



Australian Association for Unmanned Systems (AAUS)

Submission to

**Australian Government
Emerging Aviation Technologies
National Aviation Policy Issues Paper**

October 30, 2020

Background

The Australian Association for Unmanned Systems (AAUS) is pleased to provide a submission in response to the Department of Infrastructure, Transport, Regional Development and Communications National Emerging Aviation Technologies (NEAT) Policy Issues Paper.

AAUS is Australia's oldest and largest industry advocacy group for drones and the emerging Advanced Air Mobility (AAM) sector. AAUS represents drones across all three domains: air, land and maritime. AAUS' objective is to promote a professional, safe and commercially viable unmanned systems and AAM industry. AAUS achieves this through its industry advocacy and promotion, education and outreach, and networking activities.

AAUS provides a single representative voice for the full breadth of the drone and AAM industry. AAUS' 2,700 members span small-to-large enterprise, manufacturers, licensed and unlicensed operators, training providers, academic institutions, government, and other supporting technical and professional services to the Australian drone industry. Input from our members has been used to prepare this submission.

In this submission the Department of Infrastructure, Transport, Regional Development and Communication is referred to as 'the Department'. The use of the term 'drone' encompasses Remotely Piloted Aircraft (RPA) and Unmanned Aircraft Systems (UAS). Although they have similar meanings, Advanced Air Mobility (AAM) is also preferred to Urban Air Mobility (UAM) in the submission.

Submission Summary

AAUS:

- Supports the Government's "whole-of-government" approach towards the development of a comprehensive and cohesive policy set and legal framework for emerging aviation sectors. We believe that the timing is right for this approach and it has the potential to mitigate risk of regulatory inconsistencies and efficiencies inherent to the range of regulatory concerns and the multiplicity of agencies and jurisdictions that will need to be involved to address them.
- Believes the Government should provide a clear policy statement in relation to its position, relative to other nations, in its uptake and leadership of emerging RPAS and AAM sectors. Such a statement is overarching and will be a key to shaping Government's broader policy development. AAUS believes the RPAS and AAM sector can deliver significant triple bottom line benefit to the Commonwealth and that Australia is extremely well placed to capitalise on early leadership and adoption.
- Believes that in some areas, International efforts have already laid the foundation for Australia to closely follow. An example includes the ASTM standard for remote identification of drones. AAUS believes we should seek to leverage such foundations but ensure they are applied with awareness of the Australian context.
- Supports, in generality, the proposed core principles underpinning a National Emerging Aviation Technologies Policy.
- Supports the desire to harmonise with international efforts but believes that there is opportunity for Australia to become a leader in some aspects of enabling emerging aviation technologies through development of leading edge policy and regulation, thus enabling economic benefit for Australia.
- Believes that the proposed approach to policy development will adequately allow for the future direction, operations and investments for industry only if it leads to the efficient development of detailed roadmaps and a government commitment and resourcing to execute against these roadmaps.
- Notes the pragmatic need to prioritise Government and industry efforts to advance policy and regulation for the sector. AAUS identifies safety, security and airspace integration as immediate concerns. However, AAUS notes that it is important that policy work in these immediate areas still account for noise, environmental, privacy and other concerns in the holistic manner the whole of Government approach specifically seeks to enable.

