CHAPTER IV

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4.A.1 Transportation In India

Transportation in India is a large and varied sector of the economy. Modes of conveyance for transport of goods in India range from people's heads (on which loads are balanced) and bicycle rickshaws to trucks and railroad cars. The national railroad was the major freight hauler at independence, but road transport in India grew rapidly after 1947. Both rail and road transport remains important.

The share of India's transportation investments in total public investment declined during the period from the early 1950s to the early 1980s; real public transportation investment also declined during much of that period because of the need for funds in the rest of the economy. As a consequence, by the early 1980s the transportation system in India was barely meeting the needs of the nation or preparing for future economic growth. Many roads, for example, were breaking up because of overuse and lack of maintenance; railroads required new track and rolling stock. Ports needed equipment and facilities, particularly for bulk and container cargo; and at many airports the national civil airlines needed supporting equipment, including provision for instrument landings. The government planned to devote 19 percent of the Eighth Five-Year Plan (1992-96) budget to transportation and communications, up from the 16 percent devoted to the sector during the seventh plan.
Although there is a large private-sector involvement in transportation in India, the government plays a large regulatory and developmental role. The central government has ministries to handle civil aviation, railroads, and surface transportation. Counterpart agencies are found at the state and union territory level. Critical to improving the entire transportation sector in the late 1990s is the ability of the sector to adjust to the central government's national reform initiatives, including privatization, deregulation, and reduced subsidies. The sector must also adjust to foreign trade expansion, demographic pressures and increasing urbanization, technological change and obsolescence, energy availability, and environmental and public safety concerns.

4.A.2 Railroads In India

India's railroad system is the government's largest public enterprise. Its route length extends 62,458 kilometers. The railroads of India are the fourth most heavily used system in the world, which suggests the large investment made in rail transportation. In the mid-1990s, the railroad system employed 1.7 million people and carried around 66 percent of India's goods traffic (some 350 million tons in FY 1992) and 40 percent of passenger traffic (3.7 billion passenger journeys in FY 1992).

Indian Railways is administered and managed by the Railway Board, which is subordinate to the Ministry of Railways. The minister of railways is assisted by the minister of state for railways. Indian Railways is Asia's largest railroad system and the second largest state-owned system under a single management in the
world. The 63,122 kilometers of route-length track run in three gauges: narrow gauge (610 and 762 millimeters), meter gauge (1,000 millimeters), and broad gauge (1,676 millimeters). Around 17 percent, or about 11,000 kilometers, of all gauges is electrified, and about 27 percent, or 10,859 kilometers, of the broad-gauge track is electrified. Some 14,600 kilometers are double or multiple tracked. As of FY 1991, there were some 116,000 railroad bridges and some 7,100 railroad stations.

The railroad system is divided into nine zones: central, eastern, northern, northeastern, northeast frontier, southern, south-central, southeastern, and western. As of FY 2001, Indian Railways had 3,336 steam, 3,610 diesel, and 1,644 electric locomotives; 3,444 electric multiple-unit coaches; 37,953 conventional passenger coaches; 6,163 other passenger cars (including luggage and mail cars in which passengers sometimes travel); and 337,562 freight cars of all kinds.

The Eighth Five-Year Plan provided for Rs. 45 trillion investment in railroad development. Priority was to be given to track and roadbed renovation, additional electrification, conversion of high-use meter-gauge lines to broad-gauge track, the replacement of all steam locomotives, and improved signalling and telecommunications. By 1992, however, the funds actually approved by the government were only 80 percent of the eighth plan's amount, and only 42 percent would be covered by the central government budget. Indian Railways was expected to come up with the balance. Thus, in FY 1994, the outlay was set at Rs65.1 billion; Rs11.5 billion was to come from central government revenues,
Rs43.1 billion from internal railroad resources, and Rs10.5 billion from loans. Some of the investment funds, as in the past, were expected from the World Bank. The only way to cover these outlays with such low budgetary support was with drastic increases in fares and rates in passenger service. In FY 1993, Indian Railways made capital expenditures amounting to US$2 billion for items such as new rolling stock, new line construction, track renewal, and electrification.

An example of the scale of new rail line construction is the new broad-gauge high-speed Konkan Railway, a 760-kilometer coastal connection between Bombay and Mangalore featuring fifty-five stations, seventy-three tunnels, 143 major bridges, and some 1,670 minor bridges. The line crosses several mountain ranges and runs some 380 kilometers through an earthquake-prone zone. Besides opening up an all-weather transportation infrastructure between two important cities, it cuts the distance by rail between them by 1,127 circuitous kilometers.

