

12th Standard Geography

Transport And Communication

Means of Transport

There are various ways means of transportation by which human beings move goods, commodities, ideas etc from one place to another place. Major means of transportation are as follows:

Land Transport

Transportation of people and goods by road transport is not new in India. Since ancient times, pathways and unmetalled roads have been in use for this purpose. With the technological advancement, there are now metalled roads, railways, cableways and pipelines for movement of large volume of goods and passengers.

Road Transport

India has its count in countries which is having largest road networks worldwide. India has a total road length of 42.3 lakhs km that places it among the countries which has largest road network.

Road transport carries about 85% of passenger and 70% of freight traffic every year. Road transport is preferable for short distance travel. The first attempt to improve and modernise road network was made in 1943 with

'Nagpur Plan.' But due to lack of coordination among princely states and British India, it remained unimplemented.

The second attempt was made after independence with twenty year road plan (1961) to improve the conditions of roads in India but still roads continue to concentrate in and around urban centres and rural and remote areas remained less connected by road.

For the purpose of construction and maintenance, roads are classified as National Highways (NH), State Highways (SH), Major District Roads and Rural Roads:

National Highways

- NH referred to roads which are constructed and maintained by central government.
- National Highways are meant for inter-state transport and movement of defence men and material in strategic areas.
- In 2008-09, total length of National Highways was 70934 km which was 19700 km in 1951.
- These highways connect the state capitals, major cities, important ports, railways junctions, etc and carry' about 40% of the road traffic despite they constitute only 1.67% of total road length.
- The National Highways Authority of India (NHAI – 1[^]95) is an autonomous body, under the Ministry of Surface Transport which is entrusted with the responsibility of development, maintenance, operation and for the improvement of the quality of national Highways.

National Highways Development Projects

- **Golden Quadrilateral** It is 5846 km long 4/6 lane, high density corridor. It was meant to connect India's four big metro cities of Delhi-Mumbai- Chennai-Kolkata. It will deduct the time-distance and cost of movement among the mega cities of India. Its construction help ip reducing the time distance and cost of movement among mega cities considerably.
- **North-South and East-West corridors** The North-South corridor is a 4076 km long highway which is meant to connect Srinagar in Jammu and Kashmir with Kanyakumari in Tamil Nadu including Kochchi-Salem Spur. The East-West corridor is 3640 km long road which aims to connect Silchar in Assam with the port town of Porbandar in Gujarat.

State Highways

These roads are connected to the National Highways and join the state capitals with district headquarters and other important towns. Their share in the total road length is about 4%. State governments are responsible to construct and maintain these highways.

District Roads

These roads connect district headquarters and other important nodes in the district. They account for 60.83% of the total road length of the country.

Rural Roads

These roads provide links in the rural areas. About 33.86% of the total road length in India are categorised as rural roads.

Other Roads

These include Border Roads and International highways:

Border Roads

These are strategically important roads along the Northern and North-Eastern boundary of the country. Border Road Organisation (BRO) is responsible for construction and maintenance of these roads. It was established in May 1960 with the aim to accelerate economic development and strengthening defence preparedness through rapid and coordinated improvement of strategically important border roads.

BRO's major achievement is construction of roads in high altitude mountainous terrain joining Chandigarh with Manali (Himachal Pradesh) and Leh (Ladakh). This road is located at the average height of 4270 meters above mean sea level.

The total length of border roads was 40450 km in 2005 which was constructed by BRO. Besides the construction and maintenance of roads in strategically sensitive areas. The BRO also undertakes snow clearance in high altitude area.

International Highways

They are constructed with the aim to promote harmonious relationship with neighbouring countries and provide an effective connection with India.

