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United States Air Taxi Market Assessment, By Service Provided [Product, Service], By Degree of Automation [Piloted, Semi-Autonomous, Autonomous], By Fuel Type [Gasoline, Electric, Hybrid], By Propulsion Type [Turboprop, Turboshaft, Others], By Rotor Arrangement [Side-by-Side Rotor, Quadcopter, Multicopper], By Wing Type [Fixed wing, Tilt-rotor, Tilt-wing, Others], By Passenger Capacity [2 Seater, 4 Seater, 6 Seater, More than 6], By Speed [Up to 200 kmph, 200-300 kmph, More than 300 kmph], By Range [Up to 200 km, 200-400 km, More than 400 km], By Region, Opportunities and Forecast, 2022-2030F

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Abstracts

United States Air Taxi Market size was valued at USD 189 million in 2022, which is expected to reach USD 670.04 million in 2030 with a CAGR of 17.14% for the forecast period between 2023 and 2030. Air taxis are specialized aircraft designed for efficient short-distance passenger transportation in urban and regional areas. They are compact and capable of vertical takeoff and landing (VTOL), eliminating the need for traditional runways. Air taxis are a key component of Urban Air Mobility (UAM), which aims to provide convenient aerial transportation in crowded urban areas. The concept of air taxis evolved from NASA's Small Aircraft Transportation System (SATS) in the early 2000s, transitioning from science fiction to a viable concept. Recent technological advancements have brought UAM closer to commercialization in the coming years.

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Air taxis offer a fresh approach to urban traffic congestion, providing efficient alternatives for short-distance travel. They aim to make short flights more economical and accessible compared to traditional airlines. With the advancement of technology, coupled with seamless internet connectivity and artificial intelligence integration, air taxis have the potential to operate autonomously or with minimal pilot intervention. This enhances safety and accessibility, making them an attractive urban transit option.

Advancements in Battery Technology pave the way for Air Taxis

The United States air taxi sector increasingly turns to electric rotor systems powered by batteries to enable Vertical Takeoff and Landing (VTOL) capabilities. These electric motor-driven rotors, combined with advanced batteries, offer a blend of design flexibility and cost-efficiency, making them particularly well-suited for short-range inter-city and intra-city VTOL aircraft. However, it's worth noting that while battery energy density is improving, it still falls behind the capabilities of jet fuel, resulting in limitations on electric aircraft's range and weight capacity. Companies are exploring lightweight composite materials to reduce weight to address this challenge, but the demand for high-energy-density batteries remains evident. Developing these advanced batteries is ongoing, although safety concerns, including fire hazards, present ongoing challenges.

In a notable development from November 2022, Archer Aviation Inc., a prominent player in the electric vertical takeoff and landing (eVTOL) aircraft arena, entered a memorandum of understanding with E-One Moli Energy Corp. (Molicel), a leading supplier of lithium-ion battery cells. This agreement outlines Molicel's role in producing and supplying battery cells for Archer's eVTOL aircraft, named Midnight. This strategic partnership augments Archer's expansion and contributes to the advancement of the United States air taxi market.

Manufacturing Innovations and Advanced Materials Redefine Development of Air Taxis

The progress of 3D printing and additive manufacturing in the air taxi sector has ignited a significant revolution in tire development. These cutting-edge technologies empower the creation of precise, tailor-made designs for crucial components such as engines, rotors, and fuselage parts, resulting in notable improvements in performance and reliability. What's more, 3D printing has simplified the manufacturing process for these components, reducing waste and reinforcing sustainability. This technology excels in swift prototyping and customization, aligning perfectly with the distinctive requirements of the sector. The aerospace industry, including eVTOLs that depend heavily on composites, stands to reap substantial benefits from additive manufacturing.

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For instance, Joby Aviation utilizes structural additive titanium components crafted through advanced additive manufacturing techniques in its S4 design, a five-seat eVTOL air taxi with the goal of achieving certification by the end of 2023.

Governments Regulations for Air Taxi

Government regulations are of utmost importance in ensuring the seamless integration of air taxis into the traditional aviation landscape. These regulations are pivotal in harmonizing airspace utilization and raising safety standards. They are instrumental in preventing accidents and hazards, primarily focusing on safeguarding passenger and public safety. Furthermore, governments take charge of managing air taxi routes, thereby alleviating congestion in urban airspace and optimizing traffic flow. Through strategic investments in critical infrastructure like vertiports and vertistops, governments streamline air taxi operations and their assimilation into urban transportation networks.

In the United States, companies must obtain a 'type certificate' for approving the design and components of their aircraft. This certification is necessary for mass production, and entities planning to operate as air carriers must secure official authorization. The FAA has yet to specify a safety threshold, although it may target one catastrophic failure per 100 million flight hours. As of now, no air taxi has received aviation regulator certification. To provide more clarity on rules and regulations related to urban air mobility, the FAA reached a significant milestone in August 2022 by introducing Special Federal Aviation Regulations, which outline rules for advanced air mobility operations. Their 'Innovate28' plan delineates the steps to enable these operations safely and at scale by 2028, providing a clear direction to the emerging air taxi industry in the United States.