India has a major railroad-equipment production industry. Although some state-of-the-art electrical components and equipment are imported, India is developing sufficient industrial capacity to meet most of its standard locomotive and passenger-car and ancillary equipment needs and has made plans to export locomotives. The Research, Design, and Standards Organisation of Indian Railways engages in research and simulations aimed at further improving the quality of domestic achievements, which have included high-speed passenger trains (up to 140 kilometers per hour) and freight trains (up to 80 kilometers per hour) and solid-state signalling equipment. Because some two-thirds of the
nation's freight is carried by train, there is a serious freight car shortage. To overcome this and other industry-related rail transportation problems, Indian Railways envisions having to import up to 5,000 freight cars a year.

4.A.3 Process Of Railways In India

The railways in India provide the principal mode of transportation for freight and passengers. It brings together people from the farthest corners of the country and makes possible the conduct of business, sightseeing, pilgrimage and education. Indian Railways have been a great integrating force during the last hundred years. It has bound the economic life of the country and helped in accelerating the development of industry and agriculture. From a very modest beginning in 1853, when the first train steamed off from Bombay to Thane, a distance of 34 km, Indian Railways have grown into a vast network of 6,906 stations spread over a route length of 63,122 km with a fleet of 7,681 locomotives, 39,852 passenger service vehicles, 4,904 other coaching vehicles and 2,14760 wagons as on 31 March 2003. The growth of Indian Railways in the 156 years of its existence is thus phenomenal. It has played a vital role in the economic, industrial and social development of the country. The network runs multigauge operations extending over 63,122 route kilometres. The gauge-wise route and track lengths of the system as on 31 March 1999 were as under:
<table>
<thead>
<tr>
<th>Gauge</th>
<th>Route Km</th>
<th>Running track Km</th>
<th>Total track Km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board Gauge (1,676 mm)</td>
<td>44,216</td>
<td>62,184</td>
<td>85,429</td>
</tr>
<tr>
<td>Metre Gauge (1,000 mm)</td>
<td>15,178</td>
<td>15,875</td>
<td>19,158</td>
</tr>
<tr>
<td>Narrow Gauge (762 mm and 610 mm)</td>
<td>3,415</td>
<td>3,452</td>
<td>3,826</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>62,809</strong></td>
<td><strong>81,511</strong></td>
<td><strong>1,08,413</strong></td>
</tr>
</tbody>
</table>

About 22 per cent of the route kilometre, 32 per cent of running track kilometre and 31 per cent of total track kilometre is electrified. The network is divided into nine zones and further sub-divided into divisions. Divisions are the basic operating units. The sixteen zones and their respective headquarters as on 31 March 2004 are given below:

<table>
<thead>
<tr>
<th>Railways</th>
<th>Headquarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>Mumbai</td>
</tr>
<tr>
<td>Eastern</td>
<td>Calcutta</td>
</tr>
<tr>
<td>Northern</td>
<td>New Delhi</td>
</tr>
<tr>
<td>Northern Eastern</td>
<td>Gorakhpur</td>
</tr>
<tr>
<td>Northeast Frontier</td>
<td>Maligaon (Guwahati)</td>
</tr>
<tr>
<td>Southern</td>
<td>Chennai</td>
</tr>
<tr>
<td>South Central</td>
<td>Secunderabad</td>
</tr>
<tr>
<td>South Eastern</td>
<td>Calcutta</td>
</tr>
<tr>
<td>Western</td>
<td>Mumbai</td>
</tr>
<tr>
<td>East coast</td>
<td>Bhubaneshwar</td>
</tr>
<tr>
<td>East Central</td>
<td>Hajipur</td>
</tr>
<tr>
<td>North Central</td>
<td>Allahabad</td>
</tr>
<tr>
<td>North Western</td>
<td>Jaipur</td>
</tr>
<tr>
<td>South Western</td>
<td>Bangalore</td>
</tr>
<tr>
<td>West Central</td>
<td>Jabalpur</td>
</tr>
<tr>
<td>South East Central</td>
<td>Bilaspur</td>
</tr>
</tbody>
</table>

Cooperation between public and railway administration is secured through various committees including Zonal Railway Users’ Consultative Committees and Divisional Railway Users’ Consultative Committees. The rolling stock fleet of
Indian Railways in service as on 31 March 2001 comprised 3336 steam, 3610 diesel and 1,644 electric locomotives totaling 8590 locomotives. Currently, the railways are in the process of inducting new designs of fuel-efficient locomotives of higher horsepower, high-speed coaches and modern bogies for freight traffic. Modern signalling like panel inter-locking, route relay inter-locking, centralised traffic control, automatic signalling and multi-aspect colour light signalling, are being progressively introduced to increase the throughput. Indian Railways have made impressive progress in indigenous production of rolling stock and a variety of other equipment over the years and is now self-sufficient in most of the items.

