

Federal Ministry for Digital and Transport

Strategy on the establishment of U-spaces in Germany

for coordinated operation of unmanned aerial vehicles in designated airspaces



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Glossary

BOS:	Authorities and organizations with security and safety tasks (BOS) may be governmental and non-governmental players performing specific functions for the maintenance or restoration of public safety and order. BOS include, for example, the Federal Police and federal state police forces, the Federal Agency for Technical Relief (THW), the Federal Customs Administration, fire brigades, emergency services, federal and federal state disaster risk and civil defence authorities, including associated aid organizations, as well as authorities and organizations mandated by law to perform security and safety functions. Bundeswehr and allied forces are treated as equivalent to BOS.
Dynamic airspace restriction:	Dynamic airspace restrictions are temporary restrictions of areas of a U-space in uncontrolled airspace imposed by order of BOS, e.g. a corridor to give priority to manned air traffic and Unmanned Aircraft Systems (UAS) of BOS or to enable security measures of BOS on the ground without disruptions.
Dynamic reconfiguration:	In accordance with Implementing Regulation (EU) 2021/665, ATS. TR.237, air traffic control units must temporarily limit the area within the designated U-space airspace where UAS operations can take place in order to accommodate short-term changes in the demand for manned air traffic or BOS by adjusting the horizontal and vertical limits of the U-space airspace. In the event of a dynamic reconfiguration, all UAS must leave the designated area or land to give priority to manned air traffic or BOS aircraft.
Remote identification system:	A system that ensures the local broadcast of information about a UAS in operation, including the marking of the UAS, so that this information can be obtained without physical access to the UAS.
Risk assessment:	Airspace risk assessment means an evaluation of operational, safety and security risks that takes into account the required levels of safety performance as defined in the European Plan for Aviation Safety and the State Safety Programme referred to in Articles 6 and 7 of Regulation (EU) 2018/1139, the type, complexity and density of the traffic, the location, altitudes or heights and the airspace classification.

Single CISP:	The single common information service provider (single CISP) is a service provider subject to approval which has been designated for all U-spaces by the BMDV in accordance with Article 5(6) of Implementing Regulation (EU) 2021/664. The single CISP receives the data for an established U-space specified in Article 5(1) to (3) and forwards this data to the addressees specified therein, including USSPs, in accordance with Article 5(5) of Implementing Regulation (EU) 2021/664.
UA:	Unmanned aircraft
UAS:	Unmanned aircraft including its control station (unmanned aircraft system)
U-Space:	The U-space is a geographical zone for UAS designated by Member States, where UAS operations are only allowed to take place using U-space services.
U-space coordinator:	The Federal Ministry for Digital and Transport (BMDV) or a federal authority designated by it, which will receive applications for the establishment of U-spaces and carry out the administrative procedure until a decision is taken by the BMDV.
USSP:	A U-space service provider (USSP) is based on the provision of digital services and automation of functions that are designed to promote safe, secure and efficient access to U-space airspace for a large number of UAS. Each operator of a UAS in the U-space must use a USSP, which must provide at least the services specified in Article 8 (network identification service), Article 9 (geo-awareness service), Article 10 (UAS flight authorisation service), Article 11 (traffic information service) and Article 13 (conformance monitoring service) of Implementing Regulation (EU) 2021/664.

Introduction

As outlined in the Federal Government's Action Plan entitled Unmanned Aircraft Systems and Innovative Aviation Strategies (May 2020, https://www.bmdv.bund.de/ SharedDocs/DE/Anlage/DG/aktionsplan-drohnen-englisch. pdf?__blob=publicationFile), Germany is to become the lead market for unmanned aircraft systems and play a key role in setting international safety and security, data protection, environmental and sustainability standards. The designation of U-spaces will further consolidate Germany's role as a driving force for unmanned aviation and give the sector a technological and economic boost. The integration of drones as a new mode of transport into existing transport structures poses an enormous challenge to the Federal Government and the federal states, which we will tackle in order to further establish Germany as a leader in unmanned aviation. We can achieve these goals by promoting the safe and secure integration of unmanned aviation into the existing airspace structures and defining the framework conditions for the establishment of U-spaces in accordance with section 5a of the German Rules of the Air Ordinance (LuftVO) applicable to the operation of unmanned aircraft systems.

