# Evaluation Factors Required for Flight Procedure operation

(25-26 May 2021)

# Background

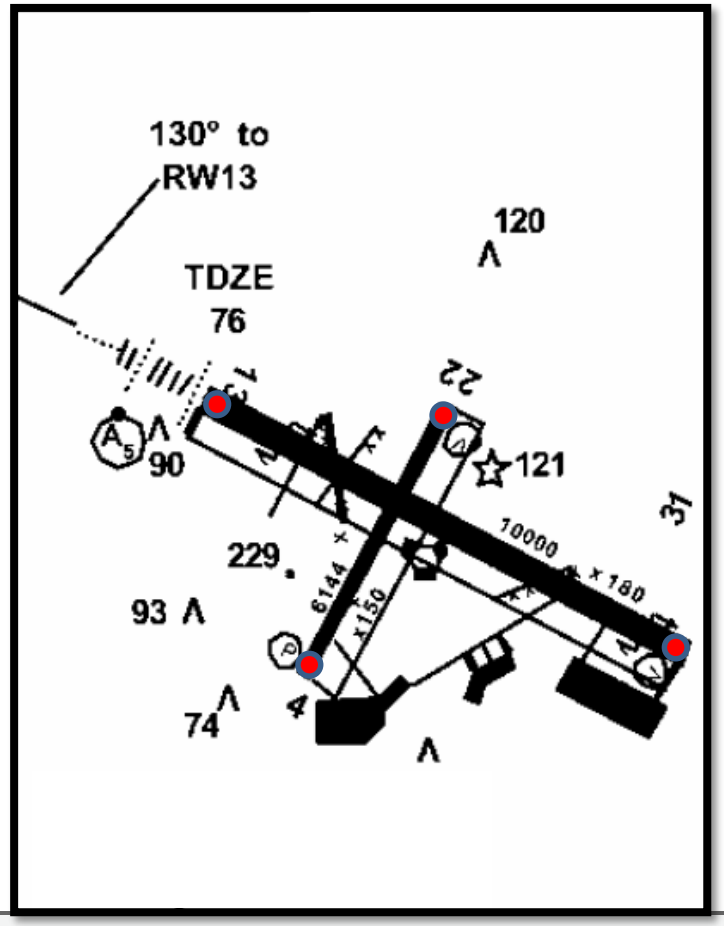
## Amendment 9 to PANS-OPS, Doc 8168

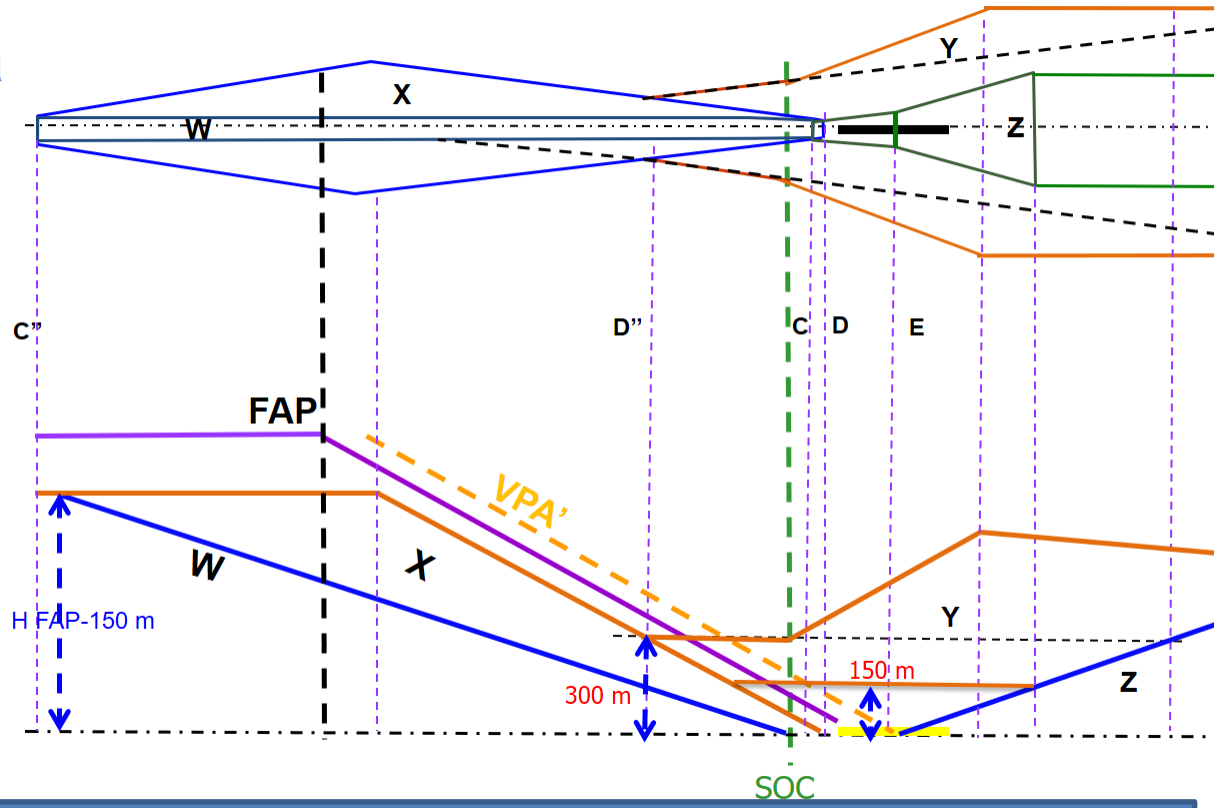
## Major Elements:

- **GBAS CATII and III Criteria**
- **Simultaneous operations on parallel & near parallel runways**
- **Visual Segment Surface (VSS)**
- **RF legs to XLS criteria**
- **PBN approach Charting identification**

# Amendment 9 to PANS-OPS, Doc 8168

- **GBAS CATII and III Criteria**

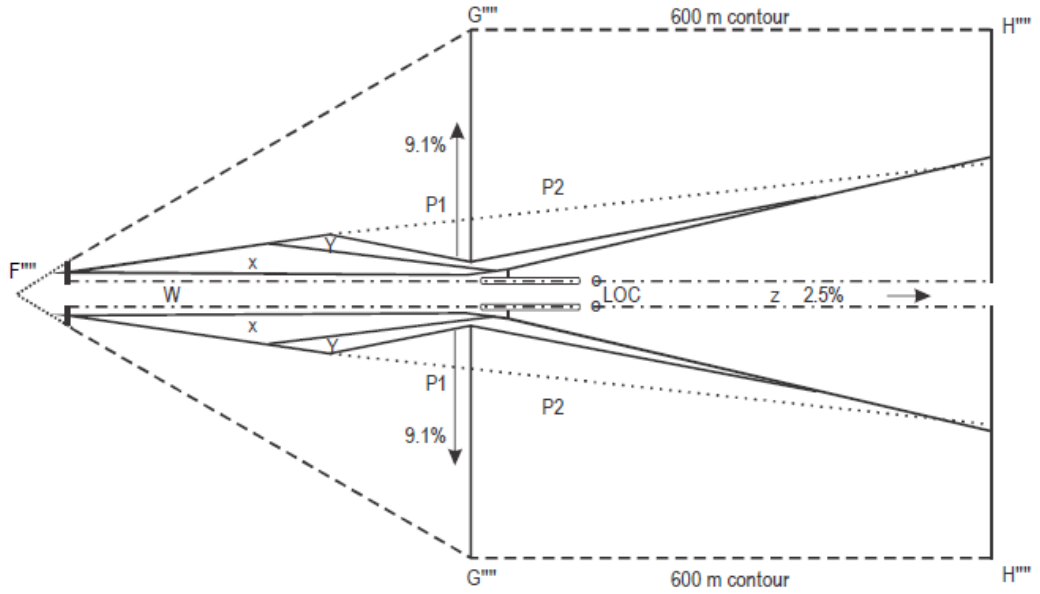



- Enhanced safety
- Optimized use of airport capacity
- Reduced flight operating costs(economy )

# Amendment 9 to PANS-OPS, Doc 8168

- **Simultaneous operations on parallel & near parallel runways**
  - **Expands the use of available approach types for simultaneous operations to parallel and near-parallel runways.**




Parallel Approach Obstacle Assessment Surfaces (PAOAS)

**Table 2-2. Approach Types available for Mode 1 Operations**

| *Instrument Approach* | *Can this approach type be used for Simultaneous Approaches?* |
|---|---|
| ILS | Yes |
| GLS | Yes |
| MLS | Yes |
| SBAS CAT I Applicable in Final Approach Segment | Yes |
| RNP AR APCH | Yes |
| RNP AR APCH (non-conforming to 2.2.1.5) | Provided an approach and mitigation-specific, documented safety assessment has shown that an acceptable level of safety can be met, and operations are approved by the appropriate ATS authority. |
| RNP APCH (LNAV/VNAV) (LPV) | Provided an approach and mitigation-specific, documented safety assessment has shown that an acceptable level of safety can be met, and operations are approved by the appropriate ATS authority. |
| RNP APCH (LNAV) | No |
| LOC | No |
| NDB | No |
| VOR | No |

Doc. 9643

# Amendment 9 to PANS-OPS, Doc 8168

- **Visual Segment Surface (VSS)**

- The deletion of the requirement to identify VSS penetrations on the instrument approach chart

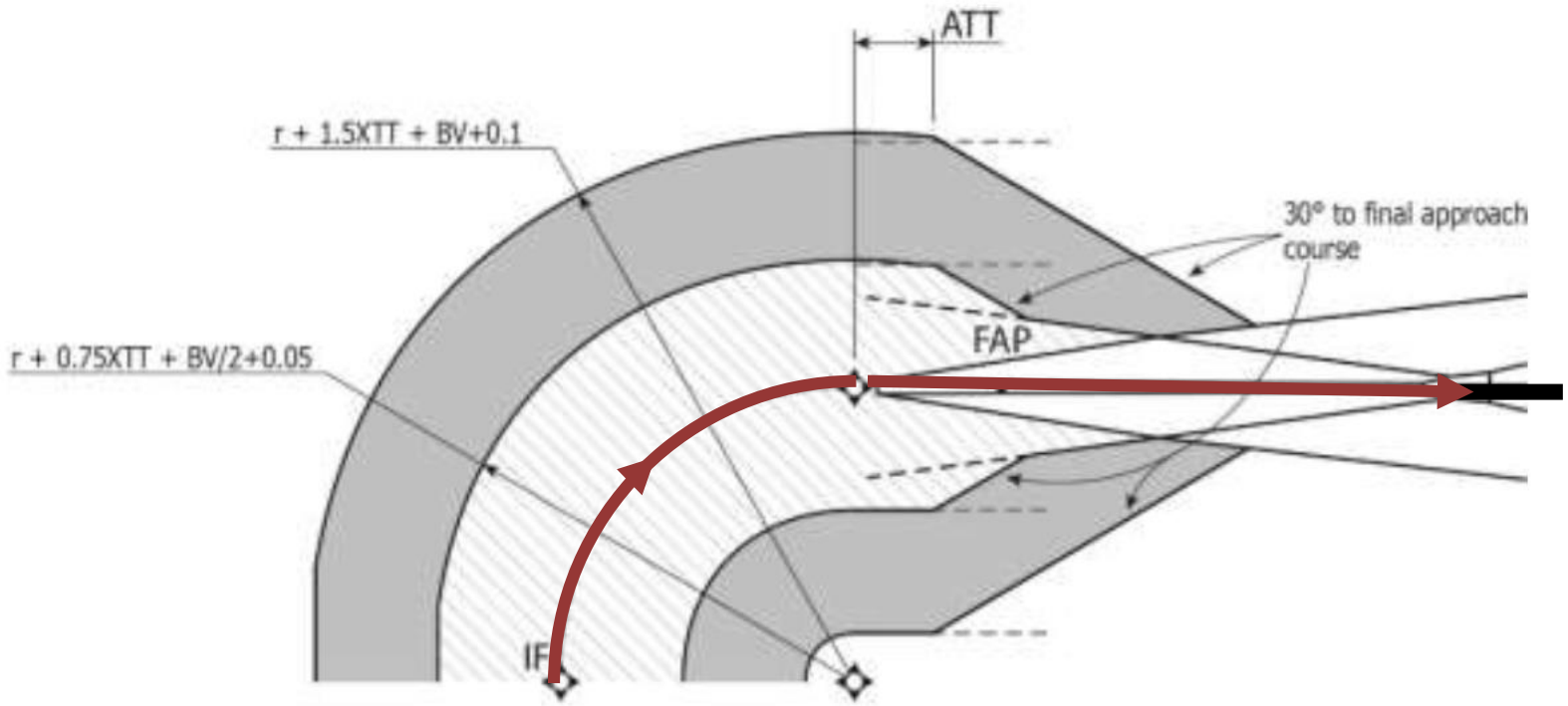
5.4.6.5 Until 3 November 2021, any penetration of the VSS shall be identified on the instrument approach chart.