The main objectives of railways planning have been to develop the transport infrastructure to carry the projected quantum of traffic and meet the developmental needs of the economy. Since the inception of the planned era in 1950-51, Indian Railways have implemented eight Five Year Plans, apart from annual plans in some years. During eight Plans, emphasis was laid on a comprehensive programme of system modernisation. With capacity being stretched to the full, investment in cost-effective technological changes become inescapable in order to meet the ever-increasing demand for rail transport. Along with the major thrust directed towards rehabilitation of assets, technological changes and upgradation of standards were initiated in important areas of track, locomotives, passenger coaches, wagon bogie designs, signalling and telecommunication.
Public Undertakings

There are five undertakings under the administrative control of the Ministry of Railways viz., (i) Rail India Technical and Economic Services Limited (RITES); (ii) Indian Railway Construction Company Limited (IRCON); (iii) Indian Railway Finance Corporation Limited (IRFC); (iv) Container Corporation of India Limited (CONCOR); and (v) Konkan Railway Corporation Limited (KRC). Centre for Railway Information System (CRIS) was set up as a registered society to design and implement various railway computerisation projects.

The Research, Design and Standards Organisation (RDSO) at Lucknow is the R&D wing of Indian Railways. It functions as a consultant to the Indian Railways in technical matters. It also provides consultancy to other organizations connected with railway manufacture and design.

Railway Finance

Since 1924-25 railway finances remain separated from general revenues. They have their own funds and accounts and the Railway Budget is presented separately to Parliament. However, the railways contribute to the general revenue a dividend on the capital invested. Quantum of contribution is reviewed periodically by a Parliamentary Convention Committee.
4.A.4 Progress Of Indian Railways

Rolling Stock

Over the years Indian Railways have made concerted efforts to achieve self-sufficiency in production of rolling stock in the country. Locomotives are built in Chittaranjan Locomotive Works (CLW), Chittaranjan, Diesel Locomotive Works (DLW), Varanasi and BHEL, Bhopal, a public sector company that has developed capability to manufacture electric locomotives for the Indian Railways. In 1998-99, CLW manufactured 165 broad-gauge electric locomotives, DLW produced 161 broad-gauge diesel locomotives (including 4 locos for public sector units). Diesel Component Works (DCW) has been set up by the railways at Patiala for manufacturing and repairs of components of diesel locos and sub-assemblies. The project has attained the rated capacity for manufacture of components for diesel engines, its repairs and rebuilding of diesel locomotives. The bulk of passenger coaches are manufactured in Integral Coach Factory (ICF), Perambur, Chennai and Rail Coach Factory, Kapurthala. Integral Coach Factory (ICF) manufactured 1,057 fully furnished coaches and the new Rail Coach Factory (RCF) set up at Kapurthala produced 1,087 coaches in 1998-99. In addition to ICF and RCF, there are two more units in public sector, viz., M/s Jessops, Calcutta and Bharat Earth Movers Limited (BEMI), Bangalore, which also manufacture coaches and electrical multiple units. A wheel and axle plant has been set up at Bangalore to cut down imports in this field. The plant performed excellently during 1998-99 and helped the railways to save valuable foreign exchange.
Railway production units are striving to develop new products for the Indian Railways. AC 3-Tier coach has been manufactured by RCF, which would make AC travel cheaper and comfortable. Further, production of 5000 HP electric locomotives and fuel-efficient diesel locomotive have also commenced at Chittaranjan Locomotive Works and diesel Locomotive Works respectively. Diesel multiple units for suburban non-electrified routes and mainline electric multiple units for electrified sections have been manufactured by Integral Coach Factory, Chennai.

Passenger Traffic

Passengers originating had risen from 1,284 million in 1950-51 to 4,971 million in 2002-03 and passenger kilometre from 66.52 billion in 1950-51 to 51.50 billion in 2002-02. Despite constraint of resources, the railways have been able to cope with increasing demand of passenger traffic. Railways are the premier mode of passenger transport both for long distance and suburban traffic. During 1998-99, Indian Railways introduced 149 new trains, extended the run of 106 trains and increased the frequency of 48 trains in non-suburban sector. Similarly, in the suburban sector, railways introduced 17 new trains. Besides, 16DMU/Diesel Hauled Push Pull trains, 14 EMU services, eight Main line EMU services and 16 Rail Bus services were also introduced during the year.
Northern Railway entered a proud phase in August 2000 when the Delhi Main Station went down in the Guinness World Records as the largest Route Relay Interlocking System (RRIS) in the World, with 11,000 relays allowing up to 1,122 signalled movements.