The following strategy is intended to provide the basis for the establishment of U-spaces and was developed by the Unmanned Aviation Project Group (PG Unb LF) at the Federal Ministry for Digital and Transport (hereinafter BMDV) in an expert group involving numerous Federal Ministries, federal states, authorities, federal companies and the Drones Advisory Board. Its purpose is to define the responsibilities, necessary structures and the procedures for the designation of U-spaces in accordance with Implementing Regulation (EU) 2021/664 of 22 April 2021 on a regulatory framework for the U-space (OJ L 139 of 23 April 2021, p. 161)¹. The strategy does not constitute a legal instrument nor does it replace the legislative procedure, which requires the involvement of government departments (section 45 of the GGO, the Joint Rules of Procedure of the Federal Ministries), federal states and associations. It also addresses outstanding issues that have not yet been definitively resolved at the European level, for example. The strategy is subject to changes in the framework conditions, as it does not yet address all matters.

Implementing Regulation (EU) 2021/664 allows for U-spaces to be established by EU Member States. In

accordance with Article 2(1) of Implementing Regulation (EU) 2021/664, a 'U-space airspace' (hereinafter U-space) is 'a UAS geographical zone designated by Member States, where UAS operations are only allowed to take place with the support of U-space services'. U-spaces are intended to safely integrate UAS into existing airspace structures where large numbers of UAS are expected to operate. This is achieved by providing key services, some of which are safety- and security-related, to businesses and individuals for the operation of UAS in these spaces. In simple terms, these services serve to make manned aircraft and UAS visible in the U-space and to implement the necessary safety, security and traffic management measures.

The following strategy is intended to provide guidance for the establishment of U-spaces in Germany based, among other things, on the findings of the U-space Real Laboratory in Hamburg (2021) and the development of the Acceptable Means of Compliance (AMC) and the Guiding Material (GM)² for Implementing Regulations (EU) 2021/664, (EU)³ 2021/665⁴ and (EU) 2021/665⁵. It can serve as a role model for other countries. The strategy primarily answers structural, operational and technical questions regarding the introduction of U-spaces in Germany.

Requirement

Since there is great demand for drone operations and a high traffic density in urban areas, most U-spaces will be established in such areas. A case can also be made for U-spaces in areas where integration of unmanned aviation into existing transport structures may be required for other reasons (e.g. military airspace, cross-border UAS operations).

U-spaces are usually established in areas where

 it is safely possible and necessary to integrate unmanned aviation into existing transport structures; and

¹ https://eur-lex.europa.eu/legal-content/DE/TXT/HTML/?uri=CEL EX:32021R0664&from=EN

² Cf: EASA: https://www.easa.europa.eu/document-library/noticesof-proposed-amendment/npa-2021-14

³ Official Journal of the EU L 139/161: https://eur-lex.europa.eu/ legal-content/DE/TXT/PDF/?uri=CELEX:32021R0664&from=DE

⁴ Official Journal of the EU L 139/184: https://eur-lex.europa.eu/ legal-content/DE/TXT/PDF/?uri=CELEX:32021R0665&from=DE

⁵ Official Journal of the EU L 139/187: https://eur-lex.europa.eu/ legal-content/DE/TXT/PDF/?uri=CELEX:32021R0666&from=EN

- if the BMDV has received an application for the establishment of a U-space and a positive assessment by the U-space coordinator and has granted its approval

 the assessment is based on objective criteria – and
- it can be expected that UAS operations will be sufficient to maintain the USSPs; and
- there is a high demand for services of USSPs that is sufficient to cover the costs and provide USSPs⁶ with a secure revenue; and
- USSPs that can ensure permanent operation and maintenance of U-spaces are available.

Criteria for the establishment of U-spaces

General criteria:

U-spaces must meet a number of criteria to be established safely and securely while avoiding collisions with other air transport users, risks as well as an inappropriate environmental impact.

- Information and regulations concerning U-spaces including the relevant approved U-space service providers (USSPs) are to be posted on the Digital Platform for Unmanned Aviation, 'dipul' (https://www. dipul.de/homepage/en/). This includes information on the purpose of the U-spaces, the geographical zones, the relevant USSPs, technical requirements for UAS operations and possible exemptions as well as technical requirements for UAS. In accordance with Article 3(6) of Implementing Regulation (EU) 2021/664, information must also be made available through the aeronautical information service.
- The horizontal surface areas of the U-spaces are composed of hexagons with positions specified using the WGS 84 coordinate system. All U-space related services such as those provided by USSPs are based on the specified hexagons.

