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# U.S. Air Force Embraces Electric Future with eVTOL Technology, Transforming Military Mobility

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# USAF Embraces Electric Future with eVTOL Technology, Transforming Military Mobility

Just over a century after the Wright brothers' historic flight, the spirit of innovation soared once more. This time ushering in a new era of electric aviation.

In 2021, the United States Air Force (USAF) embarked on a new era of aviation, conducting the first government-sponsored, remotely piloted flight of an electric Vertical Takeoff and Landing (eVTOL) aircraft Kittyhawk Heaviside. In October 2023, Beta Technologies joined the air revolution, deploying its electric aircraft ALIA for testing with the Air Force. These milestones are expected to propel us towards a future where electric aviation electrifies military operations, and also overall air mobility.

Recent advancements in electric mobility and advanced autonomous systems are paving the way for transition into the next age of air mobility propelled by electric and hybrid VTOL aircraft technology.

## How Air Force's Agility Prime Program is Fueling the Future of Air Mobility

The U.S. Air Force's AFWERX Agility Prime program is spearheading innovation in eVTOL technology. The Air Force Work Project (AFWERX), the innovation unit of USAF and a directorate within the Air Force Research Laboratory (AFRL) located at Wright-Patterson Air Force Base, Ohio, strives to cultivate an environment where innovative technology integrates with the expertise of air force, space, and cyberspace personnel to address defense challenges and expedite technology transition to operational capability.


**Lift Aircraft's Hexa aircraft is a part of AFWERX's Agility Prime project demonstration during Emerald Warrior 22.1 at Hurlburt Field, Florida, on May 3, 2022. (Image Credit: U.S. Air Force/Staff Sgt. Taylor Crul)**

Agility Prime is the Air Force's transformative vertical lift program that is partnering with the electric vertical takeoff and land (eVTOL) commercial industry to develop a new class of air mobility systems and advance the domestic industrial base for an aerospace market projected to be worth $1 trillion by 2040. This is the only all-electric passenger aircraft program in the U.S. Government.[1]

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1. AFWERX, Agility Prime, Air Force Research Laboratory. https://afwerx.com/divisions/prime/agility-prime/

Launched in 2020, Agility Prime has so far awarded contracts to 23 contracts to 15 companies totaling more than $100 million.[2] In addition to Beta, several companies working with the service to produce VTOL aircraft, include Joby Aviation and Archer Aviation, Lift Aircraft, Moog, Wisk, Elroy Air, and others. Partnering with these companies and startups, the program aims to introduce zero-emission aviation to the military along with other benefits, including a quiet noise profile and the cost savings to operate and maintain its fleet and making flight operations more environmentally friendly than conventional aircraft that rely on fossil fuels.

An urban air mobility technology simulator facility has also been established at Springfield-Beckley Municipal Airport to foster collaboration among Beta Technologies, Joby Aviation, and Loft Aircraft, accelerating advancements in eVTOL and UAS technologies in the region.

## Key Agility Prime Milestones

- December 2021 — First USAF remotely piloted eVTOL flight with Kittyhawk's Heaviside aircraft.[3]
- March 2022 — USAF pilots conduct first-ever crewed eVTOL flight with BETA aircraft.[4]
- July 2022 — Wes Ogden became the first U.S. Army aviator to fly an electric aircraft.[5]
- November 2022 — Two airmen remotely piloted the HEXA eVTOL developed by Lift.[6]

## Military Applications of eVTOL

The eVTOL aircraft has diverse applications for the service, including personnel movement, cargo transportation, recovery missions, rapid aircraft maintenance, urban mobility, disaster response, firefighting, humanitarian aid efforts, medical evacuation, logistics support, base operations and support, communications relay, missile field support, emergency response, test support, training, range, support, and search and rescue.[7]

"The Agility Prime efforts reduce the risk for technology, regulatory, and financial aspects of the eVTOL industry, increasing the pace of development, and paving the way for early operations of eVTOL aircraft for both military and commercial applications" - Agility Prime lead, Maj. John Tekell.[8]