Freight Traffic

Rapid progress in industrial and agricultural sectors has generated a higher level of demand for rail transport, particularly in core sectors like coal, iron and steel, ores, petroleum products and essential commodities such as foodgrains, fertilizers, cement, sugar, salt, edible oils, etc. Revenue earning freight traffic increased from 312371 million tones kms in 2000-01 to 353194 million tones kms in 2002-03. Transport effort measured in terms of net tonne kilometres (NTKm) increased from 38 billion in 1950-51 to 281.5 billion in 1998-99. Some of the measures taken for improvement are: (i) line capacity augmentation on certain critical sectors and modernisation of signalling system; (ii) measures such as unit train operation for bulk commodities like coal; (iii) increase in roller-bearing equipped wagons; (iv) increase in trailing loads to 4,500 tonnes; (v) operation ‘UNI-GAUGE’ on Indian Railways; (vi) strengthening the track structure by providing heavier and stronger rails and concrete sleepers; and (vii) production of prototype electric locomotive of 5000 HP for freight operation by Chittaranjan Locomotive Works.
4.A.5 New Marketing Strategy Of Indian Railways

The railways have devised a new marketing strategy following economic reforms, to attract freight traffic, which is now largely going by road transport currently. The main features of this strategy are:

- The Container Corporation of India (CONCOR), a public sector undertaking, will provide door to door services for domestic users, transportation in bulk for small customers and international transport in ISO containers.

- Introduction of trains connecting Tughlakabad with Bombay, Jawaharlal Nehru and Madras ports, for the movement of export containers on scheduled time.

- Leasing out brake van space to customers, so that they can have assured transportation between fixed points.

- Introduction of 'Own Your Wagon Scheme' to invite private sector investment for ownership of railway wagons and thereby supplement the Railway's resources.

- Introduction of long distance parcel services between Bombay and Delhi, Delhi-Mughalsarai and Wadi-Bunder-Shalimar.

- Simplification of rules in key areas like free acceptance of indents, supply of wagons, single window booking systems and faxing of invoices to destinations.
• Rebate on freight for utilization of wagons in the empty flow direction

• Closure of yards to facilitate faster movement.

The Process Of Indian Railways In Transportation

The story of the Indian Railways (IR) is not just a saga of mundane statistics and miles of rolling stock. It is the glorious tale of a pioneering institution that has blazed a trail for nearly a century and a half, making inroads into far-flung territory and providing a means of communication. Indian Railway is one of India's most effective networks that keep together the social, economical, political and cultural fabric of the country intact. Be it cold, mountainous terrain or the long stretches through the Rajasthan desert, Indian Railways cover the vast expanse of the country from north to south, east to west and all in between. More than a hundred years ago, on the 16 April 1853, a red-letter day appeared in the glorious history of the Indian Railways. On the day, the very first railway train in India ran over a stretch of 21 miles from Bombay to Thane. This pioneer railway train consisting of 14 railway carriages carrying about 400 guests, steamed off at 3:30 pm amidst the loud applause of a vast multitude and to the salute of 21 guns. It reached Thane at about 4.45 pm. The guests returned to Bombay at 7 pm on the next day, that is, April 17. On April 18, 1853, Sir Jamsetjee Jeejeebhoy, Second Baronet, reserved the whole train and traveled from Bombay to Thane and back along with some members of his family and friends.

This was the humble beginning of the modern Indian Railway system known today for its extraordinary integration of high administrative efficiency,
technical skill, commercial enterprise and resourcefulness. Today the Indian Railway (IR) is one of the most specialized industries of the world.

**The Indian Railways System**

The IR runs about 11,000 trains, serving 6,906 railway stations and carrying about 1.38 million tons of freight traffic and 13.24 million passengers per day, which is about 1.3 per cent of the total population of the country. For moving this traffic, it deploys about 1.6 million railway employees and maintains 8,590 locomotives, consisting of 3336 steam locomotives, 3,610 diesel locomotives, and 1,644 electric locomotives. These apart, there are 349560 goods wagons, 37,953 conventional coaches, 3,444 electric multiple units (EMU) coaches and rail cars, and 4,904 other coaching vehicles. Today 92% of reservation system of railway ticketing is computerized.
4.A.6 Organization of Indian Railways

The IR is at present the biggest public undertaking of the Government of India, having a capital-at-charge of about Rs.407.09 billion during 2002-03. The executive authority of railway administration vests in the Central Government and the same has been delegated to the Railway Board as per the Indian Railway Act. The present Railway Board consists of a Chairman, financial commissioner, and five other functional members. The chairman is the ex-officio principal secretary to the Government of India in the ministry of railways.

The IR system till recently was divided into nine zones having different territorial jurisdictions that generally vary between 4,000- and 10,000-km route length. The zonal railways take care of the railway business in their areas and are responsible for all management and planning of works. The year of formation of these zonal railways and their route length is given below.

To streamline the working and to improve the efficiency of railways, a proposal to set up six new railway zones was mooted by the railway ministry in 1996. There have been several developments since then and one additional zone at Bilaspur was subsequently added. A final decision to set up these zones has been recently taken. These new zones are the East Coast Railways at Bhubaneswar, East Central Railway at Allahabad, North Western Railway at Jaipur, South Western Railway at Bangalore, West Central Railway at Jabalpur, and Bilaspur zone at Bilaspur. Out of these seven new zones, two zones namely the East Central Railway at Hajipur and North Western Railway at Jaipur have been commissioned on October 2, 2002.
Apart from various zonal railways, IR has six production units for manufacture of locomotives, coaches, diesel components as well as wheels and axles of the rolling stock. In order to provide research and standardization facilities for a technical organization like IR, there is a full-fledged Research, Design and Standard Organisation under the control of the Railway board. The organization is headquartered at Lucknow.

