CHAPTER - I
INTRODUCTION
1.1 ORIGIN OF TRANSPORT

The origin of Transport is untraceable to the mankind. ‘Human records are too insufficient to tell us definitely when the idea of transporting goods and services first came into being; — But while the very constitution of man makes him a wanderer; and so transportation, simply, in the sense of movement must be regarded co-terminus with the mankind’. The transport and civilisation have been coexisting for the thousand years and both have progressed in the same breath. ‘From the beginning of history, man has revealed an urge for mobility which is indeed a measure of the progress of the society. The history of this mobility, or transport, is the history of civilisation’.

Infact the stride of a man, towards the modern means of transportation has proceeded in stages and as such it can be traced back to the ancient civilisation. Head-loading and use of animals are ancient methods of transport. ‘Thousands of years ago most of the world’s overland trade was carried by pack-animals without the help of “wheeled vehicles”’. However slow and primitive these methods of transport may seem to us now, it is a reality that human beings and animals are used as means of transport in the same manner as they did when they were beasts of the burden. Moreover, ‘neither vehicles nor roads were highly developed by the early civilisation (e.g. the Sumerians and the Egyptians) because there life was centered on the river valleys and all the heavy transport was by water’. ‘Ancient Egypt was held together
for many centuries by its Nile River and ancient Rome by its magnificent system of highways.

In this context, we do not know when the wheel was invented, and by whom.

It was used by the Sumerians, of Mesopotamia over five thousand years ago, but there is nothing to show that they invented it. Leonardo de Vinci, the great artist and engineer (1452 - 1519) designed a spoke suspension wheel (shown at Fig - 1.1), the first of its kind, but because he did not possess the necessary tools or materials he could not build it.

![The tangent-spoked wheel designed by Leonardo da Vinci.](image)

**FIG - 1.1**


With the passage of time there were improvements not only in the design of the wheel, but also in the quality of road construction and the design of the vehicles. At the close of the 20th century, there has been a tremendous increase in the variety of vehicles and range of their payloads. The progress in the transportation has not been confined to road transport alone. With the invention of the steam locomotive and the adoption of steel rails as exclusive permanent way for them, rail transport became very popular. Equally exciting has been the progress of shipping and aviation.
The Transport being a barometer of social, economic and commercial progress has brought the nations of the world closure to each other. Resultantly the quick exchange of ideas and innovations among the nations has become possibility.

1.2 SIGNIFICANCE OF TRANSPORTATION

The significance of transportation can be best appreciated from the economic, social and political point of view.

(A) Economic Significance of Transportation:

Like the provision of water supply, electricity and telephone services today, transport has been recognised a great public utility service since more than hundred years ago. ‘The collective demand for transport of an organised society with a high standard of living may be exceedingly strong as demands for primary and essential commodities depend upon an efficient system of transport’. Thus the economic significance of transportation can be analysed in five distinct but interconnected roles viz ; (i) Transport and Production, (ii) Transport and Distribution, (iii) Transport and Commerce, (iv) Transport and Prices and lastly (v) Transport and Infrastructural Development.

(B) Social Significance of Transportation:

‘Much of our social and cultural unity is based upon existence of adequate transportation as the society is a blend of many regional and local viewpoints and traditions’. Social significance of transportation can be very well realised when we talk of the effective implementation of Govt. policies and programmes for the benefit of society. To be precise, whenever we think of a welfare programme in the field of literacy and education, medical and health care, housing, water supply and sanitation,
self-employment, poverty alleviation programmes etc., transport naturally comes to play its role. Moreover, 'an outstanding contribution has been made by motor transport. Those possessing cars, motor cycles and bicycles enjoy complete freedom of frequency of movement'. Now the people are able to frequently visit and maintain personal contacts over a wide areas. It has also resulted in promoting mutual understanding and making a strong fabric by knowing the culture and traditions of the people living at distant places. Transport has helped in broadening the outlook of the people of the world.

(C) Political Significance of Transportation:

After knowing the economic and social significance of transport, it is imperative to know the political significance of transport. Whether it is a question of political administration or national unity or national defence, a country cannot be held together without an adequate system of transport. 'Australian built a railroad across the wide desert area of their continent to hold their country together politically'\(^{10}\). 'It promotes homogeneity among the people of a country; and this sense of oneness strengthens political unity'\(^{11}\). Thus interaction among the people help in building up the national character and common code of behavior.

