

# Technologies on the Future of Air Cargo Transportation

——SF Express Practice



# SF EXPRESS is a Leading CEP company in China

SF Express was established in 1993, now it is based in Shenzhen, China. In 2016 SF Express has been listed on the Chinese stock market with a stock code 002352.



**\$10.7 billion revenue, \$713 million profit in 2017**



**3.05 billion parcels in 2017**



**400k employees**



**30,000 self-owned and outsourced vehicles for main/secondary lines**



**13,000 self-owned business points**



**International express service cover 53 countries, SF E-Parcel service cover 225 countries**



# Business Scope: One Stop Logistics Solution Supplier

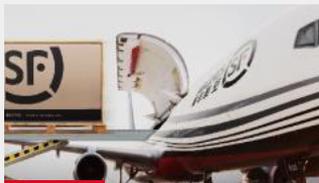
## Logistics Services



Express Service



Cold Chain Service



Heavy Freight Service



International Service



Warehousing Service



SF Industrial Park

## Financial Services



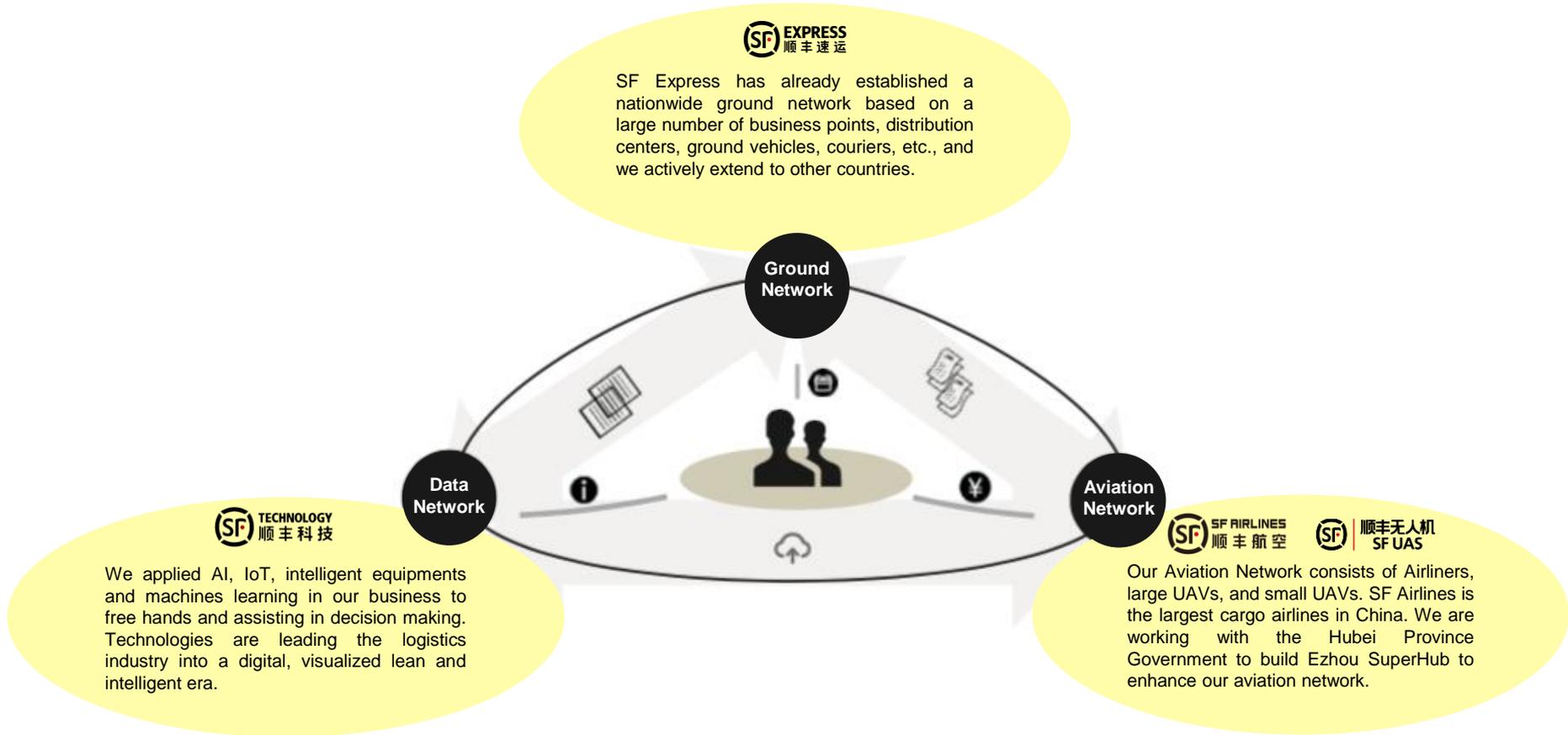
SF Financial

## Commercial Services



SF Best

# Future Integrated Cargo Transportation Network



# Data Network: Technologies Involved



**UAV**



**Intelligent Equipment**



**AI Call Center**



**Big