ECONOMICS OF TRANSPORTATION

UNIT-I

**1.Define transportation?**

**Transportation**, the movement of goods and persons from place to place and the various means by which such movement is accomplished. The growth of the ability—and the need—to transport large quantities of goods or numbers of people over long distances at high speeds in comfort and [safety](https://www.britannica.com/topic/safety-condition) has been an index of civilization and in particular of technological progress.

**2. What is meant by water transport?**

Water transport is the process of moving people, goods, etc. by barge, boat, ship or sailboat over a sea, ocean, lake, canal, river, etc.

**3. Write down different types of transportation?**

The different modes of transport are air, water, and land **t**ranspor**t**, which include Rails or railways, road and off-road transport. Other modes also exist, including pipelines, cable transport, and space **transport**.

**4. What are the economic developments of transportation?**

The Economic Importance of Transportation. Developmen**t** can be defined as improving the welfare of a society through appropriate social, political and economic conditions. ... Because of its intensive use of infrastructures, the transpor**t** sector is an important component of the **economy** and a common tool used for development.

**5. Mention the role of transport?**

1. Economic Transport

2. Industrial development

3. Social and cultural development

**6. What are the significance of transport?**

1. Industrial growth

2. Create employment

3. Stability in price

4. Use of economical resources

**7 .what is political effects of transportation?**

By decreasing cost of production and increasing the quantity and variety of goods, transportation raises the standard of living and modern recreation.

**8. Write down the Advantage of Road transport?**

1. Less capital quality: Road transport required much less capital investment as compared to other modes of transport such as railways and air transport.

2. Suitable for short distance: Delays in transit of gods on account of intermediate loading and handling

3. Lesser risk of damage in Transmit: Road transport is most suited for transporting delicate goods like chinaware and glassware, which are likely to be damaged in the process of loading and unloading.

4. Services in rural areas:- Road transport is most suited for carrying goods and people to and from rural areas which are not served by rail, water or air transport.

**9. What are the Features of water transport?**

* Sea transportation connects land which is separated by water
* Water transport is suitable for transporting low value and high volume commodities
* Water transportation is suitable for bulk goods and low prices goods such as coal , oil
* wood etc.,
* It depends on geography, rivers and channel network

**10. Transportation of people in railways?**

1. Dlectrification of more traces

2. Development of more efficient locomotives

3. Advancement in terms of passenger including better caring, toilet provisions and security features.

**11. What are the disadvantages of railways?**

* Huge Capital Outlay: The railway requires is large investment of capital
* Lack of Flexibility: Another disadvantage of railway transport is its inflexibility.
* Lack of Door to Door Service

**12. Write about divisional organization in Railways?**

The Divisional Railway Manager (DRM) heads the organization at the division level. There are currently [71 divisions](https://en.m.wikipedia.org/wiki/Indian_Railways#Railway_zones) on the system nationwide. The divisions are primarily involved with train running but may also have locomotive sheds (repair shops for locomotives), coaching depots (repair home bases for passenger trains), and wagon depots (repair and maintenance points for freight stock).

**13. What is air transportation?**

**Air transportation** is the movement of passengers and **freight** by any conveyance that can sustain controlled flight.

limitations of Air transport

(i)Cost of operating airlines is very high and so **freight** cost is very high as compared to sea **transport**. (ii) It is difficult to carry bulky, awkwardly shaped goods. (iii) Very risky in case of accident.

**14. What are the Advantage of rail transport?**

**Railway transport** is economical, quicker and best suited for carrying heavy and bulky goods over long distances. 5. Cheaper **Transport**: It is a cheaper mode of **transport** as compared to other modes of **transport**.

**15.What are the advisory comities in railways?**

Several advisory committees have been setup to advise and guide the railway administration.

* National railway user council
* Zonal railway user committee
* Divisional railway user committee
* Miscellaneous railway user committee

**16. Economic effect of transport?**

* Its increase the efficiency of production
* Its stimulates wants by increasing quantityand variety of goods and services
* Its help in producing cost of production of goods
* Transportation helps the growth of largesitics and urbanization of country

**17.What are the problems of railways today?**

Some of the major problems faced by the Indian railways are briefly discussed as under. SAFETY:ADVERTISEMENTS:..

