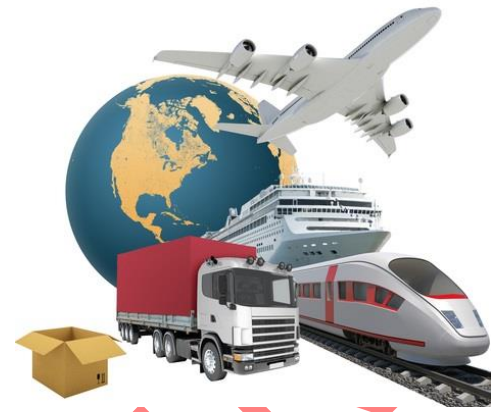


Transport is movement of human, animal and goods from one location to another. Transport system is like arteries and veins in the human body.



IMPORTANCE OF TRANSPORT:

- 1) It helps in better utilisation of resources.
- 2) It helps in process of industrialization and urbanisation.
- 3) Removes scarcity of good during any crisis.

ROADWAYS:

Sher Shah Suri built the famous **Grand Trunk (GT)** road to strengthen and consolidate his empire. This road connected Kolkata and Peshawar.

According to National Highways Authority of India (NHAI), India has a huge network of roads, making it the second largest road network in the world. 40 per cent of the villages in India still lack access to all weather roads and remain isolated during the monsoon season.



CATEGORY OF ROADS:

NATIONAL HIGHWAYS - The main highway running through the length & breadth of country connecting major cities. It is constructed & maintained by Central Government. Longest NH is NH7 (7700 km). The NHAI was set up in 1988. It is responsible for development, maintenance and management of NH.



Expressways

Expressways are highways planned for high-speed traffic, having few intersections, limited points of access or exit and a divider between lanes for traffic moving in opposite directions. They usually have six to eight lanes.

Difference between a Highway and Expressway is the access control.

- (a) In expressways, roads are not multiples. There is a controlled access where a vehicle can enter through a limited place and no further. But in the case of highways, multiple roads merge with or cross the highways at many places.
- (b) Expressways have several facilities like access ramps, lane dividers, telephone booths, CCTV cameras and mobile radars.

Some Expressways are:

1. Agra - Lucknow Expressway-3.5 hrs
2. Yamuna Expressway-Greater Noida to Agra in 2012
3. Ahmedabad-Vadodara Expressway- India first 4 lane, 1 hr , 2001
4. Delhi - Gurgaon Expressway- Gurgaon to Delhi, 2008
5. Mumbai Pune Expressway- India's first 6 lane.
6. Noida Greater Noida- 6 lane

1. Golden Quadrilateral: The Golden Quadrilateral (GQ) is the largest express highway project in India. It connects India's four largest metropolis: Delhi, Mumbai, Kolkata and Chennai and thus, forms a quadrilateral of sorts. Bengaluru, Pune, Ahmedabad and Surat are also served by this network.



The main economic benefits :

- This highway interconnects many major cities and ports;

- It provides an encouragement to truck transport throughout India;
- It enables the industrial growth of all small towns through which it passes;
- It provides vast opportunities for transport of agricultural produce from the hinterland to major cities and ports for export.

2. North-South and East-West Corridors: The North-South-East-West Corridor (NS-EW) is the largest highway project in India. It consists of four/six lane expressways which connect Srinagar to Kanyakumari and Porbandar to Silchar.

STATE HIGHWAYS - It connect NH, district headquarters, important towards tourist centres and minor port within the state. It is maintained by state government.



DISTRICT ROADS

These are important roads within a district connecting areas of production with markets. They also connect small towns with one another or with the State Highways and National Highways.

RURAL ROADS

The rural roads in India form a substantial portion of the road network. These roads constitute about 80 per cent of the total road length in the country. Most of the rural roads were initially sand roads. They provide vital links by moving the agricultural produce and the finished products of small-scale industries from the producing centres to the marketing centres.

OTHER ROADS

The other roads include the Border Roads and International Highways.

The Border Roads: The Border Road Organisation (BRO) was set up in 1960 for strengthening defence preparedness and accelerating economic development through improvement of roads along the northern and north-eastern boundary of the country. This organisation has constructed the world's highest road from Manali (Himachal Pradesh) to Leh (in Ladakh), at an average altitude of 4,270 metres. Apart from the construction and maintenance of roads in strategically sensitive areas, the BRO undertakes snow clearance in high altitude areas and construction of airfields, buildings and permanent bridges.