- Advocates for Government transparency on the development of NEAT Policy and regulations coupled with ongoing consultation and partnership with industry. We support the establishment of an Industry Advisory Group (IAG).
- Believes that these emerging aviation technologies have the potential to deliver significant benefits through their application in a wide range of civil, commercial and defence use cases. Further, the technologies and operational concepts have the potential to drive innovation that can deliver safety, efficiency and sustainability benefits for the entire aviation sector and industries that they serve.
- Believes that the nascent RPAS and AAM industries are still emerging and have many challenges ahead. There needs to be recognition that the work to develop the regulatory framework, and safety oversight infrastructure to support it, is an investment in the foundation for the industry, and this cost cannot be borne by industry in its entirety now in a user pays manner. Government should consider approaching this as a strategic investment needed to enable industry rather than an imposed cost to entry.
- Believes CASA resourcing to perform its current regulatory and safety functions is inadequate and will require a marked increase to keep pace with and support future industry growth. The Government will need to consider how it resources agencies to support any new regulatory and oversight functions required.
- Believes that the fundamental policy issues as presented in the Policy Paper are common to Defence. Defence have significant experience in the operation and regulatory oversight of RPAS that complements that of CASA. Government policy should reflect the significant opportunity that lies in fostering greater collaboration between Defence, CASA and other Government agencies on all policy areas presented in the NEAT Policy Paper. The risk of inadequate Government resources remains a persistent theme, and greater collaboration between Defence (as an operator and regulator) and relevant civil agencies could help in this regard. It is noted that CASA and the Department of Defence have already identified RPAS as a potential topic for regulatory alignment¹. The Defence Aviation Safety Authority have since undertaken a significant regulatory reform program, with the result being a framework of Defence Aviation Safety Regulations that more closely aligns with that of the civilian system. This brings new opportunity for Defence and CASA to pursue greater alignment of regulatory approaches. Maximising commonality in approaches enables bilateral recognition pathways and in turn, reduces the regulatory cost on industry. It also provides a common taxonomy for the sharing of safety data and safety promotion.
- Believes that the issues and challenges associated with emerging aviation sectors are also common to other transportation domains. The same fundamental issues relating to safety, privacy, security and emission are common to increasingly automated land and maritime transportation systems. Increasing automation, digitisation, complexity and interconnectivity of systems are broad common themes that have ramifications for regulation and oversight. The Government should consider how it can ensure

consistency of policy and regulation between these sectors and explore opportunities to better leverage resources across these domains to address common issues. We note that the Australian Road Research Board (ARRB) have also made this suggestion in their submission to the NEAT Policy Issues Paper².

- Believes that the Government must develop a dedicated policy position on spectrum for aviation. Access to spectrum is a critical enabler for the future of the entire aviation system and not just emerging aviation sectors like RPAS and AAM. Spectrum is essential to future airspace operational concepts (like Integrated ATM) that have the potential to deliver substantial safety, efficiency, and sustainability benefits for all airspace users. As well as ensuring adequate protected spectrum specific to aviation, spectrum policy should also consider how existing allocated spectrum can be used to support new and novel aviation applications. A performance-based approach should be adopted.
- Believes that there is significant opportunity for Government to explore how recent advancements in technology (such as automated and online systems) can be used to more efficiently deliver safety and regulatory oversight to the aviation sector. There should be a clear plan for the development of such tools/systems that aims to avoid the creation of siloed and agency-bespoke systems. Identifying and implementing new tools and processes is essential to Government managing the potential scale and complexity of the RPAS and AAM sectors into the future. AAUS recommends a broad policy statement that reflects this opportunity.
- Believes that education and training for the sector should focus on careers and not just licenses. Issues, not unique to the RPAS sector, include the need to align industry led ASQA qualifications with licensing requirements, and ensuring students can access to Higher Education and Vocational Education funding to develop careers. Pathways and recognition to enable greater mobility of pilots and technical professionals (e.g. LAMEs) can add more resilience to fluctuations in labour force demand across specific aviation sectors.
- AAUS believes the Government can play a role in helping to promote and identify opportunities for the exploitation of emerging aviation technology across economic sectors and industries. To this end, AAUS welcomes the inclusion of representatives of end users such the National Farmers' Federation, Australian Logistics Council, and Minerals Council of Australia to the NEAT Coordination Council. AAUS recommends additional policy that seeks to further exploit the benefits emerging aviation sectors.

Airspace Integration

Proposed Policy Approach

The Australian Government, in partnership with industry, will develop a UTM system that would support a combination of centralised government services and industry-provided services that will facilitate fair and competitive access to airspace and mitigate a wide range of risks and impacts

AAUS acknowledges the importance of safe integration of emerging aviation technology into Australian airspace and supports the Government's proposed policy approach to develop a UTM system.

