

DIFFERENT MODES OF TRANSPORTATION

Transportation has developed along three basic modes of transport

- a) Land
- b) Water
- c) Air

Land has given scope for development of transportation by road and rail transport. Water and air media have developed waterways and airways respectively. The roads or the highways not only include modern highway system but also includes the urban arterials, city streets, feeder roads and village roads catering for a wide variety of vehicles and pedestrians. Railways have been developed both for long distance travel and also urban travel. Waterways include transportation by oceans, rivers, canals and lakes for the movement of ships and boats. The airways help in faster transportation by aircrafts and carriers.

Apart from these major modes of transportation, other modes include pipelines, elevators, belt conveyors, cable cars, aerial ropeways and monorails. Pipe lines are used for the transportation of water, other fluids and even solid particles

The four major modes of transportation are:

- a) Roadways or highways for road transportation
- b) Railways for rail transportation
- c) Waterways for water transportation
- d) Airways for air transportation

ROADWAYS

The transportation by road is the only mode which could give maximum service to one and all. Road transport mode has the maximum flexibility for travel with reference to choice of the route, direction, time and speed of travel. This is only mode which caters for the movement of passengers and goods independently right from the place of origin up to the destination of any trip along the route. The other three modes (railways; water ways; airways) have to depend on transportation by road for the service to and from their respective terminals. Therefore, the roadway essentially serves as a feeder network. It is possible to provide door to door service by road transport. Ultimately, road network is therefore needed not only to serve as feeder system for other modes of transportation and to supplement them, but also to provide independent facility for road travel by a well-planned network of roads throughout the country

Advantages:

- 1) Flexibility: It offers complete freedom to the road users.
- 2) It requires relatively smaller investments and cheaper in construction with respect to other modes.
- 3) It serves the whole community alike the other modes.
- 4) For short distance travel, it saves time.
- 5) The road network is used by various types of vehicles.

Disadvantages:

- 1) Speed is related to accidents and more accidents results due to higher speed and is usually not suitable for long distance travel
- 2) Power required per tonne is more.

RAILWAYS

The concept of rail transportation is movement of multiple wagons or a train of wagons passenger's bogies on two parallel steel rails. The resistance to traction along the railway track for the movement of steel wheels is much lower than that along more uneven road surface for the movement of road vehicles with rubber tyres. The transportation along the railway track could be advantageous by railways between the stations both for the passengers and goods, particularly for longer distances. The energy requirement to haul unit load through unit distance by the railway is only a fraction (one fourth to one sixth) of the required by road. Hence, full advantage of this mode of transportation should be taken for the transportation of bulk goods along land where the railway facilities are available. The Indian railways is one of the world's largest Railway network in the world. It was introduced in 1853 and it is spread over 1,09,221 km covering 6906 stations.

Advantages:

- 1) Can transport heavy loads of goods at higher speed
- 2) Power required per tonne is less compared to roadways
- 3) Chances of accidents are less.

Disadvantages:

- 1) Entry and exist points are fixed
- 2) Requires controlling system and no freedom of movement
- 3) Establishment and maintenance cost is higher

WATERWAYS

Transportation by water offers minimum resistance to traction and therefore needs minimum energy to haul unit load through distance. The water transportation is the most energy efficient but it is the slowest among the four modes. The highest use of this mode is for bulk cargo of relatively low value. The transportation by water is possible between the ports on these routes or along the rivers or canals where inland transportation facilities are available.

Advantages:

- 1) Cheapest: Cost per tonne is lowest
- 2) Possess highest load carrying capacity
- 3) Leads to the development of the industries.

Disadvantages:

- 1) Slow in operation and consumes more time and Depends on whether condition
- 2) Chances of attack by other countries on naval ships are more.
- 3) Ocean tides affects the loading and unloading operation and the routes are circuitous.

AIRWAYS

The transportation by air is the fastest among the four modes. Air transport provides more comfortable and fast travel resulting in substantial saving in travel time for the passengers between the airports. The shipment of high value freight on long hauls is possible in the shortest time by air transport. Unlike other modes of transport, air transport allows continuous journey over the land and water, even across inaccessible places in between two airports.

For shorter hauls helicopters are used and they were developed for their landing and takeoff. Military aviation is also important to meet the defense needs of a country.

Advantages

- 1) It has highest speed.
- 2) Intercontinental travel is possible
- 3) Journey is continuous over land and water

Disadvantages

- 1) Highest operating cost (cost/tonne is more) and the load carrying capacity is lowest
- 2) Depends on whether condition
- 3) Should follow the flight rules.