The Global AAM/UAM Market Map

The global vertiport market map and forecast 2025-2029

Extracts

The global vertiport market map and forecast 2025-2029

Version 2.01

'The global vertiport market map and forecast 2025-2029' is written by Philip Butterworth-Hayes and published by Unmanned Publications Ltd, located at 61 Davigdor Road, Hove BN31RA, UK.

The information in this version of *'The global vertiport market map and forecast 2025-2029'* is correct as at January 2025. Customised updates are available by contacting the publisher.

Telephone +44 1273 724 238.

Email: philip@unmannedairspace.info

Copyright terms

All rights reserved. No part of this document may be reproduced, stored in retrieval systems or transmitted in any form or by any means, electronic, mechanical, or otherwise without the prior permission of the publisher. Infringements of the above right will be liable to prosecution under UK criminal law. All research material has been gathered based on publicly available data, to the best ability of the report author. The writer, editor and publisher shall not be liable for any indirect, special or consequential loss or damage arising from any omissions or incomplete data in the text.

Contents

Tables

Key

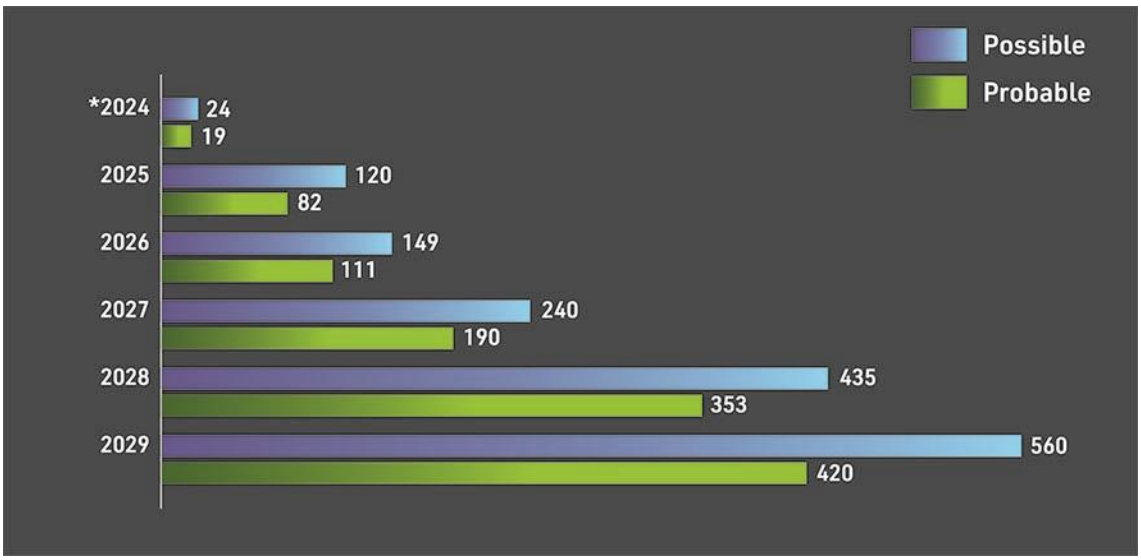
E – Expected development

D – Definite development

U – Urban location

A – Airport location

Table three: The potential global market 2024-2029 and the most likely



based on:

- *Certification of EHang commercial services start of 2025*
- *Certification of eVTOLs in ROW for commercial services in 2026;*
- *Lilium going ahead with its regional networks in North America and Europe*
- *Guangdong Province achieving plans to establish 100 vertiports across the city by 2027*

* Vertiports already built or due to be completed by the end of 2024

The global market is worth USD1,093 million – for construction costs and equipping with aviation systems. This figure has been reached by reached by assessing each vertiport programme planned and applying cost estimates as complied in section 1.5 (Vertiport development and equipage costs). We then validated this against the public statements and vertiport launch announcements from 26 of the world's major vertiport developers (section 1.4).

We have also taken account of more high level vertiport market views from competitive studies *(1.2.1 High-level market forecasts)* as a reference point.

In developing these conclusions we have seen there are wide variations in the type and costs for construction and outfitting.

- In Australasia, a high percentage of first generation vertiports will be airport based and of modular, low-cost designs.

- Although most of Europe's planned vertiports will be airport based and relatively small compared to other parts of the world, the high costs of developing new sites in urban locations will raise the average costs of vertiport development above the global average. This is somewhat mitigated by the number of new sites being planned in Turkey, where land values are often lower than in Western Europe.

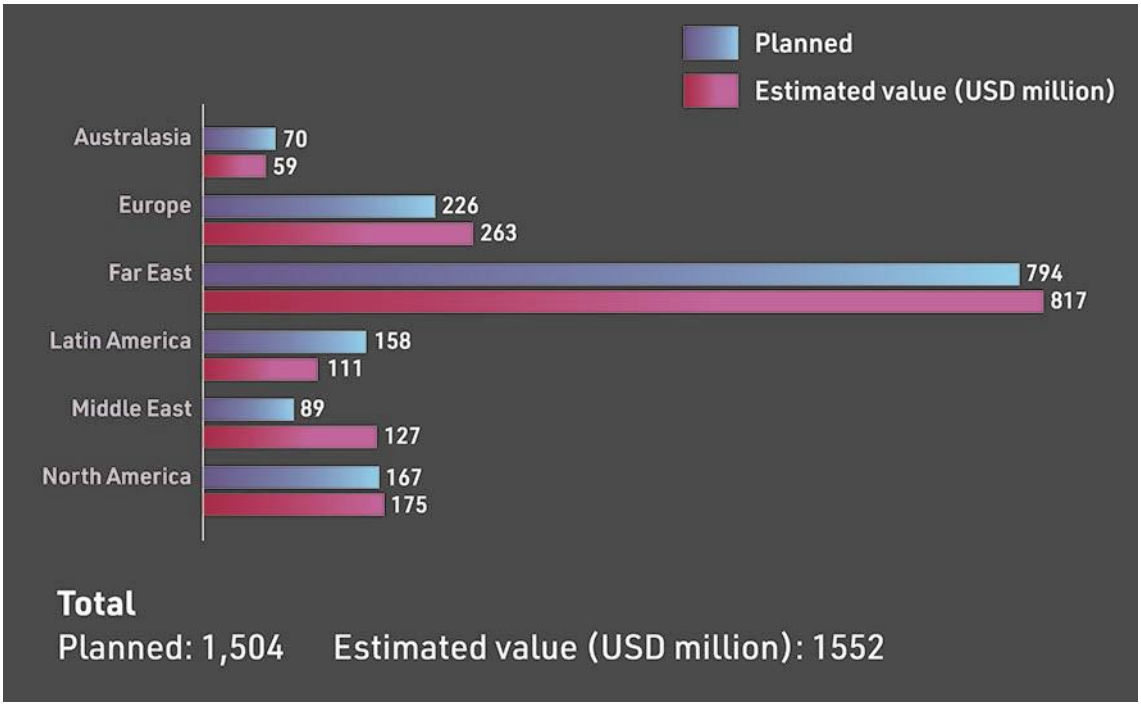
- The vertiport market in the Far East is dominated by China, where there are now 182 vertiport projects planned or estimated for development in the next three years. Most vertiports in this region will be built on greenfield sites. The market is also dominated by to huge vertiport programmes: in Guangdong Province alone the local authority plans to establish 100 vertiports across the city by 2027, while Air Chateau's August 2024 agreement with Regional Airports Company Limited (RACL) project aims to establish up to 100 hybrid vertiports across 1,200 islands in the Maldives. Vertiport development costs are estimated to be below those of Europe and North America, with many initial developments catering for tourist and sightseeing flights.

- The Latin American market is dominated by Brazil. In November 2023 Micaelis and Me Green have signed non-binding letters of intent for 100 vertiports across the country.

