

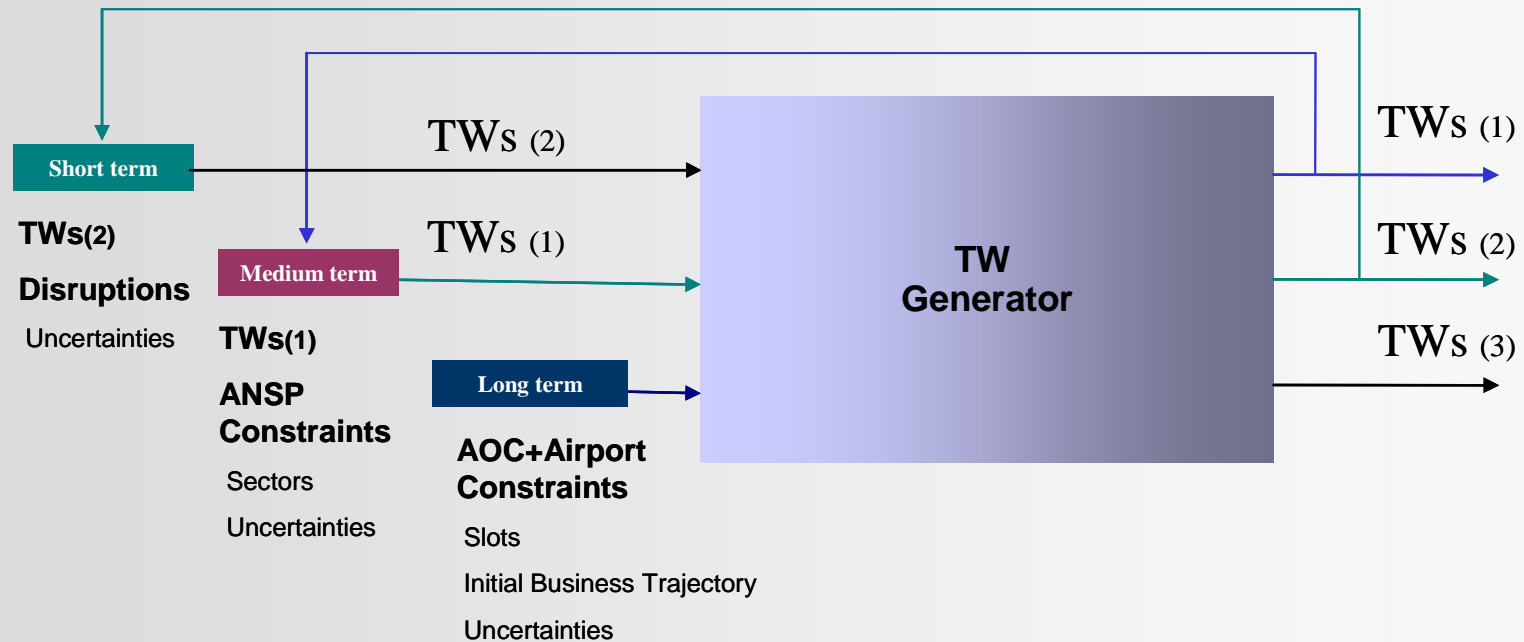


# CATS Workshop

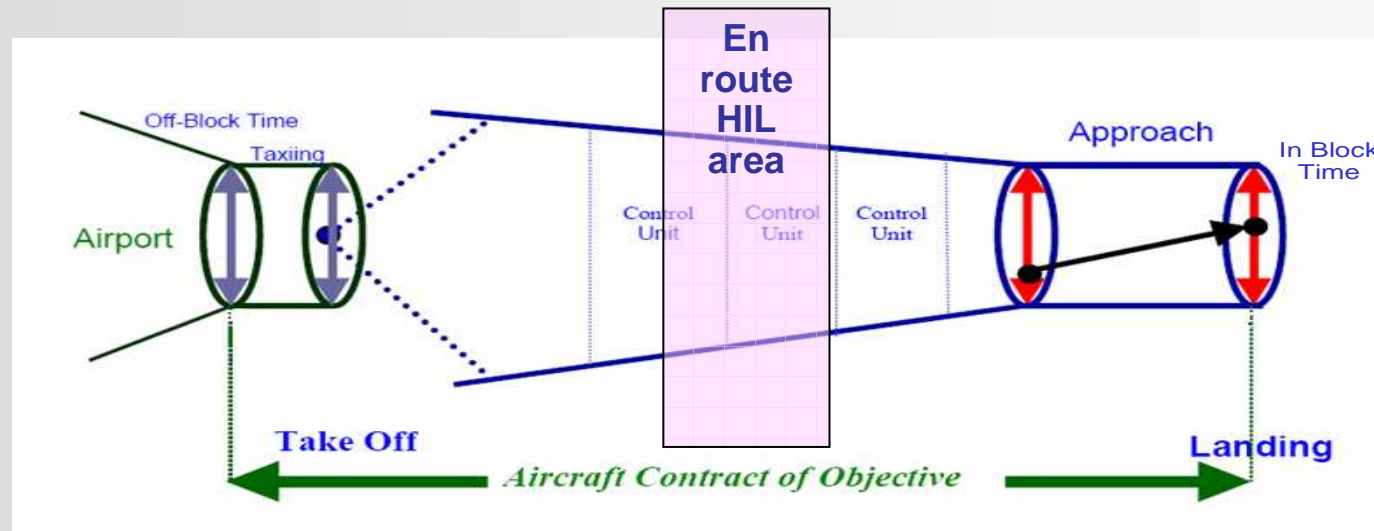
