains, chemicals, ore, wood and stone.
- These commodities are transported from far away locations by short line trains to main rail lines (without which none of the goods would travel by rail but instead by road).
- Furthermore, the operators on existing short line routes have helped to pull the big railroad players out of a financial trough (weighed down by high wages to workers and rigid union rules) by buying-off non-profitable segments characterized by high costs of operation and maintenance.
- A re-built short line network has created markets of small customers in rural areas by keeping alive the demand for rural railroads in remote areas.

The transformation of non-profitable local routes into viable business has resulted in the doubling of short distance freight haulage in twenty years. Short lines have increased from 225 lines in 1980 to some 500 lines today. They account for a 12.5 per cent share of the total length of rail track in America - surely a consolation for a country where 60 per cent of inter city freight is moved by road, and about 3,200 kilometers of railroad line is either dismantled or abandoned, annually. The revival of short line trains and routes, largely as spin-off of deregulation and the willingness on the part of entrepreneurs to re-build the network has therefore resulted in preserving sections of America’s disappearing tracks.

Source: Span May/June 1999.

8.51 IR is an Institution Full of Contradictions

Indian Railways is an institution embedded with contradictions. Contradiction 1 is that IR is one of the world's largest commercial entities, yet it is run – not by commercially savvy businessmen – but as a public utility service and as a government department by government servants. Contradiction 2 is that IR requires a fundamental rethink of the status quo, whereas in general, government servants are rewarded to not rock the boat. Contradiction 3 is that IR's future viability depends on meeting sound commercial disciplines, yet the social obligation element of IR's mission appears to increasingly dominate and distort IR's ability to deliver against its core mission of moving 1.2 million tons of freight and 11 million people per day. Contradiction 4 is that management knows that the combination of unremunerative investments coupled to massive underpricing of passenger fares is the path to financial catastrophe, yet it is not able to take any effective action to reverse the situation.

These contradictions have long been part of the genetic code of IR. If a century of success could be achieved despite these contradictions, why should they be causing problems today?

As we have noted, the answer is that the world has changed and so must IR. India is rapidly moving from a cozy, centrally planned government owned and administered system to a market based private sector model. This is a structural shift in the economy – a fundamental and irreversible redefinition of the status quo.

The first sign that the status quo had changed for IR was the rush for the exit door by important customers, tired of high costs, poor service and an inflexible bureaucratic mindset. Given the choice of “take it or leave it” most customers are leaving. Take steel for example – the absolute heart of IR's business – the facts are stark. During the 5 year period 1992 – 1997 the production of pig iron increased by 45 per cent from 23 to 32 million tons. What happened to IR's business during this period? Nothing. IR's volume remained unchanged at 12 million tons and its market fell from 90 per cent to 50 per cent. Even worse, at RINL, only 7 per cent of semi-finished products are moved by rail. In short IR is clinging on to the business of the past but is rapidly foregoing its future.

The second sign of change has been the rising cost of capital to fund renewal and expansion. The days of easy money are over. The government cannot afford to give subsidies and sops. Market based funds demand market based returns.

In combination, these two factors have raised the performance bar for all time. The writing is on the wall and plainly visible for all to see. Market forces will either drive IR into the ground or onto a higher level of performance.

Market forces are putting pressure on the contradictions embedded in IR. As any engineer will know, increasing pressure on a structure will always cause it to fracture first at its weakest point. This is what is happening to IR today – it is developing stress fractures at its points of weakness. Swift remedial action is required to prevent fractures degenerating into breakages and total collapse.

This is a period of uncertainty and potential danger for IR. The rules of the game have changed and a new generation of leaders is required to develop a winning response. A response that acknowledges the contradiction implicit

Indian Railways is an institution embedded with contradictions. Management knows that the combination of unremunerative investments coupled to massive underpricing of passenger fares is the path to financial catastrophe, yet it is not able to take any effective action to reverse the situation

Market forces are putting pressure on the contradictions embedded in IR. Increasing pressure on a structure will always cause it to fracture first at its weakest point. This is what is happening to IR. Swift remedial action is required to prevent fractures degenerating into breakages and total collapse

in IR and charts a path that can reconcile or redefine these contradictions in line with the new reality.

8.52 A Forward Looking Vision is Needed

The need of the hour is a clear vision. IR is in desperate need of a clearly articulated forward looking vision that addresses the issue of creating a modern railway to meet the needs of a modern India.

IR does not have a vision. The 5 year plan is not a vision, it is not even a strategy, it is merely a worthy exercise to assemble the requirements of the businesses as they exist today. This type of planning system is one of the most powerful mechanisms ever designed to avoid change and ensure a status quo.

An effective vision starts at some date in the not too distant future with

Exhibit 8.7 : Indian Railways Purpose Statement

Our purpose is to play a **CENTRAL ROLE IN INDIA'S OVERALL ECONOMIC GROWTH** by providing **CUSTOMER FOCUSED COST EFFECTIVE TRANSPORTATION SOLUTIONS**. We will do this through an integrated transport system which includes the Railways and other modes of transportation.

Our transportation business will cater to **THREE TARGET CUSTOMER SEGMENTS**

- Freight
- Passenger
- Suburban Passenger

Our multi-modal network should provide the **THE MOST COMPELLING VALUE** to target customer segments

We will aim to **GROW PROFITABLY** by providing **SUPERIOR CUSTOMER SERVICE** to our target segments. We will work towards enhancing our market share by equalling or exceeding the transport industry growth in freight and passenger subject to the profitability of such growth.

We will achieve these objectives through the **INTEGRATION** of :

- Clear Strategy
- Financial Discipline
- Customer Orientation

We also aim to **HELP INTEGRATE THE COUNTRY** through our transport services and aid the Indian government in its efforts in the social/developmental sphere by **USING THE FUNDS PROVIDED EXCLUSIVELY AND SEPARATELY BY THE GOVERNMENT** for:

- **PHASED AND SUSTAINABLE** expansion into socially desirables/strategically important routes
- Subsidising services deemed essentially by the government

Exhibit 8.8 : Indian Railways Strategy Statement

To accomplish this purpose on a **SUSTAINABLE** basis require IR as a whole to at least **EARN MORE THAN THE COST OF CAPITAL**, thus generating the internal resources necessary to implement its purpose. This, and this alone is the route to sustained growth and long term success.

Our operations will therefore be run **PRIMARILY** on a **COMMERCIAL** basis. This will ensure that IR at least meets / exceeds the cost of capital on an overall basis.

In line with our social/developmental role we will **SUBSIDISE SELECT FREIGHT AND PASSENGER SERVICES**. This will be done **ONLY AT THE INSTANCE OF** the Government and **ONLY TO THE EXTENT OF FUNDS MADE AVAILABLE** by it.

In addition a relentless drive on costs and technology upgradation is planned that will **IMPROVE EFFICIENCIES** and **ASSET UTILISATIONS** significantly. Simultaneous efforts will be made to strengthen human resources through a mix of training and development. External recruitment would also be used to bridge skill gaps.

This strategy requires that **SUPERIOR PROFITABILITY** be extracted from **PREMIUM MARKETS** with supporting capital expenditures and customer value delivery. The **VALUE SEGMENT** may have lower returns, but these will be subject to Railways meeting their overall target on cost of capital.

Therefore Indian Railways will meet overall profitability targets through differential returns from various segments.

a blank sheet of paper. The basic question it tries to answer is: “If we had to design a financially viable rail based transportation network for India in the year 2010, what would it look like?”

The answer to this question is unlikely to include businesses such as schools, hospitals, manufacturing and construction. The answer is unlikely to require an organisational structure based on an inwardly focused cadre system that largely ignores lines of business and customers. The answer is unlikely to require a separate budget to be presented to Parliament. The answer is unlikely to require any investment in new lines, gauge conversion or electrification until the areas of highest demand have been debottlenecked.

In contrast, a clean sheet redesign of the vision for rail based transportation would give a lot of attention to doing a small number of things very well. There would be deep commitment to exiting from non-core activities. There would be an extensive discussion about how to provide superior value in multi-modal logistics service to target segments and key customer groups. There would be sharp focus on how to increase throughput in areas of highest demand. There would be plans to provide better value to passengers in response to increased fares.

An essential criterion for success in developing a meaningful vision is that it is both owned and understood by the organisation and also syndicated and accepted by all those directly involved in transforming the vision into reality. It is therefore inappropriate for the Expert Group to define the vision on behalf of IR. The Committee has, however, drafted a Purpose and Vision statement as a starting point to catalyse the process of debate.

Exhibit 8.9 : Indian Railways VISION 2005

KEY FEATURES

- (IRC) Indian Railways Corporation constituted under a new Indian Railways Act and a new Indian Railway Board Act.
- Policy direction set by the Government of India
- Regulated by an independent **Indian Railway Regulatory Authority (IRRA)**
- Managed by an autonomous **Indian Railway Executive Board (IREB)** headed by the CEO of the Indian Railways
- Passenger, Freight and Suburban are profit centres
- Infrastructure and services are cost centres
- All profit and cost centres (SBUs) are headed by a COO (Chief Operating Officer) who heads the SBU executive board
- Indian Railway Corporation run **independently** and **primarily along commercial principles**.
- Comprehensive agreement with Government on social obligations
- Railways aid the government in the social/developmental sphere by using the funds provided by the government for :
 - Phased and sustainable expansion into socially desirable routes
 - Subsidising services deemed essential by the Government
 - Investment for providing developmental impetus to backward regions
- Extent of funds/subsidies is determined by the IRRA in consultation with the REB and is fully compensated by the Government
- Government has power to requisition Railway services during times of emergency/calamity
- In all areas not explicitly provided for by the Government Railway Executive Board has full autonomy in :
 - Financial Management – Divestitures
 - Investments – Alliances
- The Executive Board can fix tariffs within the bands prescribed by the IRRA
- All accounting is done along generally accepted corporate accounting principles
- Publication of financial results every 6 months
- Profit centre performance assessed based on :
 - ROCE – Market Share
 - Revenue – Customer Satisfaction
 - Profit – Growth
- Annual performance assessment with quarterly review at Board level

The central idea embedded in the attached purpose and strategy statements is that IR is fundamentally a commercial entity that needs to achieve independent self-sustaining financial viability. IR cannot be expected to make unremunerative business decisions unless it is directly and fully compensated

For any reorganisation to be successful there has to be an ex ante acceptance and commitment by the Government and IR alike that IR will operate on commercial lines. Only if there is this initial understanding can the commercialisation of IR proceed apace

The central idea embedded in the attached purpose and strategy statements is that IR is fundamentally a commercial entity that needs to achieve independent self-sustaining financial viability. The corollary of this central idea is that IR cannot be expected to make unremunerative business decisions unless it is directly and fully compensated.

The consequences that flow from this central idea are profound. Three areas in particular will need to be fundamentally redesigned: governance, structure and portfolio.

8.53 Governance: Separate Institutions for Separate Roles: Policy, Regulatory and Management

If IR is expected to function on commercial principles, its management needs to be allowed a degree of autonomy that is comparable to any other commercial organisation. To grant the railway autonomy by creating an arms length relationship with government is one of the salient features of railway restructuring around the world. In Europe most countries have separated railway operations from government influence and have introduced independent regulators for the sector. China has stated an aim to ensure complete separation of government and enterprise functions within the railway operations. Russia is currently separating operations, regulations and policy.

Governance defines the roles and institutional relationships associated with policy, regulation and management. These roles are currently blurred and need to be clarified and institutionalised based on the assumption that railways in India will evolve into a broad-based industry with multiple players and multiple owners.

The Expert Group debated long and hard on the most desirable restructuring of the governance of Indian Railways, and on the role of the Government of India (GOI) in governing IR. In view of the mixed record of restructuring elsewhere there was considerable discussion on the extent of re-organisation that should be suggested. In view of the complexities involved in restructuring as large an organisation as IR there is great need to ensure that the steps recommended and taken are in the correct direction. One strand of view has been that commercialisation can be done without corporatisation of IR. It has been pointed out that the functioning of a large number of public sector corporations in India would suggest that the mere act of corporatisation does not automatically reduce government interference. This is indeed correct. Mere corporatisation will not accomplish anything. For any reorganisation to be successful there has to be an ex ante acceptance and commitment by the Government and IR alike that IR will operate on commercial lines. Implicit in this is that non commercial activities mandated by the government will be clearly demonstrated and IR appropriately compensated for such activities. Only if there is this initial understanding can the commercialisation of IR proceed apace. We have documented extensively that in view of the state of finances of both IR and GOI, there is little choice. If IR is to recover there is little alternative but to pursue the Strategic High Growth path. Given the key objective of commercialising IR and making its management autonomous, we have concluded that nothing short of major restructuring will be necessary.

Indian Railways must aim to be corporatised into the “Indian Railways Corporation”(IRC) or Bharat Rail Nigam (BRaiN). The Government of India should be in charge of defining the key thrusts of

policy direction. It would also need to set up an **Indian Rail Regulatory Authority (IRRA)**, which would be necessary to regulate IRC's activities as a monopoly supplier of rail services to begin with, particularly related to tariff setting. IRRA is necessary to distance IRC from the government. This kind of restructuring has already taken place in the telecom sector, though that restructuring itself has gone through various stages of thinking and implementation, and is still in some process of flux.

The Indian Railways Corporation (IRC) would be governed by a reconstituted Indian Railways Executive Board (IREB) whose characteristics will be outlined in the next section.

Role of the Government

The Government of India should be responsible for setting the broad parameters in which policy is to be formulated, as well as constituting IRRA and IREB. As key responsibilities, it should:

- Implement changes in the structure, according to its vision. As owner of the system it will constitute the Indian Rail Regulatory Authority and Indian Rail Executive Board by designing and implementing legislative packages necessary to constitute those bodies (new Indian Railways Act, new Indian Railway Board Act and other required laws/bylaws).
- Define the extent and nature of “social obligations” to be fulfilled by the railways and provide adequate funding. Railways will contribute to the Indian social/developmental sphere, expanding socially desirable routes, providing essential services and fostering development in backward regions. The width, depth and limits to those social obligations is a political issue reserved to Indian Government, that will be stated, differentiated and funded with full transparency. Also, Government would have the power to requisition railway services during times of emergency/calamity.
- Appoint/dismiss people holding key responsibilities at both India Rail Regulatory Authority and Indian Railway Executive Board, as ultimately responsible for their overall performance. However these powers should be appropriately circumscribed in the appropriate legislation.

With this structure, separate institutions for policy (the Government), regulation (IRRA), and management (IREB) would have been created. The reconstituted Ministry of Railways will have only a policy function, not **policy + regulation + management**. It would have to be staffed with people who have adequate knowledge of the railways and who understand and are committed to the vision of IR in the 21st century. There is a view that Indian bureaucracy at the apex level is not at present adequately positioned to deal with many complex issues that confront us. Consideration could be given to evolving a “charter” between the Indian Railways and Government, so that autonomy of IR is ensured in its restructured form.

