

# Dr. ZAKIR HUSAIN COLLEGE,ILAYANGUDI

## PG DEPARTMENT OF MATHEMATICS

### PROJECT TITLE:

Unlocking Insights into the global Air Transportation Network

*Submitted by:*

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## 1.INTRODUCTION

### 1.1.Overview

The right data, harnessed in the right way, can deliver actionable insights that are truly transformative for decision-making, efficiency and smooth passenger-focused delivery of services. Jim Peters, Chief Technology Officer at SITA, reveals how big data is beginning to deliver real value in the air transport industry.

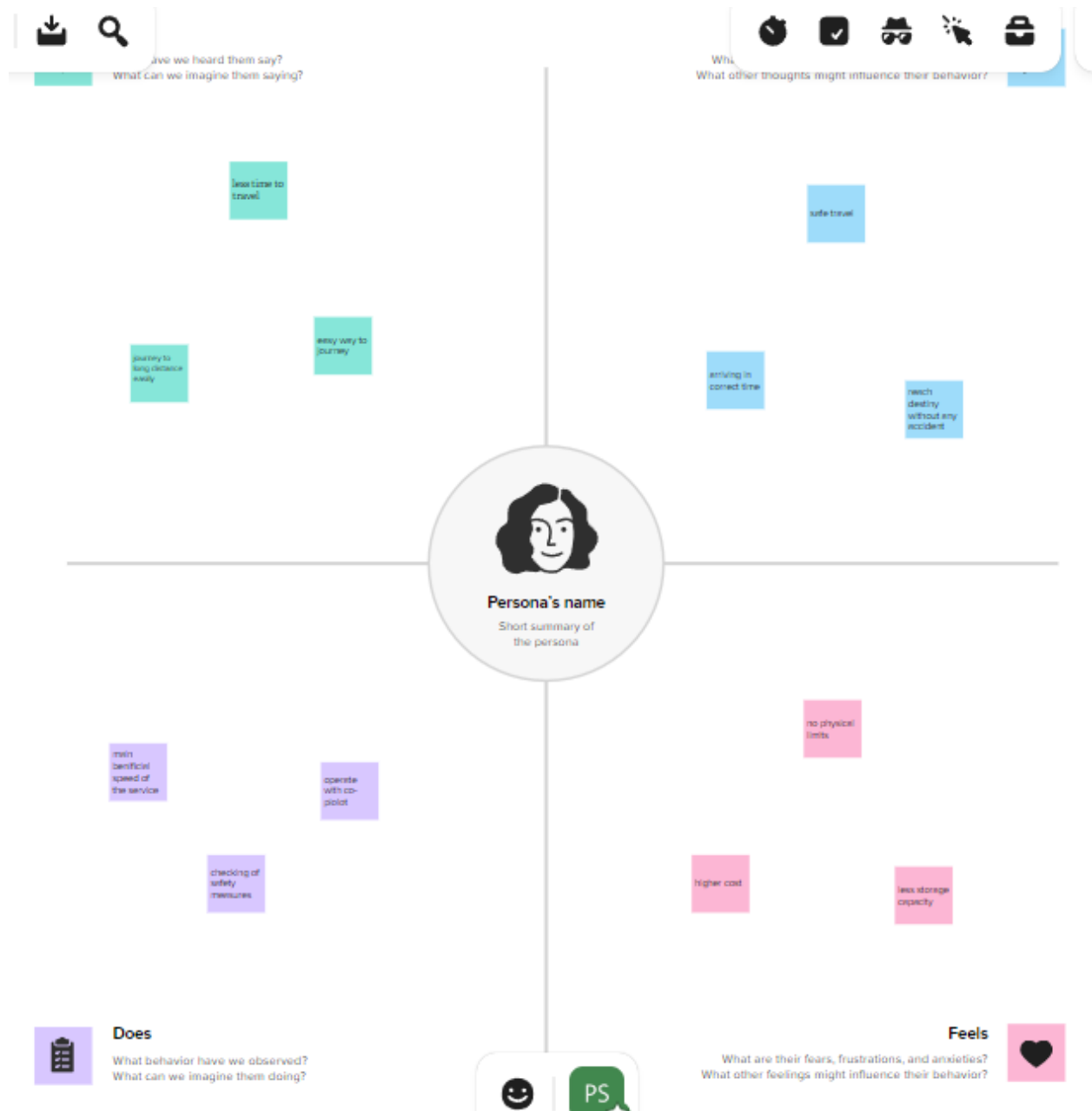
### 1.2. Purpose

As passenger volumes increase faster than new airports or terminals can be built, demand is placed on airport management for more complex and timely decisions. Costs must be controlled, productivity must be improved and security enhanced. And all of this must be done at the same time as meeting the increased expectations of passengers for smooth and efficient services which ensure hassle-free travel.

BI tools – such as SITA's Day of Operations BI – are becoming central to that delivery.

## 2. PROBLEM DEFINITION AND DESIGN THINKING

### 2.1. EMPATHY MAP:



## 2.2 IDEATION AND BRAINSTORMING MAP:

### Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

**Problem Statement:**

How can we help people who are struggling to find a job in the current market?

**Brainstorming Ideas:**

- Idea 1: Create a job board that lists remote work opportunities.
- Idea 2: Develop a mentorship program where experienced professionals help newcomers.
- Idea 3: Offer online courses and workshops to help people gain new skills.
- Idea 4: Create a network of local businesses that can provide internships or part-time jobs.
- Idea 5: Develop a mobile app that alerts users to new job openings in their area.
- Idea 6: Create a community of freelancers who can take on short-term projects.
- Idea 7: Offer career counseling and resume writing services.
- Idea 8: Create a platform where people can find temporary or gig work.

### Group Ideas

Now it's time to share your ideas with others and see if you can find a solution that everyone likes. Write down the ideas that you like best and see if you can find a way to combine them.

10 minutes

**Group Ideas:**

- Idea 1: Create a job board that lists remote work opportunities.
- Idea 2: Develop a mentorship program where experienced professionals help newcomers.
- Idea 3: Offer online courses and workshops to help people gain new skills.
- Idea 4: Create a network of local businesses that can provide internships or part-time jobs.
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- Idea 6: Create a community of freelancers who can take on short-term projects.
- Idea 7: Offer career counseling and resume writing services.
- Idea 8: Create a platform where people can find temporary or gig work.

### Size

Now it's time to think about the size of your idea. How many people will it help? How much money will it cost? How much time will it take to build? Write down your answers.

