



Draft Opinion

in accordance with Art. 16 (Accelerated procedure) of MB Decision
No 18-2015

High-level regulatory framework for the U-space

RMT.0230

EXECUTIVE SUMMARY

Unmanned aircraft — commonly called drones — are a promising source for delivering innovative services. Yet, these emerging technologies also present a challenge. The rising number of unmanned aircraft systems (UAS) operations in the European airspace poses a safety issue: how to ensure safe UAS traffic management and how to ensure that unmanned aircraft can safely operate within the existing air traffic environment?

This Opinion intends to create the necessary conditions for manned and unmanned aircraft to operate safely in the airspace where U-space services are provided, using an appropriate platform that will enable the exchange of essential information between the U-space service providers and the aircraft operators.

The final objective of the U-space system is to prevent collisions between aircraft and mitigate the air risk. Therefore, the U-space regulatory framework, supported by clear and simple rules, should permit safe aircraft operations in all areas, in all fields of application and with all types of unmanned operations.

Action area:	Civil drones (unmanned aircraft systems)		
Affected rules:	n/a		
Affected stakeholders:	Member States, UAS operators, manned aviation community, U-space service providers, ANSPs, all airspace users]		
Driver:	Safety	Expert group:	Yes
Impact assessment:	No	Rulemaking Procedure:	Accelerated

• EASA special rulemaking procedure milestones

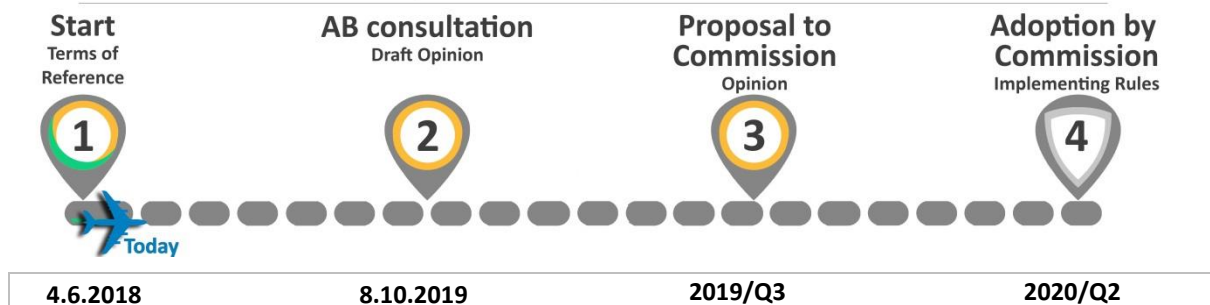


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1. About this draft Opinion

1.1. How this draft Opinion was developed

The European Union Aviation Safety Agency (EASA) developed this regulatory proposal in line with Regulation (EU) 2018/1139¹ (the ‘Basic Regulation’) and the Rulemaking Procedure². This rulemaking activity is included in the European Plan for Aviation Safety (EPAS) [2019-2023](#) under rulemaking task RMT.0230.

The text of this draft Opinion has been developed by EASA, in close coordination with the European Commission (EC), and will undergo consultation with the Advisory Bodies in accordance with Article 16 ‘Special rulemaking procedure: accelerated procedure’ of MB Decision No 18-2015.

EASA has taken the decision to follow the procedure laid down in said Article following the conclusions of the Declaration at the High Level Conference on Drones in December 2018 that priority should be given in the development of a ‘institutional framework for a competitive U-space services market and how drones need to be operated in the Single European Sky’. The Declaration notably called, as a matter of urgency, for a timely delivery of a U-space regulatory framework.

In order to implement the Amsterdam Declaration, EASA and the EC have set up a working group to support with the development of the draft regulation. This working group was composed of representatives of 7 Member States (DE, FR, ES, PL, CH, FI, NL) as well as experts from EUROCONTROL and the SESAR Joint Undertaking. The working group held 8 meetings, from January 2019 till September 2019.

EASA and the EC also organised a 2-day workshop on 14 and 15 May 2019 with the relevant U-space stakeholders, representatives of the authorities and other experts from the industry. In addition, EASA organised, in July 2019, a focused consultation to receive comments on its very first initial draft regulation. More than 1 000 comments were received from the drone and U-space stakeholders as well as from the authorities and the industry.

Based on all the discussions held in the meeting groups and the feedback received during the two workshops held in May and July, EASA is proposing this draft regulation containing provisions for a high-level regulatory framework for U-space.

In addition to safety, the draft regulation proposed with this Opinion also contains an initial set of requirements that are related to market regulation and competition. The reason is that this draft regulation has been jointly developed with the EC that wishes to have one single comprehensive regulation covering all aspects of U-space.

¹ Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91 (OJ L 212, 22.8.2018, p. 1) (<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1535612134845&uri=CELEX:32018R1139>).

² EASA is bound to follow a structured rulemaking process as required by Article 115(1) of Regulation (EU) 2018/1139. Such a process has been adopted by the EASA Management Board (MB) and is referred to as the ‘Rulemaking Procedure’. See MB Decision No 18-2015 of 15 December 2015 replacing Decision 01/2012 concerning the procedure to be applied by EASA for the issuing of opinions, certification specifications and guidance material (<http://www.easa.europa.eu/the-agency/management-board/decisions/easa-mb-decision-18-2015-rulemaking-procedure>).

1.2. How to comment on this draft Opinion

Please submit your comments via email to ken.engelstad@easa.europa.eu.

The deadline for submission of comments is **30 October 2019**.

1.3. The next steps

Based on the comments received, EASA will develop an opinion that contains the proposed regulatory framework for a U-space regulation. The opinion will be submitted to the EC, which will use it as a technical basis in order to prepare an EU regulation.

Following the adoption of the regulation, EASA will issue a decision that contains the related acceptable means of compliance (AMC) and guidance material (GM).



2. In summary — why and what

2.1. Why we need U-space

Unmanned aircraft — commonly called drones — are the future of aviation and a promising source for delivering innovative services. Yet, these emerging technologies also present a challenge. The rising number of UAS operations in the European airspace poses a safety issue: how to ensure safe UAS traffic management and how to ensure that UAS aircraft can safely operate within the existing air traffic environment?

In the perspective of the foreseen increase of manned air traffic in the years to come and the proliferation of unmanned aircraft operations, with both types of operations sometimes sharing the same airspace, hazard to air traffic, persons and property will also increase if not addressed through appropriate mitigating measures.

As drones are able to fly near people and buildings, the society expects more than safety. Drones should not intrude in the private domain and should minimise visual or noise pollution. This is why the U-space regulatory approach must go beyond traditional aviation safety issues and integrate the urban dimension of aerial mobility.

The integration of unmanned aircraft in the airspace should not endanger other airspace users such General Aviation (GA) or Helicopter Emergency Medical Services (HEMS) activities; instead, the ultimate goal should be safe integration of both manned and unmanned aircraft traffic. Currently, in the absence of information and communication in class G airspace, GA and other airspace users are relying mainly on the see-and-avoid principle to avoid mid-air collisions. In the absence of a fully validated, harmonised and certified detect and avoid system, it is obvious that this principle cannot be applied by drones when flying beyond visual line of sight (BVLOS).