The Railway Board has many undertakings under its control; these provide consultancy and other professional services kin various matters concerning railway technology and other allied technical fields. These are; Rail India Technical and Economic Services Limited (RITES), Indian Railway Construction Company Limited (IRCON), Indian Railway Finance Corporation Limited (IRFC), Container Corporation of India Limited (CONCOR), Konkan Railway Corporation Limited (KRC), Centre for Railway Information System (CRIS), Indian Railway Catering and Tourism Corporation Limited (IRCTC), and Rail Tel Corporation of India Limited (Rail Tel).

The IR has also established the National Rail Museum at Delhi. The museum has a wonderful collection of old steam locomotives, coaches, signalling systems, track and its equipment, and other heritage items apart from a mini rail, Joy Train, to attract children and tourists.
4.A.7 Achievements Of Indian Railways

The numerous achievements of the Indian Railways (IR) in the years since independence, have largely been possible by modernization of its systems and technology upgradation. IR has updated its technology in various fields of railway working – manufacture of electric and diesel locomotives, manufacture of coaches and wagons, signalling and telecommunication techniques, and in modernizing track structure and track maintenance practices. Some of IR’s major achievements are:

(i) **Introduction of Rajdhani and Shatabdi Trains:** Rajdhani express trains were first introduced in 1969. These trains presently run at a speed up to 140 kmph, thus breaking the decades-old speed barrier of 100 kmph. A number of Shatabdi trains and inter-city express trains were subsequently introduced to connect metropolitan towns and State capitals. The facilities provided in these luxury trains are of international standards.

(ii) **Metro Railway:** India’s first underground Metro Railway has been in operation for the last few years in Kolkata. This has provided considerable relief to commuters in the densely populated city. Work on Delhi’s Metro Railway is in progress. About 100 km of Metro lines are to be laid in various phases to streamline the traffic congestion in the Delhi region.
(iii) **Konkan Railway**: the Konkan Railway project consisting of the 760 km-long broad-gauge line from Roha to Mangalore has been completed. The construction of this line has been a big technical feat. This section has 1,998 bridges and 88 tunnels, with the longest tunnel and the tallest viaduct in Asia. This new line has substantially reduced the journey time between Mumbai and Mangalore, Mumbai and Cochin, and Mumbai and Goa. This line is likely to greatly accelerate the socio-economic development of the Konkan region.

(iv) **Electrification of railways**: The first railway line was electrified in 1925. About 24.5 per cent of the total route (15,398 km) has been electrified presently. This has considerably increased the output of the IR system.

(v) **Railway lines in hilly terrain**: IR has succeeded in constructing railway lines in some very difficult hilly terrains. This includes such railway lines as the Kangra Valley Railways.

(vi) **Uni-gauge project**: In a bold decision in 1992, IR decided to get rid of multi-gauge systems in favour of uniform-gauge systems. This is being done by gradually converting railway lines of other gauges to broad gauge in a planned and systematic manner. The adoption of a single, uniform gauge has been undertaken to develop alternative routes, to connect important places with the broad-gauge network, to develop backward regions, and to avoid the problem of transshipment. IR has already converted more than 10,000 km of track to broad gauge in the last 10 years, and further work is in progress.
(vii) **Computerized reservation facility:** The computerized ticket reservation facility has been provided in the last few years at a large number of stations. Presently, this facility is available at about 400 stations, covering about 95 per cent of the total workload. The computerized ticket reservation facility has been a landmark in passenger amenity works and has been greatly appreciated by rail users.

(viii) **Rehabilitation of railway assets:** During the Five Year Plan periods, the Indian Railways has consistently attempted to rehabilitate the over-aged assets, generate adequate transport capacity, increase efficiency by intensive utilisation of assets, and modernize the system to reduce cost and improve reliability.

(ix) **Safety aspects of IR:** In spite of glorious achievements, the IR has definitely some issues that are a cause of concern to railway administration as well as to the rail users and public at large. These are the safety of trains, rehabilitation of over-aged assets such as rolling stock and track as well as their maintenance standards. The recent derailment of the Howrah-New Delhi Rajdhani Express causing loss of human life and property has put a question mark on the reliability of the safety standards of IR, even though investigations are still on to confirm if the mishap was an accident or an act of sabotage.

