

ECONOMICS OF TRANSPORTATION

UNIT - I

TRANSPORTATION

Meaning of Transport:

The word 'transport' is derived from the Latin word 'transportare' which comprises of two expressions, viz., 'trans' which means 'across'(or the other side') and 'portare' means 'to carry'. In short transport means carrying from one place to another. Very few people actually produce the goods they require and they obtain such goods by giving money in exchange for them. In a wider sense, the term 'transport' includes all the clerical, mental and manual occupations involved in the operation of road, rail, canal, sea and air transport.

Transport or transportation is the movement of people, animals and goods from one location to another. Modes of transport include air, rail, road, water, cable, pipeline and space. The field can be divided into infrastructure, vehicles and operations. Transport is important because it enables trade between people, which is essential for the development of civilizations.

Definition of Transport:

According to K.K. Sexena "the transport system acts with reference to the area it serves in the same way as a candle does in a dark room. It refers to the activity that facilitates physical movement of goods as well as Individuals from location to another."

Classification of Transport:

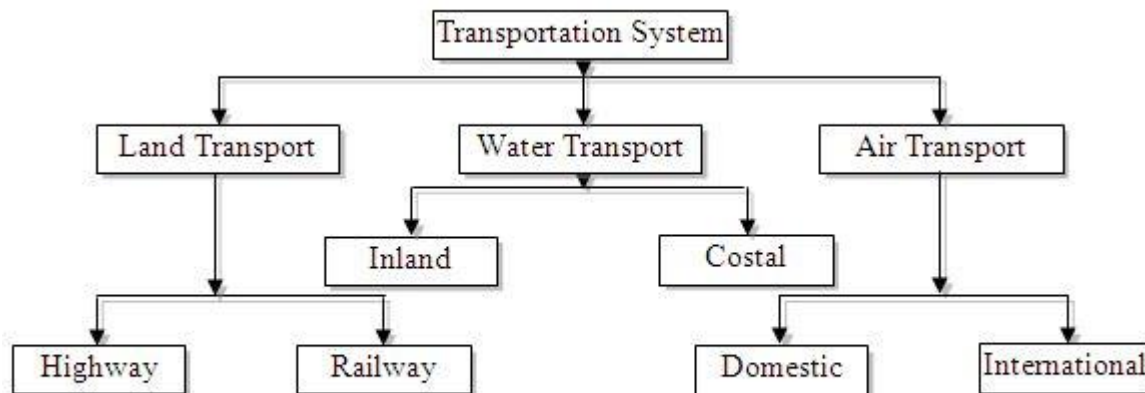


Fig: Classification of transportation system.

The most important means of transportation in a country are roads, railways, water ways and airways. India has completely revolutionized its transportation system, both external and internal.

Land Transport:

Road Transport:

India has a vast network of roads, both metalled and unmetalled. However, this means of transport and communication are still inadequate for our needs. The vehicles that are mainly used on village roads are motorbuses, trucks, and bullock carts. It is the oldest form of transport. It includes various means such as bullock cart, tempo, auto rickshaw, busses, car etc. Before the advent of railways, roads were the only means of communication for the exportation of surplus produce. With the extension of the railway system, it has become more and more necessary to construct roads to feed the railways.

At present, the economic loss caused by the inaccessibility of many agricultural districts in the rainy season is very great. In sandy, hilly, and forest-covered tracts and in other parts of the country, where railways have not penetrated, road transport still holds an important share of long-distance traffic. The opening of railways has created a demand for road-construction, which must be met by the local and provincial bodies. The question of developing the roads is also of vital importance. We cannot expect any significant progress in our rural economy unless there are good road connections between villages and towns.

Rail Transport:

Railways are the most important means of transportation in India. The improvement in railway communications in recent times has played a most important part in the internal development of the country. They have brought the different parts of the country closer. In India railways are owned and managed by the Central Government. The advent of the railway has been of special advantage to the peasantry. Social and political influences from railway construction have been no less.

Water Transport:

Water transport is the oldest and cheapest form of transport. It is one of the most important external and internal means of transport in all the civilized countries of the

world. It is useful for the carriage of bulky and heavy goods. In India, we have many great river systems. However, they are unevenly distributed, some of them are fully utilized for irrigation purposes, and some others are naturally unfit for navigation. India is surrounded by the Bay of Bengal, the Arabian Sea and the Indian Ocean. Therefore it has a long coastline. Water transport refers to movement of goods and passengers on waterways. With the help of these means goods and passengers are carried to different places, both within as well as outside the country.

In India, more navigable rivers and canals should be made. And, a systematic policy for the development of the inland water transport should be pursued. The question of shipping has also great importance in a country like India with a large coastline.

Air Transport:

Air transport is of recent origin in the development of transport system of a country. Air transport provides the fastest practical means of transportation. Indian air transport is one of the fastest developing aviation sectors of the world.

Proper attention must also be given at the same time to air transport as another means of national and international communication. India possesses some natural advantages in this respect and they have to be fully exploited for development of airways.

The Government is taking a keen interest in the expansion of civil aviation not only for its importance as a means of transport but also because of its strategic value in the matter of national defense. There are also a large number of aerodromes in the country.

Other modes:

Pipeline transport: Sends goods through a pipe; most commonly liquid and gases are sent, but pneumatic tubes can also send solid capsules using compressed air. For liquids/gases, any chemically stable liquid or gas can be sent through a pipeline. Short-distance systems exist for sewage, slurry, water and beer, while long-distance networks are used for petroleum and natural gas.

Cable transport: It is a broad mode where vehicles are pulled by cables instead of an internal power source. It is most commonly used at steep gradient. Typical solutions include aerial tramway, elevators, escalator and ski lifts; some of these are also categorized as conveyor transport.

Spaceflight: This transport out of Earth's atmosphere into outer space by means of a spacecraft. While large amounts of research have gone into technology, it is rarely used except to put satellites into orbit, and conduct scientific experiments. However, man has landed on the moon, and probes have been sent to all the planets of the Solar System.

Suborbital spaceflight: It is the fastest of the existing and planned transport systems from a place on Earth to a distant other place on Earth. Faster transport could be achieved through part of a low Earth orbit, or following that trajectory even faster using the propulsion of the rocket to steer it.

Significance of transport:

Transport plays a significant role in the overall economic development. Transportation results into growth of infrastructure, industrialization and massive production. Advancement in the transport sector has resulted into comfort and convenience. Well-functioning transportation systems form the basis for economic prosperity and social well being of societies.

1. Industrial growth:

Transportation and the Industrial development are interrelated. Without improved modes of transportation it would have been harder for the industrial producers to produce and then sell their goods to the wider markets. Transportation facilitates movement of raw material and other requirement from the place of supply to the place of production. Efficient transport is indispensable to the economic development of the nation.

2. Creates employment:

Transport also contributes to economic development through job creation. It creates both direct and indirect employment opportunities. In India, a sizeable portion of the country's working population is directly or indirectly employed in the transport sector. It also facilitates movement of labors and thereby encourages employment resulting into industrial development and thereby economic development.

3. Creates place utility:

Transportation enables movement of commodities from the producer to the final consumer whenever and wherever they are demanded. It creates place utility. Transportation plays an essential role in the agricultural sector. Agricultural requirements

are made available to the farmer at a short span of time. It is an integral part of commerce. It gives place and time utility to goods by removing them from the place of production to the places where they are to be consumed.

4. Bring countries closer:

No country in the world is self-sufficient. They have to depend on one another to fulfil their requirements. Transportation has brought the countries closer. It not only caters to the need of mobility but also provides comfort and convenience. The transport system is doing a great job by easing the pain of covering vast distance of land thereby bringing the countries closer.

5. Serve several purposes:

Transportation provides access to natural resources and promotes trade, allowing a nation to accumulate wealth and power. Transportation also allows the movement of soldiers, equipment, and supplies during war. Hence transportation is vital to a nation's economy as it serve several purposes. It includes the manufacture and distribution of vehicles, the production and distribution of fuel, and the provision of transportation services.

6. Stability in prices:

Goods can be transported to places where there is scarcity and the prices are high from places where there is surplus and the prices are low. Such transfer of goods from the place of surplus to the place of scarcity enables to stabilise the prices of the commodity. Thus stability of prices restricts the local producers to charge prices at their own will. This discourages monopoly and encourages competition.

7. Specialization and division of labour:

Transport increases the mobility of labour and capital, widens the market that leads to specialization and division of labour, which helps in stabilizing prices. Specialization provides employment to a very large number of persons. It is only due to transport that modern industrial system and large-scale industries are in a position to develop. Without efficient transport it would not have been possible to procure raw material, gather large number of workers and distribute the finished goods.

8. Use of Economic resources:

Transportation enables society to enjoy advantages of specializations of resources, and the benefits of labour by making it possible for products to be brought great distance, thus avoiding the necessity for local production for all conceivable commodities of need. It, thus, leads to a better economic use of available resources.

9. Standard of living:

Transportation raises the standard of living, making possible improved housing, clothing, food and recreation.

Meaning of Transportation:

Transportation is the foundation stone of economic infrastructure. It helps in the development of trade, commerce and industry. Transportation removes the hindrance of place and facilitates the movement of goods from producers to consumers. It also helps in removing regional inequalities. Transport system of a country refers to the different means which carry men and material from one place to the other.

