AZERAERONAVIGATION

AIR TRAFFIC REPORT 2021

AZANS
AZERAERONAVIGATION
25
1996-2021
ANNIVERSARY

Foreward

Jahangir Askerov
President
"Azerbaijan Airlines"CJSC

> For AZANS, the last decades have been a period of large-scale modernization as well as the time of implementation of the ICAO Global Air Navigation Plan.

The aviation industry is the pillar of the world's social and economic development. The last two years have been challenging for the entire sector worldwide while aviation is one of its biggest sufferers. The situation affected seriously the aviation industry severely through increased flight cancellations, grounding of aircraft, travel bans, and closure of international borders.

The shock and extent of the cessation of air travel activity caused by the outbreak of the Covid-19 virus in early 2020 were unprecedented. At the same time air navigation service providers did not completely shut down, and Azerbaijani National ANSP, AZANS, continued to work, assessing and shouldering the risks that went with working to keep the aircraft flying safely in our airspace during the pandemic. And it was at the peak of the post-covid crisis in April 2021 when AZANS entered the 25th anniversary year of its formation and development. AZANS is a nationwide organization and an important player in international aviation.

For AZANS, the last decades have been a period of large-scale modernization as well as the time of implementation of the ICAO Global Air Navigation Plan.

Despite the pandemic conditions, AZANS continued to implement the latest technologies and requirements of the international organizations.

In the outgoing year, AZANS has implemented ATC Data Link digital ground-to-air data transmission system and became the first service provider in the region to launch digital broadcasting between a pilot and an ATC controller, as well as the transmission of meteorological and aeronautical data in a digital format.

Strategic development goals have been set for AZANS in the field of digitalization of air navigation service provision. This includes usage of artificial intelligence in ATC, implementation of virtual towers, digitalization of communication services, automation of workflow control without human intervention, and much more.

As a result of the 44-day war under the leadership of the President of the country, Mr. Ilham Aliyev, the Azerbaijani people won a great Victory. During the war, "Azeraeronavigation" ATD continued to fulfill its main function - to ensure the safety of flights.

The airspace over the occupied territories of Azerbaijan has been closed for international and domestic flights for three decades. During this time, the occupants destroyed the entire infrastructure of civil aviation in this area. Today the primary task of AZANS and its personnel is the restoring of air navigation service provision in liberated Karabakh following international standards. The skies over the liberated territories are re-opened for international civil aviation. The long-term experience in operational work and modernization projects will enable AZANS to solve all the tasks set by the country's leadership and to implement a stable and reliable system for air navigation services in this territory.

The goals on flight safety provision in the skies over Karabakh are complex and extensive. AZANS specialists are engaged in the implementation of large-scale infrastructure projects for delivery and installation of air navigation systems, their certification following the requirements of ICAO and EASA, the re-opening of international air routes, and the publication of relevant aeronautical data in international aeronautical databases. All of the above are important initial steps required for the development of the air transport network in the liberated territories.

In 2021, the project on the implementation of aeronavigation equipment and services for Fuzuli International Airport was completed in record time. Construction of two new international airports is underway in Karabakh - in Zangilan and Lachin. The favorable geographical location of the new airports provides the country with opportunities to enhance the potential of international transport logistics and tourism in the de-occupied territories.

I have no doubts that AZANS experience a great sense of pride in participating in the Liberated Territories Development Program through the implementation of the above plans and projects. And in the nearest future, the once expelled population returning to the places of historical residence will be involved in the training and development of prestigious aviation careers, including Air Traffic Controller and ANS Engineer.

25 years is a serious milestone in the life of an organization, an age full of aspirations and determination. At the age of 25, AZANS has significant experience in the development and implementation of modern technologies and methods of work. I wish the whole team of "Azeraeronavigation" new achievements, prosperity, and successful implementation of the goals defined and most of the daring ideas that open brilliant prospects for the entire national and regional civil aviation.

Foreward

Farhan Guliyev
Director
“Azeraeronavigation” ATD

Aviation is a truly global industry, and one of the main drivers behind globalization. Up until the start of the pandemic crisis, aviation supported over 65 million jobs worldwide, contributing $2.7 trillion in global GDP. Aviation brings people together and connects the world like no other mode of transport, allowing people to go abroad, build international businesses and pursue education or healthcare overseas to name a few. The last two years have been truly extraordinary due to Covid-19, but we’re confident that our human desire to travel, explore and connect will return and the aviation industry will bounce back to support that desire.

Overall, IATA predicts that global air traffic will not return to pre-Coronavirus levels until at least 2024. Nevertheless, as the recovery from the pandemic takes hold there are opportunities to build back better. As shown by past recoveries, aviation is a resilient sector and will return to growth. As and when that happens, the air traffic control sector and its key specialists must be ready in terms of technology and processes to facilitate it.

For Azerbaijan, the last years have become special and memorable due to the victory in the second Karabakh war. Our national aviation and aeronavigation, in particular, started the implementation of the prioritized tasks set by the State’s leadership- to restore the aviation transport infrastructure and air navigation service, re-open closed airspace and transform them into the center of the aviation industry’s dynamic development. The construction in the liberated Karabakh of three modern airports, equipped with the latest air navigation systems and the involvement of the formerly expelled population in their operation, will become the main facilitator in the achievement of the goals defined. AZANS team is truly proud to be involved in these historical for our country processes.

No less reason for pride can be the 25th anniversary of the formation and continued development of our organization. Today, stable activity and confident development of AZANS increases the interest of foreign airlines in the airspace of Azerbaijan. For a quarter of a century, it has been possible to increase the efficiency of using the country’s airspace and its attractiveness for international users. The list of AZANS service users includes more than 120 major airlines.

While solving tasks aimed at developing national civil aviation and economy, the ANSP of Azerbaijan aims to be fully involved in support for achievement objectives of a global scale, in particular, those clearly outlined in the UN Sustainable Development Goals Plan

Aviation is extremely well-positioned to contribute to the UN’s Sustainable Development Goals. ICAO’s strategic objectives are strongly linked to 15 out of 17 Sustainable Development Goals (SDGs), highlighting the immense role civil aviation plays to improve people’s lives globally.

The United Nations SDGs were set and accepted by Azerbaijan in 2015 and are intended to achieve a better and more sustainable future for all by 2030. We all want to continue enjoying the benefits of our planet – both for current and future generations. In which case, I believe we must all take responsibility and contribute to achieving these goals. Ultimately, the SDGs can only be achieved if all areas of aviation act together. The results should not only improve life for some of the world’s poorest and hardest to reach communities – but they can build new markets and strengthen shared supply chains – delivering real business value for all parties. As we know, the aviation sector has been hugely affected by COVID-19, but I still believe the global aviation community is able and committed to advancing the SDGs.

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A number of these SDGs are closely related to environmental protection. Aviation represents around 2.5% of global human-induced CO2 emissions. According to the International Committee on Climate Change (IPCC), aircraft contribute around 3.5% of the total anthropogenic radiative forcing. Although today we have aircraft that are more environmentally efficient than decades ago, technological improvements have not been in line with the growth rate in air travel.

With almost 6 billion passengers expected in 2030, the air transport sector is reaching a crucial moment in its history. Indeed, it must therefore face a major challenge: to meet the growing demand of users while reducing its environmental footprint. The global approach for air navigation is: air navigation service providers (ANSP) and states need to work together to benefit from new technologies to move towards seamless airspace. These transformation objectives will strengthen the network’s performance while taking into account environmental impacts. New technologies will thus contribute to harmonizing air traffic systems, processes, and flows within more safe and efficient air traffic.

In Azerbaijan, we have no doubts and most of our foreign partners agree with us: digitalization is the best way to make air traffic management more efficient. Projects that are part of this new dimension of air traffic management need the development of new technologies adapted to the sector like, for example, digital tower, which allows remote air traffic control between different actors and automation. Renewing ATM tools and interoperability are essential to evolve in an optimized seamless air traffic management context. The modernization and improvements to airspace efficiency and the optimization of air traffic management and operational procedures, like the optimized continuous climb and continuous descent operations, carbon-efficient ground movements, can also significantly reduce greenhouse gas emissions. These measures benefit airports, airlines, passengers, and communities living around airports as they can achieve fewer delays and reduced levels of noise and emissions. Moreover, these crucial points increase the capacity of the network thanks to better flight predictability and reduced trajectories, enabling to limit environmental impacts and delays for the next years.

In the upcoming years, AZANS will strive to demonstrate how the combination of our deep local experience and our international collaborative activity, our knowledge, and shared experience, deliver value to us, our users, and society. How we will foster innovation and creativity to help change systems and tackle the hardest challenges standing between us and safe, environmentally oriented, and efficient service provision.

Achievements

AZANS celebrates a quarter-century of safety, efficiency and innovation : the main achievements for 25 years of service

AZANS AZERAERONAVIGATION 25 1996-2021 ANNIVERSARY

On April, 1, 1996 , the first national air navigation service provider Azeraeronavigation was founded, inheriting non-operational equipment and old facilities.

In 25 years that followed, the AZANS founders' vision become a reality through its employees' relentless pursuit of safety, professionalism and efficiency. Here are some of the notable achievements AZANS has made over the past 25 years:

1997 – 2000

AZANS Infrastructure modernization project in accordance with ICAO CNS/ATM concept (new Baku ATCC with new automated ATM system, installation of SSRs at Baku, Nakhchivan, Ganja and Yevlakh, Black/ Caspian Sea VSAT system). Project was supported by EBRD.

1997

Implementation of RNAV in Upper airspace.

2002 – 2006

Nakhchivan and Ganja airports modernization projects (new TWRs with automated ATM system, installation of ILS/DME, AWOS meteo system, upgrade of VCS/ VRS).

2005

Implementation of RVSM.

2006

The State Civil Aviation Administration was established by the Presidential Decree No. 512 on December 29, 2006. Clear separation of functions and responsibilities between the regulatory authority and the service provider was established.

2008

Zagatala airport Air Navigation Systems modernization project .

Lenkaran airport Air Navigation Systems modernization project .

2010

Certification of MET and AIS services according to ISO9001:2008 standard.

2010 – 2011

Construction of Gabala airport (new TWRswith automated ATM system, VCS/ VRS, installation of SSR, DVOR/ DME,ILS/DME, AWOS and ATIS meteo systems).

2014

New Baku ATCC and AZANS HQ (new automated ATM system, ATC SIM, AMHS).

2015

Transition to EUROCONTROL IFPS International Flight Planning System

Implementation of PBN standard departure and arrival routes (SID/STAR) and continues climb/descend operations (CCO/CDO) at Baku/Heydar Aliyev Intl airport.

2017

Upgrade of Black/Caspian Sea VSAT system.

2017 – 2018

Creation of Airspace Efficiency, Strategy and Development Center.

2018

Signing Agreement between EUROCONTROL and AZANS on Netwrok Cooperation between NM Brusslles and Airspace Efficiency, Strategy and Development Center

Implementation of AIS to AIM integrated system.

Implementation of ECO-ATFM system.

2019

Implementation of International Air route between Nakhchivan and Turkey (independent from Iran and Armenia)

Nakhchivan Air Navigation System Modernization, construction of new RWY (installation of ILS/DME, AWOS meteo system)

Implementation of Tower Emergency alerting system (TEAS) at Baku/ Heydar Aliyev Intl airport.

Increasing the maturity level of the AZANS Safety Management System according to the 4thlevel on the ICAO scale (level D on the CANSO \ EUROCONTROL SoE scale)

Perspective Expansion and Development Plan elaboration of Heydar Aliyev International Airport, taking into account the growth forecast until 2030.

2020

Implementation of remote Tower Gabala (not in operational use completed, delayed due to COVID-19).

Implementation of UTM (not completed, delayed due to COVID-19).

Implementation of Datalink communication services (not completed, delayed due to COVID-19).

Implementation of ECO-ATFM system phase 2 (not completed, delayed due to COVID-19)

Proud to introduce our miracle created within a few months

FZL

IATA CODE

Azerbaijan has completed the construction of a new airport, Fuzuli International Airport, in the region of Karabakh that was recently liberated from the Armenian occupation.

Completed in a span of eight months, this is the first of three airports to be constructed by Azerbaijan in the region of Karabakh and will function as Karabakh's gateway to the world.

AZANS has made a significant contribution to the commissioning of this airport in record time. Thanks to the high professionalism and dedication of AZANS team members, who, in difficult working and weather conditions, were engaged in the supply, installation, testing and set up of the modern aeronavigation equipment in areas recently cleared of mines and devoid of any infrastructure, this new Fuzuli airport was able to accept its first passengers in September, 2021

Fuzuli International Airport is located nearly 100km from Shusha and 300km from the capital Baku. The foundation stone for the airport was laid in January this year while the initial test flight to the airport was conducted in August. All wide-body aircraft, including large cargo airplanes, will be able to operate from this airport.

Achievements

Digital technologies at Heydar Aliyev Int Airport

A pre-Future Air Navigation Service (pre-FANS) comprising Datalink Departure Clearance (DCL), Datalink Automatic Terminal Information Service (D-ATIS) and Datalink Meteorological In - formation for Aircraft in Flight (D-VOLMET) air/ ground communications services was implemented at Baku Heydar Aliyev International Airport in July 2021.

“Azeraeronavigation” Air Traffic Department (AZANS) has completed the implementation of a suite of technical air/ground (A/G) datalink communication services for ATC towers, airlines and airspace users at Baku Heydar Aliyev International Airport in Azerbaijan.

The joint Project of AZANS and SITAONAIR will increase safety, sustainability and operational efficiency at Baku Heydar Aliyev International Airport, and the upper Azerbaijan airspace, by enabling air traffic controllers and pilots to exchange messages in digital format.

The provided pre-Future Air Navigation Service (pre-FANS) comprising Datalink Departure Clearance (DCL), Datalink Automatic Terminal Information Service (D-ATIS) and Datalink Meteorological Information for Aircraft in Flight (D-VOLMET) air/ ground communications services at the airport will allow the transmission of meteorological data and other important aeronautical information on board of aircraft. Pre-FANS will advance Baku Heydar Aliyev International Airport air navigation operations and safety, with clear digital messaging that is more consistent and dependable than voice, while reducing controller and pilot workloads.

