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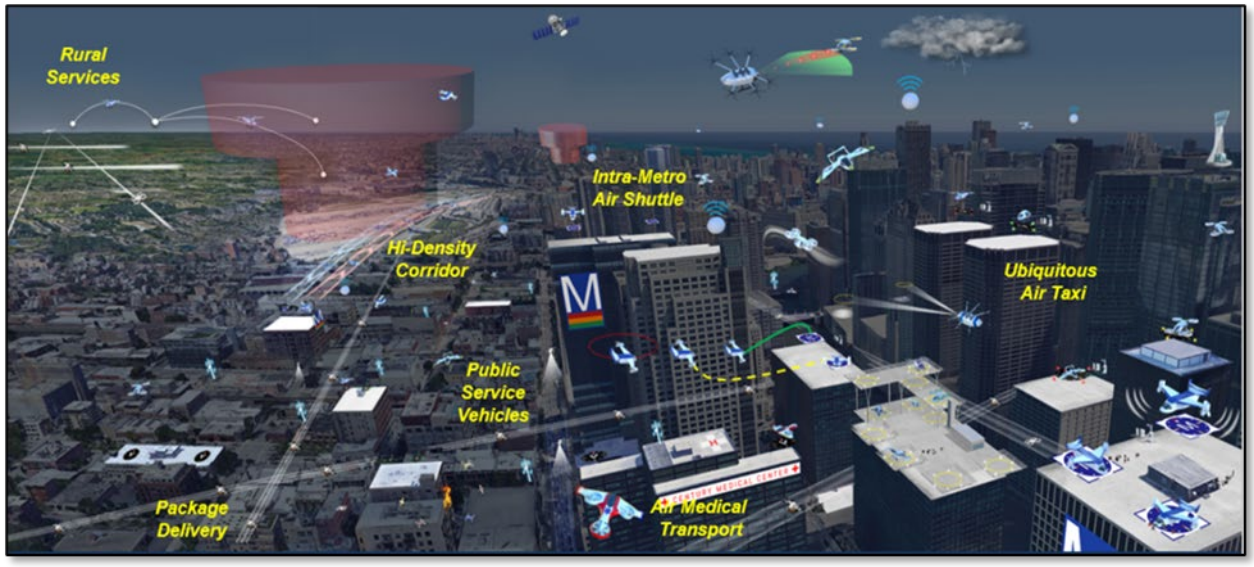


Advanced Air Mobility Comes to Arkansas

Aerospace Sector Expansion Opportunities Will Lead to New Jobs, Improved Workforce Mobility, Dramatic Healthcare Outcomes and Measurable Reduction of the Rural/Urban Divide.

AAM White Paper
September 2021

WALTON FAMILY FOUNDATION

NEXA Advisors
A NEXA Capital Company

VISION OF ADVANCED AIR MOBILITY FOR ARKANSAS

Many companies and agencies intend to facilitate development of airspace above America's cities and exurban areas, delivering advanced mobility options and benefits to society, especially residents, businesses, disadvantaged communities, Indigenous peoples, and emergency responders. Arkansas accepts this. The VISION for Advanced Air Mobility (AAM) will be to deliver equitable, inclusive, resilient, intermodal, and accessible transportation with Zero-Emission Aircraft. A centralized strategy is planned, nationally, regionally, and statewide, with the inclusion of stakeholders across government, industry, academia, and the investment community.

ABOUT THIS PAPER

This paper is about new mobility options available to metropolitan and rural areas of the United States that will make use of underutilized airspace, and their expected societal and economic benefits. It is also an exploration of how a State such as Arkansas may become an early adapter of AAM in North America, with the opportunities and challenges involved in being among the first. Our question is: How should the State go about building an enhanced, sustainable, and safe transportation economy, with the goal of increasing accessibility and quality of life for all communities?

Audiences are municipal and government agencies, transportation and social policy experts, the aviation and tech industries, research organizations, the media, universities, community leaders and, most significantly, residents of the Greater Arkansas region.

Several companies and individuals are responsible for the research and preparation of this document. Researched and prepared by NEXA Advisors LLC, the team included transportation economists and experts in aerospace transportation systems. Thanks go to authors Eleanor Herman, Phillip Dyment, Chase Leeby, Benjamin Merran, Hank Krakowski and Ian Anderson.