The Expert Group recommends an immediate and comprehensive review of the legal framework and specific statutes required to create a vibrant rail based industry grounded in such a structure. The Group anticipates that one of the features of this review and formation of IRC will be a change

An Indian Rail Regulatory Authority (IRRA) would be necessary to regulate IRC's activities as a monopoly supplier of rail services to begin with, particularly related to tariff setting. IRRA is necessary to distance IRC from the government

The reconstituted Ministry of Railways will have only a policy function, not policy + Regulation + management. It would have to be staffed with people who have adequate knowledge of the railways and who understand and are committed to the vision of IR in the 21st century

Box 8.5: Privatized Passenger Railways: Functions of Franchiser and Regulator

The privatization of passenger railway in Great Britain was completed in 1997 with as many as twenty five of the key rail routes (the entire range of inter-city, cross-country, suburban and rural routes), and accompanying stations being fully operated under franchise by private sector companies specializing in passenger rail management. The objective of such a move was to secure a progressive improvement in the quality of services available to passengers by ensuring value for money and efficiency and economy, through a franchised passenger railway. The role of the government executed through the Office of Passenger Rail Franchising (OPRAF) in such an operation was restricted to that of facilitator and franchise manager. The commitments of a franchisee include the whole gamut of rail operations, from ticketing (sales, reservations, innovative fare schemes etc.), employee training and station improvements, to the replacement of rolling stock with new fleet of trains, investments and the introduction of new trains and routes. OPRAF, however, retains the control over managing infrastructure (track maintenance and signaling).

The broad functions of OPRAF, include managing existing franchise agreements, monitoring the performance of franchise operators with the aim of ensuring the delivery of franchise commitments and obligations in the interest of customers:

- Franchisee management to ensure the prompt and effective delivery of the terms of franchise agreements through the monitoring of an operator's performance, regular review meetings and effective compliance and verification procedures.
- Increasing passenger rail traffic by stimulating the development of the railway through promoting high levels of cost-effective investments.
- Facilitating integrated transport with multi-modal travel.
- Operating incentive regimes, renegotiating a franchise with change of control if necessary and enforcing settlements with the franchisee.
- Encouraging cooperation between operators to promote network benefits to passengers which allow passengers to travel between stations irrespective of the choice of service or route.
- Collecting and publishing reliable data on the performance of franchise operators.

The franchise contract which contains franchisee plan commitments, (showing the progress of key commitments towards the delivery) holds the key to the functioning of the OPRAF as a franchise manager. Each operator has to adhere to a passenger service requirement norm, which sets out a core level of services on each route. These services are programmed to a flexible timetable (worked out in consultation with Railtrack – the rail infrastructure company) that specifies the delivery of service, frequency and journey times. On routes where operators have a strong commercial incentive, the service requirement facility protects a “core” level of passenger rail service in order to allow operators the freedom to adjust service patterns in response to passenger demand. Another vital input in the functioning of OPRAF as a franchise manager is to monitor the performance of operators on various aspects of service- cleanliness, passenger comfort, information etc.- through customer satisfaction surveys, conducted at six-month or yearly intervals. The results of the surveys (which benchmark the operator against standards set by OPRAF) are published regularly.

Following privatization, one of the main responsibilities of OPRAF has been to mobilize investments to support loss-making passenger rail services. The proposals of OPRAF were published in the form of an interim-planning guide for an integrated transport policy. This proposal was meant to offer advice to promoters or sponsors on the opportunities for maximizing the investment benefits of respective schemes, in line with OPRAF planning criteria. On the issue of multi-modal travel, many of the franchisees brought past experience from other modes, primarily from the bus and coach segments. This made it easier for OPRAF to incorporate several new schemes by the operators into the franchisee commitments since a number of such schemes for intermodal travel were developed at the operator's own commercial initiatives. Examples include bus links from stations to towns falling under the franchisee's areas or to seaside ferries, multi-modal “go-as-you-please” travel cards, rail-road season tickets etc. Split mode arrangements under franchise have taken British passenger rail a step closer to achieving a rail network with other forms of transport so that passengers can make quick, seamless journeys combining various other modes.

As part of its policy to improve the performance of operators on routes which are not sufficiently remunerative, incentive measures such as payments for better performance (benchmarked for instance against punctuality levels based on pre-franchise performance) are made to operators meeting these standards. Poor performances are however penalized with penalties by the OPRAF. A narrative on the pioneering effort of the British government to completely privatize its passenger rail system can only be weighed against the type of lessons learned from such an exercise. A quick appraisal by the OPRAF in one of its Annual Reports indicates that strong improvements are needed to improve the performance record of private operators - judged below par by OPRAF. The possible causes of drop in performance are:

- The success of the privatized passenger railways in attracting more passengers increased the pressure on services leading to train crowding.
- The existing track infrastructure was strained mainly due to the start of many new train services and partly due to pending deliveries of new train fleets.
- Rolling stock failures and repair work slowed down the average speed of commuter trains and finally, expansion plans were delayed down due to inadequate investments.

Source: Office of Passenger Rail Franchising (OPRAF), Annual Report 1997-98.

of status for IR so that it will no longer be required to present a separate budget to Parliament.

The Indian Railway Regulatory Authority will regulate the system setting rules, providing frameworks and upholding supervisory responsibilities required for assuring the good state of the system on a daily basis. The chief responsibilities would include:

- Assistance in devising a framework for investments, tariffs and resource generation.
- Creating a framework for the introduction of competition, selecting the routes capable of supporting multiple operators and providing a fair and well defined regulatory environment.
- Determining the extent of subsidy payable by the government in consultation with the Indian Railway Executive Board.
- Arbitrating between the government and the Indian Railways Corporation.
- Resolving disputes between the various stakeholders and the Indian Railways Corporation including compensation payable to consumers but excluding industrial disputes.
- Specifying quality of service and standards of safety.
- Protecting consumer interests.

8.54 Structure: Outward Looking, Business Oriented, Customer Driven

Structure relates to the internal organisational design of IR. The underlying design principle is to create an outward looking, business oriented, customer driven institution. This will involve reorganising the core transportation network into its key component parts: freight, passenger, suburban, shared infrastructure: fixed, and shared infrastructure: others. These business units will operate with a large degree of autonomy yet be held accountable for a balanced scorecard of commercial performance measures.

Disaggregation into business units is the first step towards commercialisation. IR currently consists of many different businesses. Historically, IR was forced to be an integrator of activities – in order to be successful it had both to provide cradle-to-grave care for its employees and also to produce everything from meals to wheels in order to operate.

Indian Railways today is a complex conglomerate. It runs major businesses as diverse as hospitals, schools, catering, manufacturing, real estate and maintenance. To manage these diverse businesses, however, it has created a monolithic organisational structure based on function first and geography second. This makes life more complex than it should be.

Railways across the world have made significant changes to their business structure to achieve their objectives. These changes typically involve breaking-up the integrated structure into smaller more manageable units. The first step in this separation follows from the definition of purpose wherein all activities unrelated to the basic transportation business are separated from the core business. When China restructured its railways, the rolling stock manufacturing units were separated from the main railway organisation. Japan too separated the construction, research and telecommunications wings of the Japanese National Railway (JNR) into separate units. European Railways have for long been outsourcing activities such as rolling stock manufacturing.

The Expert Group recommends an immediate and comprehensive review of the legal framework and specific statutes required to create a vibrant rail based industry. It will be a change of status for IR if it will no longer be required to present a separate budget to Parliament

The underlying design principle is to create an outward looking, business oriented, customer driven institution. This will involve reorganising the core transportation network into its key component parts: freight, passenger, suburban, shared infrastructure: fixed, and shared infrastructure: others

The implication is that the current cadre based system wherein the entire organisation is divided based on disciplines like civil engineering, mechanical engineering etc. would need to be recast.

Adopt commercial systems

The corporatisation of IR into IRC will necessitate the recasting of IR’s accounts into company format. The Government will therefore need to initiate the process of restructuring the financial accounts of IR in accordance with the Company’s Act 1956. The objective is to develop financial statements (Balance Sheet, Profit & Loss Statement) that can be understood by the financial community and the public at large. Adopting commercial systems is an essential pre-requisite for a modern railway. In addition to adhering to commonly accepted financial accounting norms railways around the world have also focused on capturing and usage of both financial and non-financial information in management decision making. Again IT based MIS systems are now essential for adopting such an approach. Both the Swedish as well as the German Railway use financial parameters like ROE used to measure performance of commercial functions while operational parameters like efficiency, punctuality are used for the evaluation of social service functions.

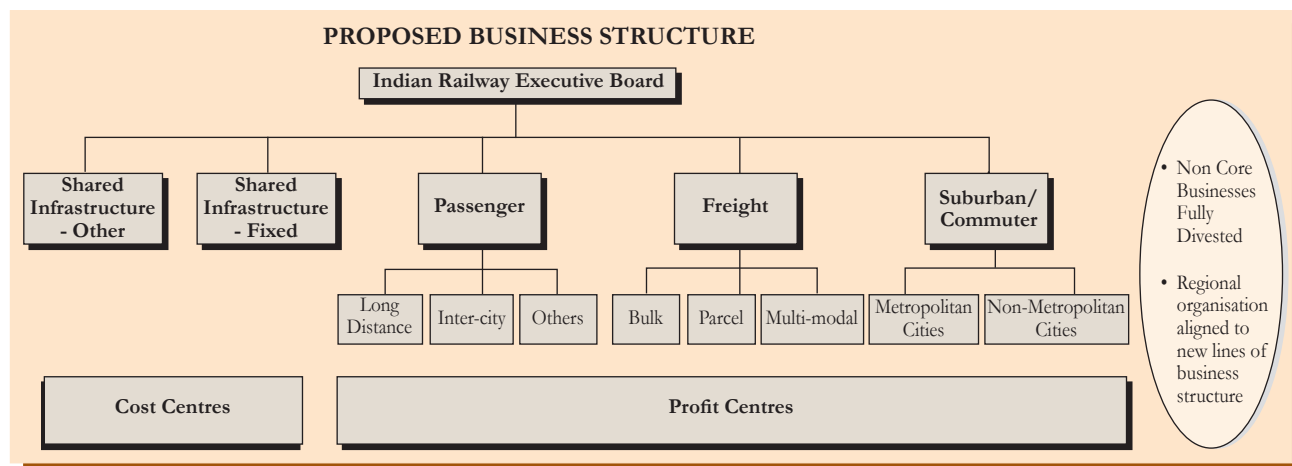
The corporatisation of IR into IRC will necessitate the recasting of IR’s accounts into company format. non-adherence to commonly accepted corporate accounting standards has made it difficult to comprehend and assess the financial performance of IR and led to under provisioning in key areas such as pensions and depreciation

The need to revamp systems is critical in the Indian context. We have shown that the non-adherence to commonly accepted corporate accounting standards has made it difficult to comprehend and assess the financial performance of IR and led to under provisioning in key areas such as pensions and depreciation.

As outlined in the phasing of the restructuring programme, full corporatisation of IR will take place in phase 3, in about 3 to 5 years from the start of the programme. Once this is done say by 2005, the Indian Railways Corporation will essentially run the core transportation business of the current IR.

Some members of the Expert Group have also felt that if all the actions outlined in phase 1 and phase 2 of the restructuring programme are implemented, there may be no need to corporatise IR into IRC: that corporatisation should only be done if railways management continues to fail despite all these measures. Such an approach would, however, be inconsistent with the objective of providing autonomy to IR in the manner described, and with separation of policy, regulatory and management roles.

Exhibit 8.10 : Indian Railways Corporation (IRC) - VISION 2005



The Indian Railways Corporation (IRC) will be responsible for managing railway assets and resources to best meet objectives of the owner within the policy direction outlined by the government and the legislative framework developed by IRRA. Its main characteristics will be the following:

- It will be an independent, corporatised, customer focused and financially viable railway, run primarily along commercial principles and subject to generally accepted corporate accounting principles and reporting.
- The Indian Railway Executive Board (IREB) will be responsible for managing the railways and executing the policies set for the IRC (i.e., the restructuring of the railways).
- It will focus on core activities, say, the provision of infrastructure and the operation of freight and passenger services. To provide adequate focus on the core business as well as improve flexibility and cost competitiveness, the non-core activities of the railways would be fully divested over time, say 5 years.
- It will combine a central organisation with a regional decentralised structure. In that context, passenger, freight and suburban will function as profit centres and infrastructure and service as cost centres.

Exhibit 8.11 : Network of Relationships

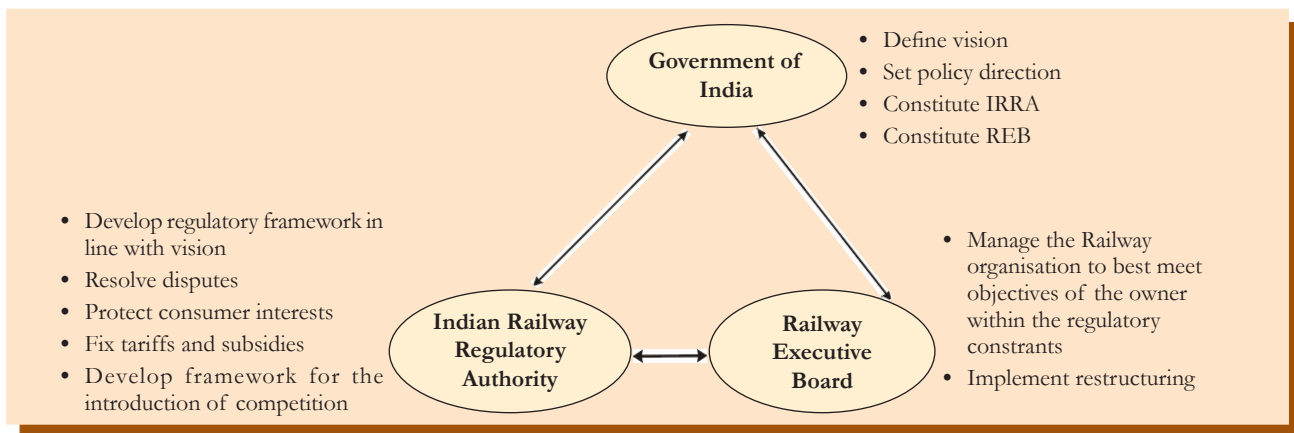


Exhibit 8.12 : Roadmap for Railway Restructuring

	Phase 1	Phase 2	Phase 3	Phase 4
Time Frame	• Upto 1 year	• 1 year to 3 years	• 3 to 5 years	• Beyond 5 years
Focus Areas	<ul style="list-style-type: none"> • Set-up Indian Railway Regulatory Authority • Make changes to legislation • Delineate social and commercial objectives • Initiate intensive communication with stakeholders 	<ul style="list-style-type: none"> • Set-up Indian Railway Executive Board • Prepare ground for changing structure • Commence non-core restructuring 	<ul style="list-style-type: none"> • Corporatise • Restructure core businesses • Complete non-core restructuring • Revamp regional organisation • Introduce Competition 	<ul style="list-style-type: none"> • Evaluate ownership options • Refine restructuring process

The leaders of each business unit will be held accountable for their unit's performance to the newly constituted Indian Railways Executive Board (IREB). The role of the IREB is to define strategy, allocate resources and ensure effective performance management

The leaders of each business unit will be held accountable for their unit's performance to the newly constituted Indian Railways Executive Board (IREB). The role of the IREB is to define strategy, allocate resources and ensure effective performance management. The IREB will comprise a diverse cross section of talent including appropriately qualified members of the business community.

