SAFETY BULLETIN

April 2022

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APRIL 2022 1

Cabinet d'Expertise en Aéronautique - Inscrit près la cour d'appel d'Amiens – Indépendant de l'EASA
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Notre Safety Bulletin n'est pas une institution pour les professionnels de l'aéronautique, ni une analyse de chacun des règlements. Il n'a pour vocation que d'informer les utilisateurs de moyens aériens sur les diverses activités de l'aéronautique.

Il appartient à chacun d'utiliser ces informations dans le cadre de ses activités.

Soyez professionnel, préparez vos voyages par une petite analyse des conséquences d'un déplacement.

Our Safety Bulletin is not an institution for aviation professionals, nor is it an analysis of each of the regulations. Its purpose is only to inform users of air assets about the various activities of aeronautics.

It is up to everyone to use this information in the course of their activities.

Be professional, prepare your travels with a little analysis of the consequences of a trip.

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Subjects of the Month:

Fake message in circulation on fuel-related aviation restrictions

The European Union Aviation Safety Agency is aware of a fake message circulating which warns of impending restrictions on aviation traffic that will be imposed due to fuel shortages. This has no basis in fact.

EASA update on transportation of cargo in passenger compartments

exemptions under Article 71(1) of Regulation 2018/1139

Since 2020, the European Union Aviation Safety Agency has issued approvals and exemptions for the transport of cargo in passenger cabins on a case-by-case basis. These were time-limited until July 31, 2022. Following a review of the operational context for transport of cargo in passenger cabin, the agency has concluded that the logistical challenges that arose in 2020 as a result of the COVID-19 crisis no longer exist to the same extent.

In accordance with the Issue 6.0 of the Guidelines for Transport of Cargo in Passenger Compartments, the Agency has therefore determined that the exemptions delivered in this context will not be extended beyond the current validity of July 31, 2022. The same applies for existing approvals that have been granted based on the use of the Deviation on transportation of cargo in passengers compartments.

This Deviation can also not be applied to any certification projects for which the approval is issued after that date.

EASA and JCAB approves modification 1 to the Technical Implementation Procedure (TIP)

The European Union Aviation Safety Agency (EASA) and the Civil Aviation Bureau of the Ministry of Land, Infrastructure, Transport and Tourism of Japan (JCAB) have approved on April 1, 2022 the modification 1 to the Technical Implementation Procedure (TIP).

Modification 1 is limited to additional information and clarifies the process for updating the Validated Type Certificate Data Sheet (VTCDS).

FAA Levies Largest Fines Ever Against Two Unruly Passengers

The U.S. Department of Transportation's Federal Aviation Administration (FAA) proposed the largest-ever fines ever against two passengers for alleged unruly behavior. The fines of $81,950 and $77,272, respectively, are part of the approximately $2 million the agency has proposed since Jan. 1, 2022.

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"If you are on an airplane, don't be a jerk and don't endanger the flight crews and fellow passengers. If you do, you will be fined by the FAA," U.S. Transportation Sec. Pete Buttigieg told THE VIEW today when he announced the fines.

The $81,950-fine involves a passenger on a July 7, 2021, American Airlines flight from Dallas-Fort Worth, Texas, to Charlotte, N.C. The FAA alleges the passenger threatened to hurt the flight attendant that offered help to the passenger after she fell into the aisle. The passenger then pushed the flight attendant aside and tried to open the cabin door. Two flight attendants tried to restrain the passenger, but she repeatedly hit one of the flight attendants on the head. After the passenger was restrained in flex cuffs, she spit at, headbutted, bit and tried to kick the crew and other passengers. Law enforcement apprehended her in Charlotte.

The $77,272-fine involves a passenger on a July 16, 2021, Delta Air Lines flight from Las Vegas to Atlanta. The FAA alleges the passenger attempted to hug and kiss the passenger seated next to her; walked to the front of the aircraft to try to exit during flight; refused to return to her seat; and bit another passenger multiple times. The crew had to physically restrain her.

The FAA's Zero Tolerance policy against unruly passenger behavior and its public awareness campaign has decreased the rate of unruly incidents by nearly 60 percent. But as today's announcement demonstrates, more work remains.

Federal law prohibits interfering with aircraft crew or physically assaulting or threatening to physically assault aircraft crew or anyone else on an aircraft. Passengers are subject to civil penalties for such misconduct, which can threaten the safety of the flight by disrupting or distracting cabin crew from their safety duties. Additionally, federal law provides for criminal fines and imprisonment of passengers who interfere with the performance of a crewmember's duties by assaulting or intimidating that crewmember.

The passengers have 30 days after receiving the FAA's letter to respond to the agency. The FAA does not identify passengers against whom it proposes civil penalties.

Now open! The application process is **now open** for the FAA's Aviation Workforce Development Grants for Aircraft Pilots and Aviation Maintenance Technical Workers. Register on Zoom for a pre-application technical assistance webinar, specific to this second round of funding, to be held Wed., May 11, 2:00-4:00 p.m., Eastern Time. For details, see the Notices of Funding Opportunity via grants.gov: Aircraft Pilots and Aviation Maintenance Technical Workers. Questions? E-mail: AWD-Grants@faa.gov.

FAA Accepting Applications for Aviation Workforce Development Grants

WASHINGTON— The U.S. Department of Transportation's Federal Aviation Administration is seeking applications for two Aviation Workforce Development Grant programs aimed at developing and inspiring a more diverse pool of pilots and aviation maintenance technicians to join the next generation of aviation professionals. This is the FAA's second funding opportunity for these programs. A total of $10 million is available for the grants.

The Aircraft Pilots Workforce Development Grants will educate students to become pilots, aerospace engineers or unmanned aircraft systems operators. The Aviation Maintenance Technical Workers Workforce Development Grants will prepare aviation maintenance technicians. Eligible entities can submit applications at www.grants.gov through June 10, 2022.

Eligible entities may apply for grants ranging from $25,000 to $500,000 for each grant per fiscal year. Last year, the FAA awarded $10 million in grants to more than 30 schools and organizations.

The Notice of Funding Opportunity for each grant provides detailed information on eligibility, deadlines, evaluation criteria and application procedures. To ensure fair and open competition for the grants, answers to public questions will be posted on the FAA website at www.faa.gov/go/awd.

Potential applicants should visit the site to review answers to frequently asked questions, eligibility requirements and guidelines that may assist them to complete their grant application.

What about this month:

FAA Updates Airport Design Guidance

The U.S. Department of Transportation's Federal Aviation Administration updated its advisory circular on Airport Design that provides guidance to airport sponsors and airport consultants designing and developing airports around the country.

"The advisory circular provides a critical roadmap for the aviation industry when planning, designing and developing the nation's airports," said FAA Associate Administrator of Airports Shannetta R. Griffin. "This update contains the latest information the industry needs as we work collaboratively to build safe, sustainable and accessible airport infrastructure to safely transport passengers, goods and services."

This advisory circular outlines the FAA's recommended standards for an acceptable level of safety, efficiency and capacity when designing and implementing projects at airports to meet the requirements of Federal Aviation Regulation, Part 139 Certification of Airports. Airport sponsors that receive federal funding from the Airport Improvement Program and the Passenger Facility Charge Program are required to fully comply with the advisory circular.

The updates to the advisory circular include restructuring the document, explaining the meaning of terms used, expanding information in certain chapters and adding graphics to support information in the circular.

This advisory circular takes effect immediately and cancels the prior version, dated September 28, 2012

FAA Commissions New Air Traffic Control Tower at Charlotte Douglas International Airport

WASHINGTON— The U.S. Department of Transportation's Federal Aviation Administration today dedicated the newly commissioned and environmentally sustainable air traffic control tower at Charlotte Douglas International Airport.

"Aviation is an invaluable part of our American life and our national economy. The new, taller control tower will enable the airport to continue to expand its flight operations to grow alongside the vibrant Charlotte economy," said FAA Deputy Administrator A. Bradley Mims.

The 370-foot-tall air traffic control tower has an 850-square-foot tower cab that provides air traffic controllers a bird's-eye view of the airfield. At the base, a 42,000-square-foot building houses an expanded terminal radar approach control (TRACON) that handles flights departing and arriving into the Charlotte airspace. Both are designed to accommodate current and future operations.

"The commissioning of the new air traffic control tower by the Federal Aviation Administration is a testament to the importance of Charlotte in the National Airspace System," said CLT Chief Executive Officer Haley Gentry. "The tower is equipped with the latest state-of-the art NextGen technology to keep up with the current and future demand of our growing airfield. This modern infrastructure is another display

of the strong partnership we have at CLT and we are grateful to the FAA for this investment to make air traffic more efficient."

The new Charlotte tower is the second-tallest tower in the nation after the 398-foot-tall tower at Hartsfield-Jackson Atlanta International Airport. The existing tower was commissioned in 1979. The facility's operational growth, new air traffic control technology and the airport's addition of new runways and taxiways made the height and size of the old tower obsolete.

A total of 179 FAA employees work at the Charlotte tower and TRACON – 136 in air traffic services and 43 in technical operations. Technical Operations employees install and maintain air traffic control equipment. The tower became operational in late February 2022. The estimated final cost of the project is approximately $94 million.

To view the ceremony, please go to: https://www.youtube.com/watch?v=HPDJjEX4D1I

Travelcare for travelers and crewmembers

ICAO or FAA

European Advice

European aviation at the crossroads: From COVID-19 to war in Ukraine – and beyond

Join us next week at our EUROCONTROL Aviation StraightTalk on 28 April, 15:00-15:45 CEST with Dómhnal Slattery, Avolon CEO.

War in Ukraine casts a shadow over the aviation recovery, and that is particularly true for aviation lessors, who are reeling after Russia's version of "Grand Theft Airplane" saw a $10 billion plane grab, with almost 800 foreign-registered aircraft forcibly reregistered domestically.

But as cash-strapped airlines increasingly look for an asset-light business model, and traffic finally looks set to stay on course for close to 2019 levels by summer 2022, the future is once more looking bright for the leasing sector. And with the percentage of leased aircraft in airline fleets already well over 50%, the fact that the industry will need between 40-50K new tech models by 2040 offers huge business opportunities.

Here to talk us through where aviation and its leasing market are right now is the CEO of Avolon, Dómhnal Slattery. In just 12 years, he and his team have built the company he founded into a global powerhouse, one of the industry's largest lessors with around 600 aircraft owned or managed across the globe, and a further 230+ new tech models on order.

In this interview, we will be hearing how he sees the future for Avolon, freshly back in the black after a painful pandemic, and the sector as a whole. Key to future success is aviation sustainability, with Avolon committed to raising steadily the proportion of new tech jets in its fleet. And we're looking forward to getting his take on the emerging market of Urban Air Mobility, where Avolon has been blazing a trail with a headline-grabbing order of 500 zero-emissions eVTOLs, all of which have been snapped up by customers.

Eamonn Brennan, EUROCONTROL Director General, will provide a market update during this webinar. The interview will be conducted by Andrew Charlton, journalist and Aviation Advocacy Managing Director.

We hope you can join us.

Kind regards,

The EUROCONTROL Events Team

Register today

French Advice (in French)

Other purposes

Cabinet d'Expertise en Aéronautique - Inscrit près la cour d'appel d'Amiens – Indépendant de l'EASA

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Environment

Français

English

FAA, U.S. Airports Team up to Meet 2050 Net-Zero Climate Challenge

WASHINGTON — The U.S. Department of Transportation's Federal Aviation Administration and U.S. airports have launched an Airport Climate Challenge to help achieve the Biden-Harris Administration goal of net-zero emissions by 2050. Airports can take advantage of several FAA funding programs to meet this goal, including grants for low- or zero-emissions vehicles, renewable energy production, energy assessments and other efforts. The challenge is one of a number of initiatives underway to meet the Biden-Harris Administration's goal of a net-zero aviation system by 2050.

"The United States should not only have the safest and most efficient aerospace system in the world, it can and should be the most environmentally sustainable as well. By partnering with the country's airports, we can meet this climate challenge," said FAA Associate Administrator for Airports Shannetta Griffin.

Airports Council International-North America and Airport Consultants Council will continue to support airports using FAA programs and funding. Airports can reduce greenhouse gas emissions through the following existing programs:

- Voluntary Airport Low Emissions Program – grant funding to implement clean technology projects that improve airport air quality.
- Zero Emissions Vehicle (ZEV) Program –grant funding to acquire zero-emission vehicles and associated infrastructure.
- Airport Sustainability Planning Program – grant funding for eligible airports to develop comprehensive sustainability plans.

The FAA also announced it will develop a tool for airports to voluntarily estimate, track and report on the emissions reduction achieved when implementing projects supported by the airport programs.

"Airports remain committed to creating a more sustainable future for air travel. Reaching net-zero carbon emissions by 2050 will require steadfast dedication from government and industry partners, and we are grateful for continued collaboration as we work toward this important goal," said ACI-NA President and CEO Kevin M. Burke. "But challenges remain. We know that most airport emissions are related to electricity, heating, and cooling. Upgrading airport facilities is critical to improving energy efficiency and reducing these emissions, further underscoring the tremendous need for additional infrastructure funding to help modernize our country's aging airports."

"Achieving the target goal of net-zero emissions at airports by 2050 will require a strong partnership by government, airport owners and industry. The members of ACC stand ready to meet the challenge and find

solutions for a more environmentally sustainable aviation ecosystem," said T.J. Schulz, President of the Airport Consultants Council, representing private companies that design and build airports.

In November, the U.S. released its first-ever comprehensive Aviation Climate Action Plan to achieve net-zero emissions by 2050. Earlier in 2021, the FAA announced more than $100 million in matching grants to increase aircraft efficiency, reduce noise and aircraft emissions, and develop and implement new software to reduce taxi delays. The White House also announced its Sustainable Aviation Fuel Grand Challenge, a government-wide initiative designed to catalyze the production of at least three billion gallons per year by 2030.

Find more information about the FAA and its environmental efforts at its Sustainability page

EUROCONTROL

has released a new long-term air traffic forecast, looking at how aviation in Europe will grow over the coming decades. For the first time, the report includes estimates of net CO2 emissions and charts how aviation can achieve net zero emissions by 2050.

"We expect the number of flights to grow by 44% between now and 2050, taking us up to 16 million a year – compared to 11 million in 2019. Our ground-breaking report shows that we can achieve net zero by 2050 with a series of tangible measures requiring coordinated action by aircraft manufacturers, airlines, airports, fuel companies, ANSPs and, crucially, governments and regulators. Key will be the wide availability and uptake of Sustainable Aviation Fuels (SAF) as they will cover 41% of emissions in our base scenario. The implementation of the Single European Sky is really important – this can make a change in the near-term by 2030 in the region of 8%. Market-Based Measures (MBM) will continue to play a very significant role in helping to achieve the net zero objective, contributing 32%. Revolutionary technological changes, such as hydrogen aircraft will be in place but not at scale for large/very large transport aircraft; they are very important but it will take longer for their impact to kick in."

Eamonn Brennan, Director General EUROCONTROL

FAA regulations

Draft ACs

Advisory Circular

AC 150/5300-13B - Airport Design

Number	Title	Publication Date
150/5300-13B	Airport Design **(posted 5/16/2022)** **New/Revised Comments:** Errata Sheet (May 2022)	3/31/2022
150/5335-5D	Standardized Method of Reporting Airport Pavement Strength - PCR **(posted 5/12/2022)**	4/29/2022
150/5210-17C	Programs for Training of Aircraft Rescue and Firefighting Personnel **(posted 4/27/2022)** **New/Revised Comments:** Addendum for Quarter 3 FY 2022 (4/27/2022)	6/12/2015
150/5230-4C	Aircraft Fuel Storage, Handling, and Dispensing on Airports **(posted 4/27/2022)** **New/Revised Comments:** Addendum for AC 150/5230-4B (Quarter 3 FY 2022)	9/23/2021
150/5300-19	Airport Data and Information Program **(posted 4/8/2022)** **New/Revised Comments:** Updated Airport Master Records Data Dictionary (1/2022)	9/30/2015

Number	Title	Publication Date
150/5345-53D	Airport Lighting Equipment Certification Program **(posted 3/8/2022)** **New/Revised Comments:** January 2022 Addendum to AC 150/5345-53D (updated 3/8/2022) Letter Clarifying the Use of Non-Original Equipment Manufacturer (OEM) Components in Certified Airport Lighting Equipment (2/20/2019)	9/26/2012
150/5345-44K	Specification for Runway and Taxiway Signs **(posted 1/14/2022)** **New/Revised Comments:** Added Errata Sheet (January 14, 2022)	10/8/2015
150/5370-15B	Airside Applications for Artificial Turf **(posted 10/3/2011)**	9/30/2011

Forms - Orders & Notices

AC 150/5210-17C - Programs for Training of Aircraft Rescue and Firefighting Personnel

AC 150/5230-4C - Aircraft Fuel Storage, Handling, and Dispensing on Airports

JO 7340.689 - ICAO THREE LETTER DESIGNATOR (3LD) "TBL" AND ASSOCIATED CALL SIGN "TERRIBLES"

8000.95B - Designee Management Policy

JO 7340.688 - Foreign ICAO 3LD Additions, Modifications, and Deletions (excluding U.S.)

8900.620 - Part 125 Letter of Deviation Authority (A125 LODA) for Foreign Operations

JO 7340.687 - COMPANY NAME CHANGE FOR: “ROK” / “RED ROCK”

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EASA regulations

Approval Data Library | EASA (europa.eu)

Rules

Regulations | EASA (europa.eu)

Opinion No 02/2022

Update of Commission Regulation (EU) No 452/2014 (Third-Country Operator (TCO) Regulation)

The objective of the proposals in this Opinion is to foster a risk-based approach in the authorisation process of third-country operators and improve the efficiency of the European Union Aviation Safety Agency (EASA) as the authority being responsible for the implementation of the TCO Regulation. In addition, the proposals in this Opinion intend to clarify existing provisions, remove inconsistencies, and improve the coherence of the TCO Regulation with the EU Air Safety List.

The proposed amendments are expected to mostly maintain the level of safety, with some expected to provide a positive impact. In terms of impacts on operators, the proposed changes are mostly neutral. The main benefit expected from the proposed changes is in terms of the cost-effectiveness of the TCO authorisation process, with a positive impact on EASA's efficiency.

Easy access Rules

Agency Decisions

Overview | EASA (europa.eu)

ED Decision 2022/009/R

CS-STAN Issue 4

The objective of this Decision is to reduce the regulatory burden and cost for general aviation (GA) with regard to the embodiment of specific Standard Changes (SCs) and Standard Repairs (SRs) in certain aircraft, while improving the level of safety.

The amendments introduced by this Decision are based on lessons learned and experience gained during the application of CS-STAN, proposals submitted by stakeholders, and on technological innovations introduced by the industry, which can bring safety benefits and allow the implementation of the latest technologies in a cost-efficient manner.

EASA also specifies in CS-STAN Issue 4, when applicable and justified, the acceptance of parts without an EASA Form 1 in accordance with point 21.A.307(b)(4) of Commission Implementing Regulation (EU) 2021/699, which shall apply from 18 May 2022.

The amendments are expected to provide economic benefits for the GA community by reducing the regulatory burden regarding the embodiment of SCs and SRs in certain aircraft when applying the acceptable methods, techniques and practices included in CS-STAN, as well as when accepting certain new parts without an EASA Form 1.

The amendments are not expected to have any significant social or environmental impact.

ED Decision 2022/008/R

Regular update of CS-ACNS

CS-ACNS Issue 4

The objectives of this Decision are:

- to maintain a high level of safety;
- to ensure interoperability compliance of aircraft with the requirements of Commission Implementing Regulation (EU) No 1207/2011 laying down requirements for the performance and the interoperability of surveillance for the single European sky (the 'Surveillance Performance and Interoperability (SPI) Regulation'); and
- to provide consolidated acceptable means of compliance (AMC) for aircraft-manufacturing industries and aircraft modification industries.

This Decision amends the Certification Specifications and Acceptable Means of Compliance for Airborne Communications, Navigation and Surveillance (CS-ACNS) applicable to all aircraft, to address a number of issues, reported by applicants, in demonstrating compliance with CS-ACNS paragraphs.

The amendments are expected to:

- maintain a high level of safety;
- ensure aircraft interoperability;
- reduce the regulatory burden of compliance with the SPI Regulation; and
- increase efficiency in implementing CS-ACNS.

