The Hon Ben Carroll MP

Minister for Public Transport
Minister for Roads and Road Safety

The Hon Michael McCormack MP
Deputy Prime Minister and Minister for Infrastructure, Transport and Regional Development

Dear Deputy Prime Minister

I am pleased to attach a submission from the Victorian Government to the Submission to Australian Government Emerging Aviation Technologies: National Aviation Policy Issues Paper.

The Victorian Government broadly supports the proposed core principles for the national policy and supports development of a nationally consistent approach. The Victorian Government welcomes the Commonwealth taking a lead role in considering these issues for the future and looks forward to working with all Australian jurisdictions on matters associated with emerging aviation technologies.

If you would like to discuss this matter further, please contact Fiona Calvert, Director Reform of DoT, on telephone

Yours sincerely

The Hon Ben Carroll MP
Minister for Public Transport
Minister for Roads and Road Safety

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Enc Victorian Government Submission to the Emerging Aviation Technologies: National Aviation Policy Issues Paper

cc Director, Airspace and Emerging Technologies, Department of Infrastructure, Transport, Regional Development and Communications

VICTORIA State Government

Victorian Government Submission
to the
Emerging Aviation Technologies: National Aviation Policy Issues Paper

VICTORIA State Government | Department of Transport

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1 Proposed Core Principles

Do you agree with the proposed core principles for the National Emerging Aviation Technologies policy?

The Victorian Government broadly supports the proposed core principles for the National Emerging Aviation Technologies policy and supports a nationally consistent approach for enabling emerging aviation technologies in Australia. The Victorian Government welcomes the Commonwealth taking a lead role in thinking through these issues for the future.

Victoria notes that to enable the introduction of these emerging technologies, guiding principles should prioritise safety, security and local industry development, while being considerate of local communities and environments and the need to achieve social licence. Victoria notes that Advanced Aerial Mobility (AAM) has the potential to present economic development opportunities to Australia and recognises the need for Commonwealth, State and Territory Governments to work closely to establish policy leadership in the sector as the industry forms and investments are made. Victoria notes the prospective benefits of AAM may align with several Victorian Government objectives, including those relating to designing a sustainable people-focused transport system, promoting regional development, fostering innovation and supporting economic recovery initiatives in transformative industries.

The Victorian Government notes that there are parallels between the emergence of advanced air mobility technologies and the emergence of automated road vehicles. Many of the same issues apply such as the importance of planning for the future with regulatory regimes and infrastructure and the need to balance maximising economic development outcomes with safety, transport efficiency, environmental and community issues.

2 Adequacy of Policy Approach

Will the proposed approach to policy development adequately allow for the future direction, operations and investments of your business/organisation?

The Victorian Government welcomes the Commonwealth's proposed approach to policy development and sees engagement and close collaboration between federal and state agencies as critical to unlock the potential of drone and AAM technologies in Australia. The release of a national, publicly stated position on emerging aviation technologies is a potential enabler for Australia to attract international investment in the AAM sector.

The Victorian Government is aware that international AAM proponents are actively seeking to invest in jurisdictions that are committed to providing certainty around plans for industry development and rule-making processes for the deployment and integration of AAM technologies. As the regulation and management of the AAM industry will involve many stakeholders, proponents are attracted to jurisdictions that can demonstrate a well-coordinated approach between federal, state and local government entities.

Engagement with relevant policy leaders at the state level will be imperative in providing certainty and clarity to investors and the community and will be critical to appropriately address the challenges and risks that AAM presents to local communities. It is important that the national policy paper signals strong alignment between government proponents, while providing clear definition and delineation between roles and responsibilities to assist investors to navigate the government stakeholder landscape.

The establishment of an Industry Advisory Group by the Department of Infrastructure, Transport, Regional Development and Communications to coordinate industry input in the development of the national policy framework is welcomed. It is recommended that a broad range of industry participants are represented on this group, as infrastructure providers, air space traffic management, maintenance repair and overhaul facilities, flight operations and potential component manufacturers and assemblers.

The Victorian Government notes that the terms ‘drones’, ‘Remotely Piloted Aircraft Systems (RPAS)’ and ‘Unmanned Aerial Systems (UAS)’ appear to be used interchangeably, and suggests that these terms may need to be clarified in future policy and in particular in any subsequent legislation or regulation.