AZANS’ Quality Management System confirmed its high efficiency and maturity

AZANS ‘Quality Management System has confirmed its high-efficient and matured status during the re-certification in June 2021. It was the first experience of AZANS in online certification audit that was arranged distantly due to the pandemic restrictions.

The audit pretended to be different from earlier ones with increased focus on ensuring the safety of personnel’s health, assessing the risks associated with the pandemic and implementing the measures to reduce the impact of Covid 19 restrictions on AZANS operations and flight safety provision.

As far as the risk oriented approach is the integrated part of AZANS policy and safety risk assessment is the permanent non-stop process in our organization, “Azeraeronavigation” Air Traffic Department was fully prepared for certification , successfully passed the external audit and was re-certified by the German certification body DQS (Deutsche Gesellschaft für Qualität) and the International Certification Network IQ NET under the standard ISO 9001: 2015.

AZANS joined the panel of judges of the International Maverick Awards 2021

“Azeraeronavigation” ATD (AZANS) was elected in the panel of judges of the international Maverick Awards 2021. The Award founded by the CANSO and is given for achievements in the field of aeronavigation.

The CANSO International Maverick Awards recognizes outstanding achievements, successes, innovations, as well as contribution to the sustainable development in the field of air navigation and air traffic management. So, based on the points given by the judges by category, the competitive projects in each nomination are ranked from highest to lowest score. At the end of the competition, the judges determine the winners. This award is a platform for the demonstration of new bright ideas, recognizing the positive contribution to the environment and improvement of the entire aviation and ATM industry. The selection of AZANS in the judges panel is the subject of our pride and an indicator of the high international authority of our organization in the aviation community

Continuous service in lock down conditions: lessons learned from Covid-19 restrictions

The spread of COVID-19 has significantly affected the global aviation community and our industry has faced the biggest challenge in its history. The sudden cancellation of international and domestic flights across the globe, travel restrictions and lockdowns of affected areas to prevent the spread of the virus put the whole of aviation into an unprecedented crisis that resulted in an almost 90% rapid decline in air traffic.

“The only way the aviation industry can successfully navigate through these difficult times is if we all work together to ensure that aviation remains the safest and most efficient mode of transport,” CANSO Director General, Simon Hocquard says. CANSO played an important global role in this coordination process and undertook prompt actions for ANSPs in this unprecedented complex situation.

The role of the ANSP in global aviation performance in this situation proved to be vital. Whilst our airline customers were heavily hit by the crisis, with some of them fighting for survival in difficult times, air navigation service providers (ANSPs) are also experiencing severe consequences. One of the main objectives of ANSPs is to preserve the business continuity of the air transport industry. ANSPs are playing a vital role in the aviation system, without ANSPs the existence and survival of the global aviation sector is not possible.

Unlike the airlines, ANSP could not suspend operations – they need to provide continuous services to cargo delivering medical supplies and food, repatriation, humanitarian and emergency flights. And they need to continue providing safe services regardless of the drastic traffic decline, the financial losses which are perpetuated by delays in the payment of charges by airlines, and the traffic decline.

AZANS was taking extraordinary measures to ensure the health of employees during this time in order to provide the maximum level of continuity in the provision of ANS and to maintain regional and global connectivity by enhancing cleaning and disinfection protocols at its facilities, implementing “work from home” policies where feasible.

Aiming for supporing its users , AZANS was applying cost-cutting measures while covering operational and maintenance costs and trying to minimize job cuts and protecting the workforce, keeping operational and technical personnel trained and skilled to guarantee the maximum level of continuity in the provision of air navigation services to our users without jeopardizing the safety of flights and maintaining connectivity around the globe. All those actions taken by AZANS made it possible to continue to provide a safe passage for air traffic during the COVID-19 impact.

In the current circumstance, we understand that due to negative economic impact there will be certain delays in delivery of planned projects and strategies. We shall be open and ready to revisit our strategies, to revise our priorities, to reconsider planned projects in order to properly align them and adapt to new realities and to find the balance between continuity of our businesses and new strategical goals.

Now in a post pandemic period, we need to concentrate on emerging technologies and put all our efforts to accelerate the development of a new era of aviation technologies and supporting regulations. There is not much more we can do with physical characteristics of aircraft, there are no major changes to plane aerodynamics and their performance on the horizon. This brings us to the conclusion that only digital innovations could bring new benefits to flight performance and environmental protection.

ANSPs, as well as other industry players, will adapt new technologies, implement new processes and will become more resilient and anti-fragile. Brainstorming, dialog, our joint efforts and effective cooperation with other industry players and respective governments will bring us to the next level of future aviation.

Plans 2022

General

In February 2021, the framework of relevant policy and reforms of the "National priorities for socio-economic development: Azerbaijan - 2030" has been approved by the President of Azerbaijan to achieve the goals set in the new strategic period.

These national priorities are relevant to the fulfillment of the commitments arising from the United Nations 2030 Agenda for Sustainable Development (SDG 2030). Under Vision 2030, Azerbaijan is determinant to implement major national priorities for socio-economic development. Out of many priorities, five key policy areas have been outlined below:

a. A society based on inclusive, dynamic, and justice
b. Steadily growing competitive economy
c. Reconstruction and great return to liberated territories
d. Clean and green environment
e. Technological transformation, modern innovation, and competent human resource development

Three of five key areas of socio-economic development and the corresponding national priorities have found their direct reflection in AZANS Strategic Plan of Development 2021-2025 and partially in our Annual Plan for the Year 2022

I . Reconstruction and great return to liberated territories:

Construction and restoration of the aeronavigation infrastructure at Zangelan Airport

By restoring state borders, the Azerbaijani people have achieved the greatest victory in the military and diplomatic spheres. To perpetuate this victory, it is necessary to ensure the return of people who have been displaced from their native lands. This Great Return will become a bridge for the sustainable resettlement of our citizens into the territories liberated from occupation and for the integration of these territories into our country's economic activity.

The restoration of a new international and regional transport and logistics corridor in the Karabakh region will not only expand the country's access to global markets but also give significant impetus to the development of the previously occupied territories. The first step of the Great return was done in 2021 by the opening of Fuzuli International Airport.

In 2022, one more international airport in Zangilan to be constructed and put into operation. To arrange the provision of ATM\CNS service at the new airport, AZANS is planning to execute delivery, installation, testing, and set up of the radar system, CVOR\DME, ATC automated system, Voice Com system, and AWOS MET system.

The new vacancies for ATCOs, ATSEP, and MET specialists' positions are going to be opened both in Fuzuli and Zangilan airports. AZANS is preparing to arrange the transfer of professional knowledge and skills from its experts in Baku and other airports to the new generation of ATSEP, ATC, and MET officers who will occupy these new vacancies at the liberated territories.

Lachin Airport: design and site planning work to start

The foundation laying ceremony of the Lachin International Airport – the third International Airport in the Karabakh region, was held on August 16, 2021. The facility will be constructed near the mountainous village of Gorchu. The length of the runway will be 3 km; the parking lots for 6 aircraft are planned. This airport is designed to simplify visits to the Kelbajar district which has a great potential for health tourism and ski resorts development. The airport construction is expected to give an impulse to the region's socio-economic development and the return of expelled population and their descendants. It will also contribute to the establishment of regional logistical centers. AZANS intends to start the site study, designing and planning activities for aeronavigation systems and facilities for this new airport in 2022.

The strategy of development of Air Space over the liberated territories: analyzing new opportunities and new air routes network capabilities

De-occupation of the Karabakh region and re-opening the part of Azerbaijani airspace that was closed for almost 30 years will give a great impulse to the development of the new air routes network and, at the same time, could become a serious challenge.

To meet those challenges and use new opportunities, AZANS is undertaking a major program to modernize the liberated airspace structure and transform the technologies to manage air traffic.

The new Airspace Strategy will set out the initiatives that the AZANS together with partners and stakeholders will deliver to achieve the Government's policies on restoration and Great Return to the liberated territories.

Modernizing airspace, which means both route design and new tools and technologies implementation, will make air traffic management in the region more efficient, helping reduce the impact air traffic has on local communities and the environment and supporting future growth.

Creating a structured route network over the de-occupied territories AZANS will start with analyzing the airflows, new opportunities, and new air routes capabilities and with consultations with neighboring FIRs to enable more efficient solutions.

II. Technological transformation, modern innovation, and competent human resource development

ATCOs licensing and ATC workflows efficiency improvement

AZANS plans to introduce two new automated systems that will improve the efficiency of the processes related to ATC personnel licensing and rostering.

The first system will support the process of maintaining the competence of the AZANS air traffic controllers, OJTIs, and Assessors. ATCOs will receive the messages which are of concern to them, all according to their ratings and dedicated unit. The system will also forward the automated warnings about due expirations of certain licenses and ratings in time, so they can perform all the necessary procedures to renew the expiring licenses. All supervisors and managers will be able to immediately check the competency of their dedicated personnel which provides a very important safety element of the chain.

Another soft will automate the process of ATCOs working hours calculation to assure the required number of hours to be spent at the ATC working positions by each ATCO for maintaining his/her ratings and endorsements. Moreover, the system will improve AZANS ATCOs rostering and planning of ATCOs workforces. Each ATCO will be able to easily check his schedule, and also the schedule of his colleagues according to the unit they are assigned to. Every change in the roster is immediately available to everyone with appropriate clearance, and, if the change has been made, all ATCOs involved in this change can get immediate notification via the system, e-mail, and/or SMS.

III. Clean and green environment

Sustainable Development: Environmentally oriented ANSP

In October 2021, the global air transport industry has adopted a long-term climate goal of net-zero carbon emissions by 2050, confirming the commitment of the world's airlines, airports, air traffic management, and the makers of aircraft and engines to reduce CO2 emissions in support of the Paris Agreement 1.5°C goal. In a signed declaration the representatives of the world's major aviation industry associations (including CANSO and IATA) and largest aircraft and engine makers committed that "global civil aviation operations will achieve net-zero carbon emissions by 2050, supported by accelerated efficiency measures, energy transition and innovation across the aviation sector and in partnership with Governments around the world." It means that one of the 17 UN Sustainable Development Goals related to Climate and Environment protection has found its direct reflection in this joined manifest of the aviation industry, and the ANSPs worldwide encouraged by the national Governments must commit to the achievement of these goals and concentrate on implementation of the relative tasks.

AZANS defined its Sustainable Development Policy focusing on introducing the environment-friendly ANSP concept and declaring the company's vision as " striving for meeting the needs of its users and society in general while minimizing any negative impacts on the local and global environment and maximizing its contribution to the national economy".

In 2022, AZANS will adhere to the Strategy through the elaboration of the Sustainable Development Plan 2030. The Plan will focus on defining and achieving the concrete quantitative and qualitative targets of Sustainable Development and tasks supporting this achievement.

As the first step in this direction, AZANS will analyze the current status of the CO2 emissions produced by the airplanes using the existing route network and will try to find further opportunities for improvement to optimize the network to be resulting in minimization of emissions volume. For this purpose, the data analysis system, including Environmental Impact (CO2 emissions) analyzer, is planned for installation and implementation in the next year.

1. The airspace of the Republic of Azerbaijan

Baku Flight Information Region (UBBA FIR)

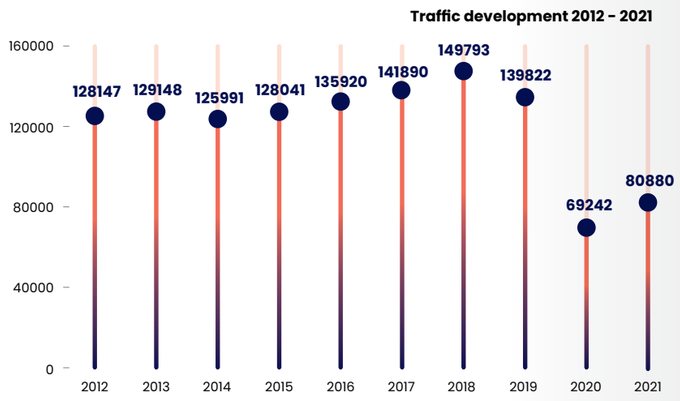
1.1 Traffic development

In Azerbaijan, the number of flights under instrument flight rules (IFR) recorded in 2021 is 80880 and it is a growth of 16.8% compared to 2020. Average number of IFR flights in Baku FIR has reached 222 aircraft per day. It should be noted that the impact of the COVID-19 pandemic on the aviation industry has been preserved and the decrease of traffic within Baku FIR is 40% compared to the pre-pandemic 2019. Also, overflight flows Europe – South and South-East Asia have significantly changed, due to the closure of Afghanistan's airspace since August 16, 2021. Historically, this flow passed through the South Caucasus region and every day up to 70 flights are forced to fly via alternative routes that do not pass through Baku FIR.

80880
THE NUMBER OF FLIGHTS UNDER INSTRUMENT FLIGHT RULES [IFR]

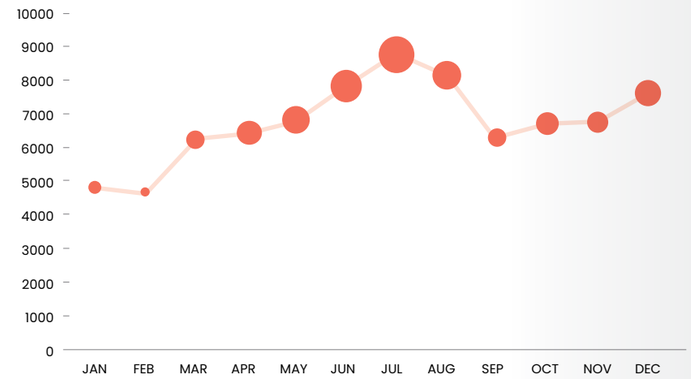
16.8%
A GROWTH COMPARED TO 2020

222
AVERAGE FIGURE OF NUMBER OF IFR FLIGHTS



Picture 1.1 | Baku FIR traffic development by year.