Notices of Proposed Amendment

Notices of Proposed Amendment (NPAs) | EASA (europa.eu)

ASECNA

AIP ASECNA

Regulations

Notam

Consultation NOTAM (asecna.aero)

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French regulations

JORF

joe_20220430_0101_0067 - Arrêté du 24 mars 2022 modifiant le tarif de la taxe sur les nuisances sonores aériennes applicable sur chaque aérodrome mentionné aux articles 158 à 159 bis de l'annexe IV au code général des impôts (rectificatif)

joe_20220430_0101_0066 - Arrêté du 24 mars 2022 pris pour l'application de l'article L. 422-56 du code des impositions sur les biens et services relatif aux coefficients de modulation entrant dans le calcul du montant de la taxe sur les nuisances sonores aériennes (rectificatif)

joe_20220430_0101_0065 - Arrêté du 21 mars 2022 relatif à la classification acoustique des aéronefs mentionnée à l'article L. 422-56 du code des impositions sur les biens et services à prendre en compte pour le calcul de la taxe sur les nuisances sonores aériennes (rectificatif)

joe_20220429_0100_0069 - Décret n° 2022-746 du 27 avril 2022 modifiant les dispositions relatives à l'atterrissage et au décollage des aéronefs hors des aérodromes et créant un régime de sanction

joe_20220427_0098_0083 - Arrêté du 14 avril 2022 modifiant l'arrêté du 1er juillet 2016 relatif à l'exploitation de services de transport aérien par la société Vueling Airlines SA

joe_20220426_0097_0064 - Arrêté du 19 avril 2022 modifiant l'arrêté du 2 novembre 2011 relatif à l'exploitation de services de transport aérien par la société ASL Airlines France SA

joe_20220424_0096_0061 - Arrêté du 6 avril 2022 modifiant l'arrêté du 11 septembre 2013 relatif aux mesures de sûreté de l'aviation civile

Décret n° 2022-587 du 19 avril 2022 relatif à la sûreté de l'aviation civile

joe_20220417_0091_0053 - Arrêté du 13 avril 2022 modifiant l'arrêté du 19 juillet 2012 relatif à l'exploitation de services de transport aérien par la société Air Tahiti Nui

joe_20220416_0090_0029 - Arrêté du 11 avril 2022 portant création d'une zone interdite temporaire dans la région de Petosse (Vendée), identifiée Petosse, dans la région d'information de vol de Bordeaux

joe_20220414_0088_0034 - Arrêté du 22 février 2022 portant suppression d'une zone réglementée identifiée LF-R 286 Saint-Michel dans la région de Lorient (Morbihan), dans la région d'information de vol de Brest

joe_20220414_0088_0033 - Arrêté du 22 février 2022 portant suppression d'une zone réglementée identifiée LF-R 207 Lanester dans la région de Lorient (Morbihan), dans la région d'information de vol de Brest

joe_20220414_0088_0032 - Arrêté du 22 février 2022 portant création d'une zone réglementée identifiée LF-R 29 île Longue dans la région de Brest (Finistère), dans la région d'information de vol de Brest

joe_20220414_0088_0031 - Arrêté du 22 février 2022 portant création d'une zone réglementée identifiée LF-R 1 dans la région de Lorient (Morbihan), dans la région d'information de vol de Brest

joe_20220414_0088_0030 - Arrêté du 22 février 2022 portant création d'une zone interdite identifiée LF-P 219 L Montervilly dans la région de Beignon (Morbihan), dans la région d'information de vol de Brest

joe_20220414_0088_0029 - Arrêté du 22 février 2022 portant création d'une zone interdite identifiée LF-P 218 L Loperhet dans la région de Loperhet (Finistère), dans la région d'information de vol de Brest

joe_20220414_0088_0028 - Arrêté du 22 février 2022 portant création d'une zone interdite identifiée LF-P 71 Lorient dans la région de Lorient (Morbihan), dans la région d'information de vol de Brest

joe_20220414_0088_0027 - Arrêté du 22 février 2022 portant création d'une zone interdite identifiée LF-P 70 Landivisiau dans la région de Landivisiau (Finistère), dans la région d'information de vol de Brest

joe_20220410_0085_0046 - Arrêté du 29 mars 2022 modifiant l'arrêté du 23 avril 2018 relatif à la réalisation du balisage des obstacles à la navigation aérienne

joe_20220410_0085_0044 - Décret n° 2022-519 du 8 avril 2022 portant classement de l'aérodrome de Mayotte - Marcel Henry

joe_20220409_0084_0041 - Arrêté du 29 mars 2022 portant changement de dénomination de l'aérodrome de Dzaoudzi-Pamandzi (Mayotte)

joe_20220408_0083_0047 - Arrêté du 31 mars 2022 portant création d'une expérimentation d'évolutions de l'organisation du travail des contrôleurs de la circulation aérienne du centre en route de la navigation aérienne Nord

joe_20220408_0083_0046 - Arrêté du 29 mars 2022 portant création d'une expérimentation d'évolutions de l'organisation du travail des contrôleurs de la circulation aérienne du centre en route de la navigation aérienne Ouest

joe_20220408_0083_0045 - Arrêté du 29 mars 2022 portant création d'une expérimentation d'évolutions de l'organisation du travail des contrôleurs de la circulation aérienne du centre en route de la navigation aérienne Sud-Ouest

joe_20220407_0082_0045 - Arrêté du 22 mars 2022 relatif à l'imposition d'obligations de service public sur les services aériens réguliers entre le Puy-en-Velay (Loudes) et Paris (Orly)

joe_20220402_0078_0015 - Arrêté du 23 mars 2022 portant création d'une zone réservée temporairement identifiée LF-TRA 9 en France métropolitaine

joe_20220402_0078_0014 - Arrêté du 23 mars 2022 portant création d'une zone réservée temporairement identifiée LF-TRA 8 en France métropolitaine

joe_20220402_0078_0013 - Arrêté du 23 mars 2022 portant création d'une zone réservée temporairement identifiée LF-TRA 6 en France métropolitaine

joe_20220402_0078_0012 - Arrêté du 23 mars 2022 portant création d'une zone interdite temporaire identifiée ZIT Hyères dans la région de Hyères (Var), dans la région d'information de vol de Marseille

joe_20220402_0078_0011 - Arrêté du 23 mars 2022 portant création d'une zone interdite temporaire identifiée ZIT Domme dans la région de Domme (Dordogne), dans la région d'information de vol de Bordeaux

joe_20220401_0077_0049 - Arrêté du 24 mars 2022 modifiant l'arrêté du 26 novembre 2003 fixant la liste des astreintes mises en place au sein de la direction générale de l'aviation civile, des établissements publics qui en dépendent et du bureau d'enquêtes et d'analyses pour la sécurité de l'aviation civile

OSAC-DSAC

G-40-02 Human factors guide to continuing airworthiness

L-01-00 Répertoire des documents

Domaine(s)	*Référence*	*Titre*	*Date de publication*	*Date d'entrée en vigueur*
Gestion du maintien de la navigabilité	(UE) 2022/410	Commission Implementing Regulation (EU) 2022/410 of 10 March 2022 amending Regulation (EU) No 1321/2014 as regards the continuing airworthiness management in a single air carrier business grouping	14/04/2022	21/03/2022
Production, Maintenance	CER-FrANDTB-FO-001-V03	Fiche N°2 Vérification de la vision	14/04/2022	N/A
Autres sujets techniques	SIB 2022-02	Global Navigation Satellite System Outage Leading to Navigation / Surveillance Degradation	14/04/2022	N/A
Autres sujets techniques	SIB 2022-03	Enhanced cleaning and disinfection of aircraft surfaces - Operational Recommendations	14/04/2022	N/A

Navigabilité individuelle, Maintenance	AIR-22-06	SAFRAN Evacuation Systems Rupture Disc Assembly	14/04/2022	N/A
Navigabilité individuelle, Maintenance	SIB 2021-05R1	Fuel Shut-off Lever Modification	14/04/2022	N/A
Autres sujets techniques	AIR-22-07	Avidyne Corporation DFC90 Autopilot System	14/04/2022	N/A
Sujets transverses	Arrêté du 13 janvier 2022	Arrêté du 13 janvier 2022 modifiant l'arrêté du 26 juillet 2016 relatif à l'habilitation de la société OSAC pour l'exercice de missions de contrôle dans le domaine de la sécurité aérienne	11/03/2022	N/A

Bulletin officiel de la DGAC

Bulletin Officiel des Ministères de la Transition écologique et solidaire et de la Cohésion des territoires et des Relations avec les collectivités territoriales (developpement-durable.gouv.fr)

TREA2212382S - DÉCISION DU 21 AVRIL 2022 RELATIVE AUX CONSIGNES PARTICULIÈRES DE CIRCULATION AÉRIENNE SUR L'AÉRODROME DE CHAMBÉRY-AIX LES-BAINS.

TRAA2137287X - CONVENTION DE DÉLÉGATION DE GESTION DU 15 AVRIL 2022 ENTRE LE BUREAU D'ENQUÊTES ET D'ANALYSES POUR LA SÉCURITÉ DE L'AVIATION CIVILE ET LA SOUS-DIRECTION FINANCIÈRE DU SECRÉTARIAT GÉNÉRAL DE LA DIRECTION GÉNÉRALE DE L'AVIATION CIVILE.

TREA2212365S - DÉCISION DU 21 AVRIL 2022 RELATIVE AUX CONSIGNES PARTICULIÈRES DE CIRCULATION AÉRIENNE SUR L'AÉRODROME DE LA TOUR-DU-PIN-CESSIEU.

TRAA2200507S - DÉCISION DU 22 MARS 2022 PORTANT DÉLÉGATION DE L'ORGANISATION DES SERVICES AÉRIENS ENTRE LE PUY-EN-VELAY ET PARIS (ORLY) AU SYNDICAT MIXTE DE GESTION DE L'AÉRODROME DÉPARTEMENTAL LE PUY / LOUDES.

European Centre for Cybersecurity in Aviation (ECCSA)

See : https://www.easa.europa.eu/eccsa

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U.A.S. – Drones

See : https://www.easa.europa.eu/eccsa

Join the FAA for Drone Safety Day

WASHINGTON—The Federal Aviation Administration (FAA) is inviting the drone community to be part of its 2022 Drone Safety Day campaign on Saturday, June 18. This year's campaign will be a one-day national event, to encourage drone pilots and recreational flyers to "Fly RIGHT." This year's safety messages will focus on:

- Register your drone
- Interact with others
- Gain knowledge
- Have a safety plan
- TRUST and Train

Since 2019, the FAA has hosted the annual campaign dedicated to drone safety and best practices. Safety is a shared responsibility that requires the community and the FAA to work together.

For additional information and to find virtual and in-person events near you, visit faa.gov. Follow the FAA on Twitter, Facebook and Instagram for the latest Drone Safety Day news.

FAA Awards $4.4 Million in Drone Research Grants to Seven Universities

WASHINGTON – The U.S. Department of Transportation's Federal Aviation Administration (FAA) today announced $4.4 million in drone research, education and training grants to seven universities. Research will focus on three areas: electromagnetic compatibility, detect and avoid classifications, and cybersecurity oversight.

The universities receiving grants are University of North Dakota, University of Kansas, Drexel University, The Ohio State University, Embry-Riddle Aeronautical University, Mississippi State University and Oregon State University.

"This funding and our ongoing partnerships with these universities will allow the FAA to safely integrate the airspace that has a growing number of diverse aircraft users," said FAA Acting Administrator Billy Nolen.

The research initiatives and grant awardees include:

Evaluate Unmanned Aircraft Systems (UAS) Electromagnetic Compatibility

This research will assess the risks, identify drone design vulnerabilities, identify material and procedural mitigations, and propose guidance for safer electromagnetic compatibility with emitted and static fields.

- University of North Dakota $325,042
- University of Kansas $325,000
- Drexel University $325,830

Investigate Detect and Avoid Track Classification and Filtering

This research will provide proposed metrics, guidance, and test methods to assess the effects of false or misleading information on detect and avoid capabilities. The findings will support Beyond Visual Line of Sight operations.

- The Ohio State University $732,441
- Embry-Riddle Aeronautical University $371,000
- Mississippi State University $330,000
- University of North Dakota $80,000

Illustrate the Need for UAS Cybersecurity Oversight and Risk Management

This research will address UAS Cybersecurity Oversight and Risk Management as it pertains to the National Airspace System and other FAA systems.

- University of Kansas $651,982
- Oregon State University $609,226
- Drexel University $608,783

Today's announcement is the second round of Alliance for System Safety of UAS through Research Excellence (ASSURE) grants, which brings the total of 15 grants valued at $18.3 million for Fiscal Year 2022.The ASSURE Center of Excellence is one of six that the agency has established to help advance technology and educate the next generation of aviation professionals. Research conducted through ASSURE is focused on helping the drone market safely grow and integrate into the nation's airspace.

More than 800,000 recreational and commercial drones are in the active drone fleet, and that number is expected to grow.

NAT OPS Bulletin

NAT OPS Bulletins - All Documents (icao.int)

Except War in Ukraine, nothing really important

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IOSA

IATA - IOSA

Top documents:

- IOSA Standards Manual Ed. 15
- IOSA Standards Manual (XML and XML X-REF Format)
- IOSA Guidance for Safety Monitoring under COVID-19 Ed. 5 (pdf)
- IPM Ed 13 – Temporary Appendix - Revision 1 (pdf)
- IAH P&G Ed 11 - Temporary Appendix Revision 2(pdf)
- IOSA Operator Alert 18 - IPM IAH updates (pdf)

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Safety Alerts

Date Posted	Affected Product(s)	Effective Date	Subject and Additional Information
April 29, 2022	**digital-Terminal Procedures Publication (d-TPP) U.S. Terminal Procedures Publication (TPP) Vol SE-3 Chart Supplement Southeast U.S**	May 19, 2022	Incorrect depiction of the airport layout and does not show the buildings. The corrected Airport Diagram will be published on July 14, 2022. See the 22-04 TERM Safety Alert (PDF) for complete information.
April, 27 2022	**NASR 28-Day Subscriber Files**	May 19, 2022	The TWR.txt and FRQ.csv Subscriber file is showing ORLANDO INTL-ATCT FATHE DP FREQUENCY data in error. See the 22-06 NASR Safety Alert (PDF) for complete information.
April, 19 2022	**NASR 28-Day Subscriber Files**	April 19, 2022	The awy.txt file of the 28 Day NASR Subscription, contains an error for Airway T370. See the 22-05 NASR Safety Alert (PDF) for complete information.
Apr 13, 2022	**digital - U.S. Terminal Procedures Publications**	September 8, 2022	d-TPP Desktop discontinued due to Internet Explorer retiring. See the 22-02 TERM Charting Notice (PDF) for complete information.

Safety information bulletin

FAA

All Information for Operators (InFOs) (faa.gov)

All Safety Alerts for Operators (SAFOs) (faa.gov)

https://rgl.faa.gov/Regulatory_and_Guidance_Library/rgSAIB.nsf/MainFrame?OpenFrameSet

Issue Date	SAIB Number	Make / Company	Subject
06/04/2022	AIR-22-07		This Special Airworthiness Information Bulletin (SAIB) is to inform owners and operators of aircraft equipped with Avidyne Corporation (Avidyne) DFC90 autopilots coupled with Avidyne primary flight displays (PFDs) and Garmin global positioning system (GPS) and GPS navigation systems (GNS) navigators of a potential uncommanded turn to heading 360 if SBAS, EGNOS, MSAS/QZSS, or GAGAN WAAS reception is lost during an autopilot coupled non-degradable localizer performance with vertical guidance (LPV) approach.
11/04/2022	AIR-22-08	Robinson R44 rotorcraft	MAIN ROTOR DRIVE SYSTEM,TAIL ROTOR DRIVE SYSTEM
12/04/2022	AIR-22-09	The Boeing Company Model 777-200, -200LR, -300, -300ER, and 777F series airplanes, and Model 787-8, -9, and -10 airplanes	This Special Airworthiness Information Bulletin (SAIB) is to inform owners and operators of aircraft the potential for mismanagement of the Flight Management Annunciation (FMA) system on takeoff due to Autopilot Flight Director System (AFDS) being latched in altitude hold (ALT) modeor GAGAN WAAS reception is lost during an autopilot coupled non-degradable localizer performance with vertical guidance (LPV) approach.

EASA

EASA Safety Publications Tool (europa.eu)

Issue Date	SIB Number	Subject
05/04/2022	2022-03	Enhanced cleaning and disinfection of aircraft surfaces - Operational Recommendations
08/04/2022	AIR-21-05R1	Cirrus SR22 aeroplanes - Tornado Alley Turbo, Inc. (STC-installed) Turbocharger Inlet Check Valves

Suspected Unapproved Parts Details

Product : EMBRAER - EMB135 BJ Legacy

Part name : Fuel tank rubber bladder

Part Number : Multiple

Serial Number : Multiple

The Brazilian NAA (ANAC) has notified EASA that the production organisation PRONAL Elastomer Engineering, B.P. 18, 59115 Leers, France has issued a number of EASA Form 1 certificates for its products (P/N RAHE70370 and RAHE70371) based on the EASA revoked ETSO DGAC France Authorisation No. F.O.011 after the revocation date of 08 March 2017. The scope of this publication is to notify the aviation community that any EASA Form 1 or Dual release certificates associated with these parts that has been issued on or after 08 March 2017 by this organisation shall be considered as not valid.

Recommendation: Maintenance organisations, aircraft owners, operators, independent certifying staff, manufacturers, and parts suppliers are invited to make a determination of eligibility of those parts for installation, before accepting such parts into their organisations or before fitting it to an aircraft.

If any part is found in stock, it is recommended that it is quarantined to prevent installation until a determination can be made regarding its eligibility for installation.

It is also recommended to maintenance organisations, aircraft owners, and operators to check whether an unapproved part is already installed on in-service aircraft. If so, the part must be replaced with an appropriately approved one. The unapproved part shall be quarantined.

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Conflict zone information bulletin

Conflict Zone Information Bulletin (CZIB's) | EASA (europa.eu)

Recently up dated on the 29/04/2022

Airspace of Egypt Sinai Peninsula - **CZIB-2017-09R9**

Airspace of Pakistan – Karachi and Lahore Flight Information Regions - **CZIB-2018-02R10**

Airspace of Yemen – Sana'a Flight Information Region - **CZIB-2017-07R10**

Airspace of Somalia - **CZIB-2017-05R10**

Airspace of Syria - **CZIB-2017-03R10**

Airspace of Iraq - **CZIB-2017-04R10**

Airspace of Libya - **CZIB-2017-02R10**

Airspace of Saudi Arabia – Jeddah Flight Information Region - **CZIB-2018-01R9**

Airspace of Mali within Niamey Flight Information Region - **CZIB-2017-01R11**

Airspace of South Sudan - **CZIB-2018-03R8**

Airspace of Afghanistan - **CZIB-2017-08R9**

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Certification Up date

FAA do not need to be followed in this part? due to ECFR – See part Regulation or safety Bulletins for completion.

EASA

- Proposed Equivalent Safety Finding ref. ESF-F25.1445-02 Cargo Compartment – Installation of a common supplemental oxygen system for flight crew and supernumeraries - Issue 01
- Final Special Condition SC-AI-01 Trustworthiness of Machine Learning based Systems - Issue 01

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Master MEL-OSD

MMEL

- EX 120 B (R0001RD)
- CE-408_Rev_0
- R-66_Rev_1
- MMEL PA-46-600TP Rev 0, Piper Aircraft Inc., PA-46-600TP

OSD – FSBR

Operational Evaluation Guidance Material (OE GM) / Operational Evaluation Reports (OEB) / Operational Suitability Data (OSD) | EASA (europa.eu)

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FAA Safety Briefing

Except War in Ukraine, nothing really important

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Publications

Recherche : NEWS (icao.int)

News & Updates (faa.gov)

Newsroom & Events | EASA (europa.eu)

Initial agenda published for FAA-EASA International Aviation Safety Conference, June 14-16, 2022

The Federal Aviation Administration (FAA) and the European Union Aviation Safety Agency (EASA) will hold the 2022 International Aviation Safety Conference in Washington, D.C. from June 14-16, 2022. Join us for one of the first in-person international aviation safety conferences since 2020. This year's theme "Uniting Efforts to Overcome Aviation Safety Challenges" aims to foster a robust discussion among the international community to improve aviation safety.

The three-day conference will bring together regulators, aerospace industry representatives, and other stakeholders from around the world to share aviation safety information, address current areas of mutual concern, and identify future collaborative opportunities with the global community. Join us for keynote addresses from FAA and EASA leadership, multiple breakout and plenary sessions on topics such as aviation resilience, managing cybersecurity threats, innovation, and safety management, in addition to many networking opportunities, and much more.

For more information on the conference or to register, visit the conference registration site. For questions related to the event, please contact events@aia-aerospace.org.

Strengthening Cybersecurity in Aviation – EASA EU - Latin America and Caribbean Aviation Partnership project

EASA Conference on Cybersecurity in Aviation at International Air and Space Fair (FIDAE) in Chile

Within the scope of the EU - Latin America and Caribbean Aviation Partnership project (EU-LAC APP), the European Union Aviation Safety Agency (EASA) organised the "Conference on Cybersecurity in Aviation – Taking stock!" at the International Air and Space Fair (FIDAE) in Chile (April 5 – 7, 2022). The purpose of the event was to strengthen the exchange and dialogue with partners in the region.

Given the increasing importance of cybersecurity and the need to protect the aviation system against new threats, EASA gave an overview of the European approach towards Cybersecurity and exchanged experiences with representatives from CAA Brazil, CAA Argentina, Airbus and Leonardo.

During the conference, areas of mutual interest and future cooperation on the management of the cybersecurity risk in aviation were identified, together with the need for global coordination.

The conference was the first in a series of events which will focus on cybersecurity within the EU- Latin America and Caribbean Aviation Partnership project.

Aiming to keep cybersecurity professionals and partners worldwide informed and up to date, EASA launched a community website providing information on regulations and standards, with particular focus on information sharing and collaboration initiatives, such as the European Strategic Coordination Platform (ESCP), the European Centre for Cybersecurity in Aviation (ECCSA) and the Network of Cybersecurity Analysts (NoCA).

For more information and to join the community, please visit us at 'Cybersecurity in Aviation'.

COMSTAC Public Meeting May 3-4, Watch and Submit Questions

Tuesday, May 3 from 1 p.m. ET – 5:30 p.m. ET

https://youtu.be/b9Z4y_hmMnY

Wednesday, May 4, from 9 a.m. – 3 p.m. ET

Morning Session https://youtu.be/hCMWfGj9Cf4

Afternoon Session https://youtu.be/Jd4MUgcYBsU

Submit questions before or during the COMSTAC meeting: https://forms.gle/uCGRZTi8MroK8z3X8

The Commercial Space Transportation Advisory Committee (COMSTAC) provides information, advice and recommendations to the U.S. Department of Transportation through the Federal Aviation Administration regarding technology, business, and policy issues relevant to oversight of the U.S. commercial space transportation sector.

Some topics that will be discussed at the two day meeting include:

Climate Change and the Space Industry: How the space industry affects climate change and how climate change affects the space industry

High Speed Aerospace Transportation: Associated spaceport operations and integration into the National Airspace System

Human Spaceflight: High priority areas for future regulation and recommended and best practices **Maximum Probable Loss (MPL)**: Recommendations for improvements on thresholds used to determine MPL, the cost of a casualty and insurance alternatives for operators

Presentation topics include: Space Health Research, National Space Council, Congressional Update and Industry Voluntary Standards Development

FAA Begins Investing $1B of Bipartisan Infrastructure Law Funding into Air Traffic Control System

WASHINGTON— The U.S. Department of Transportation's Federal Aviation Administration (FAA) has started investing the first $1 billion of $5 billion into the country's air traffic control system. The funding — made possible through President Biden's Bipartisan Infrastructure Law — will sustain, repair or replace hundreds of buildings and pieces of equipment that make flying in the United States the safest in the world.

"Air traffic control facilities are the nerve centers of our airspace system, and a big part of the reason why flying is the safest mode of transportation," **said U.S. Transportation Secretary Pete Buttigieg**. "The Bipartisan Infrastructure Law will repair, replace and modernize the infrastructure that our air traffic control system relies on to keep the traveling public safe for generations to come."

Secretary Buttigieg visited one of the 22 air traffic control facilities that will received funding thanks to the infrastructure law. View the video of Secretary Buttigieg's visit.

The FAA controls more than 5 million square miles of airspace in the U.S. and more than 24 million square miles over oceans. The air traffic system includes hundreds of towers at airports and terminal approach control facilities, which provide air traffic services to aircraft approaching and leaving busy airspace. It also includes 22 centers handling aircraft at high-altitudes. These facilities depend on power systems, navigation and weather equipment, and radar and surveillance systems across the country.

"There's a great deal of work needed to reduce the backlog of sustainment work, upgrades and replacement of buildings and equipment needed to operate our nation's airspace safely. We are going to make sure small and disadvantaged businesses owned by women and minorities have the chance to do this work so we can expand jobs and opportunities across the country," **said FAA Deputy Administrator A. Bradley Mims.**

Below is a breakdown of how the FAA will invest the $1 billion available in the first year of funding. Click on the graphic to view an interactive data visualization online.

- **Reinforce Navigation, Weather & Tracking Equipment**: The FAA uses a host of communications, surveillance, weather and navigation systems to guide aircraft safely. We will complete the backlog of supporting infrastructure sustainment projects to keep these systems reliable.
- **Power Systems:** Replace underground cables, transformers, switches at airports, engine generators and fuel storage tanks that are part of primary and back-up power systems for our air traffic systems.
- **Enroute Flight Centers:** Update and repair the country's 22 Air Route Traffic Control Centers that handle aircraft flying at high altitudes.
- **Long-Range Radars:** Renovate or replace the supporting infrastructure at long-range radar sites, which are critical to tracking flights between airports.
- **Replace Towers:** Pay for design, site evaluation and preparation for the first air traffic control towers that will be replaced over the coming years. Many of the towers selected will be located at regional and smaller airports.
- **Improve Towers and Approach & Departure Facilities:** More than 50 percent of our towers and TRACON facilities, which handle flights entering and exiting busy airspace, are over 40 years old. Funding will pay for new elevators, plumbing systems, and supporting infrastructure.
- **Environmental and Safety:** Remove and restore areas where we have outdated facilities or personnel safety infrastructure that is no longer used and incorporate environmental and personnel safety updates.
- **Personnel & Travel**: Recruit and hire installation technicians and engineers needed to improve and modernize these facilities.
- **Facility Security:** Upgrade various integrated security systems at all FAA staffed facilities. Upgrades include those for guardhouses, visitor parking, fencing, perimeter hardening, window blast protection and lighting.