From the viewpoint of national defence, 'Men and Goods Transportation' assumes utmost importance. The ability to transport troops and supplies quickly has an important bearing in the success of war and international political bargaining. Transport is both a weapon and a deterrent. Hence an adequate and efficient transport system is an asset to a nation.
1.3 TRANSPORT RESOURCES OF INDIA

As a matter of fact, physical geography of a country has two distinct implication with relation to transportation. In the first place, it provides the physical and natural resource base upon which the flow of goods and passenger traffic is founded. Secondly, it exercises a decisive influence on making the transport system more efficient and reliable.

Modern development of all the means of transport began simultaneously in India with the commencement of the rule of the Crown. During the first years of the British Raj, the greater part of the Imperial expenditure under the head “Communication” had been spent upon the great trunk lines of roads.

Transport resources of India comprises of men, machines and animals as well. To elaborate further in totality, the transport resources prevailing in India consists of human porters, animals, railways, road transport, inland water transport, coastal shipping through ports and air transport. The railways and road transport taken together tops the list as regards the utilisation of total transport network of the country. Railways and road sector carries more than the 90 per cent of passenger and freight traffic of the country.

Human Porters:

If we talk strictly of transportation work, human porters provide variety of services in India. Whether we are at a railway station, at a tourist place, at place of pilgrimage, at a bus stand, in a agricultural field or in a orchard, human porters are available to render any kind of service and even at an odd hour. Human porters do render valuable service to the society where alternate means of transport are not
available. Most of the time, the porters use to carry goods only. Passenger traffic is
carried in exceptional circumstances. Pilgrims who are unable to walk on foot are
carried in "Palkies". Patients are carried from remote rural areas to the hospital or
roadside by human porters. Usually porters charge more fare to carry human being as
compared to the goods of the same load. With the rapid increase in population, as the
demands of the society has increased, so is the number of human porters. Kumarappa
felt that this increase in the number of human porters is a sure index of the
increasing poverty of the people of this country.

**Animals:**

India possesses 19 per cent of the world animal population. There are many
benefits of the animals. They are a source of milk and milk products to us. They help
in rendering agricultural operations and provide farmyard manure. They are a valuable
source of animal protein and of raw material such as hides and skins. One of the
important task, as per the subject-matter of this study is that they are extensively used
in the field of transportation. Keeping in view the physical geography, vegetation and
climate as natural regions of India, we can see that the camels are more useful in the
like Rajasthan. It can travel 30 miles a day and can easily carry 150 - 200 Kg. of load.
It needs less fodder and water than the other animals. The camel is popularly known
as the desert’s aeroplane. The elephants are in use in the North-Eastern States,
bullock-carts are used in plane regions and we can see the use of horses, mules and
donkeys in almost every State. Thus over short distances, animals are rendering useful
service in carrying passengers and goods traffic.
Railway Transport:

The introduction of railways in India dates back to 16th April, 1953 when the first railway line - 21 miles (32 Km) between Bombay and Thane was opened by the Chief Justice of Bombay. It had 14 coaches and was driven by 3 engines. At the time of independence, effects of partition between India and Pakistan were discernible on the entire railway transport resources of the undivided India. As Srivastava says, workshops were divided on the basis of location and the rolling stock on the basis of mileage-cum-traffic. The following Table - 1.1 is indicative of the division of rolling stock and route mileage between India and Pakistan:

<table>
<thead>
<tr>
<th>Country</th>
<th>Engines</th>
<th>Coaches</th>
<th>Wagons</th>
<th>Route Mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>7,248</td>
<td>20,166</td>
<td>2,10,099</td>
<td>43,083</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1,339</td>
<td>4,280</td>
<td>40,221</td>
<td>6,957.88</td>
</tr>
</tbody>
</table>