Transportation has assumed much importance in developing economy like ours for rapid economic growth. If agriculture and industries are supposed to be the body of the country, transportation may be said to be the nerves and veins of the economy. These days transportation is known as the symbol of civilization.

It has been aptly remarked by Dr. Marshall, “**Most effective economic fact of our times is not the development of manufacturing industries but that of the transport services.**” It is clear that the property of a country does not depend on the development of agriculture, industry and mines alone but also on the development of means of transport.

Modes of Transportation-

The **modes of transport** include various types of factors or methods to transfer the goods or product from one place to another place. The modes are:-

1. Roadways Transportation.
2. Railways Transportation.
3. Water Transportation.
4. Air Transportation.
5. Pipelines Transportation.

1. Roadways Transportation:

A road is an identifiable route way or path between two or more places. This mode of transport helps to transfer the goods from one place to another place by road through various methods like auto, buses, trucks, cargos, and other suitable factors.

In road transport, the chances of an accident are very high and it is also very risky.

Advantages of Road Transport:

- (i) It is very flexible in nature.
- (ii) It helps to facilitate the movement of goods even in remote areas.
- (iii) It provides alternatives in the form of car, rickshaw, auto, cars, bus, trucks, and so on.
- (iv) It is good for transporting perishable products.
- (v) It requires low capital investments.
- (vi) It is very suitable for a short distance journey.

Disadvantages of Road Transport:

- (i) It is not suited for long distance as it is not economical.
- (ii) Slow as compared to railways.
- (iii) Goods can be destroyed/damage due to specks of dust and pollutions.
- (iv) It is time-consuming.
- (v) Accidents and Breakdowns.

2. Railways Transportation:

It is a means of transport in which the goods are transferred from one place to another place and as well as transfers the passenger from one place to another destination. It is preferred due to high speed. Invariance to road transport, where vehicles run on a flat road or surface, rail vehicles are directionally managed by the rail tracks on which they run. Rail transport helps to provide administrative facilities to the government. The public servants and defense forces run their mobility from the railways.

Advantages of Railways Transportation:

- (i) It is economical for long distances because it can easily cover all area of states and cities.
- (ii) This means of transport is very faster than roadways.
- (iii) Most suitable for carrying a bulky amount of goods and products.
- (iv) It provides proper protection from exposure to sun and dust pollutions.

(v) It is the most dependable means of transport.

(vi) It is the very safest means of transport.

(vii) Rail transport helps to provide employment opportunities to both skilled and unskilled individuals.

Disadvantages of Railways Transportation:

(i) Huge capital required for construction maintenance.

(ii) It is not suitable for hilly areas.

(iii) It is not flexible in nature.

(iv) The cost and time of terminal operations are the major disadvantages of rail transport.

(v) Monopoly in nature.

(vi) It consists much time for booking of goods through the comparison of road transport.

3. Water Transportation:

It involves the movement of goods through oceans and seas. There are more than 365 ports in India with Vishakapatnam contributing to maximum portion traffic. It can be categorized into three several categories:-

- Aqueducts, which includes tunnels and canals.
- Containers like tank car, tank ship, and tank truck.
- Towing, it is very useful to pull a large water bag or an iceberg.

In water transport, the weights of goods are very large in comparison to other means of transports. It plays a very crucial role in the development of exports and imports of goods in the different parts of the world.

Advantages of Water Transportation:

(i) It is the very cheapest or easiest means of transportation.

(ii) Goods in bulk are transported.

(iii) It promotes foreign or international trade.

(iv) It can easily carry a huge quantity of goods such as timber and coal.

(v) In comparison to other transport, the risks capacity is very low.

Disadvantages of Water Transportation:

(i) One of the drawbacks is there is a delay in the movement of goods from one place to another.

- (ii) Performance is affected by seasonal variations.
- (iii) It can be used in a limited area of operations because it can only run on seas or oceans.
- (iv) Water transport is very unsuitable for small businesses because it carries a small number of goods.

4. Air Transportation:

The distinct advantage of air transport is speed and suitability. It is very useful for less working goods with a high value of the price. Air transport is also known as **aviation**. The important characteristic of air transport is that does not need a particular surface track for its working operations. It is the fastest **means of transportation**. But the cost of operations is very high according to other modes.

Advantages of Air Transportation:

- (i) Fastest means of transportation.
- (ii) Useful moving the goods in the amount of bulk.
- (iii) Each and every area of accessible.
- (iv) Vital for national security and defense.
- (v) Very useful in earthquakes and other floods.
- (vi) It provides an efficient, regular, and quick service.
- (vii) It is very suitable for emergency services.

Disadvantages of Air Transportation:

- (i) The large capital investment needed.
- (ii) Not suitable for working goods.
- (iii) May be affected by rains.
- (iv) Risks of accidents are highest.
- (v) This mode of transport requires a specialized skill and a high degree of training for its working operations.

5. Pipelines Transportation:

Pipelines transportation is used for sending the liquids and gases from one place to another place. Through this means of transport, we can also send chemicals, biofuels, and natural gases.

Advantages of Pipelines Transportation:

- (i) They are very flexible in transporting liquids and gases.
- (ii) It consumes low energy power.
- (iii) It needs a limited area of maintenance.
- (iv) Pipelines are very safe and accident-free transport.

Disadvantages of Pipelines Transportation:

- (i) It is not flexible in nature.
- (ii) It is restricted in a limited area of work.
- (iii) Difficult to make security arrangements for this transport.

Assessing the impact of political, economic, socio-cultural, environmental and other external influences in the Transport:

The inherent fundamental changes in thinking, practice and delivery of health care required by the NHS Plan (2000) have led managers and professionals to recognise the importance and links between problem solving and decision-making skills. This form of analysis can be undertaken by reviewing the organizational (external) environment using the PEST-analysis (sometimes known as STEP-analysis), extended to the PESTELI.

The earliest known reference to tools and techniques for scanning the business environment ETPS for the four sectors of his taxonomy of the environment: Economic, Technical, Political, and Social. Over the years this has become known as PEST with the additional letters are: Ecological factors, Legislative requirements, and Industry analysis. PESTELI is known as a trends analysis.

Initially the acronym PEST was devised, which stands for:

Political factors - both big and small 'p' political forces and influences that may affect the performance of, or the options open to the organization.

Economic influences - the nature of the competition faced by the organisation or its services, and financial resources available within the economy.

Sociological trends - demographic changes, trends in the way people live, work, and think.

Technological innovations - new approaches to doing new and old things, and tackling new and old problems; these do not necessarily involve technical equipment - they can be novel ways of thinking or of organising.

Expanded PESTELI, also includes:

Ecological factors - definition of the wider ecological system of which the organisation is a part and consideration of how the organisation interacts with it

Legislative requirements - originally included under 'political', relevant legislation now requires a heading of its own.

Industry analysis - a review of the attractiveness of the industry of which the organisation forms a part. To be useful as an analysis tool, these environmental factors have to be linked to the organization's mission: which are helpful or which make it more difficult to accomplish that mission.

COMPARISON OF PEST :

Political	Economic	Socio - Cultural	Technological
Government type and stability.	Stage of business cycle.	Population growth rate and age profile.	Impact of emerging technologies.
Freedom of press, rule of law and levels of bureaucracy and Corruption.	Current and project economic growth, inflation and interest rates.	Population health, education and social mobility, and attitudes.	Impact of Internet, reduction in communications costs and increased remote working
Regulation and de-regulation trends.	Unemployment and labour supply. Labour costs.	Population employment patterns, job market freedom and attitudes to work.	Research and Development activity.
Social and employment legislation.	Levels of disposable income and income distribution.	Press attitudes, public opinion, social attitudes and social Taboos.	Impact of technology transfer.
Tax policy, and trade and tariff controls.	Impact of globalization.	Lifestyle choices and attitudes.	
Environmental and consumer-protection legislation.	Likely impact of echnological or other change on the economy.	Socio-Cultural changes.	
Likely changes in the political environment	Likely changes in the economic environment.		

Advantages and disadvantages of using a PEST analysis:

Advantages:

1. Simple framework.
2. To facilitates an understanding of the wider business environment.
3. It encourages the development of external and strategic thinking.
4. It can enable an organisation to anticipate future business threats and take action to avoid or minimise their impact.
5. It can enable an organisation to spot business opportunities and exploit them fully by taking advantage of change, that much more likely to be successful than if activities oppose it.
6. To Avoid taking action that is doomed to failure from the outset, for reasons beyond your control.

Disadvantages:

1. To be effective this process needs to be undertaken on a regular basis.
2. The best reviews require different people being involved each having a different perspective.
3. To access to quality external data sources, this can be time consuming and costly.
4. The pace of change makes it increasingly difficult to anticipate developments that may affect an organisation in the future.
5. The risk of capturing too much data is that it may make it difficult to see the wood for the trees and lead to paralysis by analysis.
6. The data used in the analysis may be based on assumptions that subsequently prove to be unfounded (good and bad).

Main Problems of Transport Development in India

1. Faulty Planning of Transport System:

The development of transport system is unbalanced. There is heavy pressure on rail and road transport in certain cities and regions. For balanced development of region, alternative routes should be developed e.g. Metro in Delhi has decreased the pressure on road transport.