The projects that this funding supports will create jobs for local suppliers, construction workers and communities nationwide.

For additional information, visit www.faa.gov/bil/air-traffic-facilities.

The President's Bipartisan Infrastructure Law, also known as the Infrastructure Investment and Jobs Act, is the Biden-Harris Administration's plan for building a better America with a $1.2 trillion investment in our nation's infrastructure and competitiveness. This Bipartisan Infrastructure Deal will rebuild America's roads, bridges and rails, upgrade and expand public transit, modernize the nation's ports and airports, improve safety, tackle the climate crisis, advance environmental justice and invest in communities that have too often been left behind. It will drive the creation of good-paying union jobs and grow the economy sustainably and equitably so that everyone gets ahead for decades to come.

FAA Accepting Applications for Aviation Workforce Development Grants

WASHINGTON— The U.S. Department of Transportation's Federal Aviation Administration is seeking applications for two Aviation Workforce Development Grant programs aimed at developing and inspiring a more diverse pool of pilots and aviation maintenance technicians to join the next generation of aviation professionals. This is the FAA's second funding opportunity for these programs. A total of $10 million is available for the grants.

The Aircraft Pilots Workforce Development Grants will educate students to become pilots, aerospace engineers or unmanned aircraft systems operators. The Aviation Maintenance Technical Workers Workforce Development Grants will prepare aviation maintenance technicians. Eligible entities can submit applications at www.grants.gov through June 10, 2022.

Eligible entities may apply for grants ranging from $25,000 to $500,000 for each grant per fiscal year. Last year, the FAA awarded $10 million in grants to more than 30 schools and organizations.

The Notice of Funding Opportunity for each grant provides detailed information on eligibility, deadlines, evaluation criteria and application procedures. To ensure fair and open competition for the grants, answers to public questions will be posted on the FAA website at www.faa.gov/go/awd.

Potential applicants should visit the site to review answers to frequently asked questions, eligibility requirements and guidelines that may assist them to complete their grant application.

President Biden, Federal Aviation Administration Deliver Historic Investments to General Aviation Airport in Kentucky

Grant will bring good-paying jobs and economic opportunity to community

Louisville, Ky. – During a visit to Bowman Field Airport, FAA Associate Administrator of Airports Shannetta Griffin highlighted funding coming the airport's way as part of President Biden's Bipartisan Infrastructure Law that provides a once-in-a-generation investment. The Biden-Harris Administration is investing in infrastructure that benefits Americans in overlooked communities to create good-paying jobs, generate new economic opportunities and build community wealth.

"For a more than century, Bowman Field has helped the aviation industry and this community take off and grow – and it still plays that important role for this region. The funding coming its way will allow it to make improvements to the airport to keep that proud tradition." FAA Associate Administrator of Airports Griffin said while visiting the airport.

Bowman Field is set to receive $295,000 in Bipartisan Infrastructure Law funding for Fiscal Year 2022. The Bipartisan Infrastructure Law program allows investments in runways, taxiways, safety and sustainability projects, as well as terminal, airport-transit connections and roadway projects. The program invests $20 billion in the nation's airports.

President Biden's Bipartisan Infrastructure Law is sending historic investments to revitalize and rebuild small and municipal communities across the country. Supporting Americans living in these areas remains a top priority for the Biden Administration, and the Bipartisan Infrastructure Law delivers on the President's promises to provide affordable high-speed Internet, safe roads and bridges, clean drinking water, modern wastewater systems, reliable and affordable electricity, and good-paying jobs in every community.

As part of this effort, the Biden Administration is also committed to working with communities to help them access federal resources and improving transparency. In small towns across the country, the Bipartisan Infrastructure Law delivers historic funding, flexibilities, and benefits.

For more information on infrastructure investments specific to America's rural communities, visit the Bipartisan Infrastructure Law Rural Playbook at build.gov/rural.

President Biden, Federal Aviation Administration Deliver Historic Investments to Airport in Denton, Texas

Denton, Texas -- During a visit to Denton Enterprise Airport, Acting FAA Administrator Billy Nolen highlighted funding coming the airport's way as part of President Biden's Bipartisan Infrastructure Law that provides a once-in-a-generation investment in communities across the country. The Biden-Harris Administration is investing in infrastructure that benefits Americans in smaller towns to create good-paying jobs, generate new economic opportunities, and build community wealth.

"General aviation airports are vital to this community and to communities throughout our nation. They are where pilots get trained, emergency medical services take off and land, and in many cases where young people are introduced to flying for the very first time," Acting Administrator Nolen said while visiting the airport. "Denton County continues its rapid growth, and it's essential we support its growth."

Denton Enterprise Airport is set to receive $763,000 through the law in fiscal year 2022. This program allows investments in runways, taxiways and safety and sustainability projects, as well as terminal, airport-transit connections and roadway projects. The airport is home to two flight training schools and one aircraft maintenance and repair school.

President Biden's Bipartisan Infrastructure Law is sending historic investments to revitalize and rebuild small and municipal communities across the country. Supporting Americans living in these areas remains a top priority for the Biden Administration, and the Bipartisan Infrastructure Law delivers on the President's promises to provide affordable high-speed Internet, safe roads and bridges, clean drinking water, modern wastewater systems, reliable and affordable electricity, and good-paying jobs in every community. The Bipartisan Infrastructure Law invests $20 billion in the nation's airports.

As part of this effort, the Biden Administration is also committed to working with communities to help them access federal resources and improving transparency. In communities across the country, like Denton, the Bipartisan Infrastructure Law delivers historic funding, flexibilities, and benefits.

For more information on infrastructure investments specific to America's rural communities, visit the Bipartisan Infrastructure Law Rural Playbook at build.gov/rural.

President Biden, Federal Aviation Administration Deliver Historic Investments to Airport in Augusta, Kansas

Grant will bring good-paying jobs and economic opportunity to community

Augusta, Kan. – During a visit to Augusta Municipal Airport near Augusta, Kan., FAA Deputy Administrator Bradley Mims highlighted funding coming the airport's way as part of President Biden's Bipartisan Infrastructure Law (BIL) that provides a once-in-a-generation investment in rural and smaller communities. The Biden-Harris Administration is investing in the infrastructure that benefits Americans in smaller towns to create good-paying jobs, generate new economic opportunities and build community wealth.

"These communities may be small in size, but they have a big impact on keeping our National Airspace System operating safely and efficiently. With this new funding, Augusta Municipal and airports across the country will get to work on projects that have waited for years," FAA Deputy Administrator A. Bradley Mims said while visiting the airport.

Augusta Municipal Airport is set to receive $159,000 in Bipartisan Infrastructure Law funding for Fiscal Year 2022. This program allows investments in runways, taxiways, safety and sustainability projects, as well as terminal, airport-transit connections and roadway projects. The Bipartisan Infrastructure Law invests $20 billion in the nation's airports.

President Biden's Bipartisan Infrastructure Law is sending historic investments to revitalize and rebuild small and municipal communities across the country. Supporting Americans living in these areas remains a top priority for the Biden Administration, and the Bipartisan Infrastructure Law delivers on the President's promises to provide affordable high-speed Internet, safe roads and bridges, clean drinking water, modern wastewater systems, reliable and affordable electricity, and good-paying jobs in every community.

As part of this effort, the Biden Administration is also committed to working with communities to help them access federal resources and improving transparency. In small towns across the country, like Augusta, the Bipartisan Infrastructure Law delivers historic funding, flexibilities, and benefits:

- Providing high-speed internet to every home: More than 35 percent of rural Americans and Tribal communities lack wired access to broadband at acceptable speeds. The Bipartisan Infrastructure Law invests $65 billion to make high-speed internet available to all Americans, bring down high-speed internet prices across the board, and provide technical assistance to rural communities seeking to expand broadband.
- Creating good-paying jobs cleaning up legacy pollution in rural communities: The President committed to (1) creating good-paying jobs in rural communities across the country and (2) ensuring those communities are safe, high-quality places to live. Legacy pollution from industries that

extracted natural resources from rural areas left behind huge quantities of environmental degradation has held back the economic growth and success of rural communities.

- Delivering a historic investment in rural mobility: Limited access to transportation options in rural and remote areas injure make it difficult for rural American's to access to jobs, basic services, and their broader communities. The Bipartisan Infrastructure Law invests billions of dollars to make sure rural families can get where they need to go.
- Providing high-quality, safe roads and bridges for rural communities: While Americans living in rural areas account for just 20% of the population, they comprise nearly half of all roadway fatalities. The Bipartisan Infrastructure Law will deliver safer roads, bridges, railway crossings, and other critical improvements to the quality and safety of our roadways.
- Ensuring clean drinking water and basic sanitation in every home: Across the country, including in rural and Tribal communities, pipes and treatment plants are aging and polluted drinking water endanger public health. The Bipartisan Infrastructure Law's transformative investment in our water and wastewater infrastructure will fundamentally change quality of life for millions of Americans by eliminating lead pipes, providing critical access to sanitation, and more.
- Building communities resilient to natural disasters and the threat of climate change: Last year, the United States faced 22 extreme weather and climate-related disaster events with losses over $1 billion – a cumulative price tag of nearly $100 billion. These included damaging floods, fires, and wind storms across rural America. The Bipartisan Infrastructure Law will improve the resilience of rural communities.

For more information on infrastructure investments specific to America's rural communities, visit the Bipartisan Infrastructure Law Rural Playbook at build.gov/rural.

Pilots Now Able to Track Medical Applications in Real-Time

WASHINGTON—The Federal Aviation Administration (FAA) has added a new feature to MedXPress that allows pilots to track the status of their medical certificates online throughout the application and review process. Prior to adding this new feature, pilots had to call the Office of Aerospace Medicine to check their application status.

"If you can track where your ridesharing car is or the status of a company delivering your package, pilots should be able to see online the real-time status of their application," said Federal Air Surgeon Dr. Susan Northrup "We will continue to explore how we can be more transparent with the aviation community."

As soon as an application is submitted, it will appear in the pilot's MedXPress profile. Status updates will change as the application moves through the FAA's review process. If an application is deferred or denied, the applicant will receive detailed information through the mail.

The certification process itself does not change. You can learn more about FAA's medical certification process at https://www.faa.gov/licenses_certificates/medical_certification/

Application Process Opens to Modernize Small Town, Regional Air Traffic Towers Using Bipartisan Infrastructure Law Funds

WASHINGTON— The Federal Aviation Administration has opened the application process for Bipartisan Infrastructure Law funding to modernize air traffic control towers at many small town and municipal airports. The FAA will fund projects that sustain, construct, repair, improve, modernize, replace or relocate airport-owned towers and install communications equipment.

"Residents of smaller and rural communities rely on aviation to get where they need to go. This funding will help ensure that air traffic is safe and reliable in communities across America," said U.S. Transportation Secretary Pete Buttigieg.

The FAA Contract Tower Competitive Grant program provides $20 million annually for five years within the newly established Airport Infrastructure Grant program. Grants awarded under this program are at a 100 percent federal participation. No airport match is required.

There are currently around 156 airports with air traffic control contract towers eligible for this funding. These towers are staffed by employees of private companies rather than by FAA employees. The FAA pays for the services on a contract basis. The FAA's Contract Tower Program began in 1982 to allow the agency to contract out the operation of certain low-activity towers.

"This funding will allow airport sponsors to build or repair their facilities to meet safety standards and be environmentally friendly and sustainable," said FAA Associate Administrator of Airports Shannetta Griffin.

Airports are encouraged to submit eligible projects as soon as possible, but must do so by May 16, 2022.

The President's Bipartisan Infrastructure Law, also known as the Infrastructure Investment and Jobs Act, is the Biden-Harris Administration's plan for building a better America with a $1.2 trillion investment in our nation's infrastructure and competitiveness. It will rebuild America's roads, bridges and rails, upgrade and expand public transit, modernize the nation's ports and airports, improve safety, tackle the climate crisis, advance environmental justice and invest in communities that have too often been left behind. It will drive the creation of good-paying union jobs and grow the economy sustainably and equitably so that everyone gets ahead for decades to come.

ICAO-Qatar Developing Country Scholarship Programme for aviation professionals

Montréal and Doha, 26 April 2022 - An agreement was reached between ICAO and the Government of the State of Qatar yesterday that will see the extension for a further three years of the ICAO-Qatar Developing Country Scholarship Programme. The programme aims to deliver training to aviation personnel globally to ensure the safety, efficiency and regularity of international civil aviation and alignment with ICAO Standards and Recommended Practices (SARPs).

The agreement was signed by ICAO Secretary General Juan Carlos Salazar and Qatar Civil Aviation Authority (QCAA) President H.E. Mohamed Faleh Al Hajri at a virtual signing ceremony held in Montréal and Doha.

Implemented through the ICAO Technical Cooperation Bureau, the programme will award Scholarships to participants worldwide in areas of training jointly identified by ICAO and the Government of Qatar targeting Developing Countries most in need of assistance in those specific areas of training. ICAO will assist the Government of Qatar in identifying and recommending relevant subject matter experts and processing the nominations received jointly with the Government of Qatar.

"The signature of this Memorandum of Understanding renews the commitment made in 2018 by the State of Qatar to assist Developing Countries through this and other initiatives aimed at ensuring adherence to ICAO Standards and Recommended Practices and continuous training," remarked Mr. Salazar. "This programme, administered by ICAO's Technical Cooperation Bureau, will have a significant impact towards achieving a sustainable global civil aviation system."

"The signing of this memorandum stems from our belief in the importance of our strategic partnership with ICAO, and in commitment to its mission, goals and principles, in addition to its international initiatives aimed at further developing a safe and sustainable civil aviation sector throughout the world," stated Mr. Mohammed Faleh Al-Hajri. "This memorandum also aligns with Qatar's vision of focusing on human development and the importance of the human role in building a prosperous and developed society. This is indeed what it will contribute to by strengthening the human capabilities in developing countries to ensure the best implementation of all ICAO's standards and recommended practices."

Announcements of the first scholarships will be issued by ICAO in the upcoming weeks.

ICAO and IFAR reach cooperation agreement on aviation innovation

Montréal, 7 April 2022 - ICAO and the International Forum for Aviation Research (IFAR) will scale-up their cooperation and information sharing to promote innovation through a new agreement concluded in Montréal this week.

The agreement was signed on the occasion of a high-level meeting between the Secretary General, the President of the ICAO Council and Council members and IFAR Principals. Both parties acknowledged the need for the independent assessment of innovations to frame and protect the notion of general interest, within the context of a variety of transformative changes within the aviation industry.

Focusing on the promotion of the innovative and sustainable development of international civil aviation globally, the Memorandum of Understanding calls for ICAO and IFAR to cooperate toward their respective safety, security, and sustainability goals, and collaborate on the scientific assessment of new avenues for innovation.

"This new ICAO-IFAR agreement will be transformative in permitting the research community to participate in a more dynamic and effective manner with ICAO," remarked ICAO Secretary General Juan Carlos Salazar. "Monitoring and understanding the impact of technological and process innovations is a pre-requisite to effectively supporting States in the establishment of related international guidance."

The exponential growth in the number of aviation innovators across the world will help the sector make the generational changes needed to meet the critical emissions reduction commitments and address the sustainability challenges the industry faces, including air space congestion, reopening of boarders, digitization, liberalization and resilience against future crises. Thus allowing international aviation to become a stronger vector for peace, growth and prosperity for all.

The dynamic evolution of the aviation ecosystem represents a tremendous opportunity for society as a whole, but it also raises challenges for standard setting and regulatory bodies to fully grasp and contextualize the emerging frontier technologies and capabilities.

With the aviation sector contributing directly towards 15 of the 17 UN Agenda 2030 sustainable developments goals, the support provided by the agreement will help ensure that these innovations contribute fully to aviation's broader role as a catalyst for sustainable development worldwide.

A specialized agency of the United Nations, ICAO was created by governments in 1944 to support their diplomacy on international air transport matters. Since that time, countries have adopted over 12,000 standards and practices through ICAO which help to align their national regulations relevant to aviation safety, security, efficiency, capacity and environmental protection, enabling a truly global network to be realized. ICAO forums also provide opportunities for advice and advocacy to be shared with government decision-makers by industry groups, civil society NGOs, and other officially-recognized air transport stakeholders.

New training programme to accelerate aviation's sustainable and resilient recovery

Montréal and Singapore, 7 April 2022 - A new agreement reached between ICAO and the Civil Aviation Authority of Singapore (CAAS) today will see the global delivery of an aviation recovery and resilience training programme for aviation leaders, accelerating the restoration of air services through improving alignment with international best practices.

The agreement was signed in Singapore by ICAO Secretary General Juan Carlos Salazar and the Director-General of the Civil Aviation Authority of Singapore (CAAS) Han Kok Juan.

The training programme will target the Directors-General of Civil Aviation (DGCAs) of ICAO's 193 Member States. CAAS will lead the programme development , while ICAO will contribute its subject-matter expertise and review the content. It will cover lessons learnt from the COVID-19 pandemic crisis, with a particular focus on aviation safety, sustainability, technology and cybersecurity.

"The launch of this programme holds the promise of a highly significant positive impact on the efforts led by governments and other stakeholders to accelerate and optimize the recovery of the global aviation sector, in particular through alignment with the internationally coordinated guidance developed by ICAO," remarked Mr. Salazar. "The delivery of this content to the leadership and senior management level of civil aviation authorities worldwide will provide a significant boost towards achieving a sustainable and resilient future for air transport."

"Singapore is deeply honoured to be able to partner with the ICAO in leadership training on aviation recovery and building resilience," added Mr Han Kok Juan. "The partnership is a recognition of Singapore's expertise and experience and testament to Singapore's commitment to contribute to global aviation recovery and human capital development."

The first delivery of the programme is currently scheduled to take place in Singapore on 18 and 19 May 2022, with further deliveries foreseen to take place later this year. The agreement provides for the delivery of the training at multiple locations worldwide to facilitate access to States in all ICAO regions.

ICAO Secretary General hails Thailand's leadership in contributing towards recovery of the global aviation sector

Montréal and Bangkok, 7 April 2022 - At a bilateral meeting that took place in Bangkok this week with H.E. General Prayut Chan-o-cha, the Prime Minister of the Kingdom of Thailand, ICAO Secretary General Juan Carlos Salazar congratulated the host State of ICAO's Asia and Pacific Regional Office on its exemplary commitment to advancing a sustainable and resilient recovery of its aviation and tourism sectors in line with related ICAO guidance.

The meeting between the leaders was attended by Mr. Saksayam Chidchob, Minister of Transport of Thailand; the Ministry's Permanent Secretary, Mr. Chayatan Phromsorn; and the Director General of the Civil Aviation Authority of Thailand (CAAT), Mr. Suttipong Kongpool.

The Secretary General appreciated Thailand's significant contributions towards all of ICAO's safety, security, and sustainability objectives for global aviation, highlighting its work to continuously enhance its oversight capacities in accordance with the relevant ICAO standards and recommended practices.

Thailand's implementation of the recommendations of the ICAO Council Aviation Recovery Task Force (CART) were seen as particularly important to its current successes, especially given the high importance of international and domestic air tourism to its overall economic prosperity.

Expressing his gratitude for Thailand's long-standing accommodation of ICAO's Asia and Pacific Regional Office, Mr. Salazar reiterated ICAO's commitment to supporting Thailand in its endeavours for the recovery of the aviation industry in Thailand and the region.

The meeting also provided an opportunity to review avenues for heightened cooperation, including enhancing the alignment of the COVID-19 provisions for entry to Thailand with international guidance by working closely with public health authorities, and a more broadly continued easing of entry requirements.

Mr. Salazar also attended meetings with CAAT and Aeronautical Radio of Thailand (AEROTHAI) officials, where he explored current technical and policy priorities. DGCA Kongpool was joined on these occasions by the CAAT Deputy Director General, Mr. Sarun Benjanirat, and AEROTHAI's President and Executive Vice President (Operations), Dr. Nopasit Chakpitak and Mr. Tinnagorn Choowong, respectively.

The Secretary General thanked both organizations for their continued contributions to ICAO's work, including the development of ICAO's standards and recommended practices and recent regional aviation safety and air navigation capacity planning, in addition to valuable financial and human resources contributions.

Mr. Salazar further highlighted AEROTHAI's excellent infrastructure, especially in the area of Air Traffic Flow Management (ATFM), acknowledging that Thailand is a key contributor to the work of the Asia/Pacific ATFM Steering Group, and appreciating the technical expertise it brings to the work of the Asia/Pacific System-Wide Information Management (SWIM) Task Force.

Throughout all his meetings in Thailand, the Secretary General was accompanied and supported by ICAO's Regional and Deputy Regional Directors for the Asia Pacific region, Mr. Tao Ma

Sites de surveillance

https://flightsafety.org/toolkits-resources/

https://aviation-safety.net

http://www.skybrary.aero

https://asrs.arc.nasa.gov/

Bulletin Officiel des Ministères de la Transition écologique et solidaire et de la Cohésion des territoires et des Relations avec les collectivités territoriales (developpement-durable.gouv.fr)

SIA - La référence en information aéronautique - Page d'accueil (aviation-civile.gouv.fr)

Info sécurité DGAC | Ministère de la Transition écologique (ecologie.gouv.fr)

http://www.developpement-durable.gouv.fr/Objectif-Securite-lebulletin.html

http://www.bea.aero/

http://ad.easa.europa.eu/sib-docs/page-1

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http://www.jigonline.com/all-bulletins/

Accueil (defense.gouv.fr)

ECCSA - Technology Watch | EASA (europa.eu)

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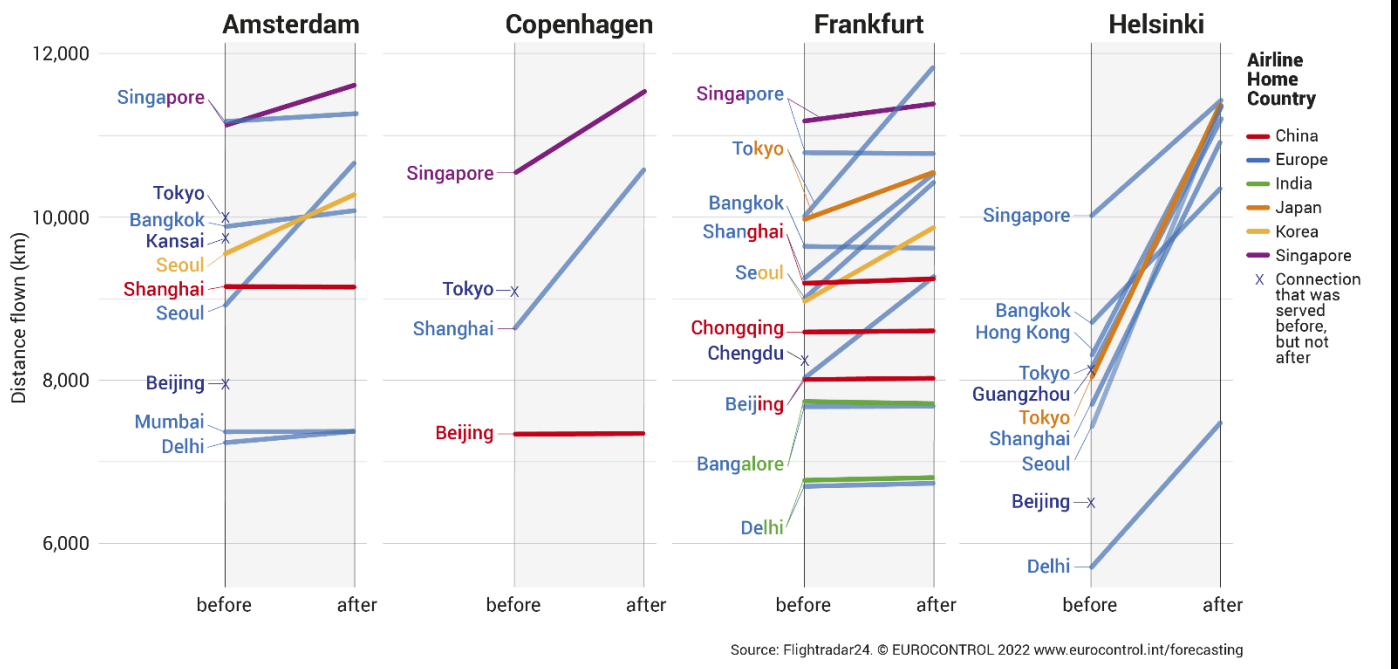
EUROCONTROL Data Snapshot

The length of the detour around Ukrainian and Russian airspace depends on the city-pair, but also on the nationality of the airline.