10 minutes

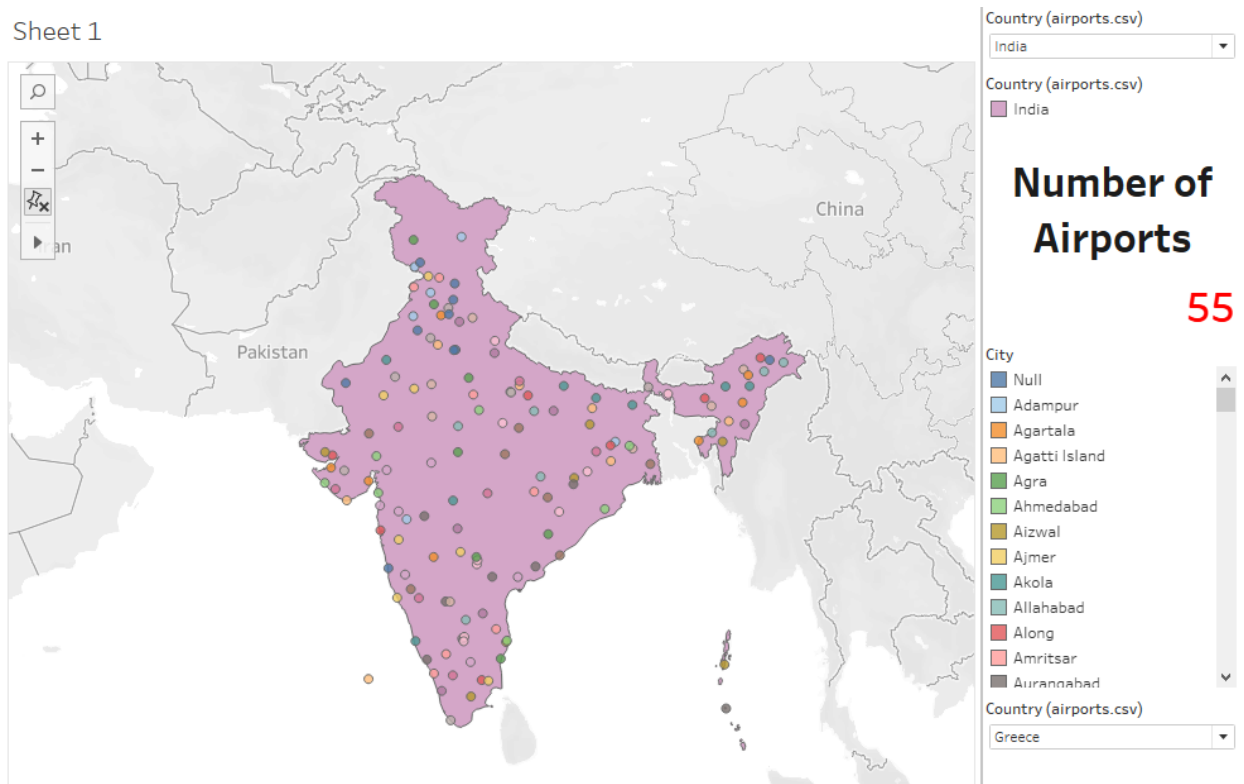
**Size:**

- Idea 1: Create a job board that lists remote work opportunities. (10 people, \$100, 10 days)
- Idea 2: Develop a mentorship program where experienced professionals help newcomers. (10 people, \$100, 10 days)
- Idea 3: Offer online courses and workshops to help people gain new skills. (10 people, \$100, 10 days)
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- Idea 8: Create a platform where people can find temporary or gig work. (10 people, \$100, 10 days)

### 3. RESULT:

#### DASHBOARDS AND STORIES:

Sheet 1



Airlines within a country

Airline ID	Name	Icao	Callsign	
218	Air India Limited	AIC	AIRINDIA	■
241	Air Sahara	RSH	SAHARA	■
569	Air India Express	AXB	EXPRESS I..	■
1026	Alliance Air	LLR	ALLIED	■
1370	Blue Dart Aviation	BDA	BLUE DART	■
2001	Deccan Aviation	DKN	DECCAN	■
2575	Go Air	GOW	GOAIR	■
2634	Gujarat Airways	GUJ	GUJARAT..	■
2850	IndiGo Airlines	IGO	IFLY	■
2851	India International Airways	IIL	INDIA INT..	■
2852	Indian Air Force	IFC	INDIAN AI..	■
2853	Indian Airlines	IAC	INDAIR	■
3000	Jet Airways	JAI	JET AIRW..	■
3142	Kingfisher Airlines	KFR	KINGFISH..	■
3907	Paramount Airways	PMW	PARAWAY	■
3918	Pawan Hans	PHE	PAWAN H..	■
4375	Spicejet	SEJ	SPICEJET	■
13105	Air India Regional	\N	ALLIED	■
13106	MDLR Airlines	\N	MDLR	■
13107	Jagson Airlines	JGN	JAGSON	■
13905	Skyline nepc	\N	Null	■
16327	Indya Airline Group	IG1	Indya1	■
16362	OCEAN AIR CARGO	IXO	Null	■
16738	NEPC Airlines	\N	Null	■
16901	12 North	N12	12N	■
19451	Air Costa	\N	Null	■
20264	Air Vistara	VTI	Null	■
20286	Air Pegasus	PPL	Null	■