Density of Roads

- The distribution of roads is not uniform in the country. Density of roads (length of roads per 100 sq km of area) is the method to compare the network of roads of one area to another area. The national average road density is 125.02 km (2008).
- The density of roads is influenced by nature of terrains, and level of economic development. As most of the Northern states and major Southern states have high density of roads (e.g. Uttar Pradesh has highest road density of 532.27 km), whereas Himalayan region, North-Eastern region, Madhya Pradesh and Rajasthan have low density of roads (e.g. Jammu and Kashmir has lowest road density of 10.04 km).
- Quality of roads, besides density, is also better in plains as compared to high altitude areas, rainy and forested regions.

Rail Transport

- India has one of the longest railway network in the world. On one hand, it facilitates the movement of freight and passengers and on the other hand, it contributes to the growth of economy. Mahatama Gandhi said, the Indian railways, “brought people of diverse cultures together to contribute to India’s freedom struggle”

- In 1853, the first Indian railway was started from Bombay to Thane covering a distance of 34 km.
- Being the largest Government undertaking in India, Indian Railways network is 64460 km long (31th March, 2011).
- To reduce the pressure of this large size railway from a centralised railway management system, Indian Railway system has been divided into seventeen zones. These are as follows:

1.	Central	Mumbai CST
2.	Eastern	Kolkata
3.	East Central	Hojipur
4.	East Coast	Bhubaneswar
5.	Northern	New Delhi
6.	North-Central	Allahabad
7.	North-Eastern	Gorakhpur

8.	North East Frontier	Maligaon (Guwahati)
9.	North-Western	Jaipur
10.	Southern	Chennai
11.	South Central	Secunderabad
12.	South-Eastern	Kolkata
13.	South East Central	Bilaspur
14.	South-Western	Hubli
15.	Western	Mumbai (Church Gate)
16.	West Central	Jabalpur
17.	Metro	Kolkata

Railway Zone Headquarters

Gauges in Indian Railways

Indian Railways has been divided into three categories. On the basis of the width of the track of Indian railways as follows:

- **Broad Gauge** In broad gauge, the distance between rails is 1.676 metre. The total length of broad gauge lines is 55188 km in 2011.
- **Metre Gauge** In metre gauge, the distance between the rails is 1 metre. The total length of metre gauge is 6809 km in 2011.
- **Narrow Gauge** In narrow gauge, the distance between the rails is 0.762 metres or 0.610 metres. The total length of narrow gauge line is 2463 km in 2011. This category of railway lines is mostly found in the hilly areas.

Indian Railways has taken major steps to improve the performance of this means of transport like:

1. To convert the metre and narrow gauges to broad gauge.
2. Replacement of steam engine by diesel and electric engines which may help in keeping the environment clean.
3. Introduction of metro rail in Kolkata and Delhi, etc.

Development of railways in India was started by the Britishers and after the independence, scenario has been changed by extending railway routes to other areas. Konkan railways along the western coast which provide a direct line between Mumbai and Mangalore was a significant development in this regard.

Konkan Railway is one of the important achievements of Indian Railways which was constructed in 1998. It is a 760 km long rail route which connects Roha in Maharashtra to Mangalore in Karnataka. It is considered an engineering marvel. Railway is still the most important means of transport for the masses. In the hill states, North-Eastern states, central part of India and Rajasthan, railway network is relatively less dense.

Water Transport

Water transport is the cheapest means of transport for carrying heavy and bulky material as well as passenger services. It is a fuel efficient and eco-friendly mode of transport. The water transport is of two types:

1. Inland Waterways
2. Oceanic Waterways

Inland Waterways

Before the introduction of railways, inland waterways was the chief mode of transport. But, now it is losing its significance due to:

1. Tough competition from road and railway transport.
2. Diversion of river water for irrigation purposes made them non-navigable in large parts of their courses.

India has 14500 km of navigable waterways which accounts for about 1% of country's transportation.

It includes rivers, canals backwater, creeks etc. At present 3700 km of major rivers are navigable by mechanised flat bottom vessels, but out of it only 2000

are actually used. Similarly, out of 4800 km of the network of navigable canal, only 900 km is navigable by mechanised vessels.

