

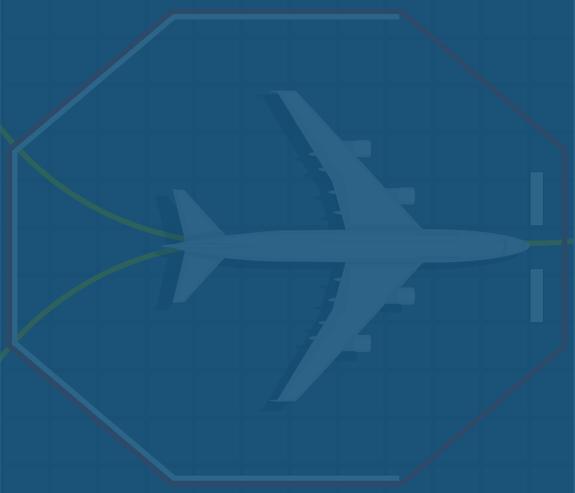


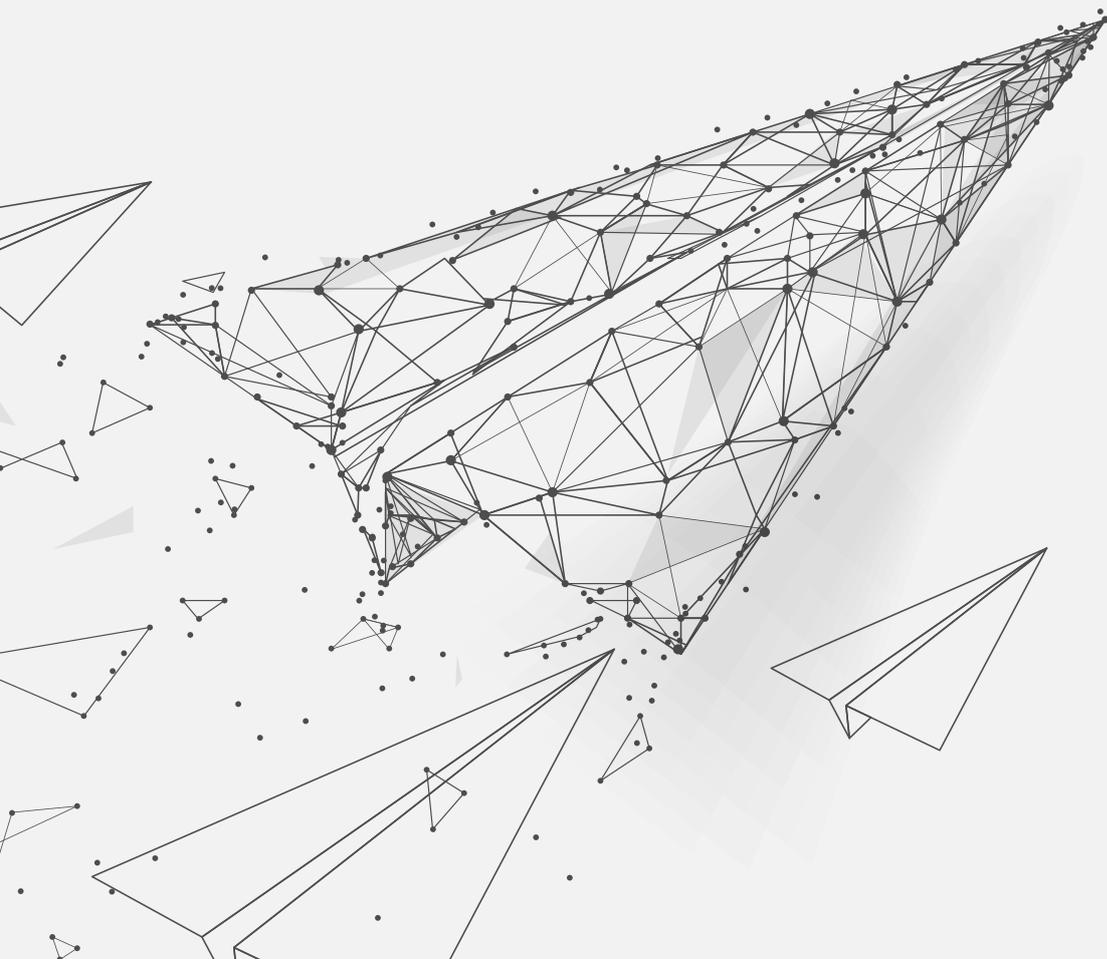
EUROCONTROL

MAASTRICHT UPPER AREA CONTROL CENTRE

ANNUAL REPORT 2020

PERFORMANCE THROUGH INNOVATION





FAST FACTS

MUAC cost-base (M€ - €2020)	2016	2017	2018	2019	2020	2020 ↔ 2019
TRAFFIC						
Movements	1,779,969	1,848,581	1,872,686	1,862,754	832,888	-55.3%
IFR flight-hours	625,901	645,062	667,869	667,596	289,992	-56.6%
Service Units	7,057,838	7,366,791	7,659,462	7,600,610	3,387,935	-55.4%
Sector Opening Times (SOTs) – (hours)	76,218	77,159	75,275	71,219	43,692	-38.7%
Traffic peak (number of flights controlled per day)	5,486	5,689	5,702	5,670	4,668	-17.7%
Average flights controlled per day	4,635	4,831	4,903	4,851	2,132	-56.0%
Average flights controlled in summer (May-October) per day	5,102	5,307	5,342	5,259	1,831	-65.2%
STAFF						
MUAC staff (excluding former Lippe staff)	616	639	681	699	755	8.0%
Former Lippe staff	-	48	47	-	-	-
ATCOs in OPS	304	302	303	300	299	-0.3%
ATCOs in OPS (FTEs)	267	266	259	255	229	-10.2%
COST-EFFICIENCY (€2020) ⁽¹⁾						
Inflation rate (Netherlands)	+0.1%	+1.3%	+1.6%	+2.7%	+1.1%	-59.3%
Revenues (€M)	€552.9	€525.1	€510.0	€479.8	€240.7	-49.8%
Capital expenditure for the year (€M)	€4.1	€5.1	€6.9	€7.6	€4.5	-100.0%
Total fixed assets at year end (net book value; €M) ⁽²⁾	€68.9	€64.6	€60.9	€56.3	€51.0	-7.4%
Cost-base (€M)	€143.3	€149.5	€156.6	€170.7	€189.4	9.8%
Staff costs	€120.1	€122.1	€125.3	€137.6	€157.3	13.0%
Non-staff operating costs	€14.6	€19.1	€21.8	€23.0	€22.9	-1.5%
Depreciation	€8.2	€8.1	€9.3	€9.9	€9.1	-8.6%
Cost of capital	€0.4	€0.2	€0.2	€0.2	€0.1	-34.3%
Total financial cost/flight-hour ⁽³⁾	€244	€244	€243	€258	€653	152.7%
Total economic cost/flight hour ⁽⁴⁾	€410	€446	€478	€309	€657	112.4%
MUAC equivalent unit rate ⁽⁵⁾	€21.6	€21.3	€21.1	€22.7	€55.9	146.3%

MUAC cost-base (M€ - €2020)	2016	2017	2018	2019	2020	2020 ↔ 2019
CAPACITY						
Productivity	2.03	2.06	2.22	2.23	1.29	-42.0%
Total delay (min.) ⁽⁶⁾	982,369	1,232,634	1,482,997	320,571	10,839	-96.6%
CRSTMP delay (min.) ⁽⁷⁾	514,499	803,384	927,974	181,387	8,568	-95.3%
Average total delay/flight (min.)	0.55	0.67	0.79	0.17	0.01	-92.4%
Average CRSTMP delay/flight (min.)	0.29	0.43	0.50	0.10	0.01	-89.4%
Punctuality (%)	96.3%	95.5%	95.4%	98.8%	99.9%	-
Delayed flights (%)	3.7%	4.5%	4.6%	1.2%	0.1%	-
Delayed flights (WO codes, %)	1.3%	1.1%	1.2%	0.4%	0.0%	-
Delayed flights (CRSTMP codes, %)	2.4%	3.5%	3.3%	0.8%	0.1%	-
Flights with 1-15 min. of delay (CRSTMP codes, %) ⁽⁸⁾	1.8%	2.5%	2.1%	0.6%	0.1%	-
Flights with 16-30 min. of delay (CRSTMP codes, %)	0.5%	0.8%	0.9%	0.2%	0.0%	-
Flights with +30 min. of delay (CRSTMP codes, %)	0.1%	0.2%	0.3%	0.0%	0.0%	-
Congested days (min. delay > traffic)	43	59	90	13	0	-
SAFETY						
Separation infringements (MUAC contribution)	3	2	3	0	2	-
ENVIRONMENT						
Flown RESTR	0.48%	0.45%	0.47%	0.47%	0.38%	-

(1) Cost-efficiency indicators are calculated on the cost-base.

(2) Total fixed assets, including work in progress

(3) Total financial cost per flight-hour: ATM/CNS service provision cost per IFR flight-hour

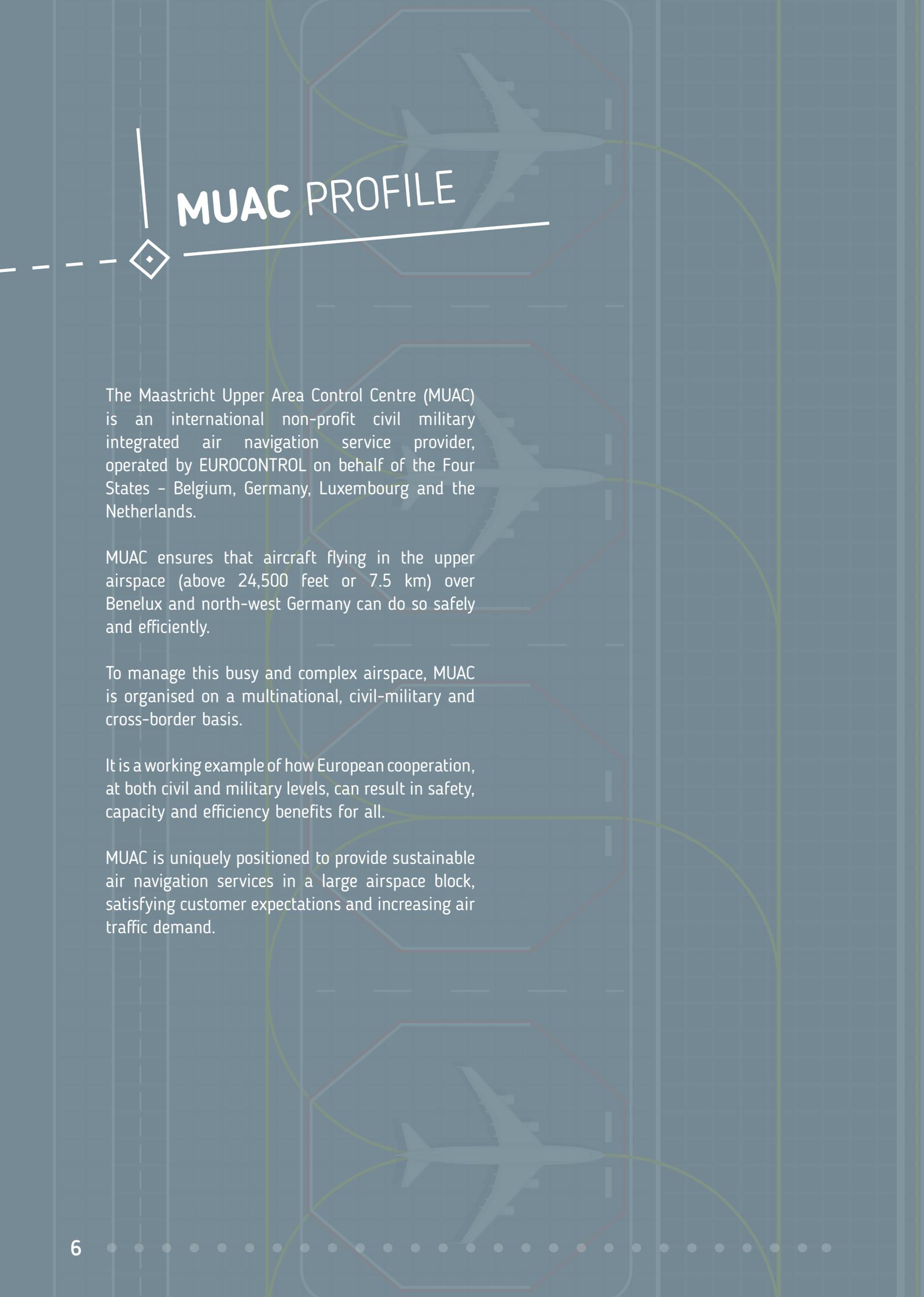
(4) Total economic cost per IFR flight-hour: key performance indicator used for ATM cost-effectiveness (ACE) benchmarking. It is the sum of ATM/CNS provision costs and ATFM delay costs per IFR flight-hour. This indicator enables the trade-offs between cost and capacity performance to be measured.

