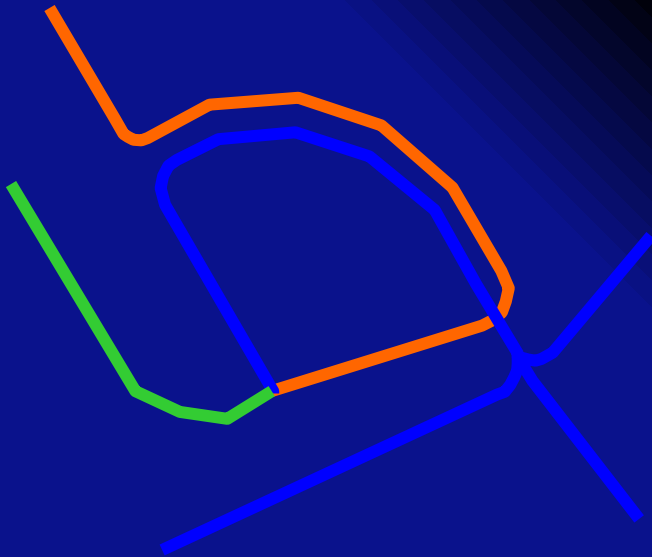


## Point Merge System Our Experience in KLIA

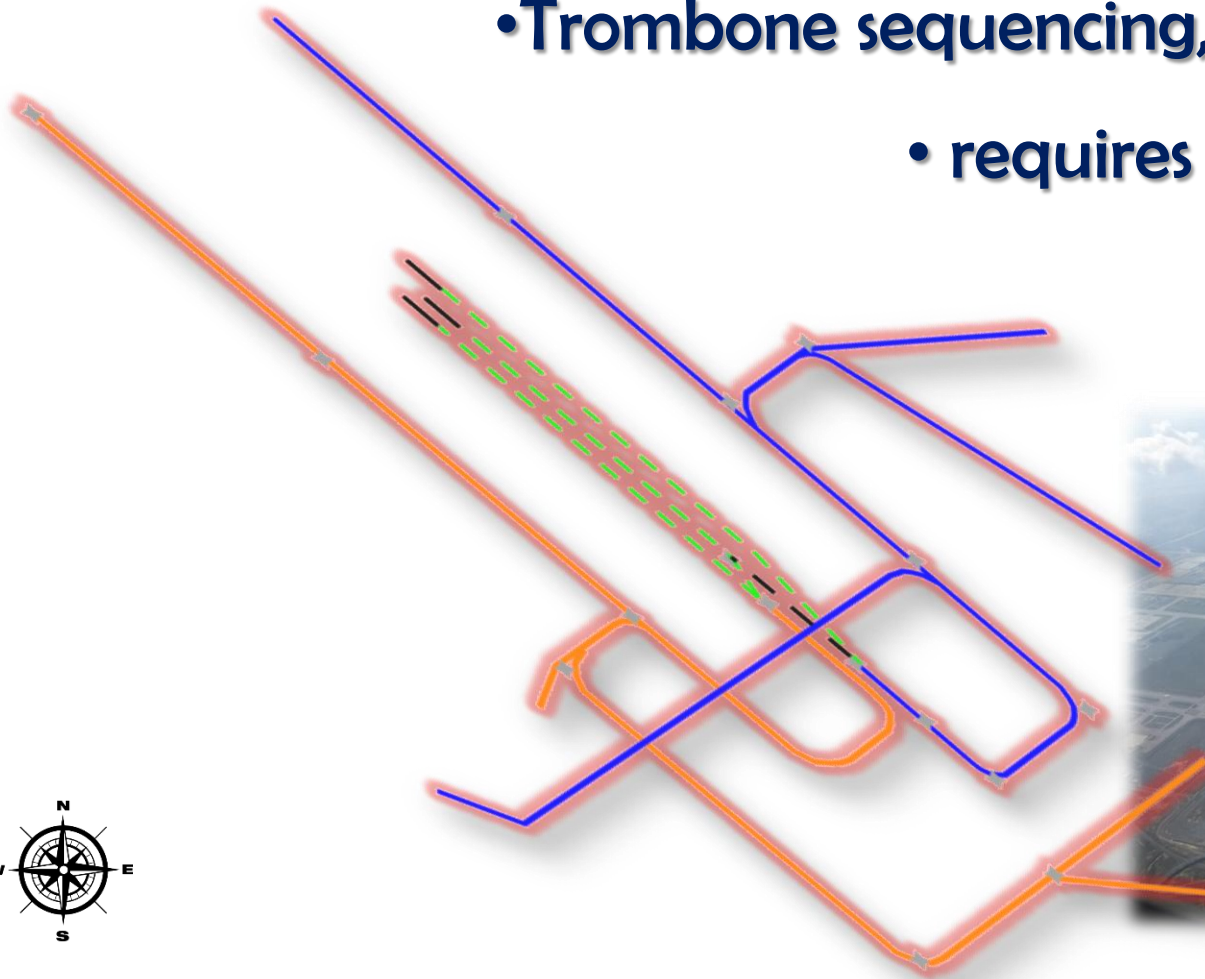
Nagayaindran S Narayanan  
R & D KL-ATCC