8.55 Less is More : Focus on Core, Spin off the Rest

Portfolio relates to the breadth of business IRC will incorporate under its umbrella of holdings. The view of the Expert Group is that less is more. In other words, IRC should be engaged in only those businesses directly related to its core activity of rail based logistics and passenger transport. Non core businesses should be spun off on an arms length basis. The eventual ownership of these entities is not an issue that concerned the Expert Group. The Group does acknowledge, however, that the CONCOR model represents one way forward. Difficult though it may be, **the Expert Group anticipates that priority candidates for accelerated spin off would be all the manufacturing units which should be done within a specified time limit.**

The Expert Group recognised that these actions represent a bold agenda. Bold, yet necessary and overdue. The Group is clear that these actions need to be taken swiftly. What is uncertain, however, is how swift is possible. The Group has suggested a 5 year time limit although – all things being equal – faster is better. The strongly held view of the Expert Group is that it is more important to get started than to worry about when the process finishes. This time limit is consistent with the financial and investment projections made in chapters 4,5 and 6. It is anticipated that IR would be fully commercial by year 7: hence the 5 year time limit.

8.6 Recommendations

8.61 Proposed Restructuring Plan

The study of restructuring experiences of Railways around the world has revealed that the process is long, often taking 8 to 12 years and sometimes even longer. The sequencing of various actions often depends on the outcomes of key steps implemented earlier, making it difficult to provide a complete restructuring plan at the outset. The Group has therefore defined a broad vision for the medium term and detailed the near to medium term actions necessary to kick-start and sustain the restructuring process. The emphasis has therefore been on ensuring that an appropriate environment is created by setting up the necessary institutions and legislative frameworks. The proposed restructuring plan covers a period of five years and has been divided into three phases (See **Exhibit 8.12**) with milestones that need to be achieved by the end of each phase. The Government could use these milestones to assess the progress of the restructuring.

8.62 Phase One - Immediate Term Actions (within One Year)

The primary objective of phase one is to demonstrate that the status quo has changed and that it will no longer be 'business as usual'. Clear signals need to be sent, and programmes initiated to create an environment conducive to the restructuring process. In the 12 months budgeted for phase one a process of widespread communication of the need for change must be completed in

The strongly held view of the Expert Group is that it is more important to get started than to worry about when the process finishes. The Group has therefore defined a broad vision for the medium term and detailed the near to medium term actions necessary to kick-start and sustain the restructuring process

order to garner adequate support for restructuring. The Government would need to communicate its seriousness of implementing the reform programme by endorsing a new purpose and vision for IR. This would signal an acceptance of the direction of reform and would facilitate all subsequent steps. It would also initiate the setting up of institutions and legislative frameworks that would be required to guide the restructuring.

Communication with Stakeholders

To have a reasonable chance of taking off, the process of restructuring would require tremendous support from all stakeholders in the Indian Railways. In this context, the transition team will need to focus on intensive communication with the unions, the different cadres of Railway employees, politicians as well as the public at large. The emphasis should be on communicating the facts to different entities and highlighting the need to change the current mode of operation. The very real threat of imminent total financial collapse should be used to drive home the point that to continue, the current system of operation is no longer an option. Whereas the Expert Group is providing a broad framework for restructuring and the relevant sequencing, this consultation process may well come up with useful modifications.

New Legislation

Once the broad framework of the proposed restructuring is accepted, the Government of India, Ministry of Railways will have to set up a special task force to frame the new legislation enabling the new organisational framework. This task force would need to commence operations with a thorough review of the Indian Railways Act and the Indian Railway Board Act. New legislation would need to be drafted that:

- Mandates **corporatisation** of the Indian Railways into the Indian Railways Corporation (IRC) while excluding the Railways from the list of 'strategic industries' in the Industrial Policy Statement 1991
- Permits a revamp of the Railway Board
- Redefines the relationship between Government and a revamped Indian Railway Executive Board (IREB) guaranteeing its independence and autonomy
- Provides for exemption from taxation – excise, sales tax etc. for the period of transition, say 5 to 7 years
- Permits private participation in Railway operations
- Facilitates the induction of personnel from outside the Railways
- Mandates the subsidisation in social areas to the extent of funds provided by Government
- Sets up a social safety net to take care of surplus labour.

Constitution of the Regulatory Authority

The Government would then need to set in motion the restructuring process by constituting the Indian Railway Regulatory Authority (IRRA). The primary role of the IRRA would be to help the Task Force to develop a robust legislative framework that facilitates the proposed restructuring. Appointments would be made from amongst private sector professionals, economists, financiers and railway officials. The chief responsibilities of the IRRA would be to:

- Develop regulatory framework in line with the vision

To have a reasonable chance of taking off, the process of restructuring would require tremendous support from all stakeholders in the Indian Railways. The very real threat of imminent total financial collapse should be used to drive home the point that to continue, the current system of operation is no longer an option

Government of India, Ministry of Railways will have to set up a special task force to frame the new legislation enabling the new organisational framework. This task force would need to commence operations with a thorough review of the Indian Railways Act and the Indian Railway Board Act

- Protect consumer interests
- Fix tariffs and subsidies
- Resolve disputes that may arise between different parties
- Develop a framework for the introduction of competition

Mechanisms to Determine Subsidies:

A clear definition of social and commercial activities would need to be arrived at by the IRRA and agreed to by the government. The resources required for the provision of social obligations would be estimated both in terms of the investment requirements as well as the ongoing support required to fund these activities. The IRRA would then need to work with the Railways and devise mechanisms for the estimation of subsidy payable by the Government for the performance of developmental/social activities.

The necessity of defining the social / developmental / strategic obligations of the Indian Railways cannot be overemphasised. Not only would this provide clarity in terms of the business purpose but also it would enable IR to estimate the funding required to support “social” obligations. As has been brought out previously the requirement would include not just funds for capital investment but the funds that would support the losses that these projects incur over their lifetime. The IR would therefore require that the Government agrees to provide the capital subsidy for these projects and fund the operating losses incurred. The Government on its part could mandate that IR operate these services at some benchmark levels of operating efficiency. Once the social activities are defined exhaustively, all other projects undertaken by IR can be subjected to stringent scrutiny to assess their financial viability.

Railway Accounts

The corporatisation of IR into IRC would necessitate the recasting of IR’s accounts into company format. The Government would therefore need

The necessity of defining the social/ developmental/ strategic obligations of the Indian Railways cannot be overemphasised. Not only would this provide clarity in terms of the business purpose but also it would enable IR to estimate the funding required to support “social” obligations

Exhibit 8.13 : Phase 1 upto One Year

Focus Area	Actions to be Undertaken
<div style="border: 1px solid black; padding: 5px; display: inline-block;">Legislation</div>	<ul style="list-style-type: none"> • Key features of legislation <ul style="list-style-type: none"> – Provide for appointment of IRRA – Mandate corporatisation – Permit revamp of the Railway Board – Redefine relationship between Government and the IREB – Provide exemption from taxation-excise, sales tax etc. for period of transition – Permit private participation in Railway operations – Facilitate the induction of personnel from outside the Railways – Extent of subsidisation in social areas to be limited to funds provided by Government – Social safety net to be set up to take care of surplus labour
<div style="border: 1px solid black; padding: 5px; display: inline-block;">Structure</div>	<ul style="list-style-type: none"> • Government to appoint the IRRA • IRRA to be constitute from among private sector professionals/financiers/economists/railway personnel/legal experts • Key responsibilities of the IRRA as specified earlier • IRRA to <ul style="list-style-type: none"> – Review the Indian Railway Act and the Indian Railway Board Act – Define framework for the estimation of subsidy
<div style="border: 1px solid black; padding: 5px; display: inline-block;">Systems</div>	<ul style="list-style-type: none"> • Experts from IR to be consulted wherever necessary • Consultants appointed by the Government to initiate recast of Railway accounts to ensure adherence to Companies Act, 1956

to initiate the process of restructuring of the financial accounts of IR by appointing consultants to recast the Railway accounts as per the Company's Act 1956. The objective would be to develop financial statements (Balance Sheet, Profit & Loss Statement) that can be understood by the financial community and the public at large. These could then be used to assess the performance of the Railways and make investment decisions. The Railways Capital Restructuring Committee (RCRC 1994) and the Expert Group have already made attempts to do such a recasting of accounts, though only at the IR-wide level. A full recasting will need to be done at the zonal and business unit levels also, and is therefore a relatively complex exercise. The Expert Group believes that this is not only feasible to do but is, in fact, essential for the restructuring of IR.

Rebalancing Pricing

All the restructuring in the world will not help a jot unless IR receives a material increase in revenues. IR is heading rapidly towards financial crisis and requires a higher level of income – fast – in order to redress the recent history of underinvestment in essential areas.

The issue of pricing falls outside the terms of reference of the Expert Group. It is however an inescapable fact that the single most important step that must be taken in the short term is to rebalance tariffs between passengers and freight on the one hand, and between the upper and lower passenger classes on the other. Indications of the kind of re-balancing required have been provided in Chapter 3.

The case for raising passenger fares is overwhelming. Consider the following:

- Operational losses on passenger traffic are close to Rs. 4,000 crore/ year.
- Passenger tariffs have increased by 9 per cent per annum over the past 8 years whilst costs have increased 15 per cent.
- Passengers generate 28 per cent of total revenue but consume 56 per cent of total rail output.
- The ratio of passenger fare to freight fare is amongst the lowest in the world. In China, for example, passengers pay four times what an Indian passenger pays relative to the price charged for freight.
- Subsidies are often not for the needy. For example, season tickets are typically used by office workers with steady employment. Furthermore, in 70 per cent of cases, season tickets are paid for or reimbursed by the employer. Subsidies therefore effectively go to the employers. (Similarly, there is a substantial component of privileged travellers who pay little or nothing, yet cannot be classified as needy.)

Passenger fares need to be rebalanced with a series of increases in excess of underlying rate of inflation as has been recommended in Chapter 3. This may be politically unpopular but the case is clear and compelling. The changes may be appropriately phased to make them practically feasible.

In addition to re-balancing passenger fares, consideration should be given to levying a 'safety cess' (about 8 per cent) to pay for overdue investments in safety related infrastructure. Consideration should also be given to raising the break-even point of monthly season tickets from the currently low level of 11 single journeys.

In summary, passengers will have to pay more for the service they receive.

The objective would be to develop financial statements (Balance Sheet, Profit & Loss Statement) that can be understood by the financial community and the public at large. These could then be used to assess the performance of the Railways and make investment decisions

It is an inescapable fact that the single most important step that must be taken in the short term is to rebalance tariffs between passengers and freight on the one hand, and between the upper and lower passenger classes on the other. The changes may be appropriately phased to make them practically feasible

Phase 1 aims at establishing an environment for the commencement of the restructuring process. the thrust area for Phase Two would be the initiation of the restructuring. The major emphasis will therefore be on reconstituting the Railway Board; initiating changes in business structure; revamping the systems in the areas of financial management and human resource development; and making IRRA fully functional

The absolute amount will not be large. The equivalent of a single season ticket per traveller per year is the difference between success and failure.

Milestones for Phase One

One year into the restructuring process, there should be a widespread understanding of the issues facing the Indian Railways and an appreciation of the need to change. The Government will have endorsed a new purpose statement for the Indian Railways and will provide its backing to the proposed Restructuring Plan. The new legislative framework for the operation of the Indian Railways will have been agreed upon and put in place. The work on the recast of Railway accounts will have commenced. The IRRA will have been constituted and made a beginning on tariff re-balancing.

8.63 Phase Two – Near term Actions (Years 2 and 3)

Phase 1 aims at establishing an environment for the commencement of the restructuring process. As a result of intensive and extensive communication by the Government on the need for railway restructuring there would be considerably better understanding and support for the change process. With the legislative framework also having been established in Phase One, the thrust area for Phase Two would be the initiation of the restructuring (See Exhibits 8.14 and 8.15). The major emphasis will therefore be on reconstituting the Railway Board; initiating changes in business structure; revamping the systems in the areas of financial management and human resource development; and making IRRA fully functional with membership and appropriate staffing .

Business Structure

The five core businesses of Indian Railways would be identified as follows:

- Freight Transportation
- Passenger Transportation
- Suburban Transportation
- Fixed Infrastructure
- Other Infrastructure

Each of these will be formed into a separate division. To begin with the accounts of each division will be separated.