*5.4.6.5* As of 4 November 2021, indication that a VSS has been penetrated shall be promulgated in the AIP, Section AD 2.23 Visual segment surface (VSS) penetration.

*Guidance in Doc 8126*

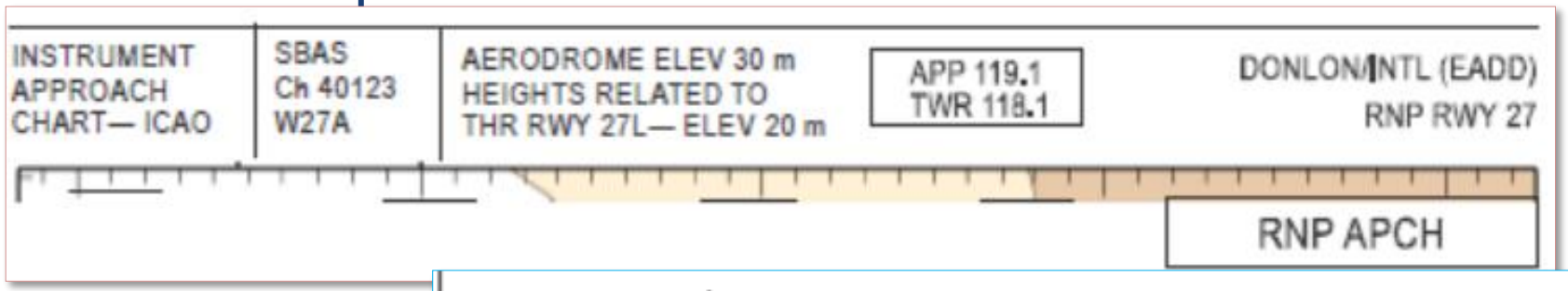
# Amendment 9 to PANS-OPS, Doc 8168

- RF legs to xLS criteria
  - To achieve the required level of safety

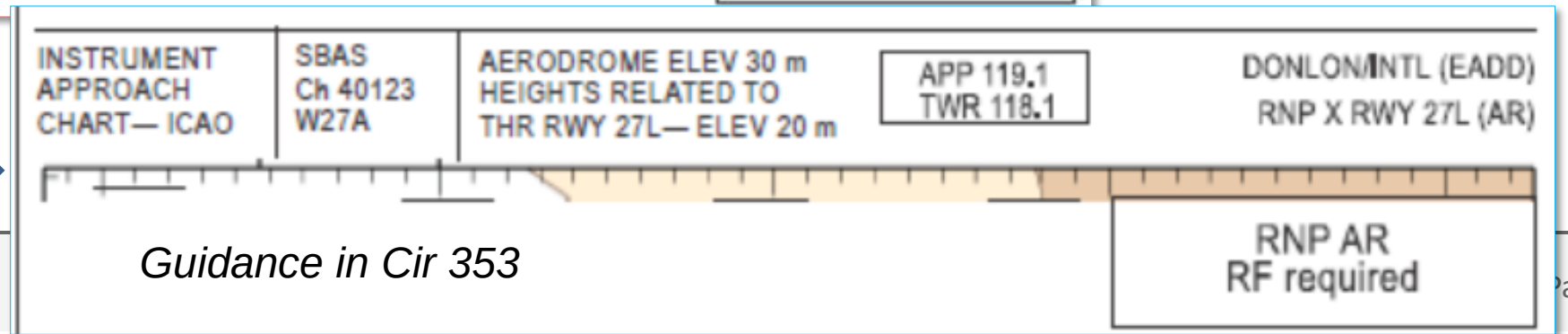


# Amendment 9 to PANS-OPS, Doc 8168

- PBN approach Charting identification
  - use of the term “procedure altitude/height” will reduce confusion and ambiguity between the operator and ATM
  - ensure consistency among ICAO documents, thus avoiding misinterpretation



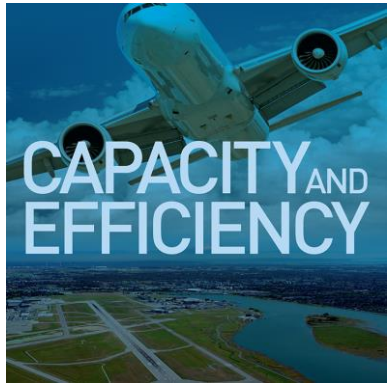

RNP AR




*Guidance in Cir 353*

# ICAO'S Strategic Objectives




## Navigation database coding

- Based on the operation experience
- FPP's trainings are more Comply with the ARNIC 424

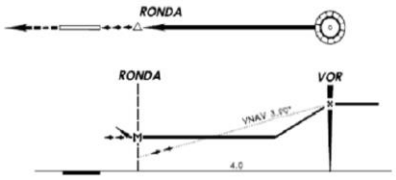
| *Serial Number* | *Path Descriptor* | *Waypoint Identifier* | *Fly-over* | *Course °M(°T)* | *Magnetic Variation* | *Distance (km)* | *Turn Direction* | *Altitude (m)* | *Speed (km/h)* | *VPA/ TCH* | *Navigation Specification* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | IF | SUSER | — | — | +2.2 | — | — | +1 550 | –470 | — | RNP APCH |
| 002 | TF | EF974 | — | 048 (045.7) | +2.2 | 12.0 | — | +1 400 | — | — | RNP APCH |
| 003 | RF Centre: EF991 r =5.240 NM | EF975 | — | — | +2.2 | 13.7 | R | — | –450 | — | RNP APCH |
| 004 | TF | EF976 | — | 348 (345.8) | +2.2 | 9.6 | — | @900 | –270 | — | RNP APCH |
| 005 | TF | RW35L | Y | 348 (345.8) | +2.2 | 9.3 | — | @150 | — | –3.0/50 | RNP APCH |

Tabular description example in DOC 8168

### Altitude at MAPt

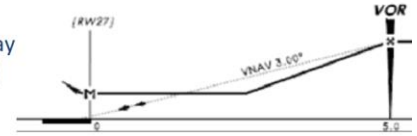
- MAPt prior to the runway threshold :

altitude must be an 'at' altitude equal to the computed altitude at the MAPt.




- MAPt at the runway threshold :

altitude must be an 'at' altitude equal to the runway threshold plus the published TCH (default 50ft)




industrial standard

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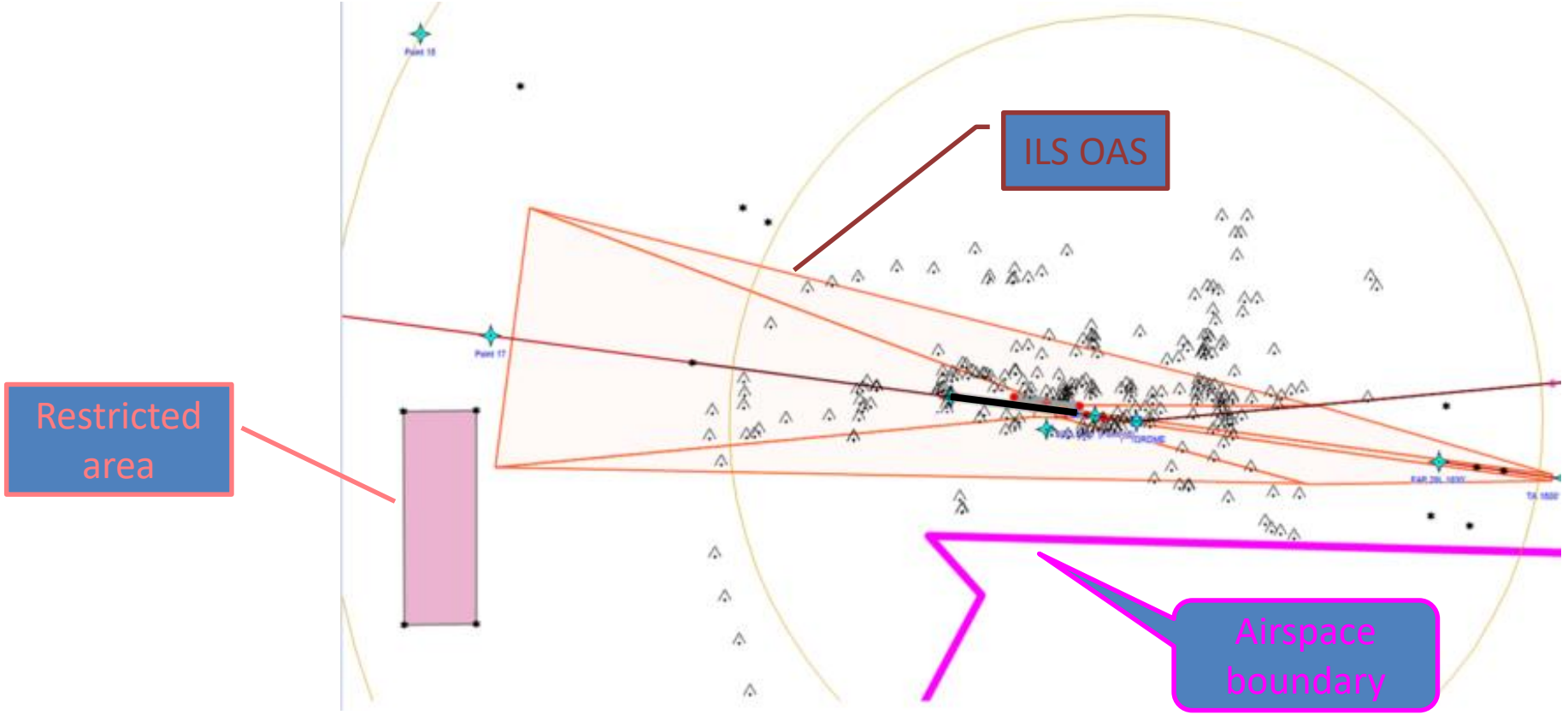
# FPP Consultation