PBN Workshop for Air Traffic Controllers (Train the Trainer)  
APAC-RSO Beijing, China 13-15 June 2017

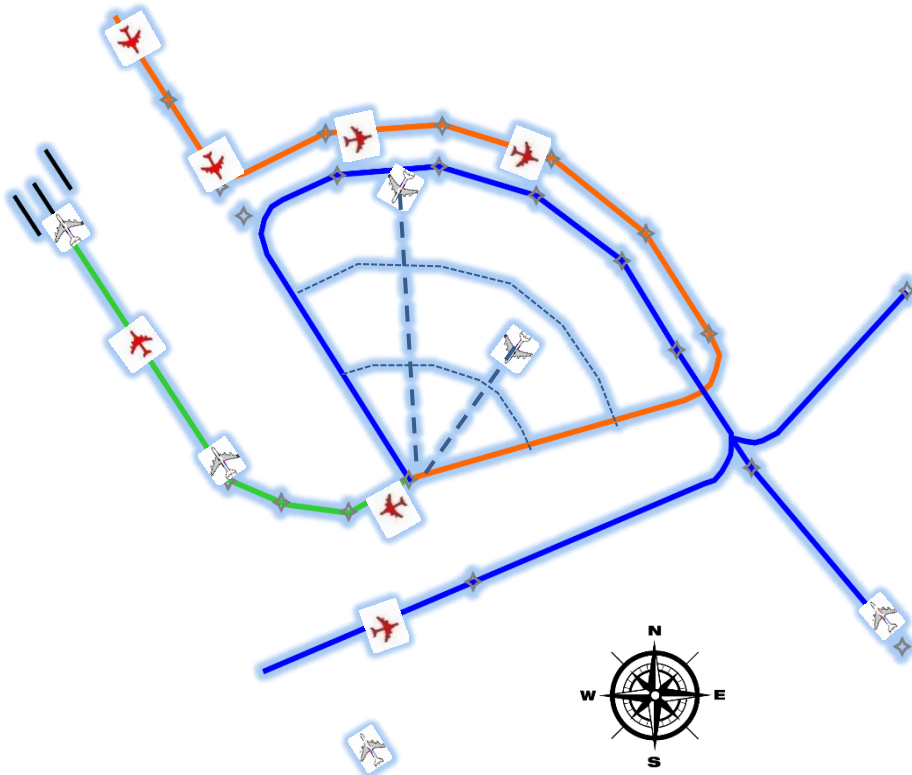
# KLIA

- 3 runway operations – phased airspace design
  - Trombone sequencing, merging & spacing
  - requires tactical interference