In metropolitans there is a lack of fast and adequate public transport system. This deficiency leads to explosion of personal transport (own vehicles) which puts extra pressure on roads and cause jams and accidents. On the other hand, hilly and remote areas lack all weather transport facility.

2. Lack of Rail Road Co-ordination:

Rail and Road transport systems are the main means of transportation in a country. These two should work in co-ordination. Generally it is not so e.g. In 1951, the share of road transport in freight traffic and passenger traffic was 11% and 26% respectively. But in present days its share is 60% and 80% respectively.

This growth is undesirable from economic and environmental point of view. In a well planned and co-ordinate way, the railways should be engaged for bulky goods and long distances while road transport should be engaged for small goods and short distances.

3. Worn out and Obsolete Assets:

The main problem of our transport system is its worn out and obsolete assets. In all modes of transport there are old and worn out infrastructure. In railways 25% of the route length and 75 to 80% of machinery in railway workshops have to be replaced. Similarly 80% and above of buses plied by State Road Transport Corporations are out-dated and out modeled. These need immediate replacement. They are main cause of accidents and environmental pollution. In air transport nearly one third of the total fleet requires immediate replacement.

4. Improved technology:

Modernisation and use of latest technology in transport system is the need of hour. In rail and road transport system, we are using age old technology so our progress is slow. Our road construction is of substandard and it increases wear and tear of vehicles and over head expenditure. Our engine design, old signaling system, multi-axle vehicles and worn out tracks are the main problem of railway transport.

UNIT - II

RAILWAY TRANSPORT

It is a means of transport in which the goods are transferred from one place to another place and as well as transfers the passenger from one place to another destination. It is preferred due to high speed. Invariance to road transport, where vehicles run on a flat road or surface, rail vehicles are directionally managed by the rail tracks on which they run. Rail transport helps to provide administrative facilities to the government. The public servants and defense forces run their mobility from the railways. In India railways are owned and managed by the Central Government.

Railways are today the predominant form of-transportation in India. The Indian Railways is among one of largest railway systems in the world. India's railroad system is the government's largest public enterprise. The Indian Railways is state-owned and operated by the Ministry of Railways.

Today, it has completed its glorious 150 years of services for the nation. Indian Railways is one of the largest railways under single management. It is one of the world's largest employers. Indian railways, the largest rail network in Asia and the world's second largest under one management. The railways play a leading role in carrying passengers and cargo across India's vast territory. The Indian Railways have played an integrating role in the social and economic development of the country.



Features of Rail Transport:

- a. It is suitable for bulky goods.
- b. It is economical for long distance.
- c. There is regularity in the operation of train.
- d. There is less pollution, as the train operates on electricity.
- e. There is uniformity in rates as the rates are fixed by the government.

Significance of Indian Railways:

1. Railways provide the cheapest and most convenient mode of passenger transport both for long distance and suburban traffic.

2. Railways have played a significant role in development and growth of industries. Growth of textile industry in Mumbai, jute industry in areas surrounding Kolkata, coal industry in Jharkhand, etc is largely due to the development of railway network in these areas. Railways help in supplying raw materials and other facilities to the factory sites and finished goods to the market.

3. Agriculture also owes its growth to railways to a great extent. Now farmers can sell their agricultural produce to distant places and even sell them in the world market at remunerative prices.

4. Railways are also helpful in removing isolation between cities and countryside and have played a significant role in disseminating innovations and new ideas.

5. Railways are particularly suited to long distance journey and provide a strong medium of national integration.

6. Railways play a vital role in mitigating the sufferings of the people in the event of natural calamities like droughts, floods, famines, earthquakes, etc. This is done by carrying relief and rescue teams and essential items to the affected areas and save people from sufferings and starvation.

7. Railways also help in facing man-made calamities like social, political, religious disturbances, insurgency, etc. It facilitates easy movement of police, troops, defence equipment, etc. The importance of railways to save the country's freedom and integrity from external aggression has been proved at several occasions.

8. Railways carry the British legacy and connect major ports to their hinterlands, thereby lending a helping hand to the overall prosperity of the coastal areas.

9. Introduction of superfast trains and container services in major cities of India have ensured quick movement of men and material.

10. Railways are specially suited to long haulage of bulky materials like coal, petroleum and ores.

Problems of Indian Railways:

Some of the major problems faced by the Indian Railways are briefly discussed as under:

1. Safety:

Indian Railways have been in the news albeit for wrong reasons. With the rapid increase in passenger and goods traffic, the frequency of train accidents is increasing very fast. This has raised serious doubts in the public mind about safety of Rail travel and the general health of the railway network.

2. Cost and Revenue Problems:

Indian Railways face chronic financial crisis. The annual rate of increase in cost has overtaken that of revenues during the last few years. In certain years in between, the revenue growth rate did exceed that of cost. But this position was achieved by providing inadequately for replacements and severely controlling the costs. Such a situation has long term implications as it affects the internal generation of resources. Following are the main causes of costs and revenue problems.

(i) Low level of employee productivity:

Indian Railways face a serious problem of low level of employee productivity. An estimated 30 per cent surplus workforce and operation of a number of lines with low traffic and assets not essential for the Railways are contributory factors. The organisation has been reducing its workforce since 1992-93 by a paltry one per cent annually.

(ii) Staff Wages:

With the implementation of the recommendations of the Fifth Pay Commission, staff wages have increased tremendously and have put heavy strain on the financial resources of

the Railways. With life expectancy going up and wage escalations taking place periodically, the position will only worsen leaving little scope for development plans.

(iii) Increase in lease charges:

Paucity of funds forces the, Indian Railways to resort to market borrowings which results in increased lease charges. Market borrowings started in 1986 and the trend is increasing. At present payout of lease charges constitute about 8.5 per cent of the revenue.

3. Slowdown in Revenue Growth:

With saturation of trunk routes and low quality of services and reliability, the revenue growth has registered a slowdown. The railways are increasingly becoming a transporter of bulk commodities for public sector (coal, iron ore, food-grains, etc.) and are consistently losing to roadways. Most of the national highways run parallel to railways and are consistently snatching revenues from the railways.

4. Social Burden:

Indian Railways have to play a dual role of revenue earning as well as meeting the social obligations. The Expert Group, constituted in study the railway sector, termed it as the 'split personality'. On one hand, the Railways are seen as a commercial organisation and on the other hand, it is treated as a social organisation which must perform its social obligations.

The two functions are diametrically opposite and difficult to reconcile. There are several social obligations on the railways which are always running below cost. Suburban passenger services, concessionary travel to certain section of travellers, concessional freight movement of certain commodities, particularly to remote and inaccessible areas like the North-east region, providing rail services to backward regions are some of the outstanding social obligations on the Indian Railways.

5. Other Problems:

A large number of miscellaneous problems include late running of trains, lack of passenger facilities including cleanliness at the railway stations, lack of security arrangement on the railways resulting in theft and dacoities, etc. Political pressure and interference is a very big problem which the Indian Railways are facing with increasing

impact. Several projects which are not economically viable have been initiated for political considerations.

Advantages of Railways Transportation:

- (i) It is economical for long distances because it can easily cover all area of states and cities.
- (ii) This means of transport is very faster than roadways.
- (iii) Most suitable for carrying a bulky amount of goods and products.
- (iv) It provides proper protection from exposure to sun and dust pollutions.
- (v) It is the most dependable means of transport.
- (vi) It is the very safest means of transport.
- (vii) Rail transport helps to provide employment opportunities to both skilled and unskilled individuals.

Disadvantages of Railways Transportation:

- (i) Huge capital required for construction maintenance.
- (ii) It is not suitable for hilly areas.
- (iii) It is not flexible in nature.
- (iv) The cost and time of terminal operations are the major disadvantages of rail transport.
- (v) Monopoly in nature.
- (vi) It consists much time for booking of goods through the comparison of road transport.

Recent development in Rail Transport:

1. There has been a tremendous development in its financial status, safety, security, projects, technology and moreover its quality service to the people. Initiatives like online ticket booking, computer-based reservation system, IVRS Interactive voice response system, and introduction of smart cards have improved the Indian railways considerably.

2. The Indian Railways, today, provide the principal mode of transportation for freight and passengers in India. It is one of the largest networks in the world with a total of 63,221 km and providing employment to 1.54 million people. Journey by train has become

one of the cheapest and convenient ways of transportation for people of all sections of the society.

3. Indian Railways has seen major technological developments in recent years. These include

- a. Electrification of more tracks,
- b. Development of more efficient locomotives, and
- c. Advancement in terms of passenger amenities including better catering, toilet provisions and security features.
- d. Facilities like Internet access and satellite phone are in the pipeline.

4. Advanced safety features have been incorporated to minimize accidents, while modern coaches have been imported for certain trains. Fast trains like the Shatabdi Express and the Rajdhani Express have made long distance train journey a relatively fast and comfortable.

5. Railways have also been modernized in terms of technology, ticketing, computerization and overall management.

Public Utility

Public utilities are those business undertakings which provide necessary services to the society. The undertakings dealing with the supply of electricity, gas, power, water and transport etc. are all covered under public utility services. All these things are needed in the day-to-day life of the people.