- This is also to enable seamless reconfiguration of the U-spaces.
- Due regard must be paid to the interests of environmental protection, in particular nature conservation and noise mitigation, as well as consumer protection.
- The BMDV or a federal authority designated by it is to appoint a U-space coordinator that is, with the involvement of the competent authorities (in particular the state aviation and environmental authorities and the Federal Office of the Bundeswehr for Military Aviation/responsible entity within the remit of the Federal Ministry of Defence [hereinafter BMVg]), including local authorities and agencies (Article 18f of Implementing Regulation (EU) 2021/664), responsible for
 - receiving application documents for the establishment of U-spaces, reviewing whether the application is suitable, necessary and adequate, and conducting a risk assessment that covers at least the areas of
 - safety of manned and unmanned aviation;
 - security, both physical and digital;
 - environment, including noise, emissions, water quality, wildlife, areas protected under nature conservation law;
 - privacy, including data protection.

Based on the risk assessment, the BMDV is to define at least the performance requirements for a U-space in accordance with Article 3(3) and (4) of Implementing Regulation (EU) 2021/664 (UAS capabilities, U-space services, operational conditions and airspace restrictions).

If the BMDV makes a positive assessment, it will decide that the U-space be established.

Modifications to a U-space (or parts thereof) will require a new risk assessment and involvement of state aviation and environmental authorities, as well as any other affected authorities and agencies, before the U-space is put into operation. If circumstances that may have an impact on the risk assessment change, a new risk assessment will also be required.

⁶ Possible business cases are being investigated as part of the LUV project, in which recommendations for action for the national implementation of the U-space Regulation for Germany are being developed.

- The approval of the BMVg is required for the designation of U-spaces that cover (low-altitude) air routes and airspaces under military responsibility.
- There must be the single common information service provider (single CISP) and at least one USSP for any U-space that has been established.
- The single CISP designated in accordance with Article 5(6) of Implementing Regulation (EU) 2021/664 and each USSP must be certified to provide their services in accordance with Articles 14 to 16 of Implementing Regulation (EU) 2021/664. The Federal Supervisory Authority for Air Navigation Services (hereinafter BAF) is responsible for the certification and oversight (including audits) of USSPs headquartered in Germany. U-space service providers whose principal place of business is in another EU Member State or in a third country must apply for certification in that other Member State or with the European Union Aviation Safety Agency (EASA). The certification is valid indefinitely, provided that the relevant company continues to provide the services described in the certificate without any changes and no facts become known which would justify that the certificate be withdrawn.
- In accordance with Annex II, Subpart B, ATM/ANS. AR.C.010, the BAF must audit the single CISP and the USSPs at least every two years, provided they have their principal place of business in Germany.
- UAS operators may only operate UAS in U-spaces if they use an approved USSP; BOS may deviate from this.
- Each U-space must be equipped with a standardized telecommunications network that covers the entire U-space and the coverage of which must not be lower than the maximum height of the U-space. The data rate of the telecommunications network must be sufficient to ensure complete and error-free delivery of all services from USSPs to all UAS operators as well as communication between USSPs and the single CISP at all times and in real time throughout the U-space.
- As part of the risk assessment, the U-space coordinator will receive findings of the assessment by the Federal Network Agency (BNetzA) on whether the data rate of the telecommunications network is as required and that effective measures have been taken to ensure that the network will be able to function even if individual components fail.

- In U-spaces, UAS not operated by BOS must give priority to manned and unmanned aircraft operated by BOS.
- In U-spaces with control zones, coordination procedures are to be established between air traffic control (ATC) units, single CISP and USSPs in accordance with Article 1(2)(b) of Implementing Regulation (EU) 2021/665.

Control zones:

- If U-spaces or parts thereof are in control zones, the ATC clearance from the ATC unit may be transmitted to the USSPs via the single CISP. In control zones, an ATC clearance for UAS is deemed to have been granted when a UAS operator has received a flight permit from the USSP. The BMDV is to issue a general decree to this end.
- On instruction by the ATC unit, the single CISP is to immediately transmit information on the dynamic reconfiguration of the U-space to the USSPs, before any manned aviation operations may be carried out in the U-space.
- The USSPs require UAS operators to operate unmanned aviation in a manner that does not conflict with the requirements of the appropriate ATC unit.

Extent and clearances:

- The lateral and vertical extent of U-spaces is to be limited to the level that is necessary for the proposed UAS operations and its integration with existing transport infrastructures.
- U-spaces extend from the ground, are based on local conditions and have a maximum vertical and lateral limit.
- The altitude of the UAS is determined as part of the risk assessment and in compliance with Section 5a of the German Rules of the Air Ordinance (LuftVO). The maximum altitude should not exceed 300 metres. Exceptions to this are possible if a higher maximum altitude is absolutely necessary for UAS operation and is considered separately in the risk assessment.
- Any deviation in the U-space ceiling must be consistent with the airspace risk assessment and must have been examined with respect to additional risks and their mitigation.