Active

☒ (All)  
☒ N  
☒ Y

Country

India

Active

☒ N  
☒ Y

Number of Airlines

15

## Airports at higher altitude within a country

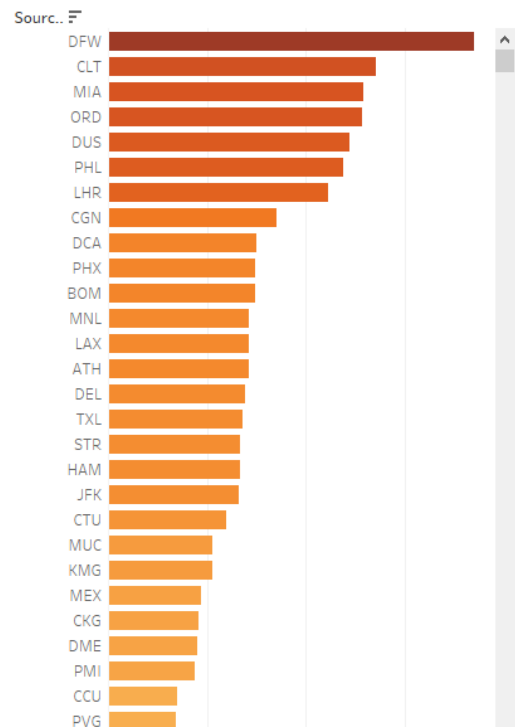
index no.	Name (airports.csv)	City	ICAO (airports.csv)	
1	Adampur Airport	Adampur	VIAX	775
	Agartala Airport	Agartala	VEAT	46
	Agatti Airport	Agatti Island	VOAT	14

Country (airports.csv)

## Airports at Highest Altitude in World

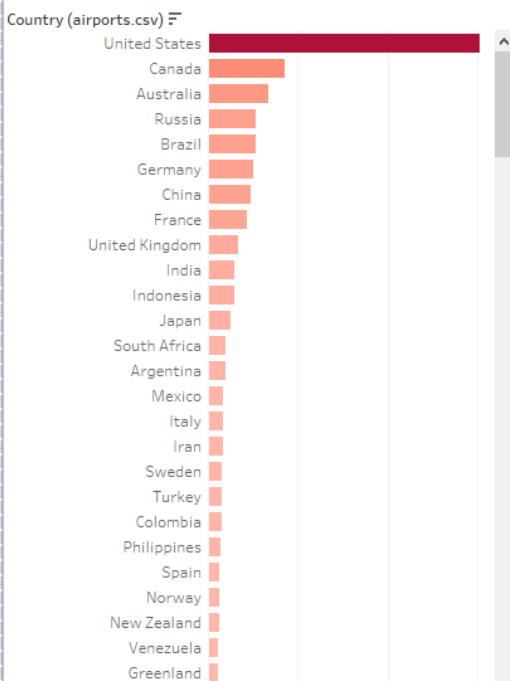
Name (airports.csv)	City	ICAO (airports.csv)	
<b>Daocheng Yading Airport</b>	Daocheng	ZUDC	14,472
<b>Qamdo Bangda Airport</b>	Bangda	ZUBD	14,219
<b>Kangding Airport</b>	Kangding	ZUKD	14,042
<b>Ngari Gunsa Airport</b>	Shiquanhe	ZUAL	14,022
<b>El Alto International Airport</b>	La Paz	SLLP	13,355
<b>Capitan Nicolas Rojas Airport</b>	Potosi	SLPO	12,913
<b>Yushu Batang Airport</b>	Yushu	ZYLS	12,816