Each of these divisions would be further divided into sub-divisions to

Exhibit 8.14 : Roadmap for Railway Restructuring

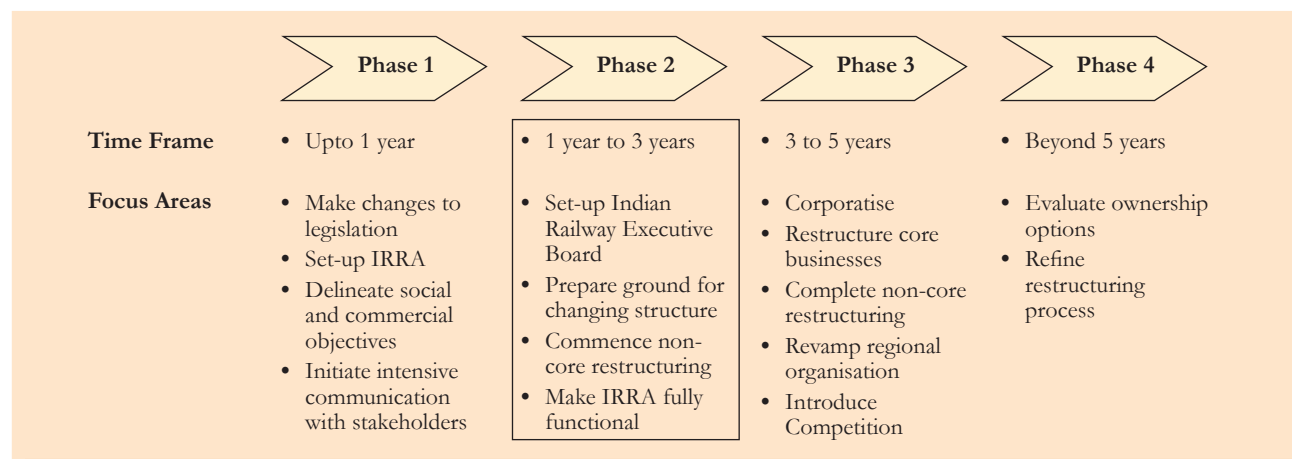


Exhibit 8.15 : Phase 2

Actions to be undertaken

- Existing Railway Board to be phased out and the Indian Railway Executive Board to be constituted by the Government
- Executive Board to have 15 members :
 - Chairperson
 - COO freight
 - COO passenger
 - COO suburban
 - COO Infrastructure - fixed
 - COO Infrastructure - other
 - VP Finance and Planning
 - VP HR
 - COOs - non core businesses (2)
 - Executive Directors (5)

Actions to be undertaken

Railway Executive Board to separate all non core activities into a separate division :

Non-core division to consist of :

- Production units – Residential colonies
- Catering – Onboard services
- Security – Hotels (Yatri Niwas etc.)
- Sanitation – Printing presses
- Medical facilities – Schools/Colleges
- Research facilities

Core business division to be divided (accounting separation) into

- Freight
- Passenger
- Suburban
- Infrastructure - fixed
- Infrastructure - other

facilitate focus on individual segments and greater accountability. The freight division would be further divided based on the nature of cargo transported. It will therefore consist of bulk, multi-modal and other cargo. Similarly the passenger business unit will be divided into long-distance, inter-city and other services. The suburban business unit will be divided based upon the city/region of operation. Hence, to begin with it will consist of the sub-urban operations in the cities of Mumbai, Chennai and Calcutta. As suburban services are offered in other cities, these will become part of the suburban division. The fixed infrastructure will comprise tracks, signalling and telecom, electrical installations and real estate. The other infrastructure division will be responsible for maintaining the stations, terminals, yards and managing maintenance depots and workshops.

The existing Railway Board will be replaced by a new Indian Railways Executive Board (IREB), which will be appointed by the Government. The Indian Railways Executive Board would be the body responsible for the overall

Once the separate divisions and sub-divisions are established, the chief operating officers of each division will need to commence the process of aligning the organisation with the new business structure. The COOs guided by the CEO and the five Executive Directors will need to appoint a board for the management of their division

management of the Indian Railways. The IREB will be constituted under the revised Railway Act and the revised Railway Board Act. The Government of India will make the appointments to the IREB. The chief responsibilities of the IREB will be to:

- Detail the Railway restructuring plan with milestones and time-tables
- Ensure success of the plan within the timeframes specified
- Ensure that the Railway organisation meets its goals on both commercial as well as social objectives
- Develop a strategic planning capability in the Indian Railways
- Chart out options for hiving off non-core businesses
- Plan for the long term separation of infrastructure and operation
- Plan for introduction of competition.

The composition and division of responsibilities within the IREB will be along business lines. At the time of formation the body will consist of the Chairman and 9 members, excluding 5 EDs Traffic & Infrastructure as shown in **Exhibit 8.16**.

Two of the fifteen positions will be temporary positions for the first two to three years of the restructuring. The CEO, VP(Finance) and VP(HRD) of the IREB could be selected from the Government, (excluding generalist civil servants), the Railways, the private sector or academia. The other members, excluding the 2 temporary COOs, who will deal with non-core business, should be selected from the Railways. The IREB will be headed by a chairperson who will also be the CEO of the Railways. The roles and responsibilities of the members of the IREB are depicted in **Exhibit 8.17**. A description of the profiles and responsibilities of different members is given in Annex 8.1

The interim business structure is depicted in **Exhibit 8.18**. Once the separate divisions and sub-divisions are established, the chief operating officers of each division will need to commence the process of aligning

Exhibit 8.16 : Proposed Structure of the Indian Railways Executive Board

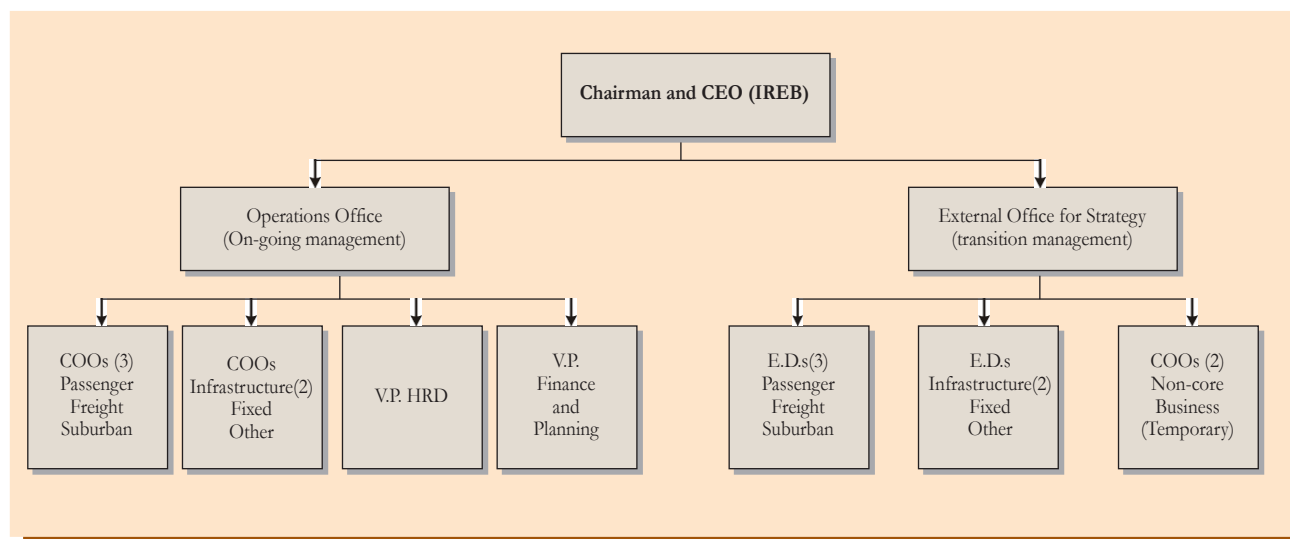
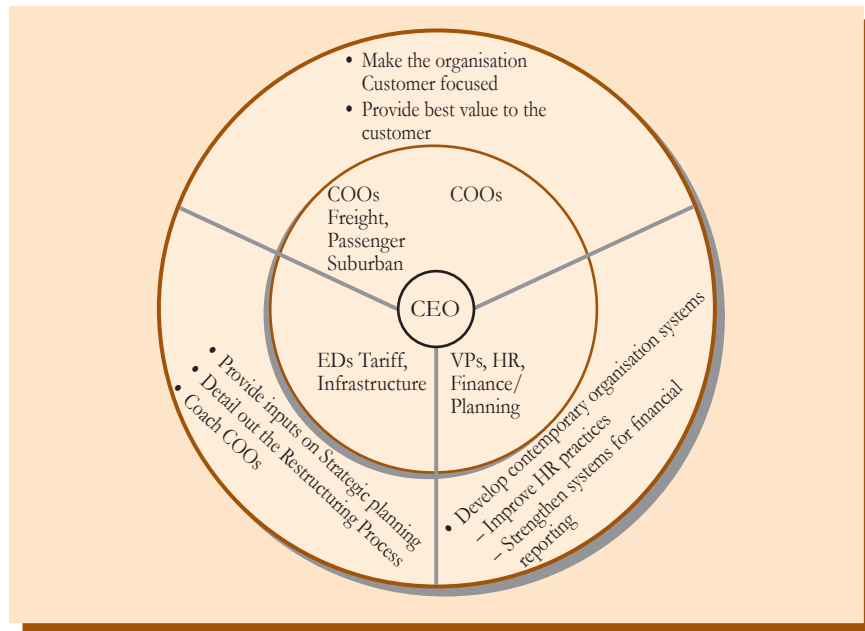


Exhibit 8.17 : Railway Board - Overall Role and Responsibilities



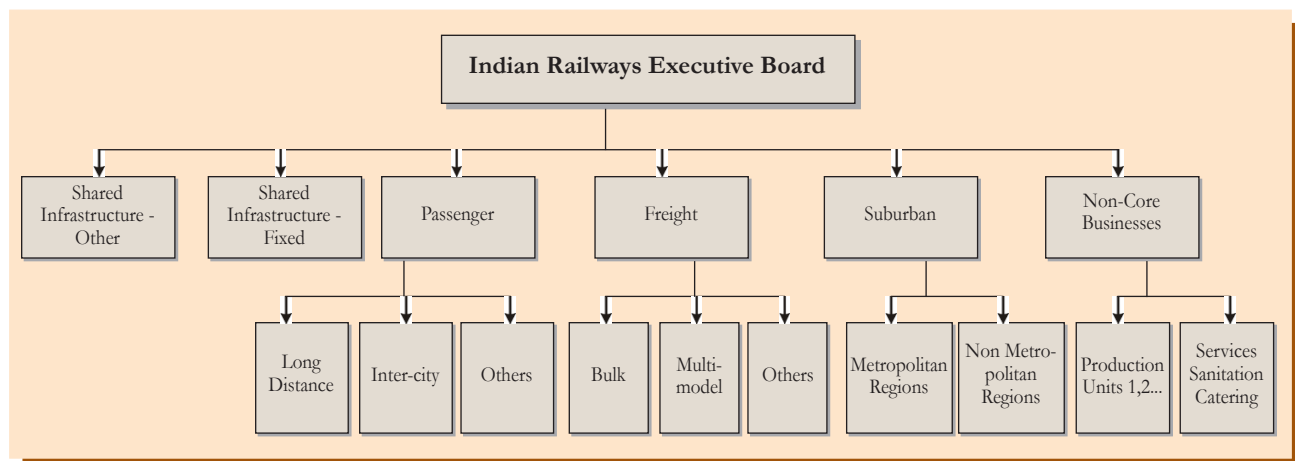
the organisation with the new business structure. The COOs guided by the CEO and the five Executive Directors will need to appoint a board for the management of their division. They will also need to conceive a line of business organisation for their division and identify the key positions that will need to be filled.

Non-core restructuring

All non-core businesses will need to be separated into a sixth division, which could consist of the following:

- Production units
- Residential colonies
- Catering
- Other onboard services
- Security
- Hotels (Yatri Niwas etc.)
- Sanitation
- Printing presses

Exhibit 8.18 : Indian Railway Proposed Structure - 2003



Box 8.6 : Shedding Excess Weight: Three Stages to Restructure Railways

A recently drafted 'vision plan' by a railway expert (Senior IR Executive) suggests a three stage process towards freeing a substantial amount of investment in idling assets, as a step towards reform and restructuring of the Indian Railways. The author calls for the creation of a 'newly incorporated' railway and the restructuring of core areas of production activity through measures such as 'unbundling' of assets and 'downsizing' of internal management organs. The author has listed these areas where such measures need to be introduced: railway workshops and sheds, telecommunications, hospitals, educational institutions, civil construction and board management.

The three stages outlined for creating a new railway are – first, the ending of railway monopoly over workshops and civil construction where ownership of assets is to be transferred to the private sector. Second, reducing the membership of board management at zonal and apex levels for operational flexibility, further privatization of other rail infrastructure, and the sourcing of expertise in 'non-core' activities. Third, setting up a regulator for overseeing that the new railway works on the basis of transparent norms and policies.

It is no longer rational for railway production units to continue functioning as public sector undertakings. An over supply of rolling stock in excess of the absorption capacity of the railways has led to a situation where the railways are required to tap export markets for this production. Extensive changes would have to be made to the railway PSUs before they could adapt to export market demands. This transition, the author of the paper argues, cannot be achieved under the traditional organizational set-up. A new railway would have to emerge where production units are instead incorporated as joint sector or private sector enterprises with revised roles and functions.

An innovative suggestion is that of 'de-monopolising' the railway production system further by IR withdrawing from the business of running railway workshops. Workshops are presently over-staffed and use obsolete equipment. It is suggested that these units should become self-supporting by allowing them to compete among themselves and charge the 'open line' system for services rendered. Among the other steps suggested for making railway workshops more profitable and efficient are:

- a) operating on the basis of full-unbroken rakes as a measure of minimum capacity in each workshop;
- b) correct capacity utilization (upto 80 per cent of total capacity) and quicker turnaround time through the adoption of modern management techniques such as work planning, production control and MIS; and
- c) proper inventory practices and upgrading existing assets as a preferred option to acquiring new stock.

Railway hospitals and schools are other idling assets that need to be unbundled since these are proving to be largely redundant under present circumstances. The criticism leveled against hospitals is that so far, populations at rail centres have at best had access to health 'units' and not hospitals and therefore need to leave their location for hospitalization. It is also alleged that railway hospitals serve only a narrow segment of railway staff since these are mostly located in the vicinity of divisional and zonal headquarters. Railways can therefore trim costs by reducing the number of hospitals and instead use the savings to provide medical insurance and reimbursement to populations at railway centres. Schools on the other hand, suffer from inadequate facilities and should therefore be amalgamated within the Central School system.

The vision plan also states that the largely privatized construction organisation of the Indian Railways should also be off-loaded during the first stage. Poor internal coordination among supervisory agencies and delays in the completion of projects has compromised the use of the more efficient construction method. The plan therefore suggests that a strong case be made for the abolition of the Construction Organisation in favour of 'open-line' contracted work.

The second stage of restructuring the railways would be to improve the operational flexibility of the management set up of railway boards at the zonal and central level. This would go hand in hand with the privatization of other infrastructure such as locomotive sheds, junction stations, telecom services etc. – the maintenance and expansion of which act as a drag on the finances of the Indian Railways. It is suggested that this infrastructure be collectively owned and operated by different private service providers. Outsourcing of expertise to operate non-core areas can be initiated after making suitable legal amendments to existing statutes that have so far prevented such steps.

The new railways in its third and final stage of creation is to be scrutinized by a regulator whose authority would effect greater transparency in operations and prescribe standards of service, quality and pricing.

Source: Thoopal, R.K. **Vision 2010 - Indian Railways**, Officer on Special Duty, West Central Railway, Jabalpur, February 2000; 140 pp.

- Medical facilities
- Schools/Colleges
- Research facilities

This is an illustrative list rather than an exhaustive list of non-core activities of IR. The future of these activities would be decided upon on a case-by-case basis: for example, the production units and medical services might be corporatized; catering and sanitation might be outsourced; the research facilities might become part of a joint venture; while the printing presses might be sold off.