In a letter³ to the Minister for Infrastructure, Transport, Regional Development and Communications dated June 4, 2020, AAUS expressed concern in regards to the lack of progress and industry involvement in the development of an unmanned traffic management (UTM) system. AAUS considers UTM to be critical to ensuring safe, secure, and efficient operations in low level airspace for all airspace users into the future. As the principal end users of the system and the likely providers of UTM technical solutions, we are firmly of the view that industry should have an active role in shaping Australia's UTM. This view is consistent with international efforts, where industry are central to policy, regulatory, and technical discussion for U-Space in Europe and UTM in the USA. To that end, AAUS believes that the establishment of an Industry Advisory Group by the Government is a positive step.

AAUS believes that objectives and guiding principles should be set to inform and support the development of government policy and regulations ensuring a safe, efficient, sustainable and cost-effective UTM system. These should be established before the Government pursues exploration of specific operational models or technical solutions. To that end, AAUS supports the ASTRA UAS and UAM Integration working group's document³ in identifying objectives and guiding principles for the operationalisation of Australian low level airspace as a solid starting point.

It is AAUS' position that a broader discussion, vision and roadmap for Australian airspace is needed; one that accounts for existing airspace users, existing airspace and ATM modernization plans, as well as new users and concepts such as UTM. UTM cannot be considered in isolation of the airspace system in which it operates.

While it is recognised that the concept of UTM will be first explored in relation to small RPAS/drones, eVTOL and aircraft operating at very high altitudes, AAUS believes the future UTM architecture should provision for a universal or unified traffic management system which incorporates all airspace and airspace users.

AAUS strongly advocates that any discussion concerning the operation and integration of emerging aviation sectors in Australian airspace include existing airspace users and

stakeholders. To this end, AAUS welcomes the inclusion of Airlines for Australia and New Zealand and Recreational Aviation Australia as members to the National Emerging Aviation Technologies Consultative Committee. AAUS advocates for broader aviation stakeholder engagement as part of relevant NEAT working group activities.

Safety

Proposed Policy Approach

The Civil Aviation Safety Authority will maintain its commitment to the primacy and safety, while taking a responsive, modern and evidence based approach to safety regulation and the certification of new aviation technology that provides scope for innovation and flexibility, having regard to the inherent risks of the operating environment, other airspace users and the travelling public.

AAUS supports the Government's proposed policy approach. We recognise the forward leaning and risk-based approach that CASA has adopted and the significant role this regulatory approach has played in the early advancement of the RPAS sector in Australia. AAUS sees significant opportunity for further leadership in this regard moving forward.

AAUS supports a risk-based approach to the regulation of the sector and the continued development of an outcome/performance-based regulatory framework. AAUS also supports the use of common tools and approaches between regulatory authorities, such as the JARUS SORA, which help foster consistent and standardised regulatory approaches globally.

Resourcing remains a critical concern. AAUS recently responded to a Senate Inquiry relating to Unmanned Aircraft Levy⁵ and CASA cost recovery⁶ for services to the RPAS industry.

The rapidly growing RPAS sector in Australia places a significant demand on CASA services and we believe that its current resourcing level does not meeting existing regulatory and safety oversight for drone operations. CASA is also in direct competition with industry to attract and retain niche talent. The situation is compounded by CASA's inability to completely recover cost for the provision of regulatory services to the sector, with the existing funding model heavily dependent on fuel excise. Consequently, resources (personnel numbers and relevant drone experience) within CASA to meet its drone regulatory functions and introduce new initiatives appear considerably inadequate. This shortfall is translating directly to longer application times for various approvals with the potential to drive up regulatory non-compliance which could impact safety outcomes. This inefficiency is directly affecting economic development across the sector and, more importantly, resulting in lost opportunity for innovation.