The U-space is considered essential to respond to such growth of UAS operations — especially today in low-level airspace — which is expected to outnumber the volume of traffic currently seen with manned aircraft. Because today's air traffic management (ATM) system is already reaching its limits, it cannot be seen as the only appropriate means to safely and efficiently manage the upcoming UAS traffic. Consequently, there needs to be an alternative to it in the European regulatory framework that is adapted to the task of ensuring safe management of traffic in the U-space.

Indeed, the U-space is the enabler to manage more complex and longer-distance operations, and to ensure that BVLOS operations are conducted safely and efficiently. Step-by-step, U-space services are expected to cover all airspace in which UAS aircraft may be operating BVLOS (as well as, in the future, when operations are autonomous), with U-space airspace also required for dense UAS operations.

The U-space is also needed to ensure fair access to UAS operators to the airspace in a cost-effective manner through a competitive U-space services market. The European approach will facilitate this competitive model by providing the basis for common data exchange protocols, establishing the cooperative environment where all the necessary information is available and transmitted to those who need it, to ensure seamless exchange of and operators intent, operational constraints and other data critical for safety and security purposes. It is considered that these principles, raised at EU level, will increase safety.

The absence of a European-wide approach could result in non-harmonised implementation or in application of non-interoperable national rules, having a potential safety impact on the integration of UAS operations into the airspace due to the use of different procedures and technology. Moreover, a European regulatory approach for the U-space can provide the safety mitigations means through a common approach to an effective implementation of UAS traffic management across the European Union. The regulatory framework will provide a dynamic and iterative process as the U-space services will be gradually rolled out when they are more precisely defined, as the wider drone industry matures to fulfil the needs of new and future types of operations.

2.2. What we want to achieve — objectives

The objective of this proposal is to develop a European regulatory framework for U-space that will be the basis for keeping unmanned aircraft operations safe, secure, manageable, technology-neutral, connected and complementing the traditional aviation environment (e.g. with ATC).

This proposal intends to create the conditions for manned and unmanned aircraft operations to operate safely in the airspace where U-space services are provided (from now on named ‘U-space airspace’), using an appropriate platform that will enable the exchange of essential information between the U-space service providers³ and the aircraft operators. The final objective of this system is to prevent collisions between aircraft and mitigate the air risk. Therefore, the U-space regulatory framework, supported by clear and simple rules, should permit safe aircraft operations in all areas, in all types of application.

In addition to air and ground safety risk mitigation, the main objective of the EC as regards a U-space regulatory framework is to create a competitive U-space services market that leads to safe and sustainable operations in the U-space airspace. Only a clear EU regulatory framework can establish a competitive European U-space services market to attract the necessary business investments in both the drone and U-space services markets. An effective and enforceable regulatory framework should support and enable operational, technical and business developments, and provide fair access to all airspace users, so that the market can drive the delivery of the U-space services to cater for airspace users’ needs.

This proposal intends to set a level of safety and environmental protection, security and privacy that is acceptable to the public. At the same time, it should provide enough flexibility for the drone industry to evolve, innovate and mature as many of the technical solutions and U-space services are still under development and demonstration phases.

The U-space regulation should be performance- and risk-based. It intends to ensure interoperability and consistency with the existing Commission Implementing Regulation (EU) 2019/947 and Commission Delegated Regulation (EU) 2019/945. It should also provide enough flexibility to allow for local variants at the level of the Member State or even at regional/local level.

2.3. How we want to achieve it — overview of the U-space eco-system

This regulatory framework aims at building the foundation of the U-space (see figure below in 2.4).

³ New entity created by the regulation proposed with this Opinion. It is the entity that is certified by the relevant competent authority to provide U-space services in a given U-space airspace designated by the Member States.

In order to achieve safe and efficient aircraft operations in the U-space, there is a need to clearly define:

- (a) the scope:
 - (1) who will be subject to this regulation; and
 - (2) in which airspace this regulation will be applicable;
- (b) the general principles that will govern the U-space:
 - (1) how the U-space shall be established;
 - (2) the provision of information to the U-space service providers; and
 - (3) the exchange of digital data and information;
- (c) the roles and responsibilities of all actors participating to the U-space;
- (d) the U-space services that are already mature and will therefore be provided in the U-space;
- (e) in which conditions can organisations/companies become U-space service providers; and
- (f) requirements for Member States and relevant competent authorities including EASA.

2.4. Main approach for the development of the U-space regulatory framework

This Opinion has been developed in a short timeframe — less than a year. Taking into account the importance of the timely delivery of a first set of implementing rules on U-space, this Opinion lays down only the first building block for the establishment of the U-space. This first building block will be complemented and enhanced as U-space services mature and more in-service experience is gained through the implementation of this first set of requirements.

This draft opinion has been developed applying the following leading principles:

- (a) a risk-based approach;
- (b) fair and equal access to the airspace and the services to be provided in that airspace;
- (c) fostering the development of the UAS market in the EU through ensuring a level playing field and a competitive market;
- (d) accommodating initial BVOLS UAS operations in the short term; and
- (e) fostering further development of U-space's implementation architectures and services thus enabling more complex UAS operations in the future (e.g. urban air mobility (UAM), more complex airspace structure and management).

What is U-space? There are many interpretations and perceptions of what the U-space is. The regulatory approach in this Opinion is to define the U-space as a set of services provided in an automated way through a digital system in a volume of airspace designated by a Member State.

This proposal lays down a first set of minimum rules and services, which are to be complemented later with further services enabling a more mature state of integration. Therefore, the proposal is built so as to allow immediate implementation of the U-space after the entry into force of the Regulation. It provides the means to mitigate the risk of collisions by requiring adapted services and sharing essential traffic information, especially when segregation is not adaptable to accommodate higher traffic

density of UAS. The entire U-space approach today is based on the U-space participants being cooperative, i.e. to provide real-time information regarding their actual position in the airspace as well regarding as their intent during the flight.

This proposal contains the requirements to allow the provision of the necessary information for the functioning of U-space in a centralised manner and made available through one single gateway. The most important objective is to ensure that the necessary information comes from trusted sources and is of sufficient quality, integrity and accuracy to ensure safe operations in the U-space airspace. The majority of the comments during the focused consultation highlighted the importance of clearly identifying roles and responsibilities with regard to the provision of this necessary information and therefore this regulatory proposal has been drafted having taken into consideration these comments.

The common information function (CIF) as presented in this draft Opinion needs to provide the necessary data and information for U-space to a platform that can enable the exchange of data and information and can be used to connect multiple U-space service providers operating in the same U-space airspace. This is the intention of Article 5: to facilitate the communication amongst the U-space service providers, through a common standard of communication protocols. The information coming from the CIF needs to be shared in this platform so as to allow data exchange among U-space service providers about airspace restrictions, aircraft operators, and other traffic information coming from ATS providers, military or state authorities, local authorities and public entities, security authorities, private persons, etc. The underlying U-space eco-system foreseen by the present proposal is proposed in Figure 1 below.