EUROCONTROL

12 April 2022



The unprovoked invasion of Ukraine has led to significant changes in flight patterns. In a recent snapshot, we explored what this meant for some countries in Eastern Europe. Here, we look at the effect on long-haul flights to Asia. The graph shows the distances flown to link four European cities with their Asian counterparts, before and after the closure of Ukrainian airspace and the closure of Russian and Belarus airspace to some airlines.

The extra flight-time led some airlines to cancel the connection, marked by an 'X' on the 'before' axis, for example Finnair has stopped flights from Helsinki to Beijing, and SAS has stopped flights from Copenhagen to Tokyo. This decision is driven by passenger and cargo demand, additional fuel costs, constraints from scheduling, staffing and airports (gates and curfews) and, in some cases, the capabilities of available aircraft, given the prevailing winds *en route*.

In many cases, if not cancelled, the frequency of the connection is reduced. This is not shown on the graph, which focuses instead on the distance flown. Out of the examples shown here, it's evident that connections from Helsinki are most affected, with additional distances between 1400km (Singapore) and nearly 4000km (Seoul). To put that in context, 1400km adds 1.25 hours to the flight, and 4000km adds 7 hours on a round trip between Helsinki and Seoul. Helsinki<>Seoul used to be about 8.5 hours but is now 12 hours, so another 7 hours on a round trip is nearly as much as the original one-way segment.

Further South, and further from the closed airspace, Copenhagen sees an additional distance around 1500km to Singapore and Shanghai. Beijing is served by a Chinese cargo operator, Air China Cargo, which is still able to fly Siberian routes, so there are no additional track miles.

Frankfurt is sufficiently far south that there is no additional flying to reach destinations in India and South-East Asia. For Lufthansa, Beijing is about 1200km further, but Air China (passenger and cargo) is barely affected.

Technical Bits: Data are from Flightradar24. 'Before' are the 6 weeks to 27 February, when airspace restrictions were introduced, and 'after' are the 5-6 weeks following. Routes with 3 or fewer flights per week are not shown and some larger routes have been omitted for clarity.

EUROCONTROL

EUROCONTROL Aviation Outlook 2050

Main Report

April 2022

SUPPORTING EUROPEAN AVIATION

FOUNDING MEMBER OF sesar JOINT UNDERTAKING

NETWORK MANAGER

Foreword by the Director General of EUROCONTROL

Aviation has been hit hard by the COVID19 pandemic and, even after traffic has recovered to 2019 levels, we can expect slower growth than previously forecast. However, growth will return and we need to prepare for significantly higher levels of traffic in the decades to come.

Long-term forecasts are never easy to produce but are vital for an industry such as aviation where long-term investment is required. This includes Air Traffic Management (ATM) systems, airports, airframes and also new types of aircraft and infrastructure that are being developed to make aviation more sustainable.

For the first time, this report includes estimates of net CO_2 emissions, it provides a real insight into how aviation can move towards the target of net zero by 2050. This challenging objective is achievable but it will not be easy – requiring coordinated action by aircraft manufacturers, airlines, airports, fuel companies, ANSPs and, crucially, governments and regulators.

Although Sustainable Aviation Fuel (SAF) is the largest contributor to achieving net zero by 2050 (41% in our base scenario), our view is other measures (e.g. Market-Based Measures) will continue to very significant role (32% in our base scenario). This is higher than other forecasts have suggested to date.

Even though aviation is only responsible for just over 2% of global CO_2 emissions, we need to play our part in improving sustainability. This report provides a clear idea of what that means in practice.

Eamonn Brennan

April 2022

DISCLAIMER: This report was prepared before the start of the invasion of Ukraine by Russia. At the point of publication, the impact on traffic (flights and emissions) is currently high for some States adjacent to Belarus, Russia and Ukraine. However, the overall impact to the full European network remains relatively small. The main focus in this report is air traffic development by 2050.

30-YEAR FORECAST 2022-2050

16 MILLION FLIGHTS BY 2050

(RANGE: 13.2-19.6 MILLION)

UP 44% ON 2019

- **10-YEAR LAG** SINCE **PREVIOUS LONG-TERM** FORECAST (2018).
- **MIDDLE-EAST** & **ASIA/PACIFIC:** MOST **DYNAMIC** FLOWS WITH ECAC BY 2050.

NET ZERO CO_2 TO BE ACHIEVED BY CUTTING 279 MILLION TONNES WITH:

- (17%) MORE EFFICIENT CONVENTIONAL AIRCRAFT.
- (2%) ELECTRIC & HYDROGEN POWERED AIRCRAFT.
- (8%) BETTER ATM AND AIRLINE OPERATIONS.
- (41%) SUSTAINABLE AVIATION FUEL.
- (32%) OTHER MEASURES.

MAIN CHALLENGES:

- LONG-HAUL MAIN SOURCE OF CO_2 EMISSIONS.
- NET ZERO CO_2 IN 2050 ACHIEVABLE BUT VERY CHALLENGING.
- FOCUS ON ATM EFFICIENCY (SES) ESSENTIAL AND SHOULD HAPPEN NOW.
- GREATER USE OF SAF: MAIN DRIVER TO DECARBONISE AVIATION BY 2050.

Supporting
European
Aviation

EUROCONTROL

EUROCONTROL Aviation Outlook 2050

Flights and CO_2 forecasts

EXECUTIVE SUMMARY

This EUROCONTROL Aviation Outlook looks out to 2050, much further than previous forecasts and in line with aviation's objective of achieving net zero CO_2 emissions by that date.

It takes into account the impact of the COVID-19 pandemic and, even after aviation has recovered to pre-pandemic levels, it expects growth to be slower than previously forecasted. The impacts of the 2022 Russian invasion of Ukraine on aviation have not been specifically included in this report. However, even if geopolitical tensions look set to remain, it is more on a medium-term horizon than on a long-term one.

The most-likely scenario shows 16 million flights in 2050. Other possible scenarios (resulting in 19.6 million flights and 13.2 million flights by 2050) are also discussed.

The most-likely flight forecast is 10 years behind the previous EUROCONTROL long-term forecast, putting it between the two lower-growth scenarios of the "Challenges of Growth" study from 2018.

This report also reflects the fact that, while airport capacity in Europe still constrains growth to some degree, sustainability is expected to become a more significant factor influencing the future of the aviation market. This is the first time that we have published an integrated forecast of flights and CO_2.

The principal ways by which aviation will become more sustainable (and their respective relative contribution in 2050 to the 'most likely' scenario) are:

- Evolutionary improvements to aircraft and engines, making them more efficient (17%),
- Revolutionary new aircraft technologies, such as the deployment of electric and hydrogen-powered aircraft, together with the required infrastructure (2%),
- More efficient flights, thanks to operational improvements such as improved air traffic management and aircraft operations (8%),
- Gradually increasing use of sustainable aviation fuels (SAF, 41%).

The range of scenarios reflects the fact that, if aviation is stronger, then it is better able to invest in more efficient technologies. However even in our most ambitious *High* scenario, 2050 is too soon to have completed the introduction of many revolutionary new aircraft, complete with their fuelling and charging infrastructure. It also reflects the fact that those technologies still seem likely to be best for shorter rather than longer-haul travel. The CO_2 improvements by then, therefore, remain

ECAC	IFR Flights						
	2019		2050			2050/2019	
	Total (million)	Avg. daily (thousands)	Total (million)	Avg. daily (thousands)	Extra flights/day (thousands)	Total growth	AAGR
***High* scenario**	11.1	30.4	19.6	53.6	23.2	+76%	+1.8%
***Base* scenario**			16.0	43.7	13.4	+44%	+1.2%
***Low* scenario**			13.2	36.2	5.8	+19%	+0.6%

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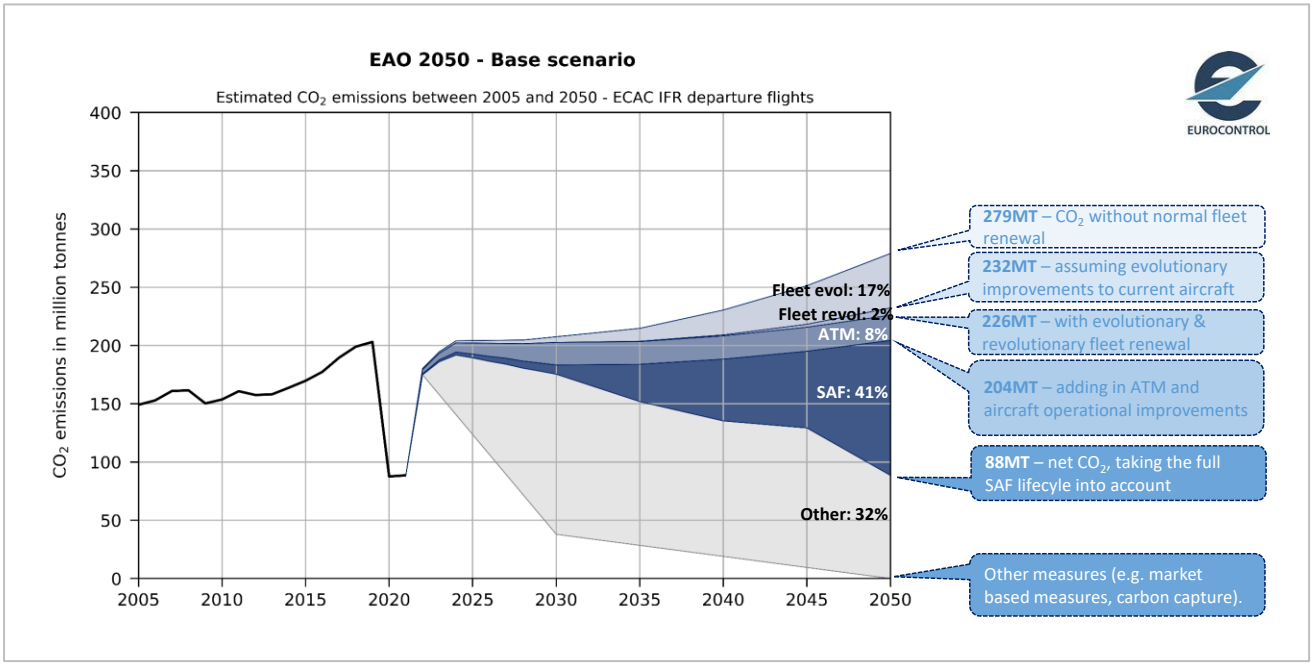
modest (2%-3% in 2050): industry and regulators will need to find ways to boost investment to improve on this. As other studies have found, the final step to reaching net zero CO_2 therefore needs 'out of sector' measures such as carbon capture.

No single solution will enable aviation to achieve net zero CO_2, but in all three scenarios here, it is the scaling up of the production, distribution and use of SAF that makes the largest contribution in the long term, with operational improvements helping more immediately. This report will be complemented by EUROCONTROL Objective Skygreen, looking in much more detail at the elements leading to cutting CO_2 emissions by 55% by 2030 compared to 1990 levels.

Aviation can do, and is doing, much to achieve its 2050 target of net zero CO_2. In our scenarios, lower growth goes together with lower investment, resulting in worse CO_2 performance. The most sustainable outcomes require the aviation industry to work with governments to ensure that the right investments and suitable regulations can be and are being made, within aviation and beyond.

Although SAF is the largest contributor to achieving net zero by 2050 (41% in our base scenario), our view is that Market-Based Measures will continue to play a very significant role (32% in our base scenario). That is higher than other forecasts have suggested to date.



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1. SETTING THE SCENE

Aviation policy is increasingly focused on sustainability and, in particular, on how aviation can contribute to meeting the 2050 climate targets. This "EUROCONTROL Aviation Outlook 2050" aims to support these discussions with forecasts of both flights and CO_2 emissions for Europe. The Outlook is the successor to the "Challenges of Growth" studies (see Ref. 1, 2).

1.1 Three scenarios for the future

What aviation will be like in 2050 is most definitely uncertain. But that is not the same as being entirely unknown. 2050 will be heavily influenced by technology and policies that are already in place or in development, whether that means the supply of sustainable aviation fuels (SAF), hydrogen or electric-powered aircraft or market-based measures, or something else.

This EUROCONTROL Aviation Outlook uses scenarios: different stories about the future, about the possible speed, intensity and success of such developments in technology and policy. These scenarios provide a structured approach to uncertainty, each with qualitatively-different outcomes, but aiming to cover a wider range of the many possible futures. The range of scenarios guides users to anticipate the implications of future events, helping them prepare for change and uncertainty (see Figure 19). The effects of the 2022 Russian invasion of Ukraine highlight the need to consider a number of issues related to the oil price and the economic cycle. On the other hand, a number of significant past events have proven to be of relatively short to medium-term impact, emphasising the limited relevance of such events to a long-term forecast. The three scenarios are:

***High* scenario:** this high-growth scenario in flight terms is characterised by strong economic growth in a globalised world, with intense investment in technology supporting sustainable aviation growth.

***Base* scenario:** This 'most-likely' scenario is characterised by moderate economic growth, with regulation reflecting environmental, social and economic concerns to address aviation sustainability. This scenario follows both the current trends, and what are seen as the most likely trends into the future.

***Low* scenario:** This low-growth scenario in flight terms is characterised by slower economic growth, higher fuel, SAF and carbon prices, more limited investment in new technology (or later than in the other scenarios). Air travel actors have to adapt to environmental and potential trade constraints, taking a more "inwards" perspective. European travellers are likely to travel and consume more locally. This scenario encompasses assumptions where energy prices would be particularly high and a severe economic downturn might happen over a 30-year period.

HOW IS THE COVID-19 IMPACT MODELLED?

The COVID-19 crisis had and still has a dramatic impact on European aviation; this impact is primarily captured through the STATFOR seven-year flight forecast covering the 2021-2027 period (see Ref. 3). The 30-year forecast picks up from the end of the 7-year forecast in 2027. In other words, the COVID impact is captured and the EUROCONTROL Aviation Outlook to 2050 is looking beyond COVID.

HOW IS THE INVASION OF UKRAINE IMPACT MODELLED?

The scenarios consider the effects of different level of economic growth patterns (Low-Base-High) and prices (oil, jet fuel). If the Russian invasion of Ukraine and the related energy price inflation have a larger impact in the short to medium run, the impact on European aviation growth is expected to be captured in the long run.

For this 30-year forecast report, the storylines and the underlying assumptions have significantly changed from the previous 20-year forecast in "Challenges of Growth" (see Ref. 1) considering a detailed analysis of the fleet forecast and innovative projects (see Section 4).

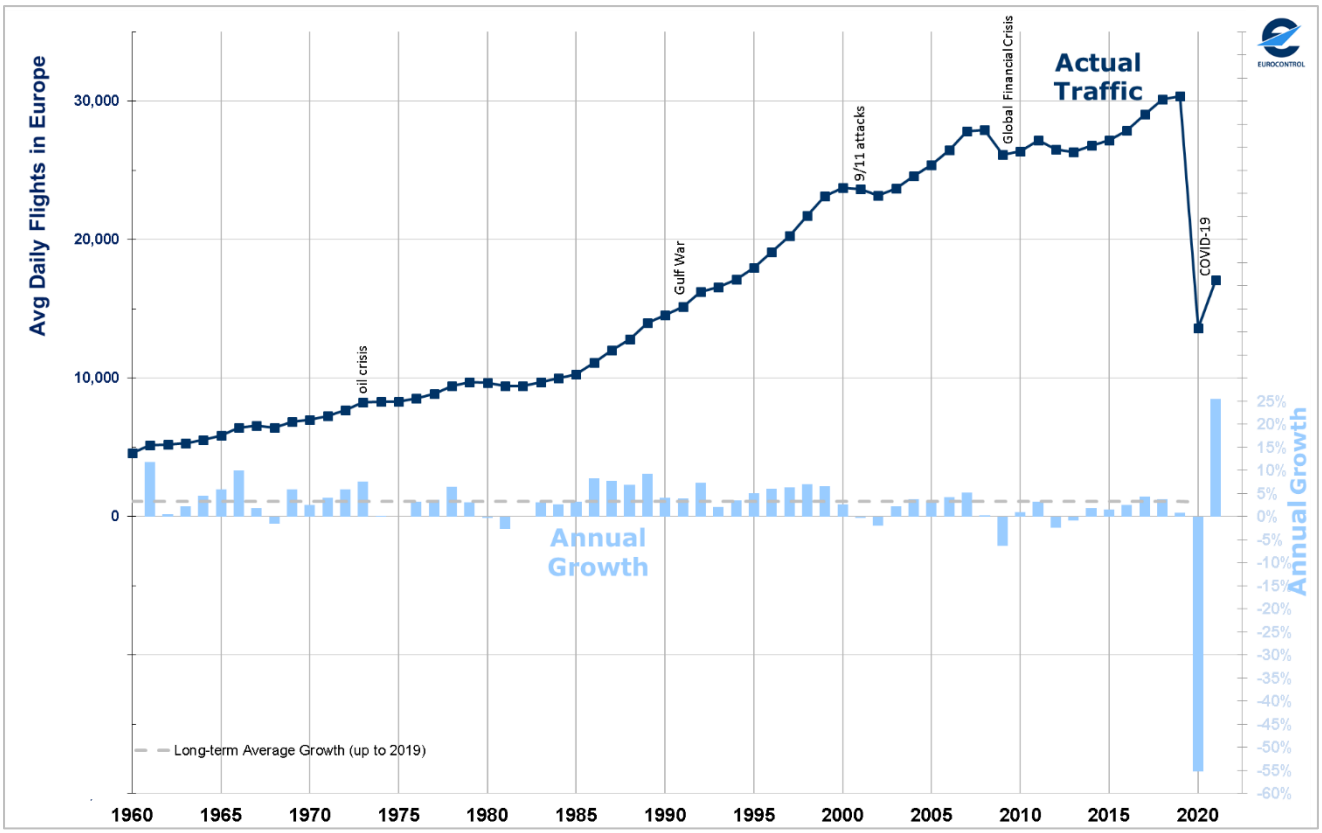
1.2 Flight growth trends to date

Our industry is cyclical, and the most recent upswing has ground rapidly to a halt. Looking 30 years ahead, to handle both these cyclical patterns, and uncertainty in the underlying trend, we detail some assumptions behind EUROCONTROL's aviation outlook scenarios.

Flights in Europe[1] recorded a rapid expansion over the 20-year period 1988-2007 (traffic doubled from around 5 million to 10 million flights a year), thanks to the expansion of the single market and related trade, the development of low-cost carriers and overall economic expansion. Of course, some years were less positive than others (e.g. early 2000s), but overall, flights were averaging 4% growth per year.

surrounding Brexit, and other events such as the Boeing 737 MAX grounding or the aftermath of bankruptcies of important airlines in the region. Besides this, the COVID-19 outbreak started in China towards the end of 2019. Nevertheless, with 11.1 million flights, 2019 recorded the highest number of flights in European skies.

Figure 1. Annual flight growth rates in Europe settled down over the last decade, before COVID-19 hit.



THE END OF A CYCLE?

The last 15 years were notably marked by a double-dip recession, as a severe worldwide economic crisis (a.k.a. global financial crisis) which started in 2007-2008 in the United States, ultimately contributed to the Eurozone crisis (2009-2012), leading to a multi-year debt crisis.

Traffic levels in Europe did not recover to 2007 levels (10 million flights) before 2016. Both 2017 and 2018 recorded solid annual growth rates of around 4%.

Then, in 2019, European flight growth rates eroded (+0.9%) due to a deteriorating situation in major European economies, trade tensions between the great powers, uncertainty

Since the start of 2020, COVID-19 has become the most severe global pandemic in a century. No part of European aviation is untouched by the human tragedy or the business crisis. This unprecedented crisis reduced traffic in 2020: flight movements declined by 55% compared to 2019 at European level. The situation was slightly better in 2021, as health measures and vaccination campaigns eased the travel restrictions for some periods. In 2021, flight growth posted a 25% increase on 2020 (i.e. a 44% decline compared to 2019). That being said, new COVID variants continued to disrupt a large number of economic sectors in Europe, and that is still the case in early 2022.

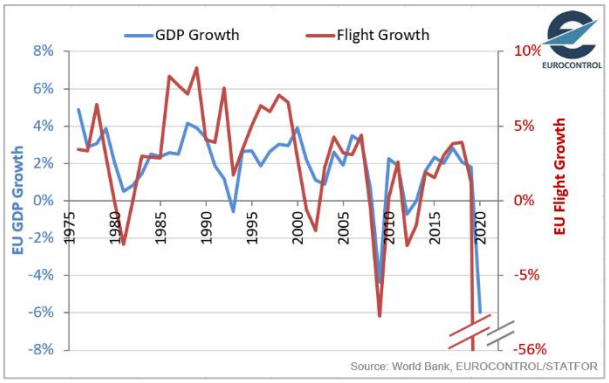
Figure 1 shows the development of the number of flights in Europe. Historical annual growth rates

[1] Unless otherwise specified, hereinafter 'Europe' means the 'ECAC region'.

were averaging 4% over the 1960-2009 period, but had slackened to circa 3% when including the global financial crisis impact (1960-2019).

In the long run, economic growth (measured by the Gross Domestic Product, GDP) remains the most important factor that influences the growth in demand for air travel. Figure 2 shows that, from year to year, demand for air travel followed the economic cycles of growth and decline. In addition, the figure shows a slowing down of economic growth rates, a deceleration which has been observed in flight growth as well. While the correlation between flight and economic growth is distorted in 2020 and 2021, the relationship is expected to be restored in future years; however, it is also clear from the graph that the same amount of GDP growth now drives less flight growth, as the market has matured.

Figure 2. Correlation between IFR flights growth (red line) and GDP growth (blue line) in Europe (1975-2020). The elasticity coefficient in Europe has reduced over the years.