## More serving for the real Operation

- Airport with Challenged terrain

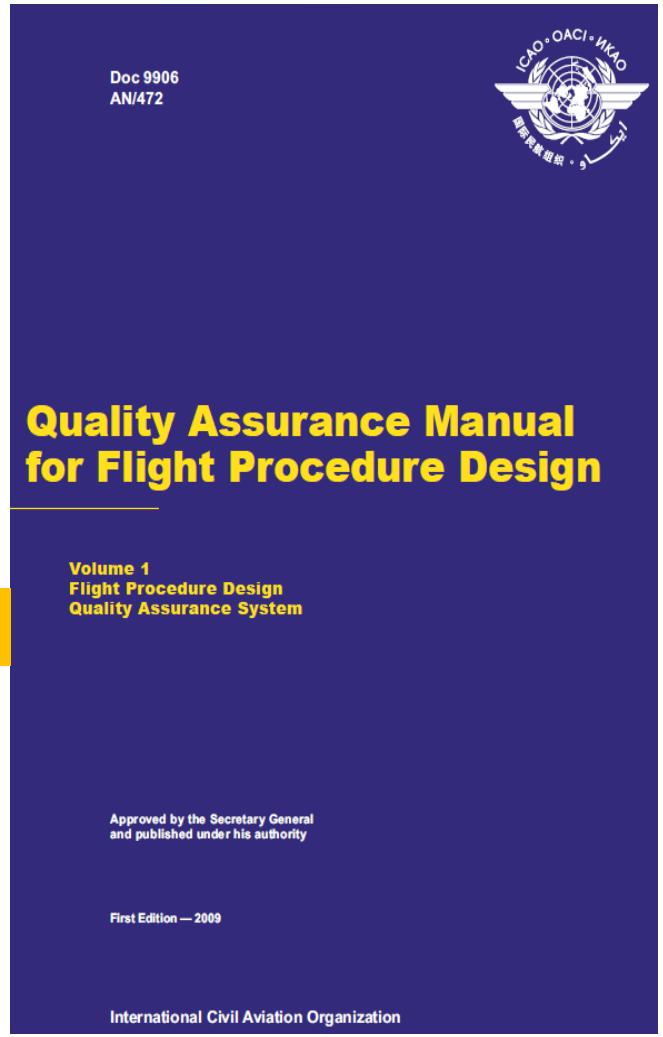
- Airports with Complex airspace



# QA System for both training and consultation

- **A Relatively complete QA System for Flight Procedure Design**
  - ❖ **DOC 9906**
- **BUT**
  - – **for Better Flight Procedure**

**some Evaluation Factors Required**



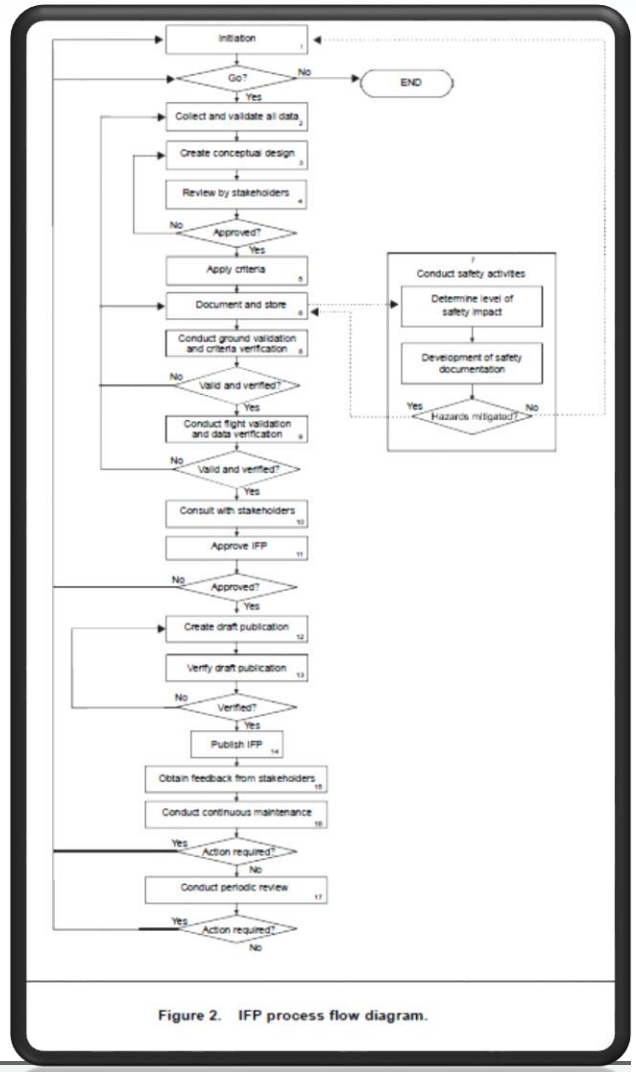



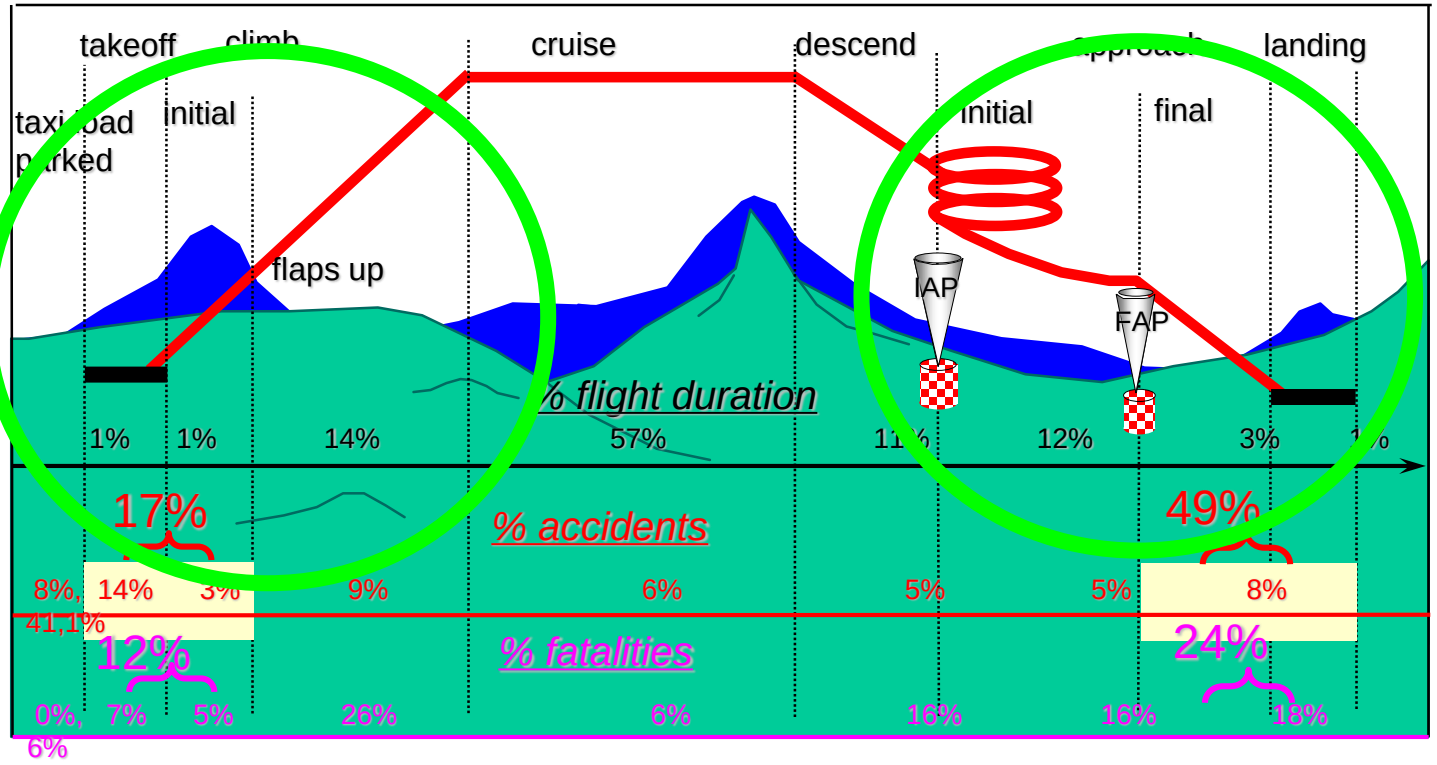
Figure 2. IFP process flow diagram.

# Contents

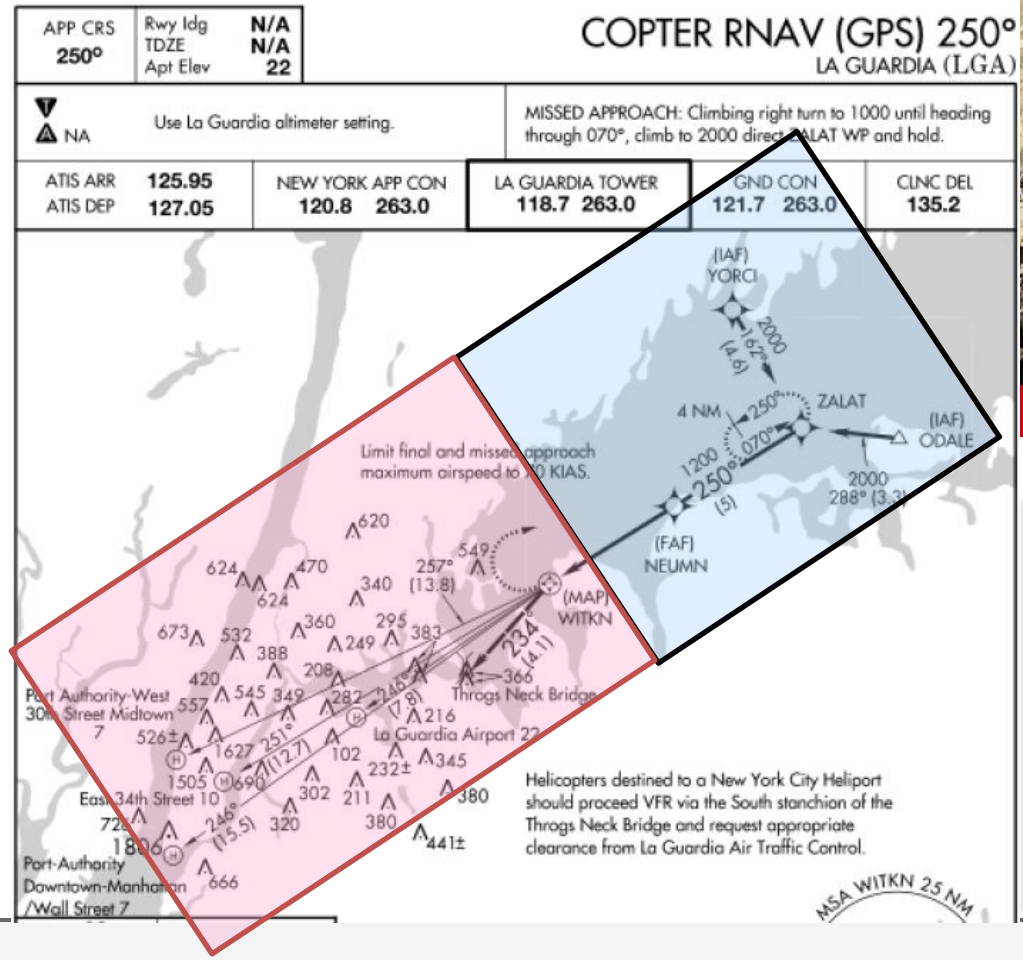
## Main considerations

- **Safety (Mandatory )**
  - Individual(Doc 8168)
  - Collective(Doc 8168+4444)
- **Efficiency**
  - Time saving
  - Capacity increasing
- **Economy**
  - Fuel/time saving by shortcut
  - Fuel/time saving by CCO/CDO
- **Environmental protection**
  - Emissions reduction
  - noise reduction