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2. AFWERX, Agility Prime, Air Force Research Laboratory. https://afresearchlab.com/wp-content/uploads/2022/03/AFWERX_Agility-Prime_FS_0222.pdf

3. Katie Milligan, AFWERX Agility Prime completes the first USAF-piloted flight of an eVTOL vehicle with partner Kitty Hawk. USAF, January 21, 2022. https://www.af.mil/News/Article-Display/Article/2906946/afwerx-agility-prime-completes-first-usaf-piloted-flight-of-an-evtol-vehicle-wi/

4. Katie Milligan, U.S. Air Force and BETA Technologies make history with the first Airman flight of an electric aircraft through AFWERX Agility Prime Program, AFRL, March 14, 2022. https://www.afrl.af.mil/News/Article/2964766/us-air-force-and-beta-technologies-make-history-with-first-airman-flight-of-an/

5. Amy Tolson, DEVCOM Aviation & Missile Center Public Affairs, U.S. Army, October 7, 2022. https://www.army.mil/article/260948/army_electric_aircraft_research_takes_flight_in_partnership/

6. Samuel King Jr., Airmen fly HEXA for the first time, Eglin Air Force Base, November 29, 2022. https://www.eglin.af.mil/News/Article-Display/Article/3232095/airmen-fly-hexa-for-first-time/

7. AFWERX, 2.0 Program Overview, Air Force Research Laboratory, 2022. https://afwerx.com/wp-content/uploads/AFWERX_2.0_Program_Overview_CLEARED-AFRL-2022-5908_web-1.pdf

8. Air Force Research Laboratory Public Affairs, AFWERX Agility Prime – A New Era of Aerospace, AFRL, November 22, 2021. https://www.afrl.af.mil/News/Article/2850369/afwerx-agility-prime-a-new-era-of-aerospace/

Agility Prime identifies and fast-tracks emerging dual-use technologies, focusing on transformative vertical lift aircraft, including electric Vertical Takeoff and Landing (eVTOL) systems in the advanced air mobility (AAM) sector. These aircraft use distributed electric or hybrid propulsion for crewed, optionally crewed, or autonomous missions. Agility Prime minimizes technical risk using government assets to instill confidence in the technology, attract investors, and expedite domestic commercialization while addressing regulatory risks through early airworthiness reviews and collaborating with the Federal Aviation Administration (FAA), NASA, and others.

## Key Players in the Advanced Air Mobility Race and Partnerships with USAF

The leading U.S. eVTOL companies like Joby, Archer Aviation, and Beta Technologies are racing for FAA certification to commence commercial flights, aiming to launch services by 2025. While the FAA targets robust air taxi operations by 2028, these companies seek defense contracts, given the FAA's lack of jurisdiction over military aircraft to prove flight capability.

The USAF is working with these companies testing, experimenting with, and evaluating the new technology for potential future national defense applications. This article details recent pivotal collaborations between the U.S. Air Force (USAF) and leading eVTOL manufacturers BETA Technologies, Joby Aviation, and Archer Aviation.

## USAF Collaborated with Beta in Electric Aircraft Trials

The most recent development is the completion of a three-month test deployment of Beta's all-electric aircraft ALIA with the U.S. Air Force. The ALIA conventional takeoff and landing (CTOL) aircraft has been developed by Beta Technologies, a Vermont-based aircraft manufacturing startup.[9]

**Beta Technologies ALIA-250 electric conventional takeoff and landing aircraft. (Image Credit: Eric Adams/Electric VTOL News)**

9. Ryan Finnerty, Beta completes USAF electric aircraft test deployment, Flight Global, January 31, 2024. https://www.flightglobal.com/fixed-wing/beta-completes-usaf-electric-aircraft-test-deployment/156728.article