(5) The key performance indicator for cost-effectiveness defined in the Single European Sky (SES) II Performance Regulation is the unit cost. Since the unit cost is calculated on the basis of consolidated costs and production at national level, the concept of a MUAC equivalent unit cost has been introduced as a performance indicator. This indicator takes into account the specific MUAC costs and production. "Equivalent" indicates that the calculation does not take the full cost of MUAC service provision into account; EUROCONTROL support costs and the cost of using CNS infrastructure, which is made available free of charge by the Four States, are not included.

(6) Minutes of delay allocated to MUAC following an adjustment and reallocation of en-route ATFM delay by the NM

(7) C-ATC Capacity, R-ATC Routeings, S-ATC Staffing, T-ATC Equipment, M-Airspace Management and P-Special event delay

(8) Flights with less than 1 minute of delay are excluded



MUAC PROFILE

The Maastricht Upper Area Control Centre (MUAC) is an international non-profit civil military integrated air navigation service provider, operated by EUROCONTROL on behalf of the Four States - Belgium, Germany, Luxembourg and the Netherlands.

MUAC ensures that aircraft flying in the upper airspace (above 24,500 feet or 7.5 km) over Benelux and north-west Germany can do so safely and efficiently.

To manage this busy and complex airspace, MUAC is organised on a multinational, civil-military and cross-border basis.

It is a working example of how European cooperation, at both civil and military levels, can result in safety, capacity and efficiency benefits for all.

MUAC is uniquely positioned to provide sustainable air navigation services in a large airspace block, satisfying customer expectations and increasing air traffic demand.

Consolidating airspace across national borders

For nearly 50 years, MUAC has played a pivotal role in integrating European airspace on a functional basis, driven not by national boundaries but by the operational requirements of international traffic flows.

Thanks to its provision of seamless air navigation services to the upper airspace (above 24,500 feet) of Belgium, north-west Germany, Luxembourg and the Netherlands, MUAC enjoys a leading position in the core area of Europe. In order to maintain this position, it continuously strives to deliver safe, efficient, cost-effective and impartial cross-border air navigation services in a dynamic air transport marketplace.

From 1975 to 2017, German controllers from Lippe Radar provided military air traffic control in the Hannover Upper Information Region (UIR) — the upper airspace (above 24,500 feet) of north-west Germany — from the premises of MUAC. On 1 January 2017, Lippe Radar was integrated into MUAC, laying the foundations for fully integrated civil-military air traffic management.

Since April 2017, military traffic in the upper airspace of the Amsterdam Flight Information Region (FIR) has also been handled by MUAC controllers. With this development, MUAC became the first cross-border civil-military ANS provider in Europe.

On 22 December 2016, EUROCONTROL and the Belgian Ministry of Defence signed an agreement for the provision, by MUAC, of air traffic control data services to the Belgian Air Defence. The shared ATS system became operational in 2019 at the air traffic control centre (ATCC) for en-route military operations and at the ATC towers in Beauvechain, Florennes, Kleine-Brogel and Koksijde for approach and tower operations.

One of MUAC's flagship activities is the development and implementation of leading-edge infrastructure and technology solutions to ensure that customers and stakeholders benefit from the highest levels of performance. MUAC's active involvement in SESAR (Single European Sky ATM Research) is instrumental in meeting this objective.

Mission and vision

MUAC's mission is to lead the way by providing safe and efficient cross-border ATM to all airspace users while developing and integrating cutting-edge systems and services with our partners.

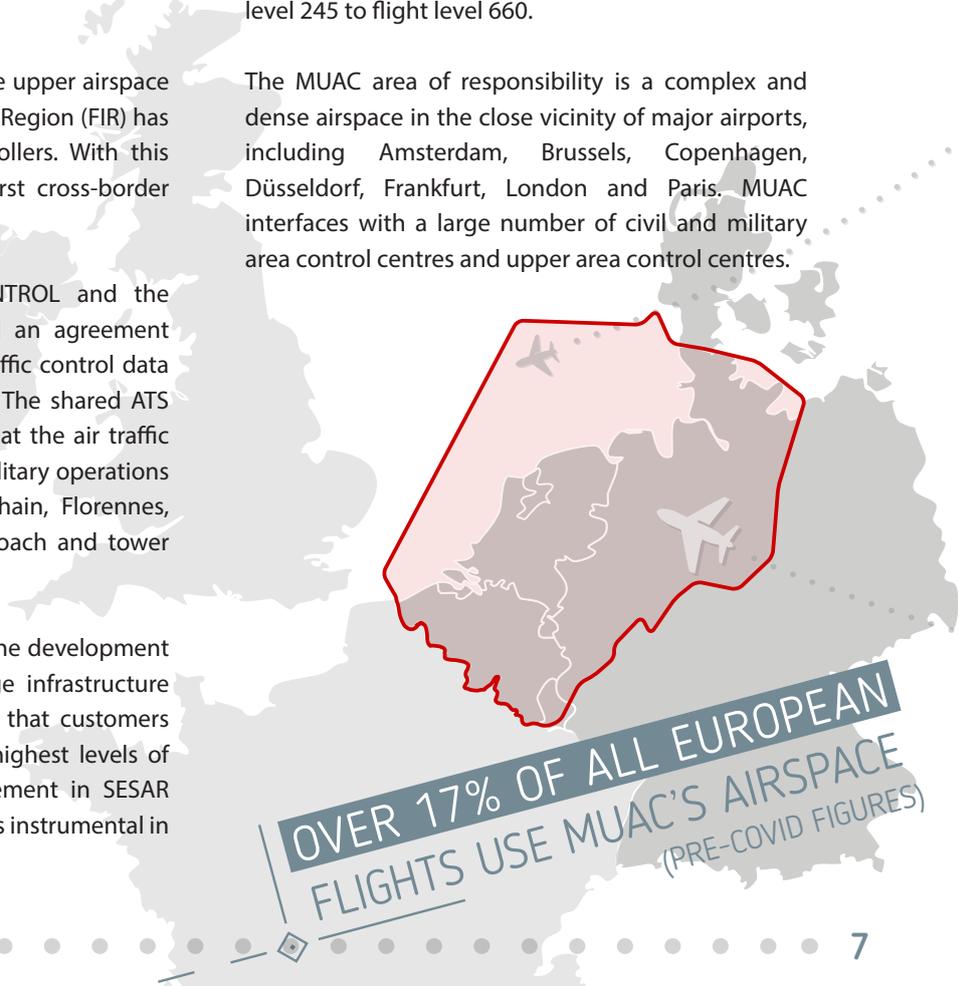
MUAC's vision:

- MUAC is a leading innovator recognised for its outstanding ATM services and systems, which set the standard for the industry.
- MUAC provides its ATM services and systems to airspace users, the Network Manager and ANSPs.
- As a leading innovator, MUAC is a strategic partner of choice.

Geographical scope

The area of responsibility of MUAC in Belgium, Germany, Luxembourg and the Netherlands consists of the Brussels UIR (Upper Information Region), the Amsterdam FIR and the Hannover UIR from flight level 245 to flight level 660.

The MUAC area of responsibility is a complex and dense airspace in the close vicinity of major airports, including Amsterdam, Brussels, Copenhagen, Düsseldorf, Frankfurt, London and Paris. MUAC interfaces with a large number of civil and military area control centres and upper area control centres.



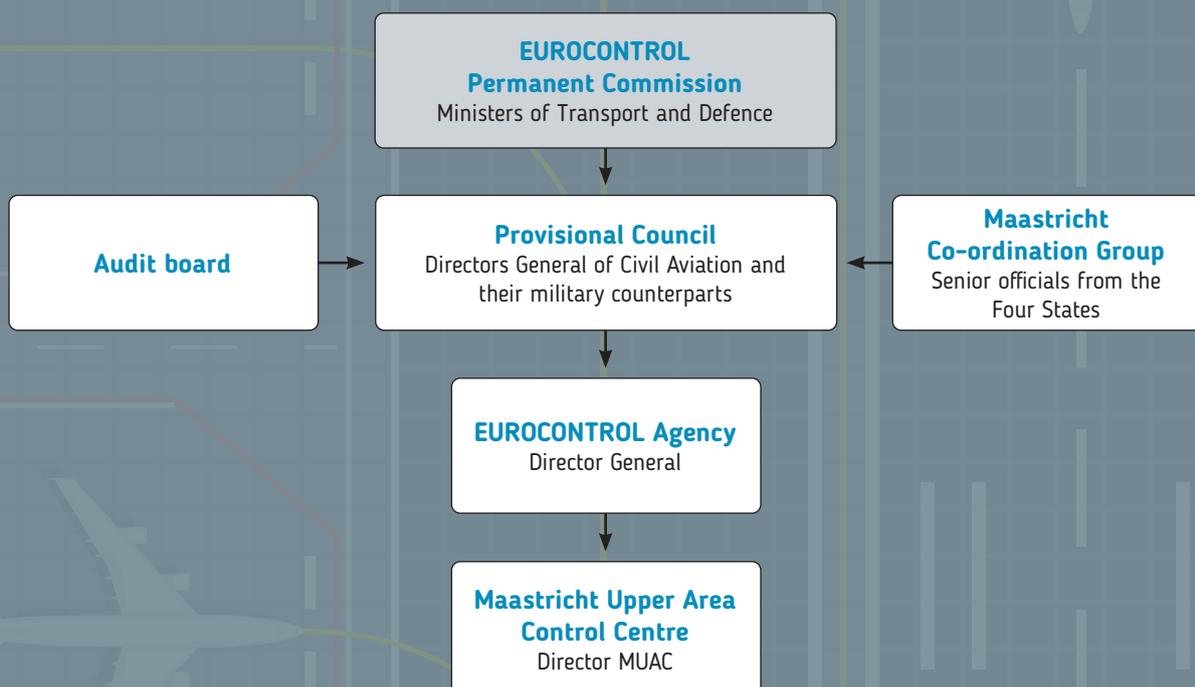
OVER 17% OF ALL EUROPEAN
FLIGHTS USE MUAC'S AIRSPACE
(PRE-COVID FIGURES)

CORPORATE GOVERNANCE

MUAC is operated by EUROCONTROL on behalf of Belgium, Germany, Luxembourg and the Netherlands on the basis of the Agreement relating to the Provision and Operation of Air Traffic Services and Facilities by EUROCONTROL at the Maastricht Upper Area Control Centre (the “Maastricht Agreement”), signed on 25 November 1986. EUROCONTROL is an international organisation established under the EUROCONTROL Convention of 13 December 1960, subsequently amended on 12 February 1981.

