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Position Paper

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EBAA contribution to the Commission's Aviation Strategy:

Towards a full EGNOS capacity deployment in aviation

The Commission's Aviation Strategy is a welcomed initiative to improve the international competitiveness of the European air transport industry, but it might lack some ambition and teeth in strengthening the internal market in a similar way. It provides an official framework through which the industry can remedy its structural weaknesses vis-à-vis global competitors, especially at a time of sluggish economic performance. Yet, its substance could be more effective in offering tangible initiatives that would have a lasting effect for all players in the air transport value chain. In particular with regards to the looming airport capacity crisis.

According to a Eurocontrol report, by 2035 European airports will be unable to accommodate 2m flights/year due to capacity shortages. The Aviation Strategy rightly emphasized that many of Europe's major airports are severely congested, while at the same time*, other airports in Europe are underused and there is overcapacity. It is therefore essential to make best use of existing capacity and plan well in advance to absorb the forecasted future needs*.

While having identified the need to tackle the capacity constraints as the main challenge for the growth of European aviation, the Aviation Strategy does not formulate any concrete measures to *make best use of existing capacity*. The Commission had, however, highlighted in its 2008 Communication, the development and implementation of modern technologies such Global Navigation Satellite Systems (GNSS) in ATM procedures as an important means of dealing with this challenge.

GNSS refers to a constellation of satellites providing signals from space transmitting positioning and timing data. Europe has been a pioneer in integrating GNSS in the design of its air navigation routes and procedures: this has significantly improved the accuracy of air navigation, allowing the reduction of the lateral separation between RNAV (aRea NAVigation) routes and optimising airspace capacity. However, Europe is not yet making full use of the advanced technologies to deliver the full capabilities of satellite-based navigation in improving airport access and increasing safety and efficiency.

These technologies comprise a large array of airborne solutions and capabilities including RNP (Required navigation performance) landing systems using Satellite-Based Augmented Systems (SBAS) such as EGNOS (European Geostationary Navigation Overlay Service), or Ground-Based solutions such as GBAS – Ground Based Augmentation System.

Why does EGNOS really bring added-value from a Business Aviation perspective?

- Develop EGNOS-based approaches at secondary airports

Business Aviation is a key contributor to the accessibility of remote regions as it flies to a large number of local destinations (it connects in Europe alone around 100,000 airport-pairs, three times the amount that airlines cover). Out of these, 25,000 or a quarter are not connected by any other direct means. This coverage could be further extended but poor ground equipment at many smaller airports is a major impediment, as safe all-weather operations are made impossible. Yet they are key for the sustainability of the business model, as well as being essential for the delivery of safe operations.

The implementation of EGNOS-based technologies is therefore a vital tool, and one that is already available, to improve access and safety to all airports and heliports by providing precision approach capabilities in all weathers without the need for ILS or other ground based aids.

EGNOS is the SBAS covering Europe that enhances the overall performance of current GNSS signals and provides integrity information of those signals. It is used for safety critical applications such as approach procedures. Indeed, EGNOS had initially been conceived and designed for aviation.

EGNOS enables precision approaches with vertical and lateral guidance – so-called LPV – inside the RNP approaches. The EGNOS-based LPV approaches guarantee similar performances to ILS cat I (200ft/800 metres visibility) approaches, but do so without the costly ground infrastructure necessary for the implementation of the latter. Indeed, ILS systems require ground equipment that is not only very expensive to purchase, but that also requires regular maintenance and re-calibration for its every-day use. The business case for LPVs is much more interesting, especially for airports with limited budgets such as regional airports. It is no coincidence that in Europe today no less than 18 countries already boast airports with EGNOS-based procedures, covering over 250 runways. Moreover, another 500 LPV procedures are planned for implementation by 2020. This is encouraging but it falls very far short of, for example, the U.S., which already published LPV procedures for more than 3,000 runways.

With the increasing pressure being felt by Business Aviation and other stakeholders such as Regional Airlines and feeders of all sorts at major hubs, Europe must think of alternative solutions if it doesn't want to aggravate the gridlock. Currently, 68% of the more than 650,000 annual movements fly to secondary (understood as having less than 5m passengers/year) or regional airports. Confining and forcing BusAv operators into larger airports where they are not welcome makes little sense and serves no one's interests at a time of acute capacity constraint.

And now is the right time to act as equipment costs are low. There is an increasing number of LPV-capable aircraft available on the market and many of them now offer LPV standard avionics suite including LPV capabilities. This is especially true for Business Aviation, which operates one of the most modern fleets in the world. More than 10 renowned BusAv manufacturers currently propose LPV-capable models. And for legacy aircraft, there is an ever-developing market with standard retrofit solutions, making it possible to benefit from LPV approaches at very reasonable costs.

- Develop RNP approaches at major European airports

The gradual deployment of LPVs at regional airports should not, however, signify the end of Business Aviation operations at major hubs. More and more BusAv operators fly to/from secondary airports and are qualified to operate in CAT 1 and Cat 2 conditions. Typical business aviation passengers still need easy access to economic centres. Although less frequent today than it used to be, access to major hubs

for interlining purposes or other reasons can also be important on given occasions. And whilst space for Business Aviation becomes less and less available, capacity at major hubs is kept artificially low for safety reasons that can be circumvented by using new technologies.