SPONSORS

This paper was sponsored by the Walton Family Foundation (WFF) which, at its core, is a family-led foundation. Three generations of the descendants of its founders, Sam and Helen Walton, and their spouses, work together to lead the foundation and create access to opportunity for people and communities. WFF believes the best ideas can come from anywhere, so stay open to new thinking from all over. And WFF partners with those who are closest to the problem because they're usually closest to the solution.

WFF work in three areas: improving K-12 education, protecting rivers and oceans and the communities they support, and investing in the home region of Northwest Arkansas and the Arkansas-Mississippi Delta. In 2019, the foundation awarded more than $525 million in grants to further its mission.

FURTHER DEEP APPRECIATION

We express our deep appreciation to the more than 30 individuals and organizations, most in the Bentonville, AR area, contributing their time and perspectives to the preparation of this paper.

ON THE COVER:

Imagery of Advanced Air Mobility at work (NASA).

Contents

Executive Summary

A new form of personal mobility will soon transform the lives of Arkansas residents, businesses, and public responders. Advanced Air Mobility (AAM) uses electric Vertical Takeoff and Landing (eVTOL) aircraft and remotely piloted aerial systems (RPAS), often known as drones, to perform countless tasks not traditionally performed by existing aircraft, and in airspace not traditionally used.

Passengers will take short, quiet, carbon-free flights within cities and suburbs, and between rural airports and urban centers. They will also fly between city pairs and rural airports at awkward distances currently not served by airlines, hopping on quick flights from Northwest Arkansas National Airport and Arkansas International Airport to places like Texarkana, Memphis, Jackson, Oklahoma City, Dallas, Kansas City, and St. Louis. In addition, AAM airport shuttles—operating in an environment already set up for air traffic and passengers—will whisk people from Clinton National Airport to downtown Little Rock and other strategic locations. And, further down the road, the public will be able to order an air taxi using a phone "app" to fly them to their desired destinations much like today's road-based Uber.

Figure 1 - Joby Aviation is an aerospace industry leader in eVTOL development and already relies upon key components made in the State of Arkansas (www.jobyaviation.com)

AAM will save lives by quickly and efficiently transporting critically ill patients, as well as organs, blood, plasma, vaccines, PPE, and cancer-treating isotopes. Fire and police departments will use it to surveille fires and crime scenes from the air to dispatch the proper ground response. AAM will bridge the rural-urban divide, allowing individuals who live at greater distances from metropolitan areas to more easily commute for better-paying jobs.

The new technology will enhance tourism and efficiently ship high-priority cargo. And AAM will energize businesses, universities, and students in technical fields. With diligent preparation, Arkansas will

become a center for multi-dimensional mobility, attracting manufacturers and investment from around the country.

Perhaps most exciting for the State of Arkansas, according to our findings the upswing in economic activity due to Advanced Air Mobility will, between now and 2045:

- **Bring nearly 4,000 new full-time equivalent (FTE) jobs to the State.**
- **Create $3.6 billion in new economic activity and related stimulus.**
- **Add 10 or more percent to the growth of Arkansas' existing aerospace sector.**
- **Produce $629 million in local, State, and Federal tax revenues.**
- **Deliver substantial catalytic benefits in healthcare and STEM education that will shrink the rural-urban divide and lift the State's economy in ways beneficial to the south-central U.S.**

This paper explains what AAM is, where the rapidly transforming new sector stands today, and the obstacles standing in the way of its immediate implementation. We will explore the social, business, and economic benefits, and why Arkansas is extremely well suited to become an early AAM user given its rural-urban divide, its healthcare needs, and its strong aerospace and STEM education ecosystems. We will also investigate the various uses of these aircraft to transport people and cargo.

Figure 2 - NASA is helping set the stage for rapid introduction of electric aircraft into urban and regional markets.

We will discuss our interviews with some 30 stakeholders in the State of Arkansas—experts in aerospace, business, government, transportation, economic development, real estate, logistics, academia, and healthcare, individually and in focus groups. These leaders in their fields described their vision for AAM and its many benefits to government, businesses, universities, and residents throughout the region.

Finally, we will detail the methods we used to arrive at our findings for jobs, revenues, and overall economic impact.

What is Advanced Air Mobility?

Advanced Air Mobility is a new concept of air transportation that moves people and cargo between places not conveniently served by surface transportation or underserved by aviation—local, regional, intraregional, urban—using revolutionary new aircraft that are only just now becoming possible. AAM covers manned and unmanned aircraft including electric Vertical Takeoff and Landing (eVTOL) aircraft and Remotely Piloted Aircraft Systems (RPAS), also known as drones.

