



# Operational Assessment by an airspace user



EASN International Conference, 20/10/2022, Barcelona

KLM/ Clim van der Weijden/ Tim ten Velde



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875154

# Key improvement 1 of the GreAT project

## Continuous Descent Operations for large and hub-size airports:

- Provided the necessary technical features are available (e.g. air-ground data exchange),
- and the airspace structures and procedures would be adapted widely,
- the GreAT concepts (Late Merging and Target Time coordination as well as Mergestrip / T-Bar) would enable CDO (instead of just ,introducing`) at a lot of destinations during most daytimes

# Continuous Decent Approaches

## Operational experience current situation

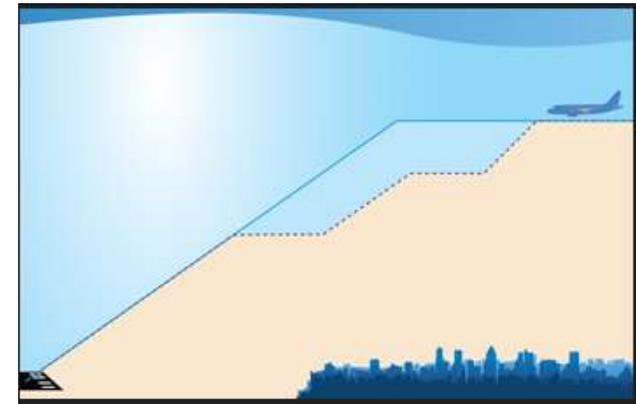
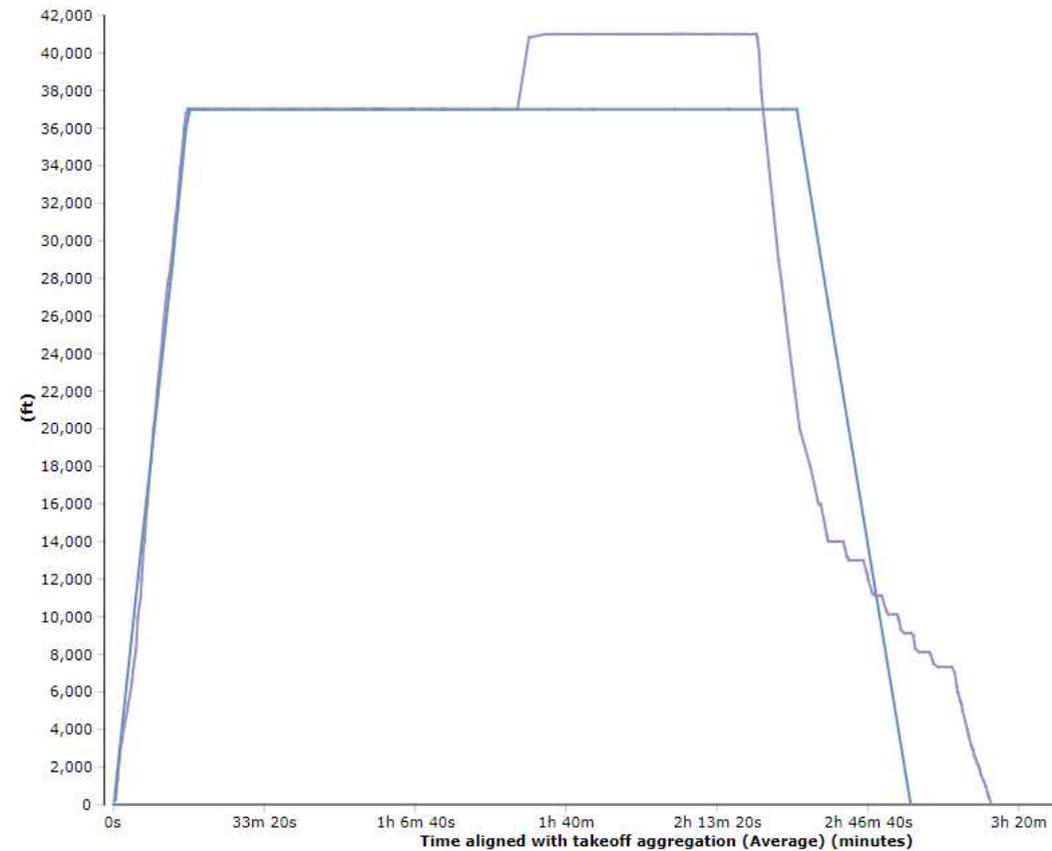
- ✈ Today many airports introduced continuous decent approaches. Most operational use is during evening or night operations as traffic density is low or in areas with high population around the airports
- ✈ In Amsterdam for example the introduction of CDAs was noise driven and contributed to reducing the noise disturbance in the night
- ✈ From the cockpit CDAs are encouraged as the aircraft and crew can perform an optimal vertical profile based on the calculations in the FMC
- ✈ However, many flights are not operating on optimum vertical flight profiles due to local restrictions, inefficient separation standards or non-adherence to flight plans