From a modest beginning, Indian Railways has grown into Asia’s largest and the second largest system of the world under a single management. With a view to improve the administrative and operational efficiency, the Govt. of India decided to reorganise the entire railway system as per the scheme prepared by Railway Board. Indian Railway System comprises of nine zones which were formed by regrouping 37 railway systems. Regrouping of railways was implemented on April 14, 1951 and by April 14, 1952 resulted into formation of six zones viz; Eastern, Western, Northern, Southern, Central and North-Eastern. With effect from Aug 1, 1955 Eastern Railway Zone was bifurcated into Eastern Railway and the South-Eastern Railway. A new zone North-East Frontier was created as the eighth zone. The creation of South -
Central Zone on Oct 2, 1966 culminated into creation of total nine zones. The first electric train (Deccan Queen) was run from Kalyan to Poona in 1925. Presently, the Indian Railway System consists of an extensive network spread over 62915 Kms - comprising Broad Gauge (40609 Kms), Meter Gauge (18501 Kms) and Narrow Gauge (3794 Kms). The electrified network with 12306 Kms account for 19.6 per cent of the total route kilometerage. The Indian Railway completed gauge conversion of 1351 Kms in 1992-93, 1619 Kms in 1993-94, 1805 Kms in 1994-95 and have set a target of 1000 Kms in 1995-96. Furthermore, the railway employs about 16 lac workers, the largest number for any undertaking in the country and have a fleet of about 9920 locomotives, 38184 coaching vehicles and 4 lac wagons, run 12660 trains a day, operate over 7083 stations everyday and yield an annual revenue of over 10,000 Crore.

As per the Economic - Survey Report, the performance of railway is given in the Table - 1.2 below:

<p>| Table - 1.2 |</p>
<table>
<thead>
<tr>
<th>Performanc of the Railways (1994-95 to 1996-97)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994-95</td>
</tr>
<tr>
<td>Total revenue earning freight traffic</td>
</tr>
<tr>
<td>Net Income kms (billions)</td>
</tr>
<tr>
<td>Net tonne kms per wagon per day (broad gauge)</td>
</tr>
<tr>
<td>Passenger Traffic originating (million)</td>
</tr>
<tr>
<td>Passenger kms (billion)</td>
</tr>
</tbody>
</table>

@ April - November
Fig-1.2
In the light of above estimation, the foremost question arises as how can we cope with the strain on roads on account of ever rising road traffic. The gravity of situation demands a systematic and critical analysis of developmental profile of Road Transport in India, especially the efficiency and sufficiency of goods transportation means. As the same has been chosen as the subject-matter of this study and will be dealt in detail in the subsequent chapters after having an overview of some empirical studies on the road transport sector; therefore the point has been left here without further elaboration.

**Water Transport:**

Water transport of India consists of coastal shipping and inland waterways. To begin with, 'The total Indian-own tonnage in 1946 was 1,00,000 GRT (Gross Registered Tonnage), which rose to 3,62,150 GRT in 1950. In the beginning of 1951 there were 73 ships with a gross registered tonnage of 2,17,202 which were engaged in coastal shipping; and 24 Indian-owned ships (1,73,505 GRT) took part in the overseas trade'. India's long coastline which is 5,560 Kms long has presently eleven major ports which are manager by the Port Trust of India under the jurisdiction of Central Government and 139 operable minor ports under the jurisdiction of the respective State Governments. The major ports on the Eastern Coast are Calcutta, Paradip, Visakhapatnam, Madras and Tuticorin; On the Western Coast are New Mangalore, Mormugao, Jawaharlal Nehru, Mumbai and Kandla. These major ports handle 90 per cent of the All India Throughput. To mention some special characteristics, the Calcutta port is a riverine port. Bombay port is the biggest port
handling approximately 20% of the cargo; Madras being the second biggest port; Kandla is a tidal port and Coachin is a natural harbor.

Trends in traffic at major ports is given in Table - 1.3 below:

### Table - 1.3

#### Trends in Traffic at Major Ports (1994-95 to 1996-97)

<table>
<thead>
<tr>
<th></th>
<th>April-November</th>
<th>Change over Previous Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Million tonnes)</td>
<td>(per cent)</td>
</tr>
<tr>
<td>POL</td>
<td>82.2</td>
<td>91.4</td>
</tr>
<tr>
<td>Iron Ore</td>
<td>34.8</td>
<td>34.5</td>
</tr>
<tr>
<td>Fertiliser &amp; raw Materials</td>
<td>8.5</td>
<td>9.6</td>
</tr>
<tr>
<td>Foodgrains</td>
<td>0.9</td>
<td>2.8</td>
</tr>
<tr>
<td>Coal</td>
<td>29.9</td>
<td>31.1</td>
</tr>
<tr>
<td>Vegetable Oil</td>
<td>0.6</td>
<td>1.5</td>
</tr>
<tr>
<td>Other liquids</td>
<td>4.9</td>
<td>5.2</td>
</tr>
<tr>
<td>Containerised Cargo</td>
<td>15.4</td>
<td>17.6</td>
</tr>
<tr>
<td>Others</td>
<td>20.1</td>
<td>21.6</td>
</tr>
<tr>
<td>Total</td>
<td>197.3</td>
<td>215.3</td>
</tr>
</tbody>
</table>