The International Civil Aviation Organisation (ICAO) refers to Unmanned Aircraft Systems as an aircraft and its associated elements which are operated with no pilot on board. This includes:

- RPAS
- Autonomous aircraft – these do not use the intervention of a human pilot to fulfill their intended flight
- Model aircraft – distinguished by their recreational use.

The ICAO acknowledges that in some instances these sub-categories overlap.

For the purposes of policy development, it is imperative to clearly define the technologies that are being considered. The Victorian Government suggests that national policy development consider all sub-categories of Unmanned Aircraft Systems, or at least RPAS and autonomous aircraft. If the policy is to be limited to RPAS, then the other sub-categories of Unmanned Aircraft Systems should be explicitly excluded to avoid future uncertainty.

3 Other Approaches

Are there any other approaches that could benefit the sector?

AAM technologies may be deployed earlier in Australia if government settings do not inhibit any emerging AAM markets and industry development efforts are well-integrated with other existing significant Commonwealth workstreams and policies. There is scope for AAM to form part of economic recovery plans at all government levels, including those supporting zero emissions technologies, community infrastructure projects, and jobs in the green economy.

For instance, the AAM sector is relevant to broader efforts to decrease dependency on hydrocarbon fuels and the Commonwealth could examine how AAM technologies can work in tandem with efforts related to establishing a national vehicle electrification network. Infrastructure Australia has included the rollout of a national electric vehicle fast charging network as a High Priority Initiative in its 2020 Infrastructure Priority List.

Progress in this sector could be linked to existing Commonwealth initiatives to encourage investment in new battery technologies as a critical part of the drone and AAM value chains. Further, the scope of support programs available under the Commonwealth’s Modern Manufacturing Strategy could be expanded to provide incentives in other advanced manufacturing areas relevant to emerging aviation technologies supply chains.

There is acknowledgement within the paper that data is not presently available to support policy development and to provide context for potential investors in Australia (for example, information to inform the potential size of market in Australia, numbers of users and current attitudes within the community). The Commonwealth might consider undertaking data collection and analysis to fill these information gaps. The Victorian Government would be pleased to provide advice to assist in this through the Department of Transport.

The issues paper focuses largely on drone technologies for freight and package deliveries, with only a small section devoted to electronic vertical take-off and landing (eVTOL) vehicle specific issues (pages 48 and 49) that relate to passenger transport options. We acknowledge this likely reflects that drones are a more well-developed technology and there has been greater market development and engagement to date. The additional complexities or risks associated with using emerging aviation technologies for passenger transport, particularly those related to safety, security and infrastructure are worth highlighting. This would enable a more nuanced discussion of the legislative and regulatory responsibilities that would apply to Commonwealth, state and territory government for emerging aviation technologies that would offer the transport of passengers as opposed to just goods.

4 Level of Service and Regulation

What level of service and regulation do you expect from the Government?

4.1 Regulatory Service Standards and Responsiveness

The Victorian Government welcomes the proposal that the Australian Government will develop a policy approach that fosters partnerships between government and industry to promote shared outcomes and learning.

Beyond, this, the Victorian Government suggests that a high level of engagement with industry and the community is needed in developing the policy. This would mean that the process of policy development would involve strong engagement with industry to hear about pain points and opportunities and strong community engagement to understand concerns and potential barriers to acceptance of this new technology. This will help establish how regulation can best balance safety, security, health and amenity with economic development.

It is expected that national AAM standards and regulation relating to AAM craft will be set federally. Best practice requires that every effort is made to ensure that regulatory burden is minimal, and that a compliance-focussed, safety-conscious industry culture is supported.

Whilst the Commonwealth has welcomed a sandbox approach and encourages technology trials, this necessitates a higher level of service than is currently on offer from the safety regulator to potential new market entrants considering trials in Australia. The Victorian Government's experience is that the current resourcing priorities of CASA could disincentivise active end-to-end vehicle certification of emerging technologies locally. The sudden emergence of this industry presents challenges for CASA's usual model of engagement with established aviation players.