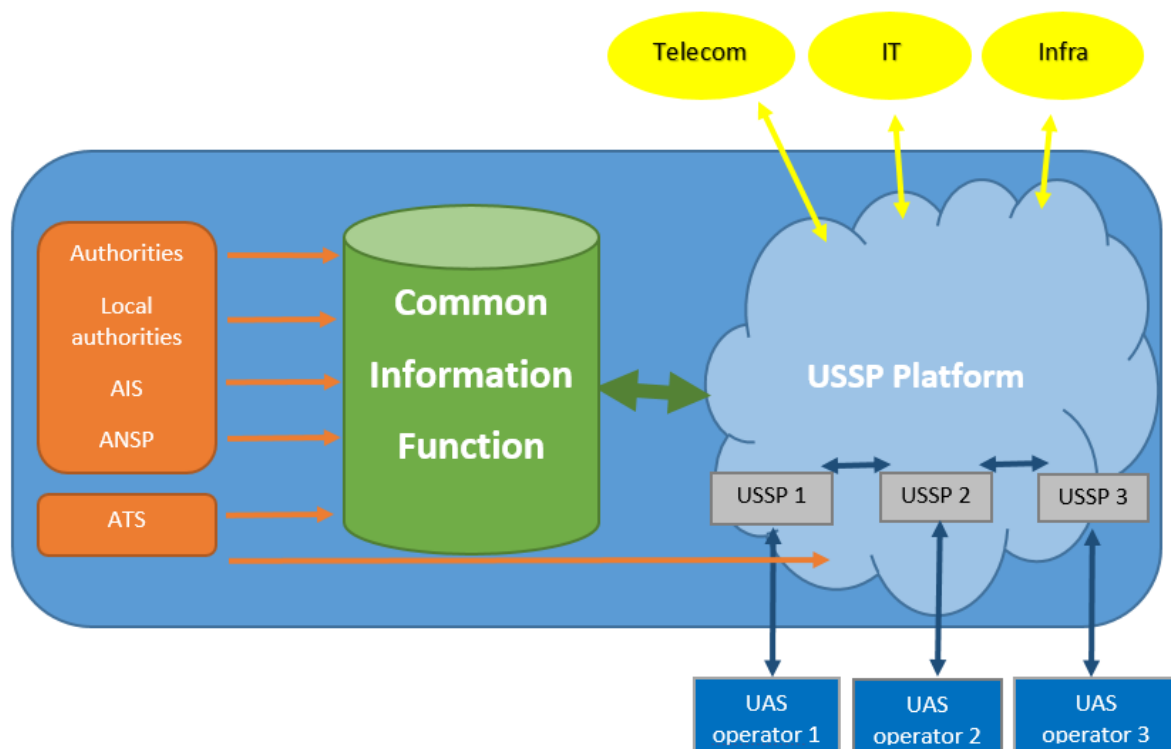


Figure 1 — Overview of the U-space eco-system

The proposal contains a certain number of mandatory U-space services (Chapter IV) to be provided in the U-space airspace by U-space service providers and additional U-space services that can be provided as required by the UAS traffic and UAS traffic complexity in the U-space airspace. Only three U-space services are proposed to be mandatory for all designated U-space airspaces : e-identification, geo-awareness and traffic information. The regulation also describes other U-space services that may be required by the UAS traffic and UAS traffic complexity in the U-space airspace. This is the list proposed by EASA based on the input received from stakeholders after the consultations. However, the list proposed reflects those services that were commonly and frequently raised during the discussions. It is important to highlight that before proposing a service in the regulation, the service should be clearly defined and when based on standards, those should be validated in the European airspace and framework. This will support not only harmonisation but also safety and competitiveness, as UAS operators will operate in the same manner in all U-space airspaces across the EU. If each EU Member State starts implementing U-space services on the basis of not commonly agreed nor validated standards this will create dis-harmonisation, inefficiency and will have an impact on safety in the long run when more autonomous operations are foreseen. If the list of services is left out of the regulation and if the Member States start implementing different type of services in different ways, UAS operators may be confused about the way the operation can be conducted from one U-space implementation to another affecting therefore safety and efficiency. Also, if the services and the way they are implemented from the very beginning are not harmonised, this could lead to having different requirements on UAS equipment and capabilities across the EU for the UAS operators. As soon as more U-space services mature and can be implemented by UAS operators or as soon as U-space services are needed for safety (e.g. tactical de-confliction service) or other reasons, amendments to the regulation will be proposed by EASA to the EC on the basis of a validated proof of concept, harmonised and commonly agreed standards. In addition, the proposal also foresees the possibility for the authorities to require other services when deemed necessary. This allows for flexibility but at the same time ensures harmonisation and safe implementation of the U-space across the EU.

The list of services in the proposal contains some explanation about the services themselves. More explanation about the procedures related to the way the services should be implemented in the different cases will need to be provided in AMC & GM, which are planned to be published next year. The description of these services is based on CORUS, the SESAR Joint undertaking blueprint, and the feedback received from the U-space service providers and industry on the basis of today's implementation and maturity. These U-space services are only the first step and it is acknowledged that more clarity should be provided for the description of the services and how the services would be implemented once more experience is gained.

With regard to the airspace classification, the majority of the comments received during the consultation stressed the difficulty to develop an airspace classification. The main reason is that such classification is dependent on the types of services that will be provided. And currently, a full list of services is not mature yet, as stated above. It was also very difficult to understand the link between the airspace classification within the U-space airspace and the present airspace classification for manned aviation based on ATM services promulgated in the SERA Regulation. In addition, this topic was also deeply discussed within the working group and no clear approach on the classification could be proposed. Therefore, this proposal does not contain any airspace classification; this will be developed at a later stage.



The same approach was applied for the U-space flight rules. During the consultation, the aviation community expressed the need to develop flight rules adapted to UAS operations that can fly VLOS or BVLOS operations. Also, the working group acknowledged that not all provisions of SERA (e.g. VFR and IFR, ATS rules and procedures, loss communication procedures, and interception procedures) cannot be applicable as such to UAS operations in a general manner; therefore, a more in-depth analysis of what can and cannot be directly applied from SERA shall be made. The limited time frame in which this regulatory proposal is developed, did not allow for the development of amendments to SERA and the option to amend SERA was discarded until this assessment is made. The development of U-space flight rules would have allowed a further safe integration of manned and unmanned traffic in the same volume of airspace. However, the amendments to SERA, as well as the impact of the potential application of two sets of rules, if they are different, would need to be validated and be compatible. In addition, the impact on the current ATM environment and manned aircraft airspace users needs to be carefully assessed. Therefore, in order to avoid developing rules that could be inconsistent or even conflicting with present flight rules, this proposal does not contain U-space or UAS flight rules and such approach can be reassessed in the future. Nevertheless, EASA still considers it possible to propose a set of priority rules in Article 7. These priority rules are based on the existing ATM priorities and are only applicable when UAS flight authorisation service is required by the UAS traffic and traffic complexity.

In summary, this first regulatory phase which is due to support operations from today at until 2022 is focused on the principles of strategic and pre-tactical traffic management techniques (strategic because the U-space airspace is established and designated by the Member States as restricted airspace and pre-tactical because it is based on sharing information and intent prior and during flight). The only tactical traffic management technique is the initial phase of geo-awareness services that allow passing on information to the UAS operators when they would need to terminate a flight or avoid a geographical zone.

Until a future state of integration can be achieved, the present proposal is considered to be an efficient regulatory framework that reflects the existing technology and on the resulting system architecture that supports the U-space implementation.