The new aircraft are possible due to state-of-the-art technologies—from lithium-ion batteries to light-weight electric motors, advanced composites, aircraft flight automation processes, and safety systems. Lithium-ion batteries may fly these aircraft for 150 miles before a recharge. Some of the first aircraft may be propelled by a combination of batteries and fuel (hybrid) for longer-range trips. At some point further in the future, hydrogen fuel cells will be an alternative.

Market analysis performed by companies such as Morgan Stanley and UAM Geomatics (Figure 3) forecast a global opportunity worth more than $1 trillion through 2045, with much of this business flowing into the regions eager to adopt this service. With considerable direct AAM industry support from NASA, and billions of dollars currently committed by the aerospace sector, the stage is being set for AAM at the local and State levels across America.

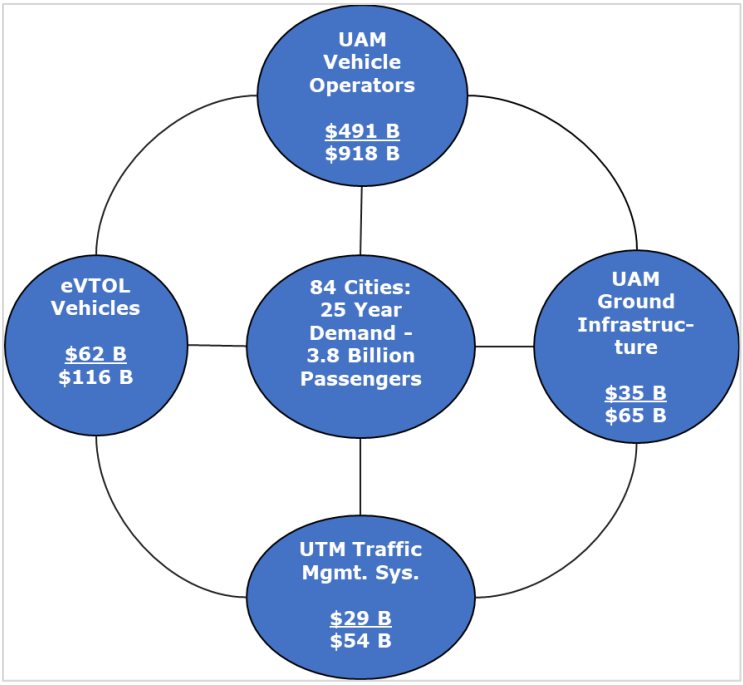


Figure 3 - According to UAM Geomatics, Inc., Morgan Stanley and other firms, the global AAM opportunity is worth over $1 trillion dollars and growing. Here the four supply chains for AAM are detailed. The upper figure is the market opportunity; the lower figure is the economic opportunity.

Many cities are planning to introduce AAM in the next few years—including Singapore, Munich, Paris, Dubai, Vancouver, Los Angeles, and Dallas—as a strategic solution to mitigating sprawl and congestion. That is why until fairly recently, this new form of aviation was known as Urban Air Mobility (UAM). However, the new technology will also bring numerous benefits to rural areas such as Arkansas: new jobs, revenues, economic opportunities for rural populations, improved access to quality healthcare, and expanded Medevac rescue, to name a few. Given its many uses in both urban and rural areas, the name has evolved to become Advanced Air Mobility.

In the past two years, the Advanced Air Mobility industry has undergone a transformation from a place of questions and hypotheses to one of dramatic non-stop developments in technology, partnerships,

and investments. This industry—which will radically change the mobility of passengers and cargo—has been taking shape exponentially in recent months, with new announcements on an almost daily basis.

Some 500+ companies around the world—from start-ups to aerospace giants—are developing AAM aircraft or the systems they will be relying upon for flight. Several companies have become early leaders in the race to the finish line. For example:

- California-based Joby Aviation plans to launch air taxi services by 2023 in its effort to be one of the first to commercialize eVTOL aircraft for passenger use in the United States. Joby is developing a four-passenger, emissions-free aircraft, which can travel up to 150 miles at speeds up to 200 miles per hour. The company is beginning construction on a 450,000 square foot manufacturing facility, designed in conjunction with Toyota, to take advantage of automobile manufacturing processes.

- In March 2021, Lilium, based in Munich, announced that its first aircraft, the seven-Seater Lilium Jet, is expected to be produced in the next few years. The aircraft, whose prototype received its CRI-A01 certification from the European Union Aviation Safety Agency (EASA) in 2020, has a maximum range of 155 miles and a cruise speed of 173 mph, with zero operating emissions. Lilium aims to commercialize its electric aerial ride-sharing services in cities across the globe by 2025.

