

Research for TRAN Committee – Unmanned Aircraft Systems integration into European airspace and operation over populated areas

KEY FINDINGS

- The integration of Unmanned Aircraft Systems (UAS) within airspace will happen in stages. Current operations are in segregated airspace away from manned aircraft. Integration with manned aircraft will require improved technical and operational procedures. These are currently being looked at as part of Research & Innovation (R&I) programmes.
- UAS have similarities and differences with manned aircraft in terms of how they operate. The focus should be on areas in which they differ, such as manoeuvrability, communications, performance and the diversity of their operating environments.
- Operations over populated areas require a specific focus on ground risk. Integration into airspace over these areas needs to account for dynamic changes in population densities as well as safety, privacy, security, noise and social acceptance concerns.
- Good practices have been identified across the areas of user-friendly platforms and information sharing, step-by-step approaches to use cases, engagement with industry and city stakeholders and military and civil synergies.
- There are a number of lessons that can be learned from Military and Civil cooperation on systems, technologies and processes. However, procurement barriers could be eased to support the adoption of civil technologies beyond R&I.
- Incentives for industry are an area in which the EU is arguably slightly lagging behind the US and China, where government programmes are seeking to reduce cost and risk for private sector development in the UAS and electric vertical take off and landing aircraft (eVTOL) markets.
- Drone Strategy 2.0 provides good coverage of the issues currently facing the UAS industry. However, it may underplay some of the difficulty in achieving full integration, which requires further coordination and prioritisation to keep the EU on track to achieve a large-scale drone market in the EU by 2030.

The present document is the executive summary of the study on Unmanned Aircraft Systems integration into European airspace and operation over populated areas. The full study, which is available in English can be downloaded at: <https://bit.ly/42vx44T>



Introduction

Drones have the potential to become an increasingly important part of mobility strategies. The [European Drone Strategy 2.0](#), which was published in November 2022 by the European Commission, provides political direction on the next steps of Unmanned Aircraft Systems (UAS) development within the European market.

However, there remain key technical, procedural, social and regulatory requirements that need to be addressed if UAS are to be safely and commercially integrated within European airspace and wider society. Accordingly, the objective of this study was to assess the challenges and possible solutions of integrating UAS within European airspace and, in particular, over populated areas, to consider military and civil integration, to identify and analyse good practices and to undertake an assessment of the Drone Strategy 2.0.

Integration of UAS within European airspace

The implementation of UAS integration within European airspace is happening in stages, with the most complex aspects due to take place after the simpler issues have been resolved.

While UAS have a lot of similarities to manned aviation, the fact that they are integrated systems, have different flight characteristics and operate without a pilot on board requires many new solutions for airspace integration. As a result, there are some safety issues regarding occurrence under-reporting (meaning a detailed description of a safety issue), collision avoidance and counter-UAS technology where further work is needed.

The economic potential of the UAS market is significant and research and innovation (R&I) into the technical development of UAS for various operational use cases is already underway. However, there remains a need to develop specific programmes to address the adoption of these technologies at scale as well as the operational and regulatory mechanisms required to support them.

Operations over populated areas

Low-altitude UAS operations over populated areas will be essential in a large number of cases. These bring with them a number of associated safety, security and privacy risks not applicable to existing manned aviation operations, which are largely banned in such areas.

Population density analysis is an important consideration in risk assessments applied to drone operations. The methods for identifying densely populated areas are also likely to move from static models, which are more commonly applied to manned aircraft, towards more dynamic approaches.

Social acceptance is a particular area that requires additional strategies to normalise the operation of UAS over populated areas. The provision of information to the public through trials and demonstrations to increase awareness around drone operations and their societal benefits will be important as more use cases become available.

Good practices

The EU is moving ahead with regulation of UAS operations, but there are elements of good practice identified in Member States and third countries that could be applied more widely to the EU as a whole. On a global scale, incentives to industry are an area in which the EU is arguably slightly lagging behind the US and China, where government programmes are seeking to reduce cost and risk for private sector development in the UAS and electric vertical take off and landing aircraft (eVTOL) markets.

