MINISTÈRE CHARGÉ DES TRANSPORTS

Liberté
Égalité
Fraternité

dgac direction générale de l'Aviation civile
DSNA

Green Operations

VFE FABEC
7th, December, 2022
NICE

Virginie BONNEVAL
DSNA, Nice

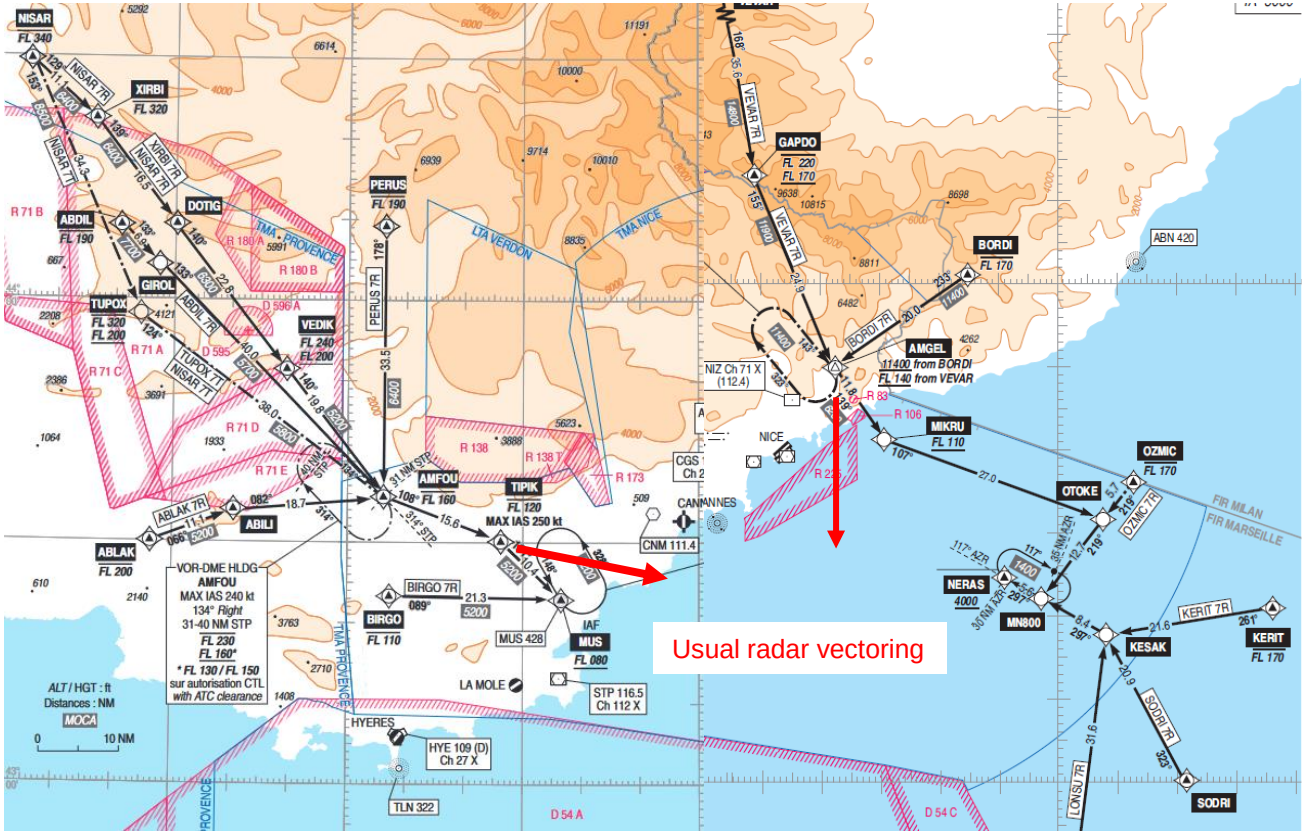
Adrien Emeraux
AIR FRANCE

PART 2 : CDO and customized PBNtoFinal 14h30-15h00

Local collaborative work @ Nice between ATC and Air France on CDO and PBN

PBN to Final : Closed trajectories for VFE improvement (CDO 195)