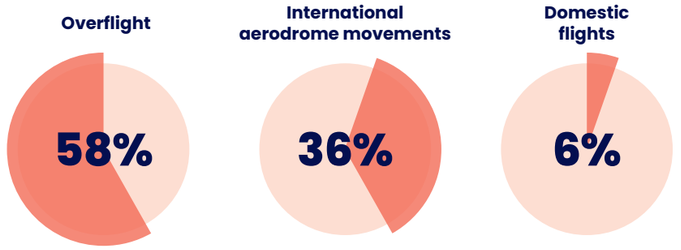
Most month traffic was recorded in July (8709 IFR flights) and peak day was recorded on July 17, 2021 (312 IFR flights).



Picture 1.2 Baku FIR traffic development by months of the year.

1.2 Traffic segments

In 2021, 58% of the flights in Baku FIR was overflights, 6% was domestic flights within Azerbaijan and the remaining 36% was international flights, arriving at or departing from airports of the Republic of Azerbaijan. Shares of traffic segments are similar to previous 10 years with a tiny variation of 1-2%.



Picture 1.3 Baku FIR traffic segments

1.3 Capacity vs traffic

AZANS has established the following criteria of the capacity for ATC sectors:

ATC Unit/Sector	Capacity ACFT/Hour
Baku ACC West	42
Baku ACC East	51
Baku ACC sector "SOUTH"	15
Baku APP	27
Baku Tower	27
Ganja TWR	15
Nakhchivan TWR	10
Fuzuli TWR	10
Gabala TWR	6
Lenkaran TWR	3
Zagatala TWR	4
Yevlakh TWR	4

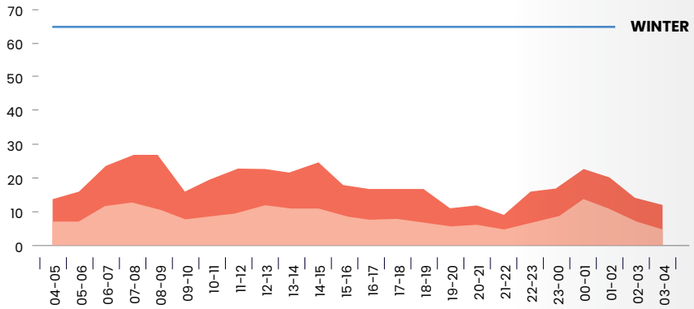
Capacity of FIR Baku is 65 ACFT/hour and published in LSSIP Azerbaijan. Existing capacity meets traffic demand. The highest traffic volume of 31 ACFT/hour were recorded on July 25, 2021 between 23:00 and 23:59 UTC.

The most congested peak hours (average data) are:

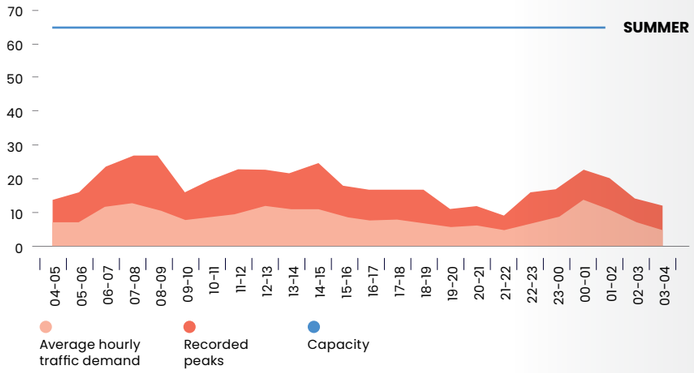
14
ACFT/hour
between 00:01 and 01:00 UTC (Winter season)

12
ACFT/hour
between 00:01 and 01:00, 07:01 and 08:00, 14:01 and 15:00, 23:01 and 00:00 UTC (Summer season)

The following picture reflects the average traffic by hour vs capacity of Baku FIR.

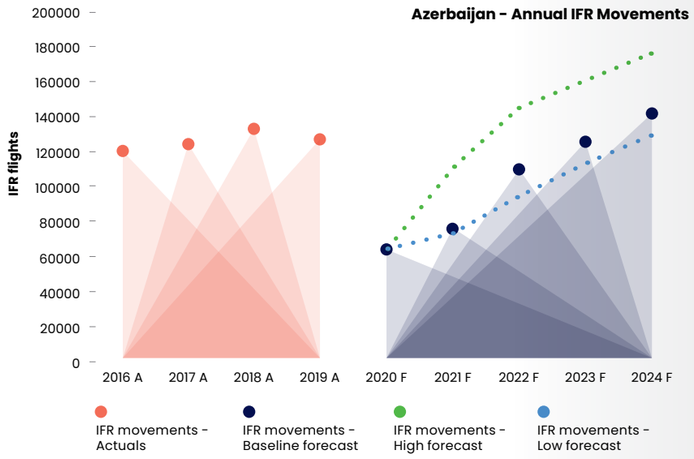


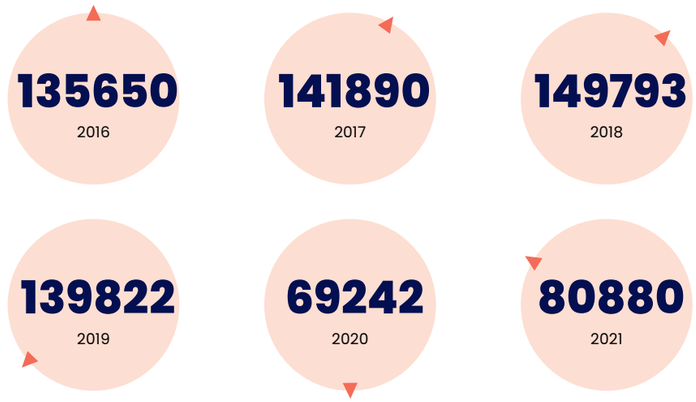
Picture 1.4 Hourly traffic volume vs Baku FIR capacity (WINTER)



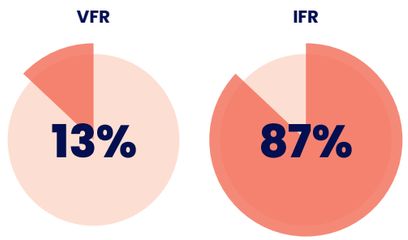
Picture 1.5 Hourly traffic volume vs Baku FIR capacity

1.4 The forecast is based on Eurocontrol's five-year forecast 2020 – 2024 where recover of the traffic after COVID-19 pandemic is predicted starting from 2022. Significant growth of 48.3% is predicted in 2022 and an average annual traffic growth between 15% and 10% and in 2023 and 2024. It shall be noticed that COVID-19 pandemic factor is not the only factor affected to traffic growth in Azerbaijan. The airspace of Afghanistan has been closed for overflight traffic due to the internal political processes of Afghanistan since August 16, 2021. This restriction has affected the 30-40% decline in transit flights through Azerbaijan.





1.5 The total number of flights recorded in 2021 is **92903** where **80880** flights are under instrument flight rules (IFR) and **12023** flights are under visual flights rules (VFR). Average number of flights in Baku FIR is **255** aircraft per day. It is a growth of **13.5%** compared to 2020. Shares of IFR flights has been decreased by 2% when share VFR flights has been increased by 2% in comparison with 2020.



2. Overflight

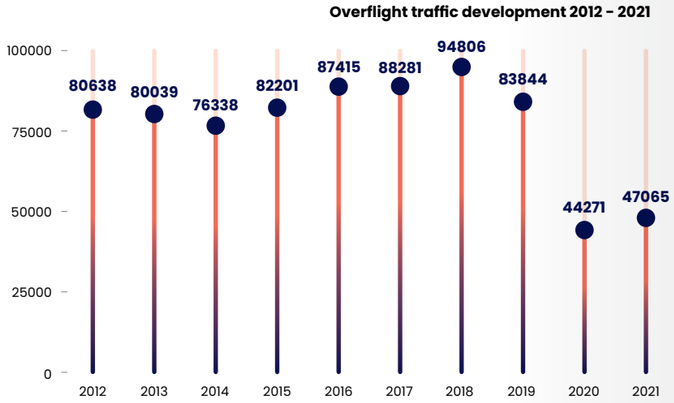
2.1 Traffic development

The number of overflights recorded in 2021 increased to a total of 47065 and it is a growth of 6.3% compared to 2020. Average figure of a number of daily overflights via Baku FIR in 2021 is 129 aircraft per day.

47065
THE NUMBER OF OVERFLIGHTS RECORDED IN 2021

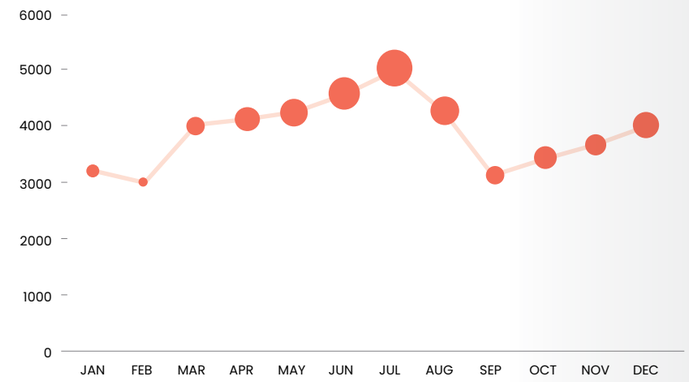
6.3%
A GROWTH COMPARED TO 2020

129
AVERAGE FIGURE OF NUMBER OF IFR FLIGHTS



Picture 2.1 Overflight traffic development by year

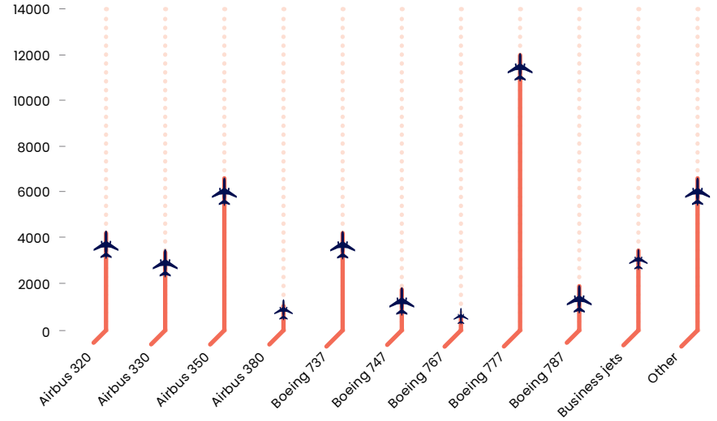
Most month traffic was recorded in July (5016 ACFT) and peak day was recorded on November 07, 2021 (193 ACFT).



Picture 2.2 Overflight traffic development by months of the year

2.2 Aircraft types

More than 70% of aircraft of the overflight traffic is wide-body long-distance aircraft. It is a decline of 10% of share wide-body long-distance comparison with pre-pandemic 2019 while the share of general aviation (business jets) increased by 3 times.



Picture 2.3 Types of aircraft of the overflight traffic

2.4 Traffic flows

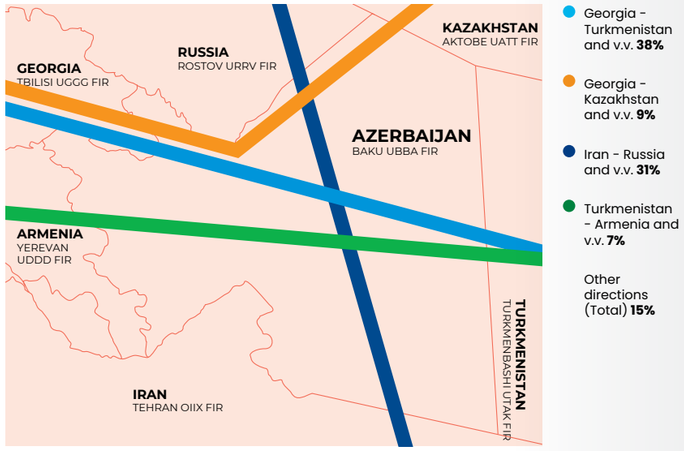
Complicated political processes in a number of neighboring regions are still existed. ICAO, IATA, EASA and/or National Civil aviation authorities issued notifications and recommendations to avoid the airspaces of eastern Ukraine, Iraq, Syria, Iran and Afghanistan.

These restrictions impacted the direction of traffic flows through the airspace of the Republic of Azerbaijan. Particularly, the closure of Afghanistan's airspace since August 16, 2021 has led to impoverishment of overflight flows Europe – South and South-East Asia via Baku FIR.

The main traffic flows over Azerbaijan in 2021 are shown in the picture below.

The outcomes of the overflight flows structure in comparison with 2020 are following:

- Decrease by 21% from total of East - West flow share due to closure of Afghanistan's airspace;
- Increase by 15% from total of South – North flow share. One of the reasons is the strict COVID-19 restrictions in Europe, subsequently growth of flights from Russia to the resorts of Middle East and Indian ocean.



Picture 2.4 Main overflight traffic flows

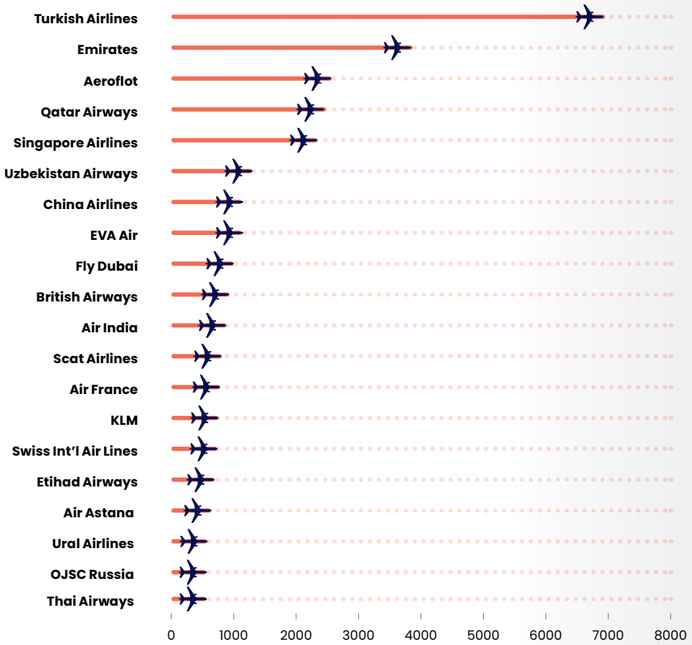
2.4 Airspace users

About 70 different airlines (passenger and cargo) make scheduled flights through the airspace of the Republic of Azerbaijan. Scheduled flights form 95% of the total number of transit flights.