Good practices have been identified in the areas of user-available information via accessible applications, publications and training on privacy and weather-related issues. A step-by-step approach to airspace integration has also been identified, adopting low-risk operations first before moving to higher-risk scenarios. This has allowed time to address social acceptance issues relating to wider UAS adoption, with certain countries considering social acceptance roadmaps.

Further good practices have been identified in the use of demonstrators and industry partnerships to increase the support of stakeholders by directly involving them in key decisions regarding UAS operations. Military and civil integration schemes that are already ongoing in third countries have also been identified as good practices.

Military and civil drone integration

Integration of military UAS into mixed airspace will be able to benefit significantly from the decades of experience gained by Air Traffic Management (ATM) in integrating manned equivalents in EU skies.

Mutual agreement with manufacturers and operators concerning responsibilities and procedures, greater UAS familiarity among ATM personnel and an understanding of how to manage the 5% of more complicated UAS operations should all be achievable and present no serious problems for the EU airspace environment. However, as with most aviation subjects, planning should be approached with the understanding that errors and unforeseen issues will arise and hence the efforts should be regarded as a fluid and evolving process.

Although synergies will develop between the civil and military spaces, these are likely to occur naturally as a result of market pressures rather than as an area where direct action can be taken at an EU level. Concurrent technology interests will spur the exchange of concepts, research and systems.

Drone Strategy 2.0

The Drone Strategy 2.0 provides a comprehensive set of flagship actions to support the evolution of the drone ecosystem and promote safe use of drones for a range of aerial operations, as well as, in time, innovative air mobility solutions in urban areas.

We assess that the Strategy correctly captures the need but may downplay the difficulty of scaling operations, both in terms of scope and diversity of operation and particularly in achieving full integration with traditional manned aviation. The Strategy also fails to provide a clear set of actions on how to overcome issues of social acceptance of UAS and issues relating to ground risk.

Conclusions and recommendations

Overall, we conclude that Europe is making good progress in the support elements necessary for UAS adoption, mostly driven by its regulatory frameworks and R&I schemes. The Drone Strategy 2.0 provides an important step in consolidating the required actions needed to achieve the vision for 2030. Achieving complete integration of UAS in airspace will nonetheless require prioritising and careful monitoring of the progress of the flagship actions identified in the Strategy. Scalable technical, commercial and operational solutions will also be required while maintaining the current level of European safety standards, protecting national security interests and encouraging the social acceptance of stakeholders.

Our recommendations are set out below:

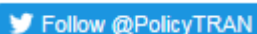
- The European Parliament should ensure that large-scale, long-running demonstrators across different environments are supported.
- The EU should prioritise R&I calls and associated funding for the most challenging airspace integration issues.
- The European Parliament should continue to promote the role of citizens in UAS operations and encourage the development of EU-wide social acceptance guidelines.
- The European Parliament should ensure that the European Commission takes a data-led approach to delivering the strategy.
- The European Parliament should promote the sharing of information across private and commercial users of UAS.
- The EU should remain aware of civil and military integration in third countries and consider the adoption of fast-track schemes such as US Agility Prime.
- The European Parliament should ensure that the European Commission has a strategic implementation plan to deliver the strategy.
- The EU should link the technological roadmap identified in the strategy to a wider European industrial plan for the development of UAS and its associated services.
- The European Parliament should promote participation in UAS adoption across the EU.

The European Parliament should ensure that UAS regulation does not become a prohibitive barrier to adoption and competition within the market while ensuring EU safety standards are upheld.

Further information

This executive summary is available in the following languages: English, French, German, Italian and Spanish. The study, which is available in English, and the summaries can be downloaded at: <https://bit.ly/42vxA4T>

More information on Policy Department research for TRAN: <https://research4committees.blog/tran/>



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