In line with Article 15 of the EUROCONTROL Amended Convention, air traffic services at MUAC are provided in accordance with the national regulations in force in the respective territories and airspaces concerned.

The Maastricht Coordination Group was established to facilitate decision-making by determining a common position for the Four States (Belgium, Germany, Luxembourg and the Netherlands) in all matters relating to the operation of air traffic services at MUAC. Day-to-day responsibility for operations has been delegated to the Director of MUAC by EUROCONTROL’s Director General. Each of the Four States retains its own regulatory competence.



Regulation

In addition to the international regulatory regime, air navigation service provision at MUAC is subject to four national regulatory regimes, each specifically defining applicable rules and regulations. Over recent years, regulation and oversight of MUAC have been exercised in a coordinated manner by the Four States' National Supervisory Authorities (4NSAs). In 2017, military regulations expanded the scope of applicable regulations.

Supervision and oversight

Following the adoption of Regulation (EC) No 549/2004 of the European Parliament and of the Council of 10 March 2004 laying down the framework for the creation of the Single European Sky (the framework Regulation), each of the Four States established National Supervisory Authorities (NSAs). In Belgium, the NSA is the Belgian Supervisory Authority for Air Navigation Services (BSA-ANS), in Germany the Federal Supervisory Authority for Air Navigation Services (BAF), in Luxembourg the Civil Aviation Authority (CAA Luxembourg), and in the Netherlands the Human Environment and Transport Inspectorate (ILT) of the Ministry of Infrastructure and Water Management.

The 4NSAs have created two bodies to support the oversight of MUAC: the NSA Committee, representing all four NSAs, having a coordination and advisory role for the relevant national decision-making authorities on oversight matters, and the Common Supervisory Team, composed of personnel from the cooperating NSAs, who have an executive role in conducting document examinations, audits and inspections. The Dutch Military Aviation Authorities (MAA) oversee MUAC as an ANSP for military traffic and as a training organisation for air traffic controllers (ATCOs).

The oversight of service provision to Germany for military traffic is provided by the 4NSA committee, which includes the BAF (Germany) and is supported where needed by the German MAA.

Designation of MUAC as an air traffic service provider

In accordance with Article 8 of Regulation (EC) No 550/2004 of the European Parliament and of the Council of 10 March 2004 on the provision of air navigation services in the Single European Sky (the service provision Regulation), EUROCONTROL was designated as an air traffic service provider in the Netherlands, by amendment to the Aviation Act in October 2007. Belgium, Germany and the Netherlands maintain the designation of EUROCONTROL as an air traffic service provider as per the Maastricht Agreement and the relevant national laws.

Certificates

In line with Single European Sky legislation, MUAC holds the certificate for the provision of air navigation services in the European Community. The certificate was granted in 2006 by the Netherlands' Transport and Water Management Inspectorate and Directorate General for Civil Aviation and Freight Transport.

In 2009, the Belgian Supervisory Authority for Air Navigation Services certified MUAC for the provision of unit and continuation training for air traffic controllers and for the provision of training to certify the roles of on-the-job training instructors, competence examiners and/or competence assessors for the delivery of air traffic services. This certificate was updated in 2011 pursuant to Commission Regulation (EU) No 805/2011.

In 2015 MUAC was certified as provider of Communication and Surveillance Services by the Dutch NSA.

MUAC has, since 1 January 2017, been accredited to provide ATC to the German Air Force. In 2017, MUAC was also accredited by the Dutch MAA to provide ATC to the Royal Netherlands Air Force (RNLAf).

MAASTRICHT COORDINATION GROUP

Belgium

Head of Delegation

Mr Koen MILIS

Federal Public Service for Mobility and Transport

Other participants

Mr Patrick VANHEYSTE

Federal Public Service for Mobility and Transport

Mr Theo NSENGIMANA

Belgian Civil Aviation Authority

General Thierry DUPONT

Belgian Armed Forces – Air Component

Ms Peggy DEVESTEL

skeyes

Mr. Pieter VERSTREKEN

Belgian Civil Aviation Authority

Germany

Head of Delegation

Mr Dirk NITSCHKE

Federal Ministry of Transport and Digital Infrastructure

Other participants

Ms Bernadette KING

Federal Ministry of Transport and Digital Infrastructure

Lt. Col. Andreas HABRUNNER

Federal Ministry of Defence

Lt. Col. Rene BANSEMER

German Air Force Air Operations Command

Chair of the BFWG-4 during 2020

Mr Dirk MAHNS

Deutsche Flugsicherung

Luxembourg

Head of Delegation

Mr Pierre JAEGER

Director General of Civil Aviation

Other participants

Mr Ender ÜLCÜN

Ministry of Sustainable Development and Infrastructure

Chair of the Maastricht Coordination Group during 2020

Netherlands

Head of Delegation

Ms Marjan van GIEZEN

Ministry of Infrastructure and Environment

Other participants

Mr Eric DE VRIES

Ministry of Infrastructure and Environment

Mr Ference VAN HAM

Ministry of Infrastructure and Environment

Chair of the BFWG-4 during 2020

Lt. Col. Leon CREMERS

Ministry of Defence

Mr Bert ROLVINK

Luchtverkeersleiding Nederland

Observers

Mr Emil KARLSSON

Staff Committee Servants

MANAGEMENT



Director General of EUROCONTROL

Mr Eamonn BRENNAN

MUAC Board

Mr John SANTURBANO

Director

Niels LOKMAN

Chief Operating Officer

Aude BARBIER

Head of Human Resources

Martin SCHNEIDER

Head of Current Operations

Razvan MARGAUAN

Head of Technical Systems

Chris JEEVES

Head of Strategy and Performance Management

Chris STADLER

Head of ATM Strategy

Bart VANDERSMISSEN

Head of Change Management

STATEMENT BY THE MCG CHAIR

One of MUAC's strengths has always been to be flexible and adaptable to the situation – transforming challenges into opportunities. Never has this strength been put to the test to such a degree than during the events of 2020. The impact of the COVID-19 pandemic on the aviation industry has been dramatic, as lockdowns across the globe forced airlines to ground entire fleets, with the attendant effects on airports, states and ANSPs. The effect was felt only too strongly in the Centre as sadly a member of the Security and Safety Team succumbed to the virus.

This report is normally an overview of the performance of the Centre in 2020, in which MUAC met the demand from airspace users and did so with an impressive safety record, low delay and within budget.

It is, however, important to address the situation following the outbreak of the pandemic. As a critical infrastructure, providing services to both civil and military customers, MUAC must both continue to operate during the crisis and provide the highest possible level of service throughout the recovery period and beyond.

As a result, MUAC has taken extensive measures to protect the health of its employees and maintain its operations and has a solid recovery plan in place to support the airlines and military partners as confidence returns and flights return to our skies.

I am confident in MUAC's ability to weather this storm and to emerge fit for the challenges ahead.

You will read in this report about the performance of MUAC over the course of 2020. This performance would not have been possible without the dedication and effort of the employees of the Centre. MUAC strongly believes in its employees and their potential, and it has made substantial efforts to foster engagement and innovation at all levels of the organisation.

It is the spirit of the staff which drives the culture, and it is this culture which will be required as we emerge from the pandemic, ready to provide the outstanding quality of service on which MUAC has built its reputation



Ender ÜLCÜN

*Chairman of the Maastricht
Coordination Group during 2020*

2020 HIGHLIGHTS

SPRING 2020

- **Division flight level raised in Brussels East:** The division flight level in the east of the Brussels Sector Group (Belgian/Luxembourg upper airspace) was changed from DFL335 to DFL355 for optimum traffic distribution and increased capacity.
- **Remote test and training infrastructure rolled out:** The MUAC test and training infrastructure was made available from outside the premises to allow staff to continue to work remotely through a secure interface during the COVID-19 pandemic.
- **RAD restrictions removed.**
- **Introduction of COVID/AIRAC flight planning advice** for aircraft operators.

AUTUMN 2020

- **MUAC and Karlsruhe reducing complexity together:** Through the Cooperative Optimisation of Boundaries, Routes and Airspace (COBRA) initiative, the two ATC facilities successfully collaborated to shorten routes and improve flight profiles.
- **Preparation for MUAC's contrail prevention trial:** The operational trial of MUAC's contrail prevention study started in January 2021 in an effort to reduce aviation's impact on the environment.
- **Controller competency maintained with simulated high traffic:** Controller competency checks and certifications were carried out in the simulator to ensure they could work on sufficient levels of traffic.
- **Extension of the remote training infrastructure to simulator pilots:** The remote training infrastructure was extended to allow simulator pilots to work from home during the pandemic.

SUMMER 2020

- **Launch of Pre-Flight Check (PFC) initiative:** The PFC offers airlines different flight paths shortly before take-off to identify the best possible route and altitude for individual flights between airports. For just 163 flights addressed, there were: 66 t less of CO₂, 21 t less of fuel, 2,700 NM saved, and 323 minutes saved, resulting in a €1,440 reduction in route charges.
- **MUAC Flexible Use of Airspace (FUA) Cell becomes operational in Dutch airspace:** The MUAC FUA Cell manages the daily allocation of airspace between civil and military in the Netherlands' upper airspace.
- **Support for more frequent and larger-scale military exercises:** Taking an advantage of a less busy airspace, bigger military activities included the "Allied Sky" NATO exercise, a historic joint air exercise between Israeli and German Air Forces or "MAGDAY II/2020".

WINTER 2020

- **Finalising study of Shared ATS System (SAS3) with skeyes:** A study was completed to determine the feasibility of using MUAC's Air Traffic Management System at skeyes in Belgium. The decision is expected in the course of 2021.
- **Successful online customer consultation:** Thirty representatives of major airlines attended the online annual consultation meeting, with a positive exchange of information and thoughts.