ADVANTAGES OF ROADWAYS

Roadways are the harbingers of economic development. The main advantages of using road transport are the following:

- It is through the roads that every village and hamlet can be reached.
- Construction cost of roads is much lower than that of the railway line.
- Roads can be constructed even in the areas of difficult terrain and where railway lines do not exist.
- Roads offer door to door service and thereby, reduce the cost of loading and unloading. Roads also help farmers to move their perishable products quickly to the markets.
- Road transport supplements the other modes of transportation. It provides link between railway stations and ports and their hinterlands.

DISADVANTAGES OF ROADWAYS:

Road transport has the following disadvantages:

- Many roads are unsurfaced and therefore, not suitable for regular vehicular traffic.
- Roads are not properly maintained. Poor road surfaces cause heavy loss in wear and tear of vehicles.

- There are multiple check-posts, toll tax and octroi duties collection points.
- The traffic on Indian roads, especially in cities, is too high.

RAILWAYS

The Railways constitute the principal mode of transportation for freight and passengers. It brings together people from the farthest corners of the country for conducting business, sightseeing, pilgrimage, education, etc.

Railways were first introduced to India in **1853** when a line was constructed from Mumbai to Thane covering a distance of 34 km.

In 1951 the systems were nationalised as one unit, becoming one of the largest networks in the world.

At present, it is one of the largest and busiest rail networks in the world, transporting over 18 million passengers and more than 2 million tonnes of freight daily. It is the world's largest employer, with more than 1.4 million employees. The railways traverse the length and breadth of the country, covering 7,137 stations .

Railway system has been divided into 17 zones.

TRACK SYSTEM

Based on the width of the track, the Indian Railways are divided into three categories:

Broad Gauge: The distance between rails **is 1.676 metre**. 85 per cent of the total length of rail route in the country.

Broad gauge railway line on the west coastal lowland known as the Konkan Railway Line, is 760 km long rail route connecting Roha in Maharashtra to Mangalore in Karnataka.

Metre Gauge: The distance between rails **is one metre**. It accounts for about 11 per cent of the total route length.

Narrow Gauge: The distance between rails is 0.762 metre and 0.610 metre. It accounts for about 4 per cent of the total route length. It is mainly confined to the hilly areas.

ADVANTAGES OF RAILWAYS

- Railways constitute one of the most efficient and cost-effective forms of transportation. Railways help in the easy movement of bulky goods and perishable commodities to distant places.
- Railways transport raw materials to the production units and finished goods to the markets.
- Railways have brought the villages closer to the cities and have helped to transfer new ideas and innovations to the rural areas.
- Railways help in reducing sufferings during natural calamities.
- Railways facilitate easy movement of police, troops and defence equipment.
- Railways provide comfortable journey as the trains have enough space to stretch legs and move in the corridors.
- Rail travel is safer and comfortable for families with babies and elders.

DISADVANTAGES OF RAILWAYS

- It lacks flexibility of routes. Difficulty to lay track in hilly areas remote forested areas.
- very long journey can be tiring.
- Steam engine causes air and noise pollution.
- They cannot cross oceans.

RAIL TRANSPORT ADVANTAGES AND DISADVANTAGES



AIR TRANSPORT:

It started between Allahabad and Naini in 1911. The Airports Authority of India is the nodal agency responsible for creating, upgrading, maintaining & managing civil aviation infrastructure.



PAWAN HANS

Pawan Hans Helicopters Ltd. (PHHL) was established in **1985** with the primary objective of providing helicopter support services to the oil sector in offshore exploration, operate in the hilly and inaccessible areas and make available charter flights for promotion of tourism.

ADVANTAGES OF AIRWAYS

- It is the fastest and comfortable mode of transport.
- Air transport is of particular importance during natural calamities.
- The speed and ease with which aeroplanes can cross mountain barriers, sandy deserts, large expanses of water or forests make the air transport indispensable.



DISADVANTAGES OF AIRWAYS

- Air transport is costly.
- It depends on weather conditions. Flights are often delayed due to bad weather.
- Air transport is run on petroleum which is a non-renewable source of energy.

- Air transport can carry small tonnage but it has high freight charges.

WATER TRANSPORT:

India is gifted with an extensive network of waterways in the form of rivers, canals, backwaters, creeks and a long coastline accessible through the seas and the oceans.



INLAND WATERWAYS

Inland waterways include rivers, canals, backwaters and creeks which are deep enough to allow the ships and boats to navigate safely.

Why the rivers of Peninsular India are not ideal for navigation ?