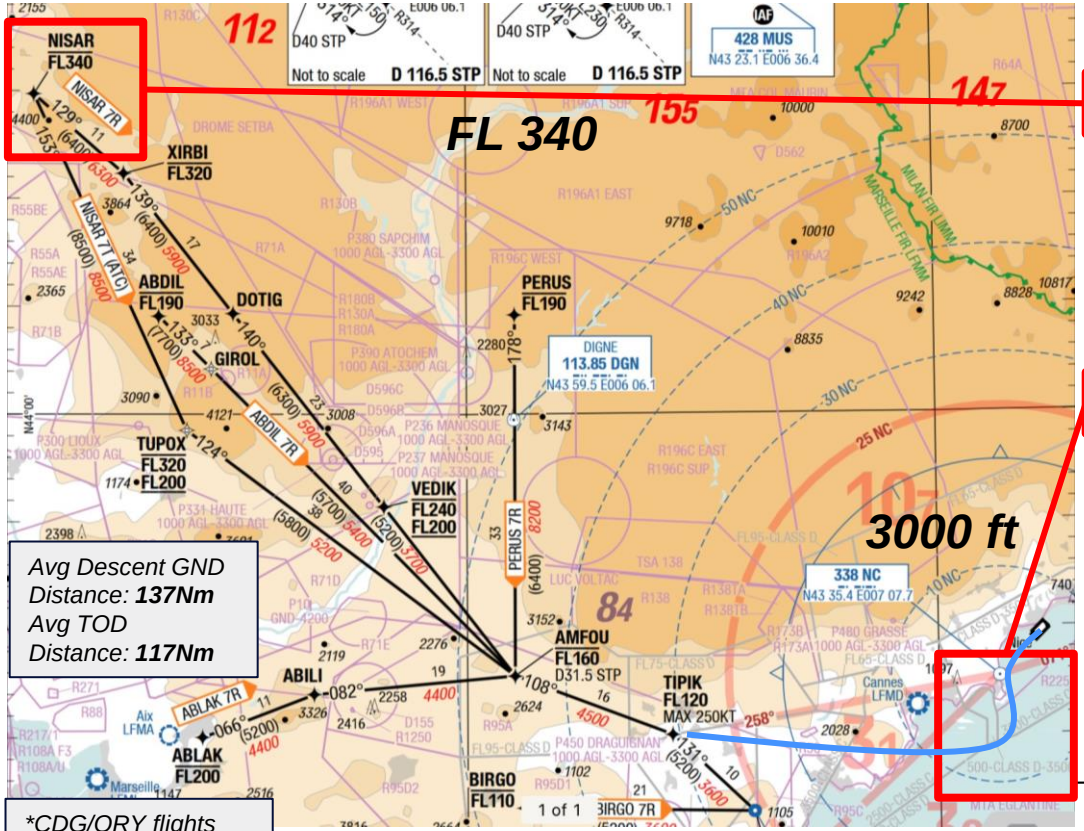
PRESENT SEQUENCING SITUATION

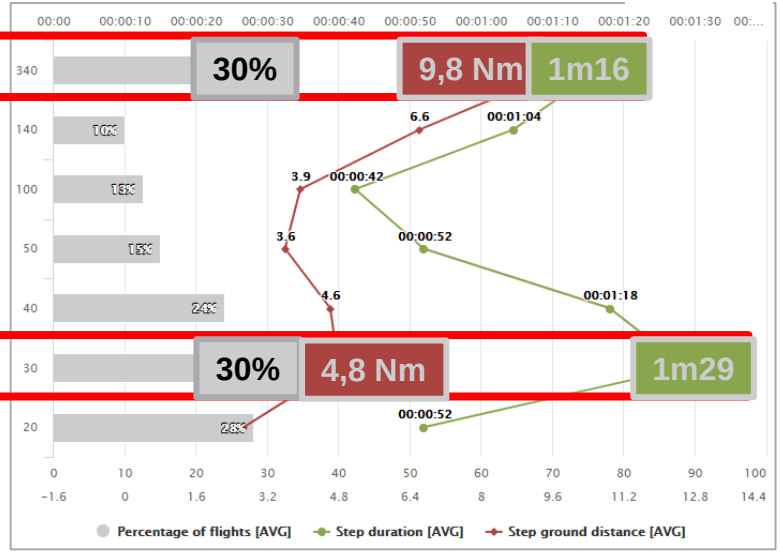


- STARs :
  too long to be flown during low trafic period
- Frequent Vectoring from TIPIK or AMGEL
- Distance To Go often requested by crew