KEY RESULTS

KEY RESULTS VS 2020 ANNUAL PLAN TARGETS AT A GLANCE

MUAC	Target for 2020	Result
Traffic forecasts <i>(STATFOR Oct. 2019 – Baseline)</i>	MUAC: + 1.8% Brussels: + 1.8% DECO: + 1.8% Hannover + 1.9%	MUAC: - 55% Brussels: - 58% DECO: - 57% Hannover: - 53%
Safety	<p>Effectiveness of safety management – Achieve a minimum level of 4 (or 80%) in each of the 5 management objectives.</p> <p>RAT methodology applied for classification of severity of all reported occurrences (i.e. 100% by the end of RP2)</p> <p>No CAT. A+B incidents – (threshold: max. 3 incidents)</p> <p>CAMAR to be in place as automated safety data recording systems</p>	<p>In place ✓</p> <p>100% applied ✓</p> <p>2 A&B incidents ✓</p> <p>In progress</p>
Capacity <i>(average delay per flight in minutes)</i>	0.18 (all delay causes) 0.15 (CRSTMP delay causes)	<p>0.01 ✓</p> <p>0.01 ✓</p>

MUAC	Target 2020	Result
Environment <i>(reduced route extension)</i>	<p>Not directly applicable at single ANSP level (see next table). However, MUAC contribution to the FABEC KEA indicator is measured via internal targets:</p> <p>Monitoring of improvement of REDES and RESTR indicators</p> <p>Annual target for:</p> <p>planned REDES (max 7.60%) actual REDES (max 3.60%) planned RESTR (max 1.80%) actual RESTR (max 0.47%)</p>	<p>7.70% ✓ 4.12% ✓ 1.80% ✓ 0.47% ✓</p>
Cost-efficiency <i>(Cost-base and MUAC equivalent unit cost (2020 euro values))</i>	<p>Approved MUAC cost-base after the Administrative Reform: M€194.2 (excluding frozen staff costs)</p> <p>The equivalent unit cost is a monitoring value, as no target was set in the Annual Plan.</p>	<p>M€ 189.1 ✓</p> <p>€ 55.8 ✓ (equating to M€189.1 M and 3.4 M service units).</p>
Customer Orientation	<p>A satisfaction rating of more than 80% with 30 key accounts, with a lowest rating of 60%</p>	<p>86.5% highly satisfied. ✓</p>

KEY RESULTS VS TARGETS AT A GLANCE

	Actual	Actual	Actual	Actual	Target	Actual
	2016	2017	2018	2019	2020	
Level of safety management effectiveness	✓	✓	✓	✓	Min. D Safety culture Min. C	✓
Application of the severity classification based on the Risk Analysis Tool (RAT) methodology	✓	✓	✓	✓	100%	✓
Reporting Just Culture by 2019	In progress	On hold	On hold	In progress	To be initiated	In progress
Capacity <i>(average delay per flight in minutes)</i>	0.55 ✗	0.67 ✗	0.79 ✗	0.17 ✓	0.18	0.01 ✓
Environment <i>(KEA)</i>	3.40% ✗	3.23% ✗	3.25% ✗	3.32% ✗	3.25%	2.94% ✓
Cost-efficiency	Considered at national level (see previous table)					

MANAGEMENT REPORT

Traffic in 2020 reached unprecedentedly low levels, with the COVID-19 global pandemic having a serious impact on aviation and ATM. The decline started in early March, when MUAC saw a 38% drop in the number of flights, and reached its lowest point in April, with an 88% decrease on 2019 values. Overall, in 2020, MUAC controlled 55% fewer flights than the year before.

Needless to say, all sector groups were affected by the pandemic. Brussels and DECO faced significant traffic reductions of 58% and 57% respectively, while Hannover experienced a 53% traffic decrease.

Many of the problems commonly reported simply did not exist in 2020, and ATFM delays were close to non-existent, with the lowest number of minutes of delay in over 10 years.

IN 2020, AIR TRAFFIC DECREASED BY **55%**
OVER 2019, REACHING A TOTAL OF **832,888** FLIGHTS.

SAFETY



In line with Commission Implementing Regulation (EU) 2019/317 laying down a performance and charging scheme in the single European sky, two leading and lagging safety performance indicators are closely monitored at MUAC, namely:

- the effectiveness of the Safety Management System (SMS), and
- the rate of Separation Minima Infringements (SMIs) per number of controlled flight hours within that airspace.

Additional lagging indicators measured at MUAC are:

- the number of SMIs by severity, and
- the number of automated safety data recordings.

These lagging safety performance indicators provide data contributing to establish safety trends.

Over the course of 2020, MUAC's reporting culture continued to be positive, and overall safety performance was good, since we had zero risk-bearing incidents in the airspace.

During the reporting period, no technical failures were reported. In fact, all technical occurrences were classified as severity E in accordance with the RAT (Risk Analysis Tool) methodology.

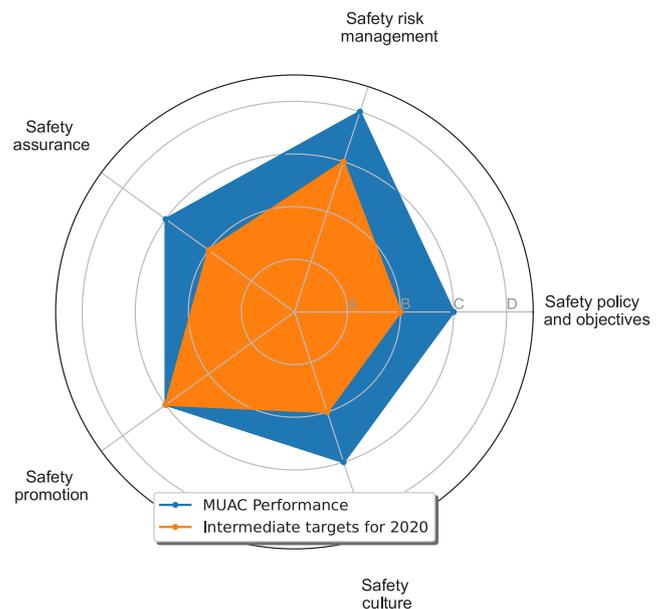
All the other lagging indicators remained within the defined threshold.

Leading safety performance indicators

Effectiveness of Safety Management

The FABEC intermediate targets for 2020 are described in Table 1. The scale goes from A (low effectiveness) to D (high effectiveness). As Figure 1 illustrates, both the intermediate and the 2024 targets were achieved.

Effectiveness of Safety Management Objectives in 2020.



Year	Safety assurance	Safety risk management	Safety policy and objectives	Safety culture	Safety promotion
2020	B	C	B	B	C
2021	B	C	C	B	C
2022	B	C	C	C	C
2023	C	D	C	C	C
2024	C	D	C	C	C

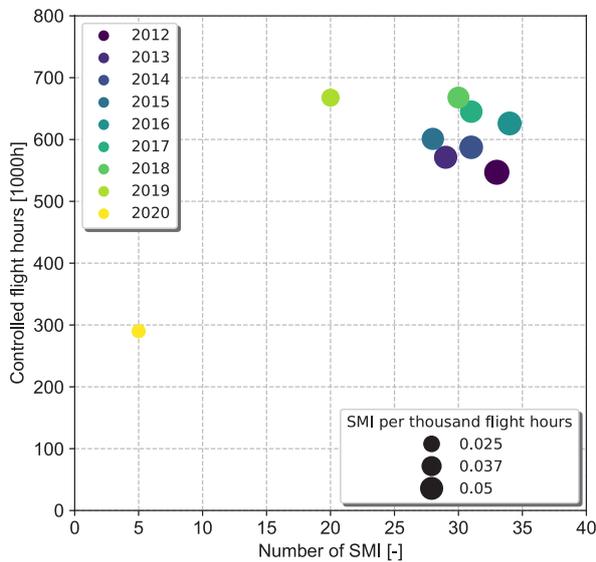
▲ FABEC intermediate targets for effectiveness of safety management objectives.

SAFETY

Lagging safety performance indicators

Separation Minima Infringements per controlled flight hours

The monitoring indicator defined in Commission Implementing Regulation (EU) 2019/317 is the “total number of separation minima infringements with any contribution from air traffic services with a safety impact divided by the total number of controlled flight hours within that airspace.”



Ratio between SMI and controlled flight hours in MUAC

Figure 2 represents this ratio where the ideal zone is located in the upper left corner of the graph. Together with Table 2, Figure 2 emphasises the non-linear decrease in SMI occurrences compared with the previous year.

The total number of controlled flight-hours at MUAC for the year 2020 was 289,992, which represents a decrease of 56.6% compared with 2019, whilst the number of SMIs decreased by 75%.

Separation Minima Infringements by severity

The frequency of severity A and B incidents plotted against time is the basis for the internal lagging safety performance indicators for 2020.

The MUAC Annual Plan defines the ceiling for this self-imposed value. Additional activities are triggered whenever the ceiling is exceeded, leading to further analysis into the existence of systemic problems which might have caused these occurrences.

Year	SMI [-]	Controlled flight hours [h]	SMI per flight hour [-/thousand hours]
2012	33	546,983	0.060
2013	29	571,231	0.050
2014	31	587,348	0.053
2015	28	600,976	0.047
2016	34	625,908	0.054
2017	31	645,067	0.048
2018	30	667,869	0.045
2019	20	667,602	0.029
2020	5	289,992	0.017

Yearly overview of controlled flight hours and SMI.



Historical overview of SMI severity A and B with MUAC contribution. Severity A (serious) refers to an incident where an aircraft proximity occurred in which there was a serious risk of collision. Severity B (major) denotes the occurrence of an aircraft proximity in which the safety of the aircraft may have been compromised. The severity scoring system is based on the Risk Analysis Tool (RAT).

All severities SMI and thresholds in 2020.

For MUAC, the most important safety goal is to ensure that, within its area of responsibility, it does not contribute to any accidents or separation infringements.

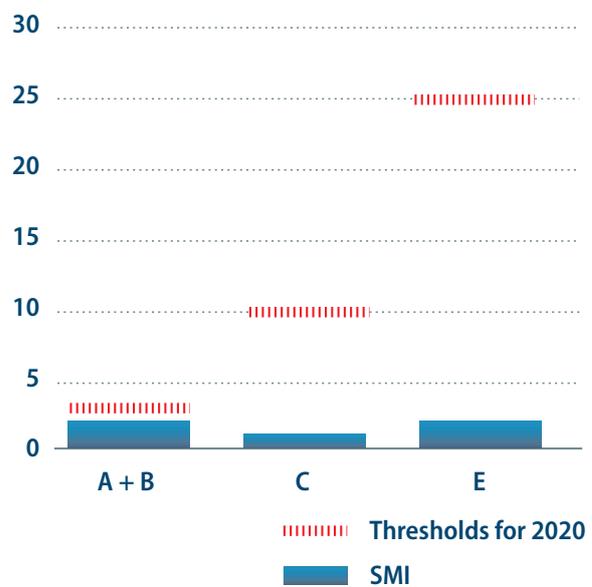
In 2020, a ceiling of three severity A and B infringements was set to take into account the variability of the diverse factors affecting safety performance. Two SMIs of severity A and B were attributed to MUAC.

In addition to this lagging performance indicator on the severity A and B infringements, another internal performance indicator is the total number of severity C and severity E separation minima infringements with a MUAC contribution. The aim of these indicators is to provide an “early warning” that the KPI for severity A and B might be underrepresentative. It allows MUAC to get a more complete picture of the overall risks.

A ceiling of 10 severity C and 25 severity E separation minima infringements with a MUAC contribution was imposed for 2020, with the actual number of incidents amounting to one severity C and two severity E.

Automated safety data recordings

To allow the measuring of the level of reporting, MUAC uses the CAMAR (Conflict Alert Message Analysis and Reporting) tool, which utilises STCA events to record losses of separation. Through the analysis of CAMAR data, MUAC is able to independently verify the reporting culture at MUAC for separation minima infringements.



Overview of events reported automatically and manually.

Events 4.9NM or less and less than 800ft	
Events retained in CAMAR	Events manually reported
4	7

In 2020, all events detected in CAMAR were also reported manually for incident investigation. Three events reported manually did not trigger an automated recording because a different logic was applied to calculate the minimum distance.