Whole aviation industry has been affected by spread of COVID-19 pandemic. Even though most of airlines began scheduled operations from beginning of 2021 the pre-pandemic operations has not been recovered in full volume.

Also, operations of all airlines from Europe to South-East and South Asia and v.v. were affected by closure of the Afghanistan airspace as they were forced to fly via contingency routings.

New airspace users: Alis Cargo Airlines, Spicejet



Picture 2.5 Top 20 airspace users.

3. Baku/Heydar Aliyev International airport.

(IATA: GYD, ICAO: UBBB)

3.1 Traffic development

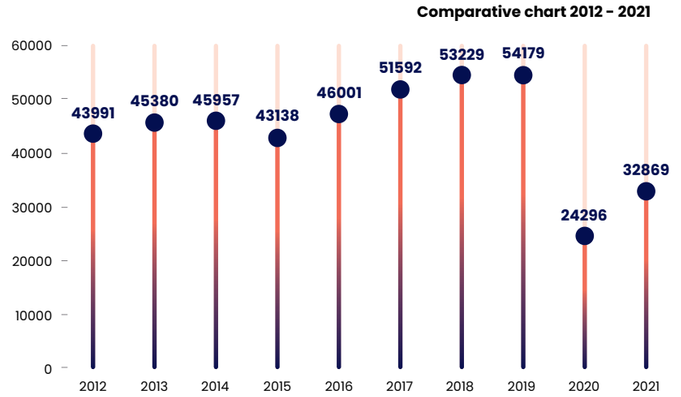
Baku/Heydar Aliyev International airport is the air gate of the capital of the Republic of Azerbaijan. It is the busiest airport in Azerbaijan and in the Caucasus region.

Total number of aerodrome movements recorded in 2021 is 32869 aircraft. Traffic increased by 35.3% compared to 2020. Average figure of number of aerodrome movements at the Baku/Heydar Aliyev International airport is 91 aircraft per day. The impact of the COVID-19 pandemic on the aviation industry has been preserved and the decrease of traffic at Baku/Heydar Aliyev International airport is 39.3% compared to the pre-pandemic 2019.

32869
TOTAL NUMBER OF AERODROME MOVEMENTS RECORDED IN 2021

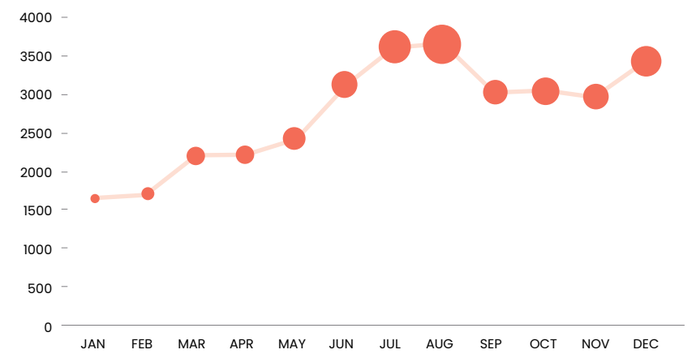
35.3%
A GROWTH COMPARED TO 2020

91
AVERAGE FIGURE OF NUMBER OF IFR FLIGHTS



Picture 3.1 Baku/Heydar Aliyev International airport traffic development by year

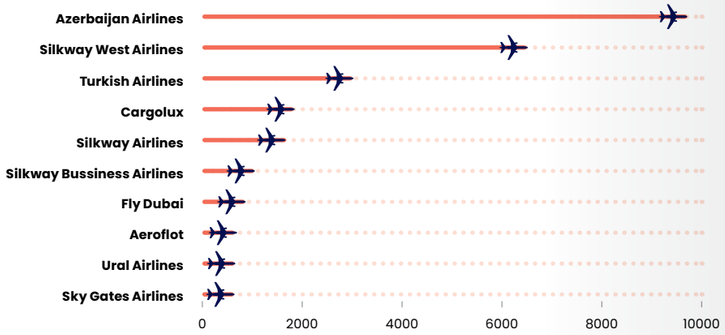
July - August is the most congested period time. Most month traffic was recorded in August (3664 movements) and peak day was recorded on December 24, 2021 (138 movements).



Picture 3.2 Baku/Heydar Aliyev International airport traffic development by month

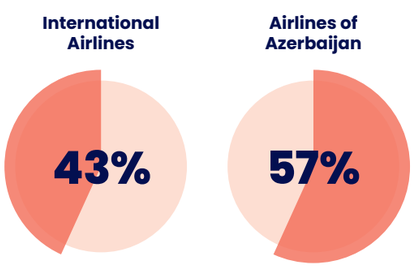
3.2 Airlines

Baku/Heydar Aliyev International airport is the home base for “Azerbaijan Airlines” national career of Azerbaijan and aircompanies of “Silkway Group”. More than 30 different airlines (passenger and cargo) make scheduled flights to Baku: Turk Hava Yollari, CARGOLUX, Qatar Airways, Lufthansa, Aeroflot, Fly Dubai, Kuwait Airlines, Air Arabia, Wizz Air, Flynas, Pegasus Airlines, etc.



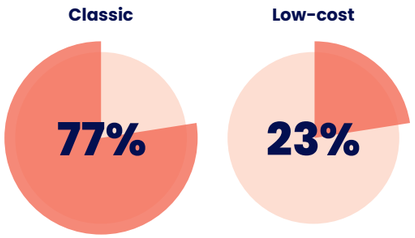
Picture 3.3 Top 10 airspace users

Share of airlines of Azerbaijan decreased by 7% in comparison with year 2020.



Picture 3.4 Share of traffic: International Airlines vs Airlines of Azerbaijan

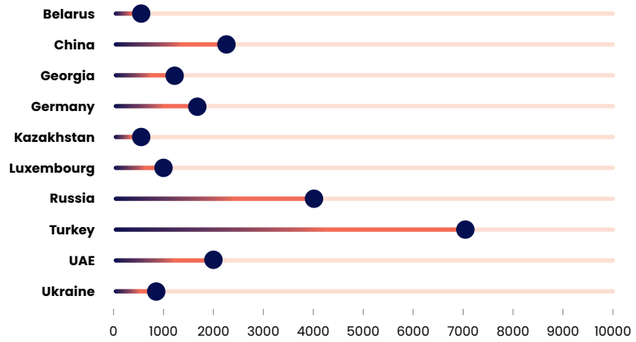
Operations of low-cost airlines has been recovered in March 2021 after a year break due to COVID-19 pandemic. Total number of low-cost airlines by the end of 2021 achieved to 8 (eight) (Buta Airways, Fly Dubai, Wizz Air/Wizz Air Abu Dhabi, Jazeera Airways, Air Arabia, Flynas, SkyUp and Pegasus Airlines).



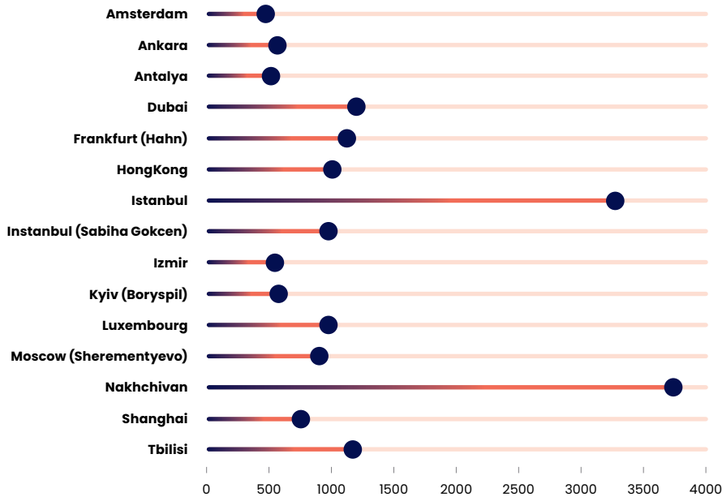
Picture 3.5 Share of traffic: Low-cost Airlines vs Classic Airlines

3.3 Destinations

Scheduled flights are performed from Baku to more than 20 countries and to more than 50 destinations.



Picture 3.6 Top destinations by country

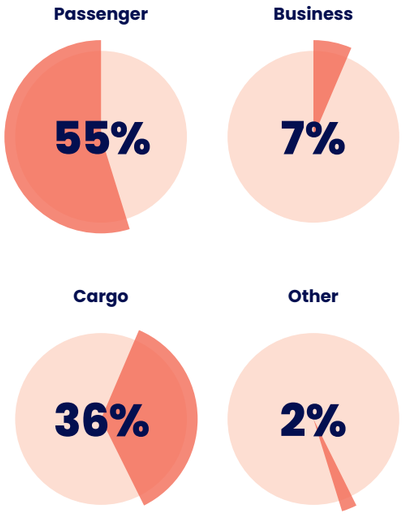


Picture 3.7 Top destinations by airport.

3.4 Type of flights

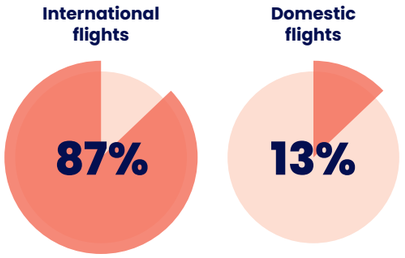
Infrastructure of the International airport Heydar Aliyev allows to provide service to all types of flight. Two passenger terminals ensures capacity of 6 million passenger per year. Separate terminal and apron are allocated for business aviation. Baku Cargo Terminal is one of the biggest and most technically advanced cargo terminals in CIS. The technical base of the terminal provides storage and processing of all kinds of cargoes in conformity to the world standards.

Growth of share of general (business) aviation by 3% and cargo flights by 20% is recorded when share of passenger flights is decreased by 23% compared with pre-pandemic year 2019.



Picture 3.8 Share of traffic: types of flight

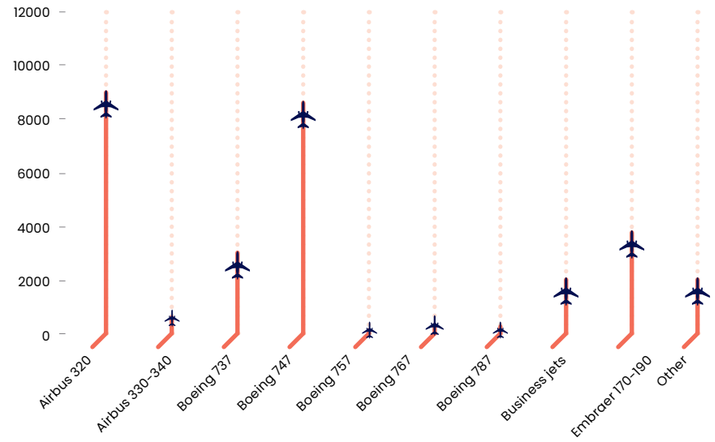
Share of domestic flights is increased by 3% compared with pre-pandemic year 2019.



Picture 3.9 Share of traffic: international flights vs domestic flights

3.5 Types of aircraft

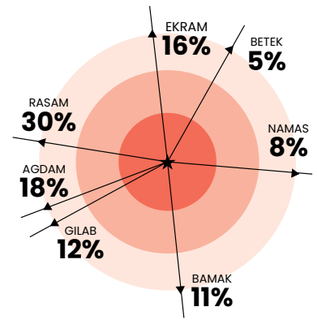
International airport Heydar Aliyev is capable to provide services to all types of aircraft, including Airbus 380 and Antonov 225 “Mriya”.



Picture 3.10 Types of aircraft

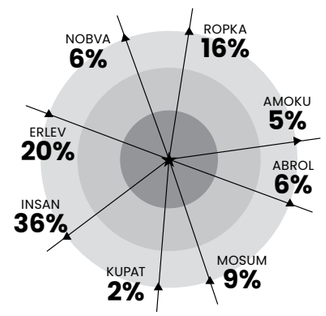
3.6 Load of SID and STAR

Baku/Heydar Aliyev Departure Flows



Picture 3.10 Load of SID (standard departure)

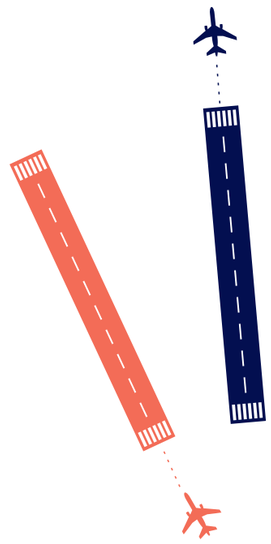
Baku/Heydar Aliyev Arrival Flows



Picture 3.11 | Load of STAR (standard arrival)

3.7 Traffic flows

3.8 Use of RWY 16/34 and 17/35



Take-off

RWY 16/34	39%
RWY 17/35	61%

Landing

RWY 16/34	41%
RWY 17/35	59%

Total

RWY 16/34	40%
RWY 17/35	60%

4. Regional aerodromes

There are 6 international airports (Ganja, Nakhchivan, Fuzuli, Gabala, Lenkaran, Zaqatala) and 2 domestic airports (Yevlakh and Baku (Zabrat)) in Azerbaijan.

4.1 Nakhchivan International airport (ICAO: UBBN)

Nakhchivan International airport is the only air gateway of the Nakhchivan Autonomous Republic, a landlocked exclave of Azerbaijan. It was built in 1976 and completely reconstructed in 2002-2004.

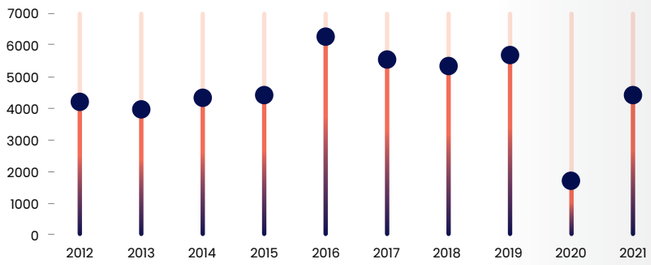
Regular flights to Nakhchivan were cancelled in April 2020 due to COVID-19 pandemic. Regular operations from Baku and Istanbul were re-launched in July 2020 with a limited volume of pre-pandemic schedule and have been fully recovered by July 2021. Scheduled flights to Baku, Ganja, Istanbul and Moscow are operated from Nakhchivan.