## PHASES OF FLIGHT ACCIDENTS and ONBOARD FATALITIES

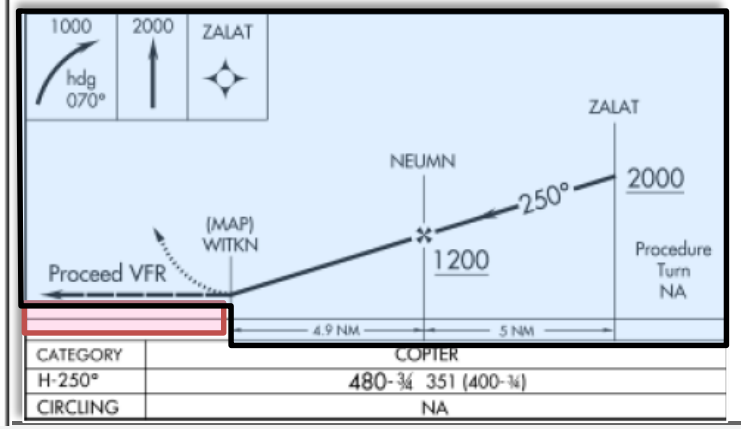


# Safety

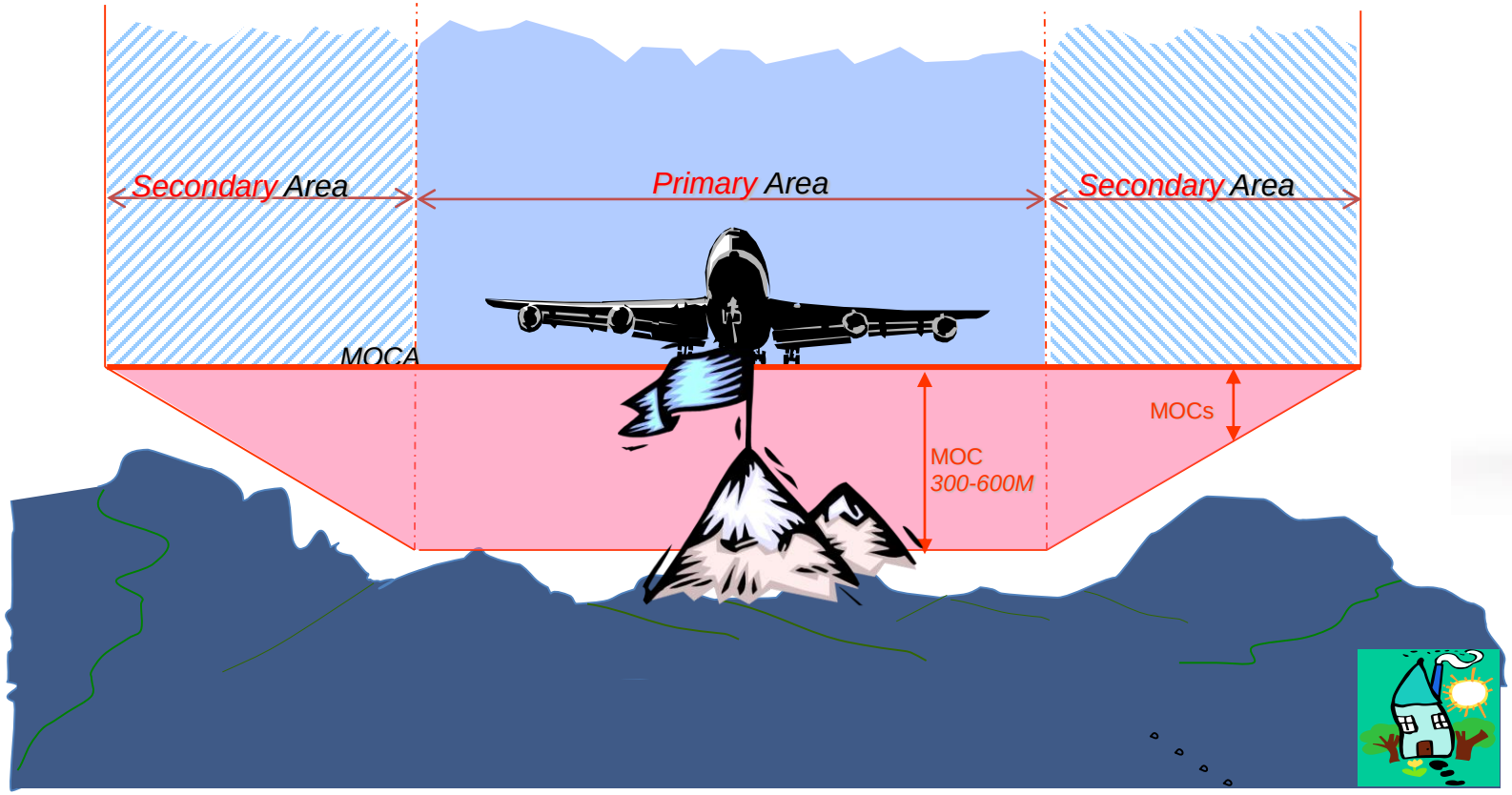




## Point In Space Procedure

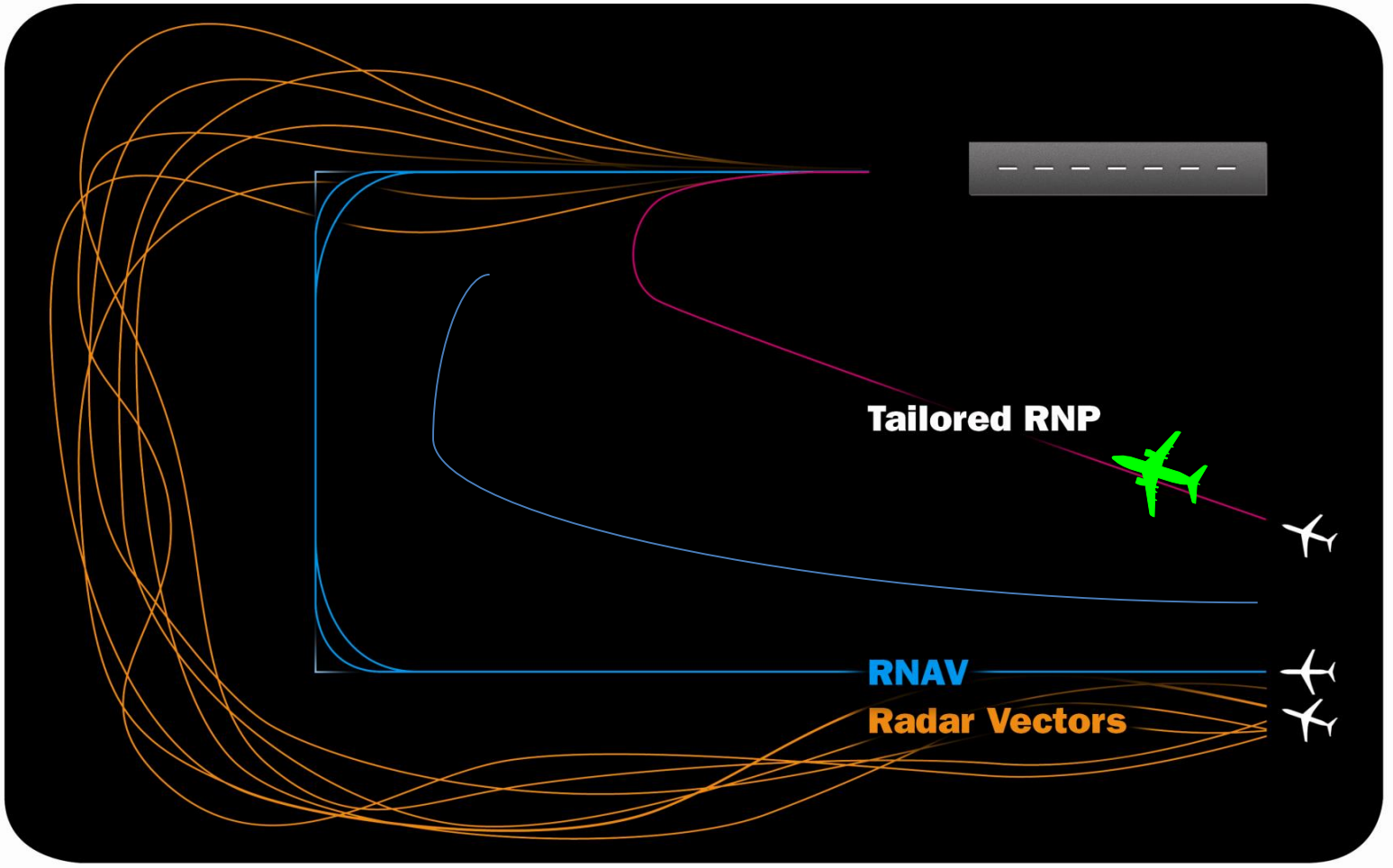


# Safety


Secondary Area
Primary Area
Secondary Area
MOCA
MOCs
MOC
300-600M

# Economy

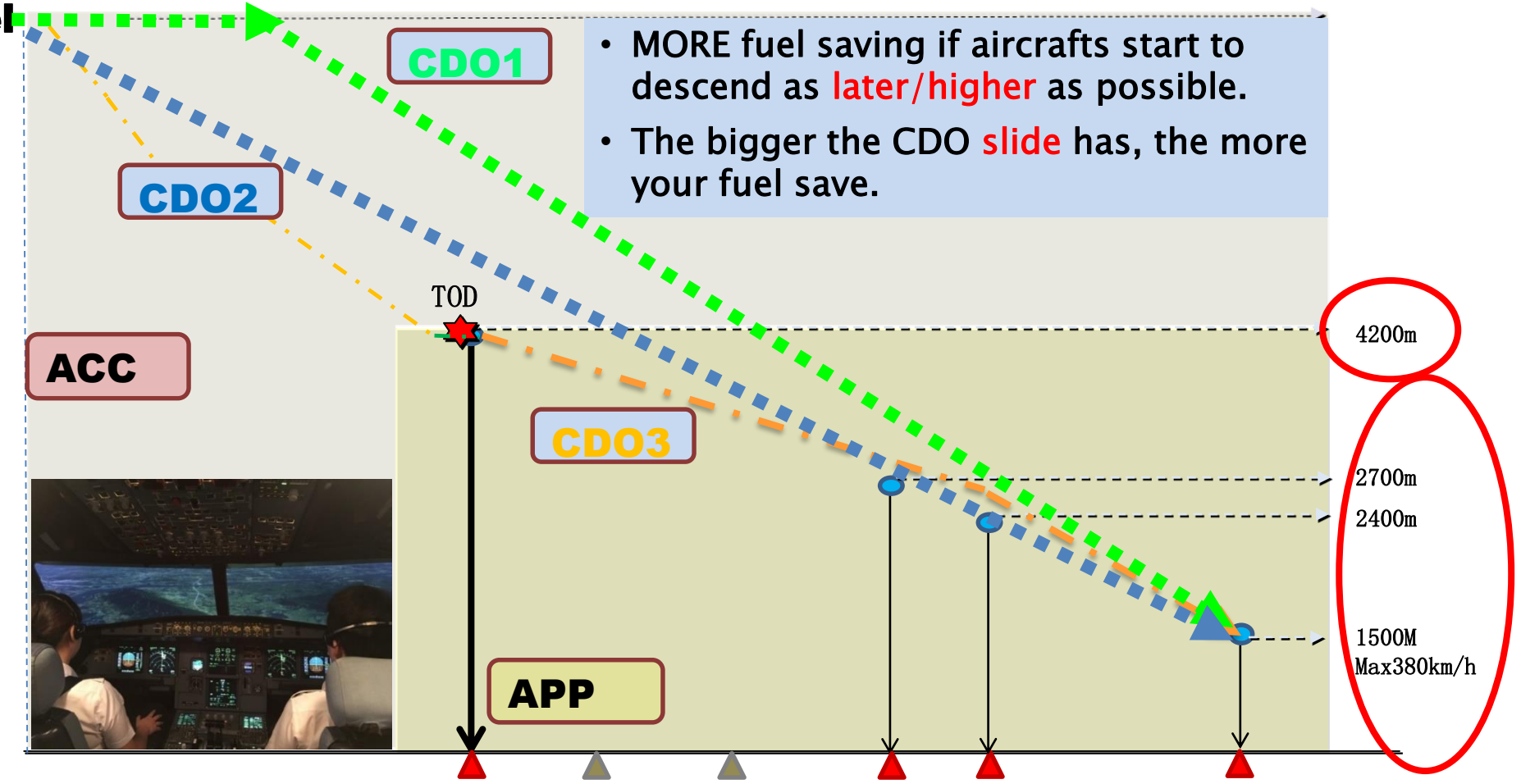
## Fuel saving by shortcut



# Economy

## Fuel saving by CCO/CDO

**Cruising level**

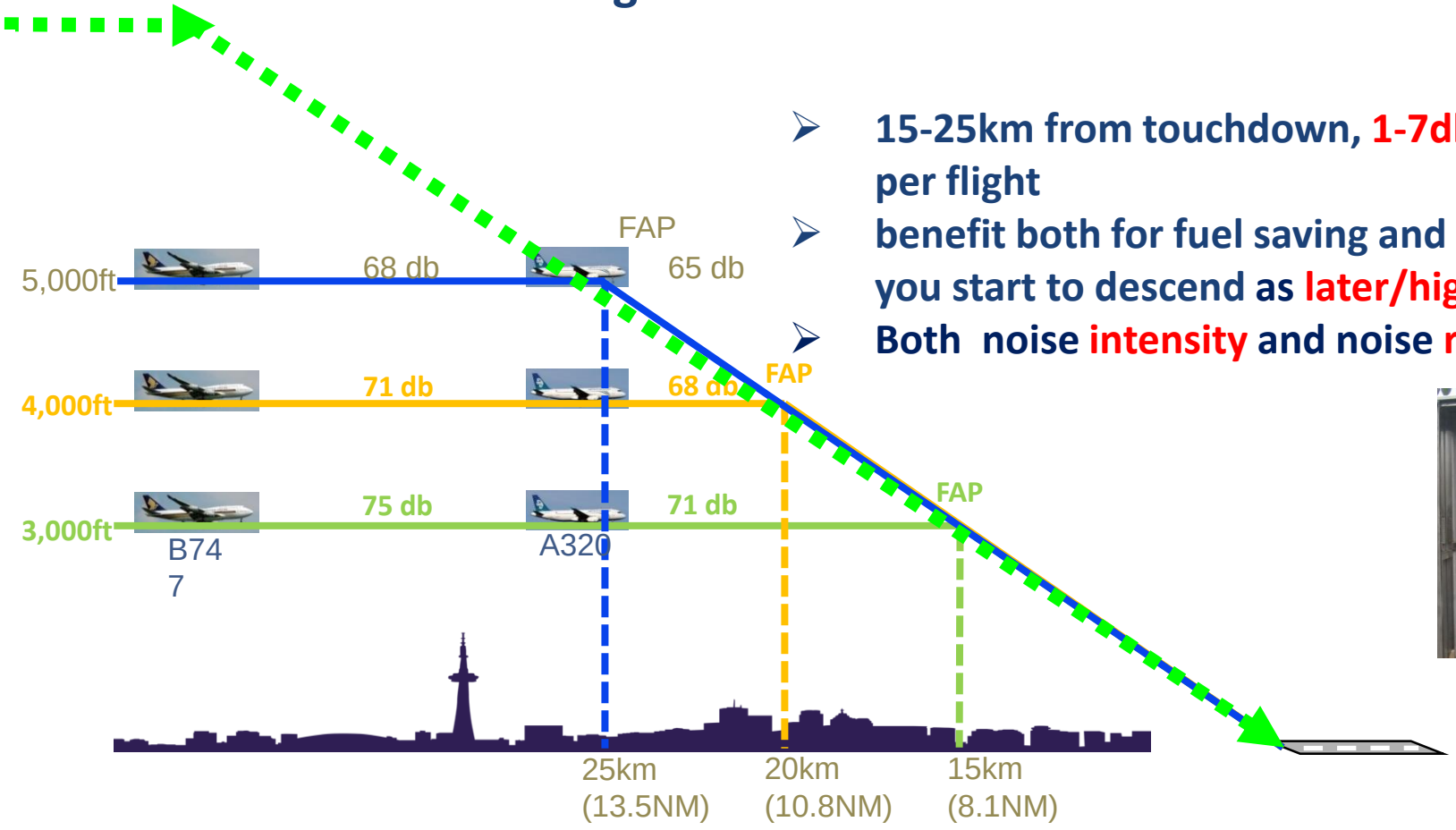



- MORE fuel saving if aircrafts start to descend as later/higher as possible.
- The bigger the CDO slide has, the more your fuel save.

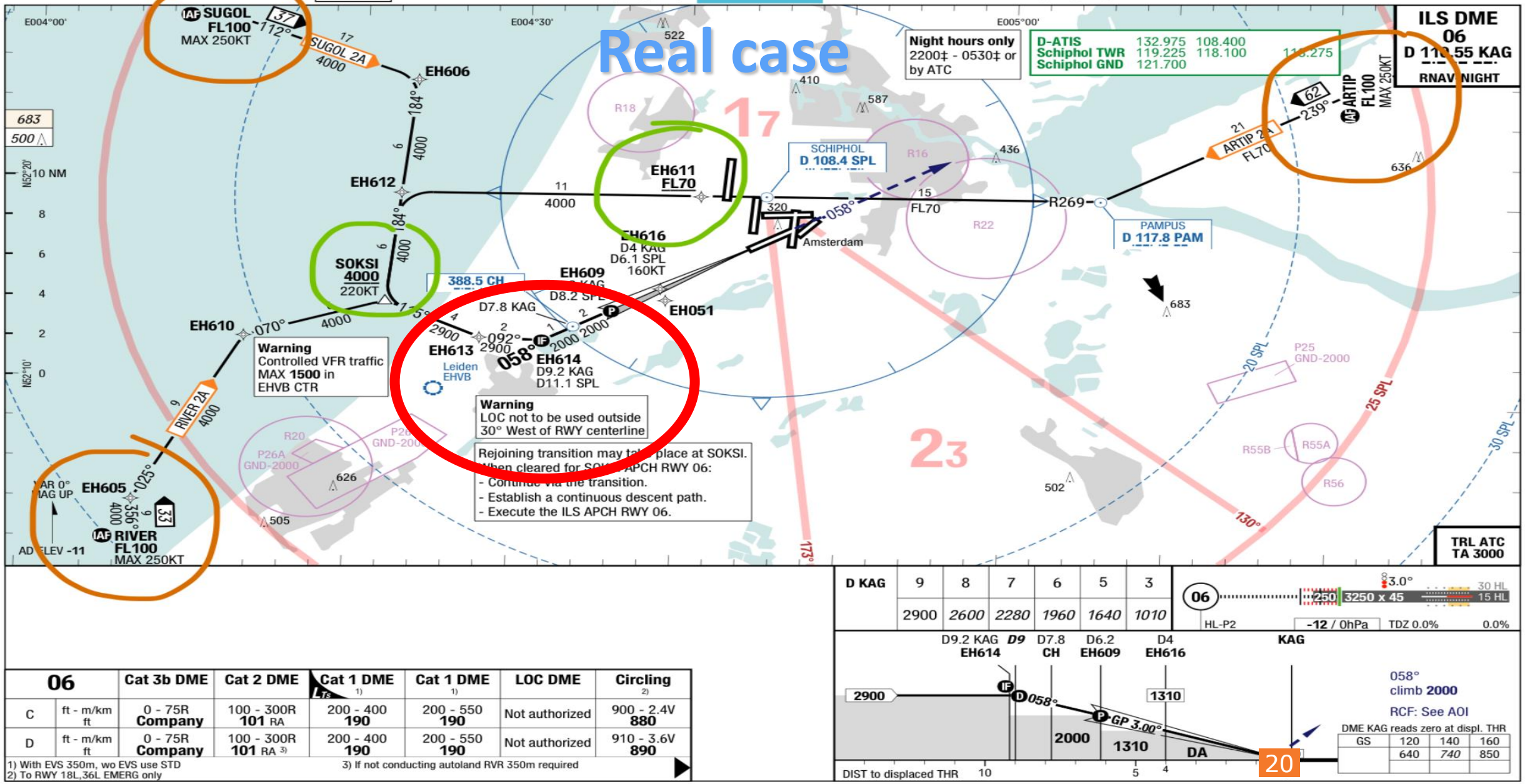
# Environmental Protection

## ❖ Noise and flight level






- 15-25km from touchdown, 1-7db noise reduction per flight
- benefit both for fuel saving and noise reduction if you start to descend as later/higher as possible
- Both noise intensity and noise range are reduced




| 06 | | Cat 3b DME | Cat 2 DME | Cat 1 DME LTS 1) | Cat 1 DME 1) | LOC DME | Circling 2) |
|---|---|---|---|---|---|---|---|
| C | ft - m/km ft | 0 - 75R **Company** | 100 - 300R **101** RA | 200 - 400 **190** | 200 - 550 **190** | Not authorized | 900 - 2.4V **880** |
| D | ft - m/km ft | 0 - 75R **Company** | 100 - 300R **101** RA 3) | 200 - 400 **190** | 200 - 550 **190** | Not authorized | 910 - 3.6V **890** |