Data**



**Smart Map**



**Green Package**



**Image Recognition**



**Car Networking**

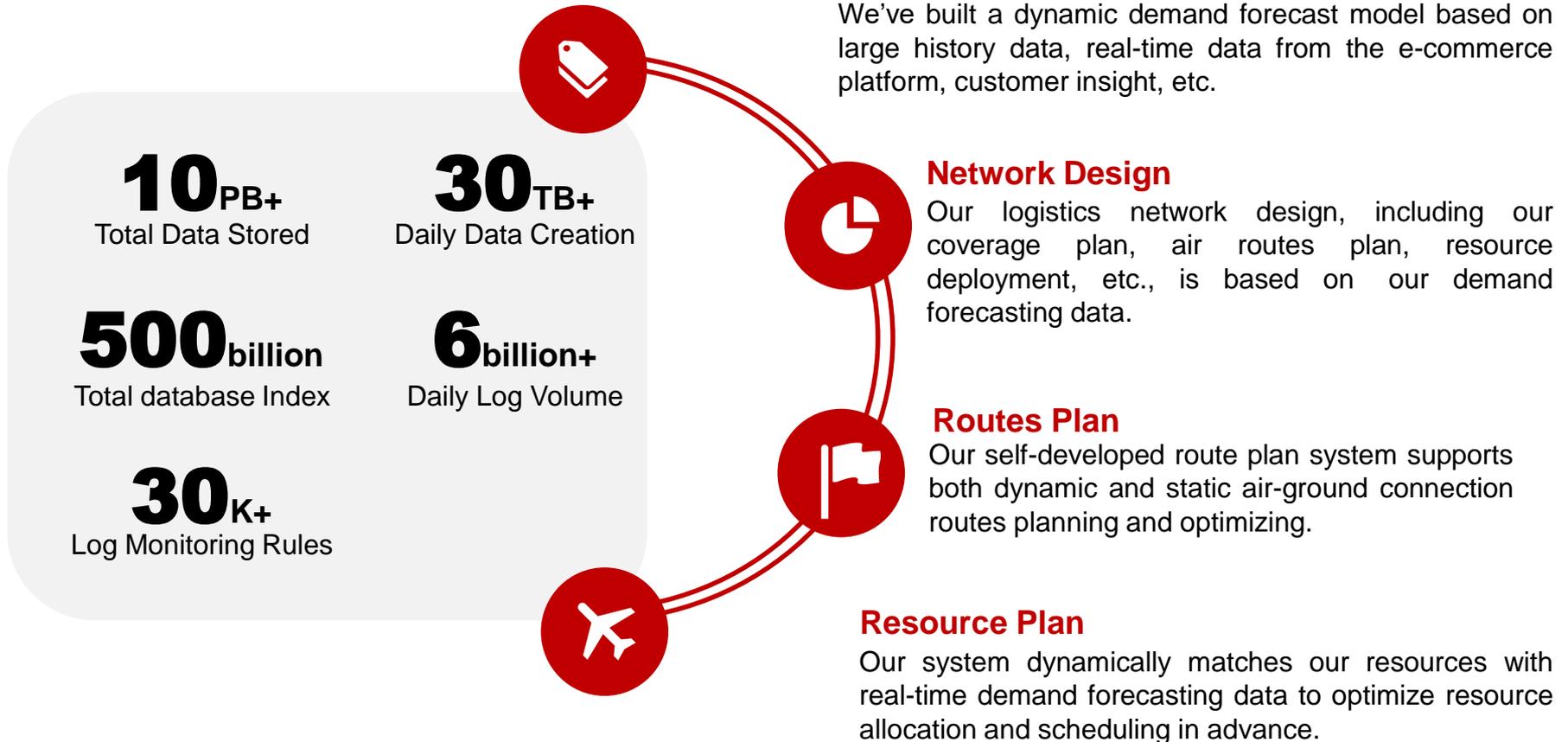


**Smart Warehouse**



**Automatic Sorting**

# Data Network: How We Apply Big Data in Our Business



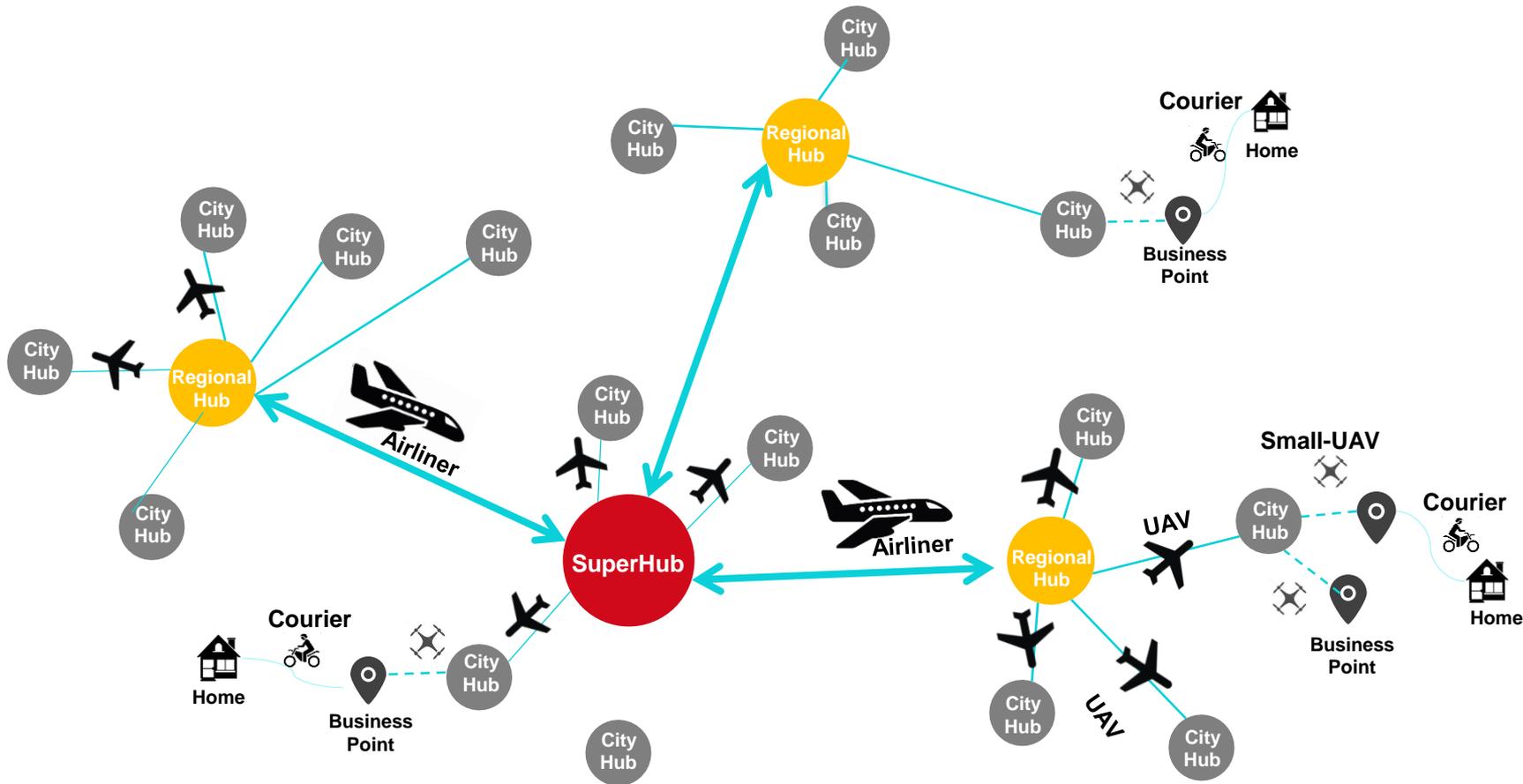


# Aviation Network: Ezhou SuperHub

- SF Express cargo SuperHub (Ezhou SuperHub) EIS in 2021
- It will be Asia's first and world's 4th 4E air freight hub
- It covers **90%** of China's GDP within **2hr** flight
- We will enlarge our large freighter fleet (B767 or similar) to more than 100 by 2022