IR has about 400 train accidents per year giving an average figure of about 0.64 train accidents per 1 million train kilometres. During the last five years, at an average, about 200 persons have lost their lives and 500
persons injured every year. The compensation paid for the loss of human life and property is to the tune of Rs.70 million. Added to this are the loss of assets worth Rs.60 million every year. The causes of these train accidents are mainly human failure (85 per cent), equipment failure (7 per cent), sabotage (4 per cent), and other miscellaneous causes (4 per cent). The railway ministry has recently got a special railway safety fund of Rs.170 billion to speed up the process of renewal of over aged assets and for the execution of other safety enhancement works. Sophisticated state-of-the-art machines such as the Modern Amslar Car for track monitoring, Tie Tampering Machine and Ballast cleaning machine for track maintenance work are being deployed to carry out maintenance works of track/rolling stock as well as monitoring maintenance/rehabilitation works. The use of anti-collision device (ACD) and axle counters will also help in enhancing the safety standards.

A lot of emphasis is being laid on training railway staff including engine drivers and guards connected with train operations. The situation looks quite difficult and IR is striving hard in every possible way to improve the safety of railways.

It is expected that with the introduction of the new railway safety fund and the new innovative methods adopted, IR is likely to come out of the woods and improve the safety standards which has been the main cause of concern to everybody.
In the year 2003, the Indian Railways (IR) completed 150 years of its existence. Since its inception in 1853, IR has grown to emerge as the second largest network in the world today. The principal mode of transport in India, it has successfully adapted to the changing needs of travel and transport in the country. It has also kept up with advancements in technology, and the growing requirements of moving large volumes of passenger and freight traffic.

The First Train in India

The idea of railways in India was first conceived in 1831-32 in the presidency of Madras to improve the transport system in South India. However, due to many technical and administrative problems, this proposal could not get through and the first railway line in South India could be opened only on July 1, 1856, between Veyasarpady and Walajah Road, a distance of about 101.38 km (63 miles), under the banner of Madras Railway Company.

The thought of having a railway line to connect Bombay with Thana/Kalyan and with the Thal and Bhore Ghats first occurred in 1843 to George Clerk, the Chief Engineer of the Bombay Government. On October 31, 1850, the newly formed Great Indian Peninsula Railway Company (GIP) started the work of constructing the Bombay-Kalyan line. On February 18, 1852, the first locomotive was seen shunting near Byculla in Bombay. It was later named "Falkland" after Lord Falkland, Governor of Bombay (1848-53).
The formal inauguration ceremony of the first train in India was, however, performed on April 16, 1853, when 14 railway carriages, carrying about 400 guests, left Bori Bunder amidst the loud applause of a vast multitude and to the salute of 21 guns. The train reached Thana (now Thiane) in about one-and-a-quarter hours, traversing a distance of about 33.79 km (21 miles). The train was hauled by three locomotives named Sultan, Sindh and Sahib. These three locomotives were from a batch of eight locomotives ordered from the Vulcan Foundry by GIP in 1852.

Having made a humble beginning, the IR system has today grown into a giant network with a 63,000-km route length covering vast distances from the Himalayan foothills in the north to Cape Comorin in the south. IR is presently the second largest railway network in the world under unitary management. The first is Russian Railways.

**Milestones Of Indian Railways**

Under the British East India Company's auspices, the Great Indian Peninsula Railway Company (GIPRC) was formed on July 15, 1844. Events moved at a fast pace. On October 31, 1850, the ceremony of turning the first sod for the GIPRC from Bombay to Kalyan was performed. The opening ceremony of the extension to Kalyan took place on May 1, 1854. The railway line from Kalyan to Khopoli was opened on May 12, 1856. It was further extended to Poona on June 14, 1858 when the traffic was opened for public use.
In the eastern part of India, the first passenger train steamed out of Howrah station for Hooghly, a distance of 24 miles, on August 15, 1854. This marked the formation of the East Indian Railway. This was followed by the emergence for the Central Bengal Railway Company. These small beginnings multiplied and by 1880, the IR system had a route mileage of 9,000 miles in India.

The Northeastern Railway also developed rapidly. On October 19, 1875, the train between Hathras Road and Mathura Cantonment was started. By the winter of 1880-81, the Kanpur-Farukhabad line became operational and further east, the Dibrugarh-Dinjan line became operational on August 15, 1882.

In South India, the Madras Railway Company opened the first railway line between Veyasarpaudy and the Walajah Road (Arcot) on July 1, 1856. This 63-mile line was the first section, which eventually joined Madras and the west coast. On March 3, 1859, a length of 119 miles was laid from Allahabad to Kanpur. In 1862, the railway line between Amritsar and Attari was constructed on the Amritsar-Lahore route. Some of the trains started by the British are still in existence. The Frontier Mail is one such train. It was started on September 1, 1928 as a replacement for the Mumbai-Peshawar mail. It became one of the fastest trains in India at that time and its reputation in London was very high.