## Number of Flights from Airport

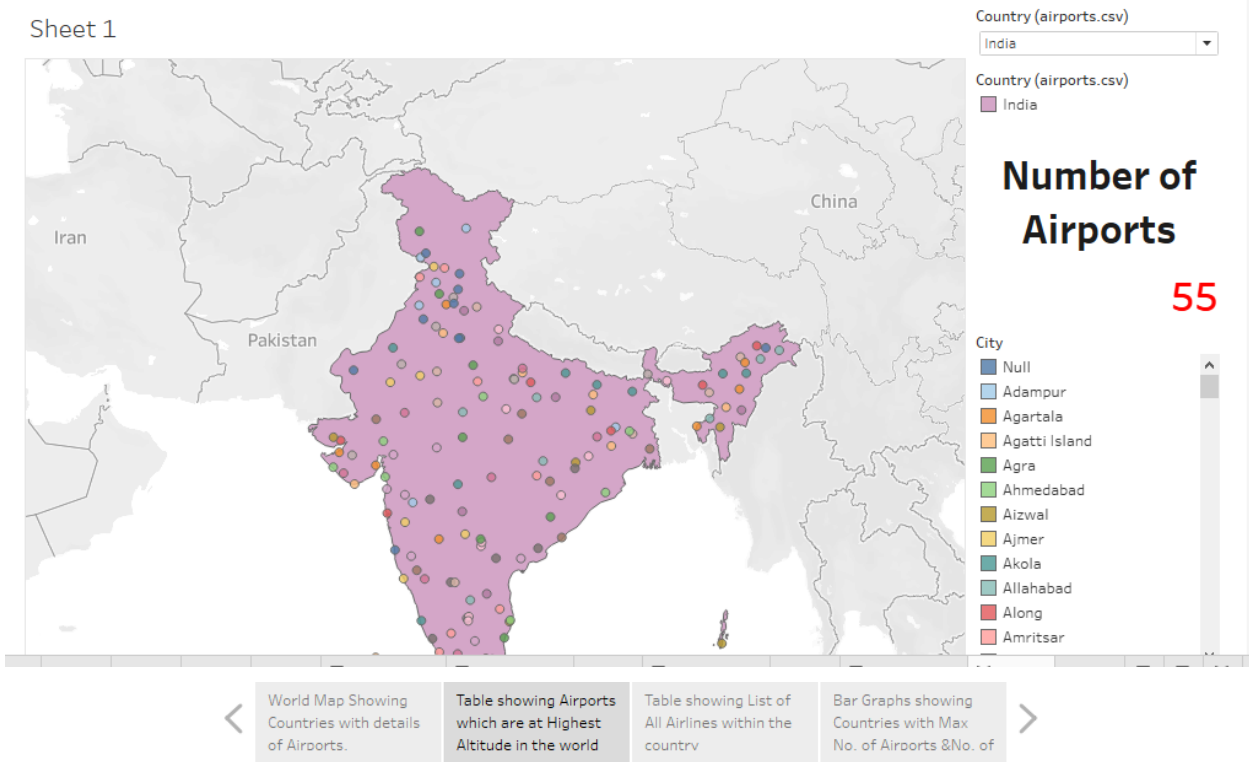


## Country with Maximum Number of Airports

Count of airports.csv  
0 185



Sheet 1



Airports at higher altitude within a country

Country (airports.csv)

India

Index no.	Name (airports.csv)	City	ICAO (airports.csv)	
1	Adampur Airport	Adampur	VIAX	775
	Agartala Airport	Agartala	VEAT	46
	Agatti Airport	Agatti Island	VOAT	14

Airports at Highest Altitude in World

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13905	Skyline nepc	\N	Null	■
16327	Indya Airline Group	IG1	Indya1	■
16362	OCEAN AIR CARGO	IXO	Null	■