Air traffic controller productivity

With 1.29 IFR flight-hours per air traffic controller-hour, MUAC's air traffic controller productivity was also affected by the pandemic throughout the 2020 business cycle. IFR flight-hours fell by 57%, whilst the number of ATCO hours on duty were also reduced by 25%.

MUAC	2019	2020	% variation
IFR flight-hours controlled	667,596	289,985	-56.6%
ATCOs/OPS hours on duty	299,377	224,104	-25.1%
ATCO productivity	2.23	1.29	-42.0%

▲ AIR TRAFFIC CONTROLLER (ATCO) PRODUCTIVITY 2019-2020

ATCO productivity dropped from 2.23 in 2019 to 1.29 in 2020. This indicator is the ratio between IFR flight-hours controlled and ATCO-hours on duty.

ENVIRONMENT

Reducing route extension

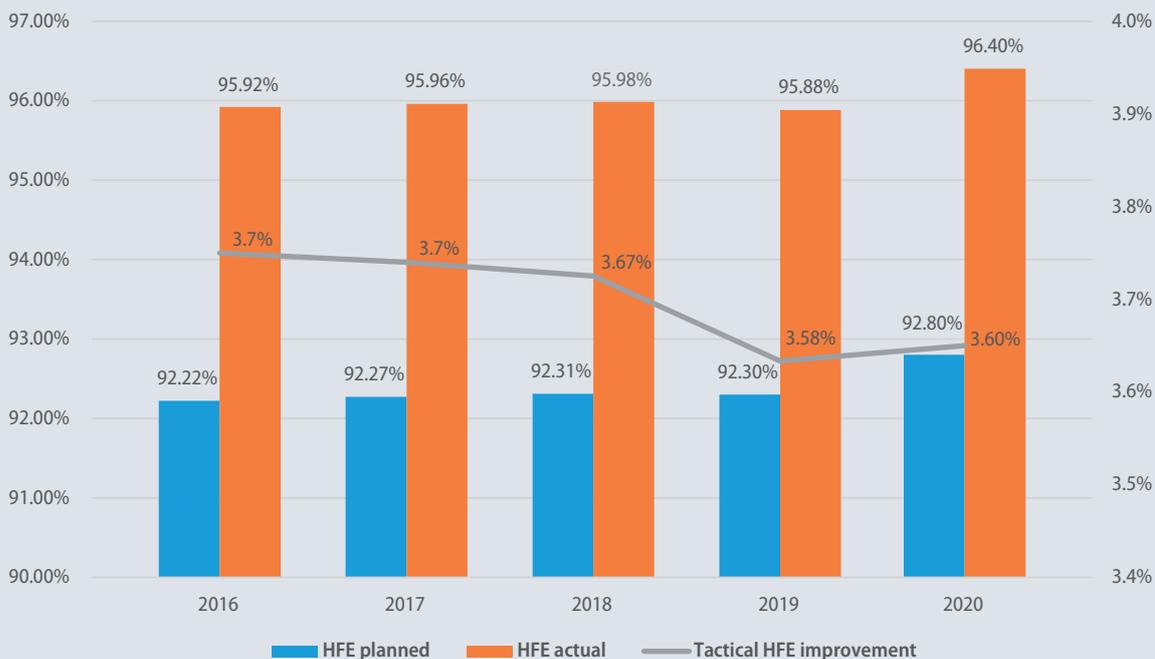
Year on year, MUAC strives to increase flight efficiency by offering shorter routes and fuel-optimal vertical flight profiles in order to achieve the ambitious European aviation target of reaching net zero emissions by 2050.

Since 2009, MUAC has been monitoring horizontal flight efficiency (calculated as the ratio of route extension relative to the approach of the flight to its destination as performed in MUAC airspace) both for the trajectories actually flown (REDES_actual/RESTR_actual) and for the last filed flight plans (REDES_planned/RESTR_planned).

With the low number of flights and the reduction of RAD restrictions, MUAC horizontal flight efficiency showed a significant improvement in 2020 compared with the year before. Horizontal flight efficiency based on the last filed flight plan showed an increase from 92.3% in 2019 to 92.8% in 2020. Similarly, actual horizontal flight efficiency shows an improvement from 95.88% in 2019 to 96.4% in 2020.

The difference between the actual and planned flight extension, the tactical HFE improvement, increased to 3.6% in 2020. Although it would be beneficial (for predictability purposes at least) to reduce the difference between the planned and actual figures, the graph shows a constant gap between the two values and it is unlikely that this difference will disappear in the foreseeable future.

MUAC FLIGHT EFFICIENCY BASED ON ACTUAL TRAJECTORY



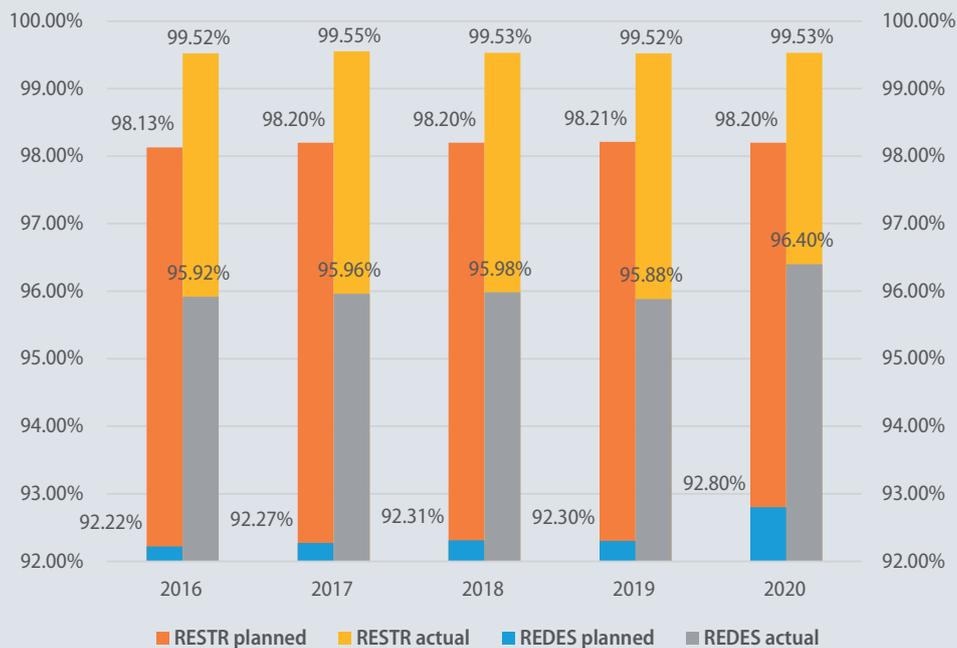
Looking in more detail into flight efficiency, we can see that the internal component of route extension based on the actual trajectory (RESTR_actual) has remained relatively constant and has stayed well inside our target. The very high number for RESTR actual (99.53%) indicates that almost all flights in the MUAC area are flying directly. The remaining 3.13% (3.64% in 2019) of route extension (RESTR_actual – REDES_actual) shows the interface component, or the network contribution to flight inefficiency, which for the most part does not depend on MUAC operations.

The internal component of flight extension implied by the planned trajectories (RESTR_planned), however, remained at the same level as in recent years, i.e. 98.2%.

The remaining 5.40% of the extension (RESTR_planned – REDES_planned), the network component, should be attributed to the existing route structure, airspace design, allocation of military areas, but also to drawbacks in flight planning process, leaving significant room for improvement.

In the meantime, we can state that the flight efficiency improvement contribute by MUAC controllers during the tactical phase (among other things by giving directs to airliners and using available military areas) resulted in a total reduction in distance of more than 3,135,000 NM (approximately 4.03 NM per flight), saving 18,811 tons of fuel and reducing CO₂ emissions by 59,255 tons in 2020.

MUAC FLIGHT EFFICIENCY BASED ON FILED FLIGHT PLAN



ACE report highlights MUAC's strengths and challenges

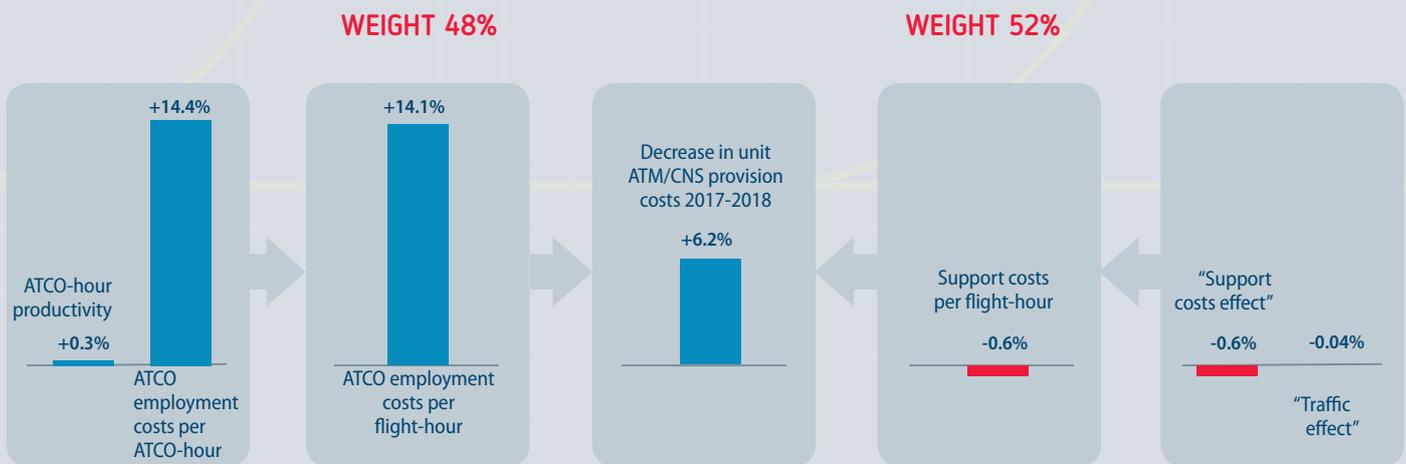
In May 2021, the ATM Cost-Effectiveness (ACE) 2019 Benchmarking Report was released.

The productivity and financial cost-effectiveness indicator confirmed MUAC's ranking among the top-performing ANSPs in Europe in 2019.

The economic gate-to-gate cost-effectiveness indicator per IFR flight-hour improved, decreasing

from €477 in 2018 to €308 in 2019. This was the result of a much decreased en-route ATFM delay in the airspace controlled by MUAC.

MUAC has already initiated a series of activities and projects to minimise the effects of controllable events and maximise the ratio between resources and outputs in an attempt to mitigate delays in the coming years.



Atco employment costs represent 48% of total ATM/CNS provision costs

Support costs represent 52% of total ATM/CNS provision costs

▲ CHANGES IN THE FINANCIAL COST-EFFECTIVENESS INDICATOR (2019 euro values) 2018-2019

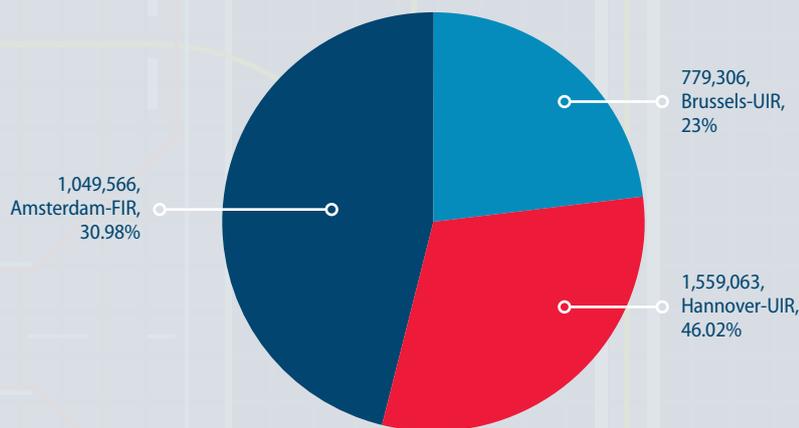
Service units and revenue distribution to States

The number of service units produced within MUAC airspace decreased by 55.4% in 2020, while overall revenues decreased by M€239.1. The national unit rates in all countries increased in 2020.