2.5. Structure of the draft Regulation

Chapter I - Principles and general requirements

- Article 1 Subject matter and scope
- Article 2 Objectives
- Article 3 Definitions

Chapter II - Establishment of the U-space

- Article 4 Designation of U-space
- Article 5 Common information function
- Article 6 The inter U-space service provider platform
- Article 7 U-space priority rules

Chapter III - General requirements for aircraft operators and providers in U-space airspace

- Article 8 UAS operators
- Article 9 Obligation for manned aircraft operators to provide data to USSP
- Article 10 U-space service providers
- Article 11 Collaboration between U-space service providers and aircraft operators
- Article 12 Occurrence reporting

Chapter IV - U-space services

- Article 13 E-identification service
- Article 14 Geo-awareness service
- Article 15 Flight authorisation service
- Article 16 Traffic information service
- Article 17 Tracking service
- Article 18 Weather service
- Article 19 Conformance monitoring service

Chapter V - U-Space service providers certification

- Article 20 Application for a U-space service provider certificate
- Article 21 Conditions for obtaining a certificate
- Article 22 Validity of a U-space service provider certificate

Chapter VI – Competent authorities

- Article 23 Competent authority
- Article 24 Tasks of the competent authorities
- Article 25 Exchange of safety information and safety measures

Chapter VII – Pricing of U-space services

- Article 26 Pricing freedom
- Article 27 Fee regulation

Chapter X – Final provisions

- Article 28 Entry into force and applicability

2.6. What are the expected benefits and drawbacks of the proposals

The proposal sets up a regulatory framework that will contribute to the management of new U-space services to support safe, efficient and secure access to airspace for a large numbers of UAS operations. It will affect as little as possible the existing ATM system and at the same time maintain equitable access to airspace. The proposal will also facilitate the overall growth of the European UAS services market while mitigating the associated risks.

The proposal's intent is to provide high-level simple rules that keep the burden for the affected entities and persons as light as possible, and enables effective U-space services provision. The proposed requirements for a safe and effective use of the airspace and for the delivery of cost-effective U-space services are meant to make best use of the fast-evolving digital technologies. The regulatory

framework is expected to support and enable operational, technical and business developments, and provide fair access to all airspace users. The market should drive the delivery of the U-space services to adequately reflect airspace users' needs.

The tasks and responsibilities of all the other actors of the U-space are clear. UAS operators will be able to rely on similar rules wherever they are operating in the EU, and U-space service providers will be subject to the same quality of service requirements throughout Europe. This also promotes efficient and equitable airspace access for all aircraft operators and at the same time minimises the effects on the traditional manned aviation.

The proposed set of services should facilitate aircraft operations in the EU supported by the necessary provision and sharing of information between all the participants in the U-space. In order to 'manage' the U-space, the proposal foresees several components such as data exchange infrastructure, technical enablers, procedures for coordination and information exchange. The quality of the services is of utmost importance for the U-space to meet its objectives. The proposal being risk- and performance-based, allows for setting the necessary quality of services needed for each U-space airspace implementation cases. Different quality of services (in terms of levels) can be developed later on, when experience is gained through AMC/GM to the present regulation.

The proposal foresees a system that is supported by the necessary open standard communication protocols that can coordinate all the actions undertaken by the U-space actors and all the interactions between those actors. The CIF is particular important to provide the U-space service providers with all the necessary information to allow them to provide services in a safe manner. The obligation to make the information available (and to share it) to all the participants in the U-space will also increase safety by providing essential flight information such as the flight intent and airspace constraints.

The proposed high-level provisions aim at ensuring the necessary level of harmonisation that will enable smooth cross-border operations. The proposal is consistent with early implementations of U-space services in the Member States as well as SESAR research and demonstrations projects, such as CORUS.

The proposal gives the necessary regulatory tools to the Member States to mandate U-space services such as e-identification and geo-awareness when designating U-space airspace. In addition, when necessary due to UAS traffic and traffic complexity, they can also mandate traffic information as well as require the UAS operators to submit their flight plans so as to obtain an UAS flight authorisation to enter in the U-space airspace.

In addition, it is expected that aircraft operators flying in the U-space airspace which is in uncontrolled airspace share their flight intent and positions to allow U-space service providers to de-conflict flight trajectories between manned and UAS traffic. This will increase the situational awareness among aircraft operators operating in the U-space and the safety level of the operations in the U-space airspace. To ensure that operators, service providers and equipment meet the appropriate capability and performance requirements for the operations planned, proportionate certification requirements are imposed.

A European regulatory framework will enable the European authorities to maintain high levels of safety as they will manage the approval process for U-space service providers. The oversight and approval functions of competent authorities will ensure safety in a harmonised way if rules are developed at EU level.

As mentioned in Section 2.4 above, this proposal was developed with the need to establish a foundational regulation. However, the development of the concept (i.e. unmanned aircraft system traffic management (UTM) architectures and services) is still ongoing and thorough validations of all services, rules and procedures has not been completed. For instance, due to the lack of experience with tactical de-confliction techniques for drones, the way to manage traffic today can only be based on strategic and pre-tactical de-confliction techniques as explained above. The main principle followed in the U-space is similar to the ones used in the dynamic flexible use of airspace, which is already used in manned aviation. New concepts such as tactical separation (separation minima, rules and procedures), and detect and avoid systems, capabilities and technologies are not considered to be mature enough at this stage to allow them to be included in a regulation on U-space. Similarly, promising developments in other areas, such as information and communications technology (ICT) and mobile telecommunications, which may become the foundation for connectivity of U-space, are still to be validated for use in a U-space environment, too. A future update of the regulation will therefore be necessary to reflect the technological advancements, once the new concepts and promising developments have reached an appropriate level of maturity.

This Opinion should be considered as the first step towards the U-space implementation. It is likely that the fast ongoing technological development and the expected evolution of the operational concepts and needs will require additional regulatory actions in the short term in order to ensure continuous harmonised development of the U-space implementation.



3. Proposed amendments

CHAPTER I PRINCIPLES AND GENERAL REQUIREMENTS

Article 1

Subject matter and scope

1. This Regulation lays down rules and procedures for the establishment of the U-space and for the provision of services in the U-space airspace.
2. This Regulation shall apply to:
 - (a) operators of manned and unmanned aircraft; and
 - (b) U-space service providers that deliver services;in the volumes of airspace designated as U-space by Member States.
3. This Regulation shall also apply to the competent authorities designated as such by the Member States in accordance with Article 22 of this Regulation.
4. Notwithstanding paragraph 2, this Regulation shall not apply to operators that fly unmanned aircraft in accordance with the limitations for the 'open' category of operations set out in Commission Implementing Regulation (EU) 2019/947⁴, unless the Member States decide to make this Regulation applicable to operators operating unmanned aircraft in the 'open' category, for safety reasons and in accordance with the following assessment criteria:
 - (a) ground and air risk;
 - (b) social acceptability as regards the expected impact on environment and privacy;
 - (c) expected demand for air traffic and for types of operations; and
 - (d) efficiency considerations.
5. Decisions taken by Member States under the previous paragraph shall be communicated without delay to the Commission, the Agency and the other Member States.
6. This Regulation shall also not apply to the operators of toy aircraft within the meaning of Directive 2009/48/EC and to UAS operations conducted in the framework of model aircraft clubs and associations in accordance with Commission Implementing Regulation (EU) 2019/247.

Article 2

Objectives

The objectives of this Regulation are to:

⁴ Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft (OJ L 152, 11.6.2019, p. 45) (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019R0947>).