# Point Merge System

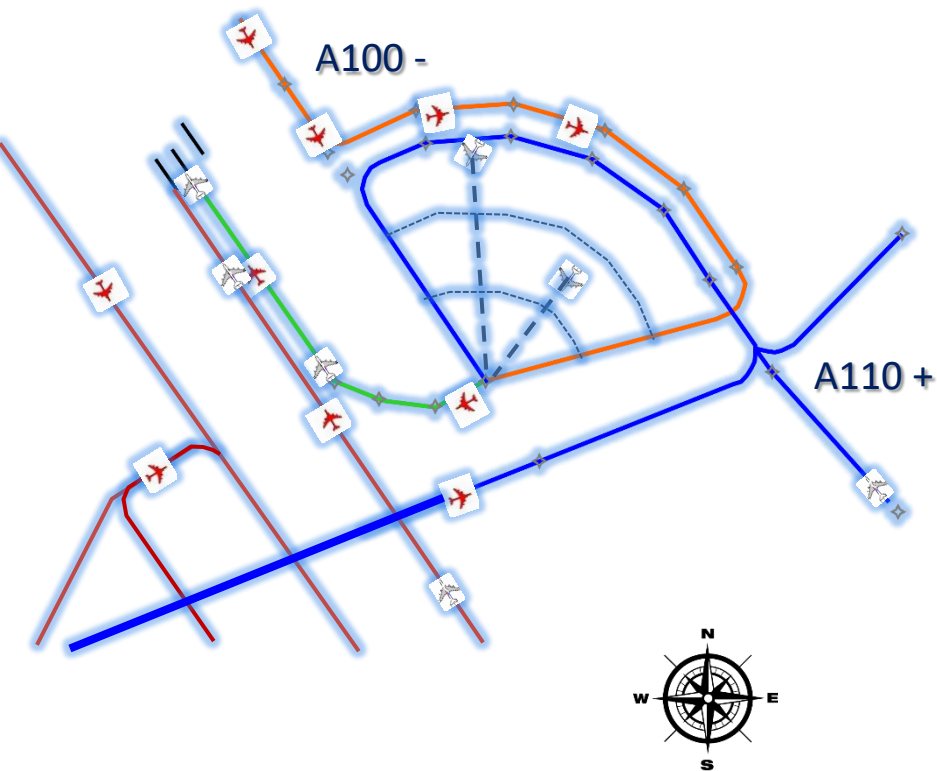
- Develop by Eurocontrol Experimental Centre
- Extensive use of onboard RNAV systems
  - Spacing, sequencing & merging
  - Closed loop design
- Continuous Descent Operations



# Our Experience in KL TMA

## Positives

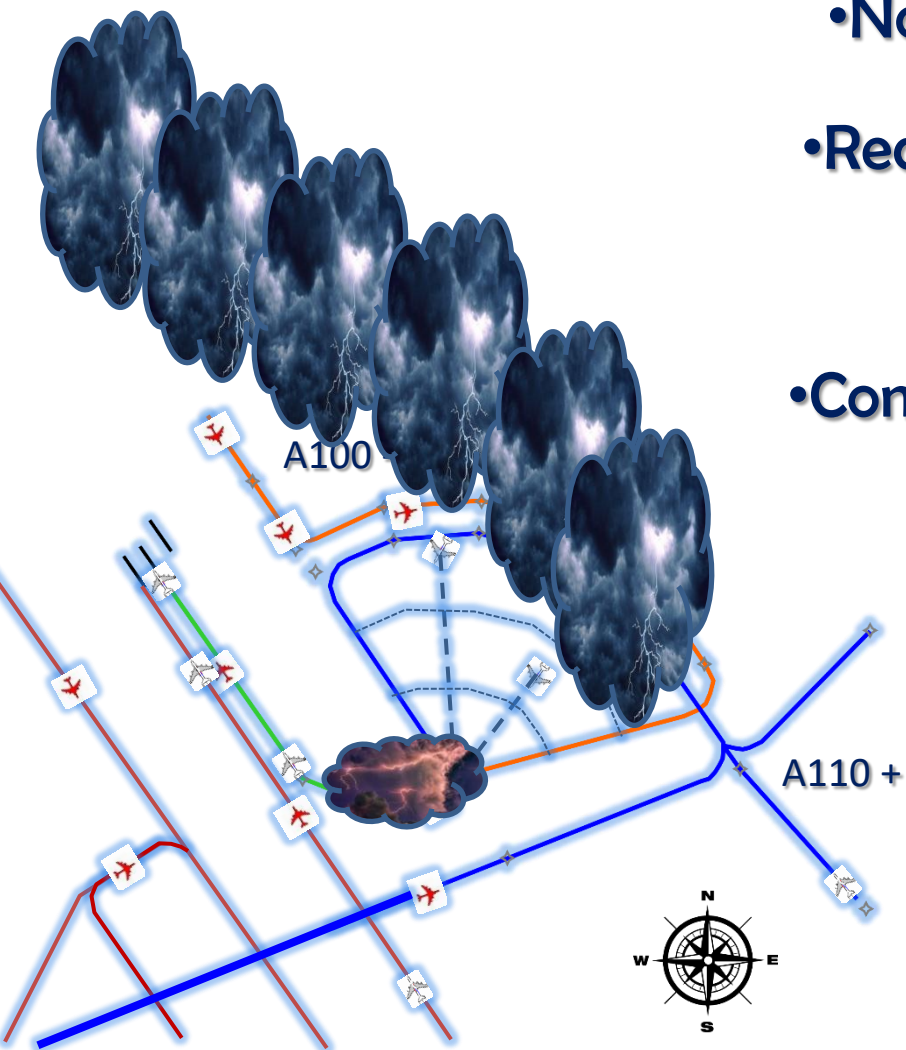
- Phase 1 experiment – mix of Trombone and PMS
- Controller focus on a smaller geography
- Application of simple sequencing rules
- Reliable spacing prediction
- Reduction in RT
- Run-offs are seldom and handled tactically
- Predictability for pilots
- Pilots love it?
- Very well received by controllers