These services are so essential to the public that any interruption in their supply would throw the normal life of the community out of gear. Economic enterprises established to operate such services are known as public utility undertakings. Public utility concerns, therefore, may be defined as undertakings which are **“clothed with public interest.”**

The purpose of making public utilities as monopoly concerns is to serve the consumers in a better way and to provide services at cheap rates. Certain special privileges are also given to these concerns with a view to improve their working.

R.G. Hawtrey defines public utilities as “a service in which a tendency to a local monopoly necessitates, the intervention of a public authority to defend the interest of the consumer.”

Garuham Roper defines a public utility as “any undertaking that meets the needs or inconveniences of a considerable section of the public and that places the undertakings in a position justifying the imposition of the control in return for monopolistic or other special privileges.”

Characteristics of Public Utilities:

(i) Protection of Consumers:

Public utilities are meant for serving the consumers. The supply of services like electricity, water, power, transport should be adequately maintained. Public cannot do without these services. These services should also be provided at reasonable rates. These services being necessities, consumer exploitation is possible. The supply of essential services should not only be at lower prices but they should be constantly maintained.

(ii) Monopoly Position:

Public utility enterprises are given monopoly in a particular area. These undertakings are the outcome of special legislations. These undertakings require large capital investments for want of resources. Small investors cannot enter these fields. The supply of essential services should be maintained regularly. Public utility service can be well maintained when the power to operate in a field is absolute.

(iii) Special Franchise:

Public utility concerns are given special powers and privileges so that regular and satisfactory supply is maintained. Franchise is a charter of special powers, privileges and duties as well. Public utility concerns may acquire and use public property, if necessary. The powers are given in good faith and these concerns should not make misuse of these powers.

(iv) Large Investments:

Public utility concerns require large investments of capital. The investments are more in fixed assets. In case of railways, large amounts are spent on providing railway

lines, purchase of engines and wagons and constructing railway stations. In the same way, electricity concerns require large investment on setting up lines. The expansion of supply of these services reduces cost per unit as no additional investment is required. Cost per unit will go on decreasing with the expansion in service.

(v) Public Regulations:

Public utility undertakings are generally created by special legislation of Parliament and state legislature. Indian Railways are set up under a special act of Parliament. Electricity Boards are set up in different states by state legislatures. Special acts are necessary because certain special powers and privileges are needed to maintain regular and efficient service.

(vi) No Business Risks:

The demand for public utility always remains. So there is no risk on this score. There is no fear of competition because of monopolistic conditions. The demand for these services is both direct and derived. The use of electricity in the house is a direct demand and the use of power for running engines is a derived demand. There is always a possibility of increase in demand. So, public utility undertakings do not suffer from business risks as other undertakings suffer.

(vii) Pricing Policies:

The primary aim of public utility services is to help the society in getting essential services at reasonable prices. The prices are also affected by the nature of demand and laws of returns. These concerns operate under decreasing cost conditions. So, they should charge reasonable prices. The pricing policy of these undertakings is generally guided by the government. Some margin of profit is allowed to maintain efficiency and expansion of these services.

Forms of Public Utility Undertakings:

The form of public utility undertakings depends upon the nature and type of service provided by them. The ownership of these undertakings is always preferred to be in government hands. It ensures regular supply of these services without any discrimination to consumers. It also helps to protect the interests of consumers.

Generally, following forms may be used for these undertakings:

- (i) Public authority.
- (ii) Private company operating under limited monopoly.
- (iii) Joint ownership concerns i.e., Public and Private companies.
- (iv) Public utility trusts.

The preference is always for a form owned and controlled by the government. Under government control, it may be departmental form, a public corporation or a government company.

Privileges and Obligations:

Privileges:

- (i) The entry into public utility services is determined by an Act of Parliament or of a state legislature. It restricts the entry of other persons into that field. Competition in public utilities is not allowed.
- (ii) They have right to use public property like streets, etc. A water supply company may dig a road to lay down its pipes, thus disturbing the traffic.
- (iii) These undertakings are allowed to charge reasonable rates for their services rendered for goods supplied. A fair rate of return is allowed to them.
- (iv) It has the rights of 'eminent domain'. Under this right they can acquire public property for its use on payment of compensation.

Obligations:

- (i) It is the duty of public utility undertakings to provide services to each and every person without any discrimination of caste and creed.
- (ii) The services should be supplied as and when required. Certain rules and regulations should be framed to standardise the use of public utilities.
- (iii) The services should be supplied through safest equipment's.
- (iv) The services should be supplied at reasonable rates so that all sections of society may be able to utilise them.

Problem of Ownership and Control of Public Utility Services:

Public utility services may be under private ownership or may be owned and operated by the public authorities. Since they require heavy capital investments, they

usually take the form of joint stock companies. The privately-owned public utility undertakings tend to earn undue profits at the cost of public welfare.

Though they are governed by statutory rules, the government regulation fails to be completely effective. Therefore, recent tendency is towards government ownership, control and management of these undertakings.

The following reasons have prompted the State ownership of public utilities:

- (i) "Difficulties in effective regulation" can be removed by direct government ownership and management.
- (ii) The "need for co-ordination" can be met more effectively if all these undertakings are under government ownership, management and control.
- (iii) Substitution of profit motive by service motive is practicable only when these undertakings are owned and managed by the government.
- (iv) In a planned economy, the key services which are clothed with public interest should necessarily be in Public or State sector. The Industrial Policy Resolution of 1956 declares that the public utility service will, as far as possible, be under State ownership and management.

Organisation of Public Utility Undertakings:

- (i) Departmental undertakings, i.e., run by a department of Central, State or Local Government.
- (ii) Public corporation created under a special Act passed by the Legislature.
- (iii) Government company registered under the Companies Act.

Railway Finance

Railway system is a very large scale undertaking involves huge investment of capital and labour. Any venture or undertaking will have 'Expenditure' and then 'income'. It can be divided into (a) Capital Expenditure, otherwise called Railway Capital and (b) Railway Working or Operating Expenditure.

(A) Railway Capital Expenditure can be divided into Five heads:

- (i) Preliminary Expenses
- (ii) Expenditure on Land Purchase
- (iii) Expenses on Construction of Railway Building and Tracks

- (iv) Expenses on Purchasing of Rolling Stock and Equipment and
- (v) Expenses on Purchasing Miscellaneous Properties.

(B) Railway Working Expenditure can be divided into Four heads:

- (i) General Charges
- (ii) Maintenance of Way and Works
- (iii) Maintenance of Rolling Stock and
- (IV) Expenses of Conducting Transportation.

Features of Working Expenditure:

- 1) Ratio of working expenditure is very low
- 2) The bulk of the expenditure is incurred on behalf of the traffic as a whole and allocation cannot be separated
- 3) The working expenses are independent of volume of traffic to a large extent and do not move in direct proportion of traffic.

Structure of Administration

Indian railways are managed by the Ministry of Railways in the Central Government, through the Railway Board. The Zones have independent administration of separate entities. Each Zone is divided into several divisions for the purpose of organisation and control.

1. The Railway Ministry:

The entire Railways in India comes under the fold of Railway Ministry of Government of India under the charge of Railway Minister assisted by State Railway Minister. The Railway Minister is responsible for the efficient administration and working of railways and accountable to the Parliament.

2. The Railway Board:

The Railway Board which is guided by the Railway Ministry. The Railway Board is fully authorized to manage the working of railways under the Indian Railway Acts, 1890. Railway Board Act, 1905 and Indian Constitution.

3. Zonal Administration:

The Railways has divided into nine Zones. Each Zone is an independent unit headed by a General Manager who enjoys wide powers in the internal administration of the Zone.

4. Divisional Administration:

Each Zone is divided into 'Divisions' with Divisional Superintendent who will be a miniature General Manager of the Division. He will be the overall charge of the Division with powers to control and manage the Division.

5. The Advisory Committee:

Several Advisory Committees have been set up to advise and guide the railway administration in various fields. They are: (i) National Railway Users' Consultative Council, (ii) Zonal Railway Users' Consultative Committees, (iii) Divisional Railway Users' Consultative Committees, (iv) Miscellaneous Consultative Committees and (v) The Railway Rates Tribunal.

Challenges Faced by Railways:

Railways facing 5 challenges today as we study as follow:

- **Maintenance & reliability:** As more and more passengers use railways, and 24/7 services become increasingly popular, delays and malfunctions on these networks may also increase. Reliable cable protection, as mentioned above, serves to reduce the risk of any damage to cables, and the consequent damages associated.
- **Innovation & new products:** Demand for the railways increases, so too does the demand for new technologies and innovative solutions; maximizing efficiency and security, whilst ensuring trains not only run on time, but they run with grace and speed. Our Research & Development teams are dedicated to innovation; regularly reviewing and updating the applications we're able to offer, as demands change.
- **Associated costs:** Keeping costs down, particularly for the end user, is important for any industry and, although we have no control over many costs associated with the rail industry - such as the rising price of fuel - what we do have control over is keeping any unforeseen damages and malfunctions which may occur due to damaged or broken cables to a minimum, which will in turn lower these costs.
- **Durability:** as demand for freight and passenger trains increases, so too does the physical demand on the railway lines themselves; increasing the need for durable cable protection that can withstand the physical strains of repeated use.