There is still a large amount of work required to develop regulatory and licensing frameworks for more complex RPAS operations and the certification of larger RPA and eVTOL systems. If we are to realise our future aspirations for the sector, AAUS believes that CASA needs to be adequately funded by government and industry to manage the increased throughput and regulatory development required of emerging aviation technologies. New automated tools and processes to assist CASA in the efficient provision of safety services to an already large (and growing) sector will be essential.

Further, we believe that the nascent RPAS and AAM industries have many challenges ahead. There needs to be recognition that the work to develop the regulatory framework, and safety oversight infrastructure to support it, is an investment in the foundation for the industry, and this cost cannot be borne entirely now by industry and that a strategic investment by government is needed. Clearly, specific investment in areas important to Australia's unique operating context or where Australia may lead international development would be necessary.

AAUS believes industry can play a significant role in helping to address resourcing challenges faced by CASA. The FAA, EASA, and Transport Canada are all examples of regulators actively seeking to collaborate with industry to advance regulatory frameworks and develop shared expertise. AAUS has established expert industry working groups that, through an appropriate engagement mechanism, good supplement CASA expertise and resources to advance regulations and effective safety oversight for the benefit of all stakeholders.

While the challenges highlighted here relate to the safety regulator, the issue is universally applicable to all Government agencies - appropriate resourcing will be required to ensure Government agencies can provide effective governance and regulatory oversight of the sector.

Security

Proposed Policy Approach

The Australian Government will lead the development of a proportionate and evidence-based approach to managing security risks associated with drones and eVTOL vehicles that is adaptable to changing circumstance while ensuring a secure operating environment.

AAUS supports the Government's policy approach. Like safety regulations, security regulations should be tailored and proportionate to the credible risk that needs to be managed. Technical and operational security risk controls should be justified on the basis of the security risk(s) with appropriate consideration of the costs imposed on the sector.

The boundary of security concerns that need to be addressed should extend beyond the aircraft, communications link(s), control stations and associated personnel. A systems-of-systems approach is needed to account for the increasing digitisation and connectivity of the

aviation system in which aircraft are operating. Consideration should also be given to the security of ground infrastructure (vertiport access, physical control stations and equipment, communications infrastructure, etc.). The Government should also consider the necessary infrastructure required to support a secure aviation system, with particular reference to the concepts and standards being explored by the ICAO Aviation Trust Framework.

Like any technology, there is a credible risk of drones being used for illegal or disruptive purposes. This includes using drones to disrupt the safe and efficient operations at airports or to conduct criminal activities like the transportation of contraband. AAUS supports the Government in deploying safe and effective technologies to mitigate such disruptive operations. However, it must also be recognised that such drone intervention capabilities pose a risk to legitimate commercial operators. Any counter-drone technology must have a means of discriminating legitimate operations from disruptive or illegal operations. Such technologies should only be available to Government approved agencies and trained personnel. Further, the privacy of legitimate operations should be protected.

Noise

Proposed Policy Approach

The Department of Infrastructure, Transport, Regional Development and Communications will manage a national regulatory approach to noise management that encourages quieter operations consistent with local community considerations.

AAUS supports the Government's proposed policy approach. In November 2019, AAUS formed an advisory group to lead the development of an all-of-industry position on noise regulations applicable to the sector. This AAUS advisory group produced an industry position paper⁷ on RPAS Noise Regulations and the key positions developed are summarised here:

Noise regulations can have a significant impact on the emerging RPAS and AAM sector and the many benefits they deliver to the community. Benefits include those directly through the provision of new services (e.g., aerial imagery, surveying, and delivery) or downstream benefits like those from enhancing public services (e.g., fire and emergency response), enhancing the efficiency and environmental sustainability of existing industries (e.g., infrastructure management and farming), through to the creation of new jobs. These benefits will continue to grow as the industry matures and new applications are realised.

It must also be recognised that the technical and operational restrictions potentially required to be compliant with noise regulations will have a significant impact on the sector and its ability to continue to deliver and grow the benefits it offers the community.

The primary objective of noise regulations must achieve an equitable balance between the public's right to freedom from unreasonable disruption and the loss of benefit delivered to individuals and the community as a whole as a result of noise regulation.