04 L/R arrivals via NISAR* - 2019 Air France analysis

NCE	• Avg step ground distance	• Avg step duration
04 L/R	9 NM	2 MIN 17 S



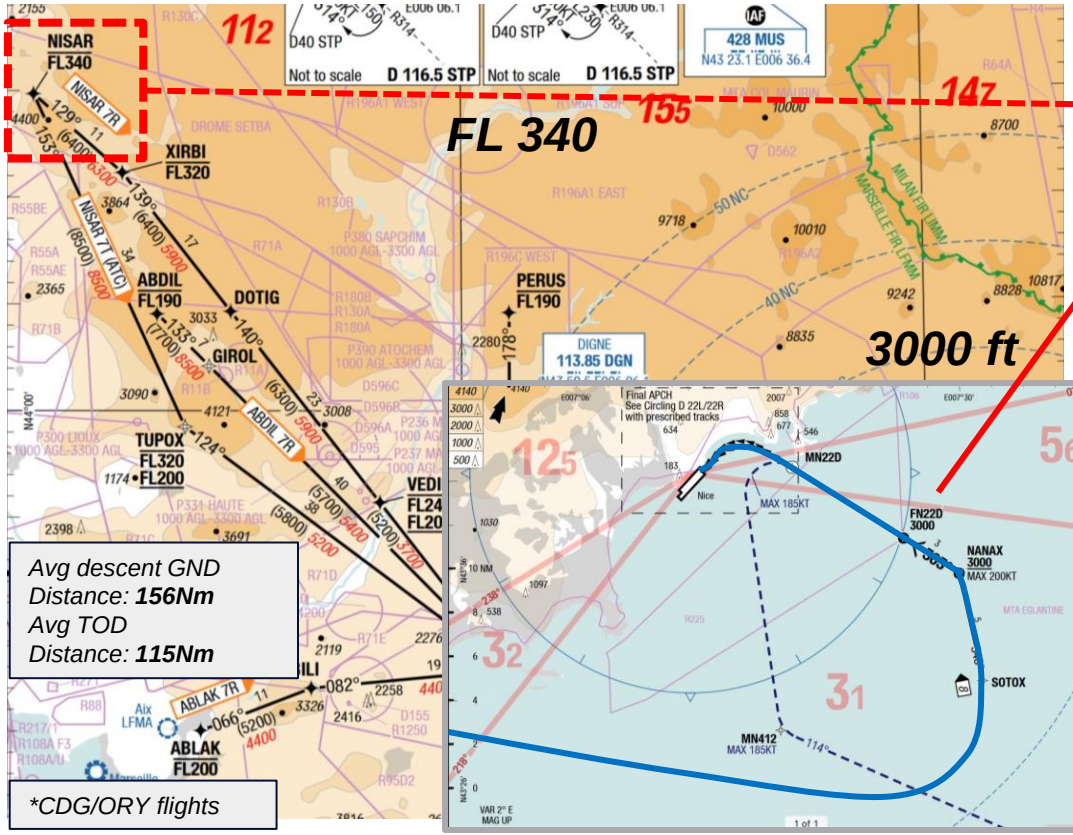


2 main level off segments :

- **FL 340** : NISAR constraint – ACC
- **3000 ft :** Low traffic => short vectoring – extended use of speedbrake (>2 min)
  High traffic => low level off – variable vectoring

=> **Objective = PREDICTABILITY**

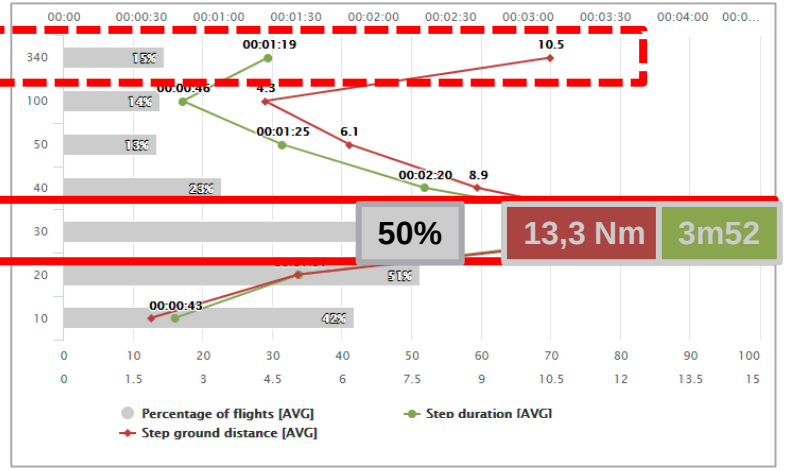
22 L/R arrivals via NISAR* - 2019 Air France analysis



*Avg descent GND Distance: **156Nm***
*Avg TOD Distance: **115Nm***

**CDG/ORY flights*

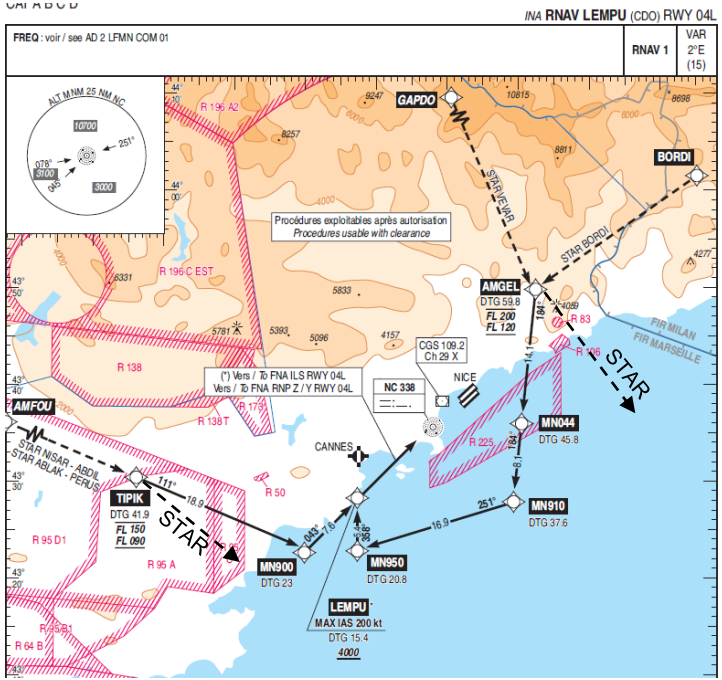
NCE	• *Avg step ground distance*	• *Avg step duration*
22 L/R	19 NM	5 MIN