Cost and revenue problems as is the case with most of the government organissations Indian railways face chronic financial crisis….slowdown in revenue growth social burden…

**18.What are the developments of five years plan in railways?**

* A transport logistics corp in india is to be established to develop common user freight facilities through PPPs.policy on freight terminals will be revised to remove obstacles which have impeded private investments..
* Four railway research centers are to be established at universities and a dedicated railway university is planned
* A forgien techonology co operation scheme is to be launched .

**19.Social effect of transportation?**

By decreasing cost of production and increasing the quantity and variety of goods and services and transportation rises the standard of living of the goods are made available to the consumers are tower prices.

**UNIT III**

**ROAD TRANSPORT**

The road transport industry is the backbone of strong economies and dynamic societies. It is safeguard in industry that is vital to economic growth, social development, prosperity and, ultimately, peace and which plays a crucial role in everyone's life in industrialised and developing countries alike by meeting the demand for the sustainable mobility of both people id goods.

The road transport industry is indeed instrumental in interconnecting all businesses to all major world markets, driving trade, creating employment, ensuring a better distribution of wealth and uniting mankind. It plays a crucial role in the daily economic and social life of industrialised and developing countries alike. For this reason, any penalty on road transport is an even greater penalty on road transport is an even greater penalty for the economy as a whole.

**Meaning & Introduction:**

Transport is a means of carrying goods and people from one place to another. Transport refers to the activity that facilitates physical movement of goods as well as Individuals from location to another.

**An important part of the road transport industry**

Sustainable progress.

Trucks, buses, coaches and taxis are safer

More efficient, cleaner and quieter today than ever before

They represent high technology

Its best and are here to ensure an even better quality of life.

**Roadways in India**: Road network in India is one of the largest networks 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 mean of communication and bas come a long way. It is today regarded as one of the most ideal and cost effect e 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 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.

**The National Highways Development Project:**

\* It is a project to, upgrade, rehabilitate und 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 lndia. National Highways Authority of India (NHAI) 1s authorized (mandate) to implement National Highways Development Project (NHDP), which is

* India's Largest ever highways project
* 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 1 & Il 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.

**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.

**UNIT-IV**

Water Transport

Water trånsport is the cheapest and the oldest mode of transport. It operates on a natural track and hence does not require huge capital investment in the construction and maintenance of its track except in case of canals. The cost of operation of water transport is also very less. It has the largest carrying capacity and most suitable for carrying bulky goods over long distances. It has played a very significant role in bringing different parts of the world closer and is indispensable to foreign trade**. Kinds of Water Transport: Water transport consists of: (i) Inland water transport (ii) Ocean-transport**

**Inland Water Transport**: As shown in the chart, inland water transport consists of transport by rivers, canals and lakes.

**Rivers:**

Rivers are a natural waterway which can be used as a means of transport. They are suitable for small boats as well as big barrages. River transport played a very important role prior to the development of modern means of land transport. Their importance has gradually declined on account of more reliable and cheaper transport services offered by the railways

**Canals :**They are artificial waterways made for the purpose of inigation or navigation or both. Canal Transport requires a huge amount of capital investment in contruction and maintenance of its track e, ihe artificial waterways. The cost of the canal transport is, therefore, higher than that of river transport. To add to it, the cost of providing water for the canals is also a very big problem of canal transport **Lakes:** Lakes can be either natural like rivers or artificial like canals.

**Advantages:**

**1. Low Cost**: Rivers are a natural highway which does not require any cost of construction and maintenance. Even the cost of construction and maintenance of canals is much less or they are used, not only for transport purposes but also for irrigation, etc. Moreover, the cost of operation of the inland water transport is very low. Thus, it is the.cheapest mode of transport for carrying goods from one place to another.

**2. Larger Capacity**: It can carry much larger quantities of heavy and bulky goods such as coal, and, timber etc

**. 3. Flexible Service:** It provides much more flexible service than railways and can be adjusted to individual requirements.

**4. Sefety:** The risks of accidents and breakdowns, in this form of transport, are minimum as compared to any other form of transport.

**Disadvantages:**

**1. Slow:** Speed of Inland water transport is very slow and therefore this mode of transport is unsuitable where time is an important factor.

**2. Limited Area of Operation:** It can be used only in a limited area which is served by deep canals and rivers.

**3.Seasonal Character:**

Rivers and canals cannot be operated for transportation throughout the year as water may freeze during winter or water level may go very much down daring summer.