The development of an appropriate regulation to address RPAS and AAM noise is complex and will take time. Before developing or modifying regulations, it is important that industry, Government, and community stakeholders agree on the principles guiding the development for these regulations.

We believe that the development of RPAS and AAM Noise regulations should be:

- **Open** – Industry, community and other relevant stakeholders should be part of the process.
- **Objective** – The rationale and basis for any regulation must be disclosed and be directly traceable to the public concern it seeks to manage.
- **Fair** – Not impose unreasonable cost or restriction on an emerging and beneficial industry. Regulations should not establish requirements above and beyond those applicable to other industries or activities.
- **Balanced** – Reflect a balancing of the needs of all stakeholders.
- **Flexible** – Be outcome-based to provide manufacturers, operators and end users flexibility in their approach to meeting requirements.
- **Future proof** – Account for the changing use cases, innovation in technology, growth in industry activity, and changing public and political sentiment.
- **Harmonised** – Regulations and their enforcement should be harmonised across all States and Territories and only one agency should have responsibility.
- **Compatible** – Noise regulations should not conflict with other regulatory requirements on RPAS and AAM. Where there is conflict, safety requirements shall always have precedence.
- **Enforceable** – Regulations should be measurable and enforceable.
- **Living** – Regulations should be periodically reviewed to account for changing social attitudes.
- **Clear** – Regulations should be clear, concise, and effective.

Environment

Proposed Policy Approach

The Australian Government will lead the development of a consistent, balanced and proportionate approach to manage the impacts on wildlife and the environment, including the enjoyment of nature areas and cultural sites.

AAUS recognises the importance of addressing community concerns in relation to potential impacts to wildlife and the environment and supports the Government's proposed policy approach.

AAUS also notes that a number of Government land authorities have put in place regulations to minimise potential disruption to protected fauna within their respective jurisdictions. Like any regulation, these regulations need to be appropriate and justified on the basis of the risks to effected wildlife.

Privacy

Proposed Policy Approach

The Australian Government will lead the development of a nationally consistent approach for managing privacy concerns that balances the impacts on privacy with the needs of drone and eVTOL operations.

AAUS supports the Government's proposed policy approach. Concerns related to privacy and the use of drones as a surveillance device are significant to the public. The regulatory landscape in Australia is piecemeal and ill-equipped to deal with emerging surveillance technologies. Federal privacy legislation generally only covers Federal agencies and large private sector organisations, and surveillance devices laws vary across the states and territories.

In May 2015, AAUS and Liberty Victoria jointly prepared a document⁸ that proposed changes to Australian privacy law and surveillance law to address issues posed by the operation of drones. Key AAUS recommendations on Privacy included:

- Surveillance law should be reformed to balance the protection of Australians against harmful surveillance, while providing certainty for UAS operators and enhancing sector economic development;
- A technology agnostic approach should be adopted, one that focusses on the intent and impact in relation to privacy, as opposed to the specific technology used;
- Federal and State surveillance laws should be harmonized to reduce uncertainties and remain abreast of technological developments;

- Individuals should have the right to seek redress from harmful surveillance, and both regulators and law enforcement authorities should be empowered to enforce the law;
- The lawful use of surveillance by UAS should be protected through clear, consistent exemptions within the law; and
- On-line Privacy training should be introduced for all UAS operators.

Electric Vertical Take-Off and Landing Vehicles and UAM / AAM

Proposed Policy Approach

The Australian Government will work with all relevant stakeholders to develop measures for safe, efficient, considerate and reliable eVTOL operations in a competitive market that supports safe, efficient and equitable access for all airspace users.

The concept of AAM and the use of eVTOL is relatively new and while the emerging concept has many potential benefits, there are many barriers to acceptance and implementation that much be overcome so that AAM can reach its full potential.