# Our Experience in KL TMA

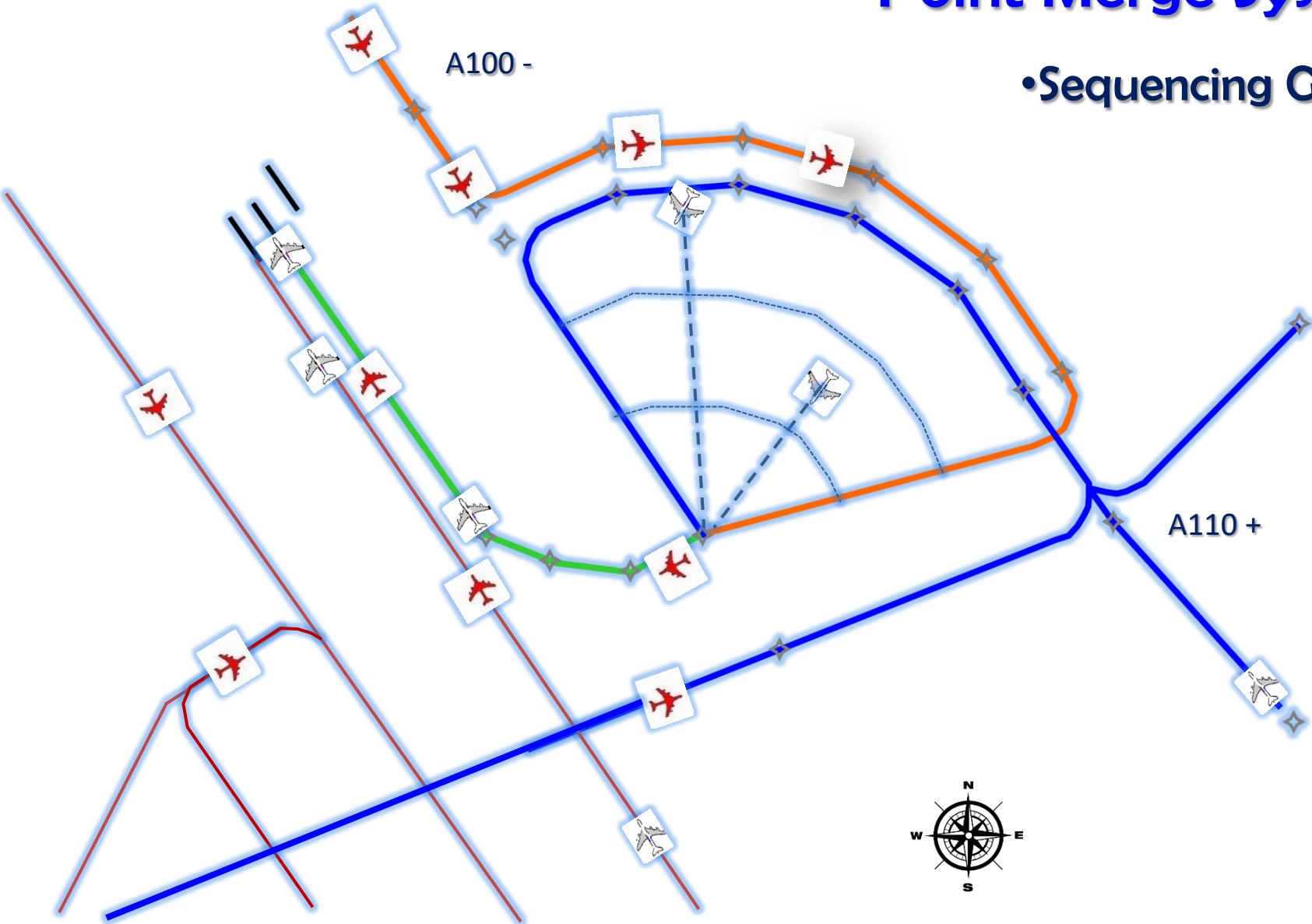
## Negatives

- Not flyable during inclement weather
- Requires advance planning to mitigate
  - Controllers loose vectoring skills
- Compliance with coded speeds essential
  - On profile descents essential
- 'Direct to' clearance has to be timed efficiently