The regulator does not appear to currently be funded to the level of 'turnkey' solutions that allow for local eVTOL vehicle certification, relying on vehicle developers to obtain certification elsewhere from a jurisdiction which Australia has bi-lateral aviation safety certification recognition agreements. Bilateral agreements with European Union Aviation Safety Agency (EASA) and the Federal Aviation Administration (FAA) are important for international proponents wanting to enter the Australian market, as this can avoid the need for separate, additional certification processes that add to regulatory burden and may dissuade operators from locating in Australia. However, sole reliance on bilateral agreements may inhibit local research and development and local manufacturing of vehicles requiring certification, which in turn potentially limits the type of employment that can be created in Australia to support this industry.

4.2 Trials and Testing

The introduction of emerging aviation technologies into Australia will require a proactive and agile approach by the Commonwealth with respect to identifying gaps in regulatory requirements that can inform waiver needs for trial program operations. With the AAM industry expected to enter commercialisation phase within five years, there is a narrow window of time within which first test flights or early stage commercial pilots can be expected. If there is a desire for these tests and trials to be attracted to Australia, supporting systems and processes will need to be established in advance.

There is a need for consistent rules across Australian jurisdictions. This will be important to the creation of a single, large market and make it easier for the existing ecosystem of companies and for new investors entering the market to navigate processes, noting that we are small player relative to the global market. Consistency regarding trial rules should also help to make Australia a more attractive place to research, trial and deploy these technologies.

While Australia has much to offer in regards to open air spaces in remote areas for testing of these technologies, it is important that the Commonwealth also examines closely the opportunity to establish narrowly-defined waivers or exemptions in urban areas that offer similar environment to

expected commercial operations. Suitable urban environments need to be identified and regulatory parameters determined that can allow the safe testing of uncertified systems and equipment for data gathering purposes that will enable commercial operations of these technologies in the future.

The Victorian Government suggests that any trials should include a noise monitoring and assessment component to further inform the noise levels that can be expected from AAM operations, their spatial and temporal distribution and their impact on the community, which in turn can inform the appropriateness of AAM operations. Trials should also include extensive participatory engagement with potentially affected communities.

5 Roles and responsibilities

What are your expectations of the Government's role and responsibilities in the management of drones and eVTOL vehicles?

As part of its national policy on emerging aviation technologies, the Commonwealth must outline specific roles and responsibilities for each department, agency and any other related entities to ensure operational safety with respect to the management of drones and eVTOL vehicles.

On matters of national security, cybersecurity and data sovereignty, Victoria expects that the Commonwealth will be responsible for working with national security, air traffic management and telecommunications agencies to identify relevant concerns, as well as tailor security protocols and guidelines necessary to reflect these concerns.

The Victorian Government recognises and appreciates the respective responsibilities of the Commonwealth, states and territories with respect to the advancement of these new technologies and their impact on Australia's airspace, transport systems and local communities. The Civil Aviation Safety Authority's (CASA) responsibility as the safety regulator for civil air operations is clear, and so is the Commonwealth's responsibility to oversee government legislation and policy relating to airports and aviation. Victoria does not regulate airspace or aircraft in flight or during flight activity. This is, as the issues paper states, a federal responsibility. Victoria supports the ongoing role of the federal regulator in its development and implementation of a new National Airspace Policy, and its regulation of aircraft and safety management of airspace, including drones and other advanced air mobility devices.

Regarding infrastructure development, it makes sense for coordination between Commonwealth and State/Territory Governments to work jointly with industry to better understand the impact of drone and eVTOL operations and provide scope for long term interstate integration of transport infrastructure networks. However, this should be done only to the same extent that it is necessary for other major transport projects and no more so. The Victorian Government notes that interstate movements are generally only a small component of total transport activity and expects that AAM will be similar.

5.1 Land Use and Transport Planning and Air Space Congestion Management

It will be important to ensure that AAM networks and, in particular, take-off and landing facilities are appropriately integrated with existing and planned local land transport networks. Integration with the road network, active transport facilities and public transport services will be important not only to the success of AAM services but to ensuring that the transport system can function efficiently and effectively. Responsibilities for the transport system rest at the state and territory level and it will be critical for national AAM policy and regulatory processes to reflect this.

Pathways for approvals on land use and zoning are a matter for state and local government consideration, that will need to factor in the perspective of the local community and the operators that utilise such infrastructure. This will be a key mechanism for ensuring that AAM infrastructure integrates with land transport networks.