Beta's ALIA light-weight electric aircraft has a 50-foot wingspan, a range of 250 miles with a top speed of 138 mph. The aircraft is 90% quieter than a helicopter and produces zero operational emissions. The ALIA aircraft can carry five passengers and a pilot, however, the Air Force test objective is to demonstrate its potential to support agile combat employment logistics with its payload capacity of 1,000 pounds.[10]

The ALIA aircraft first arrived at Duke Field on October 26, 2023, following a more than 1,500 nautical mile mission down the east coast.[11] Beta's ALIA aircraft carried out performance tests at Duke Field, Eglin Air Force Base, in Florida, with the 413th Flight Test Squadron (FLTS) as part of the USAF's Agility Prime program to assess electric aviation's applicability for DoD missions.

On January 11, 2024, the ALIA electric aircraft participated in a simulated casualty evacuation scenario with ground forces, a simulated quick reaction force, and an HH-60W helicopter. During the exercise, the HH-60 first transported the simulated casualty from a forward operating base to a location in friendly territory. The ALIA aircraft then transported the patient to simulated definitive medical care. This exercise at Eglin Air Force Base marked the first time a conventional take-off and landing aircraft conducted a direct operation mission directly with the Air Force and completed a live-casualty evacuation scenario. One of the goals of the exercise was to "augment the existing fleet with additional low-cost assets to assist in mission execution so battlefield aircraft can stay in the fight," said Maj. Riley Livermore, 413 FLTS Futures Flight commander.

### Highlights of ALIA Electric Aircraft Test Deployment

• **Time-efficient:** Completed in less than 10 minutes, the exercise was aimed at assessing the ALIA's ability and performance in military scenarios when time is of the essence and aircraft are in high demand. This simulated mission demonstrated the key impacts electric aviation can have on military services, including an increase in response time at the forward operating base.

• **Low cost:** The aircraft promises to reduce fuel costs and resources significantly. In a similar casualty evacuation scenario, a C-130 would normally require a crew of at least three and about $1,600 in fuel to transport a patient whereas the Alia required a crew of two and about $5 in electricity, Beta said.[12]

**BETA's ALIA electric aircraft arrives at Eglin Air Force Base, Florida, on October 26, 2023. (Image Credit: U.S. Air Force/Samuel King Jr.)**

10. Matthew Clouse, BETA's ALIA electric aircraft arrives at Eglin AFB, Air Force Research Laboratory Public Affairs, October 30, 2023. https://www.af.mil/News/Article-Display/Article/3571824/betas-alia-electric-aircraft-arrives-at-eglin-afb/

11. BETA, The ALIA Platform, BETA Technologies. https://www.beta.team/aircraft/

12. BETA Press Release, BETA Technologies completes first deployment with U.S. Department of Defense, Vertical Mag, January 29, 2024. https://verticalmag.com/press-releases/Beta-technologies-completes-first-deployment-with-u-s-department-of-defense/

• **Faster response time:** ALIA also took part in a simulated Maintenance Recovery Team (MRT) mission, flying to Eglin to pick up a needed part for an F-35 that had landed at Duke. This mission demonstrated the impact of faster response time and reduced costs on training, exercise, and operational maintenance responses. Beta said that ALIA's two flights took about one hour and cost $25 in electricity. A standard truck, covering the same distance, would cost approximately $45 in fuel and four hours of driving.

• **First electric aircraft charging station:** Beta also installed a Level 3 DC fast charger (350kW) — the first-ever electric aircraft charging station at a U.S. military installation.[13]

Throughout the deployment, Beta's core flight test team worked with the U.S. Air Force and 413th FLTS to conduct hands-on experimentation and training with the technology to validate military use cases including critical resupply, cargo delivery, and personnel transport.

AFWERX first partnered with Beta in December 2019 and has since awarded the company several contracts. This partnership and tests aim to accelerate the development and adoption of electric aviation and infrastructure within the U.S. military and commercial market. Over the years, Beta has provided AFWERX with three simulators, including a mobile simulator that has conducted pilot training and demonstrations and two chargers. Through this partnership, Beta became the first electric aircraft developer to receive an airworthiness certificate for manned flight from the military and also conducted the industry's only manned qualitative evaluation flights with test pilots from the Air Force and Army. Beta's all-electric aircraft, ALIA CTOL and VTOL are on track for FAA certification, anticipating entry into service in 2025 and 2026, respectively.