- Vertiport expenditure, per site, is relatively higher in Middle East than in other parts of the world as the developments planned are more extensive and complex than elsewhere, with several major hubs planned which include multiple landing and take-off areas. However, while this geographic sector is notable for the speed with which early adopters will develop a wide range of vertiports, there is then likely to be a lull following the initial launch of AAM operations in the Gulf, as states in north Africa and other parts of the regions develop the regulations to allow for scalable AAM operations.

- There are now 100 vertiports either actively planned or inferred for development from eVTOL operator route network announcements in the USA. Most recently, there has been a flurry of competing AAM networks announced in the San Francisco Bay area; whether the facilities they plan to build will be for general use, or particular to their own networks, is not yet clear.

Table four: The forecast value of the global vertiport market 2025-2029 broken down into regions



1.2.2 High level market forecasts

There is a wide disparity between market forecasters on the total market value for the global vertiport sector by 2030/2034 – with estimates ranging from USD10 billion to USD36 billion over the next ten years and compound annual growth rates (CAGR) of between 45% and 62%.

Most of these reports suggest North America will be the largest and fastest-growing vertiport geographic sector – all of them ignoring China's multi-billion dollar "low altitude economy" as a key catalyst to growth in this sector.

Table five: High level forecasts of the global vertiport market

Forecaster	Timescale of forecast	CAGR	Value
GM Insights	2023-2032	45.0% +	USD10 billion
MarketsandMarkets	2023-2030	62.1%	USD10.7 billion
SNS Insider	2022-2030	61.4%	USD11.05 billion
Prophesy Market Insights	2024-2034	59.0%	USD36.76 billion
ASD Reports[1]	2023-2033	20.29%	USD623.6 million

The vertiports market was valued at USD 400 million in 2023 and is anticipated to grow at a CAGR of over 40% between 2024 and 2032, according to GM Insights and will reach USD10 billion by 2032. There's a growing trend of private investors and venture capital firms pouring money into vertiport development.

"Based on the location, the vertiports market is segmented into ground-based, rooftop/elevated, and floating," according to GM Insights. "The rooftop/elevated segment represents the fastest growing segment, with a CAGR of over 45% between 2024 and 2032. Rooftop and elevated vertiports are increasingly being integrated into existing urban infrastructure, such as commercial buildings, parking garages, and high-rise structures. This strategic approach maximizes the use of available space in densely populated cities and minimizes the need for new land development… Based on solution, the market is segmented into landing pads, terminal gates, ground support equipment, charging stations, ground control stations, and others. The landing pads segment dominated the market in 2023 and is expected to reach over USD4 billion by 2032...

"The vertiports market is experiencing unprecedented growth in North America and is expected to reach USD 3.5 billion by 2032. North America is poised to become a leader in the market, driven by rapid urbanization and advancements in urban air mobility (UAM). In the U.S., the demand for vertiports is escalating, particularly in urban centers with high population densities and significant commuter traffic. Cities are increasingly seeking solutions to reduce road congestion and enhance connectivity through air mobility."

[1] This market report covers the overall global UAM (Urban Air Mobility) infrastructure market and the value figure represents the annual spend.

1.2.3 How many vertiports will a large city need?

According to McKinsey[1]

"For large, densely populated cities, there could be roughly 85 to 100 takeoff and landing pads… Building this infrastructure network would cost approximately USD35 million to USD45 million, with annual operating costs of around USD110 million to USD130 million per year.

"In medium-size, less densely populated cities, there would be around 38 to 65 takeoff and landing pads, including the following: vertihubs at one major airport and one or two city locations; five to ten vertibases to handle workplace commutes and retail districts; three to five vertipads near suburban commute stations. Building this infrastructure network would cost between USD15 million and USD20 million, and annual operating costs would range from USD35 million to USD50 million per year

The Demand and Capacity Optimisation for U-space programme (DACUS project) has estimated how many take-off and landing areas (TOLAs) might be needed in Europe over the next ten to 15 years for drones and passenger carrying vehicles[2].

"As a test case we applied the calculation to the population that is living in the metropolitan area of Toulouse (about 1.2 million people). In total a number of roughly 350 – 450 stationary TOLAs can be expected there." This suggests that an average of one TOLA for each 3,000 residents in European urban areas, based on the Toulouse case, might be needed by 2036. The report also looked at TOLA requirements for Madrid and Frankfurt.

Table six: Estimates of vertiport requirements per population density

TOLA Type	Toulouse[1]		Frankfurt[2]		Madrid[3]	
	Low	High	Low	High	Low	High
Vertispaces	22	45	12	25	109	218
Heliports	41	67	23	37	201	327
Transport UAV Hubs	243	243	134	134	1177	1177
Surveilance UAV Hubs	43	94	24	52	210	457
– Police Departments	7	23	4	11	35	112
– Fire Departments	36	71	20	39	175	345
Total amount of TOLAs	**349**	**449**	**193**	**248**	**1697**	**2179**

[1] Toulouse Metropolitan area: 1,200,000 people

[2] Frankfurt City area: 750,000 people

[3] Madrid Metropolitan area 6,600,000 people

[1] There are three potential archetypes for urban-air-mobility infrastructure

[2] www.unmannedairspace.info/urban-air-mobility/europe-will-need-one-vertiport-drone-landing-site-per-3000-urban-residents-by-2036-dacus-report

1.3 The global map of currently planned vertiport locations

1.3.1 Australasia

City/region	E - Expected D - Definite	U - Urban A - Airport	Information	Vertiport Manufacturer
Australia				
Brisbane	10E	5U, 5A	Skyportz is planning to build a series of vertiports to take visitors from the city centre to the Olympic Village for the 2032 Olympic Games, establishing a Moreton Bay air taxi hub. The hub would be part of the planned Australian Advanced Manufacturing Centre of Excellence, to be constructed in the Moreton Bay council area by 2023. In parallel, UAM facilitator consortium Greenbird is building an industry collaboration platform to bring together UAM players and engaging with government to develop commercial eVTOL operations for the Olympic Games. According to press reports Greenbird is initially focused on establishing AAM/UAM operations in Queensland in time for the Olympics, with a view to expanding throughout the country. Founding Greenbird partners comprise eVTOL ground infrastructure specialist Skyportz; Australian eVTOL developer AMSL Aero which has designed and developed the Vertiia electric battery and hydrogen-powered aircraft; Queensland-based helicopter operator Nautilus Aviation, which has an order for 10 of Eve's eVTOL aircraft; specialist helicopter operator Aviator Group; Queensland's Archerfield Airport and Griffith University; clean energy company H2 Energy Company (h2ec); engineering consultancy AvLogix Solutions; and uncrewed systems management platform FlyFreely. in 2024 Skyports Infrastructure and Wisk Aero agreed to work on an Entry-into-Service (EIS) network for Wisk's autonomous Generation 6 aircraft in the South East Queensland (SEQ) region of Australia. The agreement builds on an existing partnership between Wisk and Skyports announced in 2022, which marked the first collaboration between a vertiport developer-operator and an autonomous eVTOL developer.	Skyportz Skyports
Gold Coast	50E	25U, 25A	In March 2022 Skyportz and Sea World Helicopters announced a partnership to bring eVTOL operations to the Gold Coast. John Orr-Campbell, CEO of Sea World Helicopters said: "We intend to be at the forefront of the industry as it morphs into cleaner and quieter electric propulsion. We have existing helicopter landing infrastructure on the Gold Coast which we can activate with electric eVTOL aircraft as soon as they become available." He added: "We can foresee that many of our tourist operations will be very well suited to electric aviation."	Skyportz