Internet Connectivity and AI are Shaping the future of United States Air Taxis

Advancements in technology, coupled with the widespread availability of 5G connectivity, are heralding the era of autonomous aerial transportation, particularly within the air taxi industry. Air taxis hold a distinct advantage due to their reduced personnel requirements for operation and maintenance compared to traditional airlines. The integration of 5G networks has paved the way for AI implementation, which significantly enhances safety through real-time data analysis, obstacle detection, and collision avoidance systems. AI-driven algorithms further optimize flight routes, considering dynamic variables like weather conditions, air traffic, and passenger demand, ensuring efficient and responsive transportation.

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In a significant development in October 2022, Wisk Aero introduced its Generation 6 electric air taxi, designed for autonomous flights with a passenger capacity of four. This aircraft stands out as the first autonomous, all-electric eVTOL (electric vertical takeoff and landing) vehicle actively seeking Federal Aviation Administration (FAA) certification. This innovative eVTOL integrates proven technology from commercial aviation, incorporating advanced detect-and-avoid features and enhanced sensors. The combination of autonomous systems, human oversight, and a simplified design ensures the safe transportation of passengers within the commercial aviation sector.

Air Taxis are a Cost-Efficient Solution for Rapid Emergency Services and Urban Air Tourism

Air taxis, in addition to offering short-distance commercial travel solutions, are positioned to fulfill other crucial roles. They provide a rapid and cost-efficient option for emergency response operations and medical evacuations. Furthermore, air taxis hold considerable potential for promoting flight tourism, particularly in vibrant urban locations such as Manhattan. This emerging sector offers exciting opportunities for captivating aerial tourism experiences.

In March 2023, United Airlines collaborated with Archer Aviation to inaugurate the electric air taxi route in Chicago, connecting O'Hare International Airport and Vertiport Chicago. This collaboration promises to reduce commute times, offering 10-minute point-to-point journeys substantially. Archer's Midnight eVTOL aircraft, optimized for 20-mile flights with a mere 12-minute recharge, is poised to revolutionize urban transportation. There are plans for the introduction of future air taxi routes, including one connecting Newark Liberty International Airport to Downtown Manhattan Heliport, scheduled for launch in 2025.

Impact of COVID-19

The United States aviation market and United States air taxi market faced significant disruptions during the COVID-19 pandemic. Initially, the outbreak caused delays in various air taxi and urban mobility projects' development and deployment. Travel restrictions and lockdowns led to a substantial decrease in passenger demand, affecting bookings and revenues, especially in the tourism sector—a significant market for air taxis. Many UAM startups experienced financial strain due to reduced investments and passenger numbers, leading to delays in project deployment. Initiatives such as Uber's Elevate and Kitty Hawk, once leading the electric air taxi industry, encountered

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setbacks. In 2020, Uber sold its air taxi unit to Joby Aviation, and Kitty Hawk ceased operations in 2022.

Despite these challenges, the gradual easing of the pandemic has renewed interest and investment in UAM solutions. The UAM and air taxi market is in recovery, offering a positive outlook for the future as the world embraces innovative transportation solutions, despite previous delays in air taxi plans.

Impact of Russia-Ukraine War

The Russia-Ukraine conflict adversely affected the global aviation market and the United States air taxi market, causing geopolitical tensions and economic sanctions that eroded investor confidence. Additionally, this conflict worsened resource shortages like oil and metals, leading to increased manufacturing expenses for air taxi components. Following the war, US sanctions on aircraft parts shipments from Russia further disrupted the supply chain, affecting the timely production and delivery of vital air taxi components. These challenges caused delays in various air taxi projects, complicating operators' strategic planning in the sector.

This turmoil also influenced crucial air taxi infrastructure, especially airports. Airports, vital for air taxi operations, particularly in conflict-affected areas, experienced reduced traffic and declining revenues. As a result, companies in the air taxi industry had to diversify their offerings to mitigate geopolitical risks and address concerns about the long-term stability of routes and markets. Some urban air mobility (UAM) firms shifted their focus to cargo delivery services, adapting to changing market demands and introducing new strategic planning approaches.

Key Players Landscape and Outlook

The air taxi market is witnessing rapid growth and innovation as new startups collaborate with established aerospace technology leaders. Major industry players are focused on expanding their fleets and actively seeking regulatory approvals and certifications, expediting their operational readiness. Many have already been granted permission to operate on specific routes, signifying significant progress in the industry's advancement. This collective endeavor demonstrates a strong commitment to advancing urban air mobility and making efficient air taxi services accessible.

For instance, California-based Joby Aviation, specializing in electric aircraft for commercial passenger service, received FAA Special Airworthiness Certification and

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United States Air Force Airworthiness Approval for its second pre-production prototype in December 2021. Joby plans to begin flight operations with this prototype in collaboration with the United States Air Force through its Agility Prime contract.

On the other hand, Archer Aviation secured a substantial USD 215 million equity investment from industry leaders such as Stellantis, Boeing, and United Airlines, along with other financial institutions. Additionally, Archer obtained FAA approval for its Midnight eVTOL aircraft and established an autonomous flight partnership with Boeing and Wisk, resolving previous legal disputes between the parties.

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