### Joby Aircraft is the First Electric Air Taxi Delivered to the U.S. Air Force

In September 2023, Joby Aviation successfully delivered its first electric vertical take-off and landing (eVTOL) aircraft to Edwards Air Force Base as part of a $131 million Agility Prime contract with the U.S. Air Force. This marks the first deployment of an electric air taxi on a U.S. military base, said Joby, a California-based company building quiet all-electric aircraft.[14]

Joby Aviation completed the construction of its second prototype aircraft for the U.S. Air Force. The company will deliver two of its aircraft to MacDill Air Force Base in 2025 under the AFWERX Agility Prime contract.

**Joby's electric air taxi in the skies above New York City, piloted by James "Buddy" Denham. (Image Credit: Joby Aviation)**

13. Matthew Clouse, Duke Field breaks ground on first electric aircraft charging station, USAF, Air Force Research Laboratory Public Affairs, September 23, 2023. https://www.af.mil/News/Article-Display/Article/3534361/duke-field-breaks-ground-on-first-electric-aircraft-charging-station/

14. Joby Aviation, Joby Delivers First eVTOL Aircraft to Edwards Air Force Base Ahead of Schedule, Joby Aviation Newsroom, September 25, 2023. https://www.jobyaviation.com/news/joby-delivers-first-evtol-edwards/

Capable of reaching speeds up to 200 mph and covering a range of 100 miles with energy reserves, the Joby aircraft offers quiet, emissions-free transportation for a pilot and four passengers. Besides logistics missions, such as cargo and passenger transportation, the Joby aircraft can also conduct on-base operations, facilitating Air Force pilot and aircraft maintenance crew training. This collaboration provides the DOD with valuable insights into eVTOL aircraft performance, while Joby gains operational and training experience in preparation for the 2025 launch of commercial passenger service.

The arrival of Joby's aircraft at Edwards AFB is a significant step towards achieving Agility Prime's objective in 2020 to "work towards an operational capability for transformative vertical lift in the DoD by 2023," according to Col Elliott Leigh, AFWERX director.

**Joby's electric air taxi aircraft at the company's flight test and manufacturing facilities in Marina, California. (Image Credit: Joby Aviation)**

The aircraft, a significant leap in electric aviation, will undergo joint flight testing and operations with the U.S. Air Force at Edwards AFB, contributing to the DOD's insights into eVTOL performance. The partnership aligns with Agility Prime's goal of achieving operational transformative vertical lift capabilities by 2023. Joby's collaboration with the DOD and NASA demonstrates the success of public-private partnerships in advancing electric aviation technology. The aircraft, boasting a range of 100 miles and a top speed of 200 mph, is poised to revolutionize urban air mobility with its zero-emission capabilities.

JoeBen Bevirt, Founder and CEO of Joby, has said that continued support from the Department of Defense (DoD) and NASA has been "critical to the rapid development of electric aviation and eVTOL aircraft" and demonstrated the significance of successful public-private partnerships in accelerating the application of new technology. Joby's partnership with the DoD dates back to 2016 and work with the DoD represents a total potential contract value of $163 million, believed to be the largest in the industry.

## Archer Expands Military Partnership with USAF

As Joby Aviation and Beta Technologies, navigate the path towards advancing military aviation capabilities, Archer Aviation has emerged as a frontrunner in military eVTOL integration with its groundbreaking contract valued at up to $142 million with the U.S. Air Force. This includes the delivery of up to six of Archer's Midnight aircraft to the USAF for research and training purposes.[15]

In October 2023, the USAF provided the California-based Archer an initial payment of nearly $1 million, kickstarting the project under the AFWERX Agility Prime program to evaluate the transformational potential of the vertical flight market and eVTOL technologies for the U.S. military. Archer has been partnering with the DoD since 2021.