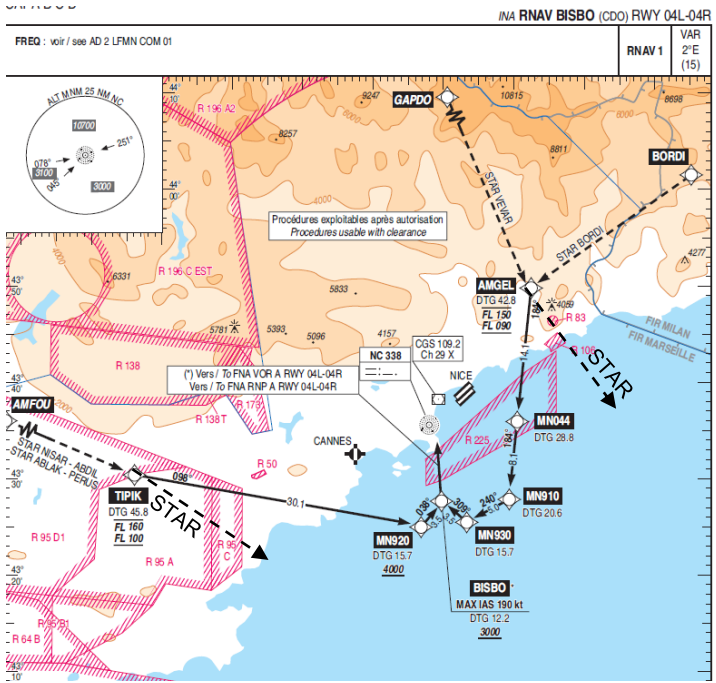


- Longer descent ground distance – longer vectoring
- **More** flights impacted by **longer & lower** level off segments
- No predictability on DTG and sequencing

=> Possibility to adapt the descent with **earlier trajectory closing**

Former CDO charts





Conditions of use :

- Only at night
- With ATC clearance
- Starting from mid-STARs

In real :

- Never used in a proper maner
- Often followed during the day by mistake
- Induced unexpected tracks

Withdrawal in 2020 and commitment to work on a new version of CDO

New PBN to Final project to improve NCE CDO application

- Nov 2021 : start of a collaborative work with Air France - Green Task Force
- March/Nov 22 : workshop for design, working methods, trials (ATCOs + Air France)
- No trial participation of ACC above TMA (expected in 2024…)

Target :

- CDO 195 (from first contact in Nice TMA to ground)
- Low, Medium traffic

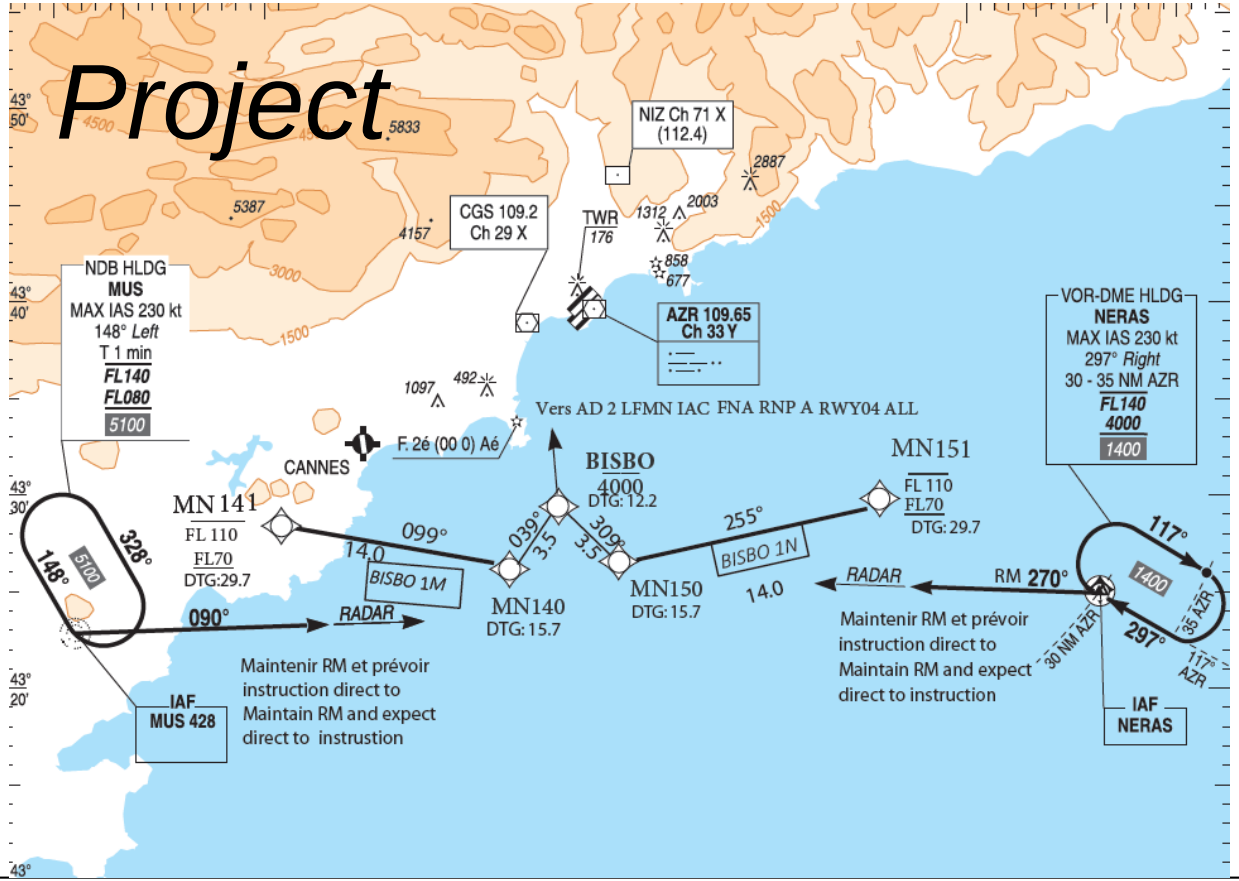
Safety objectives :