# Example of non-CDA

On the right an example of a planned flight profile (blue) and actual flight profile (purple)

Deviations from the OFP will generate more fuel burn, later arrival

But also, increase of Contingency Fuel. This will result in an increase of fuel to carry for every flight which additional results in greater fuel burn to the increase weight



# Continuous Decent Approaches

## Operational impact for airlines

- ✈ Airlines benefit from the use of CDAs:
  - ✈ Less fuel burn due to absence of level flight in approach phase
  - ✈ Increase predictability of arrival pattern and landing time, which makes it unnecessary to increase speed in the last phase to make up time
  - ✈ Optimum use of aircraft performance based on type and weight
- ✈ Working together with DLR and HungaroControl enables the airline to discuss expectations and the operational applicability
- ✈ Airlines are investing to be ready for 4D flight trajectory updates. This includes aircraft hardware and planning systems on the ground

# Key improvement 2 of the GreAT project

## Free Route Airspace in China:

- Well proven and successful concept in European countries
- The GreAT concept enabled and drove investigations for an introduction of FRA in the West of China

# Free route airspace China

## ✈️ Benefits for airlines based on current plans

- ✈️ The current use of the route structure in China is based on city pair combinations. There are limitations in the use of the routes in a flexible way compared to Europe. For most destinations in China, airlines are limited to use one dedicated route
- ✈️ Free route airspace enables airlines to make the optimum flight plan based on environmental conditions without taking dedicated routes into account, this is a big step forward
- ✈️ As the North Western part is relatively a low traffic density area it is a good way to introduce FRA in China
- ✈️ Airlines support by sharing flight plan data to confirm reduction of carbon emissions

# Free route airspace China

## ✈ Challenges for the future

- ✈ East China has the highest traffic density in China, as this is also the dense populated area of the country. It will take time to enable FRA in this area.
- ✈ Northwest China has areas with very high terrain. Airlines need to adjust the decompression and N-1 procedures. Currently these procedures are based on decision points on airways, these need to be changed to decision points in areas. Airlines may need additional help to accomplish this change.
- ✈ Focus on domestic travel may be on a higher priority than international traffic.

# Towards Greener Operation – in General

- ✈ Airlines have committed itself to Net-Zero carbon emissions by 2050 to ensure a sustainable future for aviation. Airlines continuously seek innovations to achieve this goal
- ✈ As most airlines have already introduced plans to use SAF, fleet renewal programs, weight reduction programs etc., focus is also always on operational improvements which comes from projects like GreAT
- ✈ The challenge is to join forces as airlines, and learn from each other. Set aside the commercial differences and understand we are responsible for a greener operations all together

# Conclusion

- ➊ A project where Research & Development and operational knowledge is combined is very important to make Greener Air Traffic a success. Theoretical plans need to be simulated and tested in practice to guarantee the feasibility of the plans.
- ➋ Within GreAT project we have succeeded to combine forces and are all committed to work towards results that can be turned into operational procedures in the near future



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 875154 GreAT.