Archer's Midnight aircraft, with its vertical takeoff and landing capabilities, 1,000 pounds payload, proprietary electric powertrain, and low noise profile, has the potential to revolutionize military aviation.[16]

Archer's Midnight aircraft has been designed to execute personnel transport, logistics support, and rescue operations with agility, efficiency, and enhanced rapid response while providing a quieter and cost-effective alternative to traditional helicopters, according to the company.

Archer Midnight eVTOL. (Image Credit: Archer Aviation)

Adam Goldstein, Archer's CEO and founder, said that the rapid pace of the contract execution reflects the U.S. Department of Defense's strong commitment to invest in transformational technology. The contracts underscore the commitment to advancing aerospace technology and strengthening national defense capabilities.

## Exploring the Challenges and Opportunities of eVTOL Technology

It may be a little early for flying cars but the world is approaching a new age of airpower. The age of sleek, silent, futuristic electric-powered vehicles with the potential to revolutionize personal, commercial, and military transportation.

Navigating the dynamic landscape of eVTOL technology involves addressing both challenges and opportunities. While the potential benefits of eVTOLs in urban transportation, logistics, and defense are promising, the complex terrain of regulatory hurdles, safety concerns, and infrastructure stand in the way of realizing this futuristic vision.

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15. Archer Press Release, Archer Receives First U.S. Air Force Payment On Landmark Contracts Valued At Up To $142 Million, Archer Aviation, October 4, 2023. https://investors.archer.com/news/news-details/2023/Archer-Receives-First-U.S.-Air-Force-Payment-On-Landmark-Contracts-Valued-At-Up-To-142-Million/default.aspx

16. Archer Midnight Aircraft, Archer Aviation. https://archer.com/aircraft/

**Potential Benefits of eVTOL Aircraft**

Electric Vertical Take-Off and Landing (eVTOL) vehicles are small aircraft that use sustainable electric propulsion systems and batteries to take off and land vertically like helicopters, which means that these aircraft do not need runway infrastructure. The electric propulsion system offers significant environmental benefits compared to traditional engines, making the flight quieter, efficient, environmentally friendly, and cost-effective. Some of the several potential benefits include:

• **Zero emissions:** Electric propulsion means lower greenhouse gas emissions and quieter operation. As many eVTOL aircraft currently under development are electric, they do not produce any carbon emissions. Battery-powered eVTOL aircraft, especially those powered by renewable sources, have a reduced environmental impact.[17]

• **Quieter flights:** Unlike traditional aircraft that rely on combustion engines, eVTOLs use electric motors that are much quieter, and the distributed propulsion architecture in eVTOLs makes considerably less noise as compared with a large helicopter rotor. This feature makes eVTOL aircraft suitable for use in urban areas.

• **Lower operating costs:** The eVTOL aircraft have lower operating and maintenance costs compared to traditional aircraft. Electric motors are less complex and require less maintenance. Efficient Urban Mobility: eVTOLs could provide faster and more efficient transportation solutions as they fly above the ground traffic and do not need long runways required by a traditional airplane.

• **Connectivity:** Imagine medical responders using eVTOLs to reach remote accident sites much faster and save lives. This revolutionary technology promises to improve air connectivity, not just regionally but within cities without relying on extensive ground infrastructure.

**Key Benefits of eVTOL Technology in Defense Applications**

Electric aircraft are not only revolutionizing transportation but also offer game-changing advantages for military operations. These include:

1. Rapid troop deployment and access to remote areas with vertical takeoff, landing, and crucial maneuverability.

2. The eVTOLs promise cost-effectiveness with lower operating and maintenance costs compared to traditional aircraft and a reduced environmental impact. This means easier maintenance, reduced logistical complexities, and fewer operations and support costs.

3. The all-electric, battery-powered aircraft could make operations safer and more effective. High levels of real-time situational awareness can directly enhance officer and public safety.