@ April - November

**Source:** Economic Survey 1996-97, Govt.of India Publication, N.Delhi, P - 177.

Thus it can be seen that during 1995-96, the total cargo handled at major ports was 215.3 million tonnes, registering a growth of 9.1 per cent over 1994-95.

Though the bulk of Indian trade (about 95%) is carried by sea routes, the current capacity at major ports is overstretched. As against a total capacity of 177 million tonnes as on 31.03.1996, the major ports handled 215.3 million tonnes in
1995-96. This has led to pre-berthing delays and delay in cargo-handling. Keeping the above problems in view during the 8th Plan 1992-97, the capacity of the major ports which was proposed to be increased from 169.23 MT to 253.49 MT, was subsequently revised to 215.71 MT. The commodity-wise break-up of the capacity is given in Table - 1.4 below^{20}:-

Table - 1.4

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Commodity</th>
<th>Capacity in million tonnes as on 31.3.92</th>
<th>31.3.95</th>
<th>31.3.97</th>
<th>Original</th>
<th>Revised</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>POL</td>
<td>78.00</td>
<td>78.00</td>
<td>106.15</td>
<td>91.50</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Iron Ore</td>
<td>41.50</td>
<td>41.50</td>
<td>42.50</td>
<td>41.50</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Fertiliser (Raw &amp; Finished)</td>
<td>7.95</td>
<td>7.95</td>
<td>6.60</td>
<td>7.95</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Coal</td>
<td>7.00</td>
<td>8.00</td>
<td>42.00</td>
<td>8.00</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>General Break Bulk Cargo</td>
<td>27.95</td>
<td>29.58</td>
<td>38.91</td>
<td>31.78</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Containers</td>
<td>6.83</td>
<td>8.98</td>
<td>17.33</td>
<td>8.99</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>169.23</td>
<td>174.01</td>
<td>253.49</td>
<td>189.71</td>
</tr>
</tbody>
</table>

Source: Annual Report (1995-96), M. of S.T., Govt. of India, N.Delhi, P - 5.

India has developed a largest merchant shipping fleet among the developing countries and ranks 16th in the world in shipping tonnage. There are 55 shipping companies in the country of which 19 are engaged exclusively in coastal trade, 29 in overseas trade and remaining both in coastal and overseas trade. The Govt. Shipping Company viz. Shipping Corporation of India, which came into existence in October 1961 after the merger of the Eastern Shipping Corporation and the Western Shipping Corporation carries on both. The fleet strength at the end of December 1994 was 438 vessels of 6.3 million GRT^{21}. Furthermore, the fleet strength of Indian vessels (both coastal and overseas) at the end of December 1995 was 471 vessels of 7 million gross registered tonnage (GRT)^{22}. The gross registered tonnage of Shipping Corporation of
India, the largest shipping line in the public sector as on October 31, 1996 was 3.11 Million GRT (about 45 per cent of the total Indian fleet). Further the Hindustan Shipyards Ltd. and the Coachin Shipyards Ltd. are the two major Public Sector Ship building yards in the country.

As regards the Inland waterways, the Indian rivers serve only a limited area and exists in only a few States, though India has about 5200 Kms of major rivers. The Inland Waterways Authority of India was set up on 27th October, 1986 under the Inland Waterways Authority of India Act, 1985 for the regulation and development of inland waterways for the purpose of shipping and navigation.

"The following three have been declared as National Waterways:-"

- Allahabad-Haldia stretch (1620 Kms) of Ganga- Bhagirathi-Hooghly river system since October 1986

- Sadiya-Dhubri stretch (891 Kms) of the Brahm-aputra river system since September 1988.

- Kottapuram-Kollam stretch (168 Kms) of the West Coast Canal along with Champakara Canal (14 Kms) and Udyog Mandal Canal (23 Kms) since 1st February 1993.

