Introducing Free Airspace, a way to solve Europe's airspace capacity issues

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Introduction

- Continued growth in European aviation
- Congested airspace, this problem will be exasperated in the coming years
- Solutions: Single-European Sky

Functional Airspace Blocks (FABs)

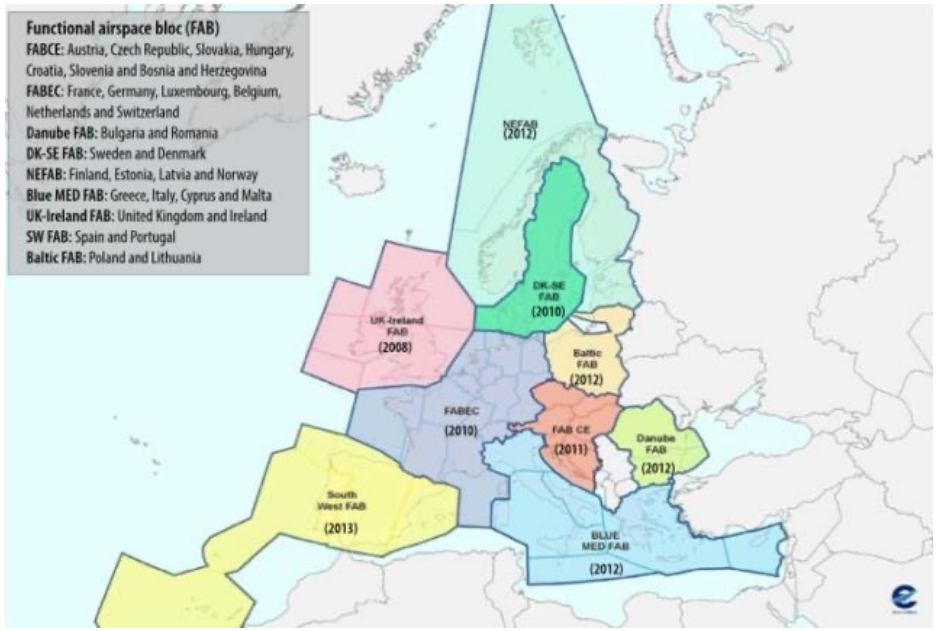
- Encompass one or multiple Flight Information Regions
  - FIR: is a country or region where flight information services are provided
  - Can cover an entire country, or regions of a country
- Larger trans-national examples include the upper area control centre in Maastricht covering, the Netherlands, Belgium Luxembourg and the northwest of Germany

What is the cost of delays?

- With the pre-pandemic traffic levels, ATC delays can cost the european economy up to $20 billion (Reuters 2018)
- IATA claims that by 2035 ATC issues could cost the european economy 1 million jobs and up to $245 billion less in GDP across the block