The COOs responsible for non-core restructuring would need to expedite the process of outsourcing all services like catering, sanitation etc. through a tendering process. A study of the competitiveness of all production units will be initiated to assess the prospects of privatising these units. Based on this study, a restructuring process will be started in units that have the potential to be sold to the private sector. The objective will be to enhance competitiveness and thereby extract a better value for the business. All production units that are identified for privatisation will be corporatised before bids are invited from the private sector through a tendering process.

Surplus labour in each area will be identified. The COOs - Non-Core would work closely with the VP HR to devise schemes for their reskilling and redeployment. For those elements of the surplus workforce for whom reskilling or redeployment is not a feasible option, voluntary retirement schemes (VRS) will be designed and offered.

Redesigning Systems for Financial Management

The exercise on recasting the Railways accounts initiated in Phase One will be used as the basis for redesigning the systems for financial management. The VP- Finance and Planning will need to use the output of the exercise to finalize the new accounting norms. Using these norms, a separate balance sheet and a profit and loss account will be constructed for each division, and later for each sub-division.

In addition, significant changes will be made to the financial reporting /management information systems to facilitate the capture of relevant and accurate financial information. Systems for the capture and allocation of costs to the business divisions will need to be redesigned. This will permit the calculation of division-wise revenues, costs and profitability. Once these systems are in place, targets will be set on relevant financial parameters for each division. Together with this, mechanisms for the appraisal of projects and the allocation of funds to different businesses will also be revised.

Processes and systems will be defined to take care of the costs of restructuring in areas like the setting up of a safety net. The safety net will have two principal sources of funds; budgetary support and gains from the sale of non-core businesses. The VP- Finance and Planning will need to specify the extent to which each source will fund the safety net.

The IRRRA will work closely with the VP- Planning and Finance on these issues. However, the most important among these will be the mechanism to determine the extent of subsidy payable to IR by the Government of India. The IRRRA will need to certify the estimates provided by the IR for the payment of subsidy. Once these estimates have been vetted and endorsed by

The COOs responsible for non-core restructuring will need to expedite the process of outsourcing all services like catering, sanitation etc. through a tendering process. A study of the competitiveness of all production units will be initiated to assess the prospects of privatising units that have the potential to be sold to the private sector

Processes and systems will be defined to take care of the costs of restructuring in areas like the setting up of a safety net. The safety net will have two principal sources of funds; budgetary support and gains from the sale of non-core businesses

the IRRA, it will be incumbent upon the Government to either provide the necessary financial support or revise its expectations from IR in terms of the provision of social services.

Revamping the Organisation and HR Systems

Together with the business restructuring initiated in Phase Two, there would

Box 8.7 : Solving the Manpower Muddle – An Exit Plan for Downsizing the Indian Railways

Railway manpower costs today account for the bulk of the expenditure of the Indian Railways. Attempts to reduce manpower costs through a roll-back in staff numbers has so far not met with much success. The lack of an effective exit plan has made downsizing difficult and slow. At the same time, regular hikes in the pay compensation package for government employees, under successive Pay Commissions of the government have kept on adding to the staff costs. The Fifth Pay Commission has recently raised the costs of railway manpower to as much as 56 per cent of total rail expenditure. Therefore, while the costs of paying railway employees will continue to increase – staff reductions or not – the Indian Railways will have to prune employee numbers. This will call for more successful staff retrenchment programme with the active participation of staff. Employees who are retained could be made stakeholders through profit-sharing arrangements, as for example through a system whereby the wage bill for each activity or department is frozen at current levels and some portion of staff savings from retrenchments is allowed to flow back to those that continue in service.

Steps towards the creation of a leaner railway should focus on:

- The abolition of the construction organisation; redistribution of its work among existing officers in the regular cadre; downsizing the railway Medical Department.
- A sharp reduction in the numbers of locomotive crews and escort guards on freight trains.
- Retrenchments in the ticket checking and reservation system; bookings through travel agents and the Internet; a daily ‘anywhere to anywhere’ single ticket option for suburban commuters.
- New labour-saving systems for freight transit and the abolition of the law on contract.
- labour; routine maintenance and conservancy duties to be outsourced.
- The privatization of railway workshops and production units.

The largest savings for the railways in terms of savings on manpower would, by far, come from laying-off surplus staff employed on goods trains. This can be achieved through strategies which speed up freight transit on high-density routes and that consequently reduce the numbers of crew required to operate slow-moving freight locomotives. New freight transit technology can also help to dispense with the need of posting escorts on goods trains. The vision paper states that these options can together trim the staff deployed on goods trains by more than 60 per cent of existing levels (The savings will equal the collective cost of 15, 000 Joint Secretary posts in the Government of India)

The author of the vision plan argues for the closure of the railway construction organisation on the grounds that there is a higher number of officers employed in this non-core business – the construction of new lines – than on the maintenance of the rail network, its primary function. There will be little justification for so many staff from the civil engineering department to be deployed in non-core work since laying of new lines is contracted out. The ‘work charged’ system in civil construction has also given rise to several questionable practices of allowing a sizeable number of officers from other departments on works (In the accounts and finance department for example, as much as 34 per cent of its officers are charged to construction activities). For medical staff, the vision plan estimates that there are as many as 5,000 surplus employees at the railway Medical Department. This work force needs to be retrenched.

More lay-offs (and a high potential for staff savings) can be made in the area of ticketing and ticket checking. The sale of tickets for reserved accommodation through travel agents and the Internet will, it is estimated, bring down staff numbers by 50 per cent in the reservation and ticketing. It is suggested that the issue of season tickets to suburban passengers in Mumbai be also made over to agents and or the Internet. Pre-bought tickets that can be validated at machines at stations on suburban routes will also help in providing satisfactory customer service at economical costs, thereby thinning down extra staff at the booking department. The checking function should be re-drawn in such a manner that the team of TTE’s should complete the checking at the originating stations with a maximum travel of 50 km to 100 km of distance. This saves costs of resting facilities and the need to hire extra TTE’s for ‘idle link’ operations.

Source: Thoopal, R.K. **Vision 2010 - Indian Railways**, Officer on Special Duty, West Central Railway, Jabalpur, February 2000; 140 pp.

be significant changes in the organisation and the HR processes. (see **Exhibit 8.19**) To begin with, the VP HR will commence the process of rationalising the various cadres in IR. The objective will be to reduce departmentalism and to facilitate the setting up of a line of business organisation. A relook at the organisation structure for each business division will be carried out by the respective COO and the VP HR. Based on their joint assessment, a detailed structure for each division will be placed before the IREB. The need to ensure adequate customer focus through quick/decentralized decision making and clear accountability will be the guiding principles behind the new structures proposed.

In addition, the VP HR will need to work with the COOs to begin exploring options for aligning the regional organisation with the new business structure. The systems for annual goal setting and performance appraisal at different levels will also be finalised in discussion with the COOs.

The most important changes that will need to be made will be in the area of personnel policies. The terms and conditions of employment will need to be revised to make these comparable with those in the private sector. This will allow IR greater labour flexibility and also facilitate the induction of personnel from outside IR.

Milestones for Phase Two

Phase Two represents a critical period in the restructuring plan. This period requires a number of actions that are meant to kickstart the change program. As a result, a large number of difficult decisions need to be taken and actions initiated in a time-bound manner. (See **Exhibit 8.20**). On the structure front, Phase Two should see the dismantling of the Railway Board and the appointment of a new Indian Railways Executive Board. It will also see the creation of a new divisional structure within IR as shown in Exhibit 8.18.

The various non-core businesses will need to be separated and the process of corporatisation and privatisation should be commenced. In addition, the financial systems will be redesigned and the Indian Railways will follow standard corporate accounting practices. Systems for the evaluation of projects and allocation of funds to the divisions and the safety net will be developed.

The most important changes that will need to be made will be in the area of personnel policies. The terms and conditions of employment will need to be revised to make these comparable with those in the private sector. This will allow IR greater labour flexibility and also facilitate the induction of personnel from outside IR

Exhibit 8.19 : Phase 2: Revamping HR Systems

Actions to be Undertaken

- VP responsible for HR to undertake a comprehensive review of the organisation with emphasis on :
 - Amalgamation/rationalisation of the various cadres within the Railways
 - Alignment of the regional/zonal organisation with the line of business structure of the Railways
 - Redefinition of the number of levels – roles and responsibilities
 - Reviewing decision making process in light of internal re-organisation. Emphasis on
 - Decentralisation and empowerment
 - Responsiveness
 - Accountability
 - Establishing processes for goal setting and performance appraisal
 - Revise the terms of employment with focus on
 - allowing greater labour flexibility
 - being able to attract talent from outside the Railways
 - Identify positions that would require induction of personnel from outside the Railways
 - Commence induction of outside personnel to fill key gaps
 - Develop mechanisms to provide training to / reskilling labour
 - Set-up safety net and devise VRS schemes for surplus labour

Phase Two requires a number of actions that are meant to kickstart the change program. Having initiated the restructuring process at the corporate level, the restructuring effort in Phase Three will focus on extending it to the regional levels

The IRRA will establish a system for the determination of subsidy to be provided by the Government.

Phase Two should also see several important changes being made in the organisation and human resource policies. The terms of employment will be revised. The IR organisation would be set-up based on a line of business structure and the many cadres of the Indian Railways will be rationalized through a process of amalgamation.

8.64 Phase Three: Medium Term Actions (Years 4 and 5)

Having initiated the restructuring process at the corporate level, the restructuring effort in Phase Three will focus on extending it to the regional levels. While the restructuring will continue for core businesses, it will be completed for all non core businesses. The key areas for focus in phase Three are illustrated in **Exhibit 8.21**

Core Business Structure

The restructuring process will be taken forward by corporatising IR.

Exhibit 8.20 : Milestones End of Phase 2

Area	Actions Completed	Actions Initiated
Structure	<ul style="list-style-type: none"> Existing Board phased out IREB appointed Non-core separated Accounting separation of business divisions SBU business structure 	<ul style="list-style-type: none"> Non-core restructuring and privatisation
Systems	<ul style="list-style-type: none"> New accounting systems Mechanisms for assessment of subsidy Mechanisms for allocation of funds (incl. safety net) Mechanisms for the induction of personnel from outside the Railway New HR systems for goal setting appraisal etc. 	<ul style="list-style-type: none"> Rationalisation of Railway cadres Induction of personnel from outside the Railway
Legislation	<ul style="list-style-type: none"> Framework for introduction of competition 	

Exhibit 8.21 : Roadmap for Railway Restructuring

	Phase 1	Phase 2	Phase 3	Phase 4
Time Frame	<ul style="list-style-type: none"> Upto 1 year 	<ul style="list-style-type: none"> 1 year to 3 years 	<ul style="list-style-type: none"> 3 to 5 years 	<ul style="list-style-type: none"> Beyond 5 years
Focus Areas	<ul style="list-style-type: none"> Set-up IRRA Make changes to legislation Delineate social and commercial objectives Initiate intensive communication with stakeholders 	<ul style="list-style-type: none"> Set-up Railway Executive Board Prepare ground for changing structure Commence non-core restructuring 	<ul style="list-style-type: none"> Corporatise Restructure core businesses Complete non-core restructuring Revamp regional organisation Introduce Competition 	<ul style="list-style-type: none"> Evaluate ownership options Refine restructuring process

(See **Exhibit 8.22**). The Freight and Passenger Business divisions will be established as line of business profit centres. All subdivisions will be treated as profit centres while the shared facilities and infrastructure will be treated as cost centres. The process to make IR more competitive will be initiated by allowing the COOs to selectively introduce competition in localised operations. The areas for the introduction of competition will be selected based on the potential profitability of multiple railway services in the region.

Regulation

The IRRA will introduce regulations and a framework for competition in the provision of railway services. Tariff bands will be fixed by the IRRA in consultation with SBUs. The IRRA will also exercise its powers to expedite settlement of conflicts resulting from restructuring of non-core businesses or from introduction of competition.

Revamp Regions/ Zones

The restructuring process will be extended to the Regional/ Zonal level. (See **Exhibit 8.23**). The 9 zones will be maintained and line of business structure would be replicated within each zone.

A Zonal Management Committee comprising 4 General Managers (GMs) one each from the Freight, Passenger and Infrastructure Fixed and Infrastructure other Strategic Business Units (SBUs), will have the

The IRRA will introduce regulations and a framework for competition in the provision of railway services. IRRA will also exercise its powers to expedite settlement of conflicts resulting from restructuring of non-core businesses or from introduction of competition

Exhibit 8.22 : Phase 3 : Restructure Core Business

Actions to be Undertaken

- Corporatise the Railways
- Freight and Passenger Business divisions to be established as line of business profit centres
- All sub-divisions to be treated as profit centres
- Shared facilities, infrastructure and operations to be treated as cost centres
- COOs of each profit centre to introduce **competition** selectively
- Objective to learn and prepare for potential introduction of competition on a larger scale
 - Study traffic flows and revenue potential across regions
 - Estimate potential profitability
 - Concession small/localised operations on an experimental basis to private operators permitting them to offer competing services

Exhibit 8.23 : Phase 3: Structure Regions and Zones

Actions to be Undertaken

- Existing 9 zones to be maintained
- Line of business structure to be replicated at the zonal level
- Each zone to be managed by a four member Zonal Management Committee comprising 4 General Managers (GMs) from the freight, passenger and infrastructure fixed and infrastructure other SBUs
- Each zonal GM to report directly to the COO of the SBU
- Zonal GMs to be empowered to independently take all decisions not impacting other SBUs
- Such decisions to be taken jointly by the Zonal Management Committee e.g. allocation of shared services to profit centre operations
- To facilitate easy decision making clear guidelines to be formulated to assist zonal management committee. These should elaborate principles established by the Indian Railways Executive Board

The end of Phase Three will see the creation of the Indian Railways Corporation with five core businesses. The Government will still own the Corporation, however, it will be run largely on commercial principles within a regulatory environment created by the IRR A

responsibility of managing the zone. The Zonal GM will report directly to the COO of their respective SBUs. Greater powers will be given to the Zonal GMs to allow them to take independent decisions regarding their own SBUs. Decisions regarding sharing of common facilities, infrastructure will be taken jointly by the Zonal Management Committee. Guidelines to facilitate decision making by the Zonal Management Committee will be laid down in line with the principles established by the Railway Executive Board.

Restructure Non-Core Businesses

Sale/contracting of non-core production units and services will be completed. (See **Exhibit 8.24**). A phased closure of all units that could not be privatized will be achieved. VP HR will handle all issues pertaining to labour retraining/separation.

Systems

The systems established during Phase 2 will be further strengthened by introducing robust corporate governance mechanisms. (See **Exhibit 8.25**) Periodic reviews will be done at all levels. Review by the Government/ Ministry will be carried out annually. The IREB will perform internal reviews every month. Performance of all profit centres will be measured against parameters like ROCE, margins and asset turnover. To introduce greater transparency, the financial accounts will be published every 6 months.