Active

☒ (All)
 ☒ N
 ☒ Y

Country

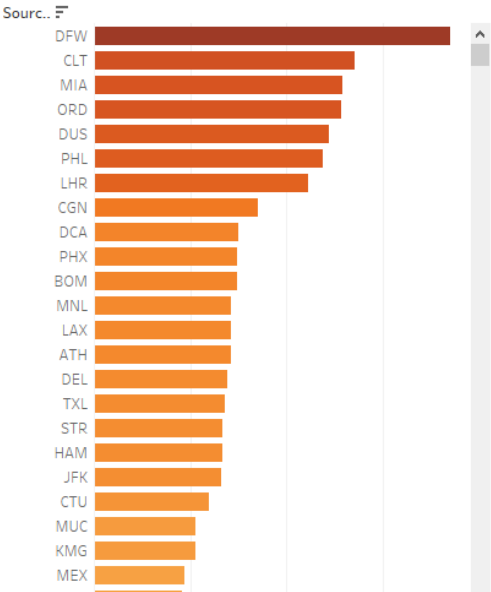
India

Active

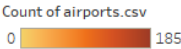
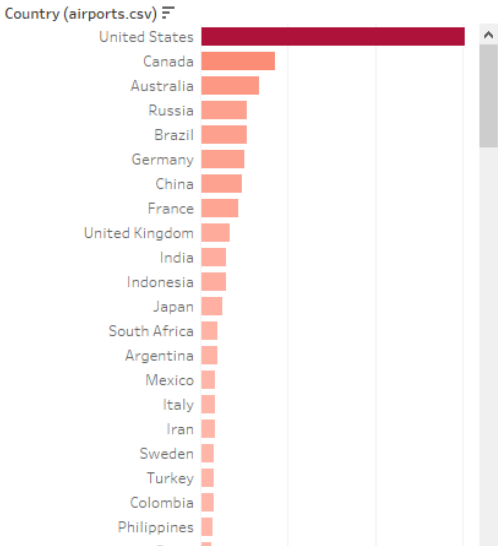
☒ N
 ☒ Y

Number of Airlines

Number of Flights from Airport



Country with Maximum Number of Airports



#### 4. ADVANTAGES AND DISADVANTAGES:

##### Advantages of Air Transportation:

### Fast delivery times

Undoubtedly, one of the most advantageous features offered by air transport is its **speedy delivery times**.

**There is no faster transport service than air transport.** In addition, the frequency of flights makes delivery times very frequent and fast.

### No Physical Limits

Air transport is the only means of transportation that **does not support physical limits**. Road transport, for example, must undergo different physical constraints that slow down delivery times.

It is one of the means of transportation that offers practically no interruption in its services, which is very attractive for companies.

### Very reliable transportation

One of the great advantages of air transport for both passengers and goods is its great **reliability**.

Delays in delivery dates or loss of goods are options that can be very difficult to achieve with this means of transport.

### Long Distances

No other means of transport in the logistics sector can **cover** such **long distances** as air transport. This is a **great advantage for international trade**, being able to cover long distances, impossible for road or sea transport.

## Disadvantages of Air Transportation:

Although the advantages of air transport are very attractive and define a totally unbeatable type of service, it is also possible to define a series of disadvantages that should be analyzed to determine whether air transport is appropriate or whether it is preferable to consider other types of transport, such as **sea transport**.

### **Higher Cost**

There is no doubt that air transport is the least economical means of transportation compared to other types of transport.

The cost of infrastructure, fuel... makes air transport economically superior to other alternatives.

It is important to know how to analyze and calculate the economic and logistical performance to know if it is the ideal option to be used.

### **Less storage capacity**

Storage capacity is lower than land and sea transport. This is a clear disadvantage, air transport is ideal for medium or low loads, but is not so attractive for large volumes of goods.

### **Restrictions on goods**

Air transport, due to its specific characteristics, cannot carry certain products or goods. It suffers from certain restrictions, especially in liquid products such as petroleum, oils, etc...