- The minimum distance between UAS, the minimum distance from UAS to manned aircraft, and the buffer zones are determined as part of the risk assessment.
- The USSP is responsible for monitoring compliance with clearances and sharing information about potential approaches with operators.
- In the event of dynamic reconfiguration (controlled airspace) or dynamic airspace restriction (outside controlled airspace) for the performance of tasks by the BOS, operators must ensure that the UAS immediately leave the restricted zone within a time period specified for each U-space, e.g. by changing the altitude, or by landing. This must be taken into account by UAS operators as part of their flight planning.
- The BOS order the dynamic airspace restriction and automatically prompt the single CISP (Common Information Service Provider) to record it on the air situation picture.
- Unless otherwise determined by the BMDV or a federal authority designated by it, geographic zones pursuant to section 21h of the LuftVO also retain their validity within the U-spaces. UAS may also be operated in U-spaces only in accordance with the rules specified in section 21c (2.), section 21h and section 21i of the LuftVO.

Communication structures:

For U-spaces to work, it is necessary to establish clear communication structures:

- Communications procedures between air traffic services, single CISPs, USSPs, BOSs and UAS operators shall be digitalized and automated to the maximum extent possible. The goal is to digitally connect all participants in an overarching system network.
- The single CISP is the central hub where all data relevant to U-space operations is pooled and forwarded to the USSPs, flight control units and authorities via appropriate interfaces.
- Where the U-space is located in Airspace G, any manned aircraft not operated by BOSs must digitally report its operational data and flight path to the single CISP in a timely manner prior to entering the U-space. Separate procedures apply to BOS (p. 10).

- Where the U-space is located in Airspace D (CTR), the air traffic control centre reports in advance to the single CISP all available and relevant operational data of manned aircraft approaching or flying in the U-space in accordance with ATS.OR.127 of Implementing Regulation (EU) 2017/373. The single CISP shares this information with the USSPs.
- Taking the reports from the manned aircraft and the operational data transmitted by the air traffic control centre into account, the single CISP automatically defines a corridor based on the hexagons determined around the respective manned aircraft and its intended route and integrates it into the air situation picture so that there can be no danger to manned traffic from UAS when flying through the U-space.
- All USSPs receive from the single CISP, on a nondiscriminatory basis and in the same quality, the required operational information and digital air situation picture in real time or as determined by the risk assessment.
- All USSPs report to the single CISP, in digital form, any authorized UAS operation and activation of the flight authorization. The single CISP integrates the data into the air situation picture.
- All USSPs report to the single CISP, in digital form and in real time, all relevant operational data for the UAS they support. The single CISP integrates the data into the air situation picture.
- The single CISP digitally reports the position data of all UAS located in U-spaces in control zones to the respective responsible air traffic control centres in real time.
- If the telecommunication network is not fully functional, the U-space must be closed until the network is error-free again.

Single CISP:

The BMDV commissions a single common information service provider (single CISP). This provider is responsible for all U-spaces in Germany and must be approved by the Federal Supervisory Authority for Air Navigation Services (BAF).

 In every U-space in Germany, the BAF-approved single CISP must be used.

- The single CISP will be approved based on the provisions of Implementing Regulation (EU) 2021/664 and, in the future, the Acceptable Means of Compliance (AMC) and the Guiding Material (GM) of EASA.
- The single CISP must inform the BAF of any change that affects the areas relevant to approval.
- The single CISP must at least provide the following information in digital form for the entire U-space for all USSPs and air traffic service providers:
 - 1. Data for the digital air situation picture.
 - Data on the UAS geographical zones available on the federal digital platform (https://www.dipul. de/homepage/en/) as well as the reported aviation obstacles.
 - Areas subject to dynamic reconfiguration or dynamic airspace restriction due to BOS operations and where UAS may only be operated by BOS,
 - Position information of manned aircraft, in particular with regard to date, time, type, track and height above ground.
 - 5. Expected operation of UAS, especially with regard to date, time, type, route and height above ground.
 - Position information of non-compliant UAS operating in U-space, if the single CISP is aware of it.
 - 7. Information about USSPs.
 - 8. Operating conditions for the respective U-space..
 - 9. Any other available information about potential hazards within the U-space.