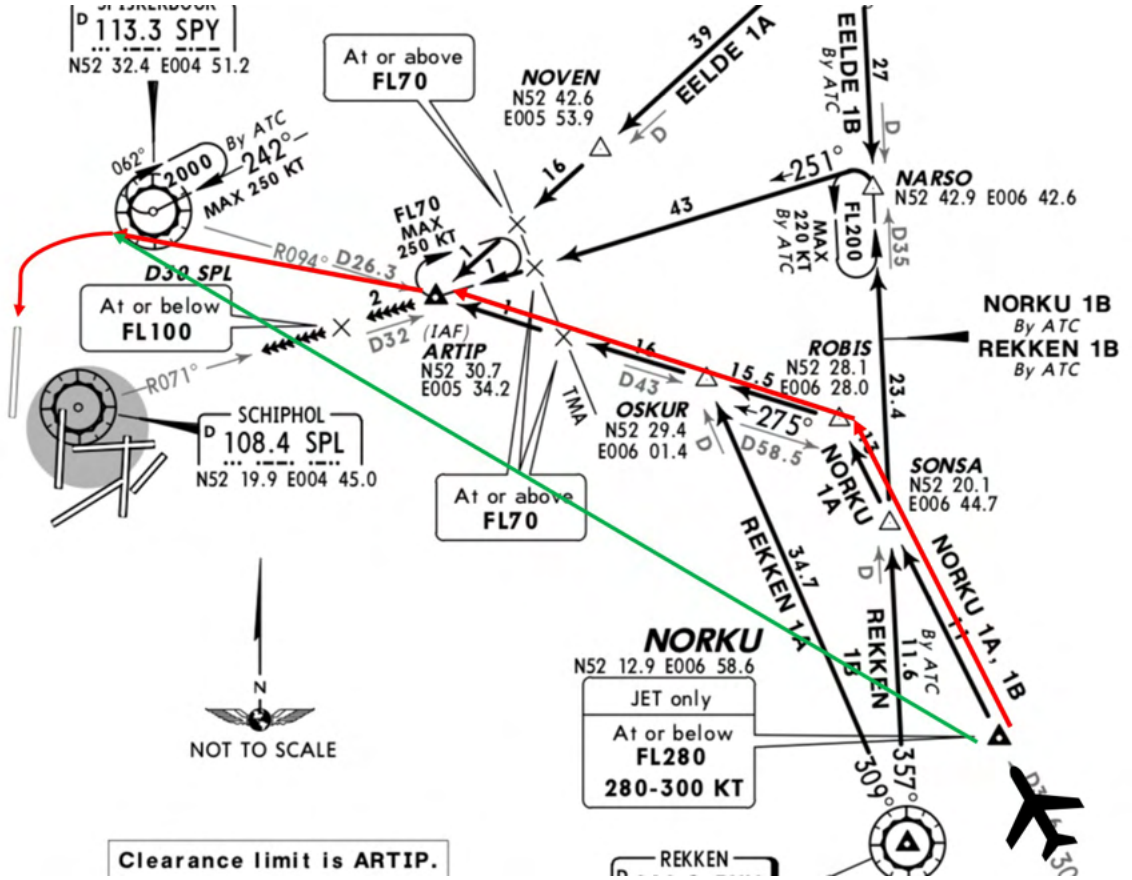
Functional Airspace Blocks (FABs)

- Single European Sky
- Small number of FABs that cover upper area control around europe
- Will bring three main benefits
- 50% capacity increase when compared to 2017 levels
- Save between 250 kg and 450 kg of CO2 per flight
- Save between 57 and 73 euros in ANSP costs per flight



Entry Points

- Points where aircraft enter and leave a contries airspace
- Aids in traffic flow and towards major hubs
- May include restrictions such as altitude and speed



Direct routing vs flying waypoint to waypoint

Comparison flight from Frankfurt to Amsterdam

Direct routing

- Straight from Frankfurt to Amsterdam
- No waypoints or use of SID or STAR
- By flying direct the route is 43% shorter at 366 km, which leads to less fuel burn and time saving