- **Withstanding extreme conditions:** with the possibilities, capacities, and capabilities of the world's railways so often challenged. Extreme and interchangeable conditions call for versatile protection that can easily withstand a multitude of extreme temperatures.

UNIT – IV

ROAD TRANSPORT

It is the oldest form of transport. It includes various means such as bullock cart, tempo, lorries, auto rickshaw, bus, car etc. A road is an identifiable route way or path between two or more places. This mode of transport helps to transfer the goods from one place to another place by road through various methods like auto, buses, trucks, cargos, and other suitable factors. In road transport, the chances of an accident are very high and it is also very risky.

Features of Road Transport:

- a. It facilitates door-to-door service.
- b. Road transport is highly flexible. The route can be changed anytime.
- c. It is economical for short distance.
- d. There are less overheads and less cost in terms of maintenance.
- e. It provides personalized service.

Advantages of Road Transport

- (i) It is very flexible in nature.
- (ii) It helps to facilitate the movement of goods even in remote areas.
- (iii) It is good for transporting perishable products.
- (iv) It requires low capital investments.
- (v) It is very suitable for a short distance journey. Road transports are economical.
- (vi) It is safe. Damage to goods is generally much less in road transport because handling is minimum.
- (vii) It gives access even to the common man.
- (viii) It offers wider coverage. Any domestic or national market can be reached by the mode of road transport.
- (ix) Loading and unloading of goods can be done more quickly.

(x) When compared to all other modes of transport, packing expenses are the lowest in the case of road transport.

Disadvantages of Road Transport

- (i) It is not suited for long distance as it is not economical.
- (ii) Slow as compared to railways.
- (iii) Goods can be destroyed/damage due to specks of dust and pollutions.
- (iv) It is time-consuming.
- (v) Accidents and Breakdowns.
- (vi) The carrying capacity is less.
- (vii) The rates are not standardized.
- (viii) It is not suitable for carrying goods to very long distances, i.e., for foreign destinations.
- (ix) Goods sent by trucks get lesser protection against rain, storm and so on.
- (x) During rainy season, the roads become unsafe and unfit for transportation.

Recent development in Roadway Transport:

India's transport sector is large and diverse. There has lot of development taken place in the transport sector. Modes of transportation comprises of roadways, railways, water ways and airways. The development taken place in various means of transport is:

Roadways in India:

- Road network in India is one of the largest networks in the world. The country's road network consists of Expressways, National Highways, State Highways, Major District Roads, Other District Roads and Village Roads. Roads are the dominant mode of transportation in India.
- They are an indispensable means of communication and has come a long way. It is today regarded as one of the most ideal and cost effective modes of transportation in India. The Indian Roadways play a crucial role in connecting the different parts of India.
- Over the years after independence there has been an extensive development of the network; of roads. Major cities of the States and capital of the state are connected by state highways.

- While District roads are connected with village roads. Village roads provide linkage to other roads in order to meet their daily needs and access to nearby markets. Roads are easily accessible to each individual.
- Roads facilitate movement of both men and materials anywhere within a country. It helps in socio-economic development as well as brings national integration. It provides linkages to other modes of transportation like railways, airways, and shipping, etc.
- The Indian Roadways play a crucial role in connecting the different parts of India. Over the years after independence there has been an extensive development of the network of roads across the length and breadth of India.
- Road network of India is the largest road network in the world. India has an extensive network of major and minor roads as well as a good number of well-maintained networks of national highways, connecting all major cities and tourist destinations.
- The road transport industry in India has emerged as the dominant part of the transport system. The road transport mode in India has come to occupy a pivotal position in the overall transport system in India. This mode is estimated to have a share of about 80% in passenger transport and 60% in freight transport.

A. the National Highways Development Project is a project to, upgrade, rehabilitate and widen major highways in India to a higher standard. The central government is responsible for development and maintenance of the National Highway System.

- The project was implemented in 1998. “National Highways” account for only about 2% of the total length of roads, but carry about 40% of the total traffic across the length and breadth of the country.
- This project is managed by the National Highways authority of India. National Highways Authority of India (NHAI) is authorised (mandate) to implement National Highways Development Project (NHDP), which is
 - i. India’s Largest ever highways project
 - ii. World class roads with uninterrupted traffic flow

- The National Highways have a total length of 70,548 km to serve as the arterial network of the country. The development of National Highways is the responsibility of the Government of India.
- The National Highways Development Project (NHDP) is the largest highway project ever undertaken by the country, is being implemented by the National Highway Authority of India (NHAI). NHDP Phase I & II envisage 4/6 lining of about 14,279 km of National Highways.
- These two phases of NHDP comprise of Golden Quadrilateral (GQ), North-South and East-West Corridors, Port Connectivity and other projects. The Golden Quadrilateral connects the four major cities of Delhi, Mumbai, Chennai and Kolkata. (NS-EW) The North-south & East-West corridor comprising 4 laning of 7,300 km of National Highway connecting North-south corridor from Srinagar to Kanyakumari with East-West corridor from Silchar to Probandar.
- India is the second largest in the world. Indian roads carry about 61% of the freight and 85% of the passenger traffic. All the highways and expressways together constitute about 66,000 kilometers. National Highways Authority of India (NHAI) is the apex Government body for implementing the NHDP.

B. Special Accelerated Road Development Programme (SARD):

- This programme was introduced to improve the road connectivity with state capital, district headquarters and remote places in the North-eastern region. This programme facilitated in connecting 85 district headquarters in the North-eastern states to national highways and state roads.
- The Special Accelerated Road Development Programme for North East (SARDP-NE) envisages widening of 3,251 km of National Highways, improvement including widening of 1,257 km of State roads and two-laning of 1,888 km of general staff roads in the region.

Rates and fares in Road Transport

Cost of Service is in general the determining factor. Competition tends to fix rates and fares for road transport at Such a level that the receipts after all working expenses have been paid and an allowance made for depreciation and afford ordinary profits and a normal return on the capital invested.

Cost of Service or Cost of Production of a commodity or service is a sound principle for fixing prices in any commercial undertaking provided it is possible to assess exactly the cost of production. It gives a solid permanent base to the rate structure.

Factors determining Freight Rates

1. It is determined mainly on principle of cost of service as stated. These are running expenses, standing charges and capital expenses. For calculating annual revenues or expenditure the capital expenses are not taken into account but which should be charged in a particular year in included in the annual expenses.
2. The price range also influenced by the characteristics of the commodities may be classified into variable goods durable goods and fragile goods. Involve more risk or liability will be charged at higher rate.
3. State regulation regarding the rates to be charged the quantum of taxes to be paid for plying the vehicles, cost of obtaining permits, cost involved in endorsement in the permits and compliance of various formalities.
4. Nature and volume of booking, industrial booking on contract basis, possibility of obtaining return load accept will vary between small load containers and full load containers.

Taxation

Motor transport system has greater paying capacity, as they operate on commercial basis. The government felt the need for introducing motor transport taxation. Motor Taxation in our country is imposed in various forms and by different agencies. These can be classified as (i) Central Taxes, (ii) State Taxes and (iii) Local Taxes.

i) Central Taxes:

The Central Government levies customs duties on the imports of motor vehicles, accessories, spare parts and on motor spirits and other goods. It levies excise duty on the production of motor spirit, power alcohol, tyres and tubes in India and Central Sales tax in case on inter – state purchase and sale, Excise duty on petrol and Customs duty on vehicles, parts and accessories.

ii) State Taxes:

Motor vehicles tax is called 'Quarter – Tax' to be paid once in three months. It maybe six-monthly or yearly. The incident of this tax is very high. The rate basis vary from State to State. The passenger vehicles are charged on the basis of seating capacity. While goods vehicles are charged on the basis of unladen weight or laden weight or authorized weight. States levy other incidental taxes, fees, etc. Some States impose 'Passenger Tax' as a percentage of passenger fare. This is collected from the operators in the form of increased fare, Permit Fees, Fees on temporary permits, Driving Licence fees and their renewals are the sources of revenue for the State Government.

iii) Local Taxes:

Local bodies are empowered to collect certain taxes from the road vehicles. Generally, Municipalities levy 'Octroi' duties on all the commodities entering the city or town. Terminal Taxes and tolls are also levied by local bodies. In large cities and towns and also in pilgrim centers, 'Parking Fees' are also levied from the vehicles. Thus, a vehicle operator has to pay central taxes, state taxes and also local taxes.

Problems faced in Road Transport in India

1. Inadequate Roads:

Roads are bad and inadequate in India. There are 34 km long roads per 100 sq. km area in India while in Japan 270 km and in West Germany 167 km long roads per 100 sq. km area are there. Government should spend more on the development of roads.

2. Heavy Taxes:

There is heavy tax burden on motor transport in India. Tax burden per motor vehicle in India is Rs. 3500 while in America it is Rs. 860 and in Britain Rs. 470. This tax burden should be lowered.

3. No proper Maintenance:

Roads are not maintained properly in India. Less than 0.1 percent of the national income is spent on the maintenance of roads in India, while in Japan it is 3 percent of the national income.

4. Lack of Co-ordination:

There is little co-operation and co-ordination among different states with regard to motor transport. As such, motor transport faces lot of difficulties. The states should pursue a co-ordinate policy in this matter.