The Kalka Mail from Howrah to Kalka was introduced with the specific goal of facilitating the annual migration of British officials, their families and their retinue of servants and clerks from the imperial capital at Calcutta to the summer capital in Shimla. From Kalka, there was the remarkable toy train service to
Shimla. Plans for this narrow-gauge train had started as early as 1847, but it was at the intervention of the Viceroy, Lord Curzon, that work actually began. Hence this train service was also known as the Viceroy's Toy Train. In order to prevent any head-on collisions on the single-track sections of this railway service, the Neals Token System has been used ever since the train was inaugurated. The train guards exchange pouches containing small brass discs with staff on the stations en route. The train driver then puts these discs into special machines, which alert the signals ahead of their approach. The Darjeeling toy train, the Matheran toy train from Neral to Matheran, the Nilgiri Blue Mountain Railway are other engineering marvels running on routes designed and built by the British. Trains like the Deccan Queen from Bombay to Secunderabad and the Grand Trunk Express from Delhi to Madras are some other prominent trains initiated by the British.

With the advancement in the railway system, electrifying railway lines began side by side, and it was in 1925, that the first electric train ran over a distance of 16 km from Victoria Terminus to Kurala.

<table>
<thead>
<tr>
<th>Year</th>
<th>Milestones of Indian Railways</th>
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<tbody>
<tr>
<td>1831-33</td>
<td>The idea of having a railway for India is first conceived. A proposal is made for a rail link from Madras to Bangalore to improve the transport system of southern India.</td>
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<tr>
<td>1844</td>
<td>Great Indian Peninsula Railway Company (GIP) and East India Railway Company (EIR) are formed in England. R.M. Stephenson submits his first private proposal for the construction of a rail line in India.</td>
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<tr>
<td>1845-46</td>
<td>Trial survey for a new line from Calcutta to Delhi is carried out.</td>
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<tr>
<td>1850</td>
<td>GIP starts the construction of a railway line from Bombay to Thana.</td>
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<tr>
<td>1853</td>
<td>First railway line from Bombay to Thana (about 38.62 km) is opened for passenger traffic.</td>
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</tbody>
</table>
1854 Railway line between Horah and Hooghly (about 38.62 km) is opened for passenger traffic.

1855 Railway line between Veyasarpady and Waljah Road (about 101.38 km) is opened for traffic under the banner of Madras Railway Company. The first proposal for this rail line was initiated in 1831 but completed only in 1854.

1869-81 Double-decker coaches, with a seating capacity of 190 to 240 passengers, are introduced on Bombay Baroda & Central Indian Railway (BB & CIR). Railway line from Calcutta to Delhi is opened after completing the bridges over the Yamuna River at Allahabad and Delhi.

1870 Lord Mayo recommends metre gauge for Indian railways, in addition to existing broad gauge.

1879 Vacuum brakes are introduced in vehicles.

1881 Darjeeling Himalayan Railway, the first mountain railway in India, is opened.

1882 The guarantee system is reintroduced. The Bengal-Nagpur Railway and Bengal and North Western Railway are incorporated under this system.

1890 The Indian Railway Act is passed.

1891 Latrines are introduced in class III coaches.

1892 Interlocking of route with signals is introduced.

1902 Electric light in carriages is introduced in the Jodhpur State Railway.

1903 Kalka-Shimla line is opened for traffic.

1904 The GIP introduces the first restaurant car with the standard British menu.

1905 The Indian Railway Act is passed.

A three-member Railway Board, consisting of a president and two members, is established.

1920 Acworth Committee is formed to examine the management of railways and the state of their finances.

1922 All-steel multiple coaches are imported from England for electric suburban trains in the Bombay region.

The Railway Board is reconstructed and given wide powers.

1924 The railway finances are separated from general finances.
1925 As a general policy of assuming control over company railways, the government takes over the management of EIR and GIP. The first railway line, consisting of the harbour branch line of GIP, is electrified.

1927 Kalka-Shimla railway introduces petrol engine rail motorcars.

1928 BB & CI Railway electrifies its Bombay suburban section.

1928-29 Kangra Valley Railway is opened, extending from Pathankot to Joginder Nagar.

1930 Deccan Queen, the first vestibule train between Bombay and Poona, is introduced.

1931 Madras suburban section is electrified.

1932 Diesel traction is introduced by Kalka-Shimla Railway on its rail Motorcars.

1936 Air-conditioned coaches are introduced in India.

1937 Burma is separated from India and about 3,200 km of railway lines are taken out from the Indian railways.

1939-42 During World War II, the Indian railways is called upon to release track materials, locomotives, and wagons for construction of lines in the Middle East. This results in the closure of 26 branch lines and the use of railway workshops for the manufacture of defence materials. At the end of the war, there are heavy arrears in renewals and replacement of various assets.