- In April 2021, Blade Urban Air Mobility, a services provider in New York City, announced a commitment to purchase up to 20 ALIA aircraft from BETA Technologies in Vermont. The aircraft is envisioned to carry five passengers plus a pilot for delivery in 2024. A month later, Blade ordered 30 eVTOLS from California-based Wisk.

- Another AAM leader based in Germany, Volocopter, expects certification by early 2023 for its two-seater, piloted VoloCity aircraft, a multicopter with 18 rotors, carrying a pilot and one passenger, with a range of 21 miles at speeds up to 68 mph. The company expects to launch commercial air taxi services before 2024 and began testing its eVTOL in France in 2021.

Figure 4 - Helicopter charter operator Blade has ordered eVTOL aircraft from Beta Technologies.

- In July 2021, United Airlines ordered 200 ES-19 electric fixed-wing aircraft from Swedish electric aviation startup Heart Aerospace. The ES-19 is a regional airplane that seats 19, can fly up to 240 miles, and runs on batteries and electric motors instead of traditional jet fuel.

- United Airlines is just one of many passenger carriers ordering eVTOL and electric fixed-wing aircraft. Orders for some 1,200 AAM aircraft have been placed by Virgin Atlantic, British Airways, UPS, RAVN, Qantas, and others.

- In 2021, to launch AAM in a leading role, Ohio became the first US state to finalize an ArcGIS mapping of its entire area with tens of thousands of data points including roads, bridges, fire stations, warehouses, airports, heliports, manufacturing facilities, logistics centers, etc. for full-scale AAM implementation. As far as we know Arkansas is now the second.

Operational Readiness

Notwithstanding the billions announced in recent funding, the airline orders, and other exciting news, the AAM industry is currently in a state of early development and certification. Aircraft developers must finalize their designs. The FAA must decide on new air worthiness and operational certifications and regulations. New air traffic management systems must be developed and certified to ensure safe flight along predetermined tunnels in the sky. Vertiports—heliports for the new aircraft with battery charging stations and passenger amenities—must be site-selected and constructed. Routes must be planned, considering zoning, safety, noise and security restrictions, and public opinion.

Given everything that still needs to happen, most cities and states are looking at a minimum of three-to-five years before the first aircraft are transitioned into the airspace for limited missions. There are numerous Advanced Air Mobility aircraft at various stages of the Certification Process by the Federal Aviation Administration (FAA). Some aircraft are manned with pilots and others are unmanned. The manned aircraft are at the front of the certifications line with the first issuances likely in late 2022. The first Commercial Operations are being planned for early-to-mid 2023. By that time, many subsequent aircraft and operators will be well on their way to certification. With this forecast, an increasing inventory of commercial AAM will begin to enter the marketplace by late 2023/early 2024.

The certification pathways for AAM to take off are as follows:

Aircraft

New AAM eVTOL aircraft are unique to the FAA and have not been certified previously, but because the process is aligned with how light aircraft are certified there is full confidence that this two to five-year process will yield a varied fleet of certified AAM types shortly.

Operators

This is the simplest pathway as existing helicopter and small commercial aircraft operators will be able to easily adopt AAM and integrate them into their existing Operator Certifications. Many such applications are already underway with the FAA. New operators will take a bit longer to become certified but should be certified well before the AAM aircraft are ready for service.

Remote Traffic Management

New ways of air traffic management (called Remote Traffic Management or RTM) must be devised to safely direct and separate AAM aircraft without relying on traditional air traffic controllers, whose numbers are already insufficient without having to monitor the addition of hundreds or thousands of new flights a day.

Vertiports

Regulations and certification must be created for vertiports, many of which will be upgraded heliports, which are already subject to regulatory approval and oversight. It is anticipated that given the low-noise, agility, reliability, and simplicity of AAM aircraft, AAM infrastructure should naturally be subject to a less burdensome regulatory process than heliports undergo. New vertiports will require environmental studies, which are often time-consuming.

Arkansas' Strong Aerospace Ecosystem is the Starting Point

AAM brings opportunities for existing aerospace companies as well as new ones that will be created. The State is home to nearly 180 aerospace and defense companies, including Lockheed Martin, Dassault Falcon Jet, Raytheon, Aerojet Rocketdyne, and Esterline (Figure 5). Aerospace products and parts are the State's leading export, bringing in some $1.8 billion a year and employing more than 10,000 people in skilled technical jobs such as machinists, mechanics, engineers, and researchers. The average annual salary for aerospace and defense jobs was $62,875 in 2017. There are approximately 2,475 Airframe and Powertrain (A&P) licensed mechanics in the State. As a result, Arkansas's aerospace industry is already working on projects related to AAM.