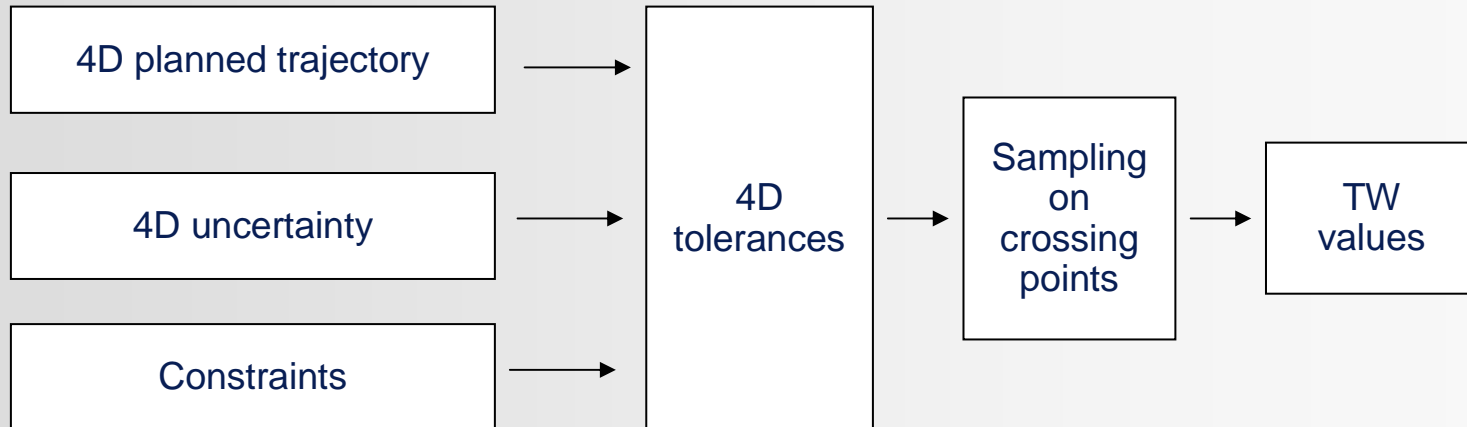
## Target Window calculation