First, these rivers are seasonal as they are rain-fed.

Second, these rivers are comparatively shorter than the rivers of northern India.

Third, these rivers are marked by a number of waterfalls.

Inland Waterways Authority of India (IWAI) is the statutory authority in charge of the waterways in India. It does the function of building the necessary infrastructure in these waterways, surveying the economic feasibility of new projects and also administration and regulation.

1. National Waterway No. 1 (NW-1): It comprises Ganga-Bhagirathi-Hooghly River System which connects Haldia-Kolkata-Farakka-Munger-Patna-Varanasi-Allahabad.

It stretches to more than 1620 kms .

2. National Waterway No. 2 (NW-2): The river Brahmaputra connecting Dhubri-Pandu (Guwahati)-Tezpur-Neamati-Dibrugarh- Sadiya stretching to about 891 kms was declared a National Waterway in 1988.

3. National Waterway No. 3 (NW-3): It runs from Kollam to Kottapuram. It comprises 168 km of west coast canal along with Champakara canal and Udyogmandal canal.

4. National Waterway No. 4 (NW-4): It connects the States of Andhra Pradesh, Tamil Nadu and the Union Territory of Puducherry.

5. National Waterway No. 5 (NW-5): It comprises Talcher-Dhamra stretch of river Brahmani, Geonkhali-Charbatia stretch of East Coast Canal, Charbatia-Dhamra stretch of Matai river along with Mahanadi delta river system (585 km).

6. National Waterway No. 6 (NW-6): It is a waterway between Lakhipur and Bhanga of the Barak River.

OCEANIC WATERWAYS

India has a long coastline of 7,517 kilometres forming one of the biggest peninsulas in the world. It has 12 Major ports and 187 notified Minor and Intermediate ports.

PORTS

Major ports handle over 80% of all cargo traffic. These ports have been classified into Major, Minor and Intermediate type.

MAJOR PORTS

1. Kolkata (West Bengal): It is a riverine port located on the bank of the Hooghly River.

2. Haldia (West Bengal): This port has been developed on the river Hooghly to relieve pressure on Kolkata.

3. Paradip (Odisha): It is located on the coast of Odisha and handles iron ore and coal.

4. Vishakhapatnam (Andhra Pradesh): It is India's deepest landlocked port handling crude oil and petroleum products.

5. Chennai (Tamil Nadu): It is the second largest port in terms of volume of traffic handled and is the oldest artificial harbour on the east coast of India.

6. Tuticorin (Tamil Nadu): This port is located on the east coast of India.

7. Kandla (Gujarat): It is a Tidal port and a free trade zone located at the eastern end of Rann of Kutch.

8. Mumbai (Maharashtra): It is a natural harbour on the west coast and is also the biggest port of India.

9. Jawaharlal Nehru (Nava Sheva) Port near Mumbai: It is the biggest ultra-modern seaport off Mumbai. It is equipped with modern facilities having mechanised container berths for handling dry cargo and service berths.

10. Mormugao (Goa): It is a natural harbour, situated at the entrance of the Zuari estuary, in Goa. It occupies fifth position in terms of total traffic handled.

ADVANTAGES OF WATERWAYS

- It is the cheapest means of transport.
- It is most suitable for carrying heavy and bulky material.
- It is a fuel-efficient and eco-friendly mode of transport.
- Travel by ships and cruise liners is comfortable as it provides lot of space and other facilities concerning daily life like catering, medicines, doctors, communication, entertainment, sports, etc.
- Water transport is safe and has less traffic in comparison to road and air transport.

DISADVANTAGES OF WATERWAYS

- It depends on weather conditions.
- It needs long travelling hours which causes sea sickness.
- Water transport is limited to the areas where rivers are navigable and oceanic routes exist.

Difference between Port and Harbour

PORT	HARBOUR
1. Ports are man-made commercial places built along the coastline.	1. Harbours are natural or created places, connecting a piece of land with a large waterbody, which serve as ports.
2. The location of ports is chosen along the coastline where water is navigable and is close to land facilities and infrastructure.	2. Natural harbours are surrounded by land on most sides but have an entrance point to the sea.
3. The main purpose of ports is loading and unloading of cargo ships.	3. Harbours are utilised mainly for providing safe parking or anchorage to ships.
4. Ports are very large with buildings and warehouses for storing goods and well-built transport system.	4. When natural harbours have all the facilities of ports they serve as ports. For example, Mumbai is a natural harbour and also the biggest port in India.