1.3.2 Europe

City/region	E - Expected D - Definite	U - Urban A - Airport	Information	Vertiport Manufacturer
Austria				
Linz and Innsbruk	2E	2U	At the Airspace World event in March 2024, Lilium showed its plans for a central European regional network of services, with Linz and Innsbruck joining the network in 2026.	
Denmark				
Odense, HCAA	2E	1A, 1U	In May 2022 Odense Municipality announced it was targeting future green mobility solutions at Hans Christian Andersen Airport (HCAA). According to a report from the local authority's economics committee ":…the Mayor's Administration is now uncovering the potential for UAM and vertiports (landing facilities for personal drones) in more detail - in order to be able to position Odense Municipality and Hans Christian Andersen Airport as visionary players in drone mobility in the long term. On the basis of the above, the mayor's administration has set up a fast-working working group, which in future will facilitate a focused and short-term cover-up effort, which will uncover the potential and prepare a business case, a project plan, defined milestones and a draft budget." In November 2023 Copenhagen Helicopter and its partner Copenhagen AirTaxi – both based at Roskilde Airport – signed a letter of intent with Dufour Aerospace for a conditional order to purchase the Aero2 UAV for cargo and aerial work and the Aero3 for passenger transportation. "The aim is to establish a route between Odense and possibly other parts of the southern Funen archipelago with the Aero2 for cargo purposes by 2026, initially on a trial basis" according to a press release. "This will serve as a learning process for the operation and maintenance of Dufour's tiltwing aircraft. Once the equivalent but larger 8-seater Aero3 is ready in 2030, Copenhagen Helicopter plan to expand the service to include passenger transport in this region and beyond."	
Estonia				
Tallinn, Hiiumaa	2E	1A, 1U	The Government has identified two early eVTOL service routes – a service to link the capital with the island of Hiiumaa, and connecting to Helsinki Airport.	

Ras Al Khaimah	**4D**	**3U, 1A**	**In May 2024 Ras Al Khaimah Transport Authority (RAKTA) and Ras Al Khaimah Tourism Development Authority (RAKTDA) signed a Memorandum of Understanding (MoU) with Skyports Infrastructure to pioneer sustainable tourism through electric air mobility. The MoU will see Skyports develop a network of vertiports to connect key attractions across Ras Al Khaimah.** **Under the agreement RAKTA, RAKTDA and Skyports will collaboratively design, develop, and operate Ras Al Khaimah's first electric vertical take-off and landing (eVTOL) air taxi ecosystem, with commercial operations set to commence by 2027.** **"This innovative project will seamlessly integrate Skyports' vertiport infrastructure with RAKTA's existing transport network, providing fast and convenient zero-emission transport to Ras Al Khaimah's most popular areas and attractions, including Al Marjan Island, Al Hamra and Jebel Jais, the UAE's highest peak," said a Skyports press release. "Tourists and residents visiting these iconic sites will experience substantial time savings from the service. For example, travelling from Al Marjan Island to Jebel Jais takes approximately 70 minutes by car. The launch of air taxi services will cut the journey time to less than 20 minutes."**	**Skyports**
	1D	**1U**	**In March 2023, vertiport manufacturer VPorts had announced the signing of a Memorandum of Understanding (MOU) with Ras Al Khaimah (RAK) Airport to build and operate a first vertiport in RAK.** **The RAK vertiport, which will be established on a 10,000-square- metre site, will be designed for all types of eVTOL aircraft.** **By 2030, VPorts plans to extend its vertiport network to all major industrial areas across the UAE. The network will focus on locations that optimize multimodal transportation connectivity, including Ras Al-Khaimah, Dubai South, Jebel Ali, Abu Dhabi and Sharjah.**	**VPorts**
Sharjah			By 2030, VPorts plans to extend its vertiport network to all major industrial areas across the UAE. The network will focus on locations that optimize multimodal transportation connectivity, including Ras Al-Khaimah, Dubai South, Jebel Ali, Abu Dhabi and Sharjah.	

Battle Creek, Michigan	1E	1A	In August 2023 Battle Creek Unlimited (BCU) a private, non-profit corporation which serves as the economic development arm for the City of Battle Creek and manages the Fort Custer Industrial Park announced that it has secured a USD7 million appropriation in the 2024 state budget to support the development of an advanced air mobility park at the Battle Creek Executive Airport (BTL). BCU says it will market the facility as a site for drone manufacture, operations, maintenance & repair, and drone training, as well as for urban air mobility.	
Bellefonte Airport, Pennsylvania	**1D**	**1A**	**At the start of 2023 Volatus Infrastructure reported that it has signed an agreement with Bellefonte Airport located in Pennsylvania to build a public use FAA-compliant eVTOL vertiport with up to eight landing pads including a charging station at each pad. Bellefonte Airport it says, will start with the vertiport and a single landing pad with a charging station that has the ability to scale up to eight landing pads with charging stations as the need for additional space grows.**	**Volatus**
Boston, Massachusetts			In December 2021 EVE Air Mobility and Republic Airways Holdings Inc, announced a Memorandum of Understanding and Letter of Intent to purchase up to 200 of EVE's eVTOLs. The strategic relationship will focus on developing a deployment network throughout the Central and East Coast markets of the United States, with an initial focus on the Boston, New York and Washington DC markets.	
Chicago, Illinois	**1D**	**1A**	**eVertiSKY and Volatus Infrastructure & Energy Solutions (VI&E Solutions) in June 2024 reported they are progressing their efforts as part of the Chicago UAM Living Labs initiative, which began January 2024, establishing Chicago's first UAM vertiport. In the third quarter of 2024, the project will transition into the next stage with Federal, State, and Local engagement. "This strategic partnership also incorporates VI&E Solutions' multimodal EV charging solutions into eVertiSKY's CityAPI Dashboard which provides a transparent, real-time view of Vertiport ground assets, including the specifications of Volatus EV units, and accessible to operators via the NASA UTM, ensuring seamless coordination and management of both air and ground operations," said the companies in a press release.**	**Volatus**

Chicago, Illinois	2E	1U, 1A	In March 2023, Archer Aviation and United Airlines announced plans to launch the first air taxi route in Chicago, between O'Hare International Airport (ORD) and Vertiport Chicago. According to a press release "Vertiport Chicago, North America's largest vertical aircraft take off and landing facility, is located in the Illinois Medical District near the Chicago Loop. This site was selected as the takeoff and landing site for this airport to city centre route because of its convenience, access and service. From there, passengers will be able to travel to and from ORD via Archer's Midnight aircraft in approximately 10 minutes. In August 2022 United Airlines (based at Chicago O'Hare) announced an order for 200 eVTOL air taxis from Eve Air Mobility by 2026, with another 200 on option. In July 2022 United paid a USD10 million pre-delivery deposit for 100 eVTOL air taxis being developed by Archer Aviation. One of the initial key eVTOL routes for the airline will be to transfer passengers from downtown Chicago to O'Hare.	
Choctaw Nation of Oklahoma	1E	1U	In April 2023 the Choctaw Nation of Oklahoma Advanced Technology Initiatives department announced it was seeking current information about AAM vertiport development. The department has issued a Request for Information (RFI) seeking relevant information from industry and academia.	
Connecticut	**13D**	**10U, 3A**	**In April 2024 Volatus Infrastructure & Energy Solutions and Spectrum Associates Inc. formally agreed to collaborate on the development of eVTOL infrastructure ecosystem, specifically focusing on vertiports in the New England region of the United States.** **"The initial phase will see the establishment of seven vertiports spanning across Connecticut, Massachusetts and Rhode Island. Subsequently, the project will expand to encompass a total of 13 vertiports, covering the entirety of the New England area, said a press release.**	**Volatus**
Dallas/Fort Worth, Texas **DFW** **downtown Dallas** **Addison Airport** **ADS Love Field**	**4D**	**1U, 3A**	**In November 2023 Dallas Fort Worth International Airport (DFW) and eVTOL aircraft manufacturer Overair announced a memorandum of understanding to cooperatively explore the future of vertiport development and eVTOL aircraft operations within the DFW Metroplex.** **The agreement will create a joint, cross-functional working group to explore the policies and infrastructure needed to implement an integrated, sustainable eVTOL program at DFW in the future. The working group will also investigate the operational procedures, including approach, landing, taxiing, charging, loading and unloading passengers, takeoff, departure, and safety protocols required for such a program.**	

1.4.3 Air Chateau

www.airchateau.com

Air Chateau was the first private heliport operator company in the UAE, with its 8-pad commercial heliport and lounge terminal located at the VIP terminal of Al Maktoum International Airport, Dubai. In October 2023, ArcosJet invested in Air Chateau through share purchase, with the aim of expanding the helicopter infrastructure in the UAE.