5. Less Roads in Rural Areas:

Sixty percent of villages are without roads in India. It adversely affects our agriculture and rural economy. Government should develop roads speedily in rural areas.

6. Lack of Guest Houses:

There is lack of guest houses and hotels along the roadside in India. More guest houses should be built along the road sides, so that people may undertake long road journeys easily.

7. Inefficient Management and Services:

According to 'Road Transport Reorganization Committee', 90 per cent of the operators are small operators owning five vehicles or less. Owing to this small number, satisfactory and efficient service is not being provided to the people.

8. Rising Prices of Petrol/Diesel:

Due to high prices of petroleum products and diesel operational costs of road transport are rising and making the mode of transport more costly.

9. Undisciplined Driving and Accidents:

Most of the drivers on the roads are unskilled and untrained. They also drink alcohol while driving. As such, road accidents are more frequent in India.

10. Bad Conditions of Road:

In India, roads are not well-maintained as there are no timely repairs. It causes discomfort and quick depreciation of vehicles.

UNIT - IV

WATER TRANSPORT

India is surrounded by the Bay of Bengal, the Arabian Sea and the Indian Ocean. Therefore it has a long coastline. Water transport refers to movement of goods and passengers on waterways. It plays a very crucial role in the development of exports and imports of goods in the different parts of the world. With the help of these means goods and passengers are carried to different places, both within as well as outside the country.

Shipping transport is the process of moving people, goods, etc. by barge, boat, ship or sailboat over a sea, ocean, lake, canal, river, etc. Shipping plays an important role in the transport sector of India's economy. Indian maritime sector facilitates not only transportation of national and international cargo but also provides a variety of other services such as cargo handling services, shipbuilding and ship repairing, freight forwarding, lighthouse facilities and training of marine personnel, etc.

In recent times, developments and advancements in sea transportation had great impacts on international trade. Shipping is a global industry and is closely tied to the level of economic activity in the world. The demands for shipping activities are rapidly growing. The shipping corporation of India is the biggest Indian shipping company owned by the Government of India.

It involves the movement of goods through oceans and seas. There are more than 365 ports in India with Vishakapatnam contributing to maximum portion traffic. It can be categorized into three several categories:-

- Aqueducts, which includes tunnels and canals.
- Containers like tank car, tank ship, and tank truck.
- Towing, it is very useful to pull a large water bag or an iceberg.

The following are the features of water transport:

- a) Water transport plays an important role in international trade.
- b) It possesses high load carrying capacity.
- c) It is a relatively economical mode of transport for bulky and heavy goods.
- d) Water transport does not require any special infrastructure like roads, and airport.

e) Sea transport requires large investment on ships and their maintenance.



Advantages of Water Transportation:

- (i) It is the very cheapest or easiest means of transportation.
- (ii) Goods in bulk are transported.
- (iii) It promotes foreign or international trade.
- (iv) It can easily carry a huge quantity of goods such as timber and coal.
- (vi) In comparison to other transport, the risks capacity is very low.

Disadvantages of Water Transportation:

- (i) One of the drawbacks is there is a delay in the movement of goods from one place to another.
- (ii) Performance is affected by seasonal variations.
- (iii) It can be used in a limited area of operations because it can only run on seas or oceans.

(iv) Water transport is very unsuitable for small businesses because it carries a small number of goods.

Recent Development in the shipping transport:

1. There are 12 major ports and more than 139 minor and intermediate ports in India.
2. The training of personnel acquired a new dimension with the setting up of a Maritime training institute at Powai, Mumbai. This institute has modern training facilities so as to ensure that the skill and expertise of shipping personnel is at an international level.
3. To improve the efficiency and competitiveness in import services the port sector has been open to private sector also.

PORT AND HARBOUR



Meaning of Port:

A Port is a maritime facility which may comprise one or more wharves where ships may dock to load and discharge passengers and cargo.

Meaning of Harbour:

A Harbour can be defined as a sheltered area of the sea in which vessels could be launched, built or taken for repair; or could seek refuge in time of storm; or provide for loading and unloading of cargo and passengers.

Definition of Port

Port is defined as the place situated at the shore of the sea which connects land with the waterbody. They work as junction points for trading internationally, as in the exchange of modes of transport, goods, etc. These are located in harbours, alongside the coastlines.

Port is nothing but a place for docking, traffic and storage of boats. On the contrary, a harbour is a place for storing boats. Ports are man – made, whereas harbours are both natural and man-made. The basic purpose served by ports is to provide trading facilities goods and cargo, from one country to another. Many times they serve similar purposes relating to administration, development, industry and commerce.

Ports provide a number of facilities that help ships to handle cargo, which includes cranes and forklifts to load or discharge goods, warehouses for storage and docks for ships to attach to. Moreover, various amenities are also available at the port like hotels, restaurants, shipbuilding and repair companies, customs facilities, etc. Right from economy to strategy, ports have a great role to play in every country, as they are used for shipping out consumer goods and also to load troop ship for sailing to war.

Definition of Harbour

Harbour is defined as a parking or storage space along the coastline, where boats, barges and ships can take shelter from bad weather or are kept for future. It is the area alongside the coast, which consists of a thick wall providing protection from the waves and currents to the ships, vessels, and cargo container loaders.

Harbours are so deep to provide safe anchorage to various ships and crafts, but they need not possess onshore facilities. There are two types of the harbour, which are:

- **Natural harbour:** A landform where a portion of ocean or sea is protected and is so deep to allow vessels to take refuge.
- **Artificial harbour:** An arrangement, which is so constructed to perform the functions of a port.

Comparison Chart:

Basis For Comparison	Port	Harbour
Meaning	Port refers to an arrangement, where boats and ships moor and transfer passengers and cargo, to/from land.	Harbour alludes to an area next to the shore, where water crafts are anchored for getting safety from stormy weather.
What is it?	It is a place for docking, traffic and storage of boats.	It is a place for storing boats.
Construction	Man-made	Natural or man-made
Used for	Trading of goods and cargo, between countries.	Seeking shelter from bad weather.
Vessels	It is a safe place for vessels.	It is a haven for vessels.
Onshore facilities	Available	May or may not be available

Difference between Port and Harbour:

1. An area situated at the edge of the water body where boats and ships moor and transfer passengers and cargo, to/from land, is called port. An area next to the shore, where water crafts are anchored for getting safety from stormy weather, is called harbor.
2. Port is nothing but a place for docking, traffic and storage of boats. On the contrary, a harbour is a place for storing boats.
3. Ports are creation of Man, whereas Harbours are either Natural or Man-Made.
4. The basic purpose served by ports are to provide trading facilities goods and cargo, from one country to another. Conversely, harbours are used for taking safe anchorage, if the weather is not fit for sailing.
5. While Ports are a safer place for vessels. As against this, harbours are a haven for vessels.
6. Ports always have onshore facilities like hotels, restaurants, and repair companies and so on. However, in the case of harbours may or may not have onshore facilities.

Shipping Policy

A shipping policy is a concise document or webpage that outlines important information around shipping when an order is placed online. It often includes details on shipping costs and methods, delivery times, and more.

Objectives of Shipping Policy:

- i. To reduce the dependence of external sea borne trade on foreign shipping services;
- ii. To safeguard the imports of essential supplies especially POL, for the national economy;
- iii. To reserve 100% coastal trade for national flag vessels;
- iv. To ensure adequate provision of shipping services to meet the requirements of the national trade;
- v. To improve the balance of payments position through import substitution and export of shipping services; and
- vi. To develop merchant fleet, to act as a second line of defense to protect India's maritime interest and preserve its channels of communication.

Features of Shipping Policy:

In order to promote development of Indian shipping a new shipping policy was initiated in 1990-91 and several policy measures were taken thereafter in that direction for the development of the industry. The salient features of the same are:

- I. Automatic approval is now given for:
 1. Acquisition of all categories of ships, except crude tankers and OSVs, by private shipping companies.
 2. Acquisition of replacement tonnage.
 3. Foreign investment upto 51% for mechanized sailing vessels upto 10,000 dwt.
 4. Approval for other ship acquisition within 45 days.
 5. For sale of ships for further trading/scrapping to Indian company within India or abroad.
 6. For acquisition of ships from an Indian shipyard.

- II. In order to attract foreign mainline vessels Cabotage laws have been relaxed for a period of 5 years for container traffic and lash barges i.e. upto 1997.
- III. Quarterly Block Allocation Scheme (QBAS) for repair of ships has been dispensed with entirely and Reserve Bank of India now release foreign exchange for ship repair / dry docking and spares for imported capital goods without any value limit.

Inland Water Transport

Rivers, lakes, canals, backwaters and reservoirs primarily constitute the source for inland waterways. A stretch of water, not part of the sea, over which craft of a carrying capacity not less than 50 tonnes can navigate when normally loaded is called navigable inland waterway. These proposed waterways will pass through nearly 138 river systems, creeks, estuaries and related canal systems of India.