**4. Unreliable:** The inland water transport by rivers is unreliable Sometimes the river changes its course which causes dislocation in the normal route of the trade.

**5. Unsuitable for Small Business:** Inland water transport by rivers and canals is pot suitable for small traders, as it takes normally a longer time to carry goods from one place to another through this form of transport.

**Ocean transport:** Ocean transport is indispensable for foreign trade. It has brought the different parts of the world closer and has knitted together all the nations of the world into one big world market. It operates on a natural track, ie, the sea and does not require any investment in the construction and maintenance of its track. It is, obviously, the cheapest mode of transport.

**Ocean transport includes:**

1. Coastal Shipping

2. Overseas Shipping

**I. Coastal Shipping:**

It is one of the most important means of transport for carrying goods from one part to another in a country. It is a cheaper and quicker mode of transport and is most suitable for carrying heavy, bulky and cheap traffic like coal, iron ore, etc. to distant places. But it can serve only limited areas. Earlier, coastal shipping in India was mainly in the hands of foreign shipping companies, But now from 1951 onwards, it is exclusively reserved for Indian ships.

**2. Overseas Shipping:**

There are three types of vessels employed in the overseas shipping: (i) Liners, (i) Tramps,(iii)Tankers

**(i) Liners:**

Liners are the ships which have regular fixed routes, time and charges. They are, usually, a collection of vessels under one ownership, ie. a fleet. They provide a uniform and regular service. Liners sail on scheduled dates and time, whether full of cargo or not. (i) Tramps: Tramps are ships which have no fixed routes. They have no set rules or rate schedule. Usually, they do not sail till they have full cargo. They can be chartered by exporters and are ready to sail anywhere and at any time. They are not as fast in speed as liners. Tramps are more suitable to carry seasonal and bulky goods. (ii) Tankers: Tankers are the vessels which are, specially designed to carry oil, petrol and such other liquids. They have a large capacity, 2 to 3 lakh tons of oil, and very shortly, we may have super tankers with a capacity of about 10 lakh tons of oil.

**Advantages:**

1. It operates on a natural track as sea provides a readymade 'road bed' for the ships to sail. Hence, it does not require huge amount of capital investment in the construction and maintenance of its track.

2. Due to the smooth surface of sea, comparatively less tractive power is required for its operation which results in a lesser cost of operation. Thus, it is the cheapest mode of transport.

3. It has the largest carrying capacity as compared to any other transport.

4. The risk of damage in transit of the goods is also less as compared to other modes of transport. But the goods are exposed to the 'perils of sea".

5. It is the only suitable mode of transport for carrying heavy and bulky goods to distant places.

6. It is indispensable to foreign trade.

**Inland Water Transport System: Current Status and Problems**

The inland water transport was an important mode earlier, but it declined after the coming of railways.

The inland water transport is a cheap, fuel-efficient, environment-friendly mode with a higher employment generation potential and is suitable for heavy and bulky goads. But, the share of inland water transport in total transport in India is only around I per cent.

**Potential und Actual Utilisation:**

In India, 14,500 km of river channels are navigable, of which 3,700 km are usable by mechanised boats. But actually, only 2000 km are used, Of the total canal length of 4,300 km in India, 900 km is navigable, but only 330 km is used.

**Pattern of Inland Water Transport:**

**Following are the important navigable waterways in India**:

1. Ganga-Bhagirathi (upper course of Hooghly)- Hooghly: This section has a gradual gradient and gentle flow, and is densely populated.

2. Brahmaputra and its tributaries

3. Deltaic courses of Mahanadi, Krishna and Godavari

4. Barak river (in the North-East)

5. Rivers of Goa-Mandovi and Zuari

6. Backwaters (kayals) of Kerala

7. Canals, such as (0) Buckingham canal-from Kommanur canal of Krishna Delta to Marakkanam (100 km south of Chennai), (ii) Cumbeijua canal links Mandovi and Zuari in Goa, (iii) Vedarraniyam canal-links Nagapattinam port with Vedarraniyam.

8. Lower reaches of Narmada and Tapti

9. Creeks of west-flowing rivers on the west coast, south of Mumbai, such as Kali, Sharavati and Netravati.

**Current Status of Intand Wafer Transport:** Presently, the inland water transport in India is restricted to following stretches and commodities:

: 1. Ganga-Bhagirathi-Hooghly stretch commodities, which are transported, include food- grains, coal, metal ores, fertilizers, textiles, sugar and also passengers.