# A 3-Tier Aviation Network to Achieve 36hr Nationwide Delivery in 2022



# Why We Need UAV in Logistics?



## Cheaper Aircraft

- No life support system, e.g. windows, AC, pressurized cabin, rest facilities, etc.
- Low requirements on structure and performance, e.g. speed, comfortability, etc.
- No human-machine interface, e.g. dashboard, cockpit, etc.
- Efficient emergency procedures and equipment (no one on board)



## Cargo Friendly

- Lower operating cost
- Larger space for cargo
- Flexible airframe design to match with containers (like a shoes box)
- Less restrictions on cargo type (liquid, flammable, explosive, odorous, etc.)

# Technologies Are Ready——Just Accommodate to Logistics

## Manned A/C is Highly Intelligent

- Autopilots are already widely in use by military and civil aircraft
- Advanced passenger aircraft are already equipped with fully autonomous flight control, flight task management, failure monitoring and isolation, detect and sense capability, etc. Very little human intervention is needed

## Military UAVs are Widely Used

- Many Military UAVs, e.g. Global Hawk(US), Predator(US), Cai Hong(CN), Yi Long (CN) are used in large-scale
- Some UAVs have granted permission to fly in shared airspace

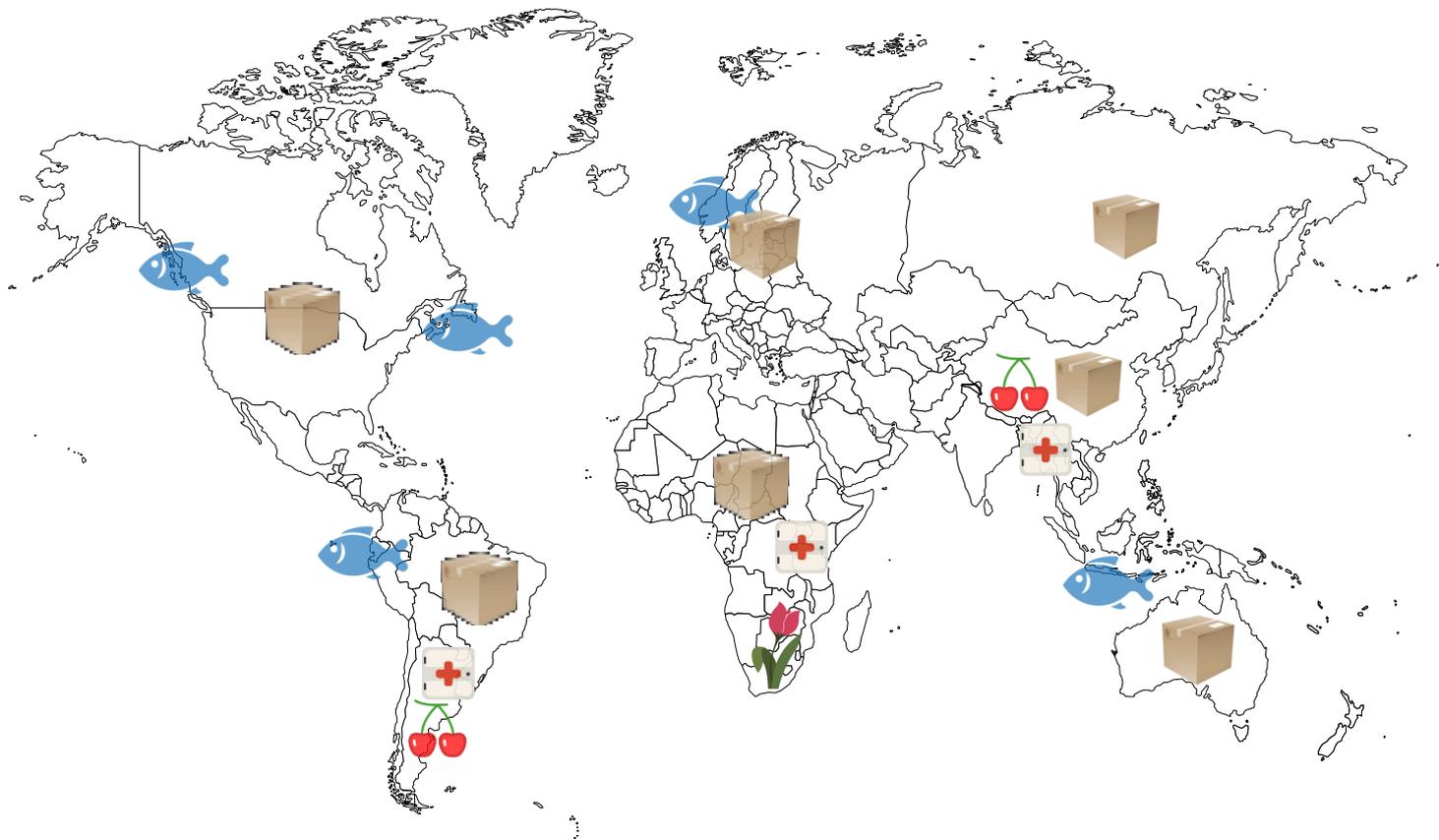
## Core Flight Systems Are Well-developed