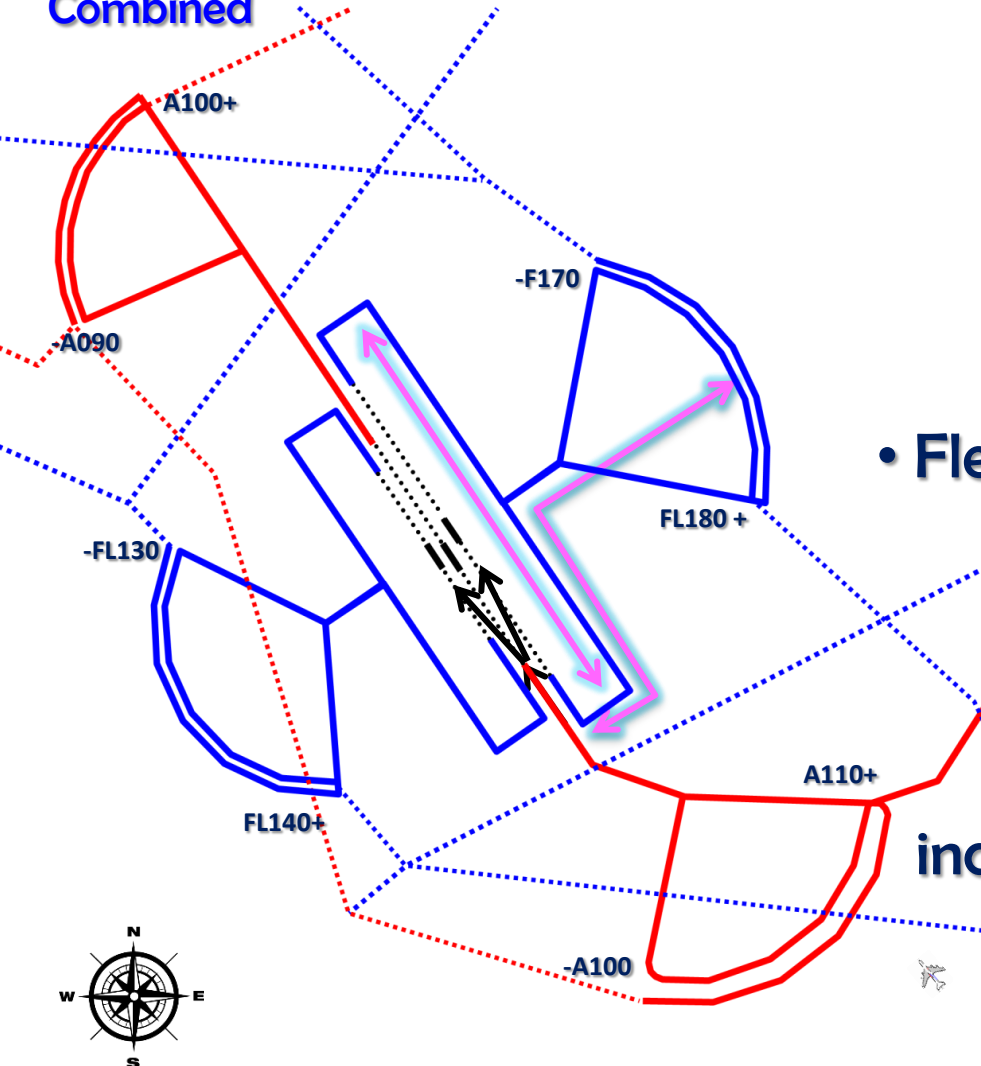


# Point Merge System

## •Sequencing Guide



## North and South Flow Combined



# Our Plan for KL TMA

## Positives 1

- Capability for triple approach
- 3 PMS – One for each runway
- Inclement weather mitigation
- Flexible PMS/runway combination : swap capable
- Simplified landing direction swap
- Sequencing leg length increase : increased delay absorption capability