2. Brahmaputra-Commodities like tea, jute, timber, rice, cdible oil, machinery and consumer goods are transported.

3. Krishna-Godavari delta

4. Backswaters of Kerala-commodities like coconut, coir fish, vegetables, timber, bricks and tiles are transported. Nearly 10 per cent of the total imports at the Cochin port are cleared through the waterways.

5. Rivers of Goa-the commodities being transported include iron ore (to the Marmagao port), manganese ore, fish, timber and coconut.

Nearly 16 million tonnes of cargo is moved by the inland waterways annually.

**Organisation:**

The Central Inland Water Transport Board formulates the policy for development of waterways. The Central Inland Water Transport Corporation is responsible for the development, maintenance and management of the goods traffic between Kolkata and Pandu (near Guwahati), between Kolkata and Karimganj (in Assam), between Kolkata and Bangladesh, and between Haldia and Patna.

A protocol under the trade agreement with Bangladesh allows the use of each other's waterways for Indo-Bangladesh commerce and for transit through Bangladesh. The third body, the Inland Waterways Authority of India (IWAI), is responsible for the development and maintenance of the National Waterways.

**In total, ten waterways have been identified to be declared as National Waterways, while the following four have actually been declared as National Waterways:**

1. Allahabad-Haldia stretch (1620 km)

2. Dhubri-Sadia stretch of Brahmaputra (891 km)

3. Kollam-Kottapuram stretch of the west coast canal (168 km)

4. The Champakara Canal in Kerala (14 km) There is a proposal to declare River Godavari, River Barak, and Goan Rivers as National Waterways.

The Central Water Commission, in a master plan, proposes to link the northern rivers With peninsular rivers for inland water transport and link Kolkata with Mangalore through a coastal system of waterways using existing canals, waterways, backwaters etc.

**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.

**ECONOMICS OF TRANSPOREAUON**

**UNIT-V**

**Introduction:**

**The air transport industry**: Air transport is one of the world's most important industries. Its development and its technical and service achievements make it one of the greatest contributors 10 the advancement of modern society.

Since the first jet airliner few in 1949, use of commercial aviation has grown more than seventy- fold. This growth is unmatched by any other major form of transport and is essential to economic progress.

Demand for air services increases the influence of air transport on the global economy, making possible the rapid movement of millions of people and billions of dollars' worth of goods to markets around the world.

The industry plays a decisive role in the work and leisure of millions of people. It promotes an improved quality of life and helps to improve living standards.

By facilitating tourism, air transport also helps generate economic growth and alleviate poverty - providing employment opportunities, increasing revenues from taxes and fostering the conservation of protected areas.

Air transportation is a major industry in its own right and it also provides important inputs into wider economic, political, and social processes. The demand for its services, as with most transport, is a derived one that is driven by the needs and desires to attain some other, final objective. Air transport can facilitate, for example, in the economic development of a region or ofa particular industry such as tourism, but there has to be a latent demand for the goods and services offered by a region or by an industry. Lack of air transport, as with any other input into the economic system, can stymie efficient growth, but equally inappropriateness or excesses in supply are wasteful.

Air transportation plays an integral role in our way of life. Commercial airlines allow millions of Americans every year to attend business conventions, go home for the holidays,take vacations around the globe, or travel to other important events. Air transportation also represents the fastest way to ship most types of cargo over long distances.

**Drivers of growth**: The demand for air transport has increased steadily over the years. Passenger numbers have grown by 45% over the last decade and have more than doubled since the mid-1980s. Freight traffic has increased even more rapidly, by over 80% on a tonne-kilometre performed basis over the last decade and almost three-fold since the mid-1980s, In 2004, the air transport industry carried 1,890 million scheduled passengers and 38 million tonnes of freight.

**Its rapid growth has been driven by a number of factors, including**:

• Rising GDP, disposable income, and living standards - increasing the demand for travel for both business and leisure purposes.

• Reduced air travel costs - improvements in airline efficiency and increased competition have. reduced world airfares by around 40% in real (i.e. inflation-adjusted) tenns since the mid- 1970s.

• Globalisation - the average distance travelled tends to increase as people take long-haul holidays and do business in countries which now have more favourable political and social environments.