In July 2024 the Dubai Civil Aviation Authority (DCAA) issued certification to Air Chateau to develop new vertiports and heliports. The aviation consultancy said the approval will allow it to press ahead with plans that include a large-scale helicopter project in the UAE announced in October. Air Chateau is planning to build six heliports/vertiports throughout the UAE.

According to Air Chateau DWC, the certification is valid for one year from June 13 and allows it to start designing heliports and vertiports in compliance with the requirements of both the DCAA and the UAE's General Civil Aviation Authority. The company will also need to satisfy regulations covering equipment specifications.

In August 2024 Air Chateau, Regional Airports Company Limited (RACL), a state owned company of the Republic of Maldives, and Wings Capital Management of Abu Dhabi, UAE, signed the Memorandum of Understanding to develop a network of vertiports and droneports to connect over 1,200 islands across the Maldives. The project aims to establish up to 100 hybrid vertiports across 1,200 islands, featuring Touch Down and Lift-Off (TLOF) areas, Final Approach and Take-Off (FATO) zones, safety zones, terminal waiting halls, and charging and fire-retardant infrastructure. Additionally, the project envisions the development of 500 drone ports dedicated to cargo operations, supporting first-, middle-, and last-mile logistics, all equipped with charging stations and fire-retardant systems.

Air Chateau International, plans to invest 100 million UAE dirhams (USD27.2 million) over the next three years to enhance infrastructure and advance the eVTOL ecosystem in the UAE. According to lucidityinsights.com. Shilton Tony Irudayaraj, co-Founder and CEO of Air Chateau, said: "We are looking at a AED100 million infrastructure investment over the next two to three years, which will lay the foundation for a mixed development that includes vertiports, hangars, a training academy for pilots and engineers, an MRO [maintenance, repair, overhaul] service, luxury lounges… in fact, everything that is needed to make us future-ready for eVTOL adoption." This investment follows Air Chateau's partnership with Kookiejar (see 1.7.9) in late 2022 to establish vertiport operations at Dubai World Central. In 2023 Archer Aviation and Air Chateau signed an MOU covering a planned purchase by Air Chateau of up to 100 of Archer's Midnight eVTOL aircraft with an approximate value of USD 500 million.

In 2024 Chateau ordered 10 Crisalion Mobility eVTOLs to operate air taxi services in the UAE in 2030.

1.4.15 Skyports Infrastructure

skyports.net/news

The UK's Skyports Infrastructure designs, builds and operates take-off and landing infrastructure for air taxis, and partners with eVTOL vehicle manufacturers. In April 2024 the company announced ACS Group had made a substantial equity investment in Skyports, to become the largest investor in the company. ACS Group in 2023 generated revenue of USD 39 billion. In addition to the new capital invested by ACS, existing shareholder, Paris-based airport operator, Groupe ADP will invest additional capital in Skyports' Series C funding round. Groupe ADP and Skyports first partnered during Skyports' Series A funding round in 2019. The company has previously secured investment from companies across the aviation and infrastructure space, including Irelandia Aviation, Kanematsu, and Deutsche Bahn Digital Ventures. Skyports Infrastructure's strategic partners include Archer, Beta, Joby Aviation, Vertical Aerospace and Volocopter.

The company has also partnered with Unified Aviation to leverage Unified Aviation's Modular Environmentally Sustainable Helipads (MESH) advanced landing platforms and Skyports' expertise in vertiport development, planning, regulation, and operations. The agreement enables Skyports to deploy take-off and landing infrastructure where and when needed, using prefabricated, modular, fast-build technology with integrated power, solar charging, lighting, safety, drainage, and fire suppression features. The MESH system in in place at Unified Aviation's Dubai South location, which will double as an operations staff training facility. The technology will then be rolled out globally with Skyports' vertiport product, with various use cases, including ground, elevated and floating options.

Skyports owns and operates one of only two commercial heliports in London. The heliport, located in Canary Wharf, serves as a node in the London vertiport network and is an active testbed for new technology solutions.

Skyports' principal vertiports include facilities such as passenger terminal, charging infrastructure, and MRO, and will be situated at major hubs such as airports, shopping malls, and metro stations, or where otherwise required. These sites and the wider network will be augmented by peripheral landing sites in suburban, lower throughput or short-term demand locations, for which Skyports would deploy the MESH system.

In August 2024 Skyports Infrastructure and Wagner Corporation, an Australian property, infrastructure, and sustainable development company, partnered to explore vertiport development opportunities in the state of Queensland, Australia. The partnership will explore vertiport development opportunities in strategic locations around Brisbane and the wider Queensland area. At the Wagner Corporation-owned Toowoomba Wellcamp Airport (WTB), Skyports and Wagner Corporation will conduct feasibility studies to assess the potential for developing a vertiport testbed and future permanent infrastructure.

In July 2024 Skyports Infrastructure Lilium and SEA Milan Airports (SEA), the operator of Milan's airports, announced the signing of a Memorandum of Understanding (MoU) laying the groundwork for the development of a passenger electric vertical take-off and landing (eVTOL) network in the Lombardy region in the north of Italy. With the signing of the MoU, the parties will collaborate to launch a vertiport network with operators of the Lilium Jet as soon as 2027. The first route to be developed will connect Milan Malpensa Airport – the largest international airport in northern Italy, which transported over 26 million travellers last year – and Milan city centre.

1.6 AAM country profiles

This section highlights the regulatory and market development approaches taken by national and regional governments in major UAM/AAM along with strategic industry plans to advance eVTOL-based services in the country.

1.6.1 Australasia

1.6.1.1 Australia

In August 2024 the Australian government has published its *Aviation White Paper—Towards 2050* which details the regulatory steps it plans to take to integrated drones and advanced air mobility vehicles into its airspace. As part of this, the government will publish an Advanced Air Mobility (AAM) Strategy in 2024 "that provides long-term policy settings to encourage investment in the nascent sector".

"The government will consider options to introduce new drone legislation by 2030 – related to security, privacy and other non-safety matters – to give law enforcement and other agencies the powers they need to protect people and infrastructure," says the text of the white paper. "The government will continue to work with state, territory and local governments to encourage increased national consistency in regulatory arrangements and enforcement.

"The government has made financing available to the aviation technology and manufacturing sector under the AD15 billion National Reconstruction Fund. Work by CASA to increase the harmonisation of Australian regulations with those in overseas markets will support Australian aviation technology businesses to introduce new products with less duplication in approval processes.

The Australian Government will incrementally put in place airspace arrangements that allow for the increased use of drones and other new aviation technologies and "will release a whole-of-government plan for air traffic management of commercial drones and other uncrewed aircraft in 2024. The Uncrewed Aircraft System Traffic Management Action Plan will outline steps the Australian Government will take to enable new types of air traffic management systems in Australia.

"Stage 2 is to provide guidance to CASA in 2024 on the Australian Government's expectations for airspace administration. The Australian Government will produce a new Australian Airspace Policy Statement to replace the policy statement that came into effect in 2021. The new policy statement will give clear direction to CASA on the Australian Government's priorities for airspace management, including in relation to drones and other new technologies.