- (a) support safe, secure and environmentally friendly operations of aircraft in the U-space airspace while respecting the privacy of European citizens;
- (b) maintain the current safety levels for manned aviation;
- (c) create the conditions for an internal market for U-space services; and
- (d) ensure fair and affordable access to the U-space airspace to all airspace users.

Article 3 *Definitions*

For the purposes of this Regulation, the definitions of Regulation (EU) 2018/1139, Regulation (EU) No 923/2012, Commission Delegated Regulation (EU) 2019/945⁵, Commission Implementing Regulation (EU) 2019/947, apply. The following definitions also apply:

- 1. 'Open communication protocols' means a set of publicly available standards that allow two or more entities of a given system to communicate with each other. Protocols define the rules, syntax, semantics and synchronisation of communication and possible error recovery methods.
- 2. 'Principal place of business' means the head office or registered office of the organisation within which the principal financial functions and operational control of the activities referred to in this Regulation are exercised.
- 3. 'U-space' means a set of services provided in an automated way through a digital system in a volume of airspace designated by a Member State.
- 4. 'U-space airspace' means the volumes of airspace designated by Member States, where U-space services are provided, or where certain capabilities from the unmanned aircraft and actions from the unmanned aircraft operators are required, or both.

CHAPTER II **ESTABLISHMENT OF THE U-SPACE**

Article 4 *Designation of U-space*

- 1. When deemed necessary for safety reasons, security, privacy or environmental objectives, Member States may designate one or more volumes of airspace as U-space airspace on a temporary or permanent basis.
- 2. Member States shall coordinate whenever the U-space airspace concerns the airspace over more than one Member State.

⁵ Commission Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems (OJ L 152, 11.6.2019, p. 1) (<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1570002032069&uri=CELEX:32019R0945>).

3. Member States shall designate U-space airspace as restricted areas in accordance with Commission Regulation (EC) No 2150/2005⁶.
4. Member States may allow the voluntary provision of U-space services in the airspace which has not been designated as U-space airspace and is under the jurisdiction of the Member State(s) concerned.
5. Member States shall set the acceptable level of safety and the environmental performance objectives in the designated U-space airspace. The setting of the acceptable level of safety shall be proportionate to the specific characteristics of the operation, the number of planned flights, the estimated distance to the ground, the estimated settlements and aggregations of people and the hazards to other aircraft.
6. Member States shall establish the set of mandatory U-space services to be provided in the designated U-space airspace which are required to keep the air traffic in the U-space airspace safe, taking due account of:
 - (a) demand of UAS operators and aircraft operators, the type of operations, the density and the complexity of the traffic;
 - (b) specific performance requirements for aircraft to be operated;
 - (c) interests and needs of authorities concerned;
 - (d) ground and air risks;
 - (e) risk of airspace infringement by airspace users;
 - (f) operational conditions for UAS geographical zones established in accordance with Article 15 of Commission Implementing Regulation (EU) 2019/947; and
 - (g) access conditions for UAS operations and their classes as defined in Commission Delegated Regulation (EU) 2019/945.
7. This set shall include, as a minimum, the e-identification, geo-awareness and traffic information.

Article 5

Common information function

1. Member States shall ensure that, for each designated U-space, a common information function is established to communicate static and dynamic information. This shall include as a minimum:
 - (a) horizontal and vertical limits of the U-space airspace;
 - (b) the performance requirements set by competent authorities for the U-space airspace;
 - (c) information on the different certified U-space providers providing services;
 - (d) the applicable operational conditions and airspace constraints;
 - (e) relevant air traffic information and other ATM/ANS information needed for the operations in the U-space airspace;

⁶ Commission Regulation (EC) No 2150/2005 of 23 December 2005 laying down common rules for the flexible use of airspace (OJ L 342, 24.12.2005, p. 20) (<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1570002219619&uri=CELEX:32005R2150>).

- (f) the relevant information with neighbouring U-space airspace(s);
 - (g) the connectivity methods and constraints, including security, within the inter-U-space service provider platform;
 - (h) access points for information on operations as required; and
 - (i) the list of all the publicly known authorities that can be contacted in relation with the common information.
2. The competent authority shall determine what traffic data U-space service providers and air navigation service providers need to provide to the common information function, including the required frequency and the quality level.
 3. The competent authority shall determine the secure open protocol that the U-space service providers and air navigation service providers are entitled to use to access the common information function.
 4. U-space service providers and air navigation service providers shall provide this information free of charge.
 5. The organisation in charge of the common information function shall not be related or connected in any manner or form to any U-space service provider and shall not provide any U-space services itself.
 6. The common information function shall offer a discovery function for interfaces and capabilities of the common information service.
 7. The common information function shall offer a way to distribute flight authorisation requests to the relevant competent authority within any given U-space airspace.

Article 6

The inter U-space service provider platform

1. U-space service providers that provide services in the same designated U-space airspace shall establish and maintain an inter U-space service provider platform.
2. The inter U-space service provider platform shall enable:
 - (a) the exchange of information between the founding U-space service providers;
 - (b) the exchange of identification and air traffic information of the unmanned aircraft;
 - (c) the dissemination of U-space service provider flight authorisations, when required; and
 - (d) the identification of authorised U-space service providers that operate in a given U-space airspace.
3. U-space service providers who have already established an inter U-space service provider platform in accordance with this Article shall allow any other U-space service providers to access the established platform in equal terms, without any discrimination.
4. The competent authority shall ensure that:

- (a) data exchange and, by extension, overall operations of the inter U-space service provider platform is governed by a set of published application programming interfaces (APIs);
- (b) all data exchanges via APIs are completed over transport layer security (TLS)-secured connections; and
- (c) the requirements related to the use of public key infrastructure, identity management, authentication, and authorisation are established.

Article 7

U-space priority rules

When a U-space service provider grants a UAS flight authorisation to the operator of an unmanned aircraft, the following priority rules shall be respected, in accordance with the order specified below:

1. when conducting special operations, in the meaning of Article 4 of Commission Implementing Regulation (EU) No 923/2012, manned aircraft shall have priority over unmanned aircraft;
2. when conducting special operations, in the meaning of Article 4 of Commission Implementing Regulation (EU) No 923/2012, unmanned aircraft shall have priority over any other air traffic;
3. aircraft carrying passengers shall have priority over aircraft without passengers on board;
4. manned aircraft shall have priority over unmanned aircraft;
5. BVLOS operations shall have priority over VLOS operations.

CHAPTER III

GENERAL REQUIREMENTS FOR AIRCRAFT OPERATORS AND PROVIDERS IN U-SPACE AIRSPACE

Article 8

UAS operators

1. When operating in the U-space airspace, UAS operators shall:
 - (a) comply with the conditions specified by the U-space service provider that issued the UAS flight authorisation referred to in Article 15;
 - (b) comply with the applicable performance requirements established by the competent authority for the U-space airspace being flown;
 - (c) ensure that their aircraft have the adequate technical capabilities for connectivity and can exchange the required information within the U-space airspace being flown;
 - (d) disseminate the information relative to the intended flight in the form of a flight plan to the U-space service providers when required. The flight plan shall comprise the information required in accordance with Appendix 1; and
 - (e) ensure that during its operations, the operator is provided with the services required in the U-space airspace by certified U-space service providers.
2. Unmanned aircraft operators shall avail themselves of U-space services in accordance with the risk of the operations, as determined in accordance with Commission Implementing Regulation

(EU) 2019/947. To that extent, they shall make the necessary arrangements, namely service level agreements, with the certified U-space service providers of their choice.