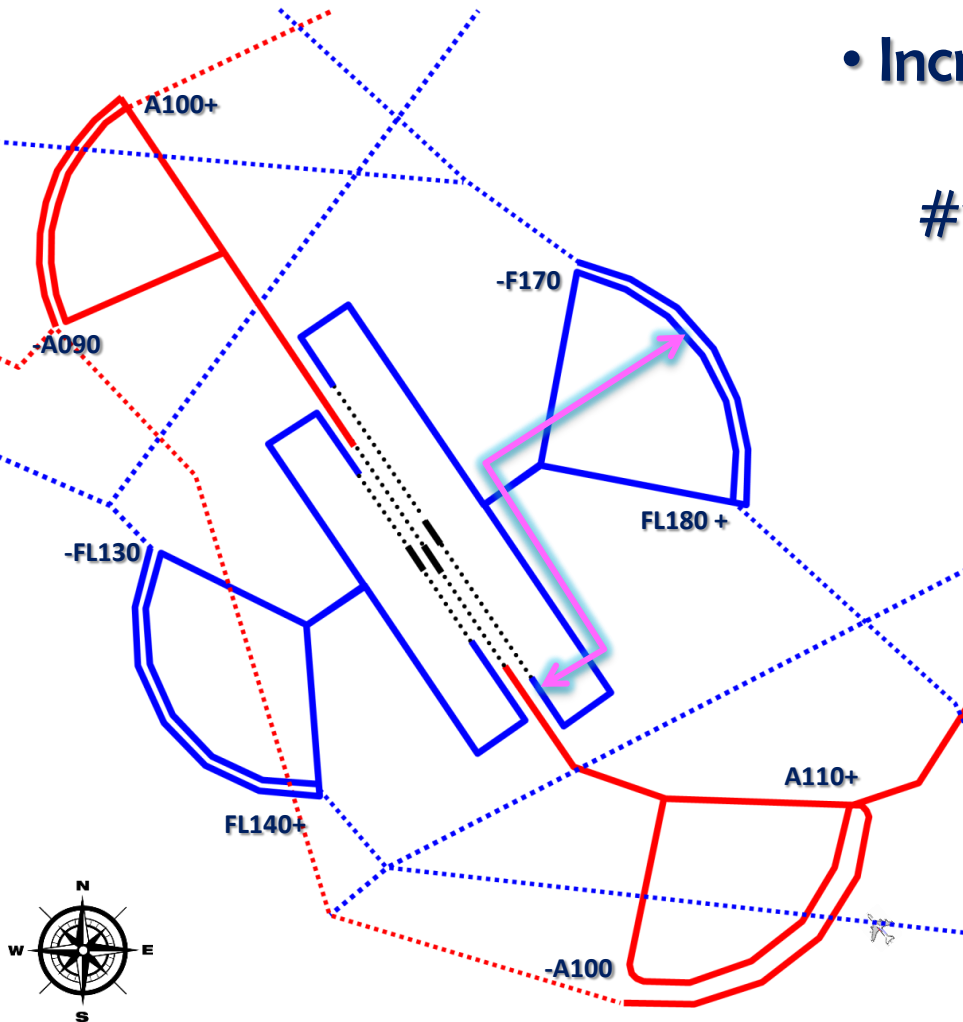


North and  
South Flow  
Combined

# Our Plan for KL TMA

Positives 2

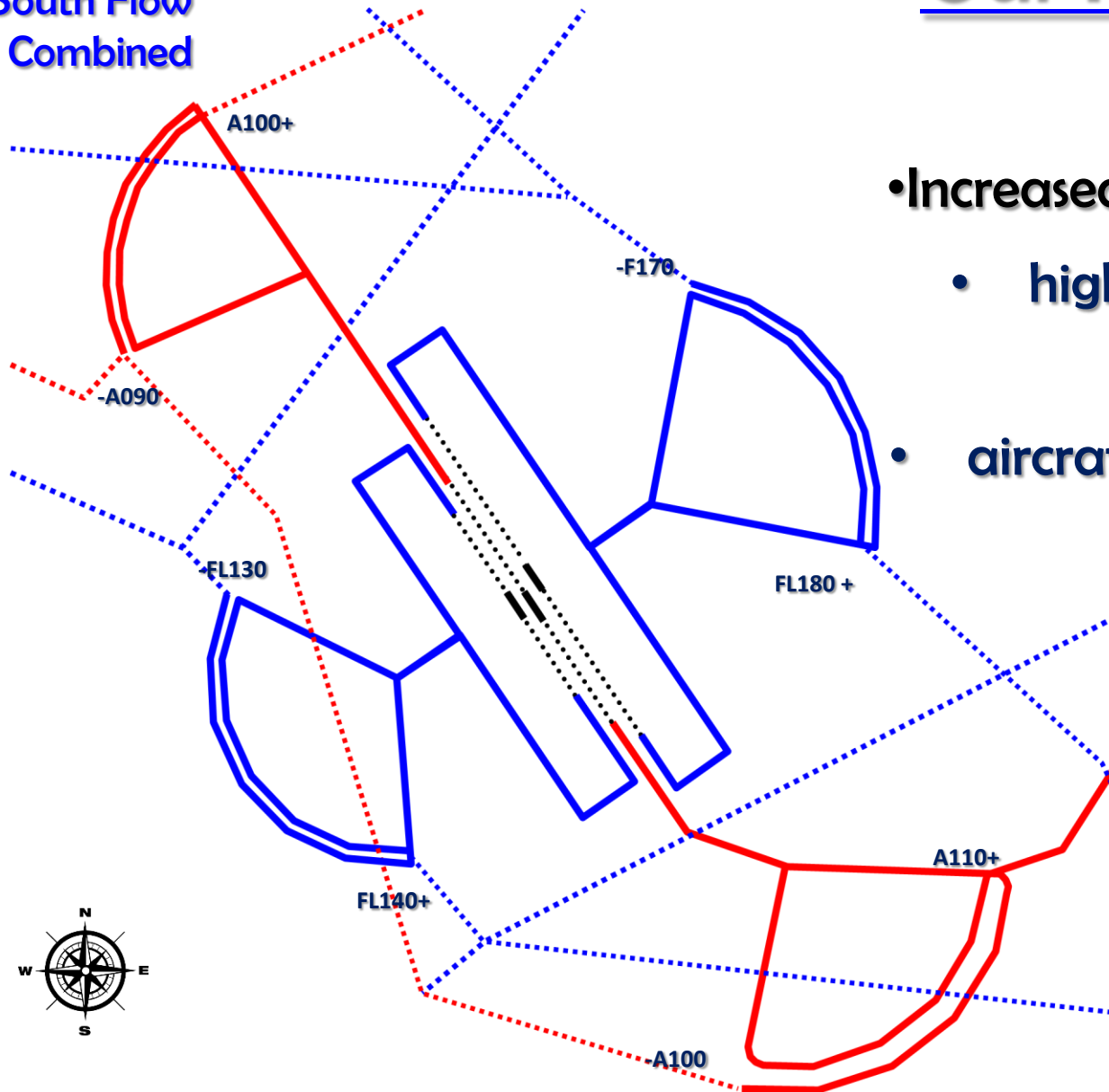
- Increased sequencing leg altitude :
  - # flight efficiency
  - #reduced environmental impact
  - # facilitates CDO



North and  
South Flow  
Combined

# Our Plan for KL TMA

Negatives



- Increased speeds at higher legs
  - higher speeds affect delay absorption capacity
- aircraft performance issues if diverse aircraft types



**Thank  
You!!!**