Besides this, the Mandovi Zuari and Cumberjua Canal in Goa and the Sunderbans and the Godavari Waterways are being used for transportation. Techno-Economic feasibility studies on New Waterways are being conducted on Kollan Trivandrum stretch of West Coast Canal, East Coast Canal and the Canal system connecting Madras & Kakinada.
As regards the safety measures, the International Safety Management (ISM) code was adopted by the International Maritime Organisation (IMO) in 1993. This code is to come into force in 1998 for passenger ship and tankers and by 2000 for other vessels. The shipping Companies are required to provide special training to on shore staff and crew on board in order to implement this code.

Road Transport:

Besides railways, roads are most important means of getting from one place to another in India. In fact, only a small fraction of our five lac seventy six thousand villages are served directly by railways. It is the roads which ultimately connects the villages in the remote areas with small or big routes and marketing centres of the country.

The total road network of the country is 2.7 million Kms, making it the third largest road network in the world. Half of this is made of unsurfaced roads. The National Highways Network constitutes 34298 Kms which is less than two per cent of the total road network, but carries nearly 40 per cent of the total goods and passenger traffic. It is estimated that road traffic accounts for 80 per cent of passenger traffic and 60 per cent of the goods traffic and will account for 87 and 65 per cent respectively by the year 2000.

Air Transport:

The development of an efficient internal and international air transport network has assumed much importance these days. The geographical importance of India has increased due to favourable situation in the air map of the world, between
the East and the West. The passenger and the cargo traffic is on the increase due to prevalence of age old culture & traditions, festivals, places of historical importance and with the expansion of important industrial, commercial and administrative centres of the country.

The functioning of civil aviation in India is broadly divided into three categories viz - infrastructural, regulatory-cum-developmental and operational. Infrastructural facilities are being provided by the Airports Authority of India (AAI) which came into existence on April 1, 1995 after the merger of International Airports Authority of India and National Airport Authority, as a result of enactment of Airport Authority of India Act 1994. The regulatory and developmental functions are being looked after by the Minister of Civil Aviation and the Directorate General of Civil Aviation.

On the operational front, Air India Ltd. operates its services between India and other countries on International routes. The Indian Airlines Ltd. is a domestic Airline Company and also provides air services to the neighbouring countries like Bangladesh, Nepal, Burma, Afghanistan, Sri Lanka etc. Pawan Hans Helicopters Ltd. provides Helicopter support services primarily to the petroleum sector and it also connects remote and inaccessible areas. With the repealing of the Air Corporation Act, 1953 on March 1st 1994, the monopoly of Indian Air Lines and Air India over scheduled air transport services came to an end. Under the “Open Sky Policy”, the Government has decided to allow private companies to transport cargo into and outside the country. On certain routes and conditions private companies have also been allowed to operate the passenger flights. Presently seven private operators have
been granted the status of scheduled Air Lines and twenty one Air Taxi operators have been given the permit of charter/non-schedule air transport services.

There are five International Airports at Delhi, Mumbai, Calcutta, Chennai and Thiruvanthapuram and more than 80 other small and major airports. There are 815 civil air crafts out of which 450 aircrafts have current certificate of air worthiness.

The passenger and cargo traffic at 256.4 lac and 561582 tonnes during 1995-96 were hire by 12 percent and 14.2 percent respectively than in 1994-95 (27). The number of passengers carried by private operators have increased from 15000 in 1990 to 48.9 lac during 1995. The obvious consequence of creating a competitive environment was that, by March 1996, 41.1 percent of the domestic Air transport was being catered to by private air services. As regards international traffic originating from India, the share of Air India which was 42 percent in 1981, came down to 20.4 percent in 1994 and improved marginally to 22 percent in 1995. Air India's overall load factor of 62 percent is also low as compared to the other international airlines.

Besides carrying passenger and cargo traffic, the planes have also helped in aerial survey, spraying and dropping of foods at the time of natural calamity. For a progressive nation, an efficient and strong network of air transport services is a must. To accomplish such objectives, there must be modernisation of the airports, improvement in the quality of service, upgradation of the facilities at the airports and improvement of air safety measures in the most sophisticated system of transport.
REFERENCES


4. Ibid.


10. Ibid.


17. Ibid.


26. 'Economic Survey 1994-95', Govt. of India Publication, N. Delhi P - 149.