Figure 5 - Arkansas is an aviation leader and home to nearly 180 aerospace and aviation companies, including America's largest, Lockheed Martin.

The Leading Arkansas Advanced Air Mobility Use Cases

This section discusses the applications of AAM that will provide the most significant benefits to Arkansas residents, businesses, and first responders. AAM for Arkansas offers a wide-ranging potential for a variety of uses that can be configured with government/public-funded backing, private investment, or perhaps Public-Private-Partnerships. In each case, they must be properly scaled, tailored, designed, and cost justified with a solid business case in mind.

For all use cases, we must bear in mind that Arkansas has a wide range of weather: severe thunderstorms, tornado-producing super cells, and high wind events during summer months. Fog can be significant in the spring and fall. In winter, snowstorms and severe ice storms are possible. While these meteorological phenomena affect all transportation modes, the initial AAM aircraft and operations will be more sensitive to operational disruption than existing ground, aircraft, and helicopter operations. Business cases developed for such AAM operations will need to factor in these weather patterns as well to account for a reasonable financial impact of this reality.

Arkansas Statewide Healthcare Access

Of the many areas where Advanced Air Mobility (AAM) can provide new tools and capabilities, perhaps the most impactful and socially important is healthcare. This is particularly true in states where the population is spread out over a large geographic area, as world class medical facilities are generally concentrated in urban centers. More than one million Arkansans live outside northwest and central Arkansas, without easy access to top level hospitals. Some entire counties do not have a hospital.

In January 2021, Arkansas registered:[1]

- 1 Level 1 adult trauma center
- 28 critical access hospitals
- 104 rural health clinics
- 116 federally qualified health center sites located outside of urbanized areas
- 22 short-term hospitals located outside of urbanized areas

Figure 6 - University of Arkansas for Medical Sciences has been designated by the American College of Surgeons as the State's only adult Level One Trauma Center, signifying UAMS can provide the highest level of trauma care for the most serious and urgent cases.

[1] www.healthy.arkansas.gov

Level 1 trauma centers, advanced hospitals, and health care centers are impossible to cost-justify in rural and low-density areas. For instance, the State's only adult Level 1 Trauma Center is located in Little Rock. And the State is in danger of losing what rural hospitals and other care facilities it has. According to a study by Navigant, from January 2012 to September 2020, 57 rural hospitals closed in states neighboring Arkansas. The Arkansas Center for Health Improvement pointed to Medicaid expansion in the State as a possible reason for its success in fending off closures.

However, according to the study, hospitals in Arkansas remain vulnerable, especially as younger residents migrate from rural areas and leave behind older populations with "high health-risk burdens, low median family income, limited provider capacity, and a deteriorating acute care safety net." The study found that 18 out of 49 rural Arkansas hospitals (36.7%) are at risk of closing in the next few years.[2] Moreover, rural healthcare facilities struggle with hiring trained and certified healthcare providers.

Figure 7 - Boston Mountain Rural HC, Inc. is typical of a rural clinic network having limited available health services.

These trends are even more alarming when considering Arkansas' overall national ranking in the Commonwealth Fund's annual Scorecard on State Health Care System Performance: it remains unchanged from 2020 at 42nd out of the 50 states and the District of Columbia.[3] Several measures contributed to Arkansas' worse-than-average overall performance, including the number of adults who report poor or fair health, hospital 30-day mortality rates (i.e., death within 30 days following hospital discharge), and the number of children without a medical and dental preventive care visit, all measures for which Arkansas is ranked last among states.[4] Measures for which the State's performance declined the most included the number of adults without all recommended vaccines and the number of adults with any mental illness reporting unmet need, a worrying trend in the lead-up to a year in which we face a global pandemic and its associated stressors.[5]

The concept of AAM to provide augmented healthcare services in outlying areas within Arkansas and adjoining states is compelling. AAM is being designed to offer time savings, mobility, ease of use, and lower expense, all of which will help save lives. The new AAM aircraft offer an ability to efficiently bring patients to the larger, more urban facilities where staffing is robust, and at times it will be used to

[2] https://stacker.com/stories/5419/states-most-rural-hospitals-risk-closing
[3] » Arkansas's Ranking Unchanged in Latest Healthcare System Performance Report (achi.net)
[4] Ibid
[5] Ibid

transport those providers and professionals to the rural areas when needed. The Arkansas Department of Health is working to improve the health of all Arkansans and reduce health inequity. We see the introduction of AAM as playing an important role in achieving this goal.