Victoria's planning system recognises that aircraft have an offsite noise and amenity impact, and that aircraft noise-sensitive use and development can impact aviation operations. Drones and other

advanced air mobility devices are not defined in the planning scheme and so would have their ordinary meaning. Victoria (through the Department of Environment, Land, Water and Planning and the Department of Transport) is a member of the National Airports Safeguarding Advisory Group and supports a national, harmonised approach to the regulation of aircraft noise and other aircraft-related impacts. Clarity and agreement are needed on the statutory land use planning approvals process and on the responsibilities of the federal regulators in providing advice to planning decision makers on land use applications involving drones and other advanced air mobility devices.

Victoria's planning scheme can and does regulate the environs of local airfields/airports and heliport/helicopter landing sites, to manage any potential amenity impacts on nearby sensitive uses (residential, hospitals, schools, childcare centres). The planning scheme recognises that a planning permit is not required for use of a site in certain circumstances, including by a helicopter engaged in emergency service operations.

Victoria's planning system can support new and emerging aviation technologies where it has a regulatory or complementary role. The Victorian Minister for Planning has established a Melbourne Airport Environs Safeguarding Standing Advisory Committee to support further implementation of the National Airports Safeguarding Framework in the planning scheme. The committee's terms of reference include advice to the Minister on the role of the federal regulator.

Clear infrastructure approval processes and management will need to be applied to vertiports or other structures that may be included on top of structures, such as buildings or railway stations. Planning for these locations is subject to state and territory planning regimes. National processes will need to recognise the existing sub-national processes and management of land use. A key benefit of this process could be to clarify those responsibilities before significant investments are undertaken as part of rolling out eVTOL and drone trials.

As AAM markets develop and mature, there is potential that there will be competition for air space. While the safety of vehicles in the air space is clearly a Commonwealth responsibility, the same clarity does not apply to access rights and responsibilities for managing congestion in air space. In further developing the National Emerging Aviation Technologies policy, the Victorian Government recommends that the intersection between Commonwealth and subnational government rights and responsibilities be clarified, including the air rights above rail corridors or arterial roads (under the control of state and territory governments), local roads (under the control of local government authorities) and residential and non-residential properties. This would include further consideration of responsibilities and rights for erecting structures over land or buildings, management of activity within the air space from a perspective of congestion and access rights and the safety of ground-based activity under air space being used by AAM vehicles.

5.2 Noise Management

AAM are emerging technologies and there is very little research on the impacts of noise from AAM vehicles on human health and well-being. It is noted that:

a) Annoyance with aircraft noise does not only relate to the overall sound levels, but also to the tonal content and other features of the noise character.
b) Annoyance is also influenced by the number of movements, the frequency of operations, the visual noticeability and the subjective appreciation associated with the source of noise.
c) The noise characteristics of drones differ from traditional aircraft. High tonal content for electric propulsion aircrafts can be expected – concentrating the sound energy to a few frequencies that emerge over background noise. This factor can increase annoyance and warrants further research.
d) The risk of impacts is expected to be like those of other environmental sources and aircraft. These impacts include annoyance, sleep disturbance and impacts on cardio-vascular health and cognition. The risk and magnitude of impacts is currently unknown and likely depends on the noise emission of the vehicles, the scale and time of operations, and their locations.

This suggests that operations and infrastructure for AAM vehicles, along with the vehicles themselves, may need to be pro-actively designed to minimise noise and any other environmental and public health impacts. Considerations should include, but are not limited to:

a) Infrastructure - where the vehicles take off and land and the routes taken, also the interconnection with other modes of transport (e.g. driving to/from skyports or nodes)
b) Vehicles - noise levels and noise character of the vehicles used (e.g. what the noise sounds like, its frequency spectrum, variations over time)
c) Operations - when and where the operations occur, including: proximity to noise sensitive receivers and sensitive land uses; responsiveness to community concerns about noise impact and other related concerns such as fear of noise source, unease with technology, risk of crashes; responsiveness to concern about loss of privacy/overlooking properties.