SUs and revenue distribution - 2019/2018 (2020 euro values)								
State	2019			2020			SUs 2020/2019 (%)	Revenues 2020/2019 (M)
	SUs	Route charges	Revenues (M)	SUs	Route charges	Revenues (M)		
Belgium/Luxembourg	1,892,266	€ 68.3	€ 129.2	779,306	€ 91.0	€ 70.9	-58.8%	-€58.3
Netherlands	2,395,810	€ 57.4	€ 137.5	1,049,566	€ 67.3	€ 70.6	-56.2%	-€66.9
Germany	3,312,534	€ 64.3	€ 213.1	1,559,063	€ 63.6	€ 99.2	-52.9%	-€113.9
MUAC	7,600,610	-	€479.8	3,387,935	-	€240.7	-55.4%	-€239.1

▲ SERVICE UNITS, NATIONAL UNIT RATES AND REVENUES PER SECTOR GROUP (€M - 2020 euro values) - TREND 2019-2020

Revenues distributed to States decreased by M€239.1 (in real terms) in 2020.



SERVICE UNITS IN 2020

Breakdown of service units in the Amsterdam FIR, the Brussels UIR and the Hannover UIR, respectively.

CUSTOMER ORIENTATION

Reduced traffic levels due to the pandemic considerably affected the traditional programme of civil and military customer consultation activities. Nonetheless, important projects continued to be discussed at bilateral level in order to boost collaborative initiatives.

Customer relationship management

Civil customer consultation and involvement

In 2020, the number of individual customer consultations meetings was drastically reduced in order to enable aircraft operators to fully concentrate on their business and the mitigations caused by the pandemic. Throughout the reporting period, both civil and military customers were regularly informed about the way MUAC was managing the pandemic, both from the operational and from the staff health and safety points of view, and what was planned to support a recovery. Some bilateral meetings were held online, as was the Annual Customer Consultation, with 30 delegates representing airlines, freight operators, Computerised Flight Plan Service Providers, airline associations and the US Air Force. The meeting was rated very successful by the participants, with a score of 91% satisfaction.

2020 saw major advances in cooperative and support activities involving the aircraft operator community.

Regular COVID and, subsequently, aircraft operator AIRAC briefs were published, informing airlines and CFSPs about significant changes in routeings and RAD restrictions in MUAC airspace. The brief aims to support the monthly update of route databases and a smooth transition to a new AIRAC (aeronautical information regulation and control).

The Pre-flight Check (PFC) initiative was launched with a view to offering aircraft operators the best possible pathway through MUAC airspace. When the opportunity arises, MUAC assists airline planning efforts through those parts of the airspace, which are often tricky to navigate, with seemingly hard and fast route availability rules or availability restricted by military activity. By making use of local knowledge and coordination, MUAC is able to offer refile advisories, which are unknown to flight planning systems. A trial held in November 2020 revealed that out of 52 flights addressed, absolute savings reached 18,000 kg of CO₂ emissions, €258 of route charges, 5,800 kg of fuel, 104 minutes of flying time and 700 km in distance flown.

Over the reporting period, overall customer satisfaction with MUAC services in general reached 86.5%. Satisfaction with the effectiveness of all MUAC consultation activities scored 95.5%.

Military customer consultation

Like the whole aviation industry, the military were also affected by the pandemic. On-site meetings were limited or cancelled altogether. However, over the reporting period, MUAC continued to improve and strengthen its relationship with its military and special operations partners by means of bespoke online bilateral meetings. The annual military customer consultation, OAT@MUAC, was postponed. MUAC's next Military Customer Consultation Meeting is planned for November 2021, hopefully face-to-face.

Cross-border Arrival Management - XMAN

The goal of XMAN is to reduce aircraft holding times at congested airports by reducing their cruising speeds during the final en-route phase of flight. In this way, flight efficiency is increased, as fuel burn levels and CO2 emissions fall. Moreover, less airborne congestion in terminal areas will also contribute to improved operational safety by reducing pilot/ATC workload.

Following the successful implementation of the XMAN London Heathrow concept in November 2015, MUAC is continuing to support further trials and implementations of XMAN at other airports. The success of the XMAN London Heathrow project was recognised at the 2015 World ATM Congress, where it was honoured with a Jane's Award for its outstanding achievement in the Enabling Technology category.

In 2019, MUAC took part in the successful operational trials for London-Gatwick and Paris Charles de Gaulle airports, both as part of FABEC projects and the SESAR Demonstration "xStream", which won the ATM Awards 2019 in the "Environment" category and the "Overall Excellence in ATM Award".

The operational trial for London-Gatwick was followed by the implementation of the procedure on a permanent basis in October 2019. For Paris Charles de Gaulle, the procedure became permanent in December 2020.

In line with the requirements set out in the European Pilot Common Project (PCP) Implementing Rule, the XMAN procedure will be extended to a total of 25 European airports by January 2024. To secure MUAC performance, we actively support the Multi-AMAN Integration Work Package.

Following the completion of these activities under SESAR 2020 Wave 1 by the end of 2019, they will be further coordinated only through the FABEC XMAN Programme.

Cross border civil/military operations and Flexible Use of Airspace

On 8 June 2020, the Dutch State established the Flexible Use of Airspace Cell at MUAC (FUA Cell MUAC). FUA Cell MUAC is part of the Netherlands AMC and it is responsible for publishing the daily Air Space Use Plans for the Amsterdam FIR. The MUAC flow management personnel was trained to execute the FUA task by experts from the Royal Netherlands Air Force.

MUAC supported all major military exercises in its Area of Responsibility during the actual operations but also in the planning phase. MUAC staff participated as ATS experts in the exercise staff during the NATO exercise Cold Igloo.

Additionally, in close cooperation with military airspace users, military planners and Airspace Management Cells (AMCs) within Belgium, Germany and the Netherlands, MUAC has implemented several Flexible Use of Airspace (FUA) initiatives. As a result of these initiatives (e.g. the FL365+ project in Belgium), civil airspace users have been given the option to flight plan through military areas when these areas are not being used by the military. This enhanced cooperation provides benefits to civil users by allowing them to flight plan shorter routes, and by giving them additional route options. While resulting in better predictability for MUAC and the network as a whole, the impact on military planning flexibility has been minimal.

INNOVATION AND DEVELOPMENT

ATC2ATM

This operationally focused programme is looking at a horizon of 2025 and beyond. The intention is to provide the required capacity to meet the SES performance targets within budgetary and staffing constraints. MUAC productivity is to increase in line with, or ahead of, the expected traffic growth. ATC2ATM intends to introduce an evolution in the concept of operations, including new roles, procedures and tools bridging the gap between the ATFCM and ATC functions and making the most efficient use of staff and airspace. The programme will improve post-ops processes, data analysis and traffic prediction in order to optimise the effectiveness of ATM decision-making and to improve the planning and execution of daily operations. As a result, flows will be optimally routed through MUAC airspace so that workload is balanced across the sectors and traffic is streamlined before it reaches the ATCO in order to operate safely and efficiently.

The main deliverables for 2020 were the following.

Optimised Sector Manning

The project is developing a new concept of operations and required systems support to improve offload sector management. The new concept envisaged for tactical use in offload scenarios would allow for a more efficient transition in opening and closing sectors. In 2020, two concepts (Assistant Controller and Offload Controller respectively) aimed at increased tactical flexibility were simulated and compared with results of previous MSP (Multi-Sector Planner) trials. The OC (Offload Controller) concept proved to be well suited for offload situations in top layer sectors in nominal traffic conditions, requiring better system support for special occurrences. The AC concept, although genuinely validated positively, requires more work in the direction of ATCO team

workload distribution by using CPDLC clearances combined with advanced HMI features.

Post-OPS Analysis & Business Intelligence (PABI)

In 2020, the first phase of SOTA (Sector Opening Table Architect) developments for MUAC pre-tactical sector configuration tuning to predicted traffic demand were completed, with new user interfaces for the FUA cell and initial support for pre-tactical CDM, with stakeholders using the NM's B2B moderation services. The upcoming OCTOPUS project will address further evolution and integration of the MUAC pre-tactical and tactical capacity and demand-balancing tooling with external partners and their tools.

2020 also saw the product development and deployment of the first three releases of the operational Data Warehouse (DWH) product, providing advanced data analysis and visualisation functions to MUAC technical, operational and performance management units as determined by the BI topical team and steered by the BI coordination board.

Demand for low-latency data crunching and agile analytical abilities is still on the rise, and in 2020, MUAC embarked on a Data Science and Analysis Lab (DSAL) study, investigating the use of the MS Azure cloud for some representative use cases. Results were encouraging, and a second phase of the DSAL study is being launched for execution in 2021.

On the human resources side, MUAC hired some proven data architects as staff in 2020, and initiated the recruitment of new temporary contractors, to address the skill set required in the future to implement the prescribed RP3 BI strategy.

Traffic Prediction Improvements (TPI)

Following successful implementation of a machine-learning algorithm to predict horizontal flight routes, MUAC has continued to investigate how artificial intelligence (AI) can bring tangible benefits to sector workload prediction and the optimisation of traffic regulations, problems which are difficult to solve with traditional software logic.

Since 2020, the machine-learning algorithm in the integrated Flow Management Position (iFMP) has been predicting the full 4D trajectory profile, including speed, rate of climb/descent and top of descent. This algorithm is an enabler for traffic "hot spot"/complexity detection (pending further operational evaluation when traffic levels increase in the upcoming years).

A second AI algorithm has been integrated, which can predict how air traffic controllers handle the sector sequence of a flight path, resulting in considerable improvements in sector workload forecasts, as AI can understand how controllers transfer flights from one sector to another. Owing to the changed COVID traffic conditions, operational experts performed extensive validation of the predictions in order to ensure that patterns which the AI algorithm had learned from pre-COVID conditions are still valid and do not reduce the accuracy of the forecasts. The sector skip algorithm will be enabled before summer 2021.

Lastly, a third AI algorithm developed jointly with colleagues of the EUROCONTROL Experimental Centre predicts aircraft take-off times. The AI algorithm is able to detect patterns in aircraft turn-around times at airports, congestion, and the impact of a delay assigned to a flight. Extensive validation was performed in order to ensure that prediction quality is superior to traditional predictions both in COVID and non-COVID traffic conditions. The new prediction module passed all tests successfully for operational use by January 2021.

Customer service

ATM-P

The ATM Portal project delivered an airline operator portal in 2018. Since then, it has been used at the MUAC Flow Management Position as an added-value tool and has been a key tool in the success of the Customer Initiative 2018-2020 trials.

Collaboration partners now include other ANSPs, namely Skyguide, the DSNA and the DFS and expansion to over 13 airline OCCs, with outreach to 25 AOCs.

Airlines were invited to use the ATM-P to report on their flights with the highest business value, such as those flights with critical problems during daily operations, which facilitated better support to the most business-critical flights.