The Pilot Common Project Regulation requires the implementation of RNP approaches – through LNAV-VNAV *and* LPVs – at all 25 major European airports. This requirement is long overdue and should remain unchanged. Therefore, potential access to these airports is technically at least guaranteed to BusAv operators thanks to their LPV capabilities. It will also provide a good back-up solution in case of ILS maintenance or failure. But GBAS, although being a relatively cheap and equally effective alternative to the existing ILS infrastructures for CAT 2/3 operations – which are the standard at hubs – should not be the only satellite-based precision approach procedure deployed at these airports.

There ought to be more solutions. One of them could be to sponsor trials using advanced technology and ATM procedures through wake vortex-free RNP Approaches (steeper glideslopes with adaptive runway threshold) with the objective to increase the current capacity in a mixed aircraft category environment (light/medium aircraft behind super/heavy aircraft). Curved approaches have become much easier with GNSS technology, and customized approach paths avoiding inhabited areas, thus boosting noise abatement measures, are now possible. Business Aviation jets have outstanding airfield performance and are highly maneuverable, so they could easily accommodate steeper glideslopes and displaced thresholds on longer runways such as those at European hubs.

For rotorcraft operations, the efficiency and integration of fixed wing aircraft with rotorcraft could be facilitated by using GNSS. So called 'Simultaneous Non Interfering' (SNI) operations allow helicopters to approach busy hubs without using and interfering with the fixed wing procedures and slots. This leads of course to increased capacity for these specific rotorcraft operations**,** a development strongly supported by our colleagues in the European Helicopter Association (EHA).

- Development of RNP procedures in complex Terminal Manoeuvring Areas (TMAs)

The development of RNP procedures could also greatly contribute to increased capacity at various airports located in complex TMAs. For historical reasons, some important airports used by Business Aviation are located in the TMA of major hubs (e.g. Paris Le Bourget, London Farnborough, and London Northolt). Whilst theoretically entirely devoted to Business Aviation, movements at these airports may be artificially constrained on grounds which have nothing to do with local capacity considerations, thereby having a knock-on effect on the overall infrastructural grid.

To unleash full capacity at these airports and hence minimise the disruption caused, one possibility could be to exploit advanced technology such ADS-B out, combined with SBAS and RNP procedures, to ensure independent arrivals/departures to/from satellite airports while minimising the impact on major airport traffic flows and on the environment. This is technically feasible, but it is nowhere to be seen in the priorities defined by SESAR or individually amongst ANSPs. This warrants further scrutiny.

These various examples demonstrate that RNP procedures can significantly improve the performance of air navigation around the airports and the impact of citizens on the ground, without the need for any additional investment.

- Develop EGNOS-based Point in Space procedures, specifically designed for rotorcraft operations.

As espoused by EHA, points in Space (PiNS) allow rotorcraft to maintain accessibility to helipads or airports by using descent rates and other manoeuvres specifically designed for rotorcraft capabilities. Introducing low-level RNP routes and connecting these different PiNS would dramatically increase the possibility of rotorcraft operations during bad visibility conditions, and potentially even save lives in case of Helicopter Emergency Medical Service operations.

A quicker adoption of satellite-based technology (precision approaches) would enable regional airports to be part of the network that could accommodate all types of aircraft. Not only is the technology readily available, it is cost effective and safer than existing equipment.

The GNSS technologies and capabilities allow more precise navigation, better access to airports and heliports. More specifically, this enables:

- Direct trajectories towards the airfield;
- Non-interfering operations between aircraft and rotorcraft;
- Curved final approaches and better descent profiles adapted to aircraft & rotorcraft performances;
- Reducing both the fuel burn and the noise footprint and minimizing the impact of air traffic on the environment and improving efficiency for all users.

They also allow the opening up of several landing locations including secondary and regional airports to safe all weather operations, thereby increasing European airport capacity and safety. Most of these solutions are already available on board the aircraft and rotorcraft and can be implemented anywhere in Europe, without the need for any additional airport-hosted infrastructure.

Need for action

The deployment of GNSS and the associated EGNOS navigation systems is a cornerstone of the European Commission's Horizon 2020 work programme.

The GNSS applications described above, in particular EGNOS LPV approaches, are excellent candidates to:

1. Fulfil the programme objectives
2. Improve airport access and tackle the looming capacity crunch and hence
3. Contribute to boosting the overall competitiveness of European industry l.

The technology exists, it is actually currently already being used at many airports, and the cost of deployment, for once, is not an issue. The barrier to a more rapid deployment is purely political. Because LPV approaches appear inexplicably nowhere in official EU documents, Member States are left to their own devices as to their deployment, with some openly claiming their reluctance to proceed with technological solutions that are not officially promoted by the European Union.

EBAA urges the Commission to publish a specific Communication to foster the deployment of the GNSS applications to aviation and in particular to include it in the Member States' local investment plans in Air Traffic Management. The Commission is also invited to update its Action plan for airport capacity in Europe to reflect the necessary measures to deploy GNSS in aviation, in particular EGNOS LPV approaches at regional airports. This item should be on the priority list of the Airport Capacity Observatory. And finally, it is emphasised that without explicit support for LPV approaches in its Aviation Strategy, the Commission risks delaying their introduction and use, which would constitute a major flaw of an otherwise bold and trend-setting document.