We note that while they are quieter than conventional aircraft, AAM vehicles are expected to fly at lower heights and it is expected that there will be a larger number of operations. While it is plausible that noise emissions from individual drones will reduce as technology improves, we are concerned that this appears to be the main assumption for the proposed approach. The noise level below which further noise reduction will not be feasible from an engineering or cost perspective should be considered. Experience with other modes of transport tells us that noise reduction also comes through regulation and enforcement of design standards and operations. To help determine the extent to which this will be needed and to begin working towards guidance on noise from AAM operations, the Commonwealth should put in place a research program, covering annoyance and health impacts of AAM noise, market sounding and engineering discussions and consideration of the most effective means of ameliorating those aspects of noise from AAM operations that are found to be the most problematic to the community.

More broadly, it can be expected that the emergence of advanced air mobility devices will result in a change in the ambient sound environment (the soundscape) in areas where AAM operations occur. Because AAM vehicles have a different character to other environmental noise sources, the magnitude and impact of this change are currently unknown. The impacts need to be considered in addition to ambient sound environment, not in isolation to it. Given other noise is an issue managed at a state level, regulatory processes are needed that can consider the interaction of noise from this emerging technology with the existing noise landscape and do not unduly add to pressures for State and Territory funded noise attenuation. A conservative approach to considering noise would be advisable, given the high level of sensitivity to noise that has been evident in the community and the likely expectation of communities that Commonwealth and State/Territory governments will take action to mitigate noise from AAM operations.

The Victorian Government notes that the proposed approach set out in the issues paper is based on community acceptance and suggests that it may be found that health-related outcomes should also be considered. Health effects of noise, in particular sleep disturbance, occur at levels separate to annoyance and community dissatisfaction, and generally at lower levels. The national policy may need to consider use of curfews, as has been done with some existing drone operations. The implications of this approach for commercialisation of AAM technologies should be understood.

We are concerned that the effectiveness of options for managing noise has not been explored broadly enough. For example, it is suggested that the framework for managing noise and its impacts relies predominantly on setting baseline noise levels across ground-based locations and the assumption that vehicles will get quieter with time. Managing noise from commercial operations and their impacts is likely to need consideration of a combination of measures pertaining to:

- quieter vehicles with acceptable noise character;
- the number and frequency of movements;
- the hours of operations;
- the flight paths and their proximity to noise sensitive receivers;
- the management of increased traffic at modal interchanges.

In principle, the introduction of an Integrated Airspace System, supported by an Unmanned Traffic System has merit. The Victorian Government agrees that this has the potential to assist in the management of noise impacts. We note that, as considered, a system of traffic management for unmanned and autonomous aircrafts (AAM) could potentially provide opportunities to manage flight paths and operations to reduce noise impacts, as well as managing no-go zones for safety and distances respectful of privacy.

Collaborative policy development is also supported and a consistent AAM Vehicle Operations Noise Policy Framework.

Many of the issues outlined above could be assessed via strategic Health Impact Assessment methodology, so the real costs and benefits from a health and welfare perspective can be considered. The Victorian Government's Environment Protection Agency would be pleased to engage with the Department of Infrastructure, Transport, Regional Development and Communications and the other relevant agencies in relation to Victoria's environment protection legislative and regulatory framework.

6 Opportunities

What are the key opportunities that these new technologies could deliver for Australia?

From an international investment attraction perspective, there is potential that the AAM sector could bring to Australia new economic activity and employment in a broad range of areas, including in advanced manufacturing, transport infrastructure and digital technologies. There is a potential to attract high value jobs and capital investment in areas such as maintenance repair and overhaul facilities, flight operations, air traffic management, community engagement and broader transport infrastructure. Other potential benefits include capability, skills and knowledge uplift and the potential to capture assembly and components manufacturing in the medium-to-long term, should Australia be able to position itself as a leader in this field.

The presence of overseas companies seeking to test drones and AAM vehicles and air traffic management systems locally could lead to increased research and development (R&D) and cross-disciplinary technology commercialisation. There is scope for industry players to leverage the capabilities of Victorian universities and other industry players in aviation and other adjacent emerging fields, such as future mobility, autonomous vehicles and new battery technologies.

The Victorian Government understands that Victorian universities are already making progress in AAM related fields. Some examples include:

- Monash University, through the Monash Centre for Additive Manufacturing (MCAM), is developing the first international aerospace standards for 3D printed titanium components for civil aircraft parts;
- Deakin University has published a white paper on AAM and is currently conducting R&D on fuel cell technology for battery applications through the Deakin Hycel Hydrogen Hub;
- RMIT University, through its Autonomous and Intelligent Aerospace Systems (AIAS) Lab, has partnered with Thales for R&D in Air Traffic Management (ATM) and has undertaken research into unmanned aircraft applications for logistics operations, UAV integration and AAM air traffic operations.

