

# Advanced Air Mobility (AAM) Frequently Asked Questions

## What is Advanced Air Mobility (AAM)?

According to NASA, the mission of Advanced Air Mobility (AAM) is to enable an air transportation system that moves people and cargo between places previously not served or underserved by aviation – local, regional, intraregional, urban – using revolutionary new aircraft that are only just now becoming possible thanks to emerging technologies.



*Electric Short Takeoff and Landing (eSTOL)*



*Electric Vertical Takeoff and Landing (eVTOL)*



*Small Unmanned Aircraft System (sUAS)*

## What does an AAM look like?

AAM aircraft are typically smaller than traditional airplanes and helicopters and have electric motors. They vary depending on passenger and cargo capacity, number of rotors, and range. Some are Electric Short Takeoff and Landing (eSTOL) aircraft with fixed wings to operate on runways or other open spaces. There are also Electric Vertical Takeoff and Landing (eVTOL) aircraft that can launch from just about anywhere, including new vertiport facilities that are similar to current heliports. AAM also includes Small Unmanned Aircraft Systems (sUAS), which are commonly referred to as drones and have fixed-wing or rotary-wing designs with a total weight usually less than 55 pounds.

## Won't AAM aircraft cause more pollution and noise?

AAM typically use electric motors to fly cleaner and quieter than aircraft with internal combustion engines that require aviation fuel. A Deloitte study says AAM usage of electric and hybrid eVTOL aircraft would reduce the number of ground-based passenger and cargo delivery vehicles in operation, improving air quality and decreasing reliance on fossil fuels. Smaller eVTOLs are expected to fall well within current noise guidelines, and noise-reducing technologies hold promise for larger electric aircraft to be good neighbors as well. Some eVTOL prototypes are already almost 100 times quieter than helicopters during take-off and landing.

## Will it be safe to fly in an AAM?

The innovative new aircraft being designed for AAM operations will only grace U.S. skies after the Federal Aviation Administration provides assurance that they are safe to transport passengers or fly over communities. Meanwhile, NASA is developing systems

that will automate safety assurance and risk management functions performed manually today. This information will provide aircraft operators, airport/vertiport managers, and air traffic controllers with vehicle performance parameters and improved situational awareness to reduce human error and ensure safety in the air and on the ground.

## Where will AAM fly?

AAM consists of Regional Air Mobility (RAM) aircraft, which have longer range capabilities, as far as 250 miles, to connect distant markets, Urban Air Mobility (UAM) aircraft, which provide short-range connections within cities and suburbs, and Small Unmanned Aircraft Systems (sUAS) which are lightweight and operate within a few miles. UAM will help passengers seeking a faster, cheaper, and cleaner way to commute, and eliminate parking expenses, than driving a car or truck. RAM will connect market pairs between rural airports and urban centers, which are not currently served by traditional air carriers. sUAS will primarily be used for deliveries, inspections and surveying.



*Regional Air Mobility (RAM)*

## How will AAM keep from interfering with other aircraft?

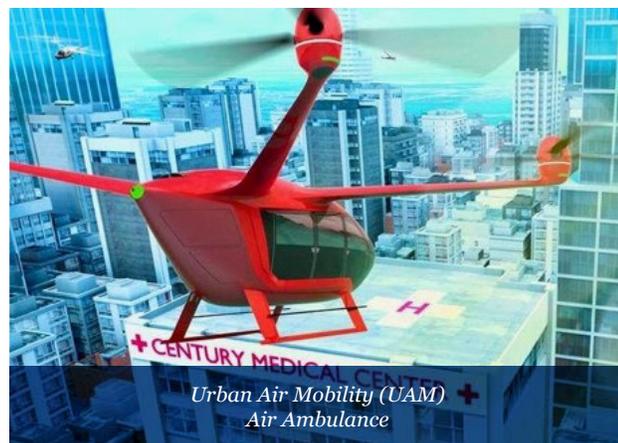


*Virginia Tech Mid-Atlantic Aviation Partnership (MAAP)*

The first AAM use cases, such as RAM, will operate with guidance from the existing Air Traffic Control (ATC) systems with human controllers because they're similar to Conventional Takeoff and Landing (CTOL) aircraft. But as the AAM industry grows to thousands of flights per day and becomes automated, and drones are permitted to fly beyond visual line of sight, AAM will need its own ATC system. NASA and FAA are currently developing Uncrewed Traffic Management (UTM) systems to ensure safe vehicle separation, especially below 5,000 feet where most AAM will operate. Virginia Tech is a leading center for UTM research.