- Avoid high energy approach
- No impact during pick hours → no change in working methods during busy time

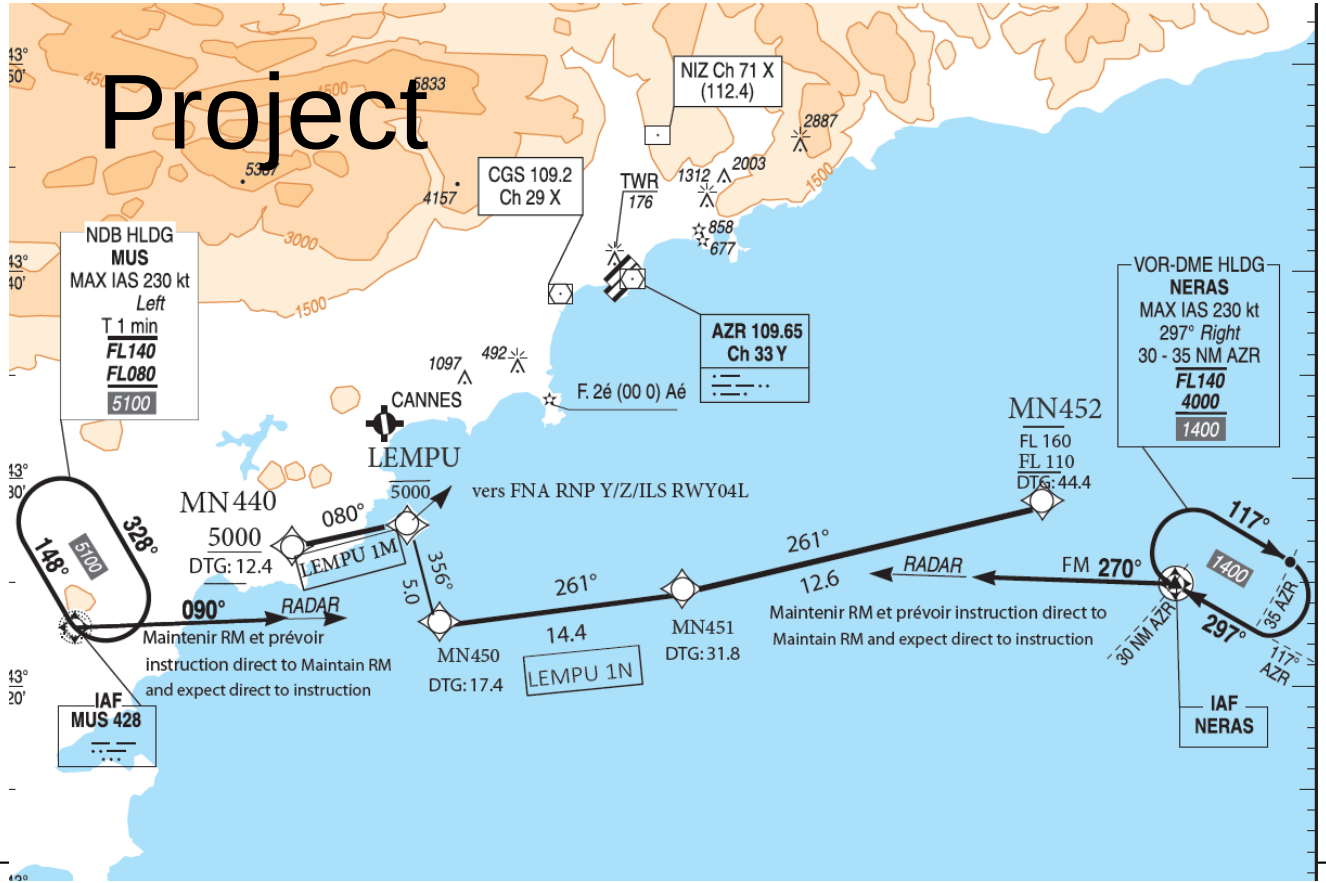
RNP A 04L/R

PBN to Final :