"Stage 3 is for CASA to prepare a new framework for Australian airspace in 2026. The Australian Future Airspace Framework will describe how classes of airspace will be implemented and administered across Australia.

"Stage 4 is to update relevant airspace legislation by 2030. These changes will give government agencies the powers they need to regulate airspace use safely as new types of aviation technology increasingly share the same airspace as conventional aircraft.

The Australian Government will also:

- "Improve information available to industry about funding and procurement opportunities. The Australian Government has expanded the drones.gov.au website to provide a single point of reference for the emerging aviation technologies sector to access a wide range of government funding and procurement opportunities.
- Release an Advanced Air Mobility (AAM) Strategy in 2024 that provides long-term policy settings to encourage investment in the nascent sector.
- Require that CASA update its Strategic Regulatory Roadmap for drones and AAM in 2024, outlining the safety regulator's strategic approach to working with industry to oversee the safe rollout of these new technologies.
- Continue working with state, territory and local governments to encourage increased national consistency and collaboration in regulatory arrangements for drones, including through the drone rule digitisation project.
- Implement a new system to enable air traffic management to communicate electronically with drones and other uncrewed aircraft. Initial capabilities of the Flight Information Management System will roll out in 2025 to support the safe integration of drones into controlled airspace, with additional features added over time.
- Continue to work with industry on the introduction of Remote ID requirements for drones to improve safety and enable responsible and accountable drone use. It is expected that legislation will be introduced and a mandate will be in place by 2030, subject to a regulatory impact analysis process.
- Introduce new legislation by 2030 to protect Australian communities, infrastructure and businesses from security risks of drones and AAM.
- Consult on regulatory amendments to manage noise impacts from AAM aircraft on communities.
- Work with stakeholders to develop AAM infrastructure planning guidance to support the introduction of AAM.
- These initiatives will complement the government's support to the sector through the AD30 million Emerging Aviation Technology Partnerships program and financing (including debt and equity) available for investment through the AD15 billion National Reconstruction Fund, which may include investment in aviation technology commercialisation.

According to the publication "AAM: Industry vision and roadmap" published by the Australian Association for Uncrewed Systems (AAUS), 2027 is the date the first of type AAM aircraft will be ready for operation in Australia. "With that said," according to the publication, "if the right ecosystem conditions can be established earlier, then this date could be brought forward, limited primarily by certification timelines and AAM manufacturer production rates."

There will be three waves of AAM development, according to AAUS.

Wave one will see initial use cases will be those that can be directly accommodated within the existing air navigation system, requiring minimal regulatory change, and posing no, or minimal, impact on existing airspace use and communities. This is likely to include replacing helicopters on existing air tourism and private charter routes and utilising existing helicopter landing areas. Illustrative use cases of wave one include:

- Theme park air tourism (Often referred to as "A to A" flights)
- Charters from Melbourne city to regional areas (e.g., Yarra Valley wineries)
- Sydney Harbour air tours
- Ad hoc flights from major airports to existing helicopter landing sites Initial civil services

There will also be niche services likely to be focussed on community-good applications, in low complex and low impact environments.

- Mail and medical services to Moreton Bay islands
- Regular medical services to outlying rural towns (from a regional hub) Low-volume scheduled commuter Potentially high value but low volume scheduled services between a small network of fixed locations.

Other feasible early operations will be highly dependent on the geography, vertiport location relative to existing transport hubs (e.g., airports and train stations), and airspace design (e.g., where operations can be accommodated with minimal or no change).

- Airport / transport hub connectors (e.g., Rose Bay seaplane terminal to Sydney Airport or Western Sydney Airport and Sunshine/Gold Coast Helipads to Brisbane Airport)
- Geelong-Docklands cross-bay commuter service
- Melbourne or Brisbane River helipad flights to airports

It is expected that defence will be early adopters and evaluators of AAM aircraft for a wide array of use cases.

Regional Air Mobility (RAM) operations (passenger and freight) will also be available.

- Regional cargo and mail services (distribution hub-to-hub)
- Regional passenger connectors (e.g., outlying towns to a regional-centre airport)

The **second wave** can be characterised as one of adaption and transition. A period defined by a series of small changes to the existing ecosystem that permit an incremental expansion in the scope of viable and supported AAM operations. Urban Public Transport Scheduled urban public transport operations will begin. They are not expected to be cost-competitive with existing transport systems, but rather complement existing networks with new routes or a higher performance service (e.g., faster, service dependability, etc.). These initial "pilot" services are not expected to be commercially viable until scale is reached. Illustrative use cases include:

- Commuter – Brisbane to Caloundra connector, Gold Coast Hinterland or Maleny to CBD or Airport
- Sydney Airport to Bondi Junction shopping centre
- Western Sydney Airport to Northern Beaches or Hawksbury area
- Sorrento to Melbourne Central Business District Complex Civil Services

Urban civil services that require high dependability and customisation (e.g., onboard equipment) will begin.

- Night time police patrols over urban areas where noise is a concern
- Hospital patient transfers

Regional Air Mobility Improvements in the performance of AAM (e.g., through the introduction of hybrid and hydrogen propulsion systems, and improved battery technology) will open up a number of new use cases

- Scheduled Melbourne to Ballarat connector service
- Patient transfer services
- Royal flying doctor services Private operations A much smaller, but in time growing, AAM use case will be private operations particularly in regional areas.

The **third wave** will see significant expansion in the coverage and capacity of scheduled passenger transport services across a growing network of urban and peri-urban vertiports.

- City mass transport networks On-demand Air Taxi

On demand passenger and freight transportation services utilising a combination of public, public-commercial and private vertiports.

- "Yellow Cabs" of aviation servicing cities

On-demand Urban Freight Similar to the Urban On-demand Air Taxi use case, flying equivalent high priority freight for courier companies. These will be focussed on hub-to-hub deliveries rather than last mile.

Eve, Joby and Wisk are all developing eVTOL routes in the country, while cities and states are drawing up regional service plans, with Brisbane's target of having air taxi operations in place for the 2032 Olympic Games an important focus for accelerating eVTOL route planning. In parallel, several projects in the country are under way to use eVTOL platforms for medical and emergency services in rural and urban areas.

In July 2022 Australia's Civil Aviation Safety Authority (CASA) published its remotely piloted aircraft system (RPAS) and advanced air mobility (AAM) roadmap. Here are the highlights for the near-term.

Immediate term (2022 to 2023)
Aircraft and aircraft systems

- Publish acceptable industry consensus standards for piloted AAM
- Review applicable maintenance policies for AAM.
- Review international frameworks, standards and methods for certification and assurance of RPAS. This includes consideration of adoption of the FAA durability and reliability process for low-risk RPAS.
- Review applicable maintenance policies for RPAS.
- Publish guidance on the evidence requirements from the OEM versus the operator for RPAS operational approvals.
- Airspace and traffic management.
- Through the AFAF (Australia Future Airspace Framework), develop a transparent, consistent and scalable method to manage Australian airspace that supports RPAS and AAM integration.
- Research how existing separation standards may apply to RPAS and AAM. Identify future changes required including conspicuity and equipage considerations.
- Review existing flight rules against the future needs for RPAS and AAM.
- Work with DITRDC (Australia's Department of Infrastructure, Transport, Regional Development, Communications and the Arts) and Airservices Australia to develop a regulatory oversight framework for UTM.

Operations

- Develop and publish further guidance material for RPAS operations already enabled in existing regulations, including acceptable means of compliance.
- Develop and publish guidance material for approval of research and development operations.
- Review and publish guidance on the carriage of dangerous goods by RPAS.
- Implement regulatory changes from the post-implementation review of CASR Part 101. Conduct a gap analysis of CASR parts to identify regulatory changes required to support RPAS and AAM operations. Publish more standard scenarios and SORA guidance for low-risk RPAS operations and emergency services.
- Talk with model aircraft, drone sport and recreation flyers to find opportunities for improved collaboration and consultation.

