GOPALAN COLLEGE
OF ENGINEERING AND MANAGEMENT
WHITEFIELD, BANGALORE

Department of
Aeronautical Engineering
GCEM, Bangalore

Course Title : AVIATION MANAGEMENT

Course Code: 21AE61

Module - 1

Suprith M, Dept. of Aeronautical Engineering, GCEM.

Airline Management

Overview:

- The complex business of running an airline involves much more than just flying passengers between destinations.
- Key aspects include:
  - Network planning and scheduling flights
  - Maintaining aircraft
  - Staffing (pilots, cabin crew, ground staff)
  - Customer service
  - Airfare pricing and revenue management

Airline Management

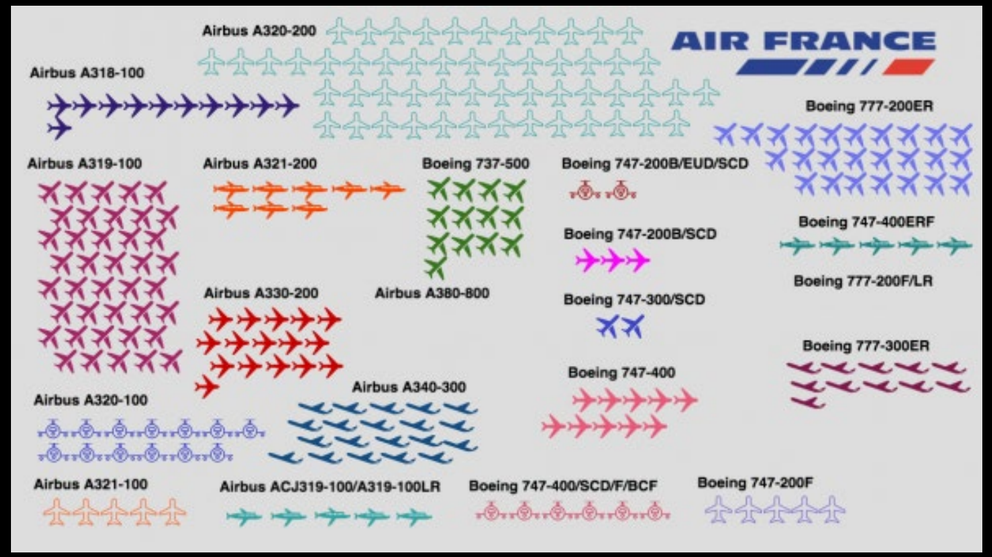
Network Planning and Scheduling:

- Decisions on routes, frequencies, aircraft types
- Factors to consider:
  - Passenger demand between cities (business vs. leisure travel)
  - Airport capacity and slot availability
  - Competition from other airlines
  - Hub-and-spoke vs. point-to-point models.

Airline Management

Fleet Management:

- Choosing the right aircraft types for different routes
- Factors to consider:
  - Passenger capacity and cargo space
  - Range (distance an aircraft can fly)
  - Operating costs (fuel efficiency, maintenance)
  - Matching aircraft size with passenger demand on a route



Airline Management

Staffing:
•Pilots, cabin crew, ground staff (operations, maintenance, baggage handling)
•Training, regulations, and safety procedures

Customer Service:
•Reservations, ticketing, check-in, baggage handling
•In-flight experience
•Passenger communication during disruptions

Airline Management

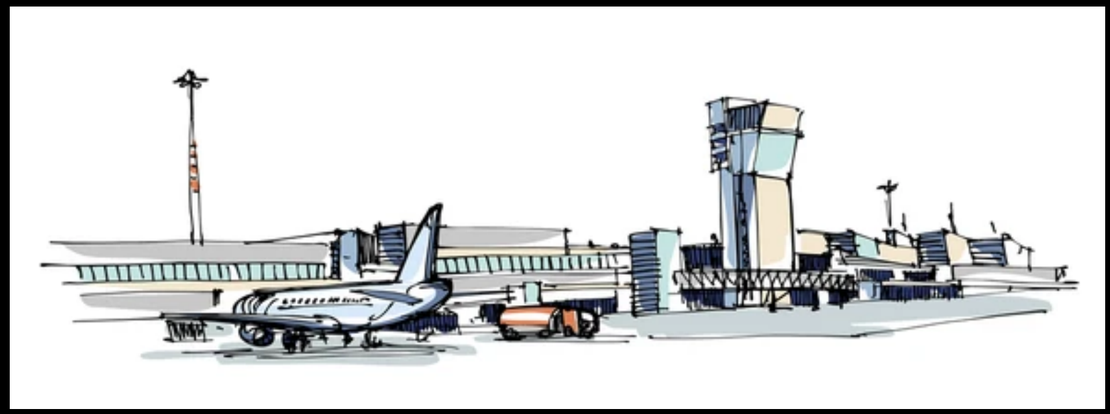
Revenue Management:

- Setting optimal airfare prices to maximize revenue
- Yield management - considering factors like demand, competition, and travel dates

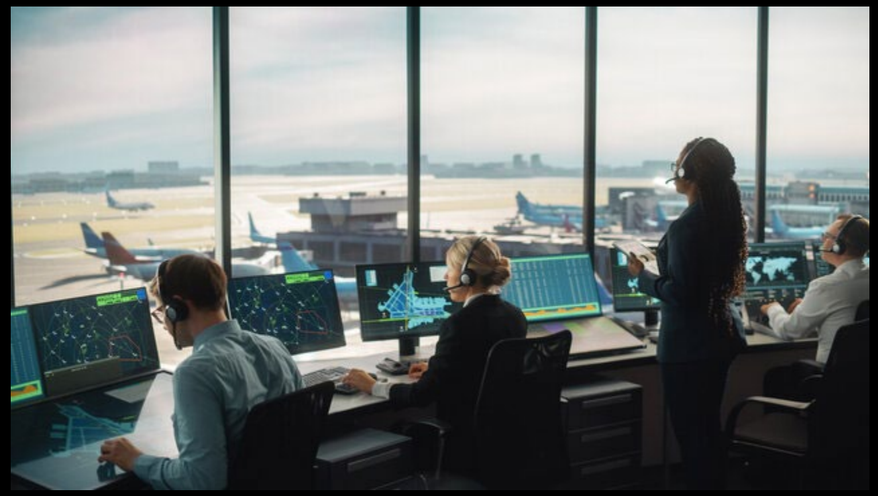
Airport Management

Overview:

- Efficient operation of airports to ensure smooth flow of air traffic and passenger movement.
- Key areas of responsibility:
  - Runway and airspace management
  - Terminal operations (gates, baggage claim)
  - Safety and security
  - Ground handling services for airlines
  - Maintenance and development of airport infrastructure



Airport Management

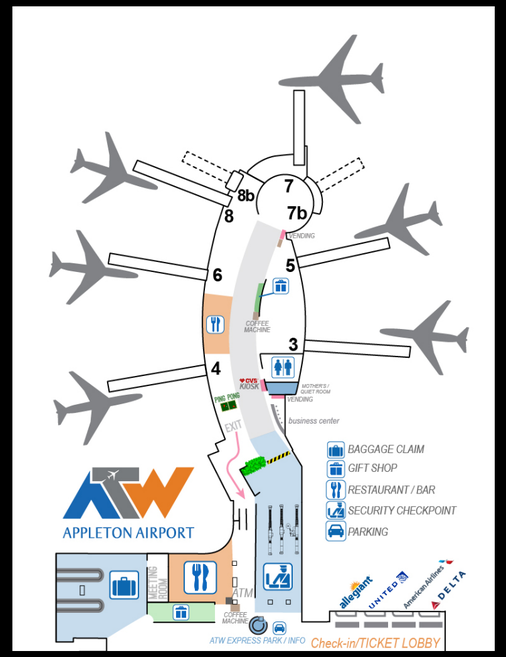


Air Traffic Control (ATC):

- Guiding aircraft safely and efficiently through controlled airspace
- Managing takeoff, landing, and taxiing movements.