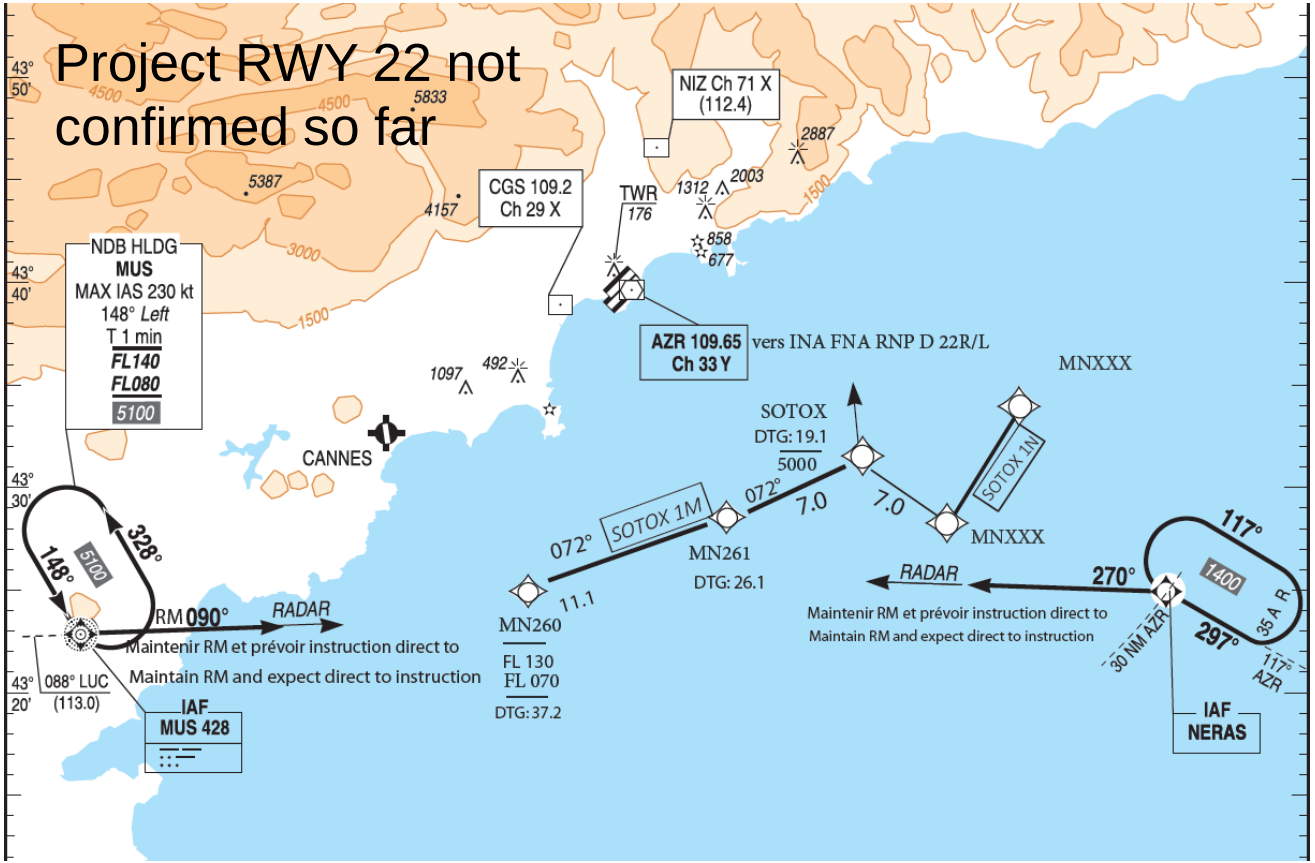
- starts from IAF with vectoring in the code : open « Dog legs »
- DCT possible at first contact from any entry point
- One chart for all kind of traffic !