Collaboration partners in the ANSP network now include Skyguide (2 ACCs), the DSNA (2 ACCs) and the DFS (2 ACCs)

Customer Initiative 2020 "COVID Service Recovery"

The previously implemented priority punctuality service, although now active, became almost dormant owing to the extremely low demand as a result of the restrictions imposed by COVID-19, yet the break in traffic workload presented a new opportunity to branch into new areas. A new era of enhanced service to customers was born, with the introduction of the "Pre-Flight Check" (PFC). The PFC offered to find more efficient fileable routes through the dense and complex route structure in the core European airspace in which MUAC sits. MUAC in coordination with the network can now assist the Aircraft Operators by suggesting improved coordinated routings which are not recognised by AO flight planning systems.

During November 2020, an initial formal trial was conducted and substantial savings were made in fuel burn, CO₂ emissions, route charges, distance and flight duration.

SESAR2020 validations & demonstrations

ADS-C

As part of the SESAR 2020 projects linked to the new ADS-C (i.e. Project 18 for validations of an enhanced trajectory predictor and Project 31 for live demonstrations), MUAC provided the downlinked Extended Projected Profile (EPP) and discrepancy indication (when not equal to the FDPS flight plan) to a sub-set of controllers in pre-operational fashion. MUAC's pre-operational demonstrations started in July 2019 and are planned to continue until at least mid-2020 under SESAR 2020 Wave 1 PJ31. Demonstrations are proposed to further continue under a new SESAR 2020 Wave 2 project call PJ38 until the end of 2022.

Interoperability via Flight Object

As part of SESAR 2020 Project 18, MUAC is supporting the validation of the Flight Object in order to introduce seamless coordination between centres as well as sharing a continuous real-time update of the flight plan. The first validation took place during April 2019 and work continued afterwards to develop functionality, a bigger validation scenario and maturity for Exercise #2 planned for June 2020.

MUAC is working on preparations for deployment together with the IOP-partners, linked to PCP AF#5 (SWIM Blue Profile).

Data services

SAS2

The SAS2 project is the development and deployment/implementation of a Shared ATC System 2 (SAS2) used by the Belgian Ministry of Defence to provide OAT services. The implementation was fully achieved in December 2019. Remote CWP's are installed at the skeyes Steenokkerzeel site and at the Belgian MOD ATC Towers and are connected via a dedicated Virtual Private Network to the PRI-ATS system in the ONL and TTI partitions at MUAC.

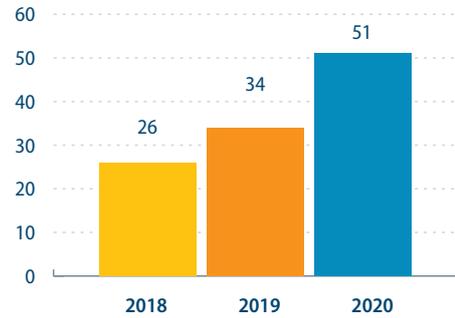
ADaaS

The ADaaS Study has deployed a prototype to demonstrate that ATM data can be provided as a service by a single distributed ATM system to one or more civil Air Traffic Service Units (ATSUs). The ADaaS Study also investigated how an existing ICT infrastructure of MUAC has to be modified to become a state-of-the-art Data Centre from which an ADSP can deliver services.

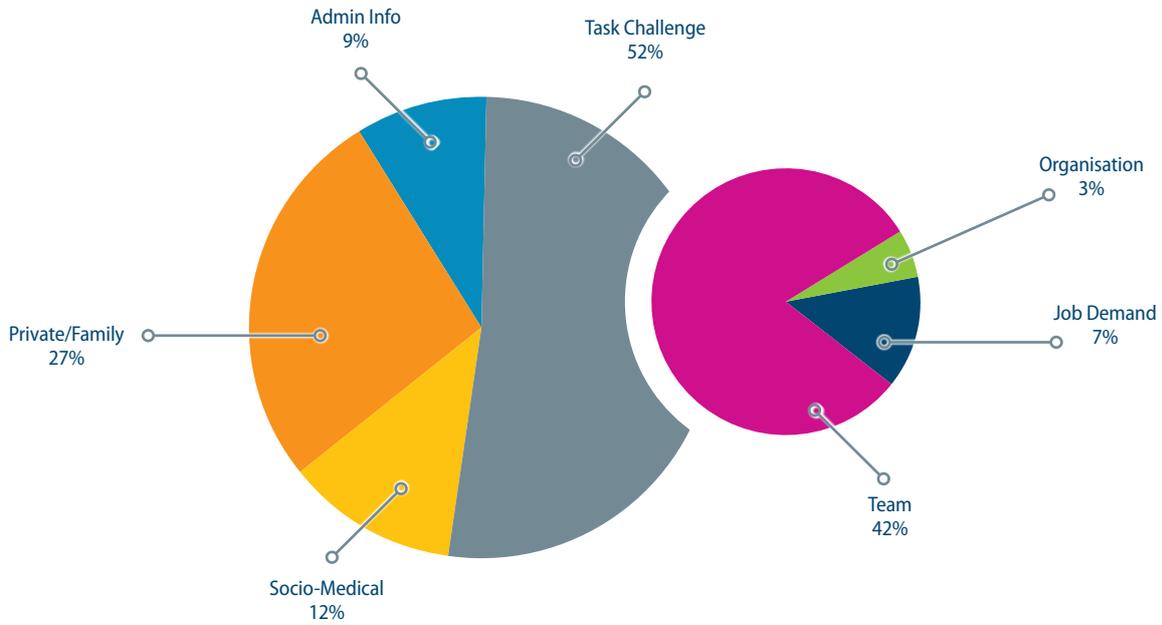
STAFF

Welfare service

Since 2018, the MUAC Welfare Officer has been established as an essential function for the Centre. She offers confidential support and advice to all staff members (serving and retired, and their families) experiencing personal, family or professional difficulties, and helps resolve them.



PEOPLE supported
2018-2019-2020
(Welfare Officers)



Nature of issues - 2020
(MUAC Welfare Officer)

Energy and Resilience Management

The MUAC Energy and Resilience Management Project has transitioned from a project to an important cornerstone of the MUAC culture, and over the years has become popular amongst employees throughout the organisation. Its aim is to implement a structural approach to energy and resilience management in order to support staff in boosting their own level of engagement and happiness both at work and in their private life, thus preventing burnout.

The Energy and Resilience Management support network is available to help staff face their challenges, with individual coaching sessions, trainings and workshops. In the course of the project, the Ops Room staff, including system control staff, have the opportunity to utilise an online development application, the GRIP, to work on their personal improvement areas. Those who have participated in the project initiatives have certainly developed skills and attitudes which will be key for the future of our jobs.

Social dialogue

Social dialogue activities in 2020 continued at both Agency and MUAC levels through the Agency consultation process, involving the trade unions and meetings of the Staff Committee (Servants), who represent MUAC staff with MUAC senior management.

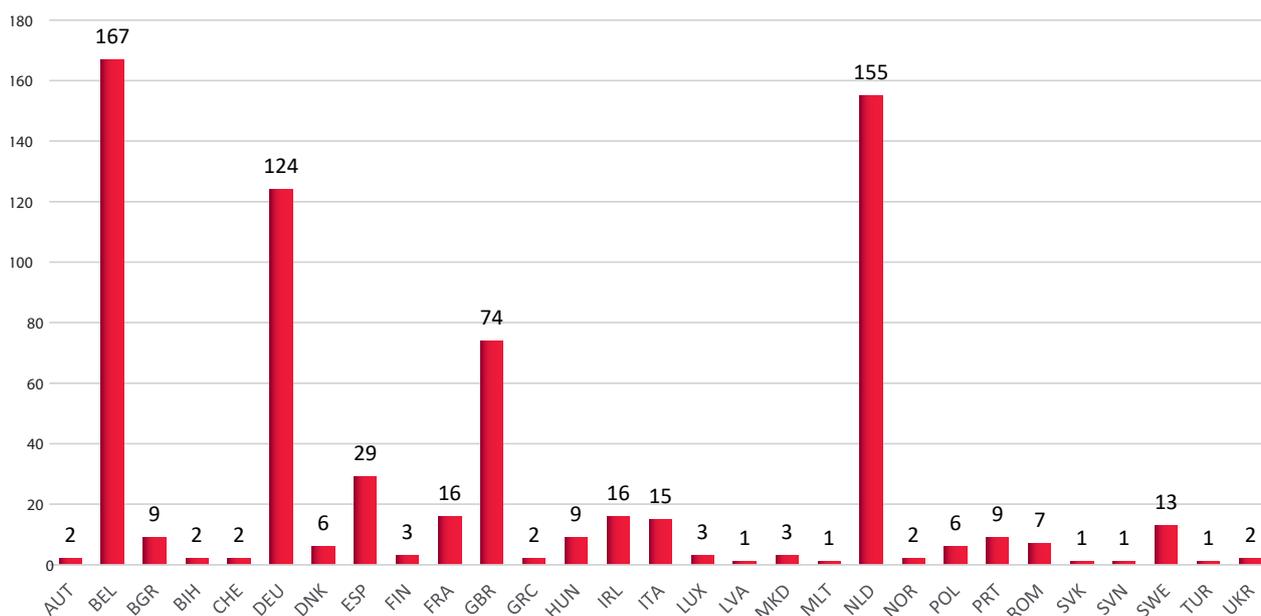
These discussions covered a number of different topics, but in particular focused on temporary provisions to contribute to savings in the context of the COVID-19 crisis. Discussions on temporary amendments to the working conditions of staff working in the Operations Room at MUAC were successfully concluded with a view to providing additional MUAC capacity at no cost when traffic levels recover. It is estimated that the amendments will generate savings for MUAC in an amount of M€4, thus providing budgetary relief for the MUAC budget for a four-year period (2021-2024).

Within MUAC, management provided regular feedback to the Staff Committee (Servants) on MUAC's main activities and its involvement within FABEC. On the basis of close dialogue between the Staff Committee and MUAC management, staff-related questions were raised, discussed and followed up.

Staff intake and outflow (2015-2020, 31 December)	2015	2016	2017	2018	2019	2020
Retirements	3	2	2	9	9	13
Other outflow*	18	4	6	6	13	11
TOTAL outflow	21	6	8	15	22	24
Recruitment (except air traffic controllers)	2	9	7	25	16	21
Student air traffic controllers (ab initio and conversion)	8	0	25	26	26	12
TOTAL intake	10	9	32	51	42	33

* Other outflow refers to student air traffic controller dismissals, resignations, early terminations of service, transfers to other EUROCONTROL units, unpaid leave, invalidity, end of contract, contract terminations or death in service.

▼ COUNT OF NATIONALITY - 31 December 2020



The MUAC Board has analysed the MUAC strategy and priorities, with the ultimate objective of providing the Centre with adequate tools and initiatives to adapt to the challenges of the coming years. Special attention is being given to cost-efficiency, and certain projects are being considered for delay until such time as the recovery materialises.

The new Agreement on the establishment of the Maastricht Decision-Making Body (MDMB) as the main executive body of MUAC, with increased decision-making power and more autonomy, is expected to be implemented by the end of 2021. This should provide MUAC and the Four States with the necessary agility to make rapid, independent and sound decisions in this dynamic business environment.