• Deregulation - starting with the US domestic air market in the late 1970s, followed in the 1980s by the European Union (effectively completed in the Iate 1990s), with other regions deregulating gradually.

**The Basic Features of International Air Transportation:**

Air transport has always been seen to have an inherently strategic role. It has obvious direct military applications, but it is also highly visible and, for a period, and in some countries still, was seen as a "flag carrier", a symbol of international commercial presence. From its earliest days, airlines were seen as having potential for providing high-speed mail services, and subsequently medium and long-term passenger transport. Technology now allows the carriage of much larger cargo pay-loads in a more reliable way. These strategic functions were used to pursue internal national policies of social, political, and economic integration within large.

countires such as Canada, the US aid Australia, but also took on international significance from the 1930s within the Imperial geopolitical systems centered mainely on the UK,France, Germany and other European countries he technology allowed for intercontinental services be developed.

Air transport was highly regulated and protected in this environment with the intention of its being used as a lever for laver political and economic objectives But even in these roles, its importance, largely because of the technology until her World War II, was small. British Imperial Airways, for example, only carried about 50,000 passengers to the colonies in the 1930s; a figure hidden in the public media coverage given to the importance of colonial air networks. Technology shifts as an offshoot of miilitary developments in World War II changed this with the introduction of planes with far longer ranges, faster speeds, enhanced lift, and the increasingly ability to cope with adverse weather conditions. Air traffic control, navigation, communications, and airport facilities have also improved considerably, and more recently the underlying management structure of the supplying Industries has enhanced efficiency

The air transport industry is now large - it accounts for about 1% of the GDP of both the EU and the US - and is vital in many industries such as tourism, exotics, and hi-technology. It is an important transporter of high-value, low-bulk cargoes. International aviation moves about 40% of world trade by value, although far less in physical terms. The market is served by a diversity of carriers, some specializing in long-haul international routes and others in short-haul markets. Table 1 offers some indication of the scale of larger airlines involved. To handle the interface between land and air transport the worlds major airports have grown to handle millions of international passengers and tonnes of cargo each year, and many have been significant catalyst facilitating, in particular, the growth of modern hitechnology industries and tourism about them. In 2008, passenger air services globally link around 15,500 airports; with the fastest growth in air services over the past two decades being in the Europe-Asian Pacific markets.

Air transport is a vital component of many international logistics networks, essential to managing and controlling the flow of goods, energy, information and other resources like products, services, and people, from the source of production to the marketplace. It is difficult or nearly impossible to accomplish any international trading, global export/import processes without a professional logistical support.

It involves the integration of information, transportation, inventory, warehousing, material handling, and packaging These are some of the Air Cargo Airlines Air Hang Kong. Alaska Central Exrpress, FedEx Express, DHL(European Air Transport), East Air Cargo, MAS Cargo

Air Cargo definitely generated and benefit Air Transportation economy in the world with it services in every aspect.

**Types of Air Services**

1. Scheduled Air Transport Service- means an airtransport service undertaken between the two or more places and operated according to a published time table or with flights so regular or frequent that they constitute a recognisably systematic series.

2. Nan-Scheduled Operation- It includes services other than scheduled air transport tervice. Eg charter basis and/or non-scheduled basis The operator is not permitted to publish time schedule and issue tickets to passengers

3. An air cargo service means air transportation of cargo and mail. Passengers are not permitted to be on these operations. It may be on scheduled or non-scheduled basis.

**Fares**:

The restrictive bilateral ASAS that typified the institutional structure of international airline markets before the advent of Open Skies manifestly had a number of adverse effects on the efficiency of supply and, specifically, on the levels of benefits society could reap from air travel, These effects are not easy to isolate and to completely quantify in a simple way, but Figure 3 offers a general representation of this issues that are involved, In particular, it highlights the potential fare- and output-implications of the various types of regulatory regimes that have been common in the past and are gradually emerging as globalization is taking place.

In practice, fares tended to reflect the bargaining power of the parties and the objectives of the countries overall approaches to the airlines market. Continental European countries have had a long tradition of supporting their flag-carriers for a variety of reasons that are linked to their perceptions of their national interest. In some cases, the fares may have been below the level required for cost recovery, whilst in others it may have been higher if, for example, one partner sought to cross-subsidize domestic services.

Air transport provides significant social benefits Air transport improves quality of life by broadening peoples leisure and cultural experiences provides a wide choice of holiday destinations around the world and an affordable means to via distant friends and relatives.