The Inland Waterways Authority which was setup in 1986 is responsible for the development, maintenance and regulation of national waterways in the country. Currently, there are three inland waterways which are considered as national waterways by the authority. Description of these waterways are as follows:

National Waterways of India

Waterways Stretch	Specification	Date of Declaration
NW1 Allahabad-Haldia Stretch (1620 km)	It is one of the most important waterways in India which is navigable by mechanical boats upto Patna and by ordinary boats upto Haridwar. It is divided into three parts for developmental purposes: (i) Haldia Farakka (560 km) (ii) Farakka Patna (460 km) (iii) Patna -Allahabad (600 km)	27.10.1986
NW2 Sadiya-Dhubri Stretch (891 km)	Brahmaputra is navigable by steamers up to Dibrugarh (1384km), which is shared by India and Bangladesh.	26.10.1988
NW3 Kottapuram-Kollam Stretch (205 km)	It includes 168 km of west coast canal along with Champakara canal (23 km) and Udyogmandal canal (14 km).	01.02.1991
NW 4 Kakinada Puduchery (1995 km)	Stretch of canal and Kalurelly Tank stretches of river Godavari and Krishna	2008
NW 5 Talcher Dhamra (623 km)	Stretch of river Brahmani Geonkhali Cherlatia stretch of East coast canal, Chertectia Dharma, stretch of Matai river alongwith Mahanadi delta river system	2008

Oceanic Routes Ten other inland waterways have been identified by inland waterways authority. The backwaters (Kadal) of Kerala has special significance which not only provides transport but also attract tourists here. The famous Nehru Trophy Boat Race (Vallamkali) is also held in the backwaters.

- These play an important role in the transport sector of India's economy.
- India's vast coastline of about 7,517 km (including islands) easily facilitates this type of transport. There are twelve major and 185 minor ports which provide infrastructural support to these routes.
- About 95% of India's foreign trade by volume and 70% by value moves through ocean routes.
- These routes give international trade service as well as provide transportation between the islands and the rest of the country.

Air Transportation

Air transport facilitates the fastest movement of goods and passengers from one place to another place. It is good for long distances and areas which have uneven terrain and climatic conditions. Air transport in India was started in 1911 with a short distance, (10 km) airmail operation from Allahabad to Nairn.

The Airport Authority of India is responsible for providing safe, efficient air traffic and aeronautical communication services in the Indian Air space. Now it manages 126 airports including 11 international, 86 domestic and 29 civil enclaves at defence air fields. There are two corporations, Air India and Indian

Airlines which manage air transport in India. Both corporations were nationalised in 1953. Now many private companies have also started passenger services.

Air India

It is a corporation of India which provides International Air Service for both passengers and cargo traffic. It connects all the continents of the world through its services.

Indian Airlines

Indian Airlines, the largest state owned domestic carrier changed its names to 'Indian by dropping' word 'Airlines' in 8th December, 2005. The new brand name 'Indian' now appears on both sides of the fuselage. The logo depicting IA which was used to be display on orange tail is now replaced by a new logo. New logo is apartly visible blue wheel and is inspired by the Sun Temple at Konark (Odisha), symbolising timeless motion, convergence and divergence. It also represents strength as well as trust that has stood the test of time.

History of Indian Airlines

- 1911-Air transport in India was launched between Allahabad and Naini.
- 947-Air transport was provided by four major companies namely Indian National Airways, Tata Sons Limited, Air Services of India and Deccan Airways.

- 1951-Four more companies joined the services i.e. Bharat Airways, Himalayan Aviation Limited, Airways India and Kalinga Airlines.
- 1953-Air transport was nationalised and two corporations, Air India international and Indian Airlines were formed. Now, Indian Airlines is known as Indian.
- Pawan Hans is the major organisation in India which provides helicopter services in hilly areas, for tourism in North-Eastern sector and mainly to petroleum sector and tourism.