Terminal Operations:

- Gate allocation, scheduling arrivals and departures
- Passenger check-in, security screening, and boarding
- Baggage handling and delivery systems

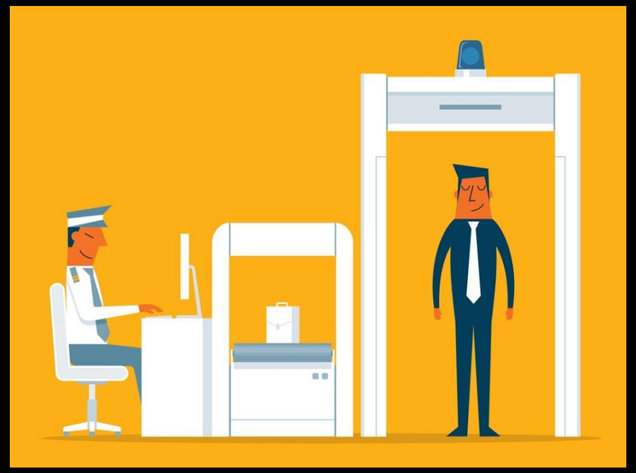


Airport Management

Safety and Security:

•Ensuring compliance with safety regulations

•Security measures for passengers, baggage, and cargo



Ground Handling Services:

- Providing services to airlines at the airport, such as:
  - •Aircraft towing and pushback
  - •Cargo handling
  - •Passenger services (e.g., wheelchairs, assistance for disabled passengers)

Airport Management

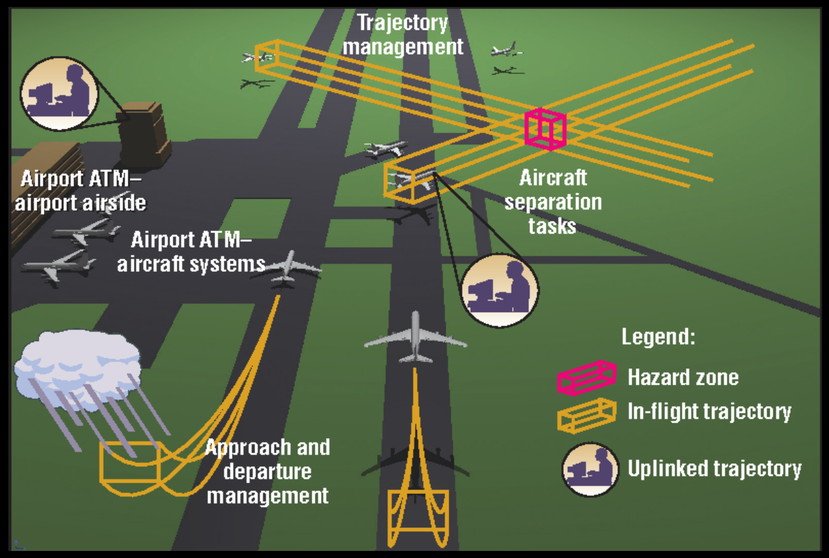
Airport Infrastructure:

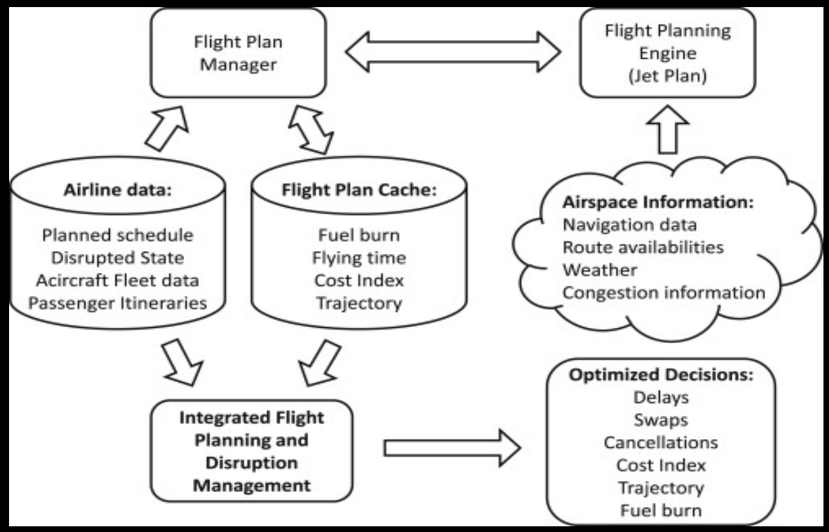
- Maintaining runways, taxiways, and terminals
- Planning for future growth and passenger demand

Airline Operation and Scheduling

Flight Planning:

- Determining the most efficient route for a flight considering factors like:
  - •Weather conditions
  - •Fuel efficiency
  - •Air traffic control restrictions
  - •Cost of overflying certain countries