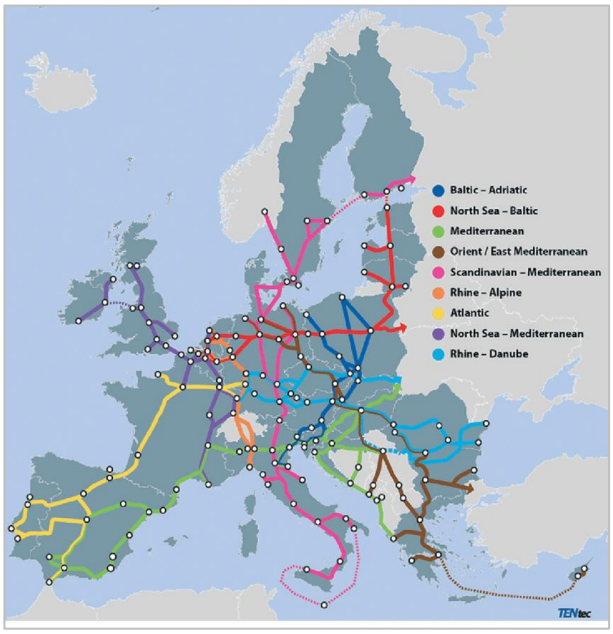
RECENT CHANGES

New high-speed rail lines and faster connections on existing lines (will) have an impact on the passenger choice between air and rail.

Over the recent years, we have observed an acceleration of the decline of short-haul flights, in particular domestic traffic. This decline of domestic traffic started many years ago for most European states.

This continuing decline can often be associated with a shift to other transport modes, such as in France with the development of the high-speed train network, but the decline of domestic flights has accelerated in 2019 following the growing pressure on environment impacting travel decisions for some traditional air travelers.

Figure 3: Nine TEN-T core network corridors: state of play and development needs. Source: European Commission 2017.



The impact is in particular visible for northern European States, for example Sweden whose domestic traffic declined by -9.3% in 2019, and represented one of the greatest changes to the Network in ECAC.

Other states also saw their internal traffic decline such as UK (-2.6%), Germany (-1%) and Turkey (-12.6%) for which the cause is also a combination of economic factors including high inflation, weak currency and widening trade deficits in Turkey.

The impact of recent events (invasion of Ukraine by Russia) has not been included in this long-term forecast. However, the assumptions of the low scenario potentially include lower economic growth development or geopolitical tensions between states.

Future development of high-speed rail network is considered in this forecast, as well as the development of night trains (see Section 2).

2. FLIGHT FORECAST TO 2050

Flight growth in Europe has lost 10 years compared to the previous long-term forecast, although the geographic balance has shifted a little. In the most-likely forecast there will be 16 million flights in Europe in 2050, 44% more than 2019. That is an average growth of 1.2% per year.

OVERALL RESULTS

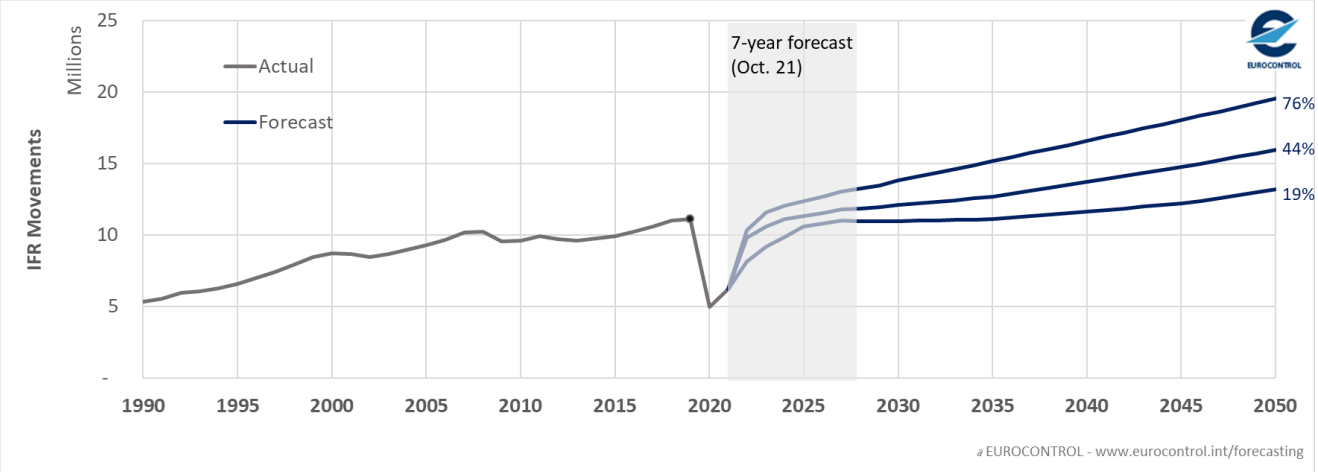
Each scenario paints a picture of a different future with a different pattern of growth. Focusing on the ECAC region, covering the zone between Iceland and Azerbaijan, we observe the following:

In the most-likely *Base* scenario**,** the forecast is for 16 million flights in Europe in 2050, 44% more than in 2019 – an average growth of 1.2% per year. Growth will be slower over the first 15 years (0.8%), catching up from the COVID-19 outbreak. It will then accelerate over the last 15 years (1.6%) as, even if the markets become more mature, and economic growth slightly decelerates, people still want to fly in increasing numbers. Europe remains a significant hub at the crossroads of the world's regions. Exchanges within Europe and between Europe and the rest of the world continue to be stimulated by trade, tourism and business, albeit with greater sustainability concerns. A staggered blending mandate and availability of SAF progressively expands from 2035 onwards. The price of travel increases but people still want to fly. Moreover, airport capacity constraints are less problematic in this forecast, as the COVID-19 outbreak delayed airport congestion.

Comparing with the previous long-term forecast "Challenges of Growth" published in 2018 (see Ref. 1) for Europe, in which the most-likely scenario was expected to pass the 16 million flights bar in 2040, we now see a lag of ten years as our most-likely scenario is now expected to reach this bar in 2050.

In the *Low* scenario, some factors are hindering traffic growth: the prices of conventional fuel, SAF and CO_2 allowances are high, making the price of travel higher; economic development is slower. Flight demand is weaker so the industry is less able to invest in fleet renewal. Only a limited number of revolutionary fleet projects can be developed and at a later stage compared to other scenarios. Flight growth develops more slowly in this scenario with 13.2 million flights by 2050, 19% more than in 2019 – an average growth of 0.6% per year. Flight levels will only get back to 2019 (pre-COVID levels)

Figure 4. Flight Forecast for Europe, with total growth between 2019 and 2050.



ECAC	IFR Flights						
	2019		2050			2050/2019	
	Total (million)	Avg. daily (thousands)	Total (million)	Avg. daily (thousands)	Extra flights/day (thousands)	Total growth	AAGR
***High* scenario**	11.1	30.4	19.6	53.6	23.2	+76%	+1.8%
***Base* scenario**			16.0	43.7	13.4	+44%	+1.2%
***Low* scenario**			13.2	36.2	5.8	+19%	+0.6%

by 2034 (flat growth on average over the first 15 years) and flights will then slowly grow at an average rate of 1.2% over the last 15 years.

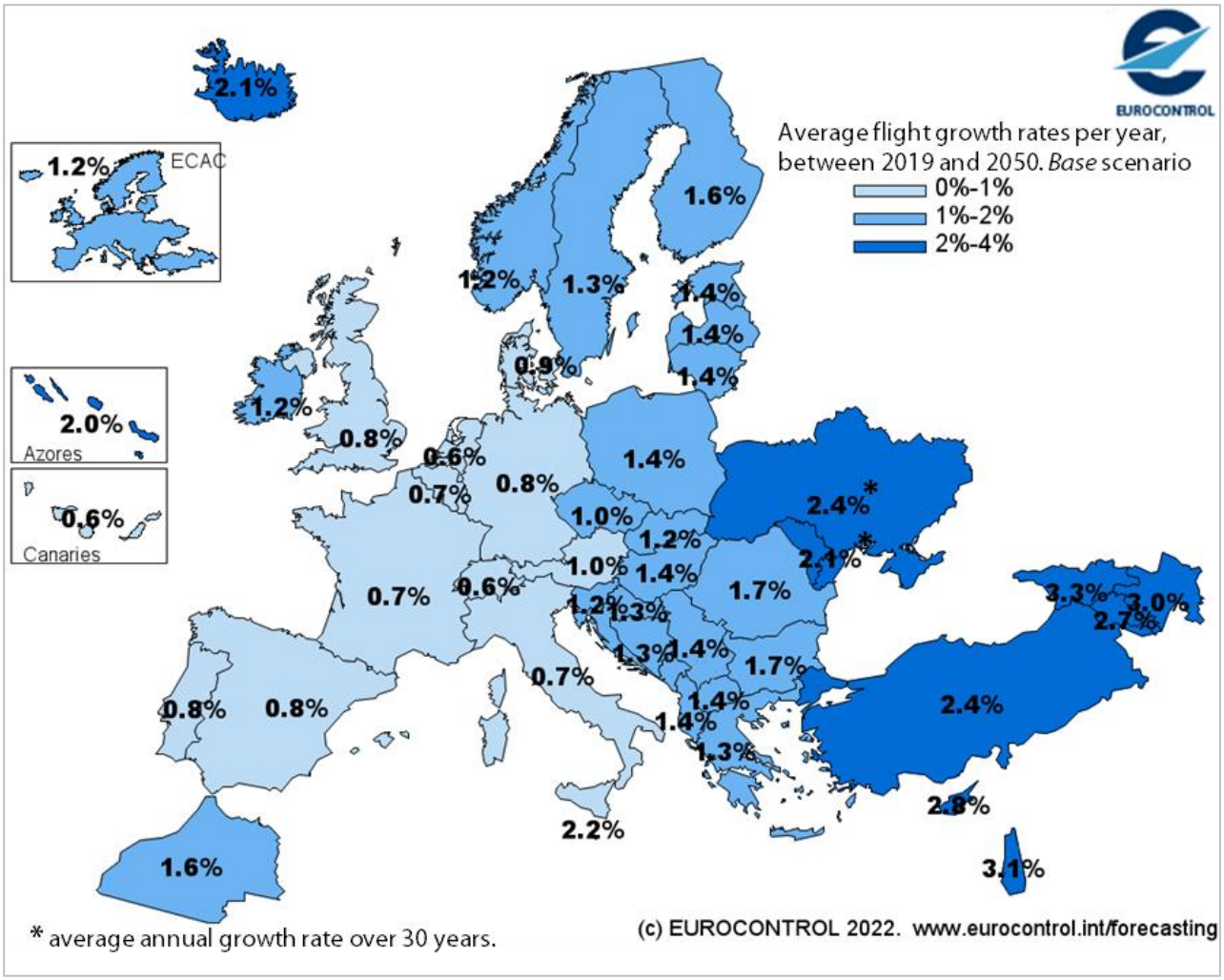
In the *High* scenario, the most ambitious scenario, high flight growth comes from sustained economic growth, a high propensity to fly, and relatively lower prices of SAF and conventional fuel (compared to other scenarios). A wide range of new fleet projects are implemented between 2030 and 2050 (electric, hybrid-electric, hydrogen). This scenario records 19.6 million flights in 2050 in Europe, 76% more than in 2019. The average annual growth rate is 1.8% with earlier years (2019-2034) seeing an average rate of 2%, and the later years, a rate of 1.7% per year (2035-2050). This decelerating trend can be explained by multiple factors including market maturity, larger aircraft, and capacity constraints at airports.

DETAILS WITHIN EUROPE

Growth will not be uniform across Europe. As shown in Figure 5, States in Eastern Europe will grow more quickly than Western ones (the latter is true for each scenario). Focusing on the *Base* scenario, we see growth across Europe, ranging from 20% in the Netherlands to 175% in Georgia. In general, the most rapid growth (in percentage terms) is for countries in southern and eastern Europe with annual growth rates above 1.2%. In part, this reflects a lower current level of flights than for countries in the north and west and thus a higher potential for growth.

The exception is Turkey, which already has high traffic volumes but is still forecast to increase at 2.4% a year. In the most-likely scenario, this will add 4,660 flights a day and means it is set to more than double its daily traffic (+109%) by 2050, see Figure 6.

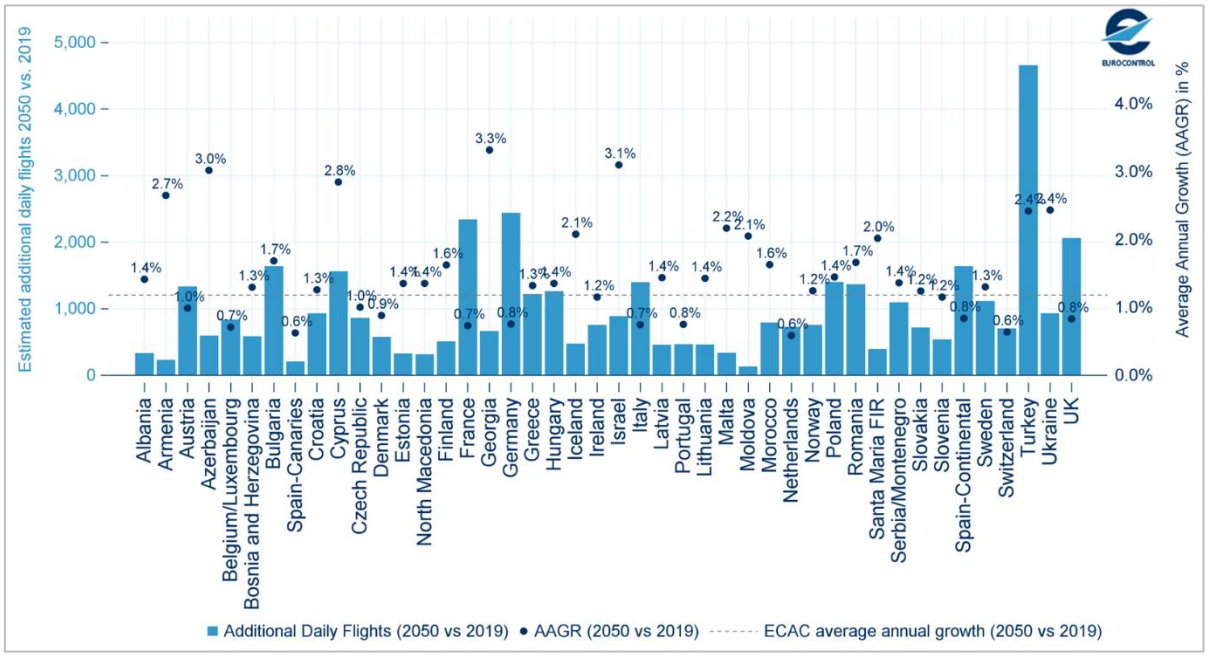
Figure 5. Average annual flight growth rates in the *Base* scenario over the next 30 years.



As shown in Figure 6, France and Germany, which each had[2] around 9,300 flights per day, will add around 2,300 flights and 2,400 flights per day respectively. Overall, four airspaces (Turkey, France, Germany and UK) will add more than 2,000 flights a day in the most-likely scenario (seventeen in the *High* scenario and just one in the *Low* scenario).

As mentioned in the table of Figure 4, the number of flights on the busiest days in a year is typically 20% above the average number of daily flights. This means that, in the *High* scenario, the number of flights on peak days could reach up to 65,000 movements.

Figure 6. Average Annual Growth rate in 2050 and extra flights a day through airspace[3], *Base* scenario.



AIRPORT CAPACITY CONSTRAINTS

A key feature of EUROCONTROL forecasts is that they consider airport capacity constraints. In practice, flight growth is capped by the maximum capacity available at several airports across Europe. Airports were mostly focused on their short to medium-term plans because of the COVID-19 pandemic. Since the previous long-term forecast, 40 airports (out of 92) have revised their plans downwards and seven upwards. Overall, though, the total increase in capacity by 2040 has declined from 3.7 million flights in our previous forecast to only a few flights in this forecast (the two lines of the *Base* scenario are largely superimposed in Figure 7). This change in the airports' view reflects the high level of uncertainty and the new challenges that airports are facing due to the COVID-19 pandemic.

Based on these latest plans from airports, less than half a million flights will not be accommodated in the most-likely scenario because of a lack of capacity at those airports.

As shown in Figure 7, without this 'capacity gap', the number of flights would be about 3% higher than our forecast. The capacity gap is wider in the *High* scenario, with 2.7 million flights unaccommodated, in other words 12% of the demand would not be fulfilled. At the other end, there is no capacity gap in the *Low* scenario. The size of this capacity gap has considerably reduced compared to our previous forecast (see Ref. 1), as the impact of the COVID-19 outbreak has delayed flight growth by approximately 10 years in the most-likely scenario. Whereas flight growth has lost ten years, the capacity gap would now be fifteen years behind for the *Base* scenario forecast as compared to the previous forecast (see Ref. 1).

Indeed, half a million flights were expected to be unaccommodated in 2035; and now in 2050 for the most-likely scenario.

[2] In 2019
[3] 'Country' here corresponds to a flight information region (e.g. Montenegro and Serbia are combined).

Figure 7. Demand exceeds capacity by less than half a million flights in 2050 across the network in the base scenario, climbing to 2.7 million (12%) in the high-growth scenario

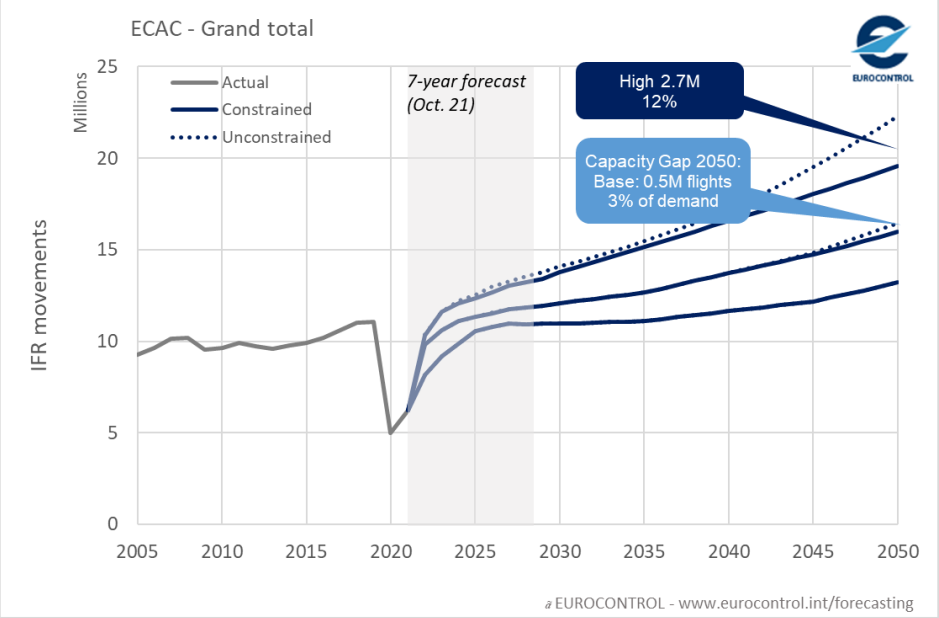


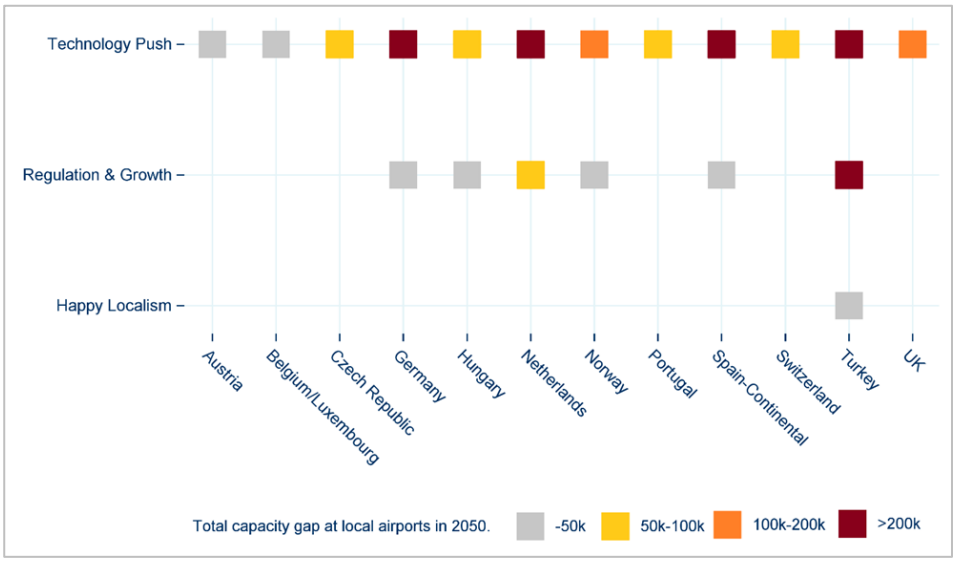
Figure 8 summarises where there is more demand for flights than there is capacity in 2050. Airports in Germany, Hungary, Netherlands, Norway and Spain will see less than 100,000 flights unaccommodated (each) in the most-likely scenario. Airports in Turkey will see a gap of more than 200,000 flights in the same scenario. The challenge is now reduced to a number of airports in six different States in the most-likely scenario, compared to seventeen in the previous forecast (see Ref. 1).

France, Greece, Ireland, Italy and Poland no longer appear in the *Base* scenario. Some airports in France and Italy anticipate that more capacity (compared to the previous forecast) could be made available from 2035.

Other airports have neither changed nor reduced their plans, but flight growth has slowed down after COVID-19, so that airport capacity constraints are not necessarily "limiting" demand as they used to.

However, Turkey remains highly constrained, in all three scenarios, as in the previous forecast, in spite of heavy investments in capacity, as growth of this rapidly-maturing market is widely spread around its airports.

Figure 8. In the most-likely, *Base* scenario, there is a capacity gap at airports in six countries, down from seventeen in the previous long-term forecast



MARKET SEGMENTS

The distribution of traffic per market segment[4] is expected to remain relatively stable over the next 30 years (Figure 10). All-cargo, accounting for the smallest share of traffic in 2019 (amongst the three market segments shown here) will see the highest increase in all scenarios. The segment will benefit from the strong economic growth in the Middle East and Asia/Pacific regions.

Passenger flights will grow by 1.8% per year in the *High* scenario (Figure 9), maintaining a 90% share of flights throughout the next 30 years. The passenger segment will have a slight reduction of market share (2 pp) in the remaining two scenarios. We discuss numbers of passengers in the next section.

Business aviation is expected to grow at an average rate of 1.4% per year between 2019 and 2050 in the most-likely scenario.

Its growth rate over the period does not vary significantly per scenario. The segment will be particularly affected by airport capacity constraints at the end of the horizon on the High scenario.

Figure 10: Distribution of flights per Business Aviation, All-Cargo and Passenger Market Segments.