Waypoint to waypoint

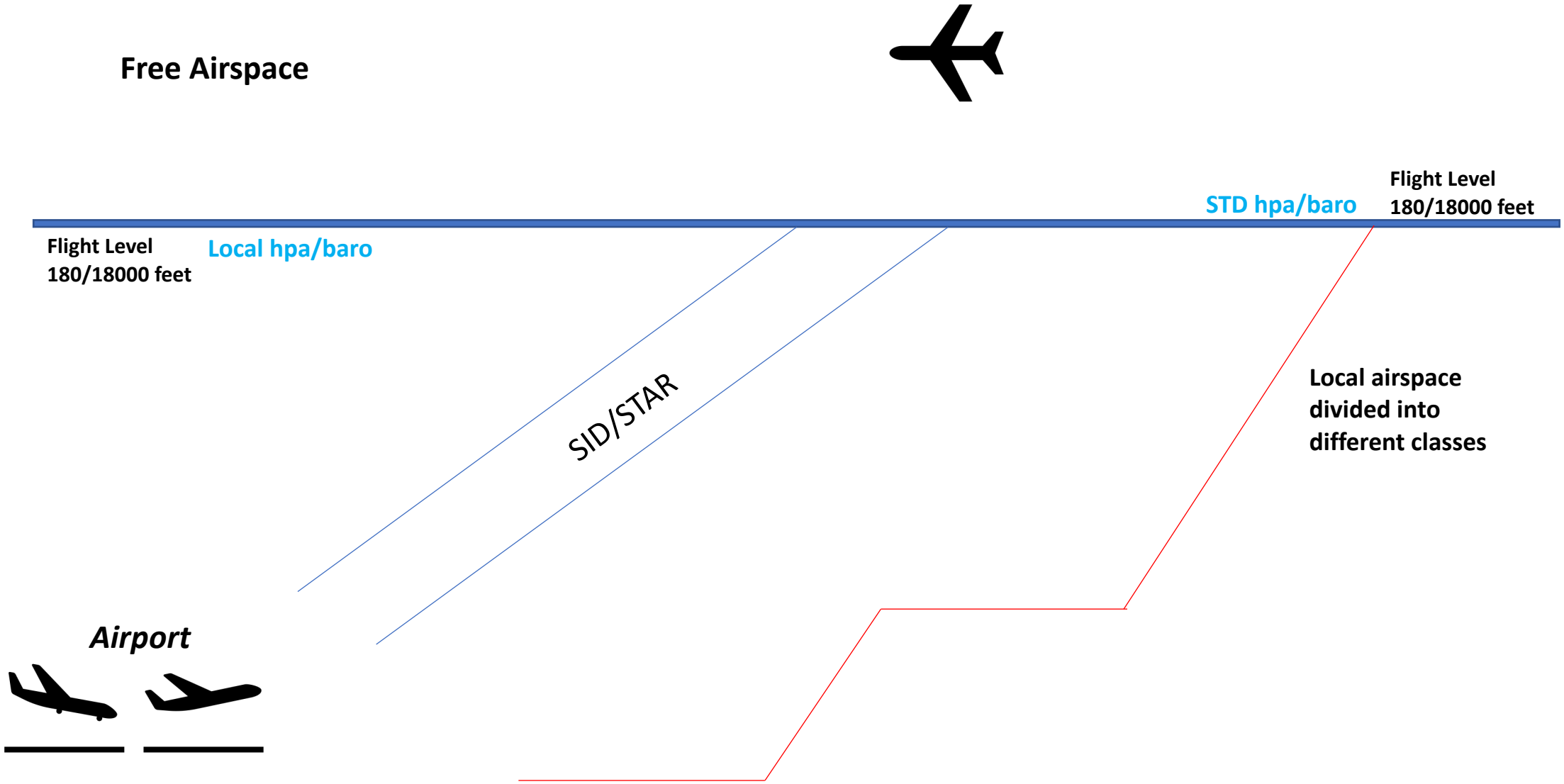
- Flying waypoint to waypoint
- Using SID and STAR
- Longer routing at 526 km

Key Variables

- A number of key variables can influnce airspace planning and efficiency
  - **Political issues**: Maximum number of flight movements at an airport
  - **Noise pollution**: Using SIDs and STARs to avoid densly populated areas
  - **Environmental factors**: Pollution (CO2, sulfur and nitrogen oxides), wildlife areas
  - **Geographical factors**: Mountains terrain (Innsbruk in Austria) or tall buildings
  - **Military Airspace:** Often restricted civil aircraft movement in military airspace
  - **External Variables:** Wars, pandemics or extreme weather

Free Airspace: What is it?

- Allowing aircraft to fly in the freest manner possible whilst taking into account the variables mentioned above
- Implemented above 18000 feet or FL180
- Limited effects on flights shorter than 555 km as the cruise time is short (i.e. above FL180)
- Longer flight segments will see benefits by removing enroute waypoints which will lead to:
  - Shorter flying times
  - Shorter distances
  - Less fuel burn
  - Less emissions
- Even though the savings per flight might be minimal, across the board this will lead to big increases in efficency


Free Airspace
Flight Level
180/18000 feet
STD hpa/baro
Flight Level
180/18000 feet
Local hpa/baro
SID/STAR
Local airspace
divided into
different classes
Airport

Conclusions

- Drive to more efficient airspace use
- Reducing emissions
- More on-time flights