3. The unmanned aircraft operator shall give U-space service providers access to the relevant registration information.
4. Unmanned aircraft operators operating in the U-space airspace shall be identified therein with a unique identifier. The unique identifier shall enable, as a minimum, the verification of the mandatory information on the UAS aircraft and the UAS operator.

Article 9

Obligations for manned aircraft operators to provide data to U-space service providers

1. Manned aircraft operators, which operate in uncontrolled airspace, entering, or in close proximity to, U-space airspace which require UAS flight authorisation or traffic information services shall provide data to the U-space service providers in order for them to establish the intent, estimated and actual operations.
2. The data shall be provided in a manner acceptable to the Agency.

Article 10

U-space service providers

1. U-space service providers shall be responsible for:
 - (a) providing the services required to ensure the safe and efficient movement of aircraft during all phases of operations in the U-space airspace.
 - (b) the quality of the services delivered in accordance with this Regulation.
2. U-space service providers shall comply with applicable privacy and data protection regulations and shall only store or process information about the aircraft operations when necessary for safety, occurrences investigation and operational purposes.
3. U-space service providers shall handle air traffic data without discrimination, restriction or interference, independently of its sender or receiver, content, application or service, or terminal equipment and shall act in accordance with the applicable requirements in the U-space airspace established in accordance with this Regulation.
4. U-space service providers shall ensure that the information contained in the unique identification of the aircraft is made available to:
 - (a) the general public as regards information that is deemed public in accordance with applicable EU and national rules;
 - (b) other U-space service providers in order to ensure safety of operations in the U-space airspace;
 - (c) the ATS providers concerned; and
 - (d) the relevant national competent authorities.

5. U-space service providers shall adhere to the open standard communication protocols and use the latest information available from the Member States in accordance with Article 5(1).
6. U-space service providers shall ensure that proper arrangements are in place to ensure the continuity of the services during operations in the designated U-space airspace(s) where they provide services.
7. When providing flight authorisation to UAS operators, U-space service providers shall take into account the information received in accordance with Article 9 and the priority rules in accordance with Article 7.
8. U-space service providers shall ensure:
 - (a) the safe storage of any data and information; and
 - (b) non-discriminatory conditions of access to the records referred to in (a).

Article 11

Collaboration between U-space service providers and aircraft operators

1. U-space service providers shall establish contractual arrangements, including service level agreements with:
 - (a) the aircraft operators covering the full set of U-space services necessary to keep all phases of flight safe in view of the applicable performance objectives and the operational risks of the type of operation; and
 - (b) other service providers from which they receive services needed to complete the required set of U-Space services.
2. Such contractual arrangements shall indicate the quality of the services provided in view of the type and complexity of the operations and in view of the applicable performance requirements.

Article 12

Occurrence reporting

U-space service providers shall report to the competent authority responsible for the oversight of the U-space service providers occurrences related to unsafe conditions, incidents or accidents. Such reports shall be made in a form and manner acceptable to the competent authority.

CHAPTER IV U-SPACE SERVICES

Article 13

E-identification service

1. E-identification service is a service to provide authorised users with information that correlates the position of the unmanned aircraft with its operator's registration and the flight intent.

2. This service shall be mandatory in the U-space airspace in order to support the identification and UAS position in the U-space airspace.
3. The identification shall include at least make, model, serial number and registration number
4. The identification service shall provision levels of access based on the credentials of the user.
5. The identification service shall correlate identification and UAS traffic information (vehicle location, altitude, and time).
6. The tracking information shall include the vehicle location, altitude, vehicle registration, and time.
7. All correlated identification information shall be retained for a period of not less than 90 days.
8. U-space service providers shall be able to receive and exchange broadcast and network e-identification information.

Article 14

Geo-awareness service

1. The geo-awareness service shall be mandatory in the U-space in order to provide the information related to the operational conditions for UAS geographical zones established in accordance with Article 15 of Commission Implementing Regulation (EU) 2019/947 and to provide the relevant data from the common information function to support the operator geo-awareness — where it is allowed to fly and where not.
2. The geometry of all airspace with special access rules for UAS shall be provided to the operator or other applicable U-space service providers.
3. Any valid times or special airspace rules shall be provided with the airspace geometries.
4. Authority to update or add to the geo-awareness information shall be limited to the authorities defined by Member States.
5. The geo-awareness information shall be updated in an timely manner and shall include its time of update or a version number and/or a valid time.

Article 15

Flight authorisation service

1. Flight authorisation service is a service that provides the authorisation to the unmanned aircraft to proceed under the conditions specified by the U-space service providers in the airspace where authorisation is mandated.
2. When flight authorisation service is provided, it shall be able to automatically reply to requests.
3. The service shall use airspace access information maintained and updated by the competent authority or by a certified air navigation service provider.
4. The airspace authorisation service shall check the request for authorisations against airspace restrictions and limitations as exposed by the geo-awareness service.

5. The airspace authorisation service shall ensure appropriate communication and coordination to maintain the safety of the operations in the U-space airspace and to strategically de-conflict the operations .
6. Each flight authorisation shall have a unique authorisation number associated with it. This number shall also enable the identification of the entity issuing the authorisation.
7. The competent authority shall ensure that U-space service providers that provide this service:
 - (a) update the data sources as necessary for this service;
 - (b) coordinate the authorisation requests with the relevant ANSPs when the U-space airspace is within controlled airspace; and
 - (c) display the information referred to in paragraph 9. to UAS operators and include the legal terms and conditions and safety-related advisories.
8. UAS operators seeking an authorisation service shall provide the following information to the U-space service providers concerned:
 - (a) flight plan as detailed in Appendix 2;
 - (b) authorisation requests;
 - (c) required notifications;
 - (d) voluntary notifications;
 - (e) contact information; and
 - (f) access to registration information
9. The following information shall be provided by the U-space service provider prior to the granting of a flight authorisation:
 - (a) airspace Information;
 - (b) regulatory Information;
 - (c) acknowledgements;
 - (d) pre-authorisation information; and
 - (e) manual authorisation information, if required.

Article 16

Traffic information service

1. Traffic information service shall be mandatory in the U-space airspace that provides:
 - (a) air traffic situation in the proximity of the actual position of the aircraft;
 - (b) alerts to the aircraft operator; and
 - (c) information about other aircraft operations.
2. It shall provide the alerts, air situation and forecasted or predicted traffic to the UAS operator.
3. The traffic information service shall include available position reports of:



- (a) cooperative and non-cooperative correlated manned aircraft in the region of UAS operation; and
 - (b) UAS originating from the tracking service.
- 4. Position reports shall be expressed as floating decimal latitude and longitude, altitude, and time of report.
- 5. The traffic information shall be updated at a frequency that has been determined to be adequate for safety.
- 6. Traffic alerts shall be given to an operator if any manned aircraft are observed within a pre-specified radius and altitude to the location of the UAS operation.