1) With EVS 350m, wo EVS use STD
2) To RWY 18L,36L EMERG only
3) If not conducting autoland RVR 350m required

| D KAG | 9 | 8 | 7 | 6 | 5 | 3 |
|---|---|---|---|---|---|---|
| | 2900 | 2600 | 2280 | 1960 | 1640 | 1010 |

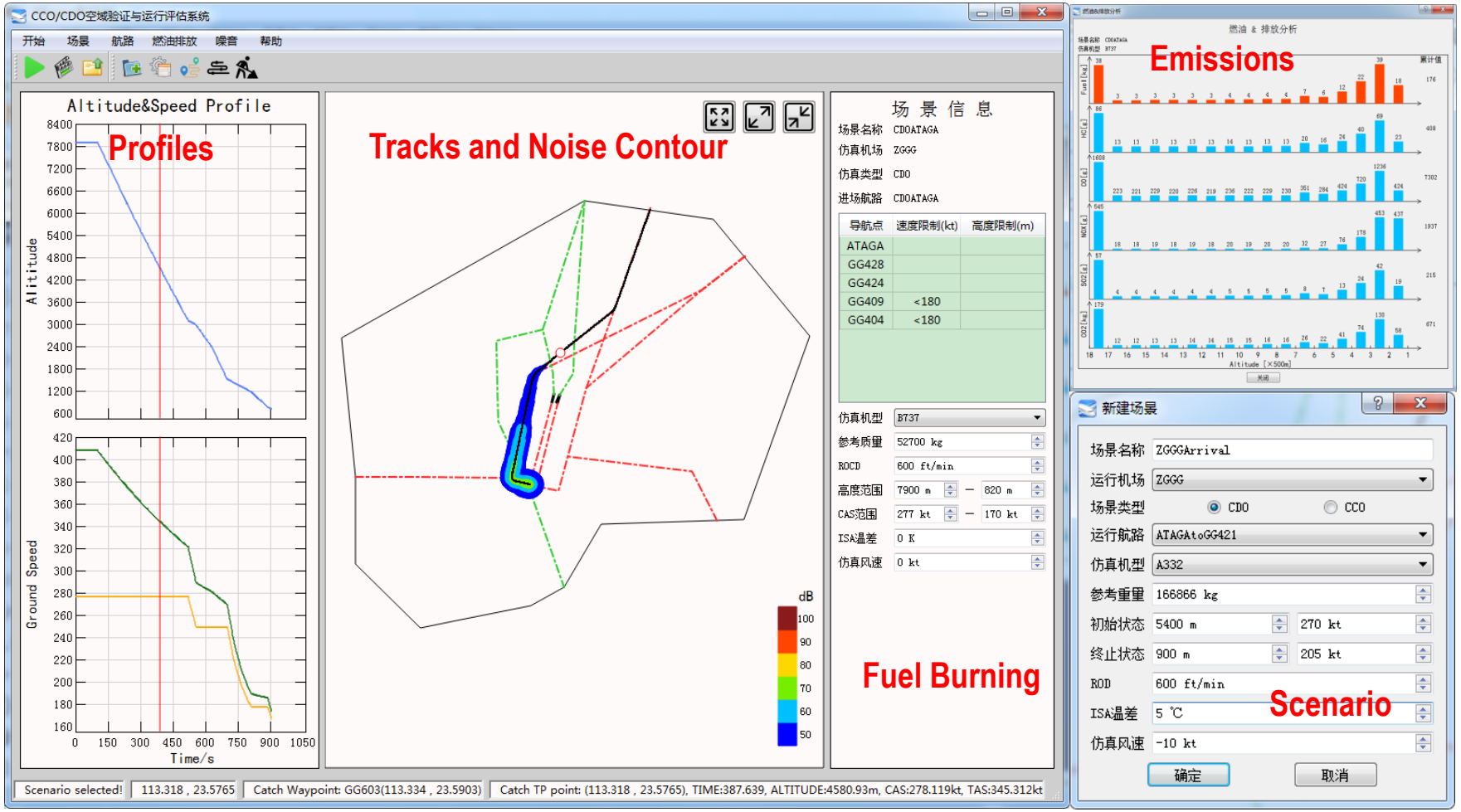
06 3.0° 30 HL 250 3250 x 45 15 HL
HL-P2 -12 / 0hPa TDZ 0.0% 0.0%

D9.2 KAG EH614 D9 D7.8 CH D6.2 EH609 D4 EH616 KAG
2900 IF D 058° P GP 3.00° 1310 2000 1310 DA
DIST to displaced THR 10 5 4
058° climb 2000
RCF: See AOI
DME KAG reads zero at displ. THR