## What are other uses for AAM?

AAM will help enhance and save lives. RAM and UAM will serve as air ambulances to quickly transport patients to hospitals. AAM will enhance economies in rural communities by providing connections to business opportunities in cities, support factories and warehouses by shipping high-priority parts and cargo, and shuttle tourists to Virginia's recreation and historic sites. UAS will deliver organs, blood, and vaccines faster than cars and trucks, and survey fires and crime scenes from the air to help public safety dispatch the proper ground response. And researchers and businesses will develop new products and services with AAM.



## Do AAM aircraft fly in bad weather?

Virginia has a wide range of weather, including severe rain and lightning, high winds, hurricanes, and snow and ice storms. While these meteorological events affect all transportation modes, the initial AAM aircraft will be more sensitive to weather-related disruption due to their operations in the lower altitudes of the airspace where severe weather typically occurs more often. Business cases developed for AAM will have to consider the weather's impact on their schedules and costs. The industry will also need to collaborate with micro-weather data analytics and forecasting providers for targeted insights that will inform decisions for safe AAM operations.

## Will taxes increase to pay for AAM?



Governments will need to invest in AAM, much like they do for other transportation networks like roads and mass transit. However, much of the cost for AAM will be offset by public-private partnerships and user fees. AAM will also make a large contribution to the tax base as the workforce expands and services are enabled. Total tax revenues of \$2.87 billion is projected to 2035. Local and state governments account for \$502 million and \$572 million and \$1.8 billion for federal.

This will allow governments to support AAM and fund other community programs such as public safety, education and healthcare.

## How much is a drone delivery?

Drone delivery services are already operating in Virginia and many other states. They offer a variety of items for delivery up to ten pounds in as little as 30 minutes for \$3.99. Drone deliveries will increase as soon as the FAA permits flying beyond-visual-line-of-sight (BVLOS), which will expand delivery areas.

## How much will it cost to fly in an AAM?

An AAM passenger might pay from \$2.25 per mile to as much as \$11 per mile for short hops, depending on several factors. For example, using the lower cost range, going from Tysons Corner to Baltimore-Washington International (BWI) Airport could be \$75 for the 15-minute flight. That's about the same fare in a ride-sharing vehicle, which would take about one hour. However, driving on the road may cost more and be longer because of the typical traffic congestion in the region.



## Will AAM be available near my home or office?

Planning is underway to integrate AAM into Virginia's transportation network. Presently, 95% of Virginians live within 30 minutes of one of the state's 66 public use airports, which will be convenient for taking RAM flights. There are also 85 public heliports, many of which can be converted to vertiports for eVTOL operations in urban areas. New vertiports will also

be built after standards and regulations are established. There are also significant cost advantages to developing an AAM network compared to expanding the highway and rail systems.

## Will the military use AAM?



The U.S. Department of Defense continues to be a pioneer in military aviation by leading the development of AAM. Already, drones have proven to be critical tools for warfighters. Last year, the Army flew its first electric aircraft. And the Air Force has launched the Agility Prime program to partner with industry to field transformative vertical lift air mobility systems. With the Pentagon and several military bases in Virginia, AAM would offer a new option for defense officials and contractors to shuttle between these installations in a fraction of the time it would take to drive.

## What educational opportunities are available for careers in AAM?

Virginia is in a strong position to meet AAM's future workforce demands. Several four-year universities offer courses and programs to prepare students for careers to support the AAM/sUAS economy. The state's 23 community colleges are developing programs in operations and maintenance. The Virginia Department of Education (VDOE) is expanding STEM educational opportunities for students and recently approved a new Career and Technical Education (CTE) course in sUAS that can be offered by any high school. Also, the Virginia Space Grant Consortium (VSGC) works with education institutions at all levels to foster education and training for emerging AAM workforce needs.

## When will AAM be ready to fly?

According to the Vertical Flight Society, approximately 700 eVTOL aircraft concepts and designs are being developed by about 350 companies worldwide. Small eSTOL airplanes are being converted from internal combustion to all-electric, and new all-electric models are being tested. The FAA expects experimental operations to start in early 2025 or when safety requirements set by the agency have

been met. While the cargo mobility market will likely be the first to grow and achieve scale, Deloitte predicts the passenger mobility market to start slowly but catch up and exceed cargo services beyond 2035. sUAS are already in widespread use.



*Passenger Air Mobility*



### *For more information*

**Tracy Tynan**

*Director,*

*Virginia Unmanned Systems Center*

*Tracy.Tynan@VirginiaIPC.org*

*804.840.6127*