Infrastructure

- Develop guidance material, design requirements and regulations for vertiports and other infrastructure required to support AAM operations.
- Develop guidance for the infrastructure required to support research and development activities.
- Work collaboratively across government to understand and establish spectrum requirements for RPAS and AAM.
- Work with DITRDC to set up the National Drone Detection Network and support all safety aspects of the infrastructure planning framework.

1.6.2 Europe

1.6.2.1 Belgium

In July 2022, ASL Group signed an agreement with Lilium to 60 buy Lilium Jets and cooperate on developing a network of landing sites in the Benelux countries. Under the agreement, ASL Group and Lilium seek to establish a safe and sustainable eVTOL network across Belgium, Netherlands, Luxembourg and Western Germany. In May 2023 Lilium announced that it has signed a contract with ASL Group for the delivery of six Lilium Pioneer Edition Jets as part of this agreement.

1.6.2.2 Denmark

In September 2023, the Danish companies Copenhagen AirTaxi and Copenhagen Helicopter – both based at Roskilde Airport – along with German aircraft manufacturer VÆRIDION signed a cooperation agreement aimed at accelerating the green transition of regional aviation in the Nordic region. By 2030 at the latest, the first 100% electric flights are expected to be introduced on domestic routes in Denmark, according to a joint company press release.

Meanwhile, Odense has become the centre of the country's urban air mobility programme. In May 2022 Odense Municipality announced it was targeting future green mobility solutions at Hans Christian Andersen Airport (HCAA). According to a report from the local authority's economics committee:

"It is the Mayor's Administration's assessment that the airport faces a unique opportunity to become an epicenter in Denmark and (Northern) Europe for the use, testing and development of drones for passenger transport. An assessment that is based, among other things, on:

- A brief initial screening of opportunities and potential carried out by the Mayor's Administration in February 2022, which is attached to the case as an appendix.
- Strong support from Naviair (the state's company for airspace traffic management), which points to Odense as a natural center for this development.

"Based on these assessments, the Mayor's Administration is now uncovering the potential for urban air mobility (UAM) and vertiports (landing facilities for personal drones) in more detail - in order to

be able to position Odense Municipality and Hans Christian Andersen Airport as visionary players in drone mobility in the long term. On the basis of the above, the mayor's administration has set up a fast-working working group, which in future will facilitate a focused and short-term cover-up effort, which will uncover the potential and prepare a business case, a project plan, defined milestones and a draft budget.

"The working group works on the basis of the attached memorandum of the case, and consists of Odense Municipality and relevant actors, who must jointly prepare solutions to the above objectives. In this connection, the focus will be particularly on the establishment of a Danish/Finnish solution for personal drone mobility in the context of future infrastructure."

In late April 2023 Nordic research agency Nordregio published a report which identified the most viable regional/commuter electric aircraft routes.

1.6.3.4 Indonesia

With a requirement for improved transport services within major cities, between islands and to improve tourist attractions, Indonesia is a key potential market for eVTOL manufacturers.

EHang is an early incumbent. In April 2022 EHang announced it had received a pre-order for 100 units of EH216s from Prestige Aviation, an Indonesian aviation company and a subsidiary of Prestige Corp.

The company says: "It's the largest pre-order EHang has received so far for its passenger-grade AAVs in Asia. Prestige Aviation previously purchased one unit of EH216 from EHang, and the two parties jointly conducted a debut flight demonstration for aerial sightseeing in Bali, Indonesia in 2021."

According to Bambang Soesatyo, Chairman of the People's Consultative Assembly Republic Indonesia, who attended the signing ceremony at the Indonesia International Motor Show 2022 (IIMS 2022) where the order was announced: "Coming next, we hope to explore more possibilities to facilitate the implementation of UAM in Indonesia, and to seek breakthroughs in infrastructure, airworthiness certification, and other related fields."

EHang has demonstrated its 216 in Bali, in cooperation with Prestige. Prior to the flight demo, the Directorate General of Civil Aviation of the Republic of Indonesia issued the Special Certificate of Airworthiness for the EHang 216 AAV, enabling it to be the Indonesia's first passenger-grade AAV approved for a public unmanned flight demo.

Meanwhile, in June 2024, Indonesian eVTOL start-up Intercrus announced in a Linkedin social media post that it has signed of a Memorandum of Understanding with PT Dirgantara Indonesia (Indonesian Aerospace). "This collaboration marks a new era of innovation in the Advanced Air Mobility sector," says the company. The scope of the MoU includes joint development manufacturing and certification of the Intercrus Sola eVTOL.

According to the company's website:

"Our mission is clear – to provide efficient, eco-friendly, and safe urban transportation solutions using eVTOL aircraft. We believe that eVTOL technology is the key to addressing the ever-growing challenges of urban congestion, pollution, and limited mobility options. By developing state-of-the-art eVTOL vehicles, we aim to offer urban dwellers a convenient and sustainable alternative to traditional ground transportation."

1.6.4.2 Brazil

In June 2024, ANAC´s Personnel Superintendency issued a 50-page proposal on licence and rating requirements for eVTOLs, for sectoral review and comments.

The proposal takes account of light recent industry and regulatory proposals on the topic, the impending schedules for aircraft certification and entry into service, and underlining FAA´s NPRM/2023 on powered-lift integration and EASA´s Opinion No 03/2023 on VTOL-capable aircraft. It starts by pointing out that FAA´s proposal is based on the existing category of powered-lift aircraft, while EASA´s takes a performance-based approach to the development of regulations, including the personnel-related aspects, by defining a new aircraft category, that of VTOL-capable aircraft, VCA. It also notes that ICAO has not yet started discussions on certification requirements for civil aviation personnel, at its Personnel Training and Licensing PANEL. ANAC also cites the regulatory needs associated with Embraer´s EVE-100 certification and entry into service schedules, relative to trained and certified pilots, mechanics and repair stations. To keep up with industry developments on PEL, ANAC just became a member of SAE´s Study Group 35 – Modeling, Simulation, Training for Emerging AV Tech.

Whereas maintenance mechanics and stations for VCA should be accommodated by the existing rules, via development and application of model-specific training programmes, ANAC sees a clear need for modification or adaptation of the existing rules to properly accommodate future VCA pilots and their new competencies, technical and non-technical. Additionally, it is also taken for granted that any regulatory solution in the PEL domain should be based on: performance-based principles, competency-based training, and a review of the role of simulation devices currently used.

In this context, ANAC set out to detail their proposal, with focus on two major industry consensus transition scenarios:

- technical requirements for licensed commercial pilots, aircraft or helicopter, to be certified on the new aircraft so as to meet the industry´s initial demand;
- technical requirements for citizens who want to become VCA pilots, and that have no previous experience in commercial operations – ab initio training.

ANAC´s full regulatory proposal in English can be found here

In July 2023 Brazil's aviation regulator ANAC published its advanced/urban air mobility roadmap document Panorama Advanced Air Mobility during the LABACE 2023 event in São Paulo.

According to ANAC, via google translate

"Panorama AAM brings a portrait of the development phase of the equipment, its differentiations, the technologies applied, the barriers to be overcome, the role of ANAC in enabling the market to develop the best solutions aligned with the safety of equipment and operation, and how Brazil can be at the forefront of regulation.

"In the market, there has been a consensus that there are still challenges, such as the implementation of air traffic management systems, the limitation of the autonomy of electric batteries and the physical structure such as "vertiports". The main manufacturers foresee the beginning of eVTOL operations for 2025-2028.

"Panorama Advanced Air Mobility is an open letter from ANAC to society, presenting in a simple, uncomplicated and realistic way what has been done so far and some of the main challenges for the wide use of this new means of transport, ranging from equipment certification, the

qualification of maintenance professionals and pilots, to the structures of navigation and operation."