Ion Berechet  
Air France Consulting

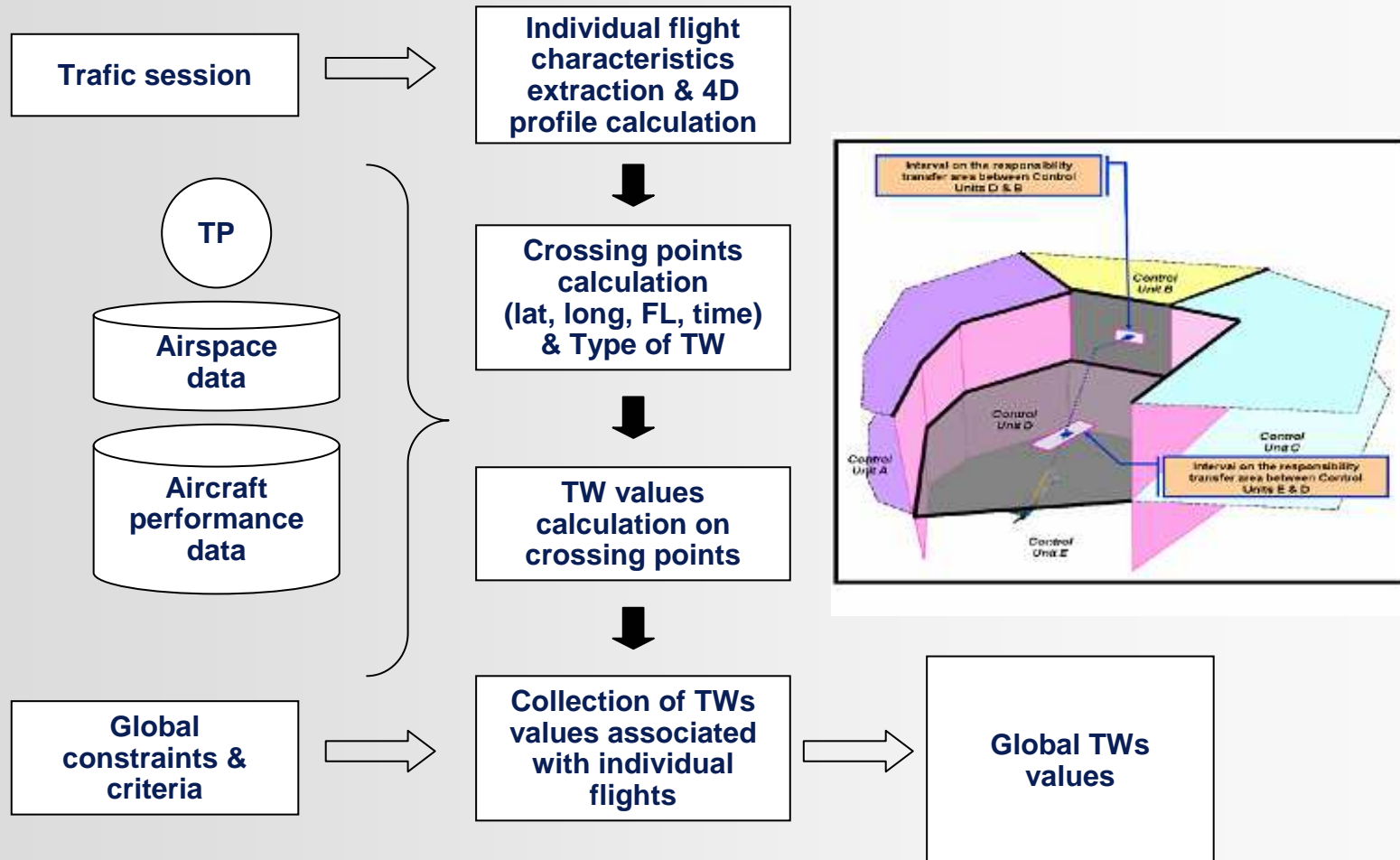
# Global view of TW generation



# Basic principles of TW calculation



# Main functional blocks of TW generator



# The non exhaustive list of inputs



- Airports slots,
- Target Time of Arrival
- Aircraft flight commercial envelop + cost decision from airlines,
- ANSPs constraints (sector design, environment limitations, network overload...),
- Military or other airspace constraints,
- Known weather disruptions (wind forecast, storm incidence in this particular season....),
- The safety issues, regarding the number of TW overlapping at the same time, same area, same FL,
- Other disruptions (tools uncertainty ...).

# Disruptive phenomena examples

## ■ Ad hoc occurrences

- Logistical delays at airports
- Runway capacities
- Meteorological phenomena such as thunderstorms, turbulence or high winds occurring during flight
- Occurrences on board aircraft

## ■ Permanent uncertainty

- Measurement noise
- Model noise
- Current aircraft position
- Aircraft performance, mass and consumption
- Air mass properties: temperature, pressure and velocity fields
- Taxiing time

## ■ ATC-flight crew

- imperfect communications
- delay

## ■ Separation function

- intrinsic limitations to reactivity: the time taken to implement an order (time lag between controller and pilot)

# Some tolerances

## ■ ADEP tolerance example (Airline)

- Tolerance of ATFM slot CTOT-5 min to CTOT+10 min
  - *CTOT – Calculated Take Off Time*
  - Any deviation from this tolerance generates a return to the park
- Tolerance of Hour of departure
  - ETOT- 5 min to ETOT+3min for short and medium haul
  - ETOT-10 min to ETOT+3min for long haul
  - *ETOT – Estimated Take Off Time*

## ■ ADES tolerance example - Punctuality destination

- Ideal tolerance company of hour of arrival: H-15 min to H+ 5 min
- Eventually, TTA H-2min to H+3min (for SESAR, out of AMAN horizon)

# Next steps



- **Global constraints and criteria identification for all actors**
  - Airlines
  - Airports
  - ANSPs
- **Global constraints and criteria integration into the model calculation**
- **TW generator automation**
- **TWs values generation for the second experiment (HIL2)**

Thanks for your attention !