Article 17
Tracking service

- 1. When tracking service is provided, it shall comprise UAS telemetry, flight plans, and identification information from UAS operators and other USSPs.
- 2. The tracking service shall comprise ground-based surveillance information where available.
- 3. A track report shall contain:
 - (a) the identity of the unmanned aircraft and operator, if available;
 - (b) the identity of the mission plan being executed (if any and if available), or an automatically generated identifier for the flight;
 - (c) the identifier of the system(s) that has calculated the track;
 - (d) the time for which the track position has been calculated;
 - (e) the 3D position of the unmanned aircraft at the time calculated, expressed as floating decimal latitude and longitude, and altitude;
 - (f) the speed vector of the unmanned aircraft at the time calculated, expressed in knots; and
 - (g) the estimated uncertainties regarding or confidence in the calculated position and speed vector.
- 4. The tracking service shall produce track updates at a rate that is appropriate for the U-space airspaces that are in its area of interest.
- 5. The tracking service shall use an approved method or algorithm for identifying and fusing tracks collected from different sources representing the same unmanned aircraft.
- 6. The tracking service shall provide track reports of uncorrelated tracks/targets.
- 7. The tracking service shall provide input to the traffic information service.
- 8. The tracking service shall keep a record of all available surveillance and data sources, as well as their coverage volumes.
- 9. The tracking service shall generate alerts of outages or of degradation of service.
- 10. Logs of all tracks and alerts shall be retained for a period of not less than 90 days.

*Article 18**Weather information service*

1. When weather information service is provided, it shall:
 - (a) collect the minimum weather data to maintain safety, supporting operational decisions of other critical services;
 - (b) provide the UAS operator with forecast and actual weather information either before or during the flight; and
 - (c) collect or make available weather information from different stakeholders.
2. The weather information shall include, at a minimum:
 - (a) wind direction and speed, including gusts;
 - (b) the height of the lowest broken or overcast layer in hundreds of feet above ground level (AGL);
 - (c) visibility in statute miles;
 - (d) temperature; and
 - (e) indicators of convective activity and precipitation.
3. The weather information shall be sufficiently reliable to support operational decision-making.
4. The weather information shall include the location and time of the observation, or the valid times and locations of the forecast.

*Article 19**Conformance monitoring service*

1. The conformance monitoring service shall monitor whether the operation takes place within the agreed flight plan after the flight authorisation has been granted.
2. When provided, the conformance monitoring service shall alert the operator where the operation deviates from the agreed flight plan after the flight authorisation has been granted.
3. Where the operation deviates from the agreed flight planned to an extent depending on the complexity and density of the air traffic, the conformance monitoring service shall alert the other aircraft operators operating in the vicinity of the UAS operators in such time limits that the safety objectives set out in Article 4(5) are met.

CHAPTER V**U-SPACE SERVICE PROVIDERS CERTIFICATION***Article 20**Application for a U-space service provider certificate*

1. U-space service providers are required to hold a certificate issued by the competent authority located in the Member State of its principal place of business or by the Agency, as applicable. The certificate shall be issued in accordance with Appendix 3.



2. The certificate shall indicate the rights and privileges of its holder to provide certain services.
3. An application for a U-space service provider certificate or for an amendment to an existing certificate shall be made in a form and manner established by the competent authority located in the Member State of its principal place of business or by the Agency, as applicable.
4. In order to obtain the certificate, U-space service providers shall comply with the requirements set out in this Regulation.

Article 21

Conditions for obtaining a certificate

A U-space service provider shall be granted a certificate by the competent authority of its principal place of business or by the Agency, as applicable, provided that it demonstrates that it:

1. is able to provide its services in a safe, efficient, continuous and sustainable manner, consistent with any foreseen level of overall demand for a given U-space airspace. To this end, it shall maintain adequate technical and operational capacity and expertise;
2. uses systems and equipment that guarantee accuracy, integrity, consistency and timeliness of communications in function of the necessary capabilities of the U-space services in accordance with this Regulation;
3. has the appropriate net capital commensurate with the costs and risks associated with the provision of U-space services;
4. has a management system, established in accordance with Subpart B of Annex III to Regulation (EU) 2017/373, and complying with all the requirements of such Regulation;
5. carries out a safety assessment to demonstrate compliance with the objectives set for the service provided in view of the intended operations in that U-space airspace; to that end, it shall provide assurance, with sufficient confidence, via a complete, documented and valid argument that their contribution to the level of safety established by the Member State for the U-space airspace in accordance with defined in Article 4(5).
6. has a robust business plan indicating that it can meet its actual obligations to provide its services in a continuous manner for a period of twelve months from the start of operations;
7. has the required liability and insurance cover appropriate to the risk of the service(s) provided; and
8. has an emergency management plan to assist the operator experiencing an emergency and a communication plan to inform those who may be interested.

Article 22

Validity of U-space service provider certificate

1. A U-space service provider certificate shall remain valid as long as the U-space service provider complies with the requirements set out in this Regulation.
2. A U-space service provider certificate shall not remain valid if the provider has:



- (a) not started operations within six months after the certificate has been issued; or
 - (b) ceased operations for more than nine consecutive months.
3. The competent authority or the Agency, as applicable, may at any time assess the operational or financial performance of a U-space service provider under its jurisdiction.
4. The competent authority or the Agency, as applicable, may, after a substantial assessment of the operational or financial performance of the U-space service provider, impose particular conditions to the certificate holder, suspend or revoke the certificate.

CHAPTER VI COMPETENT AUTHORITIES

Article 23 Competent authority

1. Member States shall designate one or more competent authorities to implement this Regulation.
2. The competent authority shall:
- (a) have a suitable organisational structure, appropriately documented procedures, and adequate resources; and
 - (b) employ or have access to personnel with sufficient knowledge, professional integrity, as well as experience and training to perform their allocated tasks.
3. Competent authorities shall ensure that their personnel do not perform activities related to this Regulation when there is evidence that this could result, directly or indirectly, in a conflict of interest.
4. The Agency shall act as the competent authority for U-space service providers providing U-space services in more than one Member State and for U-space service providers established outside EU and providing services within its territory, in accordance with Article 80(1)(a) of Regulation (EU) 2018/1139⁷.

Article 24 Tasks of the competent authorities

1. The designated competent authorities shall:
- (a) define the manner for an organisation to apply for a U-space service provider certificate in accordance with Chapter V;

⁷ Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91 (OJ L 212, 22.8.2018, p. 1) (<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1535612134845&uri=CELEX:32018R1139>).

- (b) establish a mechanism to coordinate with local authorities the designation of U-space airspace, the establishment of airspace restrictions for unmanned aircraft and the determination of the U-space services to be provided in the designated U-space airspace;
 - (c) establish a certification and continuous risk-based oversight programme which is commensurate with the risk associated with the services being provided by the U-space service providers under their oversight responsibility;
 - (d) require the U-space service providers to provide all necessary information to ensure that the provision of U-space services contribute to safe, secure and environmental friendly operations of aircraft;
 - (e) be allowed to enter any premises of the U-space service provider under their oversight; and
 - (f) carry out audits, assessments, investigations and inspections of those U-space service providers as established in the oversight programme.
2. The tasks listed in paragraph 1 shall be exercised in compliance with the national law of the Member State where the activities in question take place, with due regard for the need to ensure the effective exercise of those powers and for the rights and legitimate interests of the U-space service providers concerned.
3. The competent authority shall provide U-space service providers with means for authenticating identities of operators and UAS via the national registration databases through access to the repository of registration databases.
4. The competent authorities and the Agency shall take or initiate any appropriate enforcement measure necessary to ensure that the U-space service providers under their oversight, comply and continue to comply with the requirements of this Regulation.