Milestones

The end of Phase Three will see the creation of the Indian Railways Corporation (IRC) or Bharat Rail Nigam (BraiN) with five core businesses. Three of these SBUs will be operated on a profit centre basis while the infrastructure divisions will be cost centres. The Government will still own the Corporation, however, it will be run largely on commercial principles within a regulatory environment created by the IRR A. Phase 3 represents a period where the restructuring exercise is extended to the zonal level. On the structure front, Phase 3 will see the line of business structure being extended to the zonal level and the zonal organisation structure being revamped (**Exhibit 8.26**). The restructuring of all non-core production units should be completed and a phased closure of units that could not be privatized will be

Exhibit 8.24 : Phase 3 : Structure Non-core Businesses

Actions to be Undertaken

- Completion of sale/contracting of non-core production units and services
- Phased closure of all units that could not be privatised
- Labour retraining/separation to be handled by member HR

Exhibit 8.25 : Phase 3 : Systems

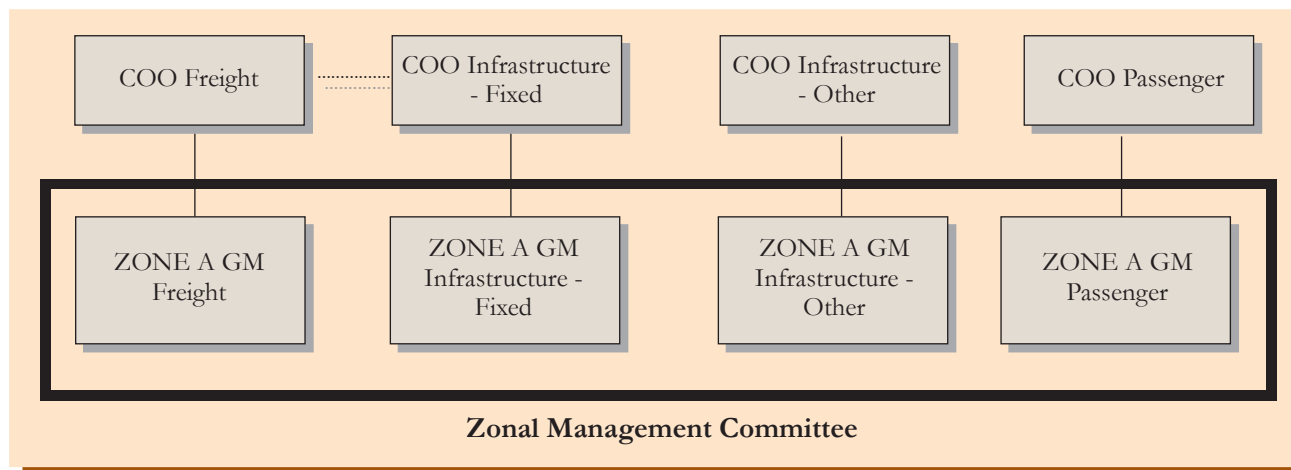
Actions to be Undertaken

Governance mechanisms to be established

- Annual performance reviews with the Ministry/Government
- Internal review by the IREB every month
- Accounts to be published every 6 months
- Financial parameters such as ROCE, margins and asset turnover to be used to set targets and assess performance for all profit centres

carried out. Selective competition will also be introduced. On the regulatory front, the IRRA will put in place regulations for the smooth introduction of competition, and for the management of any disputes arising from the closure of non-core businesses. On the systems front, mechanisms for review at all levels – Government, IREB and the SBU Boards will be introduced. Parameters like ROCE, asset turnover etc. to assess financial performance

Exhibit 8.26 : Proposed Zonal Structure



Box 8.8 : A Competitive Freight Market: Illustrative Investment Options

Indian Railways' freight services are moving from a captive to a competitive market. In order that the freight segment grows to its full potential, reliance on marketing alone will certainly not suffice. Even marketing in combination with innovating pricing solutions will not be adequate. The target customer and traffic stream needs to be considered at the stage of designing the scope of projects and determining the investment.

Following are two illustrative projects to promote freight traffic growth:

(i) Using privately owned specialized wagons and tailored pricing to gain traffic share: in the hot-rolled steel coils (HRC) market.

The share of Railways' in finished traffic of steel plant products has been declining gradually due to a combination of the commodity-linked freight pricing policy and the lack of flexible and product-tailored solutions available in rail. HRC forms nearly 30 per cent of the finished steel market, and is expected to grow faster than other steel products. In fact, the low competitiveness of rail in HRC transport is the key reason behind the decline of rail share in finished steel traffic. The special needs of this traffic can be addressed by introducing privately owned specialized wagons to eliminate additional 'packing' or 'utilization' cost incurred by customers, and modifying the existing freight charging policy for this product category. The key challenges to implementing this solution would be to design and operationalise the customized freight policy, ensure customer support and co-operation, and obtain private or third party financing of the specialized wagons.

(ii) Developing a strategy for the bulk/non-bulk freight business.

Railways have traditionally focused on the bulk long haul traffic. With the increasing growth rates of the non-bulk segment, there is need to address the long haul non-bulk segment. This would involve developing multi-modal transportation solutions with road and other private industry participation. A detailed assessment of the bulk and non-bulk transport opportunities available for the Railways as also the organizational imperatives that need to be addressed to increase customer focus and responsiveness, would be a critical step towards developing a profitably growing freight business.

The non-bulk and manufactured goods are high value traffic that can bear higher freight rates and yield higher profit. To improve the mix of goods as well as earn higher revenues and higher profits, it is necessary that Railways devise cost effective and efficient services, pricing structures and operational strategies to cater to this traffic, Railways must adopt the principle of logistics and supply chain management that offer total transportation solutions to the customers. For this purpose, it must move towards integration and partnership with complementary entities in other modes of transport and promote multi-modal transport systems.

The key imperatives and challenges to develop a cohesive strategy for the freight business would be to involve freight customers in the exercise and to gear the organization for improved customer focus.

Source: Report on IR, prepared by Swede Rail and McKinsey and Company, commissioned by ADB (1998)

of SBUs will be introduced.

8.7 The Railways in 2006

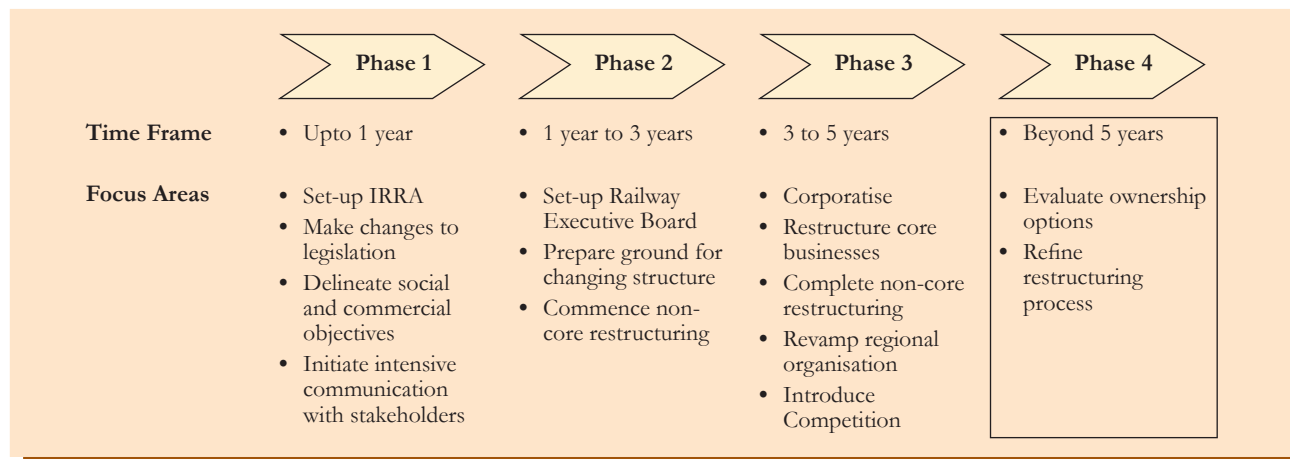
The successful implementation of the plan over a period of 5 years is likely to lead to a significant change in the structure and performance of IR. The restructuring will have seen a complete separation of roles of policy making, legislation and management of operations. The role of the Government will be to define its policy objectives and its expectations from the Indian Railways. The independent regulator, the **Indian Railway Regulatory Authority (IRRA)**, will help in developing a legislative framework that supports the policy objectives specified by the Government. The IRRA will also play an active role in arbitrating between conflicting interests.

The IRC or (BraiN) will be governed by the Indian Railways Executive Board (IREB), which will be structured along business lines. All non-core businesses will be fully divested and the IREB will be focused on managing the core transportation business comprising five strategic business units (SBUs). These will be the Freight, Passenger and Suburban divisions, which will be organized as **profit centres**. The two infrastructure divisions – Fixed and other will be organized as **cost centres**. A Board headed by a chief operating officer (COO) will manage each of the SBUs. The COO will also represent the division on the IREB. The proposed business structure has been illustrated in Exhibit 8.17.

The IRRA will prescribe tariff bands that will allow the IRC to earn an acceptable (commercial) return on these services. The IREB will have freedom to price services within the bands defined by the IRRA. In all commercial areas, the IREB will independently take decisions regarding investments, divestitures, alliances etc.

The structural changes brought about in IR will go a long way in helping address some of the most important issues identified in Chapter 1. The separation of policy making and operational control together with an independent regulatory authority will ensure that the railways have adequate autonomy to take decisions. The separation of the ministry from IRC will help facilitate arms-length dealings between the two agencies. Consequently all social obligations incurred on behalf of the ministry will need to be explicitly specified to IRC on an annual basis. The IRRA will ensure that the

Exhibit 8.27 : Roadmap for Railway Restructuring



investment and other costs incurred in the provision of these services are accurately estimated. It will also ensure that support for these initiatives is provided to the IRC in the budgetary support for the year.

The divestment of non-core businesses will help improve the quality of services while simultaneously reducing cost for IRC. In addition, management attention will now be focussed on the core SBUs. Railway services on selected routes will be provided by other operators who will compete with IR for business in these areas. A line of business organisation as well as the introduction of competition in some areas will ensure greater focus on customer needs and expectations, and help change the “government department” character of IR’s operations. IR will therefore have successfully repositioned itself from a provider of basic transport services to a provider of “total logistics solutions” as has been envisaged in the Purpose Statement. It is therefore envisaged that in the year 2006 IR will have a significant market share in the high value cargo segment and will be well positioned to be a market leader in the provision of logistics solutions.

Box 8.9 : An International Model of Multimodal Freight: Benefits for the Indian Railways

The movement of cargo by transport systems (air, ship, road and rail) in several developed countries has achieved a high degree of integration with the railways. This to a large extent has been possible through the extensive re-design of modes – particularly the railways – into an efficient operating model of long distance haulage which combines speed, reliability and the economic benefits of multi-modal handling and storage. The model is based on the following features:

- Investments in modern freight stations/hubs, linked to roads, airports and ports to facilitate the transfer of unitised cargo between different modes.
- The privatisation of “downstream” rail freight activities (viz. cargo handling, truck transit of cargo and the management of freight storage depots).
- Well-structured contracts between the rail authorities, operators of storage depots, trucking companies and handling agents.

This model has led to a radical transformation in the engineering of the systems of freight haulage by rail and is a proven concept in the developed world. The concept holds promising potential for the future of containerised rail freight movement in India and is central to a strategy to regain the freight traffic lost to road. The model pre-supposes four critical developments in rail freight – all of which are yet to take place in India: a) sale of haulage on trains rather than wagon space to a multitude of users for a price based on the density of traffic and the distance between points of haulage b) the unitisation of cargo carried by rail c) the standardisation of unit sizes for all modes d) investments in new freight stations/hubs on the railway network with modern handling and storage facilities. CONCOR in India has invested in inland container depots running parallel to railway lines but such arrangements are restricted to providing speed and safety to cargo and are yet to generate wider business opportunities for multimodal handling, storage and movement.

The future benefits of such a system can be broadly classified as a) efficiency and productivity from privatization, and b) gains carried over to the customer. IR would now be able to concentrate only on investments in track, signaling and locomotives – all of which would provide the customer with benefits of quality of services through safety, speed and reduced transit times for cargo. The model will raise productivity and overall efficiency of freight operations, as the selling of haulage will bring an end to the existing system of cross-subsidizing some freight commodities, which will now be determined by market forces. IR can instead introduce market competition through the contract sale of haulage with independent companies contracting with each other for hauling services, storage and handling. The private sector should be provided incentives to invest in the construction and operation of modern freight hubs with efficient storage and handling facilities on select points on the network. This will result in favourable benefits like downsizing the railway workforce and the freeing of excess land for commercial exploitation.

The changes brought about by privatization and re-design of railway network through investments in hubs will essentially serve to reduce the transit time for cargo. This will facilitate the efficient switching of containers and wagons between chosen origin/destination stations, or on and off tracks, and then on to trucks – leading to productivity gains and added value for money to the customer. The inter modal model in short aims at greater efficiencies and customer satisfaction through the consolidation of the loading, storage and movement of freight through private agencies, a smaller work force and above all, the faster turn-around of haulage.

Source: Cyrus Guzder. A Short Statement on the Railways, October 2000.

The overall performance of IR will be assessed annually in a joint meeting between the IREB and the Government. The Government will use this opportunity to evaluate the performance of IR on all social initiatives for which support was provided in the previous year's budget

The internal management information systems (See chapter 7) and human resource development initiatives will be revamped to support the changed organisational objectives and the lines of business organisation. All financial accounting will be based on generally accepted corporate accounting principles. The goals of all profit centres will be set on variables like revenue, profit, return on capital employed (ROCE), market share, customer satisfaction and growth. A robust capital budgeting process will have been established and all investment proposals will be supported by a detailed analysis of financial viability.

The systems for human resource development will be realigned to facilitate and support a line of business organisation. A robust goal setting and appraisal process will be in place, which will create a strong performance orientation in the Railway employees. In addition to capable managers who have risen from within the Railway organisation, managers will also be inducted from outside to staff areas where there exist skill gaps internally.

The IREB will conduct a performance review of the different SBUs and the zones every quarter. The audited financial accounts of IR will also be published every quarter. The overall performance of IR will be assessed annually in a joint meeting between the IREB and the Government. The Government will use this opportunity to evaluate the performance of IR on all social initiatives for which support was provided in the previous year's budget. The emphasis will be on assessing whether the cost and time targets for the projects have been adhered to and whether the services are being operated effectively. In addition, the Government will review the commercial operations of IRC and assess if these are meeting the cost of capital at an overall level.