| GS | 120 | 140 | 160 |
|---|---|---|---|
| | 640 | 740 | 850 |

Changes: MIN

# Evaluation for Procedure Design / Validation / Operation



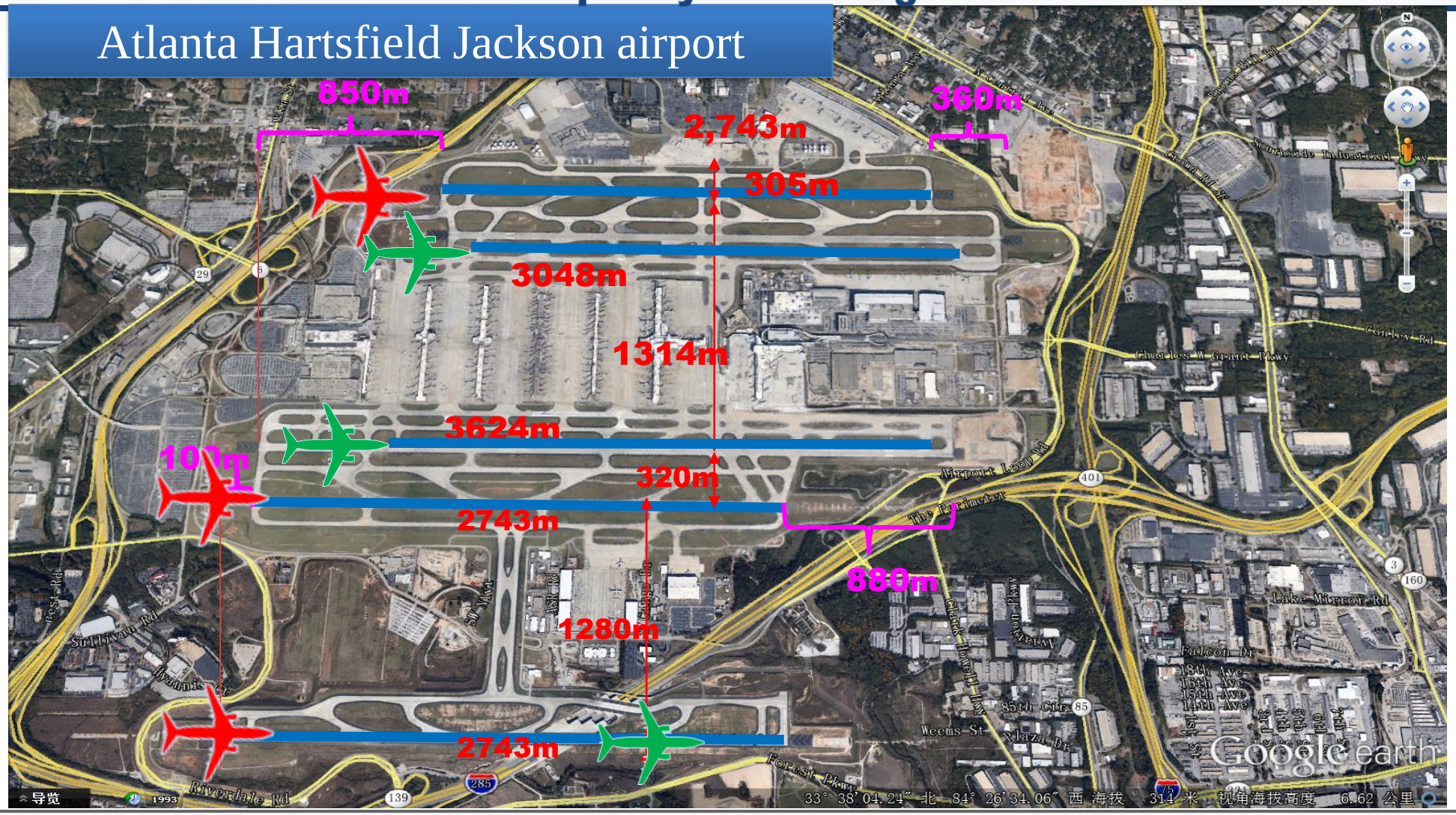
# Efficiency/Capacity

- Capacity increasing

# Efficiency/Capacity

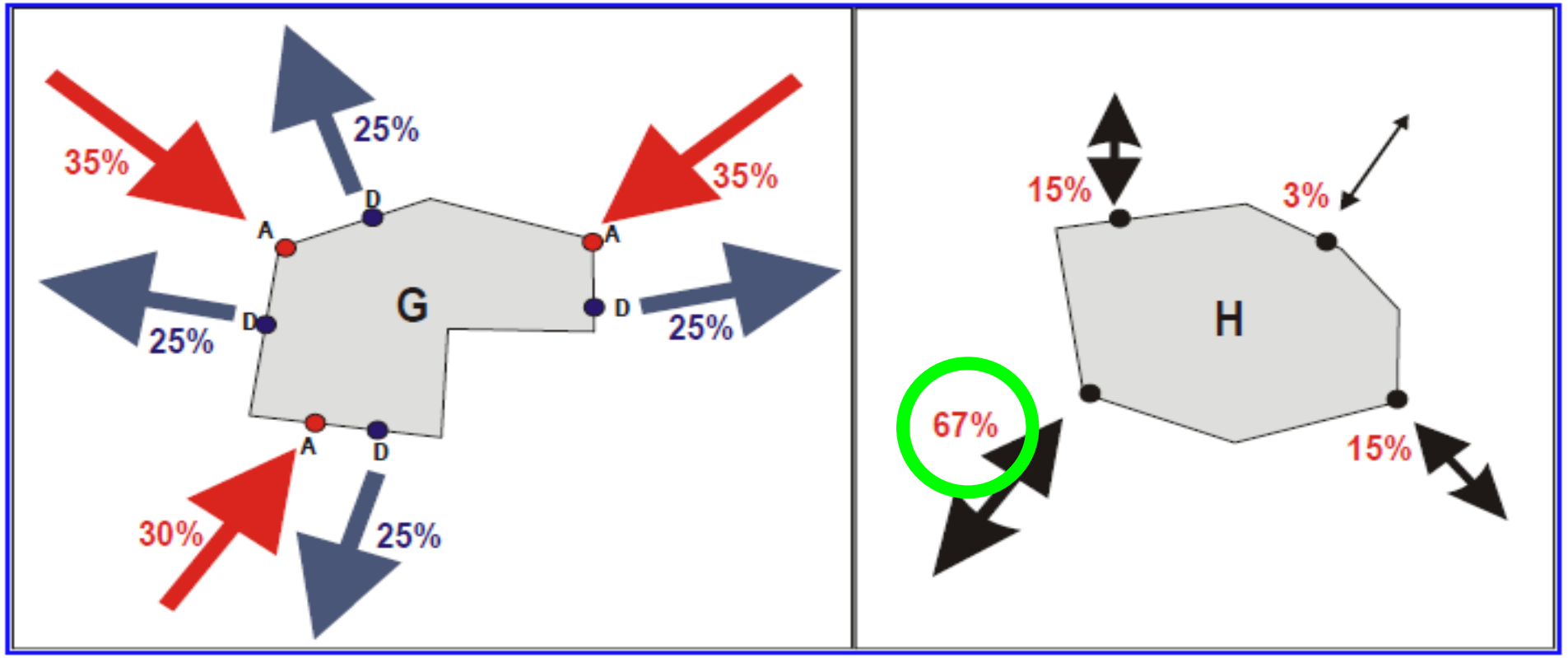
– Capacity increasing

## Atlanta Hartsfield Jackson airport



# Efficiency/Capacity

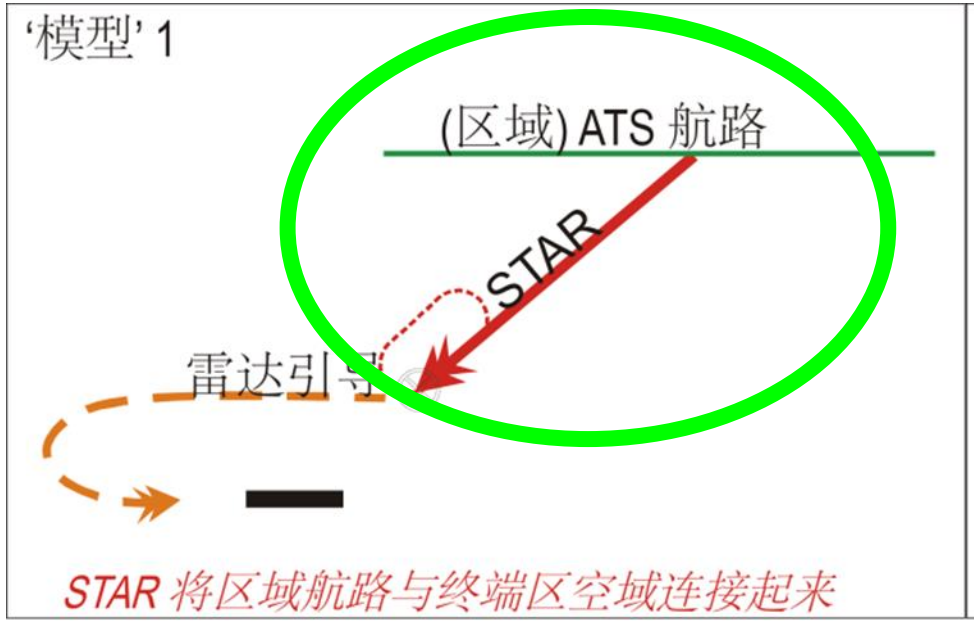
– **Capacity increasing**




**more** **less**

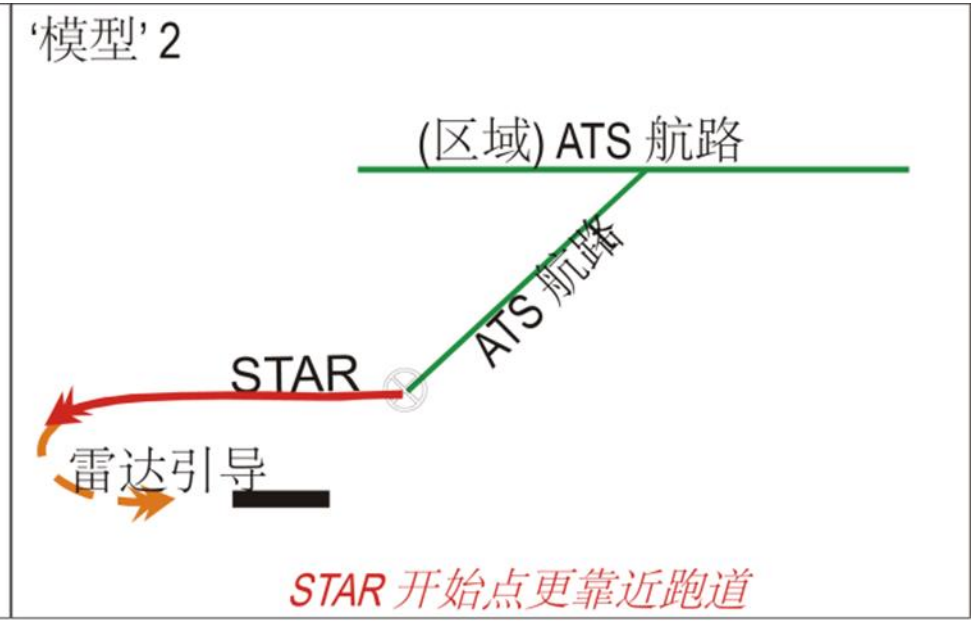
# Efficiency/Capacity

- **Capacity increasing**