Advantages of Inland Waterways:

1. Cost savings:
2. Fuel and Energy Efficient:
3. Reduces transportation and transition losses
4. Environment Friendly:
5. Least fuel consumption per tonne-km
6. Carbon dioxide emission is 50% of trucks
7. Negligible land requirement as compared to rail and road transport
8. Supplementary Mode:
9. Reduces pressure on road and rail
10. Reduces congestion and accidents on road
11. Optimal Modal Mix:
12. Better connectivity:
13. Domestic cargo transport, cruise, tourism and passenger traffic.
14. Generation of job opportunities

Disadvantages of Inland Waterways:

1. Inland waterways have low transport speed thus not suitable where time is an important factor

2. It has limited area of operation, depending on the infrastructural premises and depth of the waterways
3. There are only very few cases in which Inland water transport (IWT) can offer door-to-door transport of cargo
4. Operational disruptions due to weather is a major disadvantage.

Problems of Inland Water Transport

1. There is a seasonal fall in water level in rivers especially in the Rain-fed Rivers of the peninsula which become nearly dry during summer.

2. Reduced flow due to diversion of water for irrigation, for instance, in the Ganga which makes it difficult even for steamers to ply.

3. There is reduced navigability due to siltation, as in the Bhagirathi-Hooghly and in the Buckingham Canal.

4. There are problems in smooth navigation because of waterfalls and cataracts, as in Narmada and Tapti.

5. Salinity, especially in the coastal stretches, affects navigation.

India with a extensive network of rivers, canals, lakes has approximately 14500 km of navigable waterways. Along these Major Indian waterways are constructed – NW1: Allahabad–Haldia (Ganges–Bhagirathi–Hooghly river); NW2: Sadiya–Dhubri (River Brahmaputra); NW3: Kollam-Kozhikode (West coast canal); NW4: Kakinada–Pondicherry (River Krishna, R. Godavari). But at present Inland Waterway Transport forms a very diminutive part of total transport system, for the following problems faced by it:

Geographical challenges:

- Increased siltation: Reduced navigability due to siltation, as in the Bhagirathi-Hooghly and in the Buckingham Canal.
- Reduced water flow: Reduced flow due to diversion of water for irrigation, for instance, in the Ganga which makes it difficult even for steamers to ply.
- Geographical constraints: There are problems in smooth navigation because of waterfalls and cataracts, as in Narmada and Tapti.

Technical challenges:

- Inadequate depth: Lack of inadequate depth of waterways for commercial movement of cargo is a major concern. Also quality of water flow is becoming poorer progressively.
- Inadequate air draft: Multiple bridges with low vertical clearance obstructs the passage of bigger vessels. Eg: It is faced in NW3.
- Shortage of IWT vessels: Due to its capital incentive nature India lacks in vessel building
- Lack of terminals: It inhibits door-door connectivity to end users.
- Lack of navigation infrastructure: Rudimentary infrastructure coupled with non-availability of water round the year is an impediment for operation of waterways.
- Shortage of MRO facilities: There is severe shortage of Maintenance, Repair, Overhaul facilities for inland water transport vessels.

Regulatory challenges:

- There is lack of modal integration of and detailed mapping of waterways and industrial clusters and also lack of integration of hinterland coastal shipping with international maritime traffic.
- Lack of level playing policy (waterways were not on the national horizon for planning and connectivity for long time) among different modes of transport.
- Lack of uniformity in legal and administrative issues as inland waterways move through more than one state.

Political challenges:

- Inter-linking of rivers is a major issue, which is yet to materialize.

Financial challenges

- Under investment by the government.
- Private sector participation in MRO is dismal.
- Construction of dams/barrage to increase depth of navigation faces challenges of economic viability.

Prospects:

- Employment potential: As per National Transport development policy committee every Rs 1 lac investment would generate 33.6 person year of employment.
- Environmentally friendly: IWT consumes minimal energy compared to other modes.
- Reduced freight costs: As it is the cheapest mode of transport for cargo. Recently govt is also experimenting with innovations that would allow these barges to be powered with LNG, thus reducing freight cost plus using a cleaner fuel.
- Tourism: IWT could be a great revenue booster for its promising tourism potential.
- Linkage to NE: International protocols provide direct linkage of Haldia and Kolkata ports with landlocked NE.

Issues and Challenges

1. Cost estimation: In respect to operating costs per ton-km, IWT has lower cost than rail and road transport. However, this cost argument is challengeable. There are two factors which distinguish how freight moves on land versus on water:

i) A road travels straight while rivers bend and curve; therefore the difference between freight costs for IWT and road/ railways is not much

ii) Cost of loading and unloading freight

2. Inadequate depth: To be viable for a navigable inland waterway, river needs enough depth throughout the year. However, in their natural state; many Indian rivers simply do not have that level of water which will necessitate extensive dredging.

3. Impact on other activities: Water in rivers has competing demands, including dams and farming. To maintain the water levels in the river to the degree needed for them to function as inland waterways, the water use for such other activities might get curbed.

4. Inadequate Air Draft: Multiple bridges with low vertical clearance obstruct the passage of bigger inland water transport vessels on many inland waterways such as NW 3.

5. Lack of night navigation infrastructure: Rudimentary night navigational facilities and markings are also a major issue.

6. Shortage of IWT vessels: Vessel building is highly capital intensive and faces difficulties in obtaining project finance from banks and financial institutions.

7. Shortage of MRO facilities: There is severe shortage of MRO (Maintenance, Repair and Overhaul) facilities for IWT vessels.

8. Inadequate industries: Inadequate number of Industrial units on the riverside, especially not along the Brahmaputra is a major discouragement hindering development of inland waterways. .

9. Lack of funds: Dredging as well as infrastructure for IWT requires huge investments. However, both public and private funding in the sector is low

10. Environmental Impact:

- Dredging operations will damage river bed, and can lead to change in habitats for various aquatic flora and fauna.
- Dredging may also impact aquifers along the river, damaging the ability of water to percolate underground.
- Construction of jetties, river ports will necessitate removal of trees/ mangrove forests in the area. For example, At Dharamtar port in NW10, for construction of a jetty, the mangrove forest belt on the bank has been removed
- Other environmental concerns include pollution due to oil and diesel from vessels, leakage and spilling of cargo

11. Social impact:

- Ecological impacts can have implications for livelihoods of people dependent on the rivers and creeks. For example: impact on fishing community, people dependent on riverbed cultivation
- Displacement is another major concern as land is needed for number of facilities like ports, jetties, and other infrastructure.

UNIT - V

AIR TRANSPORT

Air transport is of recent origin in the development of transport system of a country. Air transport provides the fastest practical means of transportation. Indian air transport is one of the fastest developing aviation sectors of the world. Air transport is the most modern and the quickest mode of transport. Because of its speed travel by air is becoming popular. It not only saves time but, also reduces the tiredness involve in covering long distance. It is not a feasible means of transportation for all because of the inflated fares.

However, it is considered to be the fastest and easiest means of transportation. It operates to 57 domestic stations and 17 international stations. Some of the leading domestic private airlines are Air Sahara, Jet Airways and Air Deccan etc. The distinct advantage of air transport is speed and suitability. It is very useful for less working goods with a high value of the price. Air transport is also known as aviation. The important characteristic of air transport is that does not need a particular surface track for its working operations. It is the fastest means of transportation. But the cost of operations is very high according to other modes.



Features of Air Transport:

- a) Air transport is the most modern and the quickest mode of transport.
- b) Air transport is very expensive, as the operating costs of aeroplanes are high.
- c) Air transport provides comfortable, efficient and quick transport service
- d) Air transport requires less investment on infrastructure.
- e) Air transport is free from physical barriers.
- f) It plays a significant role in the national defence of the country.
- g) Air transport is the most risky form of transport because the chances of accidents are greater in comparison to other modes of transport.

Advantages of Air Transportation:

- (i) Fastest means of transportation.
- (ii) Useful moving the goods in the amount of bulk.
- (iii) Each and every area of accessible.
- (iv) Vital for national security and defense.
- (v) Very useful in earthquakes and other floods.
- (vi) It provides an efficient, regular, and quick service.
- (vii) It is very suitable for emergency services.

Disadvantages of Air Transportation:

- (i) The large capital investment needed.
- (ii) Not suitable for working goods.
- (iii) May be affected by rains.
- (iv) Risks of accidents are highest.
- (v) This mode of transport requires a specialized skill and a high degree of training for its working operations.

Recent Development in the Air Transport:

Indian aviation industry has shown a tremendous growth in the post- liberalised era. The following are the development in the aviation industry

1. The development of airports is no longer solely under the public sector; instead private participation is allowed and encouraged. New International airports are to be set up in Bangalore, Hyderabad and Goa with the help of the private sector.

2. The Indian aviation industry is one of the fastest-growing aviation industries in the world. The Government has adopted a liberal civil aviation policy with a view to improve domestic services.

3. Along with travel agent, Internet is now evolving as an important medium for ticket booking.

Air Freight and Charges:

Beyond the air freight, which is calculated based on the cost above, the air freight price will also likely include:

- a. Fuel surcharges
- b. Security surcharges
- c. Container freight station/terminal handling charges
- d. Airport transfers

In addition, for door-to-door costs, the price will also include air cargo services, including:

1. Customs brokerage
2. Pickup and delivery
3. Cargo insurance
4. Accessorial charges

Problems Faced By Air Transport:

1. High Costs:

Air transport in India is becoming very costly day by day with rising operational costs.