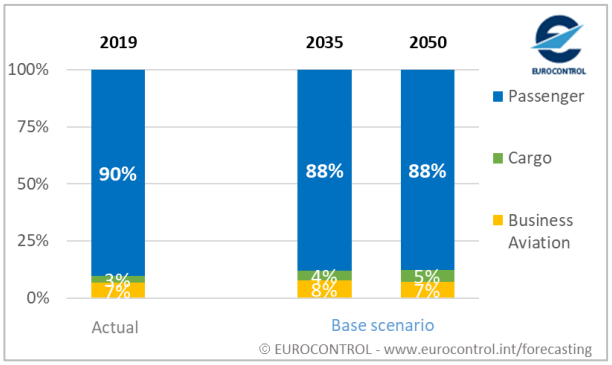


Figure 9: Average Annual Growth rates per market segment based on all European IFR movements between 2019 and 2050

Average annual growth rate 2050/2019 (%)			
IFR flights	**Passenger**	**Business Aviation**	**All-cargo**
***High* scenario**	1.8%	1.4%	3.0%
***Base* scenario**	1.1%	1.4%	2.9%
***Low* scenario**	0.4%	1.1%	2.0%

PASSENGER FORECAST

The passenger market segment accounts for by far the greatest share (Figure 10) of flights. This segment is classically looked at in terms of number of passengers or revenue passenger kilometres (RPK). In 2019, while passenger flights increased by 1.2% in Europe, the number of passengers at Europe's airports grew by 7.6% in RPK terms (compared to 2018). The amplified magnitude of the passenger rates (RPK) compared to the flights is partly due to the general trend in longer flights and larger aircraft, as well as an increase in load factors. More recently, passenger flights decreased by 61% in 2020 due to the COVID-19 outbreak and the corresponding RPK collapsed (-74% compared to 2019).

Based on Eurostat data at airport pair level, together with an analysis of the Eurostat flows and of the data from EUROCONTROL, an estimated number of passengers on board have been derived. In 2019, the number of passengers in ECAC is estimated at 1.32 billion in our statistics[5]. By 2050, the number of passengers in ECAC is expected to reach 1.88 billion in the *Base* scenario, corresponding to an average growth rate of 1.2% per year, or 1.6% p.a. in RPK terms.

In the *High* scenario, the number of passengers in ECAC is expected to grow to 2.23 billion in 2050, corresponding to an average annual growth rate of 1.7% between 2019 and 2050.

In the *Low* scenario, the number of passengers in ECAC in 2050 is expected to remain comparable to 2019.

[4] For the purpose of this report the passenger market segment includes flights from Traditional Scheduled, Low-Cost and Charter airlines.

[5] 'Departing passengers traffic only.

HIGH SPEED TRAIN AND NIGHT TRAINS IMPACT

The high-speed train (HST) travel times have been updated for this forecast, as future projects will have an impact on the air travel demand. A review of the current status of future projects has been done; the principal source being specialised websites for rail industry professionals (UIC) and dedicated HST projects websites (e.g. railbaltica.org).

Given the length of the forecast horizon and the growing environmental concerns that push to transfer from air travel to alternative modes, an optimistic approach with a number of projects covering 66 city-pairs in the *High* scenario and 56 city-pairs in the remaining scenarios has been considered (the previous long-term forecast only considered 21 city-pairs).

If the benefits of travel time can play an obvious part in the case of high-speed train, slower train links have also been considered that could gain market share in the longer term. The focus was put on night trains, which can easily operate on the existing track network. Based on other dedicated websites (e.g. interrail.eu), 29 city-pairs were identified as plausible candidates. A constant impact has been assumed for every line in terms of passengers: 10% of the market share from air to rail in the *High* scenario, 6% in the *Base* scenario and no impact in the *Low* scenario (as limited investments are made in this latter scenario).

Due to more passengers opting for high-speed train and night train instead of travelling by air, the unconstrained[6] demand for flights (in principal short-haul) is expected to be reduced by less than 1% in Europe by 2050 in the most-likely scenario, with similar impact on the other scenarios. The high-speed train network and night train offer do not develop in all parts of Europe to the same extent.

Even if the train networks are cross-border, the States with more projects in the pipeline are likely to see a stronger reduction in demand for flights by 2050, such as Sweden (-8.5% in the most-likely scenario), UK (-1.5%), France (-1.3%), Spain (-0.8%), Portugal (-3%) and Austria (-2.6%).

ECAC AND OTHER REGIONS

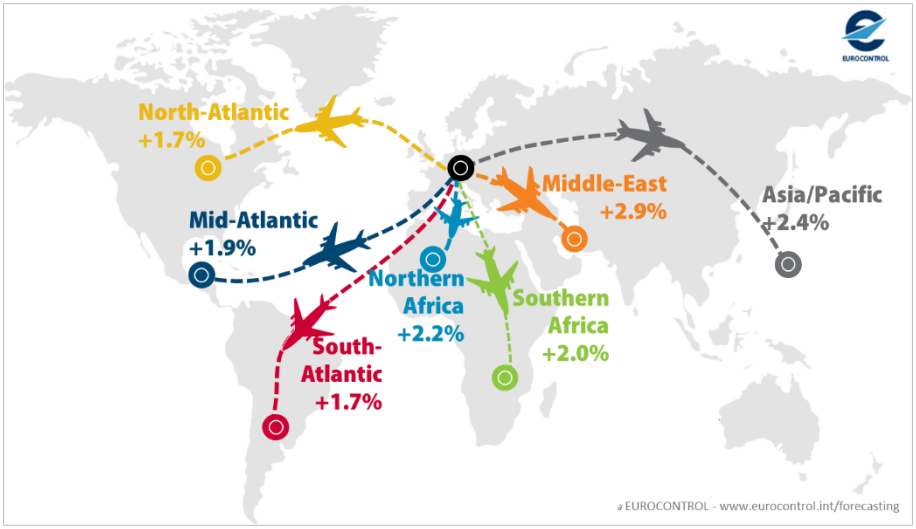
Figure 11 shows that the Middle East and Asia/Pacific regions will be the most dynamic partners by 2050: the average annual growth rate for flights departing ECAC to these regions is likely to be respectively 2.9% and 2.4% per year in the *Base* scenario.

More mature markets will record moderate growth; for example, the North Atlantic is expected to grow at an average rate of 1.7% per year.

Middle East arrivals and departures will become the busiest external flow by 2050, taking the position of the North Atlantic in all three scenarios. In the *High* and *Base* scenarios, the traffic to/from that region is set to exceed one million flights.

China and India will be the countries adding more flights on the Asia/Pacific flows with annual growth of 2.1% and 3.1% (*Base* scenario). As for the Middle East flows, Israel and the United Arab Emirates will be the main traffic generators by 2050, with annual growth of 3.2% and 2.8% throughout the forecast period in the most likely scenario.

Figure 11: Average Annual Flight Growth Rates from Europe (ECAC) to World regions 2019-2050 - *Base* scenario.



[6] A fair comparison implies to compare the forecasts before the capacity constraints.

3. CO_2 EMISSIONS FORECAST TO 2050

Our three scenarios include assumptions about how aviation rises to the sustainability challenge: through improvements to existing aircraft and engines, but also by making radical changes in aircraft design and propulsion. This includes large-scale switching to use of sustainable aviation fuels (SAF, see Section 4.3), consistent with and indeed sometimes exceeding the proportions of SAF currently foreseen in EU "Fit for 55" regulations. These assumptions differ significantly between scenarios. For example, in the *High* scenario, investment both within aviation and beyond pays off with SAF more widely available and cheaper, and new aircraft types available sooner. In the *Low* scenario, weaker aviation growth means that airlines and manufacturers are less able to invest in overhauling the fleet.

These assumptions affect the price of flying, and hence demand. This has already been taken into account in the flight forecast just described. But they also allow us to estimate the net CO_2 emissions from those flights.

For this forecast, we focus on how new aircraft types and the switch from kerosene to SAF together reduce the CO_2 emissions from flying. There will also be fuel efficiency improvements and CO_2 savings from improvements in air traffic management and aircraft operations (see EUROCONTROL Objective Skygreen, Ref. 4).

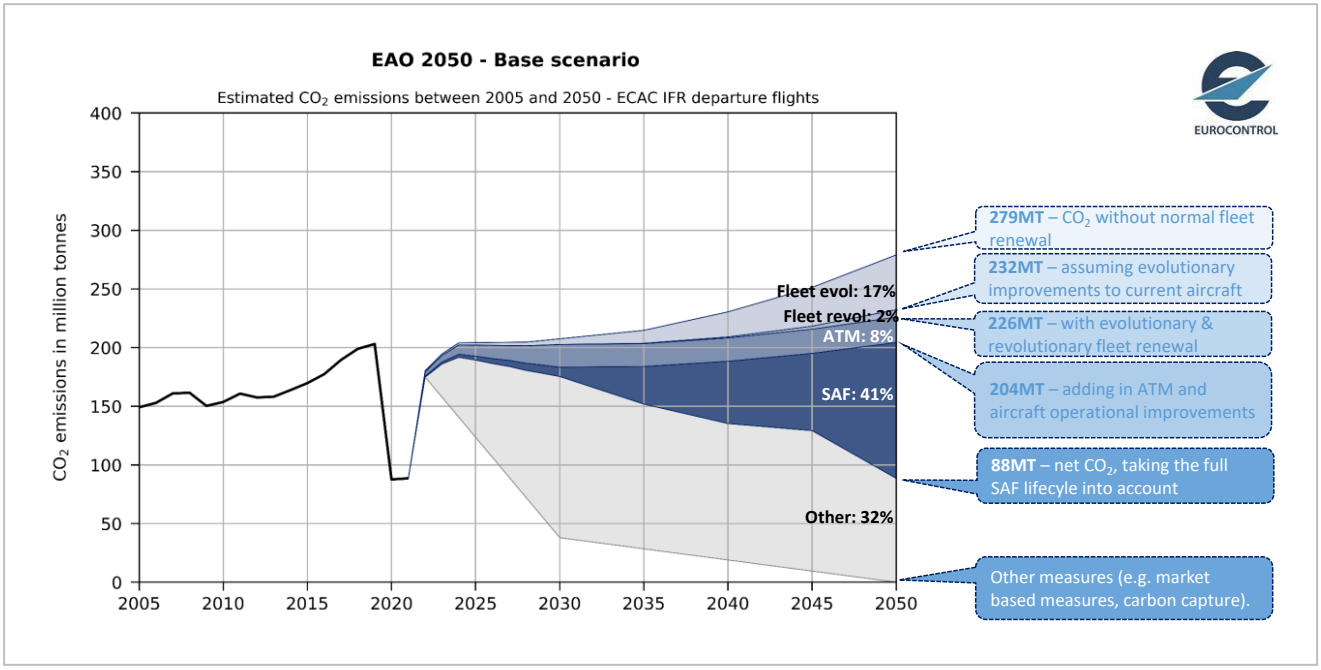
On this basis, Figures 12 to 14 show the CO_2 forecast[7] for the three scenarios only addressing departing flights, estimated for the entire trajectories. The figure show clearly the impact of being able to invest in renewing the fleet, in that the three scenarios change places by 2050.

In the most-likely *Base* scenario (Fig 12), net CO_2 emissions fall to around 40% lower than 2005 levels by 2050. The majority of these savings are obtained by the use of SAF. New aircraft types do come into service and deliver CO_2 savings, with electric propulsion over some distances, and hydrogen over slightly longer distances, but they are still relatively new and not a dominant part of the fleet by 2050 (see Section 4).

The *Low* scenario (Fig 13) has the fewest flights in 2050. Net CO_2 is reduced at around 46% lower than 2005, the highest of the three scenarios. Less SAF is available, and it is more expensive due to demand from other sectors. Higher ticket prices have reduced demand, but there is less scope for radical re-shaping of the fleet.

The *High* scenario (Fig 14) shows more than twice as many flights in 2050 than in 2005, but net CO_2 is significantly reduced by around 65% compared to of 2005 volumes. In addition to widespread use of SAF, this scenario sees wider and earlier adoption of new aircraft types, although even then by 2050 the changes to the fleet are only partly revolutionary, and part evolutionary (see Fig 18).

Figure 12. By 2050, CO_2 emissions, net of SAF, fleet and operational improvements, are reduced by about 41% compared to 2005 in the *Base* scenario.



[7] As is normal with CO_2 forecasts, we report emissions for all flights departing airports in the region, here ECAC airports. This therefore excludes arrivals from out-of-area and overflights.

Figure 13. By 2050, CO_2 emissions, net of SAF, fleet and operational improvements, are reduced by about 65% compared to 2005 in the *High* scenario.

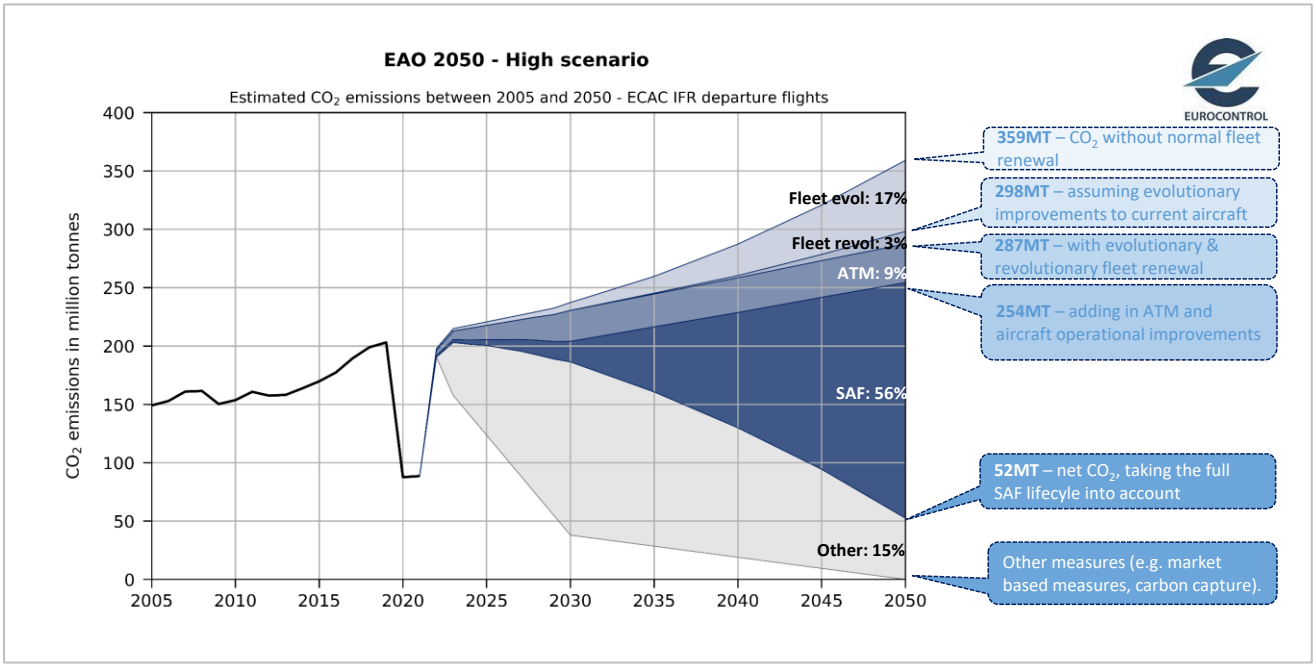


Figure 14. By 2050, CO_2 emissions, net of SAF, fleet and operational improvements, are reduced by about 46% compared to 2005 in the *Low* scenario.

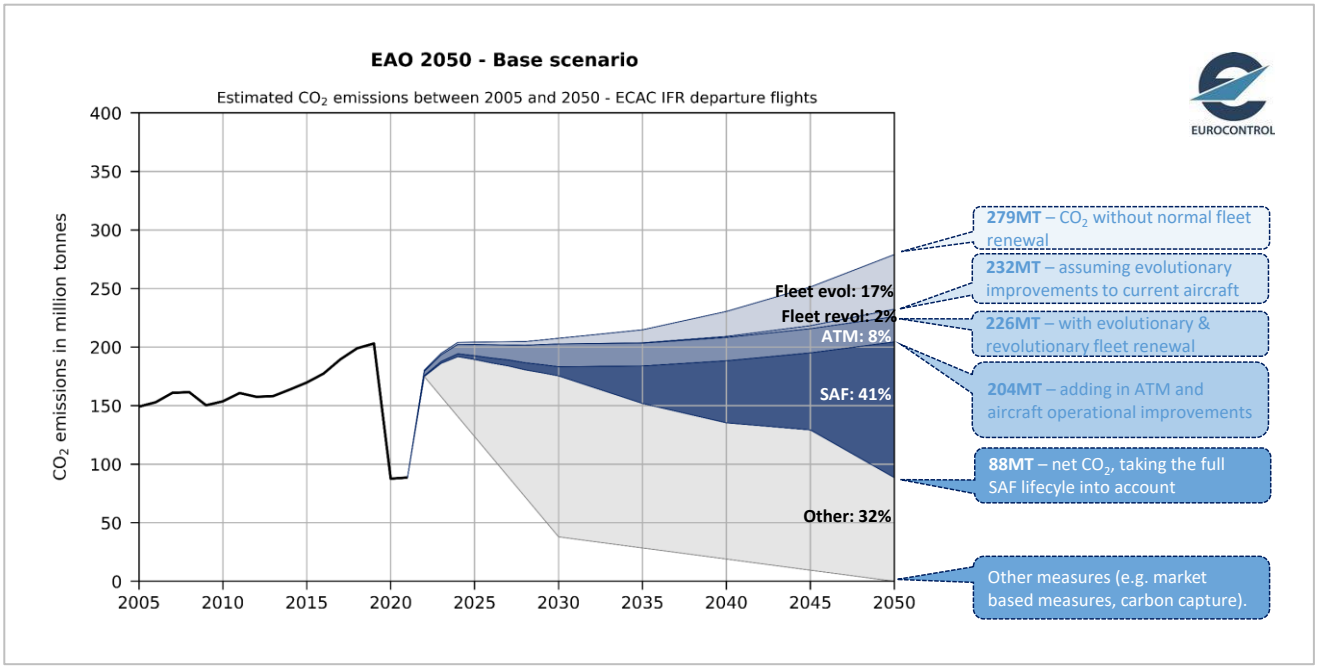


Figure 15 summarises the results for each of the 3 scenarios. It shows the relative share of each means to decarbonise aviation as well as the relative stability of the share of fleet evolution and fleet revolution across the 3 scenarios. It also shows the critical importance of SAF which is by far the main means contributing to reaching net zero CO_2 emissions. In all our scenarios, market-based measures will still be needed in 2050 to fully decarbonise aviation.

It is therefore critical to use all possible means to develop SAF fuels.

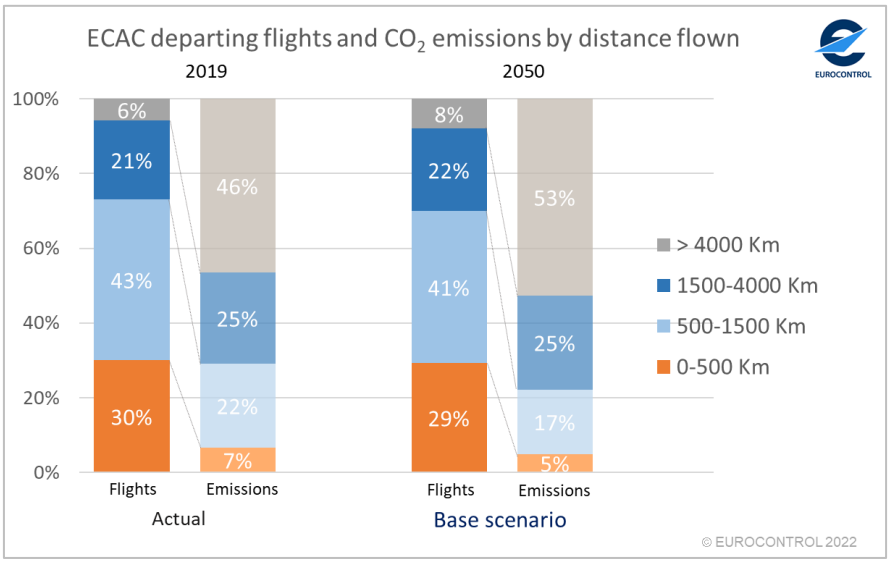
Figure 15. Summary of net zero CO_2 results for each scenario.

Net zero CO_2 can be achieved by 2050 via the following:	Low Scenario	Base Scenario	High Scenario
Required CO_2 reduction for Net zero	194MT	279MT	359MT
Fleet evolution: More efficient conventional aircraft	17%	17%	17%
Fleet revolution: Electric & hydrogen powered aircraft	2%	2%	3%
ATM: Better air traffic management and airline operations	6%	8%	9%
Sustainable Aviation Fuels	34%	41%	56%
Other measures: Market-based measures, carbon capture	41%	32%	15%

We have reported in a data snapshot how a small minority of flights, those over 4,000km, are responsible for around half of CO_2 emissions. All three scenarios forecast that the share of long-haul flights will increase by 2050. Over this time horizon, it will remain difficult to substitute for long-haul flying, so the CO_2 efficiency of SAF will be key.

Over shorter distances, there are substitutes; we discuss high-speed rail and night trains, for example, in Section 2. Even with substitute travel modes, the *Low* scenario actually forecasts an increasing share of very short-haul flights (less than 500km) driven, in part, by the arrival of electric aircraft with fewer seats, hence increasing frequencies, but not increasing the share of CO_2.

Figure 16. Long-haul continues to be the source of the majority of CO_2 emissions timeline in the all scenario (including the *base*).



4. KEY FACTORS FOR THE MOVE TOWARDS SUSTAINABILITY BY 2050

A variety of approaches to reducing the emissions effects of aviation have been identified, ranging from new fuel sources (biofuels or power-to-liquid fuels, collectively referred to as sustainable aviation fuels or SAF; hydrogen in fuel cells or directly combusted; battery electric; or hybrid-electric) as well as operational measures and policy measures. For short-haul flights, 9 and 19-seat aircraft will start paving the way for sustainable aviation in the 2025-30 timeframe, while new propulsion technology, hybrid-electric or hydrogen, could serve slightly longer segments of air travel in the *Base* scenario by the 2040 timeframe. These fleet and fuel-related improvements are discussed further in this section.

Over the next ten years, aviation expects to unlock the potential of Unmanned Aircraft Systems (drones operating as IFR) and supersonic aircraft. However, these future projects have not been included in this forecast.

4.1 Fleet and technology development

The development and deployment of new and more efficient aircraft are key to reduce CO_2 emissions induced by the aviation industry. The successful roll-out of these more efficient aircraft is conditioned on four elements:

1. The successful development of the necessary technologies to equip the revolutionary new type of aircraft (batteries with high energy density, H_2 efficient storage, new engines, new design),
2. A certification process for the new types of technologies likely to be deployed on the new types of aircraft (H_2, hybrid electric, full electric),
3. The industrialisation of an efficient and cost-effective production process and the availability at airports of these three additional sources of aircraft energies,
4. An efficient production process supported by a sustainable supply chain and the availability of ad hoc financial conditions to support airlines to deploy more efficient aircraft in their fleets.

We consider that a proactive fleet renewal effort is key to achieve significant CO_2 emissions reduction.

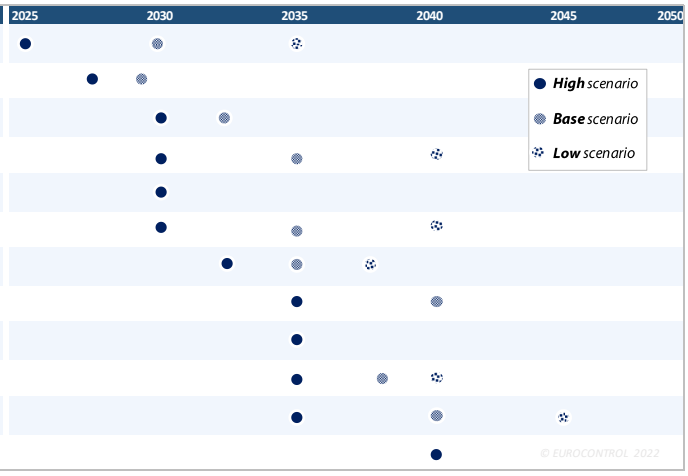
We make the assumption that by 2050, in the *High* scenario, 12 types of aircraft will be rolled out from 2025 to 2050. We based this on the review of the different aircraft projects currently in progress, the analysis of the technology progress and their availability. We also benefited from the insights of various stakeholders in the aircraft manufacturing industry. These assumptions are developed below.