Airline Operation and Scheduling

- **Crew Scheduling:**

•Assigning pilots and cabin crew to flights based on qualifications, duty hours, and regulations

- **Maintenance Planning:**

•Scheduling regular maintenance checks for aircraft to ensure safety and airworthiness

- **Dispatch:**

•The final authorization for a flight to depart, considering all operational factors

- **Schedule Disruptions:**

•Developing contingency plans for handling delays, cancellations, and other

Airline and Airport Data Analysis for Business Decisions

Data Analysis Techniques:

Traffic data: Analyse passenger numbers, cargo volume, origin-destination pairs, to identify popular routes, under-served markets, and potential for new routes.

Pricing data: Analyse ticket prices, fuel costs, competitor pricing, to optimize pricing strategies, maximize revenue, and identify opportunities for discounts or promotions.

Operational data: Analyse on-time performance, delays, cancellations, maintenance records, to improve operational efficiency, reduce costs, and enhance customer satisfaction.

Market data: Analyse economic trends, demographics, travel patterns, competitor analysis, to understand market demand, identify new customer segments, and develop targeted marketing campaigns.

Airline and Airport Data Analysis for Business Decisions

Business Applications:

- **Network planning:** Decide which routes to offer, flight frequencies, aircraft types, based on traffic demand and profitability analysis.
- **Yield management:** Optimize ticket pricing based on real-time demand, competitor pricing, and customer segmentation to maximize revenue per seat.
- **Resource allocation:** Allocate staff, ground handling equipment, and aircraft resources efficiently across airports and routes.
- **Customer relationship management:** Analyze customer behavior and preferences to personalize offers, improve loyalty programs, and enhance customer experience.

Airline and Airport Data Analysis for Business Decisions

Benefits:

- **Improved decision-making:** Data-driven insights to support strategic planning, resource allocation, and operational improvements.
- **Increased profitability:** Optimize pricing, reduce costs, and identify new revenue opportunities.
- **Enhanced customer satisfaction:** Improved on-time performance, targeted marketing, and personalized travel experiences.
- **Competitive advantage:** Gain insights into market trends and competitor behavior to develop effective strategies.

Economic Analysis for Business Decisions

Economic Concepts:

- **Cost analysis:** Identify and categorize airline and airport costs (fixed, variable, marginal) to understand cost structure and optimize resource allocation.
- **Demand analysis:** Analyze factors affecting travel demand (income, fuel prices, economic conditions) to forecast future passenger numbers and cargo volume.
- **Market competition:** Analyze competition from other airlines, low-cost carriers, and alternative transportation modes (e.g., trains) to develop competitive strategies.
- **Economic impact assessment:** Analyze the economic contribution of airlines and airports to the local and national economy (jobs, tourism, GDP).

Economic Analysis for Business Decisions

Business Applications:

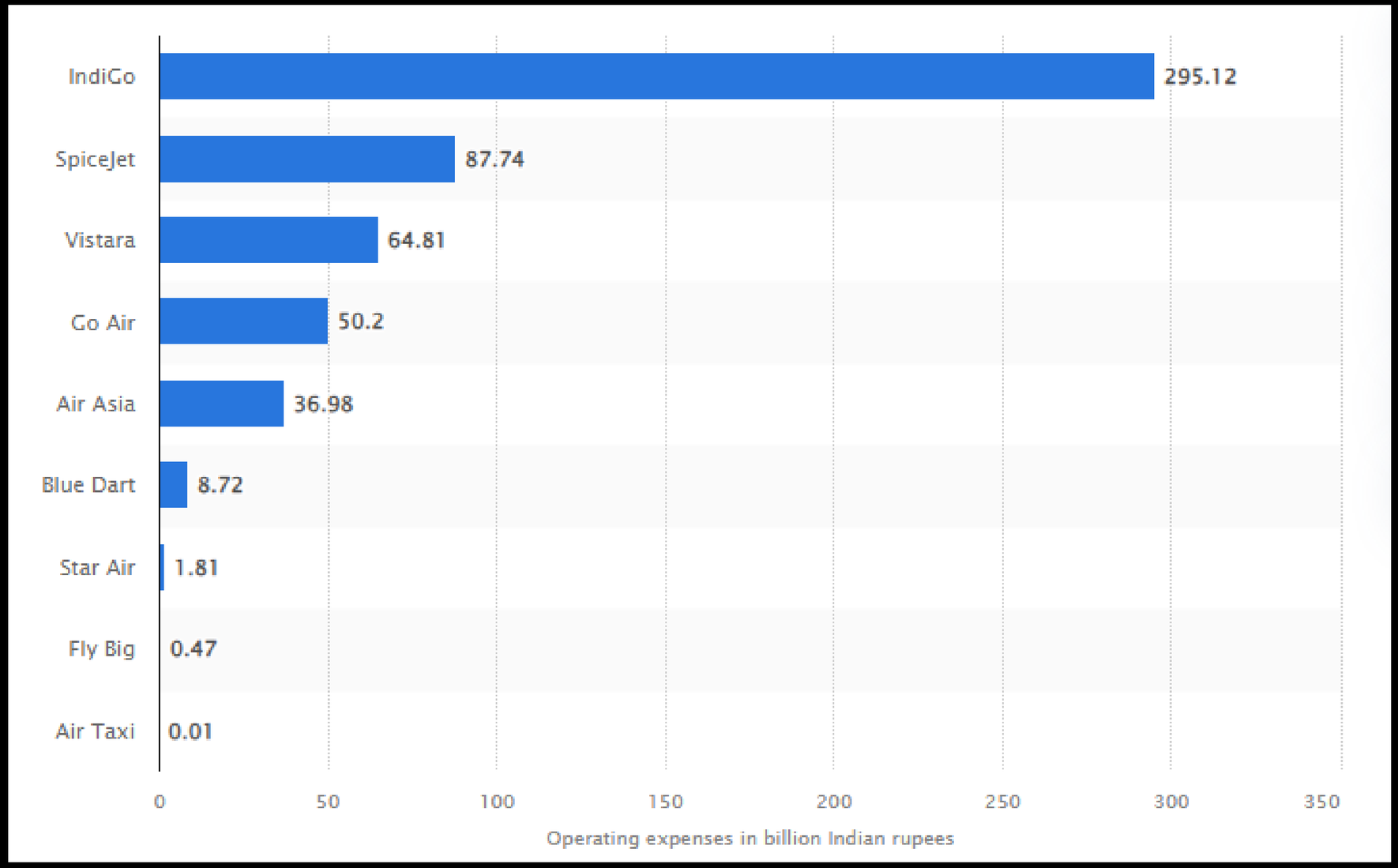
- **Investment decisions:** Evaluate the economic viability of new routes, aircraft purchases, airport expansions, based on cost-benefit analysis and risk assessment.
- **Mergers and acquisitions:** Analyze the economic benefits and potential risks of mergers and acquisitions with other airlines or airports.
- **Government regulations:** Analyze the economic impact of government regulations on air travel (e.g., taxes, environmental regulations) to inform policy decisions.
- **Negotiations:** Strengthen negotiation positions with airports (landing fees, gate access), suppliers (fuel contracts), and labor unions (wages, benefits) through economic data and analysis.