RNP Y/Z 04L/R


Project
NIZ Ch 71 X
(112.4)
CGS 109.2
Ch 29 X
TWR
176
AZR 109.65
Ch 33 Y
NDB HLDG
MUS
MAX IAS 230 kt
Left
T 1 min
FL140
FL080
5100
VOR-DME HLDG
NERAS
MAX IAS 230 kt
297° Right
30 - 35 NM AZR
FL140
4000
1400
CANNES
LEMPU
5000
vers FNA RNP Y/Z/ILS RWY04L
MN440
5000
DTG: 12.4
MN452
FL 160
FL 110
DTG: 44.4
328°
148°
090°
RADAR
Maintenir RM et prévoir instruction direct to Maintain RM and expect direct to instruction
080°
LEMPU 1M
356°
5.0
MN450
DTG: 17.4
261°
14.4
LEMPU 1N
MN451
DTG: 31.8
261°
12.6
RADAR
FM 270°
Maintenir RM et prévoir instruction direct to Maintain RM and expect direct to instruction
117°
297°
30 NM AZR
35 AZR
117° AZR
IAF
MUS 428
IAF
NERAS

RNP D 22L/R


Project RWY 22 not confirmed so far
NIZ Ch 71 X (112.4)
CGS 109.2 Ch 29 X
TWR 176
AZR 109.65 Ch 33 Y
vers INA FNA RNP D 22R/L
NDB HLDG MUS
MAX IAS 230 kt
148° Left
T 1 min
FL140
FL080
5100
CANNES
SOTOX
DTG: 19.1
5000
SOTOX 1M
SOTOX 1N
MNXXX
MN261
DTG: 26.1
MN260
FL 130
FL 070
DTG: 37.2
072°
7.0
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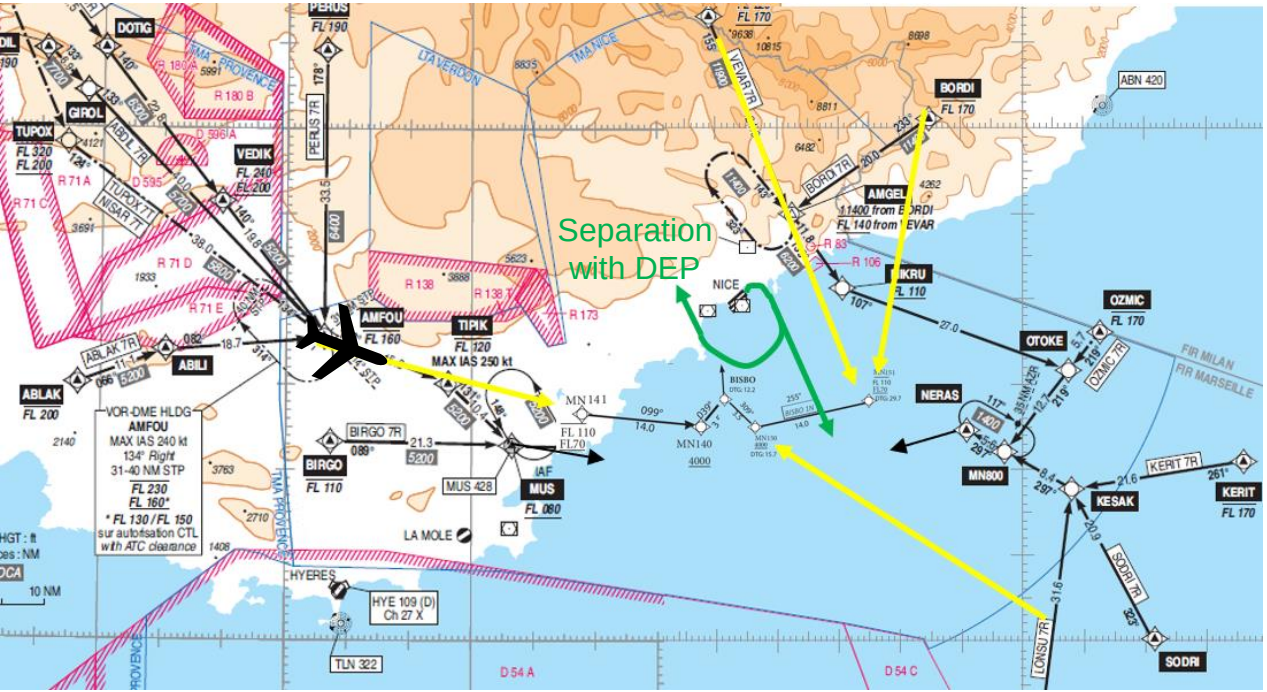
RADAR
RM 090°
Maintenir RM et prévoir instruction direct to
Maintain RM and expect direct to instruction
088° LUC
(113.0)
IAF
MUS 428
270°
297°
117°
1400
35 A R
30 NM AZR
AZR
IAF
NERAS