As a consequence of the successful implementation of the restructuring it is expected that there will be significant improvements in the operating and financial performance of IR. It is expected that the successful implementation of the restructuring plan will help channelise resources both financial and managerial into the areas which create maximum impact. By 2006 IR will therefore have successfully increased capacity on the high density-profitable routes. IR will also significantly increase investments in repairs and maintenance and cover the existing backlog in this area. Such investments will make Rail transport far safer and more reliable than it is currently. The greater business and customer focus will help the IR increase growth rate of passenger and freight businesses from the current levels of ~3 percent per annum to around 7 percent per annum and thereby at least halt the steady decline in its market share in these businesses.

It is expected that by 2006 IR will have successfully increased capacity on the high density-profitable routes. The greater business and customer focus will help the IR increase growth rate of passenger and freight businesses from ~3 percent per annum to around 7 percent per annum

Options

Once the restructuring has proceeded as per plan for the first five years and the vision outlined by the Expert Group has been achieved, the Railways will need to address themselves to several key issues in the light of the restructuring experiences of the five years gone by. The view taken at this stage will determine the course that the Railways will need to adopt while going forward. Some of the important decisions that will need to be taken will relate to:

- *Ownership*

The degree to which the Government needs to maintain ownership of the

Indian Railways will need to be decided. The extent and nature of private sector participation will also need to be determined.

- *Competition*

While the need to introduce competition in Railway services is not open to question, the framework for the introduction of competition on a large scale will need to be reassessed in the light of the ownership decision taken by the Government. Based on the view taken, competitive services could be introduced in larger areas/regions.

- *Toll Based Structure*

Once the systems for the determination and allocation of costs have been well established, the infrastructure unit could also be treated as a profit centre that levies tolls for the provision of its facilities to the various service providers. The tariffs could be determined by the IRRA that could ensure a level playing field for all service providers.

- *Future of Suburban Railways*

By the end of five years a view could also be taken regarding the extent to which the Railways should be involved in the provision of Suburban transport services.

Conclusion

Indian Railways has a long history of achievements and is an effective institution that delivers. It is a truly unique institution that cannot be compared lightly with that of any other country. It has a distinctive role to play in a distinctive country. Any recommendations to change an institution of the scale, complexity and achievement of IR must be based on compelling evidence that suggests a way forward without bringing turmoil to the lifeline of the nation.

The restructuring plan proposed has set difficult but achievable targets, which will allow IR to achieve the vision outlined by the Group within a period of five years. However, this will require considerable commitment on the part of the Government who will need to endorse the process and facilitate the establishment of the enabling institutions like the IRRA.

It is critical for the long term well-being of the Railways that the process be started without any delay. The timely achievement of the 5 year vision outlined by the Group will help the Railways avert the impending financial crisis. It will also position it well towards achieving its twin objectives of sustainable profitable growth and contribution towards the development of society and the nation.

The view of the Expert Group is that the potential exists to double the underlying rate of growth in IR. Accepting anything less will be a loss to the nation. The rail system is too important to permit the withering of IR. The work of the Expert Group, has clearly revealed that the withering of IR is a clear and present danger – it is the ***default option if nothing is done to change how IR is structured and run. The decline of the Railways is not an immutable law of economics. The future of India's primary infrastructure asset needs to be a choice. The choice is between a decisive action to reinvent a modern railway system for a modern India, or a dithering***

It is critical for the long term well being of the Railway that the process be started without any delay. The timely achievement of the 5 year vision outlined by the Group would help the Railways avert the impending financial crisis. It would also position them well towards achieving their twin objectives of sustainable profitable growth and contribution towards the development of society and the nation

debate that will result in the withering of one of the nation's finest institutions.

Box 8.10 : The Mass Transit System of the Paris Transport Region: A Success of Institutional Organisation

The densely populated Ile-de-France region, which includes the capital, Paris - is the setting for success story in the planning and provision of a modern multi-modal public transport service, larger than all of France's provincial cities combined. The urbanised area of the region is vast with a population of 9.4 million and contributes 28 per cent of total French GDP. Demography and economic importance are not the only two factors to make the region of special interest. The unique institutional structure of its mass transport system makes the Paris transport region a showcase of how the effectiveness of a unitary organizing authority can result in an expanding transport network.

The urban public transport system in the Paris region relies on two state-owned rail operators and two private road carriers. SNCF and RATP are the suburban rail and metro rail service providers respectively. The Professional Road Carriers Association (APTR) and the Association for Development and Improvement of Ile-de-France Regional Transit System (ADATRIF) operate bus lines on the periphery of the Paris transport region. The transport services providers are controlled by the Paris Transport Authority (Syndicats des Transports Parisiens, STP). STP, the public transport organiser is responsible for the choice of transit routes, the selection of transport operators, the mode of the operator, fare policy and the management of the transport operators budgets. The institutional organization of the network of the Paris region is structured as follows:

- A unitary public transport authority - a quasi-regulatory role vis-à-vis transport operators.
- Complexity of its institutional structure - four transport operators against one in other regions.
- Clear definition and designation of services of public transport operators.
- Special fare policy - an all network seasonal travel pass-covering 60 per cent of the total ridership.
- Steady expansion of a multi-modal passenger transport network.

All the four transport service providers have to prepare, under decree, a regular passenger service plan to be approved by the STP. For passenger services not included in the plan, STP is authorised to frame certain conditions to prevent competition with regular passenger services. The relationship between the authority and the transport operator is indicated by a clear definition of obligations and commitments of the service provider. The RATP for example, is not just responsible for the operation of metro lines assigned to it but also performs other technical functions approved by the STP. These include conducting feasibility studies, conceptual design of newly dedicated lines, the design, tendering and construction of many approved rail projects etc. SNCF on the other hand is controlled through a contract plan (signed between the State and the STP) which determines its service commitments as a national monopoly. This in major part includes the application of its resources to a national master plan. On fare policy, interventions of STP are restricted to only rail fares and not bus fares. STP fixes the fare for the urban lines of RATP and for the sub-urban lines of SNCF. This is done in a way to assure fare coordination between different services and to provide for a balanced financing of RATP's operations. STP also protects the financial interests of rail operators. Agreements with these companies insulate them against losses; methods to calculate fare losses due to fare reductions imposed by the urban transport authority are also firmed up by agreements between the parties.

An integrated, multi-modal transit system of urban transport in the Paris region is perhaps the key success of the STP. This it has achieved by bringing together a large number of operators under its unitary institutional structure, designing a special fare policy for passenger rail lines and clearly defining the obligations and commitments of RATP and SNCF. This approach has resulted in a public transport usage rate which far exceeds the national average. The integration of the transport system has also led to a steady expansion of urban metro lines, double track lines and stations.

Source: Amsler, Yves. "Urban Public Transport in France", Land Transport Directorate, Paris (France), December 1997.

Annex 8.1 : Profiles of Members of the Proposed Indian Railways Executive Board

Chairperson/ CEO

Profile: The success or failure of the proposed restructuring effort will depend to a large extent on the commitment and the capabilities of the CEO. A serious attempt therefore needs to be made to appoint a person with the necessary conviction and skills to transform the IR into a profit making, competitive and professionally managed organization. The chairperson/ CEO of the Railways should have a proven record of managing a large multi-location, multi-divisional organization. The sheer diversity and complexity of the Railways makes this necessary for a prospective CEO. To lead the corporatisation of the IR, the CEO should have experience of leading a large team of professionals with diverse technical and business skills. Prior experience in a large restructuring exercise and of working in a competitive environment will also be useful. The search for such a CEO should be done worldwide since there are now a number of Indian CEOs in the largest corporations in the world.

Responsibilities: The overall role of the CEO of Railways should be to provide strategic direction to the Railways and to turn around the performance of the Railways. He should:

- **Ensure progress of the restructuring:** The CEO needs to ensure that the restructuring plan is on schedule. He will review implementation plans and ensure that contingency plans are in place to avoid any major delays in implementing the restructuring.
- **Meet the commercial objectives:** IR is involved in a number of activities, some of which do not meet the cost of capital. It will, however be the CEO's responsibility to ensure that the new IR at least meets its cost of capital on an overall basis.
- **Ensure development objectives are met:** The CEO should also ensure that the funds given by the Government for developmental work are utilised effectively and the developmental objectives agreed upon are met.
- **Set targets for the management team:** The CEO should set operational and financial targets on critical parameters like cost reduction, safety, service levels, revenue, growth and profitability for his COOs. The performance of the COOs should be reviewed by the CEO against these targets .
- **Make the new IR responsive and customer focussed:** The CEO should lead a cultural change in the Railway

Exhibit 8A.1 : Phase 2 : Restructure Core Businesses

Actions to be Undertaken

- Passenger sub-division to be further split into
 - Inter-city
 - Long distance
 - Others
- Freight to be split into :
 - bulk
 - multi-modal
 - others (parcels etc.)
- Suburban operations to be divided on the basis of cities of operation
- Infrastructure - fixed to compromise :
 - Track
 - Signaling / Telecom
 - Electrical installations
 - Land/Real Estate/Construction*
- Infrastructure - other to compromise :
 - Stations/Terminals/Yards
 - Workshops
- COOs of the core business units to commence developing plans for restructuring their operations :
 - Constitute a board for the management of each SBU
 - Develop an appropriate organisation structure for each division
 - Identify managers to occupy key positions
- Executive Directors (Traffic) to assist profit centre heads in finalising their plans
- Executive Directors (Infrastructure) to assist cost centre heads in finalising their plans

organisation and make it a more nimble, responsive and customer focused organisation.

- Prepare the Railways to survive profitably in the new market-driven, competitive transport sector.
- Negotiate with the Regulatory Authority, Government and Labour Unions.

COOs – Passenger, Freight and Suburban

Profile: The COOs – Passenger, Freight and Suburban will be the business heads of the three profit centres within the new railway organisation. They should possess a strong mix of operational and commercial skills to effectively manage the respective profit centres.

Responsibilities: Their role is to ensure that the performance of their division/business is in line with the overall purpose and objectives of the new railways. (See **Exhibit 8.18**) Their key responsibilities should be to:

- **Manage overall operations of the divisions** including the working of stations, goods sheds, yards and terminals
- **Meet Performance targets:** They should ensure that the financial, operational targets for their divisions that are committed to the CEO are met. In turn the COOs will set and review targets for their operating managers
- **Coordinate with infrastructure divisions:** They need to coordinate and plan for any support required from the infrastructure divisions to meet their targets and to provide the best value and service to their customers. This will include finalising service-level agreements with the infrastructure divisions.
- **Ensure use of new technologies:** They should also ensure the use of new technologies to achieve world class standards on cost, efficiency, reliability and safety.
- **Coordinate with VPs Finance and HR:** The COOs of the profit centres need to coordinate with the VPs - HR and Finance to identify systems needed to make their divisions customer focused and competitive. They will then need to ensure that these are implemented in their respective divisions.
- **Assist in negotiations with the government**

COOs Infrastructure

Profile: The COOs Infrastructure should have a thorough knowledge of the infrastructure needs of the Railways. They too should have a strong mix of technical and commercial skills.

Responsibilities: The overall role of the COOs Infrastructure should be to ensure that their divisions provide the profit centres with adequate support keeping in view the overall commercial and social role of the Railways. One COO could be in charge of the “fixed” infrastructure such as track, signalling & telecom and electrical installations while the other could be responsible for the infrastructure of stations, terminals yards and managing maintenance depots and workshops. Their main responsibilities would be to:

Exhibit 8A.2 : Phase 2 : Restructure Non-core businesses

Actions to be Undertaken

- COOs responsible for non-core businesses to :
 - Award contracts for outsourcing of **all services** in
 - Catering
 - Sanitation
 - Other services (Bedding etc.)
 - Assess competitiveness of all production units
 - Initiate restructuring to enhance competitiveness
 - Identify surplus labour in each of the production units
 - Detail options for surplus labour with the assistance of member HR
 - Reskilling and redeployment
 - VRS
 - Corporatise units that are to be privatised
 - Commence privatisation of production units through the bidding route

- **Manage all shared services:** The members should be responsible for upgradation and management of all the shared services (outsourced or from within Railways).
- **Meet operational targets:** They also need to meet targets on cost reduction, improving efficiency, service levels.
- **Finalize cost allocation mechanisms and service level agreements:** They need to interact with the COOs of various profit centres – Freight, Passenger and Suburban, and finalize mechanisms to allocate costs. They will also need to finalize service level agreement with the COOs of the profit centres.
- **Coordinate with VPs - Finance and HR:** By coordinating with VPs Finance and HR, they need to identify and implement new systems in their division.
- They will be responsible for initiating the technological upgradation of the system, ensuring the progress of its implementation, and monitoring its performance.

COOs Non-Core Businesses

Profile: The two COOs incharge of restructuring the non-core businesses of IR should be professionals with experience of asset restructuring and sale.

Responsibilities: The two COOs will have the overall responsibility of ensuring the separation and sale of non-core activities of IR within a timeframe of two to three years. (See Exhibit 8A.2) They will need to manage the transition. Specific responsibilities will include:

- **Complete Out-Sourcing of Services:** Onboard services such as catering, sanitation and other services like bedding can easily be outsourced at substantially lower cost and comparable or better quality. Considerable progress has already been made in this direction and hence this should be a short-term priority for the non-core COOs.
- **Restructure the Production Units and Disinvest:** The competitiveness of various production units will need to be assessed. The COOs will then need to work closely with the VP (HR) to identify surplus labour and work out plans for reskilling/redeployment or separation. They will also need to identify units capable of attracting private investment and ensure corporatisation of these units. Subsequently the COOs will need to see through the privatisation of the corporate entities through a transparent bidding procedure..
- **Close Down Non-viable Units:** The members will need to draw up phased closure plans for units that are found to be unviable.
- **Communicate with Unions:** Since the issue of restructuring of non-core businesses is likely to require redeployment or separation of parts of the workforce it will be a primary responsibility of the COOs to communicate with the unions. They will be required to explain the logic of the decisions to the workforce and also ensure complete transparency when the different units are being assessed and the disinvestment/ closure plans are being finalised. They will negotiate and bargain with the Labour Unions in consultation with CEO

Exhibit 8A.3 : Phase 2 : Planning and Finance

Actions to be Undertaken

- VP - Planning and Finance to :
 - Finalise new accounting procedures in discussion with consultants appointed by the REB
 - Prepare B/S and P&L for each division/sub-division and all non-core units based on new norms
 - Establish cost allocation systems to the three lines of business
 - Assess projects through the calculation of IRR, ERR etc.
 - Participate in setting annual financial and operational targets for profit and cost centres
 - Supplement budgetary support for areas like safety net with gains from sale of right of way, real estate or any other assets
 - Provide fixed percentage of budgetary support to the safety net managed by VP HR
 - Extent of subsidy payable by the Government in consultation with the IRRA
 - Extent of funds to be transferred to the safety net
 - Guidelines for the allocation of resources between the different SBUs
 - Norms for new investments including method/process for the assessment of viability
 - Avenues for raising resources and the nature of instruments that could be used

and VPs Finance and HRD. This should be taken as the collective function of the Board.