- **Flight Control Systems:** fly-by-wire flight control system with multiple redundancies, 4D navigation, flight task management, failure monitoring and isolation
- **Communication System:** Broadband data link/satellites high-speed real-time communication and remote telemetry
- **Navigation Systems:** DGPS with high precision navigation capability
- **Surveillance Systems:** ADS-B、 TCAS etc.
- **ATC Systems:** Digitalized ATC systems and flight service station, remote control tower

## Technologies In Other Areas Can Be Applied

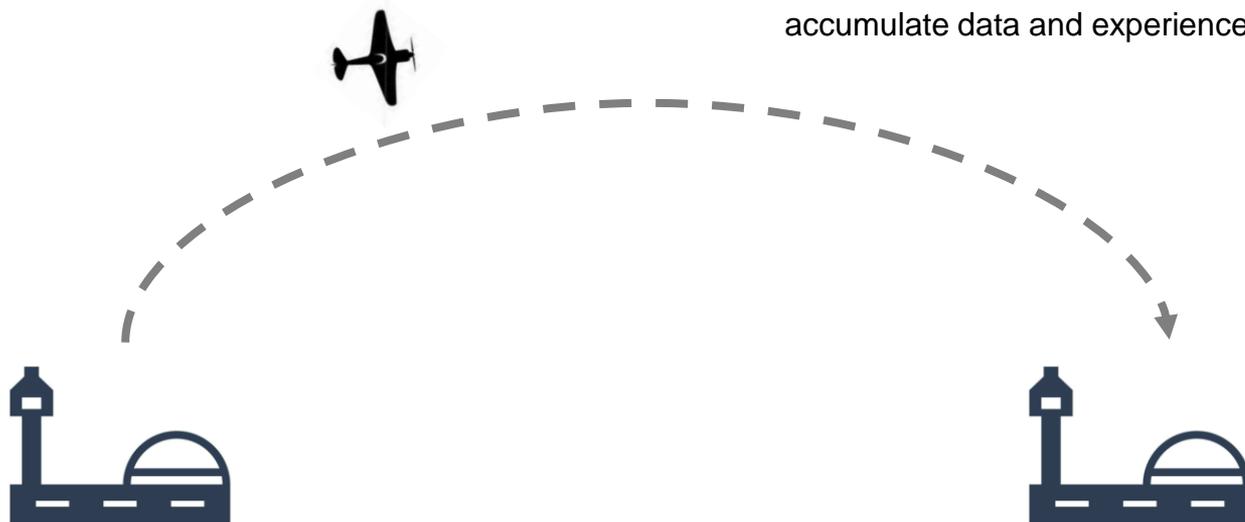
- **AI:** can be applied in aviation to a high level of autonomy
- **Big Data:** can be applied in aviation to improve airplane performance, optimize operation network, data mining of airplane full life cycles

# Opportunities Are All Over the World



# Logistics Will Be the Breakthrough of UAV Commercialization and Regulations

- Simple task with compromised requirements towards speed, endurance, maneuverability, design, etc.
- Point to point flight along fixed route in isolated airspace with preprogrammed emergency procedures, avoiding the crowd
- High utilization (e.g. 2 flights per day, 6 days per week) to accumulate data and experience for regulations



# Thank You