\* Air transport helps to improve living standard and alleviate poverty, for instant through tourism.

\* Air transport may provide the only transportation means in remote areas, thus promoting social inclusion.

Air transport contributes to sustainable development. By facilitating tourism and trade, it generates economic growth, provides jobs, increases revenues from taxes. and fosters the conservation of protected areas.

• The ait transport network facīlitates the delivery of emergency and humanitarian aid relief anywhere on earth, and ensures the swift delivery of medical supplies and organs for transplantation.

**The economic benefits of air transport:**

The air transport industry has a substantial economic impact, both through its own activities and as an enabler of other industries. Its contribution includes direct, indirect and induced impacts, which are related to the total revenues of the air transport industry. The catalytic impacts of the industry are "spin-off" effects on other industries.

**Direct impacts**:

These cover employment and activíty within the air transport industry including airline and airport operations, aircraft maintenance, air traffic control and regulation, and activities directly serving air passengers, such as check-in, baggage-handling, on-site retail and catering facilities. Not all of these activities necessarily take place at an airport, with some taking place at head office. Direct impacts also include the activities of the aerospace manufacturers selling aircraft and components to airlines and related businesses.

Of the 5 million direct jobs generated by air transport industry worldwide. 4.3 million people are employed by the airlines and airports (aviation sector) globally, contributing around USS 275 billion of GDP to the global economy. This is as large a world industry as the pharmaceuticals sector.

**The breakdown of the S million direct Jobs s as follows:**

• The civil aerospace sector (manufacture of aircraft systems, frames and engines, etc.) employed 730,000 (14% of total direct jobs) people in 2004.

An estimated 2.1 million people (or 41%) work for airlines or handling agents (e.g. as flight crew, check-in staff, maintenance crew, etc.).

• Around 330,000 people (7%) work directly for airport operators (e.g. in airport management, maintenance, security, etc.)

• A further 1.9 million (38) work en-site at airports in retail outlets, restaurants, hotels, etc.

**Indirect impacts**

These include employment and activities of suppliers to the air transport industry, for example, jobs linked to aviation fuel suppliers; construction companies that build additional facilities; the manufacture of goods sold in airport retail outlets, and a wide variety of activities in the business services sector (call centers, IT, accountancy, etc.).

5.8 million indirect jobs are supported through purchases of goods and services by companies in the air transport industry. Examples include jobs in the energy sector generated through the purchase of aircraft fuel; employment in the IT sector providing computer systems for the air transport industry; or the workers required to manufacture retail goods. The contribution of these indirect jobs to global GDP is USS 375 billion.

**Induced impacts**

These include spending by those directly or indirectly employed in the air transport sector that supports jobs in industries such as retail outlets, companies producing consumer goods and a range of service industries (e.g. banks, restaurants, etc.).

**Air transport provides vital economic benefits:**

Aviation provides the only worldwide transportation network. Which makes it essential business and tourism it plays a role in facilitating economic growth, particularly in developing countries

• Aviation transports close to 2 billion passengers anaully and 40% of interregional exports of goods (by value). - 40% of international tourists now travel by air

• The air transport industry generates a total of 29 million jobs globally (through direct indirect, induced and catalytic impacts)

• Aviation's global economic impact (direct, indirect, induced and catalytic) is estimated at US$ 2,960 billion, equivalent to 8% of world Gross Domestic Product (GDP)

• The world's 900 airlines have a total fleet of nearly 22.000 aircraft. They serve some.1.670 airports through a route network of several million kilometres managed by around 160 air navigation service providers

• 25% of all companies' sales are dependent on air transport. 70% of businesses report that serving a bigger market is a key benefit of using air services.

Air transport is a highly efficient user of resources and infrastructure

· Aviation boasts high occupancy rates of 65 to 70%- which is more than double those of road and rail transportation.

• Air transport entirely covers its infrastructure costs. Unlike road and rail, it is a net contributor to national treasuries4 through taxation.

• Modern aircraft achieve fuel efficiencies of 3.5 litres per 100 passenger-km or 67 passenger- miles per US gallon. The next generation aircraft (A380 & B787) are targeting an efficiency of less than 3 litres per 100 passenger-km or 78 passenger-miles per US gallons, which exceeds the efficiency of any modern compact car on the market.