4. Tactical benefits include faster medical evacuation, efficient supply delivery to remote or dangerous locations, reduced risk through remote-piloted reconnaissance and attack capabilities, and quieter engines for silent operations in covert missions and urban warfare.

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17. Parker Aerospace, Electrification Of Aircraft Enables Sustainable, Net-zero Carbon Emission Aviation, Aviation Week, July 20, 2022. https://aviationweek.com/business-aviation/electrification-aircraft-enables-sustainable-net-zero-carbon-emission-aviation/

Archer Midnight eVTOL. (Image Credit: Archer Aviation)

**Potential Challenges**

While eVTOLs hold immense promise for advanced air mobility, the technology faces several hurdles before widespread adoption.[18] Aviation experts as well as Vertical Flight Society, which tracks the evolving eVTOL industry, pointed out these challenges for the fast-paced eVTOL industry:

**Battery Technology:** Current battery technology restricts range and payload capacity compared to traditional aircraft, limiting travel distance and cargo weight. Advances in battery technology to power aircraft that can carry a pilot and up to four passengers.

**Infrastructure:** Building a robust network of charging stations for electric eVTOLs is essential for the widespread adoption of eVTOLs. Dedicated vertiports or landing pads need to be developed in urban areas to efficiently manage eVTOL traffic.

**Regulatory Approval:** New regulatory frameworks need to be established to ensure the safety and airworthiness of eVTOLs and integrate these aircraft into existing airspace. NASA, the FAA, and the European Aviation Safety Agency (EASA) are working to ensure the safety and airworthiness of eVTOLs. That can long and complex process.

**Sustainability Concerns:** The environmental impact of lithium-ion batteries used in eVTOLs needs to be addressed through responsible sourcing, recycling, as well as alternative technologies. The long-term sustainability of eVTOLs depends on various factors, including the use of renewable energy sources such as solar and wind power, for charging.

**Safety Concerns:** Ensuring the safety of eVTOL operations is another challenge that requires the development of operational procedures and safety protocols.

**Cost:** While it is lower in the long run than traditional aircraft, the initial development and operational costs of eVTOLs are currently high. Achieving affordability and making these aircraft economically viable for mass adoption currently remains a challenge.

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18. AeroCar Journal, eVTOLS: Challenges, Obstacles, and Opportunities, June 23, 2020. https://aerocarjournal.com/evtols-challenges-obstacles-and-opportunities/

**Public Acceptance:** Addressing public concerns about noise, safety, and privacy is crucial for gaining public trust and support for widespread eVTOL operations.

Despite these challenges, the manufacturers, government, and regulators are working in collaboration to overcome these challenges and unlock the full potential of eVTOLs to transform transportation.

## Future of eVTOL Technology in Commercial and Military Domains

The latest technological advancements in the eVTOL industry have brought us closer to the era when the whirring noise of helicopters is replaced by the quiet hum of eVTOL aircraft. These futuristic vehicles hold immense potential to revolutionize both commercial and military domains, transforming everyday transportation.

In the commercial realm, eVTOLs promise to unlock new possibilities for urban mobility. Imagine ordering an eVTOL taxi for a quick commute, avoiding traffic jams, and reaching your destination in minutes. On-demand air cargo services could deliver packages faster and more efficiently, while eVTOL ambulances could provide swift medical response in congested areas. These aircraft have the potential to improve public service with applications in firefighting, public safety, search and rescue, and disaster relief.

For the military, eVTOLs offer a game-changer in terms of agility, efficiency, and versatility. Silent operations could enable covert reconnaissance and troop deployment, while rapid response capabilities could revolutionize casualty evacuation and disaster relief efforts. Smaller, more maneuverable eVTOLs could access remote locations and provide logistical support in challenging terrain. The possibilities for tactical applications are vast, promising to enhance military capabilities and redefine warfare strategies.

Collaborations between innovative companies like BETA Technologies, Joby Aviation, and Archer with the U.S. Air Force signify a strategic shift toward incorporating eVTOLs into military operations.