Vice President (VP) – Human Resources

Profile: The restructuring process requires several difficult changes to be implemented. Some of the most complex and sensitive issues relate to the area of human resource management and organisational restructuring. The position of the VP HR is therefore critical and requires a proven record as the head of HR in a large business. The incumbent should also have prior experience in drawing up VRS plans, in dealing with unions and in initiating and implementing contemporary HR practices.

Responsibilities: The VP-HR will have to play a key role in managing unions, training and developing the employees and institutionalizing contemporary practices within the Railways. He will need to:

- **Integrate the current structure with the line of business organisation:** The current organisation structure of the Railways is hierarchical and cadre based. The VP-HR will need to draw up a plan to guide IR towards a contemporary line of business structure. He will then need to ensure that the zonal organisation is aligned with the line of business organisation. The VP also needs to ensure that the new structure and systems empower managers to take decisions and thereby improve the responsiveness of the IR.
- **Plan for dealing with surplus labor:** One of the most important aspects of the job of the VP-HR will be to deal with the unions and manage the issue of retraining and redeployment or separation. He will therefore, need to not only design schemes for retraining/ redeployment and separation, but will also need to communicate proactively with the unions and attempt to win their confidence.
- **Implement contemporary HR systems:** The VP-HR should implement contemporary HR systems for goal setting and performance appraisal. He should ensure that these are aligned with the organizational objectives. He also needs to identify and implement training programs to build the capabilities of the managers.
- **VP-HR will be responsible for reduction/merger/re-alignment of existing cadre and for revamping the method of selection.**

Vice President– Finance/ Planning

Profile: The VP-Finance/ Planning should have experience as the CFO of a large diversified, multi-location business. Experience of managing a company facing financial crisis would be an added advantage.

Responsibilities: The VP- Finance/ Planning will be responsible for the revamp of the accounting policies and financial systems. (see Exhibit 8A.3) He will need to draw up a plan to help Railways deal with an impending financial crisis. The key responsibilities for this position will be to:

- **Introduce accepted corporate accounting procedures:** The lack of availability of financial reports that can be understood by the financial community/ public needs to be rectified. The VP Finance/ Planning should hence introduce standard corporate accounting procedures in the organisation.
- **Establish systems for capture of financial and operational parameters:** The VP will assist the CEO in enforcing greater business discipline and accountability by setting in place systems to capture relevant information. He will then need to institute key processes (e.g. Capital Budgeting) to ensure that the new information systems are used for managerial decision making.
- **Assist the CEO in setting operational targets:** He should assist the CEO in setting financial targets for the COOs of profit/ cost centres and ensuring that these are in line with the overall financial objectives of at least meeting its cost of capital.
- **Assist the IREB in negotiating with the government:** He should assist the IREB in determining the extent of subsidy required.
- **Raise resources for the different divisions:** He should also be responsible for raising resources at the lowest possible cost and for allocating these to the various divisions.

Executive Directors (EDs)–Traffic and Infrastructure

Profile: The EDs should be persons of repute from IR or the private sector. Prior experience in infrastructure restructuring (roads, power etc.) will be desirable. One ED will be associated with each cost centre/ profit centre.

Responsibilities: The EDs will provide an internal review mechanism for the IREB. On the one hand, they will assist the CEO in implementing the restructuring plan. At the same time, they will ensure that the best practices in terms of corporate governance are adopted and that the interests of major stakeholders are protected. Their key responsibilities will be to:

- **Provide support to the CEO:** They should support the CEO in the restructuring effort and act as a sounding board while taking important decisions during the restructuring exercise.
- **Detail the Railway restructuring plan:** They should use their prior knowledge and experience of infrastructure restructuring to help detail the restructuring plan, identify milestones and thereby ensure a timely implementation of the plan.
- **Develop a strategic planning capability:** They should help build a strategic planning capability in the Railways by acting as coaches/ mentors to their respective COOs of the profit/ cost centres.
- **Build support for the restructuring:** They will also need to interact with the Government and other stakeholders (for e.g. employees) to build support for the restructuring effort.
- **Institute best practices for corporate governance.**

STATISTICAL APPENDIX

Exhibit SA.1 : IR's wagon Fleet and Capacity : 1950-51 to 1999-2000

Year	All Gauges		Broad Gauge		Metre Gauge		
	Total Number of Wagon \$ (000)		Total Capacity (Million Tonnes)	Number (000) in Units	Average Capacity (Tonnes)	Number (000) in Units	Average Capacity (Tonnes)
	In Units	In Four-Wheelers					
1950-51	195	208	4.14	149	22.6	43	17.1
1960-61	295	323	6.30	207	23.1	83	18.0
1970-71	368	473	9.35	271	27.8	91	19.1
1980-81	387	532	11.14	299	30.6	83	23.0
1989-90	338	544	11.44	278	36.3	57	22.7
1990-91	335	550	11.50	276	36.9	55	22.9
1991-92	335	564	11.84	278	37.9	54	23.3
1992-93	326	559	11.79	272	38.7	51	24.0
1993-94	301	536	11.32	259	39.7	40	25.0
1994-95	280	510	10.76	246	40.2	33	25.8
1995-96	270	498	10.62	238	41.2	30	25.9
1996-97	261	492	10.64	233	42.4	27	26.7
1997-98	253	490	10.69	227	44.0	25	26.7
1998-99	243	483	10.70	223	45.3	19	29.6
1999-2000	235	480	10.57	219	46.0	15	31.2

Note : \$ Excludes departmental service wagons and brake vans.

Source : Indian Railways Annual Statistical statements and Year book for the relevant years.
(Year Book 1999-2000: page 33; Annual Statistical Statement 1999-2000, page 52-54)

Exhibit SA.2: Traction-Wise Shares in Total Annual Train Kms and Gross Tonne Kilometres

Year	Passenger						Freight							
	Steam		Diesel		Electric		Steam		Diesel		Electric			
	TKMs	GTKMs	TKMs	GTKMs	Loco TKMs	GTKMs	EMU TKMs	TKMs	GTKMs	TKMs	GTKMs	TKMs	GTKMs	
1950-51	93	92.4	-	-	2	2.8	5	4.8	99	98.3	-	-	1	1.7
1960-61	91	91.9	-	-	2	2.7	7	5.4	94	90.5	5	8.1	1	1.4
1970-71	77	74.1	7	10.7	7	8.2	9	7	46	32.2	39	47.7	15	20.1
1980-81	49	41.2	25	33	14	17.2	12	8.6	80	9	62	67	20	24
1990-91	21.8	15.1	42.4	47.1	22.6	29.5	13.2	8.3	3	0.8	60.6	57.8	36.4	41.4
1991-92	19.6	13.4	43.5	46.6	23.6	31.7	13.3	8.3	2.5	0.5	59.6	55.8	37.9	43.7
1992-93	14.7	9.6	45.7	47.7	26.2	34.8	13.4	8.2	1.6	0.4	57.4	52.5	41	47.1
1993-94	8.7	5.4	49.4	49.2	28.4	37.1	13.5	8.3	1	0.2	53.7	49	45.3	50.8
1994-95	3.1	1.7	55.1	52.3	28.5	37.7	13.3	8.3	0.3	0.1	50.4	45.5	49.3	54.4
1995-96	1.3	0.6	57.3	54.1	27.8	37	13.6	8.3	0.1	-	48.5	43.5	51.5	56.5
1996-97	0.6	0.3	57.5	53.8	28.4	37.4	13.5	8.5	0.1	-	47.4	42.7	52.5	57.3
1997-98	0.2	0.1	56.3	52.3	30.4	39.7	13.1	7.9	-	-	45.3	41.5	54.7	58.5
1998-99	0.1	-	56.2	52.1	30.9	40.3	12.8	7.6	-	-	43.7	40.6	56.3	59.4
1999-00	-	-	56.3	52.1	31	40.8	12.7	7.1	-	-	43.2	39.8	56.8	60.2

Note:

All figures in percentage.

Source : Indian Railways Year Book for the relevant years Year Book 1999-00; page No.37

Exhibit SA.3 : Locomotives-Number in service as on 31st March

Year	BG			MG			NG				
	Steam	Diesel	Electric	Total	Steam	Diesel	Electric	Total	Steam	Diesel	Total
1951	5331	17	68	5416	2490	-	4	2494	299	-	299
1961	6301	146	127	6574	3610	27	4	3641	401	8	409
1970	5862	801	532	7195	3448	257	20	3725	390	33	423
1980	4591	1744	954	7289	2918	434	20	3372	347	65	412
1991	1295	2893	1723	5911	1482	731	20	2233	138	135	273
1992	986	3003	1851	5840	1402	750	20	2172	104	152	256
1993	501	3122	1992	5615	1149	788	20	1957	75	159	234
1994	204	3232	2097	5533	649	791	20	1460	58	169	227
1995	24	3321	2282	5627	286	773	20	1079	37	165	202
1996	2	3392	2357	5751	178	757	20	955	29	164	193
1997	2	3492	2507	6001	61	707	20	788	22	164	186
1998	2	3617	2626	6245	41	715	20	776	21	164	185
1999	2	3736	2765	6503	35	684	20	739	21	166	187
2000	0	3813	2790	6603	35	672	20	727	21	166	187

Source : IR's Annual Statistical Statements 1999-2000; Page No. 36 & 38, Page No. 36 & 38.

Exhibit SA. 4 : Average Load Per Train-Broad Gauge

Year	All Traction	
	Total Wagons Per Train (in 4 Wheelers)	Net Freight Weight Per Train (Tonnes)
1950-51	44	489
1955-56	46	537
1960-61	51	656
1965-66	57	725
1970-71	60	737
1975-76	61	782
1980-81	66	884
1985-86	76	1001
1990-91	85	1079
1991-92	88	1119
1992-93	91	1128
1993-94	93	1142
1994-95	96	1100
1995-96	98	1158
1996-97	100	1169
1997-98	103	1175
1998-99	105	1180
1999-00	106	1208

Source : Indian Railways Year Book and Annual Statistical Statements. (Year Book 1999-2000, page 62; Annual Statistical Statement 1999-2000, page 162)

Exhibit SA.5 : Broad Gauge Locomotive Performance-Freight Services

Year	Engine Kilometres Per Day Per engine in use			Net Tonne Kilometres Per goods locomotive in use		
	Steam	Diesel	Electric	Steam	Diesel	Electric
1950-51	150	-	191	44576	-	81579
1955-56	151	87	206	51343	4070	99127
1960-61	155	300	156	60267	191178	89643
1965-66	125	353	327	40907	245398	245104
1970-71	121	347	316	29582	224137	226957
1975-76	114	321	331	25419	207913	231989
1980-81	89	303	274	11718	212502	201472
1985-86	76	416	395	5330	237804	311726
1990-91	59	454	395	3193	208166	317314
1991-92	41	436	395	2191	205924	322775
1992-93	44	426	412	2554	190497	325427
1993-94	30	407	423	932	175532	305250
1994-95	27	413	423	862	174355	323032
1995-96	-	415	422	-	184059	332155
1996-97	-	403	401	-	183438	312738
1997-98	-	400	422	-	185891	337835
1998-99	-	396	444	-	182027	324907
1999-00	-	393	442	-	188093	332090

Source : Indian Railways Year Book for the Relevant Years, Year Book 1999-2000 page 59.

Exhibit SA.6 : Growth in Container Traffic

Year	No. of Containers Handled (TEUs)		
	Domestic	International	Total
1991-92	12495	96782	109277
1992-93	32940	122645	155585
1993-94	48813	188347	237160
1994-95	127017	275615	402632
1995-96	244977	349141	594118
1996-97	278801	424741	703542
1997-98	230238	491481	721719
1998-99	225156	576790	801946
1999-00	238637	664514	903151

Source : Indian Railways Year Book for the relevant Years, Year book 1999-2000, page 97. Break-up obtained from Railway Board.

Exhibit SA.7 : Composition of IR's Wagon Fleet-1999-2000

Category	Number in terms of		% Share in Total	
	Units	Four-Wheelers	Units	Four-Wheelers
Covered Wagons	90730	174623	36.8	36.0
Open High Sided Wagons	93930	230260	38.1	47.4
Open Low Sided Wagons	8216	19374	3.3	4.0
Other Goods Stock	41646	52122	16.9	10.7
Total Wagons for Public Use	234522	476379	95.0	98.1
Departmental Wagons	5958	2718	2.4	0.6
Brake Vans	6304	6304	2.6	1.3
	246784	485401	100.0	100

Source : Annual Statistical Statements 1999-2000, pages 46-54. (Data for BG and MG only)

Exhibit SA.8: Number of Passengers originating**(in Million)**

Year	Suburban		Non-Suburban			Total non-suburban	Grand Total
	(all classes)	Upper Class	Second Class				
			Mail/Exp	Ordy.	Total		
1950-51	412	25	52	795	847	872	1284
1960-61	680	15	96	803	899	914	1594
1970-71	1219	16	155	1041	1196	1212	2431
1980-81	2000	11	260	1342	1602	1613	3613
1990-91	2259	19	357	1223	1580	1599	3858
1991-92	2412	20	371	1246	1617	1637	4049
1992-93	2282	20	332	1115	1447	1467	3749
1993-94	2302	21	314*	1079	1385	1406	3708
1994-95	2430	23	335*	1127	1462	1485	3915
1995-96	2484	27	380*	1127	1507	1534	4018
1996-97	2578	27	403*	1145	1548	1575	4153
1997-98	2657	29	446*	1216	1662	1691	4348
1998-99	2668	30	461*	1252	1713	1743	4411
1999-00	2771	38	445*	1331	1776	1814	4585

* includes sleeper class.

Source : Indian Railways Year Book for the relevant years.

Exhibit SA. 9 : Tractive Effort of IR Locomotive Fleet

Year	Number of Locomotives	Total Tractive Effort(000 Kgs)	Tractive Effort (Kgs) Per Locomotive	
			BG	MG
1950-51	8209	89661	12801	7497
1960-61	10624	129143	14733	8201
1970-71	11158	159143	17303	9607
1980-81	10908	180159	19848	10429
1989-90	8590	171863	23632	12183
1990-91	8417	171810	24088	12438
1991-92	8268	173794	24778	12593
1992-93	7806	174223	26090	13393
1993-94	7220	168396	26366	14500
1994-95	6919	170412	26702	22585
1995-96	6909	175412	27430	16908
1996-97	6975	181186	27600	18186
1997-98	7206	195953	28417	18262
1998-99	7429	200675	28577	18428
1999-00	7517	206135	29002	18455

Source : Indian Railways Year Book and Annual Statistical Statements for the relevant years. Year Book 1999-2000, page 31; Annual Statistical Statement 1999-2000, page 36-38



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