Economic Analysis for Business Decisions

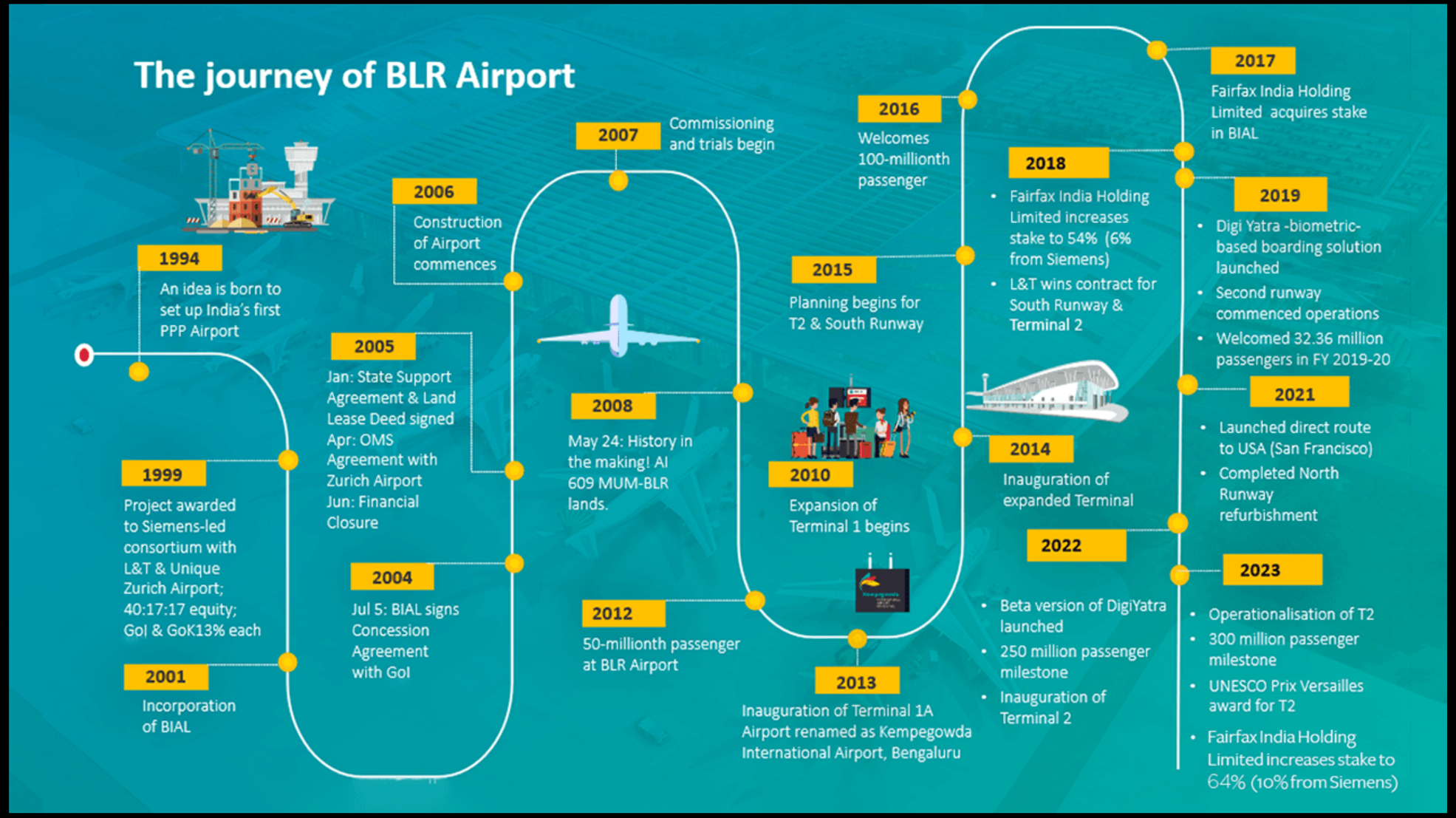
Benefits:

- **Informed decision-making:** Economic analysis provides a foundation for making strategic decisions based on financial viability and long-term impact.
- **Risk mitigation:** Identify and assess potential economic risks associated with business decisions.
- **Increased profitability:** Optimize resource allocation, pricing strategies, and investments based on economic principles.
- **Competitive advantage:** Gain a deeper understanding of the economic forces shaping the airline and airport industries.