The advanced air mobility (AAM) sector has garnered substantial momentum, recording over 13,000 orders for eVTOL aircraft from more than 400 companies, as mentioned in the World eVTOL Aircraft Directory by The Vertical Flight Society (VFS). The directory also lists a diverse portfolio of 900 eVTOL designs and concepts globally as of January 2024.[19]

Despite being relatively new, the urban air mobility market has experienced remarkable growth. In 2021, five future air mobility companies, Joby Aviation, Lilium, Archer Aviation, Blade Air Mobility, and Vertical Aerospace, went public via special purpose acquisition company (SPAC) deals, with a combined market cap of $10.7 billion, according to McKinsey & Company.[20]

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19. Electric VTOL News, VFS Electric VTOL Directory Hits 900 Concepts, Vertical Flight Society (VFS), October 10, 2023. https://evtol.news/news/vfs-electric-vtol-directory-hits-900-concepts/

20. Axel Esqué and Robin Riedel, A milestone year for future air mobility, McKinsey & Company, February 8, 2022. https://www.mckinsey.com/industries/aerospace-and-defense/our-insights/future-air-mobility-blog/a-milestone-year-for-future-air-mobility/

Morgan Stanley Equity Research has estimated that the urban air mobility industry could be worth $1.5 trillion by 2040. The financial services firm detailed in a new BluePaper how investment in autonomous flying aircraft is accelerating, with implications for the future of passenger travel, military and defense applications, and the transportation industry.[21]

Major tech companies like Amazon, Google, Apple, and Facebook are actively investing in the eVTOL sector, contributing significant capital and expertise. "The intersection of many technologies, such as ultra-efficient batteries, autonomous systems, and advanced manufacturing processes are spawning a flurry of activity in this space," says Adam Jonas, who leads Morgan Stanley's Global Auto and Shared Mobility research team.

Leading eVTOL manufacturers, including U.S.-based Joby Aviation, Archer Aviation, Beta Technologies, Wisk Aero, Germany-based Lilium, and Volocopter, have cumulated extensive flight hours and are moving toward mass production, collaborating with regulatory bodies to establish certification standards.

Meanwhile, outside the U.S., China-based EHang has achieved remarkable success, securing the Chinese air taxi manufacturer obtained the Civil Aviation Administration of China (CAAC) type certification in October 2023 for its EH216-S. This certification makes it the first eVTOL aircraft in the world with such approval. The approval is a major milestone for urban air mobility (UAM) providers worldwide, paving the way for EHang to operate pilotless passenger-carrying aerial vehicles on commercial transportation and tourism routes in China.[22]

**Multiple EHang EH216-S multicopter aircraft parked on a vertiport. (Image Credit: EHang/via EVTOL News)**

German startup Volocopter is on track to become the second globally to receive type certification in Spring 2024. Volocopter hopes to have EASA certification in time for the 2024 Olympics in Paris, where it plans to launch its commercial services.[23]

The future of urban mobility is no longer a distant dream. The year, 2024, marks a pivotal moment as global eVTOL manufacturers prepare to take eVTOLs to take to the skies, navigating crucial regulatory approvals. With substantial funding, government support, flight achievements, and certifications, these industry leaders are not only shaping the landscape of aerial transportation but are also laying the foundation for a new era of sustainable urban mobility, transforming both the commercial and military.

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21. Morgan Stanley, Are Flying Cars Preparing for Takeoff?, Morgan Stanley Research, January 23, 2019. https://www.morganstanley.com/ideas/autonomous-aircraft/

22. EHang Press Release, EHang Successfully Obtains Type Certificate for EH216-S Passenger-Carrying UAV System Issued by Civil Aviation Administration of China, October 13, 2023. https://www.ehang.com/news/990.html

23. Volocopter, Urban Air Mobility, Volocity air taxi. https://www.volocopter.com/en/


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**Cover Image:**
Archer Midnight eVTOL aircraft. (Image Credit: Archer Aviation)



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