Oil And Gas Pipelines

Pipelines are convenient and best means of transporting liquids and gases over long distances. These can also transport solids after converting them into slurry. Oil India Limited (OIL) is responsible for exploration, production and transportation of crude oil and natural gas.

Its one of the major achievement is the construction of Asia's first cross country pipeline. This pipeline covers a distance of 1157 km from Naharkatiya oil field in Assam to Barauni refinery in Bihar. In 1966, this pipeline was further extended to Kanpur, Uttar Pradesh.

In Western region of India, OIL also constructed extensive network of pipelines – Ankleshwar-Koyali, Mumbai High-Koyal and Hazira-Vijaipur-Jagdishpur (HVJ) pipelines. Recently, a pipeline is also constructed from Salaya (Gujarat) to Mathura (Uttar Pradesh). It is 1256 km long pipeline which transport crude oil from Gujarat to Punjab (Jalandhar) via Mathura.

Construction of a 660 km long pipeline from Numaligarh to Siliguri is also in progress.

Communication Networks

A number of communication cum-transportation means have been used since human history, for e.g. messages were delivered by beating drum or hollow tree trunks, giving indication through smoke or fire or with the help of fast runners. Development in the field of science and technology brought many revolutionary inventions in means of communication like post office, telegraph, printing press, telephone, satellite, etc.

On the basis of scale and quality, the mode of communication can be divided into following categories:

Personal Communication System

- The most advanced and best means among all personal communication system is internet which is widely used in urban cities.
- E-mail is the main source through which a user can directly connect with others and can also get access to the world of knowledge and information.
- Use of internet is increasing for e-commerce and carrying out money transactions.
- The internet is like a huge control warehouse of data, with detailed information on various items.

- It is a cheaper mode of communication which provides an efficient access to information at a comparatively low cost.
- Letters, telephone, fax are also used for personal communication.

Mass Communication System Radio

- Radio broadcasting was started in 1923 by Radio Club of Bombay. Within short time, it gained immense popularity and became a part of every household in India.
- After seeing its popularity, the government of India, in 1930 took the control of this mode of communication under Indian Broadcasting System.
- It was changed to All India Radio in 1936 and to Akashwani in 1957.
- It broadcasts various programmes related to information, education, entertainment and special news bulletins on special session of parliament and state legislature.

Television (TV)

- Television (TV) broadcasting has emerged as the most effective audio-visual medium for disseminating information and educating masses.
- First television broadcasting was started in National Capital in 1959. Till 1972, it was the only urban place where TV services were available.
- After 1972, several other centres became operational. In 1976, TV broadcasting services were separated by All India Radio and got a separate identity as Doordarshan (DD).

- Its revolutionary development began after the launch of INSAT-IA (National Television -D1) when Common National Programmes (CNP) were started for the entire network and its services were extended to the backward and remote rural areas.

Satellite Communication

Satellite is an advanced mode of communication. They also regulate the use of other means of communication. From economic and strategic point of view, use of satellite is very vital for the country as these give continuous and synoptic view larger area. Various operations can be done through satellite images, e.g. weather forecast, monitoring of natural calamities, surveillance of border areas, etc.

There are two satellite system in India on the basis of configuration and purposes:

Indian National Satellite System (INSAT)

This was established in 1983. It is a multi-purpose satellite system for telecommunication, meteorological observation and for various other data and programmes.

Indian Remote Sensing Satellite System (IRS)

- The IRS satellite system started in India with the launch of IRS-IA in March 1988 from Vaikanour in Russia.
- India has also developed her indigenous launching vehicle PSLV (Polar Satellite Launch Vehicle).
- These remote sensing satellites collect data in several spectral band and transmit them to ground stations which is very useful in the management of natural resources and other various purposes.
- The National Remote Sensing Agency (NRSA) at Hyderabad is responsible for facilitating for acquisition of data and its processing.