Brazil is shaping up to be one of the world's pioneering centres for UAM development. The country manages close to 100 million domestic air passengers a year and is currently one of the world's leading civilian helicopter and business aviation markets.

More than 4,000 eVTOL aircraft will be flying in South American skies within 15 years, according to André Duarte Stein, Co-Chief Executive Officer at EVE Air Mobility speaking at the ICAO webinar, *Challenges and Opportunities for eVTOL Aircraft in South America*, which took place on 30 August 2022.

The company's milestone in February 2022 – when ANAC formalised the process for obtaining a Type Certificate for its eVTOL aircraft – is a step towards establishing a broader regulatory framework in a global marketplace. "Potentially there could be 1,000 eVTOLs in Brazil alone, roughly 15 flights per day carrying up to 16 million passengers," said André Duarte Stein. "Sao Paul is the largest market where there is potential for 400 eVTOLs, but there is also Buenos Aires, Lima, Bogota and Rio. This is a new frontier for aviation in a new space." He sees a new appetite from regulatory authorities across the region to embrace this innovation and ensure it remains safe. "It is a collaboration from the beginning with a lot of interaction and a lot of conversations. EVE began talking not just with ANAC, but also the FAA, EASA, CAA UK, and others in 2017."

ICAO Strategic Planning and Regional Coordination Officer Chrystelle Damar said with some vehicles likely to be ready to enter into service in 2025, there is the wider ecosystem to consider – for example the vertiport infrastructure, power supplies, communications and emergency services. EVE is working with partners including vertiport developers such as Skyports in cities worldwide, and airport authorities including Rio Galeão, to address some of these issues. "We brought along the energy company in Rio to understand how it works in practice, the power grid requirements, and the sustainability perspective," said André Duarte Stein. While regulating these services is beyond the scope of aviation bodies like ANAC, conversations with city authorities, communities and industry form part of process. "We bring people around the table," added Roberto Honorato, Technical Manager of the Normative Process at ANAC. "There are a lot of start-ups unfamiliar with the aviation environment and we have to use this energy to innovate and complement our decades of knowledge of aviation safety."

"We see potential for over 100 routes in Rio, including about 35 vertiports around the city and some 240 eVTOLs in the future," said André Duarte Stein. "It is important to understand this is not like adding one or two general aviation aircraft in the sky. This is a large network." The company recently announced Halo Aviation as the launch customer for its urban air traffic management (UATM) solution designed to support operations in multiple urban environments.

In December 2024 Brazil's Micaelis announced a partnership with the Brazilian Association of Aeromedical Operations (ABOA) to develop the integration of eVTOLs in the transport of organs, tissues, samples for examinations, and blood products in emergencies and catastrophes. Mlicaelis is also developing an autonomous eVTOL route network based in Rio de Janeiro; images of both programmes feature the EHang EH-216

In November 2023 Micaelis and Me Green, a Spanish company specialising in renewable energy solutions announced the development of a network of vertiports powered by solar panels in Brazil. According to the companies:

"The company has garnered immense interest from Brazilian clients with non-binding letters of intent for 100 units, along with letters of intent from public and governmental organisations for

demonstration and operation. Furthermore, Micaelis has embarked on a pilot UAM solution cooperation with the city of Rio de Janeiro. Through this partnership, Me Green and Micaelis are committed to building a network of vertiports powered by solar panels, fuelling cleaner flight operations and fostering sustainable air mobility solutions across Brazil and Latin America.

"As part of this collaboration, Me Green will embark on an immediate export campaign to Brazil, bolstered by the support of Micaelis, to introduce their innovative renewable energy solutions to the Brazilian market. Micaelis will play an active role in ensuring that all communications related to Brazilian activities align with their vision and mission before dissemination."

In May 2022, Embraer, ITA (Technological Institute of Aeronautics), and FAPESP (São Paulo Research Foundation) announced the approval of a joint investment of R$48 million in an Engineering Research Centre (ERC) for the future of air mobility over the next five years.

In a press release the institutions say: "This unprecedented research in Brazil will gather representatives of the scientific community and professionals of the aeronautical industry in activities that are based on three pillars: low carbon aviation, autonomous systems and advanced manufacturing. The initiative creates a favourable environment for knowledge dissemination, highly qualified human resources training and production of high-impact scientific publications."

"Over the last few months," the Press release reports, "the institutions have described the research and the main activities scope to materialise this partnership, which proposed innovative technological solutions that will maximise the competitiveness in the global innovation ecosystem," and continues: "Partnerships such as the ERC guide and enable the conditions for the technology's transfer among industry players, stakeholders and the third sector, and strengthen connections and innovations through partnership models and intellectual property management. These partnerships also generate new business incubation and stimulation of entrepreneurial activity in which the research results are applied."

This is not the only consortium driving UAM growth in the country.

In June 2022 a partnership of global leaders in aviation and airports announced its intention to explore the infrastructure requirements of bringing eVTOL passenger flight to Brazil within this decade. The partnership is reported to include: Avolon, the aircraft leasing company; Corporación América Airports, the global private sector airport operator; GOL, a Brazilian airline; Grupo Comporte, a Brazilian transport operator, and Vertical Aerospace, the aerospace and technology company developing and manufacturing eVTOL aircraft.

The Press release reports that: "The partnership will explore and define vertiport design and locations, as well as further infrastructure requirements for eVTOL operations in Brazil. With its well-developed UAM market based on helicopter services, advanced aviation ecosystems and unique demographics, Brazil is set to become one of the pioneering markets for eVTOL services, including for Vertical's VX4."

But much of the progress towards UAM is driven by the presence of Embraer's EVE Urban Air Mobility, which has been busy developing partnerships with infrastructure providers and aircraft operators to begin UAM services in the country by 2026. EVE has become a focus for developing an industrial air taxi ecosystem in the country. Strategic partners include Halo Aviation in the US and UK, Ascent in Singapore and more recently, Skyports. It has also recently announced agreements with ABS Jets and The Mobile Repair Team (MRT).

In June 2023 at the Paris Air Show Eve Air Mobility and Voar Aviation, a general aviation service company, announced today the signature of a Letter of Intent (LOI) to evaluate the sale and purchase of 70 eVTOL aircraft. Voar Aviation aims to operate in the main metropolitan areas and popular tourist destinations, such as Sao Paulo, Belo Horizonte, Brasilia, Goiania, Vitoria, Florianopolis, Camboriu, Fortaleza, Natal, Recife, and Salvador.

EVE's (other) most significant partnerships:

- In December 2022 EVE signed a Letter of Intent (LOI) with FlyBIS Aviation Limited, an advanced air mobility start-up based in Caxias do Sul, in the south of Brazil, to collaborate on the development of eVTOL operations in Brazil and South America. Based on the agreement, FlyBIS will also purchase up to 40 of Eve's eVTOL vehicles, according to a company press release. "This new collaboration with FlyBIS will enable us to expand the future of air mobility to Southern areas of Brazil and other South American countries," said Andre Stein, Co-CEO of Eve. "This region has several high-traffic tourist areas that will benefit from eVTOL operations, reinforcing our commitment to fostering the urban air mobility market in different regions around the world." After starting operations in Brazil's southern states, FlyBIS plans to expand operations to neighboring countries and contribute to the implementation and development of Eve's air mobility ecosystem, said the press statement. FlyBIS is backed by Brave Aviation whose current fleet includes Embraer Phenom 100 as well as other aircraft.

- In April 2022 EVE and Thales teamed to work on the technical issues for developing eVTOL services in Brazil. Thales' work in this area will focus on developing avionics, electric, flight control, navigation, communication, and connectivity systems. According to a Press statement: "Both Thales Technological Space Centre, in São José dos Campos, and their recently opened Avionics Centre, in São Bernardo do Campo, will provide support to EVE's and Embraer's teams working on the project, which will also rely on Thales' engineers from France, Canada and the United States."