1940 A small number of all-steel broad-gauge coaches are built in the Indian railway workshops.

1942 War Transport Board is formed.

1947 Due to the partition of the country, division of railway lines and assets takes place between India and Pakistan. Out of a total of 65,983.2 route km of rail lines, about 11,265.4 km go to Pakistan.

1948-51 After independence, there are 42 railway systems, including 32 lines owned by ex-Indian States. The Government of India decides to rationalize these railways and put them into groups that are viable and can work efficiently.

Re-grouping of railways is completed and six zones are formed, namely, Central Railway, Eastern Railway, Northern Railway, North Eastern Railway, Southern Railway, and Western Railway.

1953 IR celebrates 100 years of its existence.
1955 The first metre-gauge diesel locomotive is introduced. Motorcar is introduced on the Kalka-Shimla rail line.

1956 The first broad-gauge diesel locomotive is introduced.

1969 The first Rajdhani Express between New Delhi and Howrah is introduced.

1977 The first metre-gauge super fast train, Pink City Express, is introduced between Delhi and Jaipur. The National Rail Museum is opened at Chanakya Puri, New Delhi.

1984 First Metro Railway service is started in Calcutta. It covers a distance of 16.3 km between Dum Dum and Tollygunge.

1986 Computerized ticket reservation system is started in New Delhi.

1988 The Shatabdi Express is introduced, connecting important cities.

1991 The first full-fledged hospital of IR on wheels, the Lifeline Express, or Jeevan Rekha, is flagged off. Apart from other facilities, it also has an operation theatre.

1996 The first satellite telephone service with STC/ISD facilities is introduced in trains.

1998 The 760 km-long Konkan Railway line opens for traffic.

1999 IR and Standard Chartered bank jointly introduce the Rail Credit Card that provides the facility of booking railway tickets on phone.

2002 IR introduces the facility for making ticket reservations on the Internet using credit cards. IR begins celebrations of the 150th year of its existence.

Profile of Indian Railways

- **Largest employer:** Indian Railways employ about 16 lakh people, the largest by a single organization.

- **First railway trains in Asia:**

  **Broad gauge:** 34 km track between Boribunder and Thane was opened to traffic on April 16, 1853.

  **Metre gauge:** The 84-km track between Delhi and Rewari and 12.3-km track (Faruknagar Sait branch) of the Rajputana-Malwa Railway were opened for traffic on February 14, 1873.
Narrow gauge: first line opened in 1862 near Baroda by Gaekwad Baroda State Railway.

- **Only Reck-Railway:** The Nilgiri Railway uses the rack-railway system between Mettupalayam and Udhagamandalam covering a distance of 46 km.

- **First ladies special train:** The first ladies special train ran between Churchgate and Borivili station.

- **Fastest train:** Shatabdi Express touches 140 kmph on New Delhi-Bhopal route. The tracks in this route can withstand speed up to 160 kmph.

- **Slowest train:** Mettupalayam-Udhagamandalam train of the Nilgiri Railway on NG is the slowest, covering 16 km in 7 hours & 25 minutes, at an average speed of 10.42 kmph.

- **Oldest working locomotive:** The Fairy Queen built in 1855 by Kitson, Thompson & Hewitson of UK, is the oldest working locomotive on Indian Railways.

- **Railway station at the highest altitude:** Ghoom station on the Darjeeling Himalayan Railway (gauge: 610 mm) is 2,258 m high.

- **First woman engine driver:** Surekha Bhonsie of Mumbai joined the Indian Railways as trainee assistant driver in 1990 when she was 24.

- **First woman station master:** Rinku Sinha Roy joined the Eastern Railway in Aug 1994 in the Dum Dum Cantt station of the Sealdah-Bangaon section.

- **Railway section with maximum tunnels and bridges:** The Kalka-Simla route has 102 tunnels on one section, which is less than 100 km. It has 809 bridges and 919 curves, which cover about 3% of the length of the track.

- **Longest platform:** The platform at Kharagpur in West Bengal is 833 m (2,733 ft) long.

- **Longest tunnel:** Karbude tunnel on the Konkan Railway connecting Mumbai with Goa is 6.45 km long.

- **Longest railway bridge:** The Dehir-on-Sone railway bridge over the river Sone near Sasaram, Bihar, on the Calcutta-Delhi mainline is 3.06 km (10.052 ft.) long and has 93 spans of 105 ft each. It was opened for traffic on Feb 27, 1900.

- **Tallest viaduct in Asia:** the Panvel Nadi Viaduct on Konkan Railway is 64 m high.
• **Longest passenger train:** The New Delhi-Allahabad Prayag Raj Express with 24 / 26 coaches.

• **Ticket to the millennium:** Fakhruddin Takulla of Mumbai purchased on July 15, 1973 a Rajdhani ticket (No.35582) for January 19, 2000 to witness the golden jubilee celebrations of the Republic Day in 2000.
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