Total number of aerodrome movements in 2021 is 4587 aircraft. Traffic increased by 150.2% compared to 2020 and decreased by 16.0% compared to pre-pandemic year 2019. Average figure of number of aerodrome movements at the Nakhchivan International airport in 2021 is 13 aircraft per day.

4587
TOTAL NUMBER OF AERODROME MOVEMENTS RECORDED IN 2021

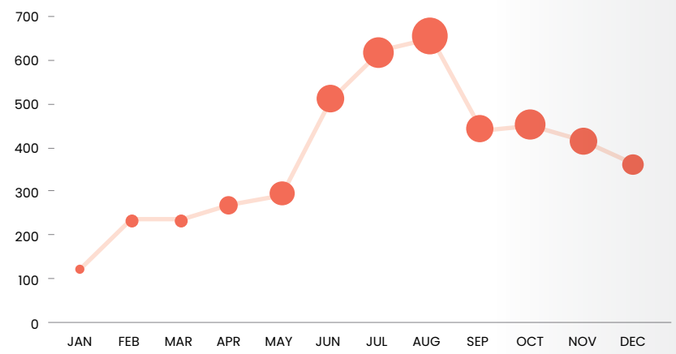
150.2%
A GROWTH COMPARED TO 2020

13
AVERAGE FIGURE OF NUMBER OF IFR FLIGHTS



Picture 4.1 Nakhchivan International airport traffic development by years

UBBN - Nakhchivan



Picture 4.2 Nakhchivan International airport traffic development by months of the year

4.2 Ganja International airport (ICAO: UBBG)

Ganja International airport is an airport serving Ganja, the second largest city in Azerbaijan. It was reconstructed in 2006.

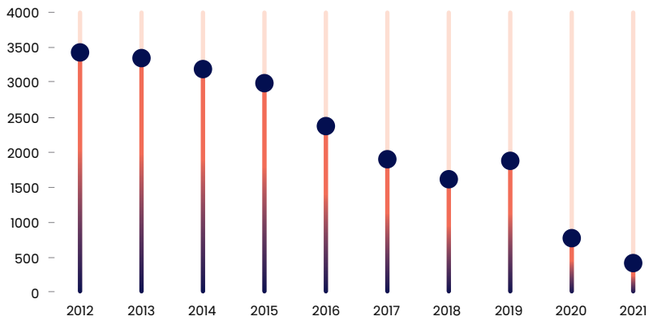
Regular operations to Ganja were cancelled in April 2020 due to COVID-19 pandemic and re-launched in May 2021 with a limited volume of pre-pandemic schedule. Scheduled flights from Nakhchivan, Istanbul, Moscow, St. Petersburg, Odessa are operated to Ganja.

Total number of aerodrome movements in 2021 is 445 aircraft. Traffic decreased by 41.3% compared to 2020 and by 77% compared to pre-pandemic year 2019. Average figure of number of aerodrome movements at the Ganja International airport in 2021 is 2 aircraft per day.

445
TOTAL NUMBER OF AERODROME MOVEMENTS RECORDED IN 2021

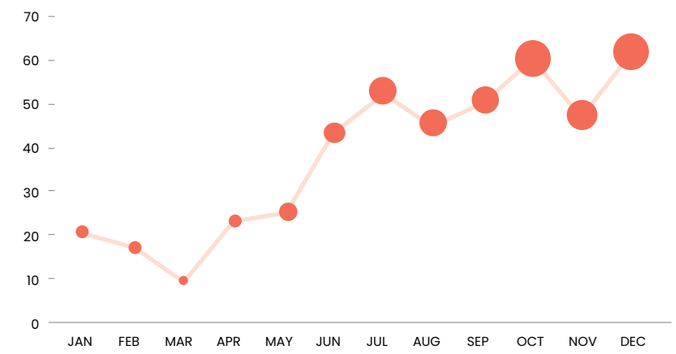
-41.3%
A GROWTH COMPARED TO 2020

2
AVERAGE FIGURE OF NUMBER OF IFR FLIGHTS



Picture 4.3 Ganja International airport traffic development by years

UBBG - Ganja



Picture 4.4 Ganja International airport traffic development by months of the year

4.3 Gabala International airport (ICAO: UBBQ)

Gabala International airport is an airport of Gabala city located in the north-west of Azerbaijan. Construction of Gabala airport started in 2011 and was inaugurated by the President of the Republic of Azerbaijan, Ilham Aliyev on 17 November 2011.

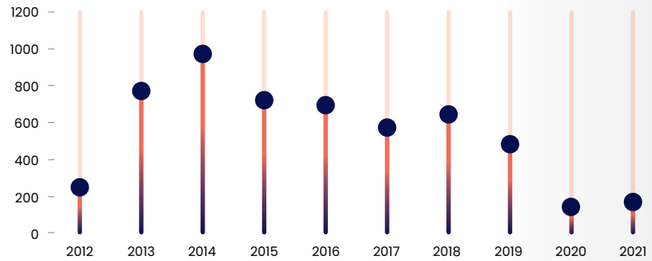
No scheduled flights are operated in 2021.

Total number of aerodrome movements in 2021 is 184 aircraft. Traffic increased by 2.8% compared to 2020 and decreased by 63.3% compared to pre-pandemic year 2019.

184
TOTAL NUMBER OF AERODROME MOVEMENTS RECORDED IN 2021

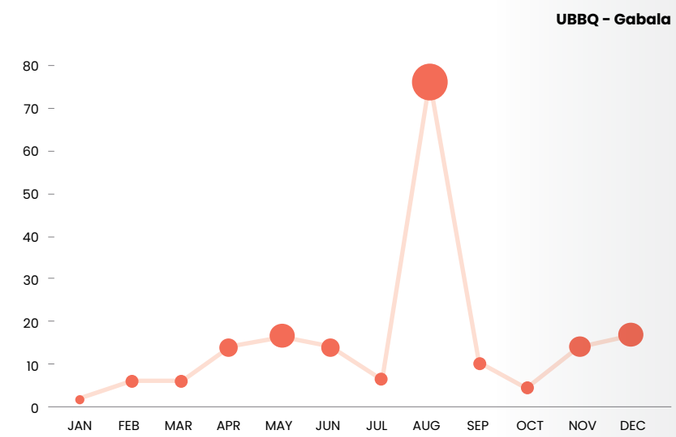
2.8%
A GROWTH COMPARED TO 2020

0
AVERAGE FIGURE OF NUMBER OF IFR FLIGHTS



Picture 4.5 Gabala International airport traffic development by years

Gabala TWR is also responsible for ATS provision for VFR flights to/from helipads in the vicinity of Gabala aerodrome (Gabala, Sheki, Ismailli).



Picture 4.2 Gabala International airport traffic development by months of the year

4.4 Lenkoran International airport (ICAO: UBBL)

Lenkoran International airport is located in the town of Lenkoran in the south-east of Azerbaijan. Reconstruction of the Lenkoran airport was started in 2005 and was finished in 2008.

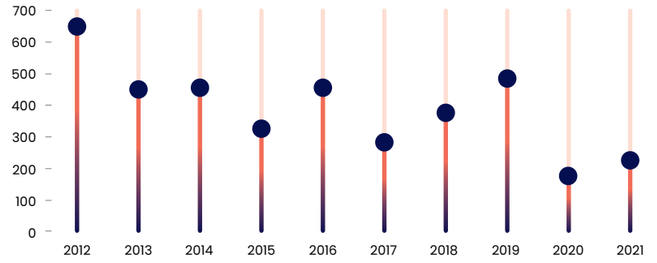
Regular flights to Lenkoran were cancelled in April 2020 due to COVID-19 pandemic and have been recovered since June 2021. Scheduled flights to Moscow, St. Petersburg and Novosibirsk are operated from Lenkoran.

Total number of aerodrome movements in 2021 is 245 aircraft. Traffic increased by 50.3% compared to 2020 and decreased by 50.7% compared to pre-pandemic year 2019.

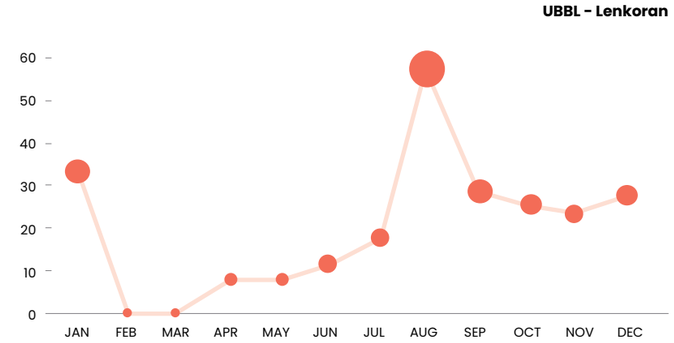
245
TOTAL NUMBER OF AERODROME MOVEMENTS RECORDED IN 2021

50.3%
A GROWTH COMPARED TO 2020

0
AVERAGE FIGURE OF NUMBER OF IFR FLIGHTS



Picture 4.7 Lenkaran International airport traffic development by years



Picture 4.8 Lenkoran International airport traffic development by months of the year

4.5 Fuzuli International airport (ICAO: UBFF)

Fuzuli International airport is an airport in the city of Fuzuli and an air gateway to the territories liberated from occupation. The airport was built in 2021 within 8 months on an airdrome that has been abandoned for almost 30 years and was surrounded by former minefields. Fuzuli International Airport was officially inaugurated by the President of the Republic of Azerbaijan, Ilham Aliyev and President of Turkey, Recep Tayyip Erdoğan on October 26, 2021.

No scheduled flights are operated in 2021. Total number of aerodrome movements in 2021 is 170 aircraft.

4.6 Zagatala International airport (ICAO: UBBY)

Zagatala International airport is an airport serving Zagatala city. It is located at the southern foot of the Main Caucasus range. The latest reconstruction of the airport terminal was completed in 2008, after which the airport received an international status. Zagatala International airport was closed since March 2014 due to reconstruction works on the runway and has been re-opened in October 2018.

No scheduled flights are operated in 2021. Total number of aerodrome movements in 2021 is 8 aircraft.

4.7 Yevlakh airport (ICAO: UBEE)

Yevlakh airport is an airport serving the city of Yevlakh. Complete reconstruction of Yevlakh airport was completed in September 2013. Yevlakh airport does not have status of "international airport".

No scheduled flights are operated in 2021. Total number of aerodrome movements in 2021 is 24 aircraft.

4.8 Baku/Zabrat airport (ICAO: UBTT)

Baku/Zabrat airport is home base airport of "Silk Way Helicopter Services"(SWHS) company. Fleet of SWHS consists of the following types of aircraft: Augusta Westland AW139, MI171, Sikorsky S92, Eurocopter Super Puma AS332, Eurocopter Dauphin EC155 and Cessna 172. Main objective of SWHS is the provision of services for and support of the oil industry of the Republic of Azerbaijan (flights to ships and offshore drilling rigs, air patrolling and monitoring of oil and gas pipelines). In addition to this SWHS provides the following services:

- transportation of passengers, VIP flights;
- transportation of cargo;
- Medical Evacuation (Medivac);
- Emergency Medical Service (EMS);
- Search and Rescue operations (SAR)

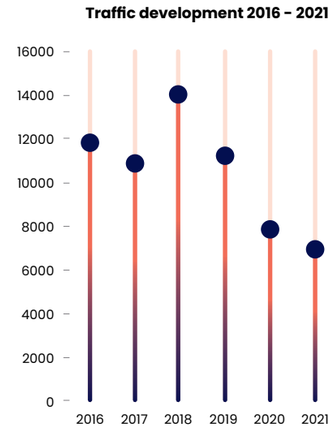
Baku/Zabrat airport is also base for training of student-pilots of National Aviation Academy. Training program includes en-route flights, take-off, landing and go around maneuvers on Cessna-172.

Total number of aerodrome movements in 2021 is 6682 aircraft. Traffic decreased by 11.5% compared to 2020. Average figure of number of aerodrome movements at Baku/Zabrat airport in 2021 is 19 aircraft per day.

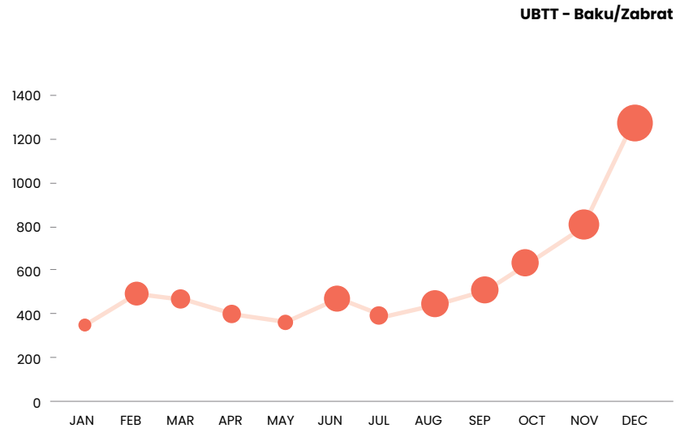
6682
TOTAL NUMBER OF AERODROME MOVEMENTS RECORDED IN 2021

-11.5%
A GROWTH COMPARED TO 2020

19
AVERAGE FIGURE OF NUMBER OF IFR FLIGHTS



Picture 4.11 Baku/Zabrat airport traffic development by years



Picture 4.12 Baku/Zabrat airport traffic development by months of the year

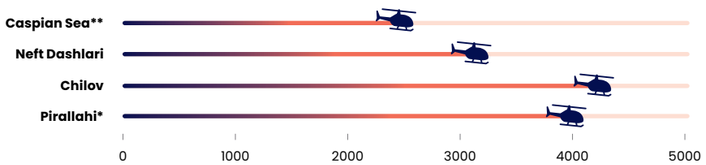
ATC staff of Baku/Zabrat airport is also responsible for ATS provision for helicopter flights in the Caspian Sea. The Sea is divided on the sectors where Chilov, Neft Dashlari and Pirallahi TWRs are providing ATS according to their area of responsibility.