Article 25

Exchange of safety information and safety measures

1. The competent authorities and the Agency shall cooperate on safety matters, and establish procedures for an efficient exchange of safety information.
2. The competent authorities and the Agency shall collect, analyse and disseminate safety information concerning operations in the U-space airspace in their territory in accordance with this Regulation.
3. Upon receiving safety information, the competent authorities or the Agency, as applicable, shall take appropriate measures to address any arising or latent safety issues in accordance with the respective terms of mandate and competencies.
4. Such measures shall immediately be notified to all persons or organisations that need to comply with such measures under Regulation (EU) 2018/1139 and its implementing rules. The competent authorities shall also notify those measures to the Agency.

CHAPTER VII PRICING OF U-SPACE SERVICES

Article 26 *Pricing freedom*

1. The financing of U-space services shall not be subject to Article 15 of Regulation (EC) No 550/2004 on the provision of air navigation services in the single European sky.
2. Member States shall ensure that the cost for U-space services is not passed on to airspace users that are subject to Regulation (EU) 2019/317.
3. U-space service providers are free to set prices for their services and shall offer aircraft operators a package of U-space services covering all phases of flight depending on the type of operation.
4. U-space service providers shall communicate in a transparent way on the price of the package.

Article 27 *Fee regulation*

The authorities designated on the basis of Article 4 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 shall ensure that any fees levied for the common information function are:

- (a) subject to price regulation;
- (b) proportionate to the costs of the service provided, based on data volume, number of operators;
- (c) determined with due consideration for the objectives of safety and economic efficiency.

CHAPTER VIII FINAL PROVISIONS

Article 28 *Entry into force and applicability*

1. This Regulation shall enter into force on the day following that of its publication in the Official Journal of the European Union.
2. This Regulation shall be binding in its entirety and directly applicable in all Member States. It shall apply one year after its entry into force.



Appendix 1

Data quality requirements for the common information function

[TBD]



*Appendix 2**Information for the UAS flight plan referred in Article 9(1)(d)*

The flight plan of an UAS shall comprise the following information:

- (1) Aircraft identification;
- (2) Flight rules (mode) (VLOS, BVLOS);
- (3) Type of flight (special operations, commercial operations (with passengers or cargo), unmanned with people on board, recreational flights);
- (4) Category of operation (open, specific, certified) and UAS aircraft class (C1...C4...) or UAS type certificate if applicable;
- (5) Flight path (coordinates of start, intermediate and end points);
- (6) Estimated take off time;
- (7) Altitude (the highest altitude during the flight in meters) and altitude datum (above ground of the departure point, above MSL, QNE, WGS84);
- (8) Cruising speed(s);
- (9) Estimated landing time;
- (10) Identification technology (ADS-B, FLARM, Mode S, WIFI, etc.);
- (11) Expected telemetry (a flag indicating whether it is expected that telemetry will be available during the flight);
- (12) Contact URL (URL for contacting the UAS operator/pilot);
- (13) Endurance;
- (14) Applicable emergency for C2 loss;
- (15) Registration of the operator/aircraft;
- (16) Other information.

Appendix 3 to Article 21(1)

CERTIFICATE FOR U-SPACE SERVICE PROVIDER

EUROPEAN UNION

COMPETENT AUTHORITY

U-SPACE SERVICE PROVIDER CERTIFICATE

[CERTIFICATE NUMBER/ISSUE No]

Pursuant to Regulation (EU) .../.... (and to Regulation (EU) .../....) and subject to the conditions specified below, the [competent authority] hereby certifies

[NAME OF THE U-SPACE SERVICE PROVIDER]

[ADDRESS OF THE U-SPACE SERVICE PROVIDER]

as a U-space service provider with the privileges, as listed in the attached service provision conditions.

CONDITIONS:

This certificate is limited to the conditions and the scope of providing services as listed in the attached service provision conditions.

This certificate is valid whilst the certified U-space service provider remains in compliance with Regulation (EU) .../... and the other applicable regulations and, when relevant, with the procedures in the U-space service provider's documentation as required by Regulation (EU) .../..., Part-.....

Subject to compliance with the foregoing conditions, this certificate shall remain valid unless the certificate has been surrendered, limited, suspended or revoked.

Date of issue:

Signed:

[Competent authority]



**U-SPACE SERVICE PROVIDER
CERTIFICATE****U-SPACE SERVICE PROVISION CONDITIONS**

Attachment to U-space service provider's certificate:

[CERTIFICATE NUMBER/ISSUE No]

[NAME OF THE U-SPACE SERVICE PROVIDER]

has obtained the privileges to provide the following scope of U-space services:

(Delete lines as appropriate)

Services	Type of service	Conditions	Limitations*
U-space services	Geo-awareness		
	E-identification		
	Traffic information service		
	Flight authorisation		
	Tracking service		
	Weather service		
	Conformance monitoring service		
	Other (as defined by the Member State)		

4. Impact assessment (IA)

No impact assessment has been conducted for the rules proposed through this draft Opinion.

An impact assessment (IA) process is about gathering and analysing evidence to support policymaking. It verifies the existence of a problem, identifies its underlying causes, assesses whether EU action is needed, and analyses the advantages and disadvantages of available solutions.

For this draft Opinion, an efficient IA can only be conducted when there is sufficient information to assess the potential impact of the proposal in terms, notably, of cost of the technology/products/operations, technical requirements to support these developments, and benefits in terms of safety.

Today, many of these parameters are still unknown in the framework of the development of the U-space. Indeed, there is neither enough material to properly measure the potential impact on technological requirements to implement for U-space nor to measure the cost of the future technologies. Furthermore, because the effectiveness and efficiency of the U-space relies on advanced services that can be provided to the UAS operators (and to all aircraft operators in the future), the necessary elements to define what could be the options are missing. Another important element that would be needed is to know how many UAS aircraft can be managed in the U-space, now and in the future. It is therefore impossible to quantify the impact of the proposal.

Therefore, in the case of the U-space regulatory framework, the maturity of the specifications does not allow a complete analysis. The first step is to initiate a European harmonised framework to enable the development of UAS traffic management. It is only at a later stage that an IA might be performed when the technical, operational and service provision specifications of the U-space are further defined.

However, when developing the final Opinion, EASA will submit to the European Commission the main elements of an IA explaining the positive consequences from a safety, economic and environmental point of view in developing a common approach for the development of U-space in the European Union.



5. References

5.1. Related regulations

- Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft (OJ L 152, 11.6.2019. p.45)
- Commission Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems (OJ L 152, 11.6.2019. p.1)
- Commission Implementing Regulation (EU) No 923/2012 laying down the common rules of the air and operational provisions regarding services and procedures in air navigation and amending Implementing Regulation (EU) No 1035/2011 and Regulations (EC) No 1265/2007, (EC) No 1794/2006, (EC) No 730/2006, (EC) No 1033/2006 and (EU) No 255/2010 (OJ L 281, 13.10.2012)

5.2. Affected decisions

- n/a

5.3. Other reference documents

- n/a