2. Non Co-operation of Staff::

Indian airlines are facing problems due to non-cooperation of the staff, such as, strikes by pilots, etc.

3. Outdated Planes:

Aviation technology is changing very fast. But our planes are outdated and not very safe. Consequently Indian airlines find it difficult to compete with the world airlines.

4. Huge Investments:

Creation of aviation facilities requires huge investments. The Government is least capable of increasing the number of planes and airports in the country. The private sector has its own limitations.

5. Inadequate Training Facilities:

There are no adequate facilities to train a large number of pilots in the country. On privatization of airlines we are again facing the problem of sufficient trained staff.

6. Maximization of Risks:

In air transport, risks are increasing day by day due to crime and terrorism, violence, hijacking, etc. all over the world.

Transport Co-ordination

Transport coordination helps in overall economy development. There should be cooperation in providing facilities for an easy transshipment of passengers and goods between areas served by different modes of transport. It is very essential in developing countries so as to fulfill the utilization of scarce resources. Unwanted competition among other form of transport can be eliminated through transport coordination – railway and road transport, shipping and airways. The competition is the main hindrance of transport sector growth. The governments in all developing countries are seriously engaged in seeking proper policy of coordination among various modes of transportation. Transport coordination helps in overall economy development.

The objective of transport coordination is the combined use of a nation's transport resources and potential in such a way as to obtain the maximum benefits from each form of transport, based on the inherent advantages of each as reflected in operating costs and standards of service.

The guiding principles in formulation of transport coordination policy in a developing country should be the following:

There should be cooperation in providing facilities for an easy transshipment of passengers and goods between areas served by different modes of transport.

Each form of transport should be used with its most suitable spheres, where it can function efficiently and economically.

A sort of balance in provision of transport facilities should be maintained. In other words, there should not be an over supply of transport facilities in some areas accompanied by an inadequate supply in other areas.

There should be controlled coexistence, where there is more than one kind of transport, to avoid mutually wasteful competition.

In the developing countries, there is scope for joint road rail, rail river and road river services, whose benefits include thorough booking facilities and joint handling arrangement. Transport coordination is difficult in few countries which restrict the economy growth. The proper planning will help in developing a new transport system with coordinating with old transport system.

The coordination of transport was a live topic 30 or so years ago when concern was shown at railway losses and their bad effects on the economy of the country. More recently, when much greater losses have been accepted with apparent equanimity, there seemed less interest in the problem. The subject was revived, if only temporarily, by evidence tended to the Royal Commission of Inquiry (1961) on the State Services in New Zealand. This evidence showed differing views on the implications of transport coordination, and at least one witness suggested seriously that coordination was part of the apparatus of the totalitarian State.

Coordination implies that each of the various forms of transportation has some sphere of usefulness in which it is most efficient. Thus new forms of transport have attracted business from the older and less efficient forms. Horse-drawn transport was partly replaced by the railway and, later, by the motor vehicle; the railway, too, has been partly replaced by the motor vehicle. Air transport presents an ever-growing challenge. The growth of the newer forms means that the old ones have been left with surplus capacity. Successive Governments have considered it wise to ensure that the older forms, in which public money is invested, are given legislative protection. The problem is to decide what are to be the spheres of operation of each form, and so to develop an efficient national transport system with a minimum reliance upon the country's resources.

Competition in Transportation

Reductions in dividend rates during the first quarter of 1931 by leading railway systems whose stocks are widely distributed have brought sharply to public attention the effects of eighteen months of declining revenues upon the financial condition of American railroads.¹ The temporary effects of the general business depression have tended, however, to obscure the more permanent effects of the “new competition” which has developed during the last decade and is now held in some quarters to threaten the preeminence of the railroads in the field of transportation.

During recent years the railroads have had to face intensified competition from several quarters. The automobile and motor truck have made heavy inroads upon railway passenger and freight traffic. Inland waterways have entered a period of renaissance, aided by large governmental appropriations for rivers and canals and by direct subsidies to the government-owned barge line on the Mississippi and Warrior rivers. Pipe line systems are growing in extent. The production of electricity at the mine mouth and waterfall and its extensive transmission by high-power lines is displacing steam-generated power and the movement of coal by rail. And the airways have also entered the field.

Rail – Road Competition and Co-ordination in India

Rail-Road Competition:

In India, Railways is facing increasing competition from road transports. As for example, the share of road transport in respect of freight has increased from 11 per cent in 1950-51 to 58 per cent in 1985-86 and then declined to 40 per cent in 1992. But the share of railways in respect of freight has come down from 89 per cent in 1950-51 to 42 per cent in 1985-86 and then again increased to 60 per cent in 1992. Same is also the case in respect of passenger traffic. Thus through evil competition road transport in India is expanding its network over railway transport. Although such competition has enhanced the level of efficiency and productivity but it has also generated various problems in the transportation system.

Causes of Rail-Road Competition:

Factors which are mostly responsible for growing rail-road competition include:

- (a) Flexibility of time table of road transport as compared to railways;
- (b) Facilitating door to door service by road transport which the railways could not provide;
- (c) Time consuming system of booking and other formalities in railway which the road transport system are not adopting;
- (d) Higher operational cost of railways due to increasing expenditure on overheads as compared to lower operational cost of road transport;
- (e) Increasing involvement of railways in social welfare programmes leading to higher overhead cost as compared to lower overhead cost of road transportation; and
- (f) Increasing facility of route changing both for passenger and freight traffic under road transport as compared to railways.

Need for Rail-Road Co-ordination:

- (a) Huge investment in the fixed assets of railways should be utilised optimally for gaining maximum return;
- (b) Lack of proper co-ordination between road and rail transport leads to the establishment of dual system of competitive transportation leading to huge wastage;
- (c) Rail-road co-ordination is an important prerequisite for all-round development of the country; and
- (d) Rail-road co-ordination is very important for the development of new projects such as construction of river bridges, new railway lines etc.

Measures Adopted for Proper Rail-Road Co-ordination:

In order to attain proper rail-road co-ordination the Government has instituted various committees like:

- (a) Mitchel Kirkness Committee, 1932,
- (b) Rail-road conference, 1933,
- (c) Central Transport Advisory Conference, 1935,
- (d) Wedgewood Committee, 1939,
- (e) Road Transport Enquiry Committee, 1959 for avoiding rail-road, evil competition and to have a better understanding between these two modes of transport.

Committee on Transport Policy and Co-ordination was set up in 1959 which suggested the following recommendations:

1. National Policy:

The committee suggested to enforce a national policy for the development of transportation so as to meet the growing transport needs of the country.

2. Appropriate Co-ordination:

Appropriate standards for co-ordination be developed for sharing the traffic between road and rail transport and also to reduce the competition.

3. Co-ordinated Development of different modes:

Different modes of transport should be made complementary rather than to make them competitive and a rational proportion be maintained for all modes of transport.

4. Transport Co-ordination Council:

Steps should be taken to establish a transport co-ordination council for establishing co-ordination between rail and road transport.

5. Documentation:

Steps should be taken for maintaining statistical record of different modes of transport. Such documentation would help in the formulation of required transport policies of the country. Thus there is an urgent need to develop two modes of transport simultaneously so as to have coordination between the two. There should therefore be balanced growth of both these two modes of transport.

Transport Policy

Transport Policy is an international refereed journal aimed at improving quality of transport policy and strategy analysis, designing and sharing innovative policy and management practices, and application bridging the gap between theory and practice in transport. Its subject areas reflect the concerns of policymakers in government, management strategists in industry, and the public at large, providing independent, original and rigorous analysis to understand how policy and strategy decisions have been made, monitor their effects, and suggest how they may be improved.

The transport sector including all modes: air, maritime, urban, intercity, domestic and international transport economics, policy and strategy issues, etc. Policy and strategy

concerns in transport are wide and cover safety, efficiency, economic development, infrastructure, environment, energy, land-use, equity and access. Papers are expected to have clear policy and strategy relevance, to analyze/evaluate transport policies and strategies using up-to-date research methods (both quantitative and qualitative).

ECONOMICS OF TRANSPORTATION (16ANMEEC2)

SYLLABUS

Module I : Meaning and Classification of Transport - Land -Water- Air and other modes of transports - Economic, Political, Social, Cultural Significances and drawbacks.

Module II : Railways – Features- Monopoly- Public Utility-Large Scale Operation- Railway Development in Five Year Plans - Route Length – Goods Traffic – Productivity – Railway Finance- Administration- Railway Research – Training of Staff Consultancy- Rates and Fares- Administrative Control – Problems of railways.

Module III : Road Transport Road Transport- Roads – Vehicles – Significance- Characteristics- Competition – Monopoly – Nationalisation- Road Development during Plans- Road Finance – Regulation – Taxation – Current problems of motor transport.

Module IV : Water Transport Water Transport- Advantages- Limitations- Problems and Prospects – Features of Shipping policy- Competition- Ports and Harbors- Current Problems- Inland water transport.

Module V : Air Transportation Air Transportation - Nature and Significance- Revenue and Expenditure- Rates and Fares - Competition and Monopoly - State Regulation- Recent developments – Transport Policy- Transport competition and Coordination - Methods of Coordination- Coordination in India.

Reference: 1. Sankaran, S.(2010), Indian Economy, Margham Publications, Chennai.