Total number of helicopter flights in the water area of the Caspian Sea in 2021 is 8288 helicopters. Traffic increased by 1.9% compared to 2020. Average number of flights in the water area of the Caspian Sea in 2021 is 23 helicopters per day.

8288
TOTAL NUMBER OF HELICOPTER FLIGHTS IN THE CASPIAN SEA IN 2021

1.9%
TRAFFIC DECREASED COMPARED TO 2020

23
AVERAGE NUMBER OF FLIGHTS IN THE CASPIAN SEA IN 2021



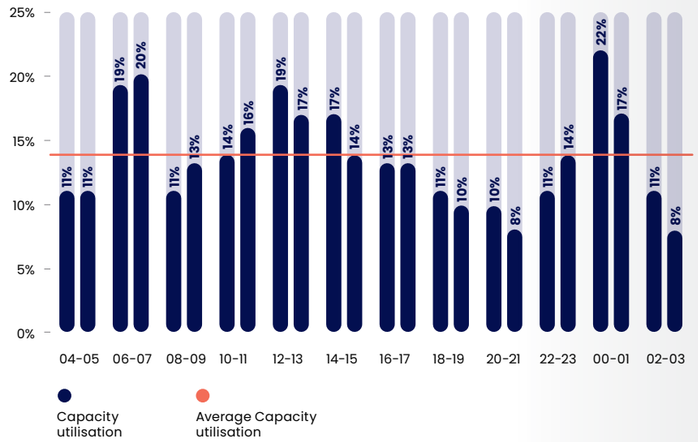
* Heliport
** Helipads on the ships and offshore drilling rigs

Picture 4.13 Helicopter flights to/from heliports and helipads in the water area of the Caspian Sea

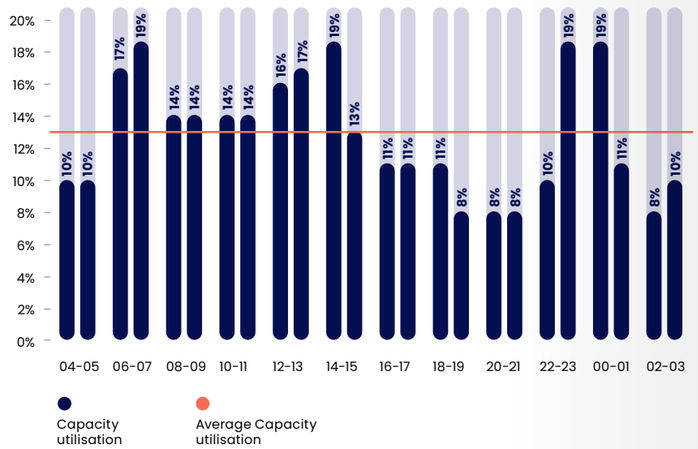
5. Key Performance Indicators

5.1 KPI - Capacity Utilization

Capacity utilisation assesses how effectively capacity is managed. It is a measure of accommodated demand, compared to the available capacity of Baku FIR. AZANS has declared capacity of Baku FIR of 65 ACFT/Hour. KPI - Capacity Utilization is calculated by the formula: the value of "accommodated demand" is divided by the value of "capacity" and is multiplied by 100%.



Picture 5.1 KPI Capacity Utilization – Winter Season



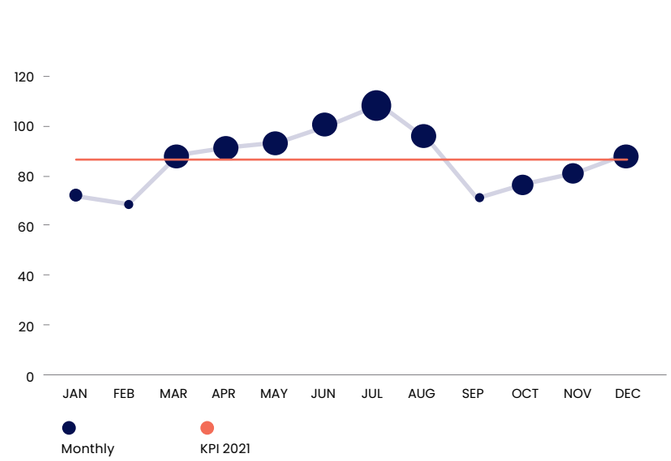
Picture 5.2 KPI Capacity Utilization – Summer Season

5.2 KPI – Staff Productivity

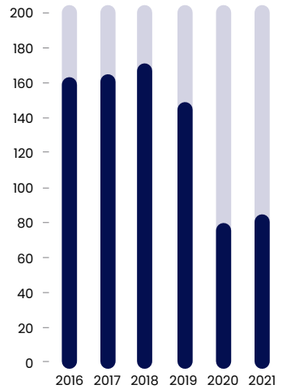
KPI Staff productivity is a measure of the production output per staff member employed or per hours worked

5.2.1 KPI – Staff productivity (En-route)

«KPI – Staff Productivity» is calculated by the formula: the value of "number of aircraft" is divided by the value of "number of ATCOs". Overflight traffic data only is used for calculation of Staff productivity (En-route). KPI is ACFT/ATCO Staff productivity (ENR) 2021 – **86 ACFT/ATCO**



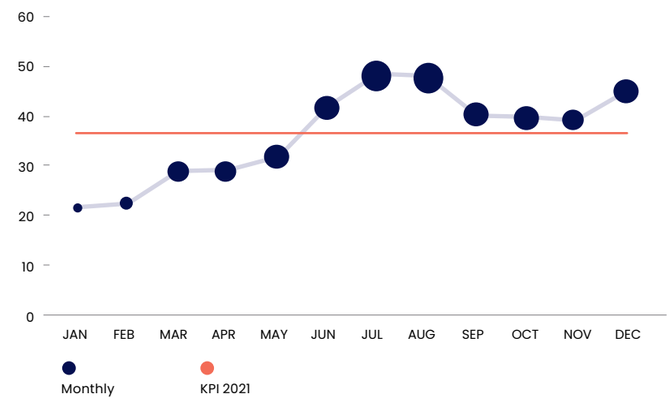
Picture 5.3 KPI Staff productivity (En-route) 2021



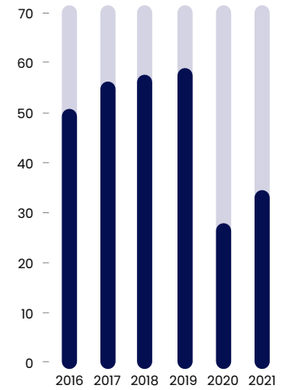
Picture 5.4 KPI – Staff productivity (En-route). Comparative chart 2016 – 2021

5.2.2 KPI – Staff productivity (TMA)

«KPI – Staff Productivity» is calculated by the formula: the value of "number of aircraft" is divided by the value of "number of ATCOs". Aerodrome movements data of Baku/Heydar Aliyev and other aerodromes within Baku TMA is used for calculation for KPI – Staff productivity (TMA). KPI is ACFT/ATCO
Staff productivity (TMA) 2021 – **36 ACFT/ATCO**



Picture 5.5 KPI Staff productivity (Baku TMA) 2021

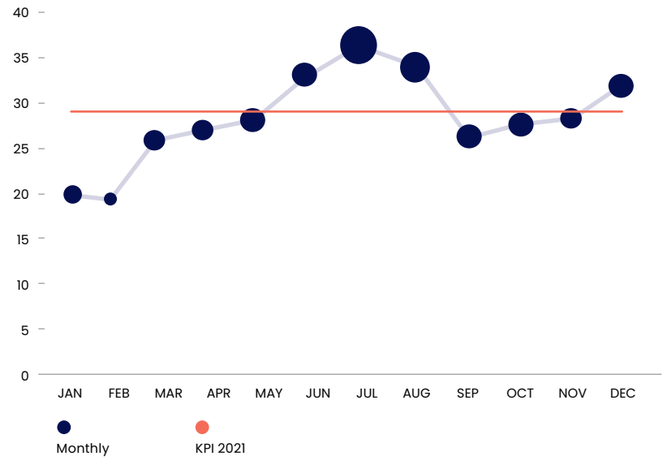


Picture 5.6 KPI – Staff productivity (Baku TMA). Comparative chart 2016 – 2021

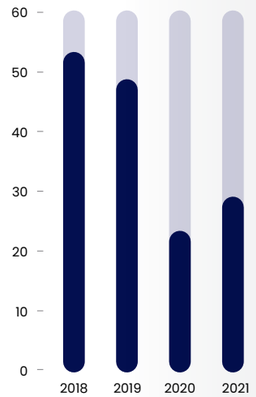
5.2.3 KPI – Staff productivity (ATCO's workload)

«KPI – Staff Productivity (ATCO's workload)» is calculated by the formula: the value of "flight hours controlled" is divided by the value of "number of ATCOs". KPI is Hour/ATCO

Staff productivity (ATCO's workload) 2021 – **29 Hour/ATCO**



Picture 5.7 KPI – Staff productivity (ATCO's workload)



Picture 5.8 KPI – Staff productivity (ATCO's workload). Comparative chart 2018 – 2021

5.3 KPI – Traffic Efficiency

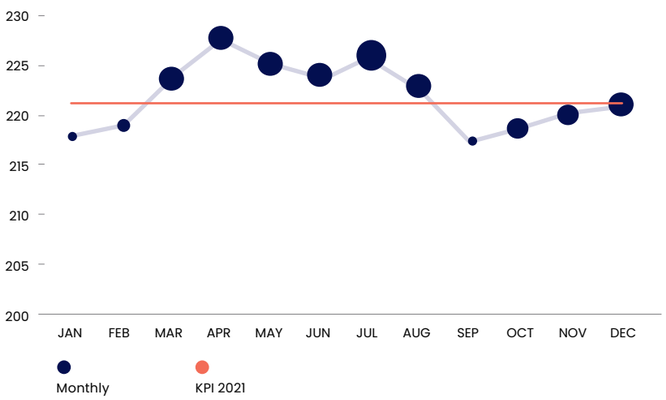
KPI-Traffic Efficiency is a calculation of average distance flown by ACFT.

«KPI – Traffic Efficiency» is calculated by the formula the value of "total flown distance in nautical miles" is divided by the value of "number of ACFT". KPI is NM/ACFT

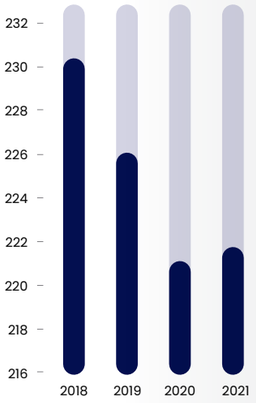
5.3.1 KPI – Traffic efficiency (FIR)

All the traffic data of Baku FIR (overflight and aerodrome movements) is used for calculation of Traffic efficiency (FIR).

Traffic Efficiency (FIR) – **222 NM/ACFT**



Picture 5.9 KPI – Traffic efficiency (FIR)

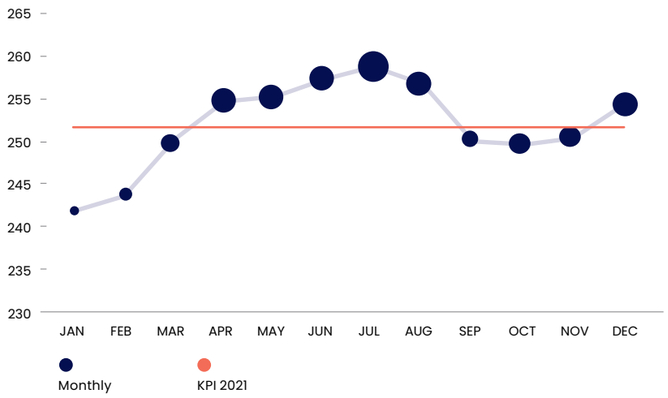


Picture 5.10 KPI – Traffic efficiency (FIR). Comparative chart 2018–2021

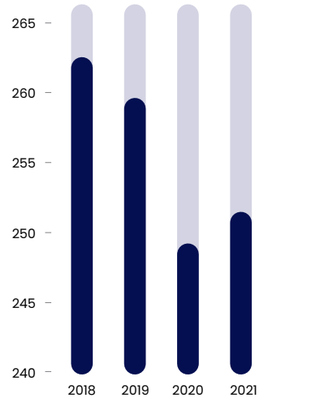
5.3.2 KPI – Traffic efficiency (ENR)

Only overflight traffic data is used for calculation of Traffic efficiency (ENR).

Traffic efficiency (ENR) – **252 NM/ACFT**



Picture 5.11 KPI – Traffic efficiency (ENR)

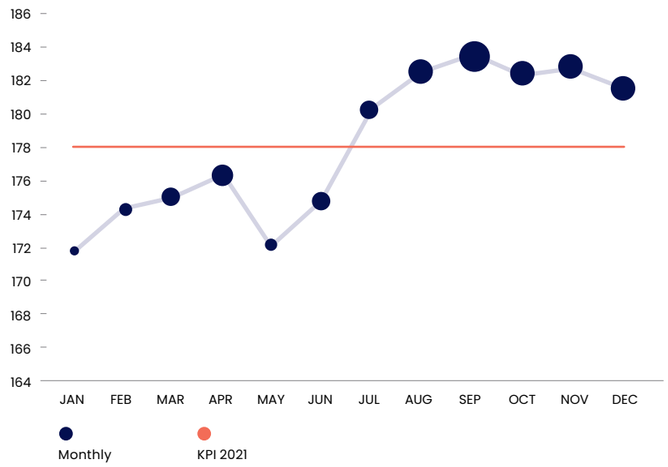


Picture 5.12 KPI – Traffic efficiency (ENR). Comparative chart 2018–2021

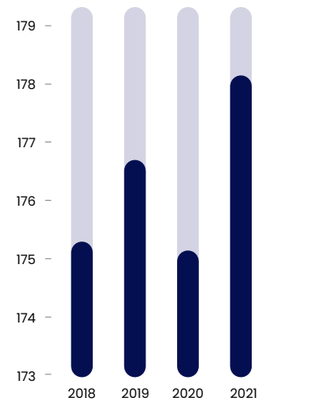
5.3.3 KPI – Traffic efficiency (AD)

Only aerodrome movements data is used for calculation of Traffic efficiency (AD).

