

Transport

Transport

The economy of any nation depends on its infrastructure. One of the main components of infrastructure is the transport system. The transport system plays an important role in the Indian economy. These are

- It links the interior regions to the other parts of the country, thus helping in use of resources.
- It helps in industrialisation and urbanisation.
- It transports goods from one place to another.
- It minimises the effects of natural disasters.
- It enables easy movement of people across regions.

Roadways

India has one of the largest networks of roadways in the world. The length of road per 100 sq. km. of area is known as the density of roads. Kerala has the highest density of roads.

India has a large network of 41 lakh kilometres, making it the second largest road network in the world. This network of roads in India includes national highways, state highways, district roads and rural roads like border roads.

National Highways

Roads which run across the country and connect various cities and are maintained by the central government are known as national highways (NHs). Some facts about NHs:

- They handle about 40% of the total road traffic.
- The traffic on NHs is growing because of rapid industrialisation.
- The National Highways Authority of India (NHAI) was constituted in 1988. It is responsible for the construction of NHs and for implementing projects which are related to the improvement of NHs.
- Besides NHAI, the Public Works Department and Border Road Organisation carry out the development and maintenance of NHs.

Two major projects undertaken by NHAI are the Golden Quadrilateral and North–South and East–West Corridor.

Golden Quadrilateral

- It is the largest express highway project in India connecting the four metropolis cities of Delhi, Mumbai, Kolkata and Chennai.
- The Golden Quadrilateral has enabled the industrial growth of all small towns through which it passes and has provided an impetus to truck transport throughout India.

North–South and East–West Corridor

- The North–South and East–West Corridor is the largest ongoing highway project in India.
- It aims to connect Srinagar, Kanyakumari, Porbandar and Silchar.

Express Highways

Express highways are six-lane roads constructed to provide high-speed movement without any obstacles like speed breakers. Some major express highways in India are

Yamuna Expressway: It connects Greater Noida with Agra. It is a six-lane expressway. This expressway has reduced the travelling time between Delhi and Agra by over two hours and connects the main towns located on the eastern side of River Yamuna. It has helped farmers to transport their agricultural, horticultural and dairy products to major cities.

Ahmedabad–Vadodara Expressway: It was India's first four-lane expressway. It reduced the journey between Ahmedabad and Vadodara to less than 1 hour.

Mumbai–Pune Expressway: It is India's first six-lane high-speed tolled expressway. It has separate tunnels and complete fencing to prevent crossing by humans or animals.

Panipat Expressway: It has been constructed to decongest the traffic on the busy Delhi–Amritsar route. It is a 10-km elevated highway at Haryana.

State Highways

These are constructed and maintained by state governments. They link cities and towns within the state and connect the national highways.

Differences between national highways and state highways

National Highways	State Highways
National highways are constructed and maintained by the central government.	State highways are constructed and maintained by the state government.
They connect major cities, industrial centres and pilgrim places across the country.	These connect district headquarters, tourist centres, pilgrim towns and national highways within the state.

District Roads

These roads connect areas of production with markets in a district. They also connect talukas with district headquarters within the state.

Rural Roads

Rural roads constitute about 80% of total road length in the country. These roads facilitate the movement of agricultural produce and finished goods from production centres to market centres. Prime Minister's Rural Road Scheme was launched in December 2000 by the Government of India to provide connectivity to the rural areas.

Border Roads

The Border Road Organisation (BRO) was set up to strengthen the defence of the country. BRO has built the highest road in the world running from Manali to Leh.

Advantages of Roadways

- They provide door-to-door services.
- The cost of construction of roadways is much lower than that of railways.
- Roadways can be constructed in hilly regions.
- Roadways supplement the other modes of transport. For example, roadways connect railway stations and ports to the hinterland.

Disadvantages of Roadways

- The road network is inadequate to tackle India's large population.
- About half of the roads are unmetalled roads, and hence, their use is restricted during the rainy season.
- The number of NHs is also not enough keeping in mind the large population of the country.
- In cities, roads are highly congested. Sometimes, the encroachment of the road by hawkers and vegetable sellers also results in congestion.
- The passing of heavily loaded trucks which carry a load above the prescribed limit also damages the roads in the long run.

Railways

The first railway service ran from Mumbai to Thane in 1853. India has one of the largest and busiest rail networks in the world. India has both long distance and suburban rail networks. New Delhi, Mumbai, Kolkata and Chennai have their own metro networks. Indian Railways help not only in the movement of people but also in the transport of goods such as fertilisers, agricultural produce, and iron and steel products.

Railways have three kinds of tracks—broad gauge, metre gauge and narrow gauge.

Broad Gauge: Almost all major rail routes are broad gauge routes. The distance between the rails is 1.676 metres. Broad gauge connects major ports with interior towns and industrial centres. It handles 85% of the total goods traffic in tones-km. It is also called India gauge. The broad gauge railway line on the west coast is known as the Konkan Railway line which is an engineering feat.

Metre Gauge: The distance between the rails is one metre. It accounts for 11.22% of the total rail route.

Narrow Gauge: The distance between the rails is 0.610–0.762 m. Metre gauge is mainly confined to the hilly regions.

Advantages of Railways

- It transports raw materials to production units and finished products to the markets.
- Bulky goods can be easily transported over a long distance.
- Railways have brought villages closer to the cities.
- It facilitates easy movement of people, police and defence equipment.
- Railways help in reducing suffering during natural calamities.
- It provides for a comfortable journey even during the nights.