USSP:

Each U-space must have at least one USSP certified by the BAF, by a Member State of the European Union or by EASA.

- The single CISP will be approved based on the provisions of Implementing Regulation (EU) 2021/664 and, in the future, the Acceptable Means of Compliance (AMC) and the Guiding Material (GM) of EASA.
- USSPs which have their principal place of business in Germany must inform the BAF of any change that affects the areas relevant to approval in the company..
- In German U-spaces, each USSP must offer at least the following services:

- a network identification service in accordance with Article 8 of Implementing Regulation (EU) 2021/664;
- 2. a geo-awareness service in accordance with Article 9 of Implementing Regulation (EU) 2021/664;
- a UAS flight authorization service in accordance with Article 10 of Implementing Regulation (EU) 2021/664;
- a traffic information service in accordance with Article 11 of Implementing Regulation (EU) 2021/664;
- a conformance monitoring service in accordance with Article 13 of Implementing Regulation (EU) 2021/664, unless it is determined in the risk assessment that it is not required.
- As required, the BMDV or an authority designated by it may require the provision of a weather information service in accordance with Article 12 of Implementing Regulation (EU) 2021/664 for individual or all U-spaces.
- USSPs notify the BMDV or a federal authority designated by it and the single CISP of the start of operations in a U-space.
- Those wishing to operate a UAS in a U-space apply for a UAS flight authorization by submitting the required information to the USSP of their choice operating in the U-space. If the necessary technical and operational requirements are met and no authorized flight overlaps with the requested flight in terms of space and time, the USSP issues the permit to fly and forwards it to the single CISP. The single CISP informs all other USSPs of the planned operation.
- When issuing a UAS flight authorization, the first application for issuance of a flight authorization which is decided by a USSP and submitted to the single CISP takes precedence over other applications (first come, first serve).
- A UAS flight authorization may be revoked or modified at any time by the responsible flight authorization service if manned aircraft or BOS aircraft fly in the U-space or if other reasons exist, in particular hazards to the planned operation. These missions are represented in the digital situation picture as dynamic reconfigurations or, outside the control zones, as dynamic airspace restrictions.

- Immediately prior to take-off, the UAS operator activates the flight authorization with the USSP. Prior to confirming the activation of the flight authorization, the USSP will check for airspace restrictions affecting the operation.
- USSP are to align random samples of the registration data entered by UAS operators with the data from the Federal Aviation Agency (LBA).
- USSPs are to see to it that the routes transmitted by the BOS are kept free of UAS as soon as they become aware of any dynamic reconfiguration or dynamic airspace restriction in the U-space.
- As long as a restricted area exists due to a dynamic reconfiguration or dynamic airspace restriction, the USSP may not authorize or confirm activation of UAS flights that pass through that area.
- All airspace users in U-spaces must make themselves electronically visible. All USSPs must be able to generate an air situation picture from data of these systems or obtain one from third parties. The systems to be used in each case are determined as part of the risk assessment.
- When a USSP becomes aware of non-compliant UAS in the U-space, they immediately inform the single CISP, if possible, of the position, altitude over ground and route of the UAS.
- If the route of a non-compliant UAS cannot be verified, the air traffic control centre and the USSP are to be notified via the single CISP by the USSP that first noticed the UAS and an alert is to be raised.

UAS operators:

- The UAS operator is responsible for ensuring that their UAS is equipped with a remote identification system that transmits the information in accordance with Article 8 of Implementing Regulation (EU) 2021/664.
- UAS operators are required to comply with USSP instructions.
- BOS are exempt from the obligation of electronic visibility if the purpose of use does not allow the use of the aforementioned detection systems.

- The operator of the UAS is responsible for ensuring that they have all necessary permits to operate within the U-space.
- After activation of the UAS flight permit, the UAS must take off immediately. If the UAS has not started five minutes after the activation has been confirmed, it will lose its validity and a new activation must be requested from the USSP.
- The UAS operator must notify the appropriate USSP that operations have ended immediately after landing.