This existing body of work presents potential for education institutions to develop educational and training programs/materials to train new and existing workforces that meet the requirements of the drone and AAM sectors.

The Victorian Government also notes that drones are a practical option for some of its own activities and are being used for infrastructure and heritage asset maintenance. Drones can more easily access normally inaccessible locations such as rooftops or high spaces that were previously unable to be monitored. Drones supported by sensors can monitor cracks and defects in sensitive heritage assets, providing new datasets to maintenance teams. The broad applications that drones offer to improve productivity and safety in surveillance, disaster management, firefighting, mining, animal health, crop farming, pest control, crop irrigation, animal mustering, geo-fencing, and other agriculture-related activities are evident.

7 Barriers

What are the most significant barriers to realising these opportunities?

7.1 Social Licence to Operate

Gaining the 'social licence to operate' will be key in realising the opportunities that emerging aviation technologies offer. It is important that the Commonwealth works closely with industry, state and local government in addressing community concerns around noise, visual amenity, safety and privacy.

Proving safety, health, amenity, security and privacy is a key to acceptance of this new technology and unlocking economic development. The Victorian Government has received some anecdotal feedback from companies that they may choose to locate activity in Australia because of its high-quality safety and regulation. If they can meet safety and other requirements in Australia, they can be confident they will be able to do the same in other markets.

7.2 Incentivising Research and Development

The Commonwealth demonstrates an appreciation of the research and development potential of the AAM sector, and hence the Victorian Government notes the need for the Commonwealth to support research and development through mechanisms such as tax incentives that encourage such activities. Australia has seen significant cuts in this area, and an analysis of Organisation for Economic Co-operation and Development (OECD) figures shows sharply falling public incentives are already well below those of Slovenia and Greece. In the current business environment with dampened R&D activity, the Commonwealth must play an active role in incentivising and fostering an innovative business ecosystem. Business uncertainty also arises when there are annual changes to the Australian R&D regime. This may further slow Australian innovation and risks long-term economic damage. Businesses need certainty and international businesses need less complexity and to have confidence that R&D can be supported on more than a year by year proposition.

7.3 Foreign Investment Review Board

As much of the development of emerging aviation technologies is currently taking place overseas, the attraction of these capabilities to Australia to build a local industry will rely on the attraction of foreign direct investment. This will be subject to the Foreign Investment Reform (protecting Australia's National Security) Bill 2020 currently under consideration.

Australia needs to ensure that it maintains its national security interests and its attractiveness as an investment destination in the current global economic climate, but the proposed reforms are broad and may have unforeseen impacts in hindering this industry's development. The nature of the changes will likely lead to a significant number of investments being subject to FIRB review that would not have been reviewed in the past and may create perceptions that impact on the attractiveness of Australia as an investment destination for AAM.

8 International Harmonisation

To what extent should Australia's approach be harmonised with approaches taken in other countries?

The Victorian Government notes there is an imperative for consistency with international rules or rules in 'peer' jurisdictions that can create easier pathways for recognition of overseas accreditation.

In the short term, Australia can look at best practice in jurisdictions that are seeking to position themselves as first-movers in the AAM field. The US, Singapore, South Korea and New Zealand are key case study jurisdictions that are utilising strong government support to signal their interest to

industry players in this field. Time is of the essence for Australia to create an authorising environment for the drone and AAM industries, and the Commonwealth may wish to examine closely how leading jurisdictions are navigating complex regulatory environment and encouraging industry investment and development.

The bilateral aviation safety agreement (BASA) between Australia and the US which allows for the import to the US of certain aeronautical products designed and manufactured in Australia, Australian acceptance of certain FAA approvals and bilateral agreements with the European Union Aviation Safety Agency (EASA) could be the model for other jurisdictions with reputable AAM players with strong safety records. By encouraging bilateral acceptance, international companies see clear product development pathways to certification when Australia's 'safety brand' is strong.

Authorised by the Hon Ben Carroll MP
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