- In October 2021 EVE and Avantto (Aviation Management Services) signed a Letter of Intention (LOT) aimed at developing the UAM ecosystem in Latin America, reports a Press release. This partnership includes an order for 100 of EVE's eVTOL aircraft, as well as a collaboration to develop a new eVTOL operation in Brazil and across Latin America. Deliveries are expected to begin in 2026. The developments will focus on critical aspects of the passenger experience in order to design for all users, including how to maximise accessibility and inclusiveness in vertiports and eVTOL boarding operations.

- In June 2021 EVE and Helisul Aviation, a leading helicopter operator in Latin America, announced a partnership which included an order for up to 50 eVTOLs with deliveries expected to begin in 2026. Helisul and EVE aimed to start their collaboration with a proof of concept (POC) operation, using helicopters to validate parameters that apply to future eVTOL activities.

- In June 2021 EVE and vertiport company Skyports formed a partnership to develop urban air mobility (UAM) solutions, with a focus on vehicle-vertiport operations in Asia and the Americas.

- According to a July 2021 *BlueSKy Business Aviation News* Press report EVE expects to provide Flapper with up to 25,000 hours of flight time per year across key cities in South America, including São Paulo, Rio de Janeiro, Belo Horizonte (all in Brazil), Santiago de Chile (Chile), Bogotá (Colombia) and Mexico City (Mexico). 'The parties plan to foster a culture of on-

demand UAM booking using helicopters to serve as data collection for the future development of the EVA. This agreement has the potential to bring up to 25 of EVE's Electric Vertical Aircraft to Flapper's platform."

- EVE is not the only air taxi manufacturer to take market share in Brazil.
- AZUL Linhas Aéreas Brasileiras in August 2021 signed an order with Lilium worth USD1 billion for 220 six-seat eVTOLs to be delivered in 2025. Part of the deal is for Azul to operate and maintain the Lilium Jet fleet, while the German company provides an "aircraft health monitoring platform", replacement batteries and other custom spare parts. Azul will also support Lilium with the necessary regulatory Brazilian approval processes for certification of the Lilium Jet and any other required regulatory approvals. In October 2021 ABB E-mobility and Lilium planned to provide the charging infrastructure for Lilium's eVTOLs, reports a Press release. The plans include launching networks in Florida, Germany and Brazil.
- Gol Linhas Aéreas will receive 250 vehicles from Vertical Aerospace through a September 2021 deal signed with the Irish plane-leasing firm Avolon.
- In September 2021 Europcar Brazil announced its intention to purchase 50 eGyro eVTOL aircraft from Skyworks Aeronautics for use in Brazil.

In October 2022 Auro Aero, a French manufacturer of a 19-seat Electric Regional Aircraft (ERA), announced its order book which includes an order for 20 aircraft from Brazilian logistics group Dux. The company plans the first flight of its full-scale prototype in 2024. The aircraft is reported to have a maximum payload range of 1,000 nm, reduced to 215 nm for all-electric operations, and a cruise speed of 300 knots.

At the August 2022 ICAO eVTOL webinar, ANAC's Roberto Honorato said Brazilian regulation already allows new aircraft to be certified, but new requirements may be needed for this technology. He anticipates a guideline document within a few months aimed at the eVTOL market to replace a case-by-case approach. "We have to be careful about beginning regulations without sufficient experience of the new technology. We are working on the rule-making now. Regulations need to support this industry development, and not act as a barrier." Activities include extensive interaction with industry, learning from initial concepts of operations (ConOps) under development, and working with neighbouring aviation authorities.

In April 2023 Brazilian helicopter operator Helisul announced it will buy 50 Moya eVTOL autonomous cargo drones. The all-electric drones have a payload capacity of 200kg and a range of 110km and the prototype is due to fly before the end of 2023.

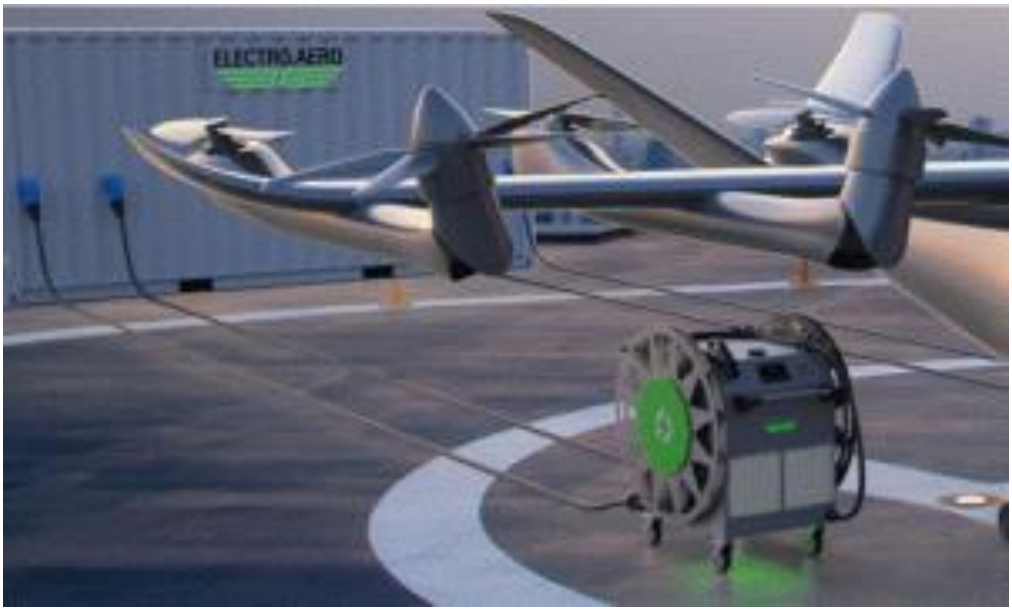
1.7 Vertiport types and their characteristics

As the urban air mobility (UAM) market approaches its commercialisation phase, there are emerging eight different concepts of vertiport design: the essential, the simple, the elevated, the integrated, the floater, the enclosed, the urban hub and the UAM/AAM regional hub. The distinctions between these are sometimes blurred (an elevated vertiport can also be an urban hub), but these different categories reflect the need to develop very different types of infrastructure to support different AAM/UAM services.

A new class of vertiport announced in April 2023 was *The essential*, "vertiport in a box" design, an affordable, modular, turn-key solution for smaller property sites proposed by Skyportz and Electro.Aero. Speaking at the April 2023 Revolution Aero conference in Dublin, Clem Newton-Brown, Skyportz CEO said "The focus in the industry to date has been on larger vertiports located at existing airports. This is the low hanging fruit which will form the essential backbone of an advanced air mobility (AAM) ecosystem. However, if this industry is to reach its potential we need to break the nexus between aviation and airports and let private property owners develop their own vertiports.

"At Skyportz we are focusing on affordable options that property developers can incorporate right now into new developments or retrofit into existing buildings. We will soon be releasing a beautiful tiny modular vertiport building that can be delivered to site in a shipping container, and assembled without heavy equipment, complete with a high powered battery bank and charger with solar panels."

The essential



The UK's first permanent vertiport opened at Snowdonia Aerospace Centre for eVTOL and drone testing in July 2024 and is another example of "an essential" design. SLiNK-TECH designed the "PORTAL" vertiport at the site with installation completed at the end of June.

According to the company in a Linkedin post: "PORTAL is an advanced landing solution, which is highly automated and provides integrated flight management at any location. It features advanced sensor technology and uses this to dynamically guide drones within its airspace to land safely, without the need for a pilot. The system can be deployed temporarily or as a permanent installation and is drone agnostic – demonstrating a clear focus on flexible adaptation and scalability for the consumer."