NEW TYPES OF AIRCRAFT

Figure 17 presents the new projects considered in

Figure 17. New types of aircraft - Entry Into Service Year timeline per scenario.

New type of aircraft	Size	Technology	Range	Aircraft segment
Electric aircraft (2 versions)	9 19	Revolutionary	Very short Short	Turboprop
Turboprop with regional jet specificities / capabilities	70	Evolutionary	Short & Medium	Turboprop
Turboprop with regional jet specificities / capabilities	90	Evolutionary	Short & Medium	Turboprop
Hybrid electric	30-40	Revolutionary	Very short & Short	Turboprop
Conventional aircraft (re-engined and upgraded)	170	Evolutionary	Medium & Long	Single aisle
Wide body aircraft (re-engined and upgraded)	300	Evolutionary	Long	Wide body
Regional jet (re-engined and new aircraft design)	145	Evolutionary	Medium	Regional jet
Electric regional aircraft	100	Revolutionary	Short	Regional jet
Hybrid electric (H2 fuel cells)	70	Revolutionary	Short	Turboprop
Hybrid electric H2	200	Revolutionary	Medium	Single aisle
Blended wing body H2 aircraft	140	Revolutionary	Medium	Single aisle
New version of the A220	150	Evolutionary	Medium & Long	Regional jet

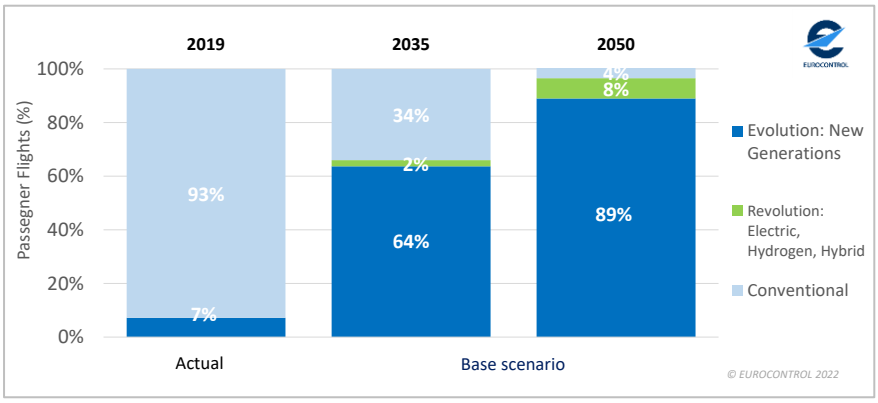


the forecast, both evolutionary and revolutionary, that will come on top of the conventional fleet and aircraft programmes currently available on the market.

From 2025 to 2035

We first expect that six types of aircraft will take off in these ten years. These aircraft are divided into two categories, the *revolutionary* types of new aircraft and the *evolutionary* ones. The first revolutionary ones to be rolled out are nine-seater electric aircraft in 2025 followed by a nineteen-seater version in 2030[8] and a 30-to-40 seater hybrid-electric aircraft (also in 2030). A new electric regional jet may follow, setting new standards of energy efficiency thanks to its conception (but with a limited range). The successful roll-out of these three new types of aircraft is heavily reliant on progress made on battery energy density and on access to battery raw materials.

Figure 18. Forecast mix of aircraft in future years, based on the expected number of flights



More efficient conventional aircraft will be also rolled out such as two different turboprops with regional jet characteristics and capabilities, new wide-body aircraft potentially replacing current A350 or B787, and new single aisle aircraft. We expect the last two aircraft to achieve around 15% fuel efficiency improvement compared to the previous generation of aircraft.

From 2035 to 2050

During this period, we expect six new types of aircraft to enter into the airline fleet. Amongst these six aircraft, two are the evolution of a conventional narrow-body aircraft to achieve improved efficiency but the four other ones are *revolutionary* new types of aircraft.

One hydrogen hybrid-electric single-aisle aircraft and two hydrogen aircraft (coming from both the current concepts developed by Airbus and the Universal Hydrogen conversion kits). Figure 18 summarises how these expectations affect the mix of aircraft in the fleet, for each scenario in 2035 and 2050.

4.2 Operational improvements

Operational improvements cover air traffic management (ATM) and aircraft operations. In the short to medium term, operational measures improving aircraft fuel efficiency are key and can be considered "low hanging fruit" in the route to net zero carbon emissions. They include optimising flight efficiency (e.g. flying more fuel efficient trajectories), introducing specific operational measures that reduce fuel burn (reduce holding and taxi times), and minimising fuel burn in aircraft operations in all phases of flight (e.g. through better aircraft weight management and optimising fuel management practices). In the medium term, SESAR 3 and the Digital European Sky input will help to deliver these benefits.

All the details related to optimised flight trajectories from 2021 to 2030 can be found in EUROCONTROL Objective Skygreen (See Ref. 4).

4.3 Sustainable Aviation Fuel

Sustainable aviation fuels are the most promising pathway to decarbonisation. Unlike other pathways, SAF, being a 'drop-in' type of fuel, can be used without changes to aircraft and airport infrastructure and can be the leading edge of how we travel for all distances (short to long-haul).

While electric and hydrogen systems have the potential to be 'true-zero' carbon solutions, usage of SAF has no bearing upon exhaust CO_2 emissions[9]. The CO_2 savings estimates come when the full lifecycle is taken into account (net CO_2). SAFs vary in their saving, but a typical value is an 80% reduction compared to fossil-based aviation fuel.

The faster that production and use are scaled up, the faster aviation decarbonises. In that context, the European Commission's 'Fit for 55' (see Ref. 5) climate package, integrating the ReFuelEU

[8] Eviation Alice, Aura Aero ERA aircraft, Heart Aerospace.
[9] Although SAF can also reduce NOx emissions – this is outside the scope of this study.

Aviation proposal, is an instrumental booster for the uptake of SAF. This outlook considers that the EC's proposal, i.e. a blending obligation commencing from 2025 at 2% SAF, gradually increasing to 63% in 2050 and including a sub-obligation for synthetic aviation fuels starting in 2030 with 0.7% and progressively getting to 28% of e-fuels in 2050, will apply to the *Base* scenario. The *Low* scenario considers a less proactive approach with 1.6% in 2025, 4% in 2030 and 50% blending in 2050. Finally, the *High* scenario considers that there is sufficient feedstock and potential production capacity in Europe to meet 10% of all demand in 2030, commencing from 2.8% in 2025 and reaching 88% in 2050.

SAF costs considerably more to produce than fossil jet fuel. Due to high price pressure, currently low SAF demand and policy uncertainty, although the proposed blending mandate gives guarantee that there should be a market, there is a great deal of uncertainty about SAF costs. Uncertainty in cost has been quantified by the use of ranges of cost for the different technology pathways considering cost of feedstock and availability, capital investments and costs driven by the cost of green hydrogen production as well as carbon capture.

More details related to blending, production outlook, costs and net savings can be found in EUROCONTROL Objective Skygreen (see Ref. 4).

4.4 Market-based measures

Market-based measures (MBM) ensure or incentivise the reduction of aviation emissions, either directly or indirectly. They are complementary, in that they cover the gap when other measures (such as the new aircraft technology and SAF, just described) would not permit the targets to be met. MBM allow, or require, aircraft operators to balance some of their CO_2 emissions by paying for CO_2 savings elsewhere.

This forecasting exercise accounted for the various effect of the measures envisaged such as the latest EU proposal from the "Fit for 55 Package" (see Ref. 5) and the current ICAO Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). Here we describe two major market-based measures: the EU's ETS and CORSIA.

EU EMISSIONS TRADING SYSTEM (EU ETS)

The EU ETS applies to flights operating within the European Economic Area (EEA: EU27, Iceland, Liechtenstein, Norway), both domestic and international. The revision of the ETS directive[10] defines the ETS and CORSIA implementation mechanisms under the umbrella of the EU Green Deal, with the aim of achieving at least a 55% net reduction in greenhouse gas emissions by 2030.

The revised directive is expected to tighten the existing rules: accelerating the reduction of availability of ETS allowances from 2.2% to 4.2%; and reducing the allowances provided for free to aircraft operators by 25% every year from 2024, leaving no free allowances for aviation from 2027.

CORSIA

ICAO's CORSIA aims to stabilise CO_2 emissions at 2019 levels. It applies from 2019 until 2035, with reporting-only in 2019 and 2020, and offsetting of emissions above the baseline from 2021. It covers international civil aviation emissions between ICAO Member States (excluding domestic). It is likely that the EU will exempt airlines of CORSIA offsetting where ETS applies.

Further details related to ETS and CORSIA implementation can be found in EUROCONTROL Objective Skygreen (see Ref. 4).

In the forecast, we combine these market-based measures costs (Section 4.4) together with SAF prices (Section 4.3) and jet fuel prices to get estimates of future total fuel prices. Depending on the scenarios, the prices range from [€550-€1,100] per tonne in 2025 to [€1,000-€1,500] per tonne in 2050.

4.5 Net zero CO_2 emissions by 2050

Increasingly large sections of the aviation industry are committing to the ambitious goal of net zero CO_2 emissions from flights by 2050 (see Ref. 6, 7) in light of the Paris Agreement. In particular, European states, European aviation and regulators are also committing to and planning for net zero. As recently as February 2022, and following the EU Aviation Summit on decarbonising the air transport sector, the European Commission, the 27 EU Member States, and 10 other ECAC Member States reaffirmed their commitment for achieving carbon neutrality in the air transport sector by 2050 (the "Toulouse Declaration"). The "Destination 2050" report (see Ref. 7) describes one route to net zero by 2050 as estimated by the European aviation industry.

[10] Commission proposal COM (2021) 551.

This EUROCONTROL Aviation Outlook addresses a broad range of potential futures through three scenarios for European aviation. Each includes in-sector innovation that reduces net CO_2 emissions: new versions of current aircraft and engines; revolutionary changes in aircraft type and propulsion, electric, hybrid-electric and hydrogen (Section 4.1); improvements to air traffic management and aircraft operations (Section 4.2); and the switch to sustainable fuels (Section 4.3). As Destination 2050 found, these get us much of the way to net zero, but not all of the way.

The remaining step involves out-of-sector initiatives, or market-based measures (Section 4.4). This means purchasing out-of-sector reductions in CO_2 which, by 2050, will increasingly mean carbon capture.

In the *High* scenario, those remaining measures need to cover 17 million tonnes of CO_2, similar to Destination 2050. In the *Base* scenario, the need is around 40 million tonnes.

There are other differences between this EUROCONTROL Aviation Outlook and "Destination 2050". For example, even the *High* scenario sees more modest CO_2 reductions from hydrogen aircraft by 2050. The *High* scenario is an ambitious scenario building on aircraft and propulsion projects that we see in development. But in 2050 the hydrogen and electric powered aircraft in our scenarios have relatively short range, while most CO_2 emissions are in long-haul (Figure 16). Perhaps future technologies, beyond SAF, will be able to meet the long-haul need, but that goes beyond this Outlook.

5. CONCLUSIONS

Mostly because of COVID-19 and the resulting downturn, flight growth in Europe will have lost 10 years compared to our previous long-term forecast: in the most-likely scenario there will be 16 million flights in Europe in 2050, 44% more than in 2019, or an average growth of +1.2% per year. Other possible scenarios surrounding the most-likely (19.6 million flights and 13.2 million flights by 2050) are also discussed.

We forecast that a small minority of flights, those over 4,000km, remain responsible for around half of CO_2 emissions, and in all scenarios the share of long-haul flights increases by 2050. Over shorter distances, there are substitutes; we discuss high-speed rail and night trains, for example, in Section 2. However at this time horizon, it will remain difficult to substitute for long-haul flying, so the CO_2 efficiency of SAF will be key.

The EUROCONTROL Aviation Outlook to 2050 scenarios reflect the fact that, if aviation is stronger, then it is better able to invest in more efficient technologies. It also reflects the fact that those technologies (including electric and hydrogen-powered aircraft) still seem likely to be best for shorter haul, rather than longer-haul, travel. CO_2 improvements by 2050 from revolutionary aircraft changes, therefore, remain modest (2% to 3% in 2050); industry and regulators will need to find ways to boost investment to improve on this. As other studies have found, the final step to reaching net zero CO_2 therefore needs 'out of sector' measures such as carbon capture.

No single solution will enable aviation to achieve net zero CO_2, but in all scenarios here it is the scaling up of the production, distribution and use of SAF that makes the major contribution in the long term, with operational improvements helping more immediately.

The most sustainable outcomes require the aviation industry to work with governments to ensure that the right investments and suitable regulations can be and are being made, within aviation and beyond.

This report will be complemented by the EUROCONTROL Objective Skygreen report, which looks in much more detail at the elements leading to cutting emissions by 55% by 2030 compared to 1990 levels.

A. Input assumptions

To structure the uncertainty surrounding the possible outlook in the long term, some scenarios have been defined, with qualitatively-different representations of the many possible futures. Each scenario follows a specific path of events and developments that then drives the flight forecast.

These scenarios are characterised by specific assumptions expressed in the figures. Main assumptions are reproduced in Figure 19.

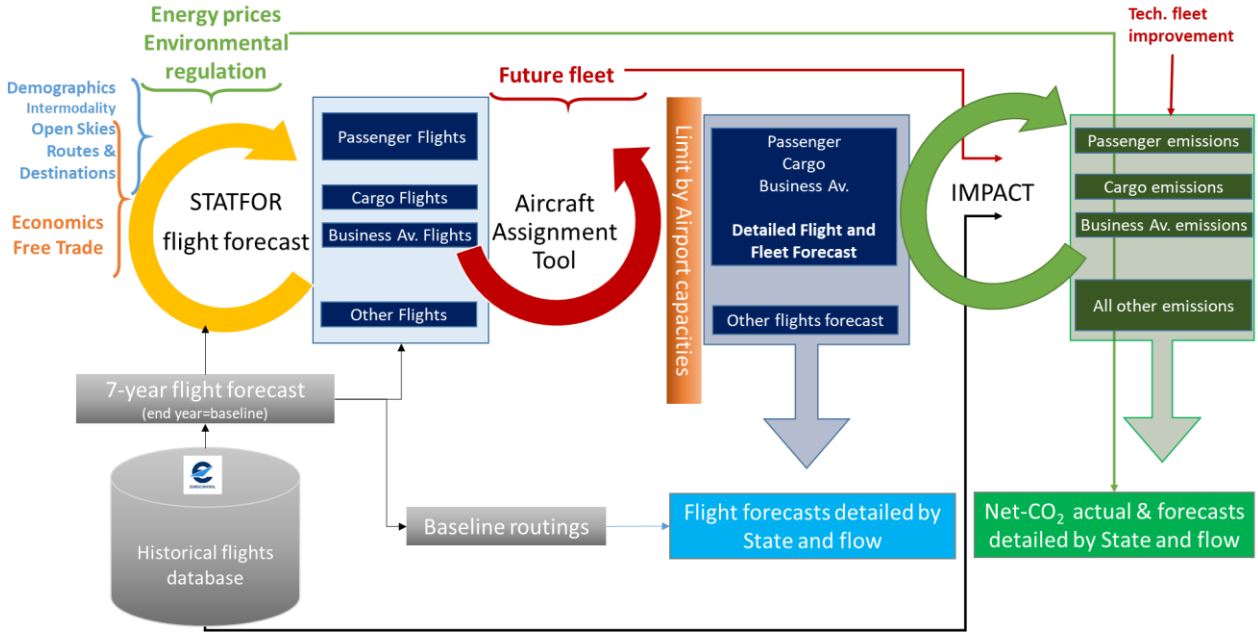
Figure 19. Summary of the input assumptions per scenario.

	High scenario	Base scenario	Low scenario
(EUROCONTROL 7-year forecast dated Oct. 2021): 2027 baseline	High ↗	Base →	Low ↘
Passenger			
Demographics	Aging	Aging	Aging
(Population)	UN Medium-fertility variant	UN Medium-fertility variant	UN Zero-migration variant
Routes and Destinations (summary)	Less short-haul (High-Speed Trains and Night Trains).	Maintained short-haul (High-Speed Train projects implementation delayed 2 years compared to plans and lower impact of Night Trains).	More short-haul (High-Speed Train projects implementation delayed 5 years, no Night Trains).
High-speed rail (new & improved connections)	66 city-pairs, *implementation as planned,* with projects in Morocco and Poland	56 city-pairs, *implementation slightly behind plans (+2yr)*	56 city-pairs *implementation behind plans (+5yr)*
Economic conditions			
GDP growth	Stronger ↗	Moderate → (baseline OE)	Weaker ↘↘
Free Trade	Global	Global	No additional benefits
Price of travel (2025/2050)			
Price of CO2 allowances	Low/High (63€/ 125€)	Moderate/Moderate (68€/120€)	High/Low (72€/115€)
Price of oil/barrel (jet fuel)	Low (59€/91€)	Moderate (60€/96€)	High (113€/168€)
Price of SAF	Low (942€/1000€)	Moderate (1162€/1155€)	High (1380€/1374€)
Change in other charges	noise: no change	noise: no change	noise: no change
	security: no change	security: no change	security: no change
(airline) Operating cost	Decreasing ↘↘	Decreasing ↘	slight increase ↗
Structure Network			
Long Haul, Medium Haul, Short Haul	Hubs: Europe (major hubs)↘, Turkey↗ Middle East ↗↗	Hubs: Middle East ↗↗ Europe&Turkey ↗	No change →
	Point-to-Point: N. Atlantic ↘	Point-to-Point: N. Atlantic ↗, European secondary airports ↗	
		N. Atlantic (major European hubs) ↘	
Market Structure			
Growth and replacement	Assumptions based on EUROCONTROL assumptions and CIRIUM fleet forecast (new programmes detailed below)		
Conventional (re-engining)	2 TP (drop-in up to 2045, then switch to non drop-in fuel), 3 Regional Jets (RJ), 4 Single Aisle (SA), 5 Twin-Aisle (TA)		
Electric - Hybrid - H2 (new build) ~"non drop-in fuel"	**Earliest (as announced):** small e-TP 9/29/35 seats by 2025/2030 + Electric RJ 100 seats + HybridElectric SA 200 seats + H2 project 140 seats + Hybrid Elec TP, all by 2035 + Electric/H2 TP 70/90 seats by 2045	**A bit later (shifted 5 yrs):** small e-TP 9/29/35 seats from 2030/2033/2035 + electric RJ 100 seats from 2040 + HybridElectric SA 200 seats by 2037 + H2 aircraft 140 seats by 2040	**Later:** small e-TP 9/29/35 seats by 2035/2040 + HybridElectric SA 200 seats by 2040 + H2 (Airbus) 140 seats by 2045
Retirement	Retirement curves varied by market segment classes (ie: All-cargo, Business Aviation and Passenger sub-classes), derived from historical trends over the past 50 years		
Availability of SAF			
Fuel mix	10% SAF - 90% Jet by 2030 49% SAF - 51% Jet by 2040 88% SAF - 12% Jet by 2050	5% SAF- 95% Jet by 2030 32% SAF - 68% Jet by 2040 63% SAF - 37% Jet by 2050	4% SAF- 96% Jet by 2030 26% SAF - 74% Jet by 2040 50% SAF - 50% Jet by 2050

B. Methodology

The EUROCONTROL Aviation Outlook uses a method relying on a model of economic and industry developments to grow airport-pair demand from the 7-year flight forecast 2021-2027 (October 2021, Ref.3) further into the future. An aircraft fleet forecast, in line with the initial flight forecast, is modelled for the main market segments using the Aircraft Assignment Tool. A final flight forecast is then derived, adjusted to take account of the effects of future airport capacity constraints. The flight forecast is then used by the IMPACT environmental modelling tool to forecast fuel burn and CO_2 emissions (Figure 20).

Figure 20. The flight forecast feeds the fleet forecasting tool, which is handed over to the emission modelling tool (IMPACT).



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GUIDELINES

TRANSPORT OF CARGO IN PASSENGER COMPARTMENT - EXEMPTIONS UNDER ARTICLE 71(1) OF REGULATION (EU) 2018/1139 (THE BASIC REGULATION)

Issue 6.0, Cologne, April 11th 2022

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1. Purpose of these Guidelines

Air cargo services had been vital for the economy and for coping with logistical challenges linked to the COVID-19 pandemic due to the reduction of cargo transported in the holds of passenger commercial planes. During the peak of the pandemic, when almost all long haul operation had been suspended, there was a need to support the logistic chain with solution to increase the cargo capacity using passenger aircraft to transport cargo on the main deck. Cargo capacity in the holds of passenger aircraft is expected to increase by summer 2022, thus reducing the pressure on the logistic chain.

In order to enable transportation of cargo in the passenger cabin during the pandemic, Design Organisations (with adequate scope) may apply and receive from EASA airworthiness approvals which are time-limited due to the fact that the design of the passenger cabin does not meet any of the CS-25 cargo compartment class definitions. For that purpose, EASA has published[1] since October 26th 2020 the Deviation (and subsequent updates) from CS 25.855 related to the "Transportation of cargo in passenger compartments". The Deviation provides a standard approach according to which design changes can be developed in order to allow the transportation of cargo in passenger compartments until July 31st 2022. The concept of such approvals offers sufficient flexibility while ensuring adequate exposure to a cargo fire risk from an aircraft certification perspective.

Alternatively, and only in case of transporting medical supplies and after having demonstrated an urgent need, an operator may exceptionally consider to apply for an exemption pursuant Article 71 of the Regulation (EU) 2018/1139 (hereinafter, "the Basic Regulation"). In fact, the transport of general cargo is now possible with the installation of a time limited STC approved by EASA based on the Deviation from CS 25.855. Certificates have been issued to Design Organisations allowing several aircraft types to perform a regular entry into service without the need for exemptions based on Article 71 of the Basic Regulation.

In case an operator applies for an exemption before July 31st 2022, this should be issued only to enable to continue operations covered by an expiring exemption, provided that:

a) there is the evidence that an application for an associated Major Change to TC or STC has been made to EASA,
b) the duration of the requested extension of the exemption does not exceed the time to complete the technical investigation for the associated design change approval and does not extend beyond July 31st 2022
c) and the Operator has committed to comply with Annex 1 of these guidelines at Issue 6.0.

The above conditions for issuance of exemptions cannot be valid after July 31st 2022:
following a review of the operational context for transport of cargo in passenger cabin, the agency has concluded that the logistical challenges that arose in 2020 as a result of the COVID-19 crisis no longer exist to the same extent and that those guidelines do not apply anymore.

1 https://www.easa.europa.eu/document-library/product-certification-consultations/deviation-transportation-cargo-passenger

The purpose of this document is to provide guidelines for NCAs to consider when granting exemptions under Art. 71 to allow the Transport of Cargo in Passenger Compartments in the context of the current COVID-19 outbreak. These exemptions granted as per Article 71(1) should take into account the present guidelines. Those guidelines apply as well to older exemptions to be extended after the publication date of this document consecutively to a positive EASA recommendation as per Article 71(2).

Exhaustive technical guidance from EASA is included in Annex 1 of these guidelines. Documents published by the Industry (aircraft OEMs, SAE) to provide guidance on how to transport cargo in the passenger cabin are referenced in Annex 2.