Traffic efficiency (AD) – **179 NM/ACFT**



Picture 5.11 KPI – Traffic efficiency (AD)



Picture 5.12 KPI – Traffic efficiency (AD). Comparative chart 2018–2021

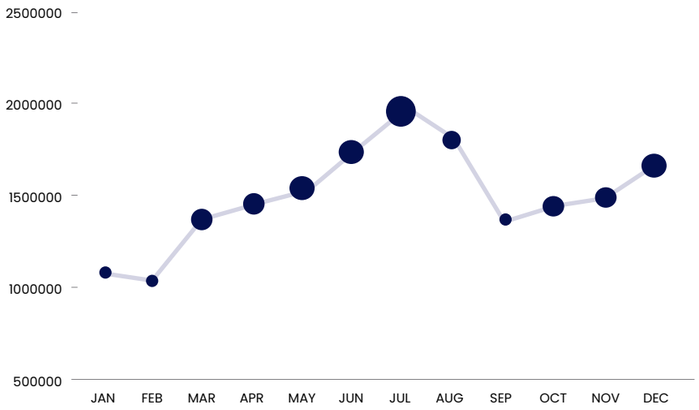
5.4. KPI – Flown distance

KPI – Flown distance is a total flown distance. KPI is NM

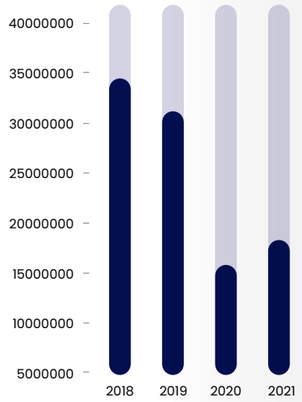
5.4.1 Total flown distance - FIR Baku

All the traffic data of Baku FIR (overflight and aerodrome movements) is used for calculation of Total flown distance (FIR).

Total flown distance (FIR) – **17 943 621 NM**



Picture 5.13 KPI Total flown distance (FIR)

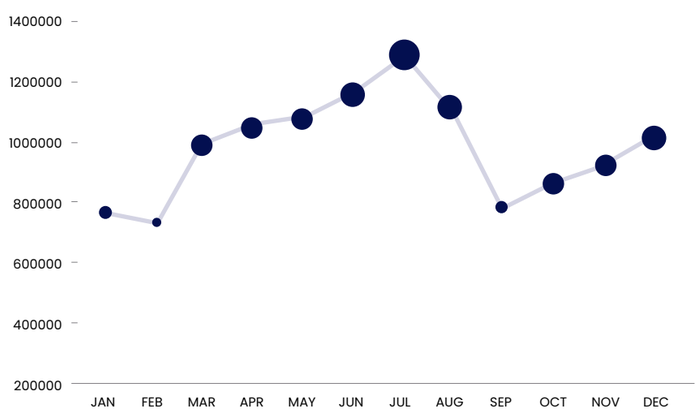


Picture 5.14 KPI Total flown distance (FIR). Comparative chart 2018–2021

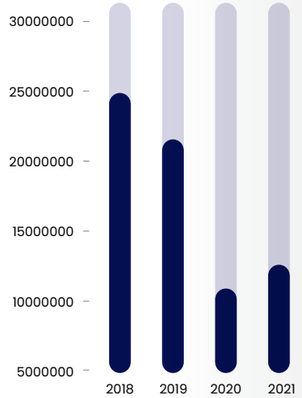
5.4.2 Total flown distance – En-route

Only overflight traffic data is used for calculation of Total flown distance (ENR).

Total flown distance (ENR) – **11 889 424 NM**



Picture 5.15 KPI Total flown distance (ENR)

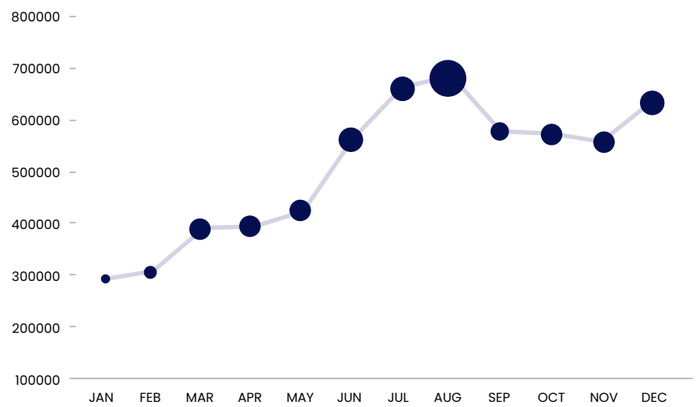


Picture 5.16 KPI Total flown distance (ENR). Comparative chart 2018–2021

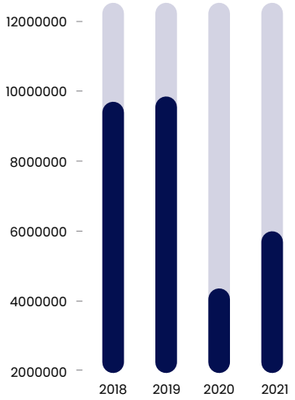
5.4.3 Total flown distance – Aerodrome movements

Only aerodrome movements data is used for calculation of Total flown distance (AD).

Total flown distance (AD) – **6 054 197 NM**



Picture 5.17 KPI Total flown distance (AD)



Picture 5.18 KPI Total flown distance (ENR). Comparative chart 2018–2021

5.5 CANSO Productivity KPIs

The key indicator of ANS productivity is IFR flight hours per ATCO in OPS hour, often described as 'ATCO in OPS productivity'.

Although generally reflective of ANSPs' performance, factors beyond the control of the ANSP can cause low levels of productivity – for example a geopolitical event that alters traffic demand.

ATCO in OPS productivity is driven by traffic levels and an ANSP's ability to utilise its ATCOs in operations (OPS) resources. Although they cannot affect traffic demand, ANSPs may improve productivity by utilising flexible rostering and adapting airspace configuration to open and close sectors according to evolving traffic patterns.

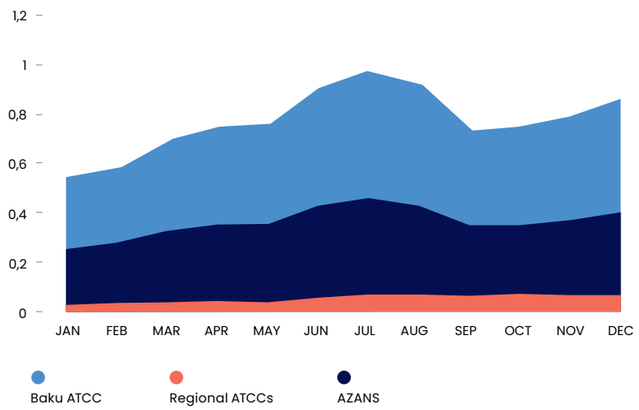
Furthermore, advances in technology are now focusing more than ever on reducing the workload of ATCOs in OPS to enable them to safely manage higher levels of traffic in a given volume of airspace. Training associated with the introduction of technology, however, can lead to short-term reductions in productivity.

Airspace complexity also affects ATCO in OPS productivity. Lower airspace will typically have lower levels of ATCO in OPS productivity than upper airspace where aircraft are flying at more consistent altitudes and on non-crossing routes. Therefore, an ANSP operating a high proportion of sectors in lower airspace, or with numerous busy airports with complex approach sectors, is likely to have lower ATCO in OPS productivity than an ANSP with more overflights at higher altitude.

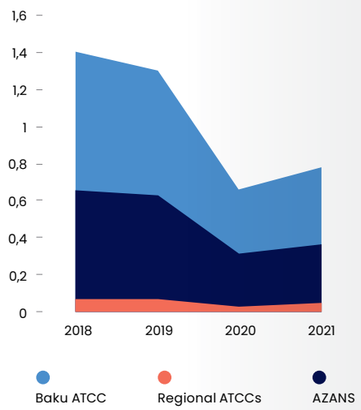
5.5.1 ATCO in OPS hour productivity (CANSO KPI 2B)

KPI "ATCO in OPS hour productivity" is calculated by formula "IFR flight hours" divided by "ATCOs in OPS hours"

ATCO in OPS hour productivity (AZANS)	**0.368**
ATCO in OPS hour productivity (Baku ATCC)	**0.788**
ATCO in OPS hour productivity (Regional ATCCs)	**0.043**



Picture 5.19 KPI ATCO in OPS hour productivity

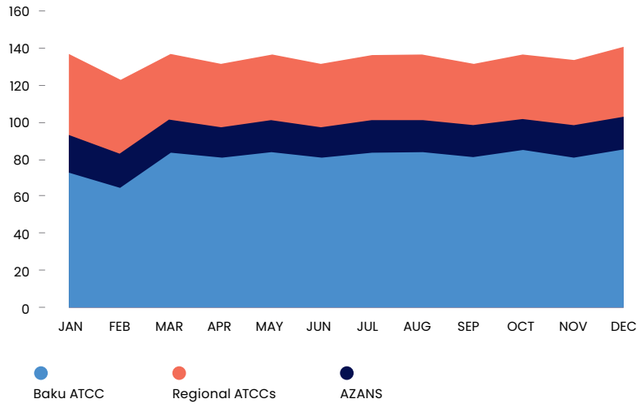


Picture 5.20 KPI ATCO in OPS hour productivity. Comparative chart 2018 – 2021

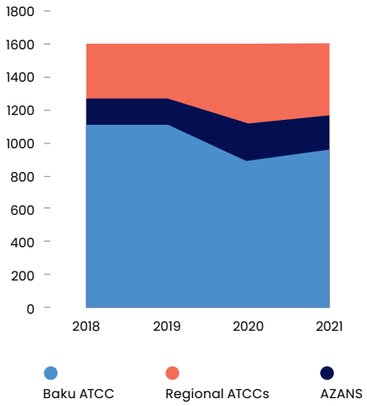
5.5.2 Working hours per ATCO in OPS (CANSO KPI 3B)

KPI "Working hours per ATCO in OPS" is calculated by formula "ATCO in OPS hours" divided by "No of ATCO in OPS"

Annual working hours per ATCO in OPS (AZANS)	**1180**
Annual working hours per ATCO in OPS (Baku ATCC)	**971**
Annual working hours per ATCO in OPS (Regional ATCCs)	**1613**



Picture 5.21 KPI Monthly working hours per ATCO in OPS

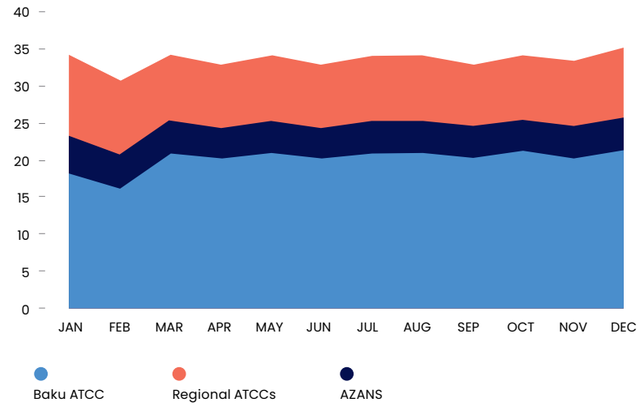


Picture 5.22 KPI Annual working hours per ATCO in OPS. Comparative chart 2018 – 2021

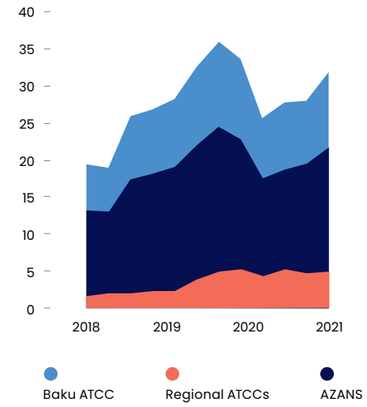
5.5.3 IFR hours per ATCO in OPS (CANSO KPI 3C)

KPI "IFR hours per ATCO in OPS" is calculated by formula "IFR flight hours" divided by "No of ATCO in OPS"

Annual IFR hours per ATCO in OPS (AZANS)	**230**
Annual IFR hours per ATCO in OPS (Baku ATCC)	**338.3**
Annual IFR hours per ATCO in OPS (Regional ATCCs)	**44.3**



Picture 5.23 KPI Monthly IFR hours per ATCO in OPS

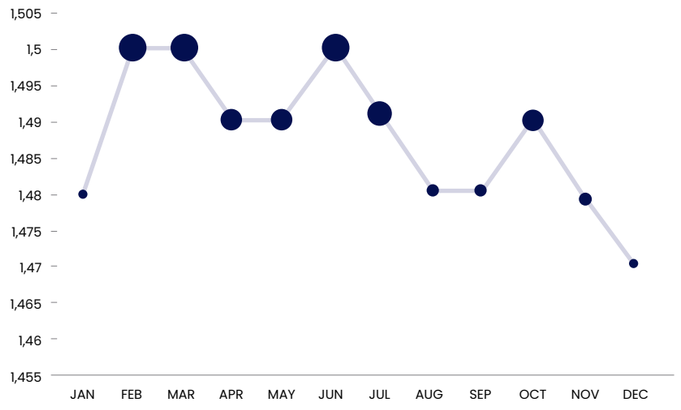


Picture 5.24 KPI Annual IFR hours per ATCO in OPS. Comparative chart 2018 – 2021

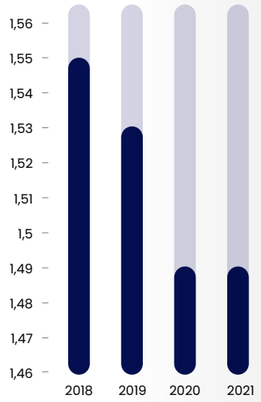
5.5.4 Ratio of Frontline Service Staff to ATCO in OPS (CANSO KPI 3D)

KPI "Ratio of Frontline Service Staff to ATCO in OPS" is calculated by formula "No. Frontline Service Support Staff" divided by "No of ATCO in OPS"

Ratio of Frontline Service Staff to ATCO in OPS – **1.49**



Picture 5.25 KPI Ratio of Frontline Service Staff to ATCO in OPS 2021



Picture 5.26 KPI Ratio of Frontline Service Staff to ATCO in OPS. Comparative chart 2018 – 2021

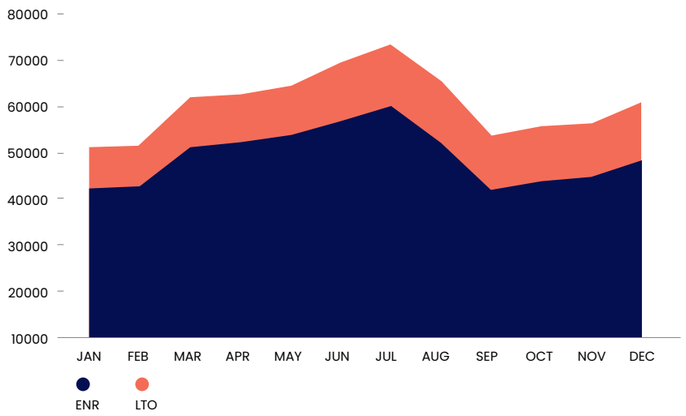
5.6 CO2 emissions

All the KPI's for CO2 emissions are calculated for FIR, En-route (ENR) and Landing-take-off Operations (LTO).