Disadvantages of Railways

- Railway tracks cannot be laid down in hilly and remote forested regions.
- Every industrial town does not have railway tracks.
- Trains cannot cross oceans. They are limited to land travel and cannot transport products from one continent to the other.
- Train travel is long and tedious as compared to air travel.

Air Transport

- Air transport in India made progress after Independence. India has both domestic and international airlines. The Airports Authority of India was set up on 1 April 1995 after the merger of National Airport Authority and International Airports Authority.
- The Airports Authority of India is responsible for providing safe and efficient air traffic services in the country.
- Air India is a government-owned carrier serving 50 domestic destinations and 39 international destinations. It is the 16th largest airline in Asia. Some private airlines operating in India are Jet Airways, GoAir and SpiceJet.
- The cargo airline companies in the country are Deccan Cargo and Express Logistics Pvt. Ltd. and Blue Aviation Pvt. Ltd.
- Pawan Hans Helicopters Ltd. (PHHL) was established with an aim to provide helicopter support services to the oil sector for offshore exploration.

Advantages of Airways

- It is the fastest means of transport.
- It is also a prestigious and comfortable means of transport.
- Regions which are covered with dense forests, deserts and high mountains have easily become accessible because of air travel.
- In case of a natural calamity like floods, when roads cannot be used, relief work is carried out with the help of helicopters.

Disadvantages of Airways

- It is the costliest means of transport and hence is out of the reach of common people.
- Unlike roads and railways, airways have still not been connected to the smallest cities.
- Petroleum which is used as fuel is a non-renewable source of energy.
- Freight charges are high.

Water Transport

Waterways are the most important means of transporting bulky and heavy goods. It is a fuel-efficient and environment-friendly means of transport. Water transport can be divided into inland waterways and oceanic waterways.

Inland Waterways

Inland waterways connect rivers, canals, backwaters and creeks within the country. These waterways should be free of barriers such as waterfalls and rapids. Inland Waterways Authority of India (IWAI) is in charge of the waterways in India. It has declared five inland waterways as national waterways. These are

Name of Inland Waterway	Features
National Waterway No. 1	Comprises the Ganga–Bhagirathi–Hooghly river system connecting Haldia–Kolkata–Farakka–Munger–Patna–Varanasi–Allahabad.
National Waterway No. 2	River Brahmaputra connects Dhubri–Pandur–Tezpur–Neamati–Dibrugarh–Sadiya.
National Waterway No. 3	Comprises the West Coast Canal along Champakaran and Udyogmandal. It was declared a national waterway in 1993.
National Waterway No. 4	Connects Andhra Pradesh, Tamil Nadu and Puducherry.
National Waterway No. 5	Comprises the Talcher–Dharma stretch of River Brahmi, the Goenkali–Charbatia stretch of the East Coast Canal and the Charbatia Dharma stretch of Malti River along with the Mahanadi delta.

The following waterways have been declared as national waterways by the government:

- The River Ganga between Allahabad and Haldia
- The River Brahmaputra between Sadiya and Dhubri
- The West Coast Canal in Kerala

Apart from the Ganga and the Brahmaputra, Godavari, Krishna and Buckingham Canal and East–West Canal are important inland waterways.

Oceanic Waterways

India is a peninsular country with a long coastline of 7517 km. It has 12 major sea ports and 187 minor sea ports.

Sea ports handle over 80% of all cargo traffic. Some major sea ports in India are

- Mumbai Port is the largest port in the country. Jawaharlal Nehru Port was built to decongest the Mumbai Port. Apart from various other goods, Mumbai Port deals with mineral oil and dry cargo.
- Mormugao Port in Goa is an important iron ore-exporting port in the country. It is a natural harbour and occupies the fifth position in total traffic handled.
- Kolkata is an inland riverine port. Haldia Port was developed on the River Hooghly to reduce pressure on the Kolkata Port.
- Paradip Port is located on the coast of Odisha and handles iron ore and coal.
- Vishakhapatnam Port in Andhra Pradesh is the deepest landlocked port which handles crude oil and petroleum products.
- Chennai is one of the oldest artificial ports of the country. It is next to Mumbai in trading activities. It handles petroleum products, crude oil, fertilisers, iron ore and dry cargo.
- Tuticorin Port in Tamil Nadu has a natural harbour and mainly handles coal, salt, edible salt, dry cargo and petroleum products.
- Kandla Port is a tidal port located in Gujarat. It handles crude oil, petroleum products, edible oil, food grains, cotton and salt.
- New Mangalore in Karnataka exports iron ore of Kudremukh and imports petroleum products, fertilisers and edible oils.
- Kochi Port is located in the southwestern part of the country. It has been developed alongside a natural harbour. It handles the export of tea, coffee and spices and the imports of petroleum oil and fertilisers.

Differences between Oceanic Waterways and Inland Waterways

Oceanic waterways	Inland waterways
It includes transport along the coastline.	It includes transport through navigable rivers and canals.
Coastal and foreign trade usually takes place through oceanic waterways.	Domestic trade takes place through inland waterways.

Advantages of Waterways

- It is the cheapest means of transport.
- It is suitable for carrying heavy and bulky materials.
- It is a fuel-efficient and eco-friendly mode of transport.
- It is safe and has less traffic in comparison to road and air transport.

Disadvantages of Waterways

- It is dependent on the weather.
- It involves long hours of travel which cause sickness.
- It is limited to areas where rivers are navigable and where an oceanic route exists.



Map of India showing Paradip Sea Port, Kochi Sea Port, Northern terminal of the North South Corridor and the Southern Terminal of the National highway No. 7