The guidance material detailed in this document is designed to mitigate during a limited period of time the additional risks associated with those configurations, the most critical of which being a fire on board during flight. A particular consequence of those risks is that a combination of passengers and cargo transportation in the cabin is in no case foreseen and will therefore not be covered by those Guidelines.

2. Scope of exemptions

The transportation of cargo in the passenger cabin of large aeroplanes beyond already approved stowage areas is usually not covered by the approval of the aircraft. AMC2 CAT.OP.MPA.160 (b) (2) specifies the need for approved restraint equipment to secure cargo in stowage provisions available in the passenger cabin. The terminology "cargo" used in CAT.OP.MPA.160 is intended to include everything that is not a luggage.

The conditions that operators should meet in order to be allowed to transport cargo in the passenger cabin under the provisioning of Art. 71 of the Basic Regulation are included in Annex 1 and Annex 2 of these guidelines.

2.1. When applying Article 71(1) of the Basic Regulation to exempt operators from certain requirements of Regulation 748/2012, Regulation (EU) n° 1321/2014 and Air OPS- Regulation 965/2012,[2] the NCAs should specify the following:

a) The period of exemption: the period should refer to the duration of the COVID-19 outbreak in the Member State, but in any case should be less than 8 months.
b) The scope of exemption: as applicable.
c) The exempted provisions should be limited to:
    - CAT.IDE.A.100 "Instrument and Equipment/General, if applicable
    - CAT.OP.MPA.160 "Stowage of Baggage and Cargo",
    - 21.A.181 Duration and continued validity (of the airworthiness certificate)
    - M.A.304, M.A.501 M.A.902(b)(2), M.A.902(b)(5) of the Annex I (Part M)

2.2. The exemption should allow, on a temporary basis and as applicable or necessary, the transport of cargo and a limited number of occupants in the passenger cabin, if justified by a fire risk assessment. Cargo items may be installed on seats, with adequate restraint

2 Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 296, 25.10.2012, p. 1).

systems/means, or, if seats are removed, directly attached onto the aircraft floor[3] using the available seat tracks.

3. Operational aspects for Transport of Cargo in passenger compartment

Cargo shall only be transported by Operators holding valid Cargo transport approvals.

3.1. Crew composition

a) Operations without passengers shall still require the presence of cabin occupants to survey and access all areas of the cabin during all phases of flight. Any fire that might occur must be timely detected and effectively fought utilizing the available existing emergency equipment.
b) (deleted)

3.2. Procedures

a) A risk assessment shall be performed in order to identify hazards related to operating cargo flights using cabin configurations which have been approved for transporting only passengers.
b) Checks shall be made before take-off, before landing and whenever requested by the captain to ensure that cargo is properly stowed and secured.
c) Operators shall establish procedures to manage emergencies in the cabin.
d) Operators shall publish temporary revisions to the OM to include the new type of operations and the related procedures.

3.3. Loading, Mitigations (Focus areas for the competent authorities) for transport of cargo in passenger compartment including on passenger seats

a) Exact cargo weight and position in the cabin and in the cargo hold shall be reflected in the mass and balance documentation (load sheet).
b) The pilot-in-command shall be provided with information on the content of all the cargo such as through provision of the cargo manifest or other appropriate documentation.
c) The operator shall load the aircraft considering the different levels of available fire protections of the loading areas (i.e. passenger cabin and lower deck cargo compartments).
d) For the bulkheads that have a placard indicating maximum capacity, the cargo items stowed in aft of these bulkheads shall not exceed the maximum capacity indicated in the placard.
e) The maximum capacity limitations in the required safety placards (on or adjacent to the cargo approved stowage locations) shall not be exceeded. All stowage instructions specified in the placards apply.
f) The mass of the cargo shall not exceed the structural loading limits of the aircraft. Compliance with CS 25.561, 25.787 and CS 25.789 is expected.
g) The cargo placed in enclosed stowage areas shall not be of such size that they prevent latched doors from being closed securely.
h) The cargo items shall be stowed only in a location that is capable of restraining it.

[3] Note: The expression "cargo restrained on the cabin floor" refers to any installation in which seats are removed and the cargo does not transfer load to the aircraft structure only through the seats.

i) The cargo stowage location shall be such that, in the event of an emergency evacuation, it will not hinder aisle access and egress.
j) The cargo shall not be placed where it can impede access to emergency equipment.
k) The cargo shall be checked to ensure proper stowage in the following instances (at the minimum):
    - Before take-off,
    - Before landing,
    - Under orders of the Pilot in Command (PIC).
l) The available aisle(s) shall remain free to enable access to the cargo to fight a fire.
m) Any smoke/ fire within the cabin must be able to be detected and extinguished using the existing emergency equipment. Thoroughly briefed cabin occupants (not part of the flight crew) shall be on-board to survey and access all areas of the cabin during all flight phases. There must be an adequate number of trained cabin occupants acting as fire-fighter with sufficient amount of firefighting equipment. This equipment may be stowed in the cabin using existing stowage provisions (overhead bins, stowage's) provided that the location is identifiable for the crew. Specific details must be coordinated with local regulatory authorities.
n) Cabin occupants should use existing cabin crew seats and must not share seat rows with cargo. There must be a clear separation of areas occupied by cabin occupants and those fitted with cargo during taxi, take-off and landing. At least one empty seat row between cargo and reserved occupant seats must be established.
o) 'Under seat stowage' is allowed only if the seat is equipped with a restraint bar system and the cargo items can be placed fully underneath the seat. The loading of the cargo under each seat should not exceed 9 kg (20 lbs).
p) The cargo packaging shall be able to equalize the pressure so that it can handle the delta pressure during the flight, as applicable.
q) All smoke and fire detectors shall be maintained as per Maintenance Manual instructions.
r) The Air Conditioning system shall be set taking into account the nature of the cargo transported in the cabin and the number and distribution of cabin occupants.
s) (deleted)
t) (deleted)
u) (deleted)
v) If nets are used to restrain cargo items, these nets should be (E)TSO approved and any load limitations of these nets including their attachment means should be adhered to. Any deformation of these nets due to the mass of the cargo items restrained under emergency landing, flight or ground loads should be evaluated for contact to other objects in the cabin and be shown not to block emergency evacuation paths nor access to emergency equipment.

4. Transport of Dangerous Goods

Dangerous goods (DG) shall only be transported by Operators holding an approval (SPA.DG).

a) In the absence of passengers, the limits for the dangerous goods can be those established in the Technical Instructions for Cargo Aircraft, instead of Passenger Aircraft. The operator shall nevertheless include this aspect in the risk assessment performed.
b) Additional training/briefing shall be given to the crew, particularly letting them know whether the limits have been increased from those applicable to passengers to those applicable to cargo. This should, at least, include the following:

- the risks and consequences of increasing the amount of DG in the hold;
- any changes in the emergency procedures and the emergency equipment that may be on board.

c) Relevant information on dangerous goods (e.g. affecting emergency procedures) shall be included in the briefing given to other people occupying the aircraft.

d) Dangerous goods (with an exemption to vaccines cooled by dry ice) shall not be carried in the passenger cabin and always be carried in the hold and shall be transported under the conditions established by the Technical Instructions.

e) Nobody other than a crew member, an operator's employee in an official capacity, an authorised representative of a NCA or an authorised person accompanying a consignment or other cargo may be present on board. Any other person will be considered a passenger and, therefore, the aircraft will no longer be able to use the provisions applicable to cargo aircraft as regards the transport of dangerous goods.

5. Airworthiness aspects for transport of cargo in the passenger cabin of Large Aeroplanes

5.1. Transport of cargo in the passenger cabin under the provisioning of Article 71.1 of the Basic Regulation 2018/1139

In order to continuously provide a transport solution in the frame of the current COVID-19 situation, EASA supports the use of Article 71 of the Basic Regulation 2018/1139, also in case of on-going certification projects. A design change approval is not a prerequisite for the issuance of an Exemption. However, certain design data may support the process.

Further guidance can be found in Annex 1 of these guidelines.

The present guidelines and additional technical support to NCAs and operators, as required, should enable to address to an acceptable level on a temporary basis (i.e. up to 8 months) the airworthiness certification aspects for projects regarding transport of cargo in the passenger cabin of Large Aeroplanes.

5.2. Transport of cargo in the passenger cabin under a design change approval

In order to allow transport of cargo beyond the limitations set by Article 71 of the Basic Regulation, a design change approval must be pursued.

For transport of cargo restrained on seats as well as in case a removal of seats is necessary to allow fixation of cargo onto the aircraft structure, a Major Change to TC or STC application is required and will be processed by EASA with priority using a certification basis which includes the recently published Final Deviation.

The type of cargo to be transported in the passenger cabin would need to be under control (no unidentified cargo) and assessed beforehand in the frame of the technical investigation by the EASA certification team.

6. Information

For the purpose of notification of exemptions, NCAs are invited to inform EASA of the granted exemptions through EASA Flexi tool.

7. Other applicability

For flights not falling under the scope of the Basic Regulation, the NCA may use these Guidelines with the necessary adaptations.

Annex 1

1. Guidance for transport of cargo in the passenger cabin under the provisioning of Article 71.1 of the Basic Regulation 2018/1139.

The following guidance address in general the transport of cargo restrained on seats and/or on the cabin floor.

The primary objectives to be achieved when using the passenger cabin for transport of different kind of cargo are:

- Timely fire detection, effective fire-fighting and adequate protection of the occupants from hazardous quantities of smoke and toxic gases ;
- Fixation of cargo to ensure occupant safety and prevent changes of aircraft centre of gravity, in normal and emergency conditions;
- Emergency evacuation of occupants.

An applicability list of the below listed areas - depending on the kind of cargo – is provided in Table 1.

1.1. Restrictions to the kind of cargo:

The Transportation of the following cargo in the cabin shall be prohibited:

i) dangerous goods (with an exemption to vaccines cooled by dry ice dealt with in the separate EASA “Transportation of vaccines using dry ice” guidelines);
ii) mail;
iii) batteries, including batteries contained in, or packed with, equipment;
iv) Cargo of a piercing, dense, rigid, or penetrating nature, or cargo with sharp edges or corners, such as rods, pipes, extrusions, or beams, that could become a projectile hazard during flight operations;
v) live animals.

1.2. Cabin preparation:

a) Passenger convenience systems (IFE, in-seat power, galley systems and any other heat generating systems) in the cabin areas in which cargo is transported will have to be disabled or deactivated.
b) Automatic supplemental oxygen systems in the cabin areas in which cargo is transported will have to be removed from the PSU channels, without leaving any opening, or should be deactivated.
   Note: Chemical O2 generator or decentralized gaseous O2 installed in the PSU channel will start the O2 generation or O2 release when certain temperatures are reached. Based on the possible fire scenario originating from the cargo loaded the O2 systems would need to be removed or deactivated (O2 mask drop prevented to keep the shielding from the container doors).
c) Cargo should not be stowed in any compartment containing oxygen bottles and/or PBEs, as well as devices containing lithium batteries.

1.3. Cargo loading:

a) It is not required to install a 9g barrier and a smoke barrier to protect the flight deck and cabin occupants. Cargo shall be restrained so that each cargo installation meets 25.561 and other applicable structural requirements.

b) In each section of the cabin where cargo is transported:
   - there should be at least one longitudinal aisle meeting the minimum width dimensions specified in 25.815 for aeroplanes with a seating capacity of 10 or less passengers.
   - Cargo should be loaded so that there is sufficient access to the cargo to allow effective fire-fighting.
   - For twin-aisle aeroplanes in which seats are not removed and are used to restrain cargo, there should be an unloaded seat row to allow crossing from one aisle to the other. To the extent possible the unloaded seat row should be located at equal distance from the available cross-aisles required by CS 25.813.

c) Floor path marking may be removed or obscured by cargo in areas that are not going to be used as evacuation paths by the cabin occupants.
d) Features that allow decompression should be maintained, i.e. pallets or cargo should not obstruct decompression vents or flow.
e) When cargo is loaded on the floor:
   - The height of the cargo shall not exceed 127 cm (50 inches) (approximately the height of a typical economy class seat).
   - The volume of each cargo loading area, whether on a pallet or directly tied to the floor should not exceed 3.54m³ (125 ft³).
   - A lateral access should be provided fore and aft of each cargo loading area as noted below. To allow for appropriate access to the cargo and for firefighting the following should be provided:
     i. A longitudinal aisle(s) width of at least 51 cm (20”). Each longitudinal aisle must enable a crewmember to traverse it while walking upright
     ii. A lateral access fore and after of each loading area of at least 38 cm (15”) wide
     iii. Access provisions should be unobstructed including from the cargo restraint means
   - In addition, limitations applicable to the mass, distribution and method of restraint of the cargo should be established based on guidance from the aircraft OEM as deemed necessary by the NCA; EASA support can be provided upon request.
f) Cargo loaded on a seat should not exceed 22.5 kg (50 lbs) per seat place or 50kg (110lbs) in a single package per triple seat respectively, unless other loads can be substantiated. Underseat stowage of up to 9 kg (20 lbs) per seat place is allowed in addition to this limitation. The cargo should not extend above the seatback height. Potential restraint methods might include:

   - Seat tracks (after removing the plastic row-to-row track cover), based on guidance from the aircraft OEM as deemed necessary by the NCA.

     Attach netting over the seat and boxes. Secure the net to the seat track. Ensure that the net is moderately taut so as to maintain an aisle width for in-flight surveillance of smoke and fire.

   - Seat belts or seat belt shackles.

     Add additional strapping attached to or going around the forward and top side of the boxes. This strapping to be attached to the buckled and cinched down seat belt (seat belt does not go around box since it doesn’t adequately restrain the box in forward and up directions).

- Seat beams (located immediately below the seat bottom cushion)

  Strap the forward and top side of the boxes to the forward and aft beams by routing the straps under the seat.

- Seat legs

  Strap the forward and top side of the boxes to the front legs and to the aft legs by looping the straps around the legs.

1.4. Safety equipment:

a) Portable oxygen equipment should be provided for each cabin occupant whose duties on board include fire detection and fire-fighting in the cabin. The equipment shall meet 25.1439 (b) (1), (2) and (4) and 25.1443(e) and shall be carried by the cabin occupants during their inspections.
b) Appropriate protective garments (e.g. fire gloves, etc.) shall be stored adjacent to the cabin occupant's stations.
c) In addition to the extinguishers already installed in the cabin the need for additional firefighting capabilities should be evaluated by considering the cargo to be transported (e.g. expected class of fire).
   The following additional fire extinguishers would provide adequate firefighting capabilities in case of no cargo restrictions other than the ones prescribed in paragraph 1.1:
   - Two Underwriters Laboratories (UL)2A (2-1/2 gallon) rated water portable fire extinguishers, and
   - At least two fire extinguishers with a minimum UL 4A-80B:C rating or equivalent. Four UL 2A-10B:C extinguishers is considered equivalent.
d) Extinguishers should be located next to fire fighters station(s) or at other locations that the operator determines would be more effective in providing fire protection.

1.5. ECS settings:

a) Normal Procedures
   ECS settings shall be adapted considering the number aircraft occupants. If the ECS system is configured with Gasper outlets they should be in close / off position at all phases of flight.

b) Emergency Procedures
   In the event of a fire in the cabin it should be ensured that the ventilation system is set to low flow. The existing Smoke, Fire, Fumes FCOM procedures (which includes possible divert, don oxygen masks, establish crew communications, re-circulation fans switched off, Smoke Fumes Checklist) must be followed.

1.6. Procedures and documentation:

Existing procedures, including emergency procedures, should be reviewed and adapted as necessary.

The Airplane Flight Manual (AFM) should be revised as to include the following:

a) Minimum number of additional occupants in the cabin:
   1. Minimum of two additional cabin occupants whose duties are to detect and fight a fire, and relay information to the flight crew.
   2. For twin aisle and other large long range airplanes, a minimum of 3 additional cabin occupants will likely be needed. Additional cabin occupants above 3 should be justified based on a risk assessment. The number of cabin occupants should be minimized to the number necessary to satisfy item 1.

b) the additional cabin occupants should have received training, including practical sessions, on:
   - Fire-fighting procedure
   - Use of the emergency equipment, including portable oxygen systems
   - Operation of emergency exits and evacuation procedures

c) The additional cabin occupants should make a visual inspection of the cargo on a regular basis including prior to TT&L.

d) When making the inspection required above, the additional cabin occupants should carry portable oxygen equipment (see section 1.4 Safety Equipment).

e) Provisions should be available to allow the flight crew members to notify the cabin occupants of emergencies (e.g. decompression).

f) Seats that need to be occupied during TT&L and emergency scenarios such as turbulence or decompression (possibly ensuring visibility of cargo).

g) A new cabin fire emergency procedure based on manual fire-fighting.

2. Return to passenger service

Before the aircraft is used for passenger service, the operator should ensure the return of the cabin back to the configuration certified for passenger transportation. Operators are reminded that if the operator wishes to make these changes permanent, then a design change approval is required.

Applicability of sections in Annex 1 depending on the restrictions to the kind of cargo			
	Restrictions to the kind of cargo As per paragraph 1.4	**Restrictions to the kind of cargo** Positive list of kind of cargo	**Restrictions to the kind of cargo** Medical supplies only
Cabin preparation	✓	✓ (except that deactivation/removal of supplemental oxygen systems may not be required, depending on the type of cargo)	N/A
Cargo loading	✓	✓	✓
Safety equipment	✓	✓ (with adaptations, as appropriate, depending on the type of cargo transported in the cabin)	✓ (with adaptations, as appropriate)
ECS settings	✓	✓ (with adaptations, as appropriate)	✓
Procedures and documentation	✓	✓ (with adaptations, as appropriate)	✓ (with adaptations, as appropriate)
Appendix to Annex 1	✓	✓	✓

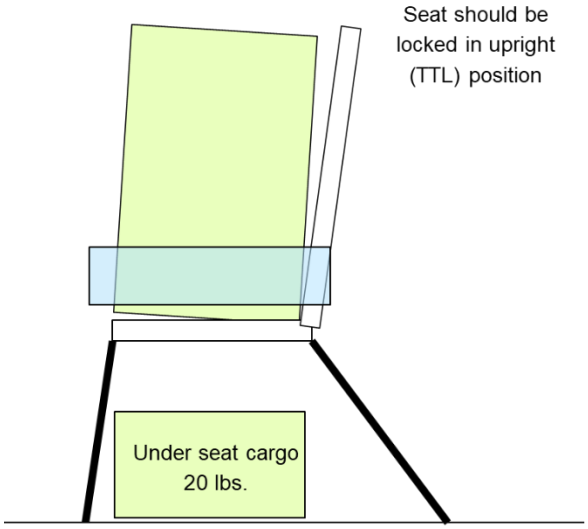
Table 1 - Applicability of sections in Annex 1 depending on the restrictions to the kind of cargo

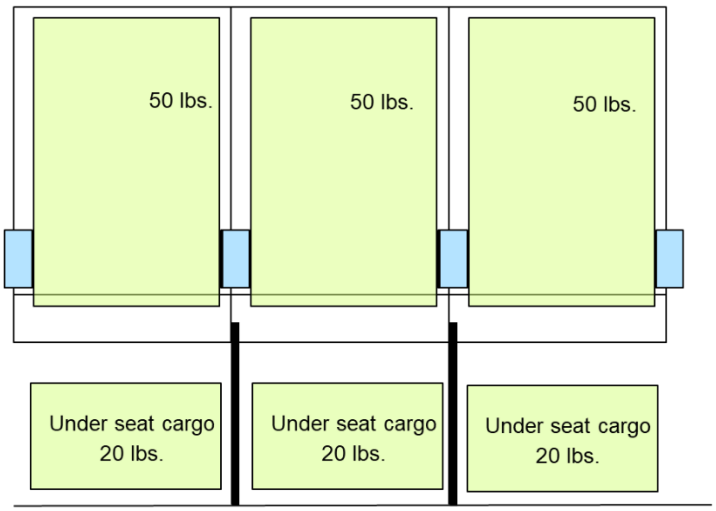
Appendix 1 to Annex 1

Example for loading cargo on seats

Interim cargo transportation on seat for 3 boxes maximum 22.5kg (50 lbs)

Maximum height of cargo not higher than top of seat backrest

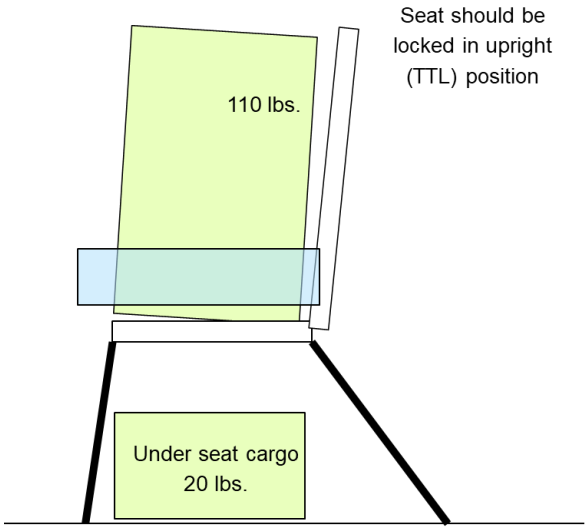


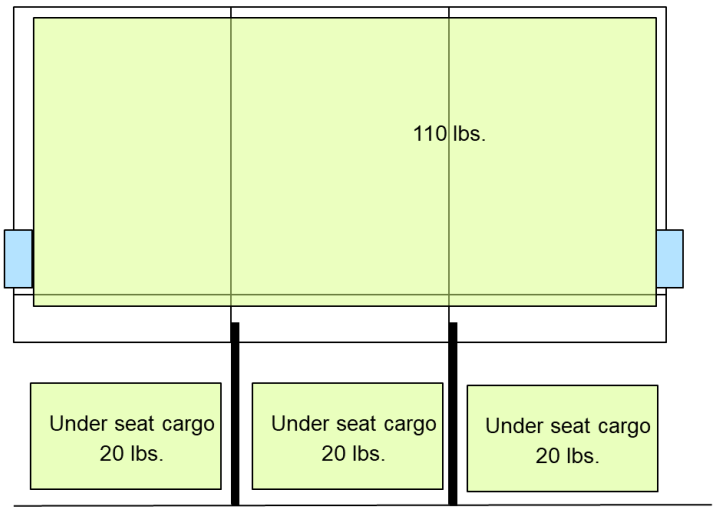


Interim cargo transportation on seat for 1 box maximum 50kg (110 lbs)

Maximum height of cargo not higher than top of seat backrest

Cargo restraint means are not shown.





Appendix 2 to Annex 1:

Recommended procedures for loading and unloading cargo

The below recommended procedure is an example. The recommended loading / unloading sequence depends on the aircraft type.

Sequence for loading:

- First, load the lower forward cargo compartment
- Next, load the main deck from the front to the back
- Last, load the lower centre/aft cargo compartments (lower cargo compartment aft of the wing)

Sequence for unloading:

- reverse order from loading sequence

Annex 2
Industry guidance

The following documents were sent by certain aircraft OEMs to provide guidance on how to transport cargo in the passenger cabin:

- Airbus SAS : FOT-999-0028-20-00)
- ATR: OIM2020/003
- The Boeing Company : MOM-MOM-20-0239

Guidance on how to restrain cargo on seats can be found in SAE ARP 4049 Cargo Restraint on Aircraft Passenger Seats – Main Passenger Cabin.