The Board will promote further cooperation with key partners and stakeholders (e.g. FABEC, the NM, military partners, etc.), and will ensure that MUAC's role as a key player on the European ATM scene will enhance the solutions and agreements required to tackle the upcoming challenges.

In the medium to long term, "innovation" will remain a pivotal element of the MUAC strategy. As an outstanding service provider, MUAC has to be effective, and be at the forefront of technical and operational innovations, while at the same time remaining an attractive employer. In this regard, a number of initiatives and studies are on the table, including our ATC2ATM programme, the business intelligence activities, shared systems and automation, all of which are key to our future development. In parallel, the Board will be promoting internal initiatives to ensure the best use of available platforms, fora and resources in order to come up with new creative, innovative and effective ideas.

The context of the COVID-19 crisis has created significant cost pressure on the entire ATM industry. MUAC is not immune to this pressure and the Board is committed to playing its part in ensuring that MUAC can continue to flourish while strictly controlling costs.

The MUAC Board

Annual accounts

EUROCONTROL produces annual accounts which provide a consolidated view of the Agency's financial situation and budgetary performance. In line with the applicable financial regulations, the specific performance of MUAC is identified in Part III of the Agency's accounts. This report includes an excerpt from the data available in the Agency's Annual Accounts in order to present a reference Balance Sheet and Statement of Financial Performance for MUAC. The Agency's Annual Accounts are produced in accordance with the principle of a true and fair view.

The Agency's accounts, including Part III, which relates to MUAC, are audited by the Audit Board with the assistance of external consultant auditors. The Annual Accounts, including the auditor's opinion, are subsequently submitted to the Commission via the Provisional Council. The Commission gives a final ruling on the Accounts and decides on the discharge to be given to the Director General in respect of his financial and accounting management.

The figures presented in this report are therefore subject to the approval of the Audit Board and the Provisional Council, which was received in June 2021.

Accounting principles and general notes on accounting matters

The main accounting principles underlying the present financial statements are set out below.

Since 2011, the financial statements with regard to expenditure and receipts have been prepared in accordance with the International Financial Reporting Standards (IFRS), on the basis of the provisions of the Financial Regulations of the Agency and their Rules of Application.

The Agency's policy regarding fixed assets is based on revised Director General's Decision XI/7(2020), dated 01/01/2020 and the Decision of Director CF (DCF/II/04 dated 01/01/2020). Fixed assets are entered at their historic value and amortised over their useful lifetimes, in accordance with

amortisation rates, which apply equally to the calculation of the investment costs to be recovered from the airspace users through the EUROCONTROL part of the cost-base (on the basis of ICAO rules adopted by the Permanent Commission).

Following a decision by the Provisional Council in November 2004, the Agency applies International Accounting Standard 38 (IAS 38) and, since 1 January 2006, capitalises only intangible assets which fully comply with this standard. Following this principle, only computer software for which EUROCONTROL owns intellectual property rights is capitalised.

As regards operating expenditure, contributions from the Four States participating in MUAC are calculated on the basis of an agreed cost-sharing formula. At year end, the over-/under-payment of contributions is calculated by comparing the level of expenditure with the level of contributions paid.

Investments are fully financed by bank loans. The residual value of fixed assets on the Balance Sheet is therefore fully compensated by an equivalent amount of loans. In the Statement of Financial Performance, the amortisation charge for the year is balanced by contributions from the Four States.

In accordance with Article 23 of the Financial Regulations, any over-/under-payments of contributions are deducted from/added to contributions for the subsequent year.

In accordance with Article 29 of the Financial Regulations, and as approved by the Permanent Commission, the Annual Accounts incorporate both the Budgetary and the Financial Accounts.

The 2020 Budgetary Accounts, which determine the amount of contributions due from the Member States in 2020, are based on the IFRS principles (with some exceptions). Similarly, the 2020 EUROCONTROL cost-base, which has been charged to the users through the route charge recovery cost mechanism, is also based on the IFRS principles (with some exceptions).

The exceptions to the IFRS are listed in Article 6 of the Rule of Applications of the Financial Regulations in the areas of contributions to social security schemes, compensation of national taxes and provisions.

▼ BALANCE SHEET (NOMINAL VALUES)

ASSETS		2019	2020
FIXED ASSETS			
	Buildings & installations	32,821,964	32,141,318
	Equipment	22,502,980	18,753,279
	Vehicles	75,749	104,976
	Work in progress	901,291	43,695
	TOTAL FIXED ASSETS	56,301,983	51,043,267
CURRENT ASSETS			
	Contributions to be received	27,709,760	40,725,498
	Intercompany receivables	14,979,674	
	Deferred charge	12,358,213	12,949,482
	Other debtors	1,448,218	682,417
	TOTAL CURRENT ASSETS	56,495,866	54,357,396
OVERALL TOTAL		112,797,849	105,400,664

LIABILITIES		2019	2020
CURRENT LIABILITIES			
	Contributions to be reimbursed to Member States	6,112,886	2,651,836
	Deferred income	39,872,250	39,376,960
	Other creditors	9,437,630	5,164,359
	Accrued charge	1,073,100	1,820,188
	Intercompany payables		5,344,053
	TOTAL CURRENT LIABILITIES	56,495,866	54,357,396
OTHER LIABILITIES			
	Loans > 1 year	56,301,983	51,043,267
	TOTAL OTHER LIABILITIES	56,301,983	51,043,267
FINANCIAL POSITION			
	TOTAL FINANCIAL POSITION	-	-
OVERALL TOTAL		112,797,849	105,400,664

GLOSSARY OF ACRONYMS

A

ACC	Area Control Centre
ACE	ATM Cost-Effectiveness
ADaaS	ATM Data as a Service
ADS-C	Automatic Dependent Surveillance - Contract
ADSP	ATM Data Service Provider
AMC	Airspace Management Cell Acceptable Means of Compliance
AMAN	Arrival Manager
ANSP	Air Navigation Service Provider
ATC	Air Traffic Control
ATCC	Air Traffic Control Centre
ATCO	Air Traffic Controller
ATC2ATM	Air Traffic Control to Air Traffic Management
AtDSUP	Assistant to Duty Supervisor
ATFCM	Air Traffic Flow and Capacity Management
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATM/CNS	Air Traffic Management/ Communications, Navigation and Surveillance
ATN	Aeronautical Telecommunications Network
ATS	Air Traffic Services
ATSU	Air Traffic Service Unit

B

BAF	Bundesaufsichtsamt für Flugsicherung/ Federal Supervisory Authority for Air Navigation Services
BSA-ANS	Belgian Supervisory Authority for Air Navigation Services
B2B	Business to Business

C

CAA	Civil Aviation Authority
CNS	Communications, Navigation & Surveillance
CPDLC	Controller-Pilot Data Link Communications

CRSTMP	Capacity, Routeing, Staffing, Equipment, Management, Special Event
CSS	Central Supervisory Section
CWP	Controller Working Position

D

DNV GL	Det Norske Veritas Germanischer Lloyd
--------	---------------------------------------

E

EC	European Commission
ENAC	Ecole Nationale de l'Aviation Civile
EOS	Executive Operations Support
EPP	Extended Project Profile
EU	European Union
EUROCONTROL	European Organisation for the Safety of Air-Navigation

F

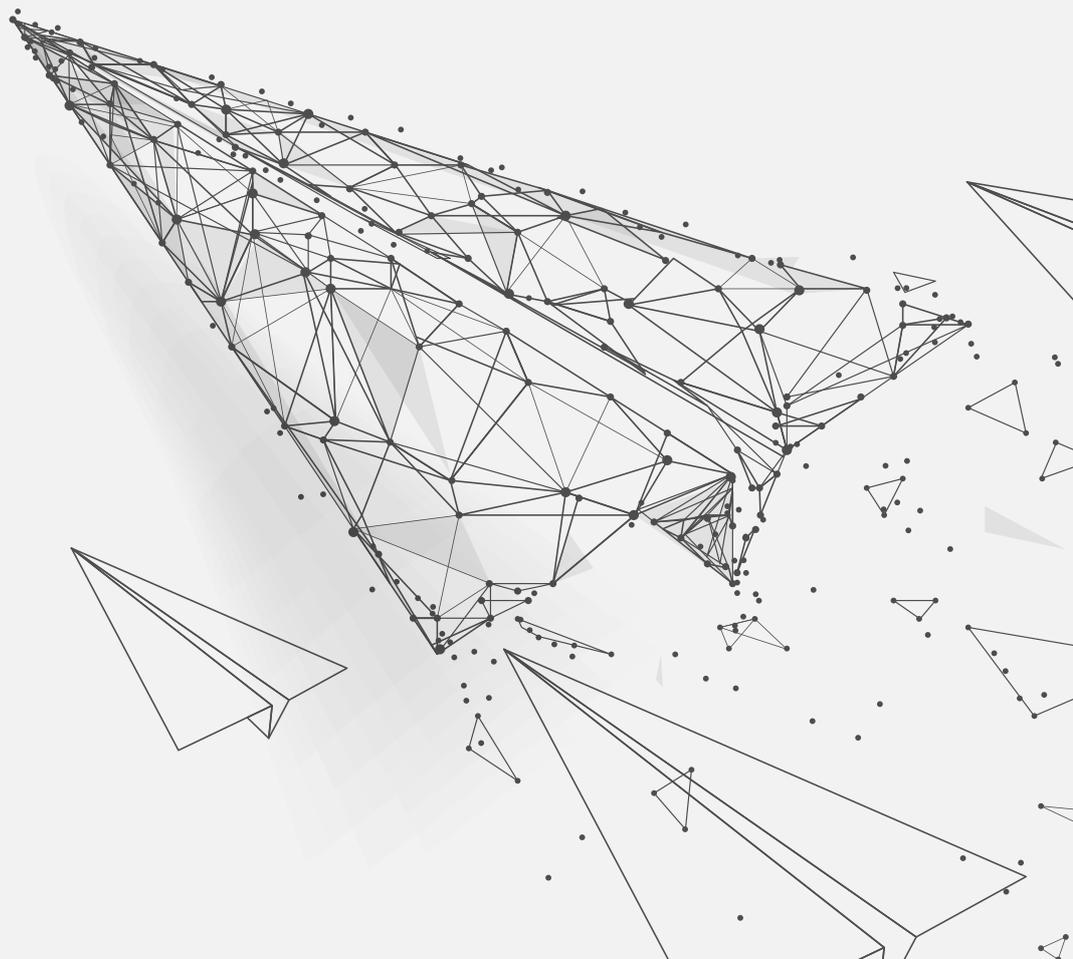
FAB	Functional Airspace Block
FABEC	Functional Airspace Block Europe Central
FANS	Future Air Navigation System
FDPS	Flight Data Processing System
FIR	Flight Information Region
FRA	Free Route Airspace
FTE	Full-Time Equivalent
FUA	Flexible Use of Airspace

G

GAT	General Air Traffic
-----	---------------------

H

HR	Human Resources
HRS	Human Resources Service
H24	Available 24 hours a day, 7 days a week



EUROCONTROL Maastricht

Horsterweg 11
NL-6199 AC Maastricht-Airport
Phone: +31-43-366 1234
Fax: +31-43-366 1300
muac.info@eurocontrol.int
www.eurocontrol.int/muac

© July 2021 – EUROCONTROL

This document is published by EUROCONTROL for information purposes. It may be copied in whole or in part, provided that EUROCONTROL is mentioned as the source and that it is not used for commercial purposes (i.e. for financial gain). The information in this document may not be modified without prior written permission from EUROCONTROL.