**more**

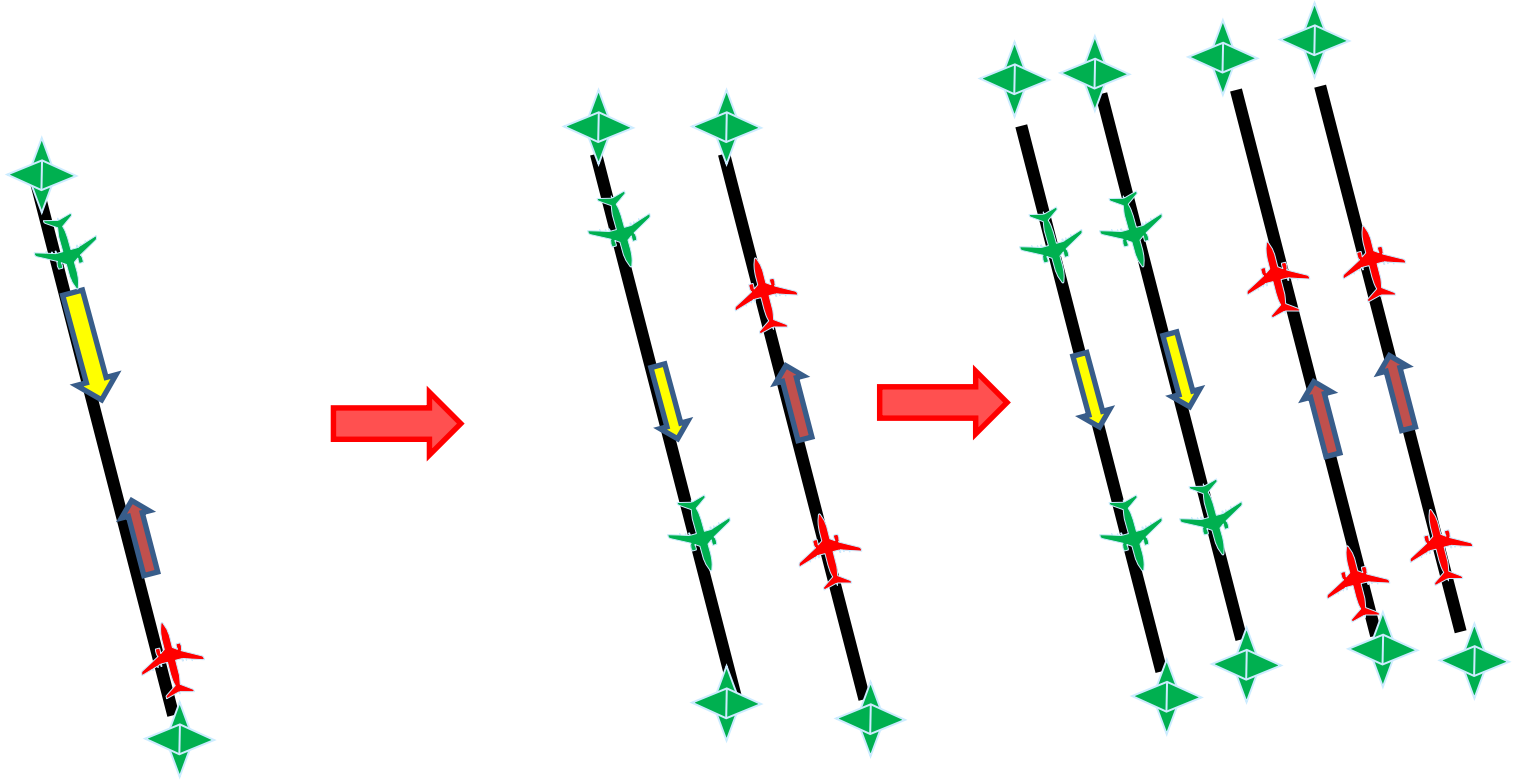
- **Time saving**



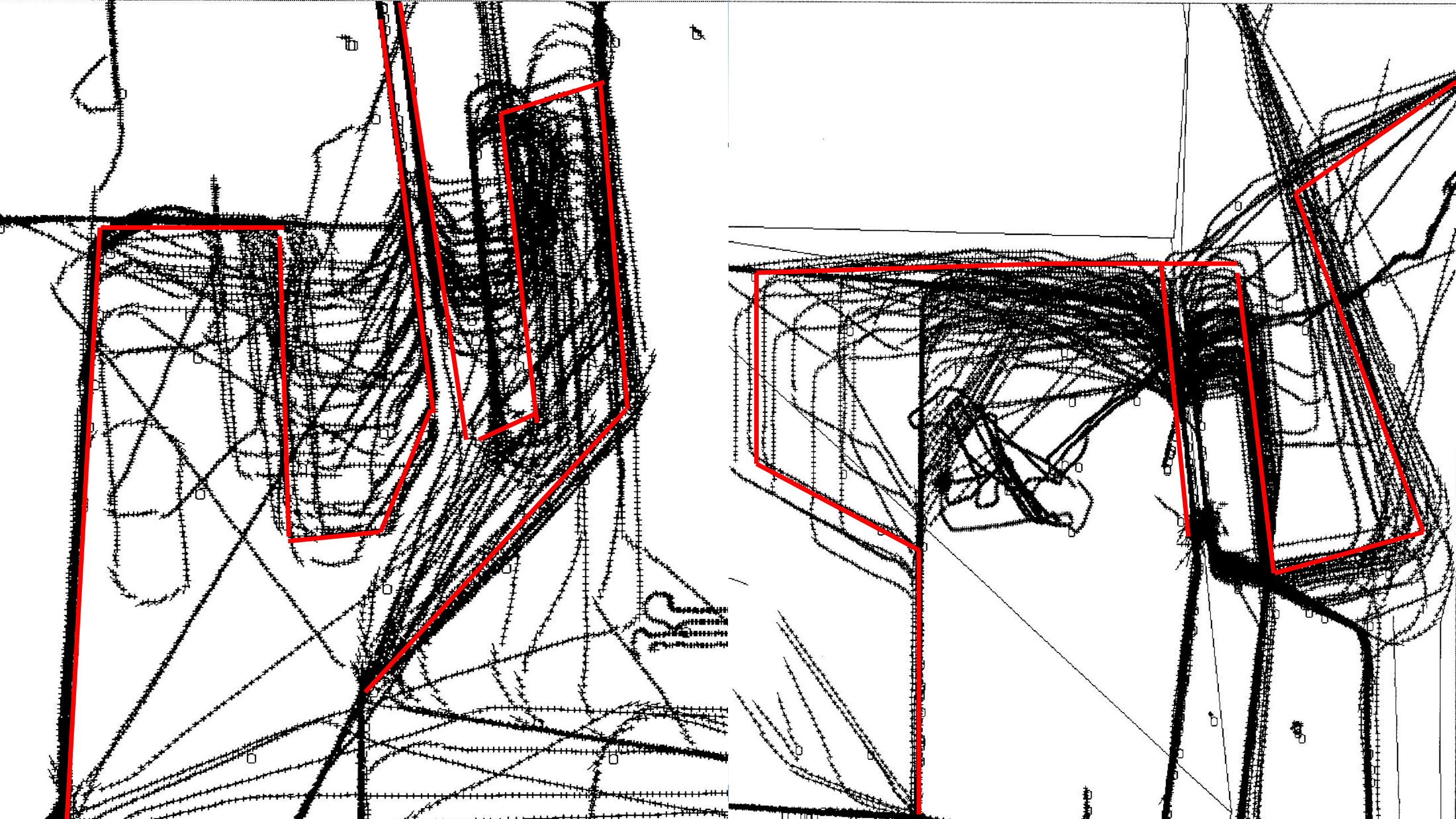

**less**

# Efficiency/Capacity

- **Capacity increasing**

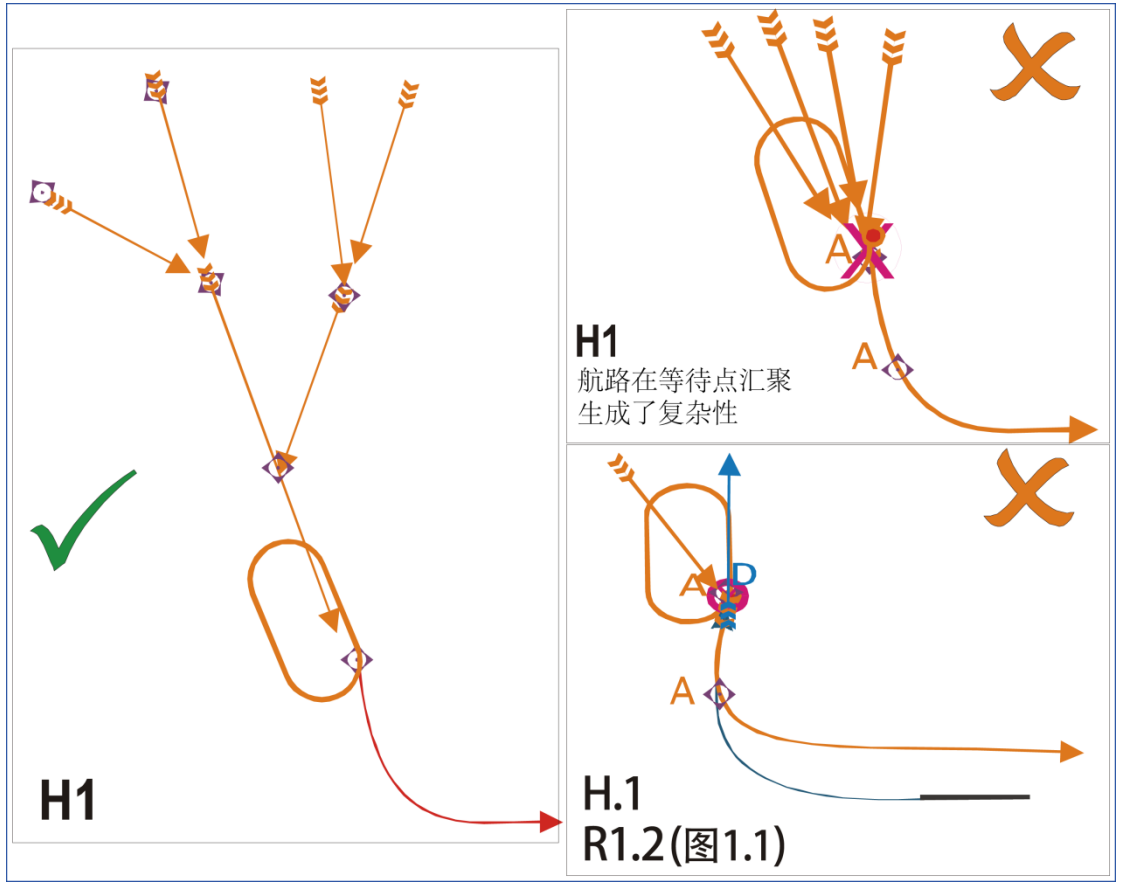


**less** **middle** **more**



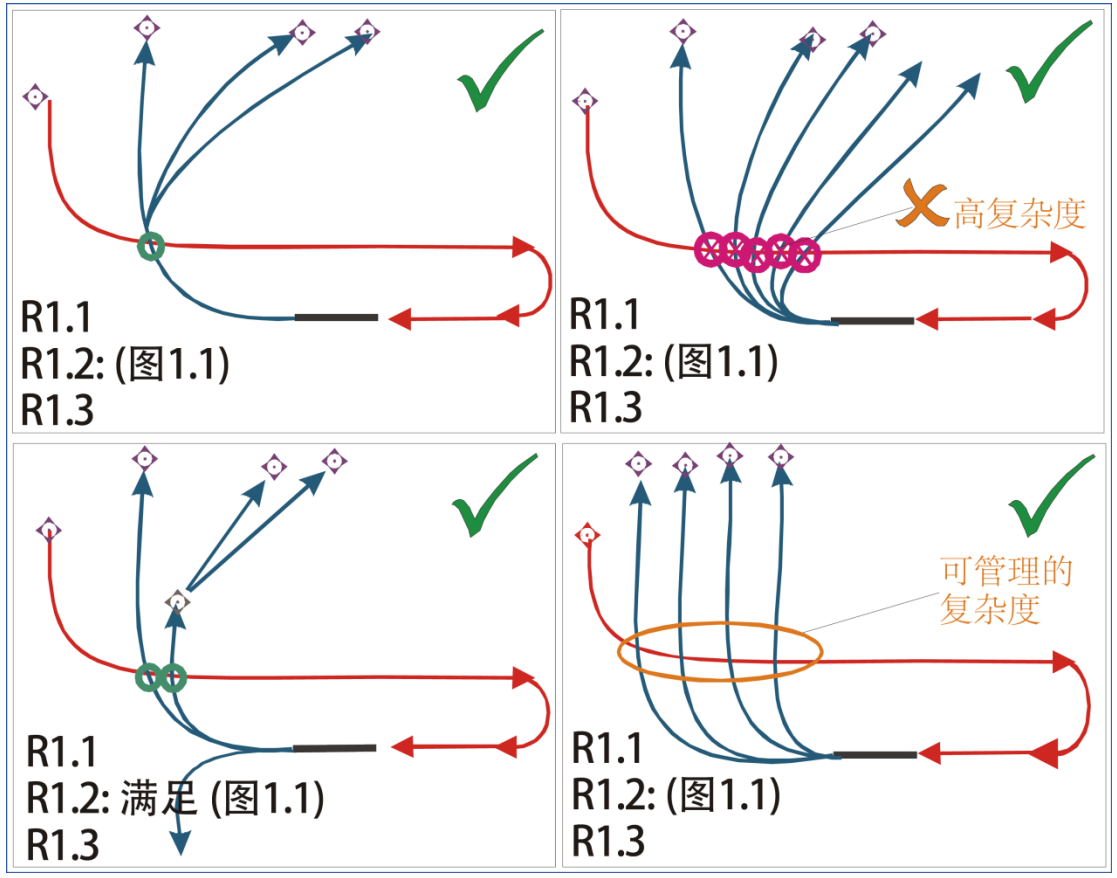
# Efficiency/Capacity

– **Time saving**

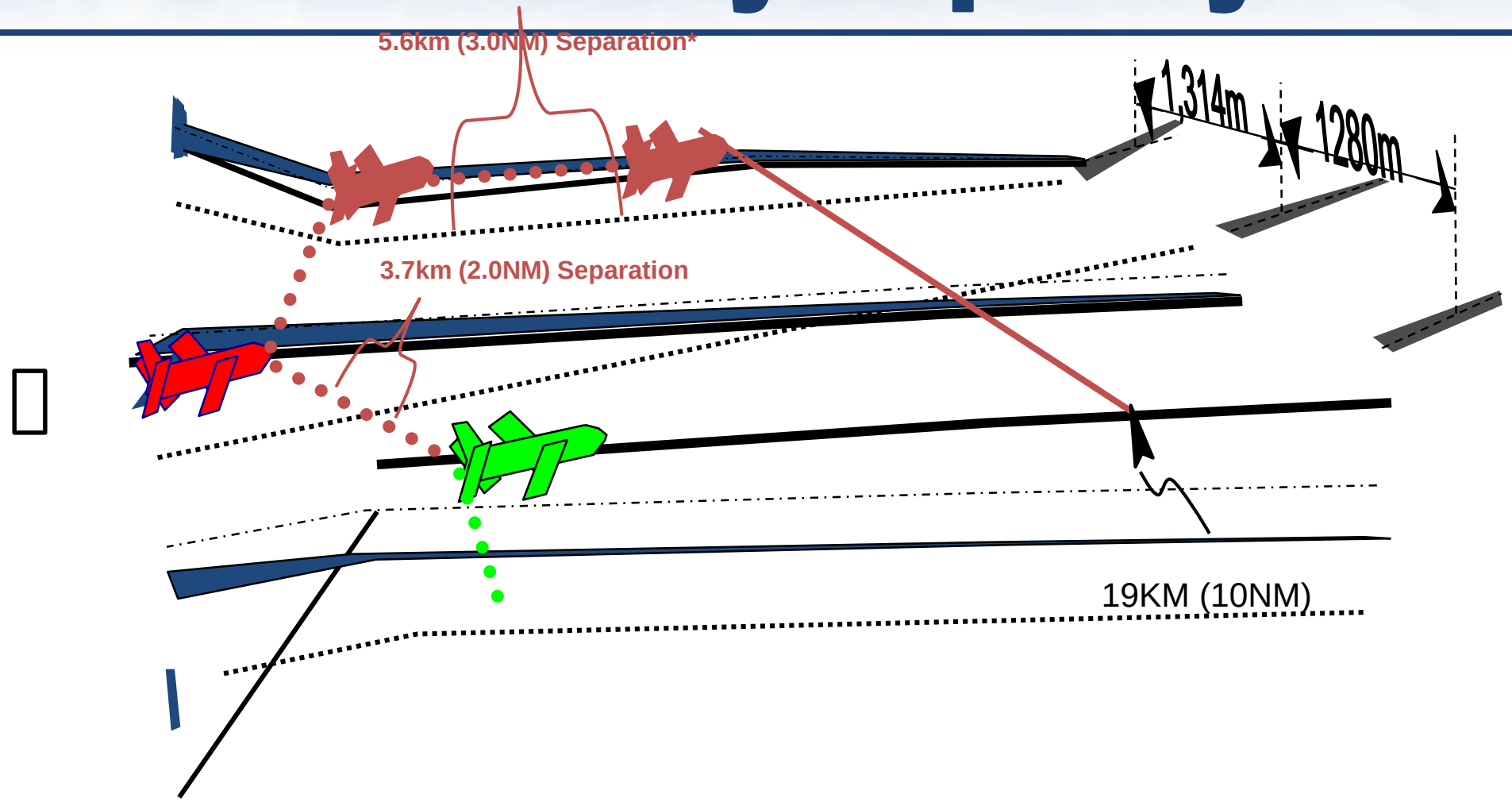


# Efficiency/Capacity

– **Time saving**



# Efficiency/Capacity




*Unless increased separation is required due to Wake Turbulence.

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