## **5.APPLICATIONS:**

Air transport is currently used in almost all industrial sectors and distribution chains. Most companies use air transport to market goods and products internationally or to deliver samples and documents related to foreign trade operations.

### **Air transport today**

Currently, all countries have different airports. With the tourism boom and the search for new experiences, this sector found a niche in which to grow. In fact, it is one of the means of transport most used by passengers during their vacation periods and to go to business appointments.

However, as a consequence of the agility and speed it generates, it is also being used more and more as a means of transporting goods. It has even become the preferred means of transport for sending specific, high-cost or urgently received products.

### **Air transport in logistics**

Air logistics has become an almost indispensable element of foreign trade both due to the high value of some goods and the immediacy of delivery demanded by end customers.

The use of this type of transport works best for perishable or very high value products, which require a quick replenishment and those whose buyers demand an urgent delivery.

In recent years, the rise of e-commerce has increased the demand for air service as consumers have become demanding with delivery times and security, and their satisfaction has become an element of competitiveness for companies.

# Types of air transport

Many types of classifications can be established around air transport, from the most general ones that can distinguish, for example, the different means of air transport (helicopter, plane, airship, hot air balloon, plane, etc.) to more specific ones, which classify types of air transport according to the type of cargo moved. In this case, three large groups are distinguished:

- Mixed aircraft: carry passengers in the cabin and goods in the hold. The best known are those built by Airbus and Boeing.
- Cargo planes: transport exclusively goods.
- Super transports: aircraft designed to transport large goods.

## 6. CONCLUSION:

The importance of air transport lies in its ability as an economic engine to generate and support jobs, strengthen trade and connectivity between people and countries, promote tourism, and connect remote communities.

The undoubted economic and social benefits of aviation are clear, with the growth of the sector being important for all countries, developed and developing. However, these benefits also come at an environmental cost. For aviation to grow sustainably, it is vital that the industry balance the benefits of air travel growth with the responsibility to take action on climate change.

Air connectivity also enables social connection and inclusion and the promotion of the exchange of knowledge and ideas. In the same way, it encourages increased productivity, improved efficiency and favors innovation.

It is estimated that the commercial aviation sector is responsible for 2% of the greenhouse gases generated by human activity that are released into the atmosphere and 3% if other polluting gases are included.

This impact will increase over the years. According to Airbus forecasts, the number of passenger aircraft in 2034 will double that of 2014, reaching 35,749 units (of which more than 31,000 have not yet been built).

## 7.FUTURE SCOPE:

Mobility and its pillars of transport (air, inland and maritime) are at the very center of our socio-economic fabric. They underpin social connections and facilitate access to goods and services, including trade, jobs, health care and education. In today's world, mobility by air, road and water is all about efficiencies, speed, interconnectivity and accessibility by all. However, this raises the issue about sustainability. The UN predicts that by 2050 two thirds of the world population will live in cities<sup>1</sup>. How can we adapt and enhance today's already-stretched mobility system for it to respond to our expectations and increased demands? How can mobility be reinvigorated for it to be sustainable and support the 2030 Agenda of Sustainable Development and its 17 Sustainable Development Goals (SDGs)?

For a start, mobility actors should come together in a shared vision. This is where the World Bank-led Sustainable Mobility for All (SuM4All) steps in. For the first time ever, the SuM4All provides the transport sector and its modes of transport with the opportunity to speak with one voice and jointly unpack a Roadmap of Actions that is tailored to countries and cities to implement on a voluntary basis. The SuM4All includes all modes of transport, including aviation.

We also see that the aviation is becoming more accessible to the global population. This figure shows for each country, what percentage of the population lives within 100 km of an airport.

World wide – 51% of the population lives within 100 km of an International Airport – and 74% live within 100 km of any kind of airport.

So airspace is quickly becoming congested and air traffic is slated to double over the next two decades.

In addition to air space – we have to consider airports themselves. Airports are already built up around population centres and are already operating at high capacity.