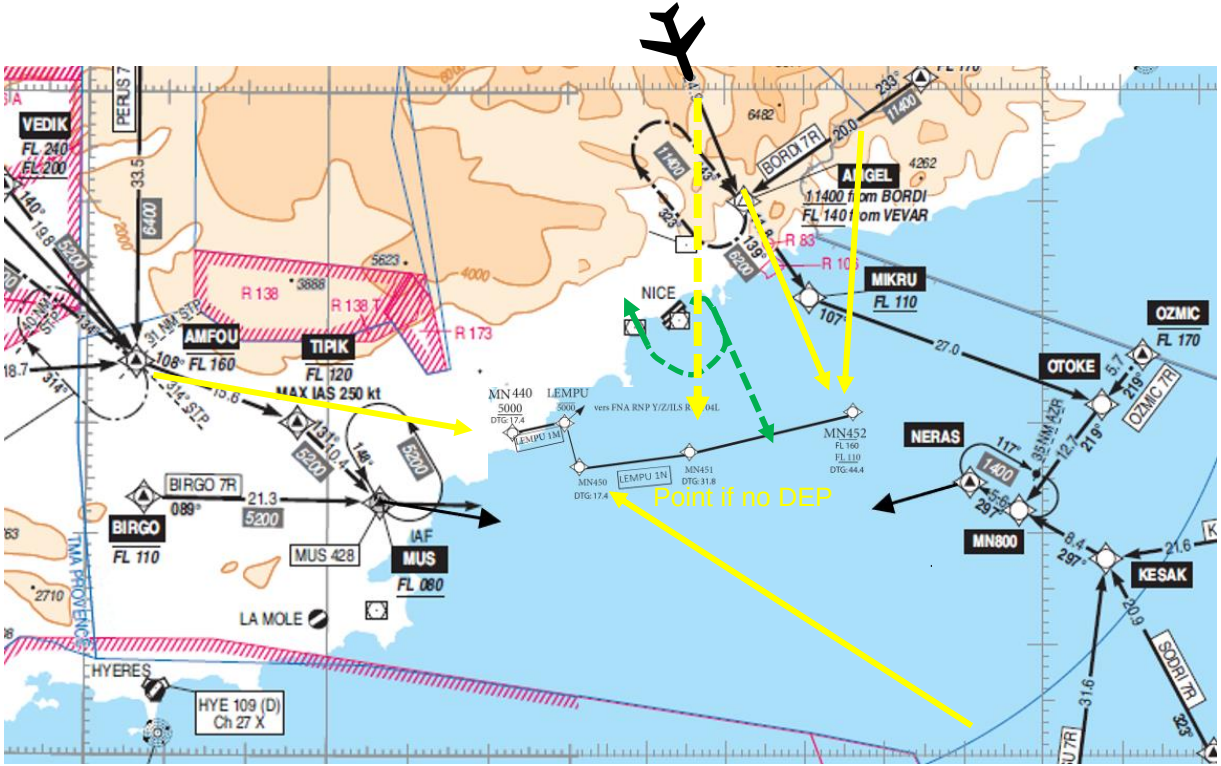
Exemple with RNP A 04 L/R



- DCT ASAP : End of vectoring
- DTG available → pilots manage descent
- Optimised distances

- Compromise with some departure tracks to increase the use
- Sequencing tool would increase the use

Exemple with ILS RNP Y/Z 04



Phraseology, for an arrival from the North :

- “XPE732, Bonjour, expect LEMPU1N (transition) then RNP Z 04L approach”
- “XPE732, Direct MN452, descend FL140 »

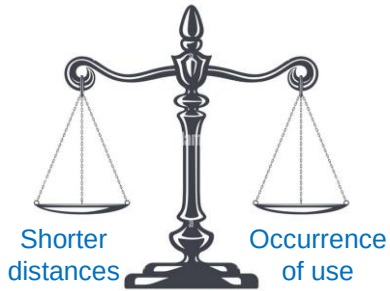
When cleared of terrain…

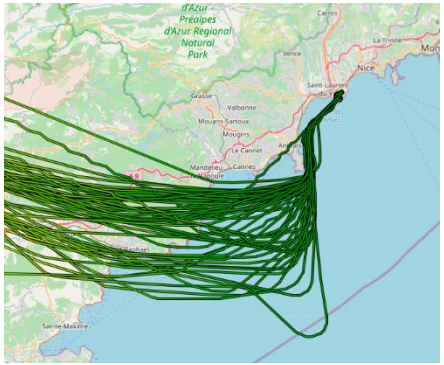
- “XPE732, **Continuous descent via** LEMPU1N to 4000ft QNH 1010’’
- « XPE732, Cleared RNP Z 04L »

PBN to Final experimentation to improve CDO rate

Strategy of design :

- Optimise the distance flown → shortcut in departure sector
- Limit the time of radar vectoring → Waypoints located on optimised tracks
- Give the pilots DTG at first contact or ASAP with closed trajectory → Predictability
- Reduced constraints on Waypoints to let the FMS manage the VFE
- Starting at IAF → Avoid the risk of unexpected from STARs
- Containing a vectoring after IAF → transition usable all the time :
  - **Low traffic : early DCT to intermediate points => closing trajectory**
  - **Heavy traffic : vectors to Initial Fix (as usual)**





Next steps

- **Assess** and **adapt** the project with feedbacks from ATCOs, Air France and other Aos + data from ACROPOLE Tool

- Include **ACC** in live trial: Optimised ToD on selected flights

- Develop sequencing tools to increase the use with more traffic

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Questions ?