Operating expenses of Indian domestic private airlines in financial year 2022

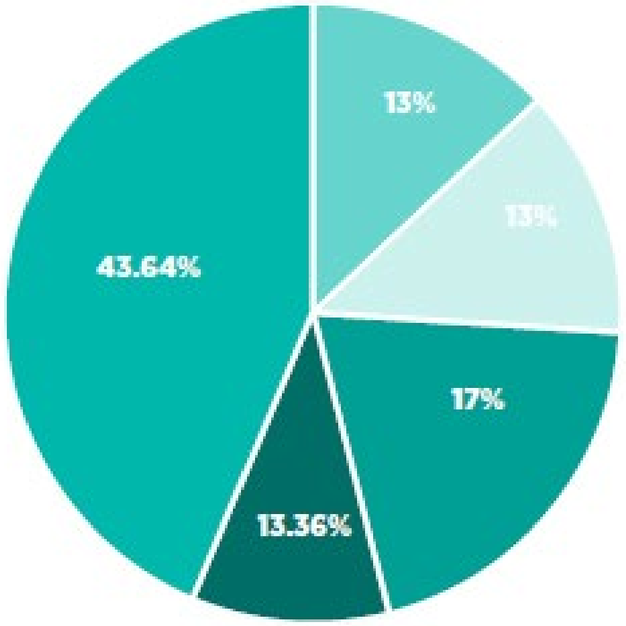


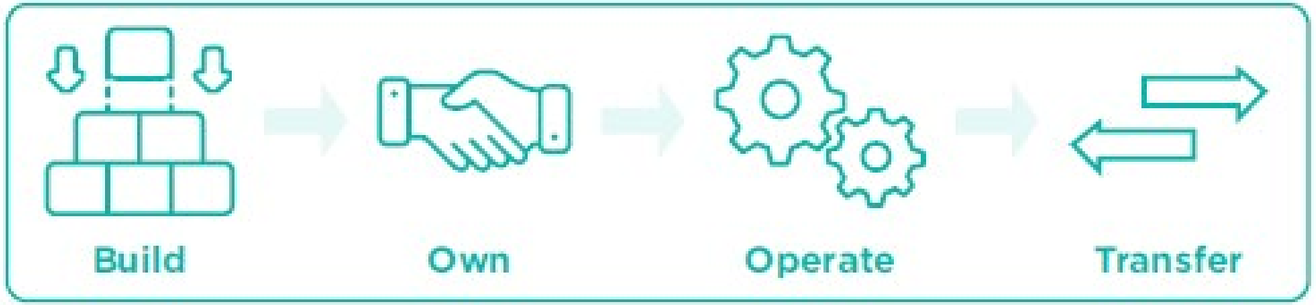
Bengaluru Airport History



Bengaluru Airport History

Shareholding Pattern





Anchorage Infrastructure
Government of India
Government of Karnataka
Siemens
Fairfax

Bengaluru Airport Services

Airport operations by BIAL

- Airfield
- Passenger terminal building
- VIP lounge and VIP terminal building
- Airport Operations Control Centre (AOCC)
- Aviation security
- Airport safety
- State-of-the-art Information & Communication Technology (ICT) infrastructure
- Passenger flow management
- Dedicated passenger convenience facilities
- Engineering & maintenance

Aviation services by concessionaires and partners

- Flight catering
- Ground handling
- Cargo handling
- Fuel farm
- Into-plane service
- Line maintenance

Sovereign and reserved functions

- Air traffic navigation services
- Aviation security
- Customs
- Immigration
- Animal quarantine certification services
- Plant quarantine certification services
- Transhipment cargo
- Additional drug controller
- Textile committee office
- Airport health organisation

Non aviation services by concessionaires and partners

- Retail and duty-free outlets
- Food and beverage outlets
- Airport advertising
- Airport hotel
- Meet and assist service lounge
- Day hotel
- Landside traffic, budget & premium parking
- Airport taxis
- Airport shuttle service
- Intercity airport bus service
- Medical care

ACI AIRPORTS COUNCIL INTERNATIONAL
Best Airport at ACI's ASQ Arrival Survey Globally for the year 2022

CIRIUM aviation analytics
Second best airport globally in 2022 for on-time arrivals and departures by Cirium

IGBC GREEN RATING INDIAN GREEN BUILDING COUNCIL IGBC PLATINUM
'IGBC Platinum' rating under IGBC Green New Buildings Rating programme (KIA Terminal 2)

Aircraft Rules and Regulation

- Aircraft rules and regulations are essential guidelines established by aviation authorities to ensure the safe operation, maintenance, and management of aircraft.
- These rules are formulated based on international standards, national laws, and regulatory bodies directives to promote aviation safety and security.

1. International Civil Aviation Organization (ICAO)
2. Federal Aviation Administration (FAA)
3. European Union Aviation Safety Agency (EASA)
4. Civil Aviation Administration of China (CAAC)
5. Transport Canada Civil Aviation (TCCA)
6. Directorate General of Civil Aviation (DGCA)
7. Civil Aviation Authority (CAA)
8. Australian Civil Aviation Safety Authority (CASA)
9. International Air Transport Association (IATA)

Aircraft Rules and Regulation

- Licensing and Certification
- Airworthiness Standards
- Operational Regulations
- Safety and Maintenance
- Security Measures
- Environmental Regulations
- Emergency Procedures
- Air Traffic Control (ATC) Regulations
- International Standards and Collaboration