Authorities and organizations with safety and security responsibilities (BOS):

- BOS may deviate from the regulations in accordance with section 21k of the LuftVO, insofar as this is necessary for the fulfilment of their tasks, taking into account public safety and order. Derogation from the rules governing behaviour in the airspace shall only be permissible if this is imperative for the performance of statutory functions.
- BOS are exempt from the requirement to use a USSP in the U-space.
- BOS operating manned or unmanned aircraft in the U-space are to be digitally connected to the single CISP and communicate the routes and destinations of their aircraft and any necessary temporary airspace restrictions to the single CISP as soon as they are known.
- The competent BOS entities report data on planned flights, times, modes of operation, routes and altitudes above ground affecting U-spaces to the single CISP in uncontrolled airspace and to the competent air traffic control centre in controlled airspace as early as practicable in view of the mission. The air traffic control centre (controlled airspace) or single CISP (uncontrolled airspace) transfers the data to the air situation picture and performs a dynamic reconfiguration or dynamic airspace restriction.
- If the purpose of the operation does not permit the disclosure of this information, the competent BOSs report the date and time of a possible airspace use to the air traffic control centre and the single CISP without providing further details. No more flight permits may be issued during the specified period, and existing ones are withdrawn.

- UAS must maintain at least the distance to the routes transmitted by the BOS as determined in the risk assessment.
- BOSs must be digitally connected to the single CISP and communicate the routes and destinations of their aircraft to the single CISP as soon as they are known, if the mission allows, so that the single CISP can initiate a dynamic airspace restriction of the U-space or, in the case of a control zone, request the air traffic control centre to perform a dynamic reconfiguration.
- Each aircraft operated in U-space by BOSs needs to have an approved remote identification system that must be put into service when the mission allows.

Operations of model aircraft:

Model flying sites are only expected to be located within U-spaces in exceptional circumstances.

- Model aircraft operations are permitted in U-spaces only by arrangement and assignment of a USSP.
- This does not apply if operations take place within the boundaries of an approved model flying site located in a U-space and this site is adequately identified on the Digital Platform for Unmanned Aviation (dipul).
- Information on newly established model flying sites located in whole or in part in U-spaces must be provided to the single CISP prior to initial operation.

Application procedure:

- Authorities, natural persons or legal entities that have an interest in establishing a U-space submit a corresponding application to the U-space coordinator.
- The U-space coordinator coordinates with the federal and federal state agencies (especially aviation and environmental agencies) as well as the regional and local levels in an established participation process and takes into account other interest groups (e.g. environmental protection organizations, companies, citizens' initiatives) that may be affected by the planned U-space.

- The U-space coordinator uses defined criteria to check whether
 - it is possible and necessary to integrate unmanned aviation into existing transport structures while guaranteeing safe aviation; and
 - there is a high demand for USSP services that is sufficient to allow for economical operation of the U-space; and
 - environmental and social concerns are taken into account.
- The U-space coordinator or a federal authority designated by the BMDV conducts a risk assessment.
- After a positive review, the U-space coordinator forwards the application and the results of the assessment, including defined operating conditions for the U-space, to the BMDV or a federal agency designated by it.
- The BMDV or a federal authority designated by it decides on the establishment of the U-space on the basis of the documents submitted. If environmental, noise, nature conservation or consumer protection concerns are significantly affected, the decision is made in consultation with the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection or a federal authority designated by it.
- No later than two years after the designation of the U-space, the U-space coordinator examines whether the requirements of the U-space identified in the review process continue to exist and confirm this to the BMDV or recommends to the Ministry that adjustments be made to the U-space with the goal of optimizing the U-spaces in Germany.
- If the U-space requirements cannot be met, the U-space coordinator will recommend to the BMDV that the U-space be closed..

Annex: Members of the expert group

The expert group for the development of the U-space strategy consisted of representatives of the following ministries and organizations:

- 1. Federal Ministry for Digital and Transport (BMDV)
- 2. Federal Ministry for Economic Affairs and Climate Action (BMWK)
- 3. Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV)
- 4. Federal Ministry of Defence (BMVg)
- 5. Federal Ministry of Food and Agriculture (BMEL)
- 6. Federal Aviation Office (LBA)
- 7. Federal Supervisory Authority for Air Navigation Services (BAF)
- 8. Drones Advisory Council working group 1 (WG 1))
- 9. Drones Advisory Council working group 2 (WG 2)
- 10. Hamburg Authority for Economy and Innovation (BWI)
- 11. Bremen Senator for Economy and Ports (SWH)
- 12. Berlin Senate Department for the Environment, Urban Mobility, Consumer Protection and Climate Action (SenUMVK)
- 13. Darmstadt Regional Commissioner's Office (RPDA)
- 14. DFS Deutsche Flugsicherung GmbH (German Air Navigation Services, DFS)
- 15. German Aerospace Centre (DLR)
- 16. GLVI Gesellschaft für Luftverkehrsmanagement (Air Traffic Management Association, GLVI)

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