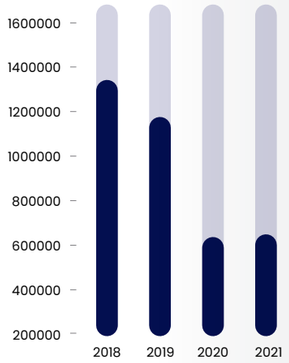
5.6.1 Total CO2 emissions

KPI "ATCO in OPS hour productivity" is calculated by formula "IFR flight hours" divided by "ATCOs in OPS hours"

Total CO2 emissions (FIR) **666 849 tons**
Total CO2 emissions (ENR) **487 074 tons**
Total CO2 emissions (LTO) **179 775 tons**



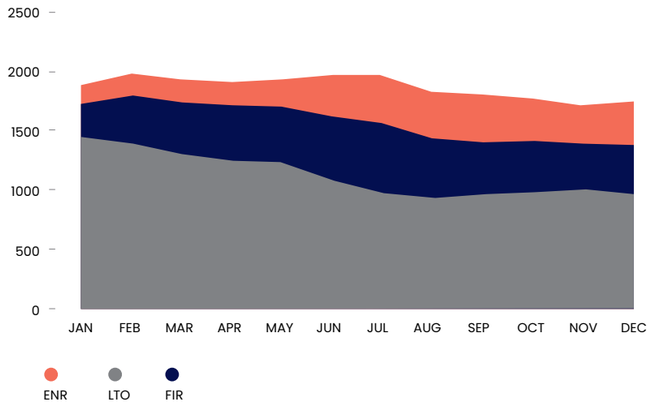
Picture 5.27 Total CO2 emissions



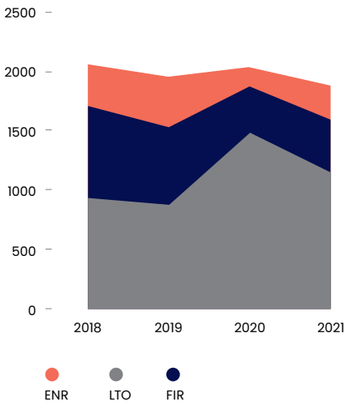
Picture 5.28 Total CO2 emissions. Comparative chart 2018 – 2021

5.6.2 CO2 emissions per a flight hour

CO2 emissions per a flight hour FIR) **15 947 ton/hour**
CO2 emissions per a flight hour (ENR) **18 988 ton/hour**
CO2 emissions per a flight hour (LTO) **11 316 ton/hour**



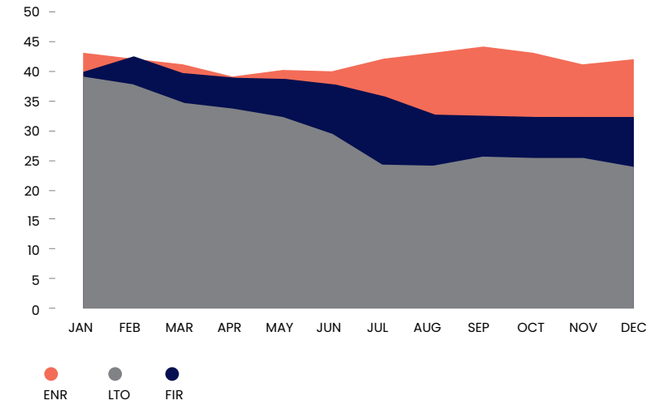
Picture 5.29 CO2 emissions per a flight hour



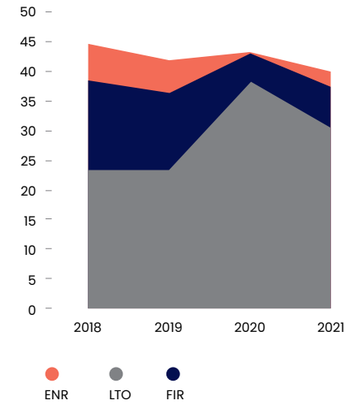
Picture 5.30 CO2 emissions per a flight hour. Comparative chart 2018 – 2021

5.6.3 CO2 emissions per a nautical mile flight distance

CO2 emissions per a nautical mile flight distance FIR) **38 kg/NM**
CO2 emissions per a nautical mile flight distance (ENR) **41 kg/NM**
CO2 emissions per a nautical mile flight distance (LTO) **31 kg/NM**



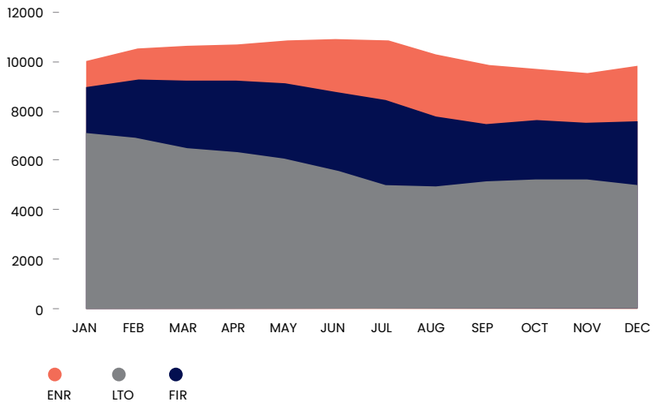
Picture 5.31 CO2 emissions per a nautical mile flight distance



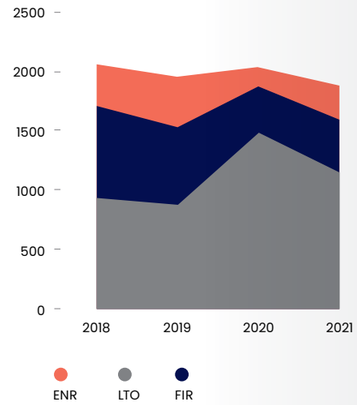
Picture 5.32 CO2 emissions per a nautical mile flight distance. Comparative chart 2018 – 2021

5.6.4 CO2 emissions per a flight

CO2 emissions per a flight (FIR)	**38 kg/NM**
CO2 emissions per a flight (ENR)	**41 kg/NM**
CO2 emissions per a flight (LTO)	**31 kg/NM**



Picture 5.33 CO2 emissions per a flight



Picture 5.34 CO2 emissions per a flight. Comparative chart 2018 – 2021

5.7 KPIs - CNS

5.7.1 ATC Automated System

KPI – "ATC System Reliability" is calculated by the formula: the value of "total hours of ATC system operation without failure" is divided by the value of "total number of hours" and is multiplied by 100%

KPI "ATC Systems reliability"– **92.8% (target indicator is 100%)**

5.7.2 Surveillance Systems

KPI – "Surveillance systems Reliability" is calculated by the formula: the value of "total hours of SUR systems operation without failure" is divided by the value of "total number of hours" and is multiplied by 100%

KPİ "SUR System reliability" – **99.3% (target indicator is 100%)**

5.7.3 Communication Systems

KPI – "COM systems Reliability" is calculated by the formula: the value of "total hours of COM systems operation without failure" is divided by the value of "total number of hours" and is multiplied by 100%

KPI – "COM systems Reliability" – **100% (target indicator is 100%)**

5.7.4 Navigation

KPI – "NAV systems Reliability" is calculated by the formula: the value of "total hours of NAV systems operation without failure" is divided by the value of "total number of hours" and is multiplied by 100%

KPI – "NAV systems Reliability"– **100% (target indicator is 100%)**

5.8 KPIs - Aeronautical Information Service

5.8.1 KPI "Timeliness of preparation, issue and publication of aeronautical information"

KPI – "Timeliness of preparation, issue and publication of aeronautical information" is calculated by the formula: 100% minus (the value of "the number of NOTAMs, AIP amendments and other aeronautical information prepared, issued and published with delay" is divided by the value of "total number of NOTAMs, AIP amendments and other aeronautical information prepared, issued and published" and is multiplied by 100%)

KPI "Timeliness of preparation, issue and publication of aeronautical information" - **100% (target indicator is 100%)**

5.8.2 KPI – "accuracy and integrity of aeronautical information provided

KPI – "accuracy and integrity of aeronautical information provided" is calculated by the formula: 100% minus (the value of "the number of NOTAMs, AIP amendments and other aeronautical information prepared, issued and published with errors and omissions" is divided by the value of "total number of NOTAMs, AIP amendments and other aeronautical information prepared, issued and published" and is multiplied by 100%)

KPI – "accuracy and integrity of aeronautical information provided – **98,9 % (target indicator is 100%)**

5.8.3 KPI - Timeliness of aeronautical calculations performed

KPI – "Timeliness of aeronautical calculations performed" is calculated by the formula: 100% minus (the value of "aeronautical calculations performed and published with delay" is divided by the value of "total number of aeronuatical calculations perfomed" and is multiplied by 100%)

KPI - Timeliness of aeronautical calculations performed - **100% (target indicator is 100%)**

5.9 KPI - Provision of Meteo Services

5.9.1 KPI – "Baku/Heydar Aliyev Intl. airport Forecast (TAF) accurancy"

KPI – "Aerodrome Forecast (TAF) accurancy for Baku/Heydar Aliyev Intl. airport" is calculated by the formula: the value of "the average number of TAF elements forecasted accurately and verified" is divided by the value of "the average number of TAF elements forecasted and verified", and is multiplied by 100%

KPI – "Baku/Heydar Aliyev Intl. airport Forecast (TAF) accurancy" – **96.2% (target indicator according to ICAO is 80-90%)**

1 Route optimization

The improved network structure of Azerbaijan Airspace and direct route assignment (DCT) procedures implemented by AZANS are contributing factors for reducing aircraft fuel consumption and mainly for CO2 emission. AZANS ATCOs based on close and instant cooperation with military aviation are able to direct flights by assigning shorter routes via Azerbaijan Airspace and thus effective and efficient airspace utilization.

2 Continuous Climb Operations and Continuous Descent Operations (CCOs and CDOs)

Continuous Descent (CDO) / Continuous Climb Operations (CCO) implemented in Azerbaijan Airspace is one of the beneficial environmental solutions in high-density operations. CDO/CCO permits maintaining optimal vertical profile, avoiding horizontal phase in climb/descent operation. This allows to reduce excessive CO2 emission by significant reduction of fuel consumption and to take into account the preference of the Airspace User for the most efficient climb/ descent profile for the flight.

3 Noise Abatement Procedures

Continuous Descent (CDO) / Continuous Climb Operations (CCO) implemented in Azerbaijan Airspace is one of the beneficial environmental solutions in high-density operations. CDO/CCO permits maintaining optimal vertical profile, avoiding horizontal phase in climb/descent operation. This allows to reduce excessive CO2 emission by significant reduction of fuel consumption and to take into account the preference of the Airspace User for the most efficient climb/ descent profile for the flight.

4 Reduced Vertical Separation Minima (RVSM)

AZANS introduced RVSM in Azerbaijan Airspace in 2011 reducing air quality impact in the upper atmosphere. By implementing RVSM Azerbaijan Airspace capacity greatly increased allowing aircraft to fly at more optimal altitudes. Operations in RVSM environment benefited from less fuel burn and Carbon Dioxide, Sulphur Oxide, Water emissions.

5 CO2 emission control

Aviation's impact on climate change is measured on an analysis of fuel use and CO2 reduction. AZANS does its part to reduce aviation's impact on the environment by close monitoring of amounts of pollutants released into the environment. Since 2018 AZANS calculates CO2 emission KPI in Azerbaijan Airspace for FIR, En-route (ENR, and Landing-take-off Operations (LTO) by which effectiveness of implemented measures can be tracked.

6 Performance-based navigation. PBN/ RNAV/RNP

AZANS implemented PBN solutions for advanced air traffic management and as a key enabler for direct environmental benefits. PBN enables more efficient aircraft operations resulting in opportunities to both reduce Greenhouse Gas (GHG) emissions and options for reducing the aggregate production of aircraft noise.

RNAV/En-route environmental solutions

AZANS use RNAV 5 specification on en-route operations to enable aircraft to fly on any desired flight path routes providing Optimum profile descent (OPD) capability, and thus leading to significant reductions of CO2 emissions and fuel consumption.

RNP/Approach

RNP approach is one of the most precise approach equipment that can reduce noise, emissions, and fuel consumption providing continuous climb operations (CCO) and continuous descent operations (CDO) for arriving aircraft. AZANS implement RNP 1 navigation specifications in order to take advantage of the effective SID/STAR schemes that better avoid noise-sensitive areas appropriately addressing the issue.

7 Efficient TMA design and utilization

Yearly AZANS provides services to over 40 000 aircraft at national airports forcing TMA and structures to be more efficient and environmentally friendly. Putting forward the TMA operational design improvements AZANS thrives to ensure enhanced flight efficiency in TMAs which includes RNAV approaches, airspace design, and continuous descent approach (CDA). Solutions directed to optimization of SID/STAR and aerodrome structure reduce the environmental impact caused by fuel consumption as well as CO2 emissions in the atmosphere.

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