Benefits of AAM include:

- Enabling of air taxi and air shuttle services for passengers and freight in both urban and rural areas that were previously not commercially viable for conventional aviation modes.
- Utility for emergency services.
- Low or zero emissions when compared to alternate transportation modes.
- Reduced road congestion, particularly in urban areas.
- Being a high-tech industry sector development opportunity for Australia, with potential for employment and export.

Barriers include:

- Public acceptance that eVTOL systems and operations are safe and affordable.
- Public acceptance that privacy and environmental impacts (particularly noise) are appropriately managed.
- Lack of standards and regulation for eVTOL manufacturers, AAM operators and infrastructure owners and lack of certainty on clear roadmaps for the development of these standards and regulations.
- Infrastructure investment.

Given the fact that many of these barriers have not been researched in any detail, AAUS supports an approach that engages with all layers of federal, state and local government, industry and academia to better understand the social and technical challenges.

Infrastructure

Proposed Policy Approach

The Australian Government will lead the development of a coordinated and informed approach to infrastructure planning, investment, requirements and approvals.

AAUS supports the Government's proposed policy approach relating to the development of infrastructure required by emerging aviation technologies.

We agree that a coordinated and informed approach is needed as the uptake of emerging aviation technologies will influence land-based transportation decisions and vice versa.

We advocate for a national approach to the development of infrastructure required by AAM (e.g. vertiports) to ensure that standards are harmonised across Australian States and local government. Local governments will be essential stakeholders in advancing a consistent approach to land use regulations.

It is important to recognise that discussion on infrastructure must be considered within the context of the broader system. For example, siting of vertiports must also account for airspace (e.g., existing airspace and airspace usage, design of approach and departure routes, etc.), communication, navigation and surveillance coverage and performance, in addition to safety (e.g., ground risk), noise, privacy, security and interconnected infrastructure (e.g., power, parking and intermodal transport facilities).

Technology Trials

Proposed Policy Approach

The Australian Government will develop an approach that fosters partnerships between government and industry to promote shared outcomes and learning with the goal to support the commencement of future commercial operations.

AAUS supports the Government's policy approach relating to technology trials and the desire to explore avenues for greater industry-government collaboration. We believe that a testing and collaborative environment to promote shared outcomes and learning will be particularly valuable to inform many technical, operational, and regulatory challenges associated with emerging aviation technologies. A collaborative approach is needed to keep pace with ongoing innovation but also to address Government resourcing pressures. A transparent

framework for industry engagement should be established. The NEAT Industry Consultative Committee can play a valuable role in prioritising areas of collaboration and ensuring programs deliver outcomes that benefit the advancement of the entire industry.

As noted in the Issues Paper, effort will be required to allow this activity to proceed safely without unnecessary regulatory burden.

Central Coordination

Proposed Policy Approach

The Department of Infrastructure, Transport, Regional Development and Communications will coordinate an ongoing whole-of-government policy approach to manage future challenges associated with emerging aviation technologies to ensure a consistent and coordinated approach to regulation across issues and jurisdictions.

AAUS supports the broad direction proposed for the coordination of policy development associated with future challenges. We also advocate for a focus on benefits realisation related to emerging aviation technology.

As AAUS represents a broad cross section of the unmanned systems sector, we advocate the need for significant industry involvement in policy design and execution, along with transparency in decision-making processes.

The involvement of key industry members and stakeholders at the IAG level and in each of the policy working groups will afford the best opportunity for concepts, systems and processes which are developed to suit the Australian context. AAUS believes it is well placed to contribute at the IAG level and to assist in coordinating and participating at the working group level.

AAUS believes the concepts of use for the future aviation systems must be developed before architectures and solutions are refined. While this may require trials and testing of some architectures and systems, we warn about adopting certain technologies too rapidly. Further, AAUS believes it is important for the development and roll-out of an UTM solution to be staged to minimise risk and the potential impact on UAS operators.

AAUS also believes the design of future aviation systems must consider the CASA regulatory and safety roles and processes to ensure these roles can be conducted effectively and efficiently, so as not to impact operations or innovation within the industry.

References

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