The scenarios below discuss some of the possible uses of AAM aircraft to assist in healthcare.

Scenario #1: AAM augments existing EMS operational infrastructure for First Responder events

Some 44 percent of Arkansas' population of three million lives in rural areas, far from major trauma centers, and are at severe risk from a delay of treatment if they sustain a serious accident, heart attack, or stroke. Due to the current scarcity and expense of helicopters, the only fallback is ground-based transport (ambulances). Depending on the ER location, ground-based options may experience critical time-in-transport issues, particularly if the ER event is in a truly rural area or is widespread, affecting road travel. This creates a triage situation where only the most critical patients receive timely helicopter transportation leaving other critical/less critical patients with slower, less reliable options.

Ambulance response times are crucial in saving lives. Conventional Medevac helicopters take 10-13 minutes to prepare for lift-off, while eVTOL aircraft will take only about one minute, depending on the final designs. In the case of a critically ill or injured person, every minute before help arrives means there is a greater chance of death, brain damage, and other serious complications. With regards to cardiac arrest, for every minute the victim waits to receive defibrillation, his or her odds of survival decrease by about 10 percent.

Figure 8 - Arkansas-based Survival Flight, Inc. workers stand next to a helicopter used to transport COVID-19 patients. New AAM eVTOL vehicles will cost less to operate and have less environmental impact.

Moreover, in the case of traffic accidents, a helicopter needs a 100-foot by 100-foot space to safely land. Sometimes, on a gridlocked road, such a space is difficult to find. Police must first clear out a space, or the helicopter must land further away and its team travel toward the victim with a stretcher, again wasting time. eVTOLs, however, will need much less square footage to land safely.

Medevac helicopters have saved countless lives, but they are expensive, and their transport costs are usually not fully covered by insurance. The average price of a Medevac transport in the US is $25,000, though many are double that. Patients are surprised by bills in the tens of thousands of dollars. It appears that the eVTOL aircraft in development will be far less expensive to purchase, maintain, and operate than current Medevac aircraft. An eVTOL alternative would save financially strained hospitals and healthcare systems millions of dollars a year, and patients thousands of dollars of costs uncovered by health insurance.

Medevac helicopters are expensive and limited in number, yet they provide good lift, speed, and heavy weather capabilities. As a result, there will always be a need for them. AAM, though likely more susceptible to weather, offers numerous new capabilities to augment helicopter operations. For

instance, many hospital centers in densely populated areas do not use Medevac helicopters as the noise is a nuisance to the surrounding community. But given the potentially much lower noise signatures of the new aircraft, more urban hospitals may opt for life-saving Medevac eVTOLs.

AAM would be a force-multiplier to existing helicopter medical and ambulance services rather than competing against them. It is likely that existing service companies will want to add AAM as an additional service offering to complement their current fleets.

Scenario #2: Provide non-critical patient transport

Not everyone who is ill or injured needs immediate rapid transport to a Level 1 or advanced healthcare center as does a patient who is so critical that a helicopter transport is clearly justified. However, delay of care can negatively impact the outcomes of some patients, a need that AAM could fill easily fill. eVTOL aircraft could pick up patients in rural areas for visits to urban hospitals.

Figure 9 - Due for commercial release in 2023, Vertiia could be the world's first eVTOL aircraft designed exclusively for aeromedical transport. Its small dimensions allow for close-in operations at the site of patient transport.

Scenario #3: Clinics and screening events

This is perhaps one of the more intriguing areas where AAM could provide a new and cost/time-effective capability to deliver healthcare services in Arkansas. While Telehealth took off with the beginning of the COVID-19 pandemic, and remains popular for its convenience, in many cases a doctor must physically examine the patient to diagnose the illness and recommend proper treatment. Medical teams and their equipment could make routine travel to rural town-centers for:

- Screening & monitoring events
- Day Clinics to visit Telehealth patients and others
- Community outreach and health seminars with State experts and subject matter experts

Scenario #4: Delivering Medical supplies

The regular and on-demand need of medicines and medical supplies can be quickly and efficiently delivered by AAM to any area within Arkansas from various distribution centers as needed. This would be particularly useful with:

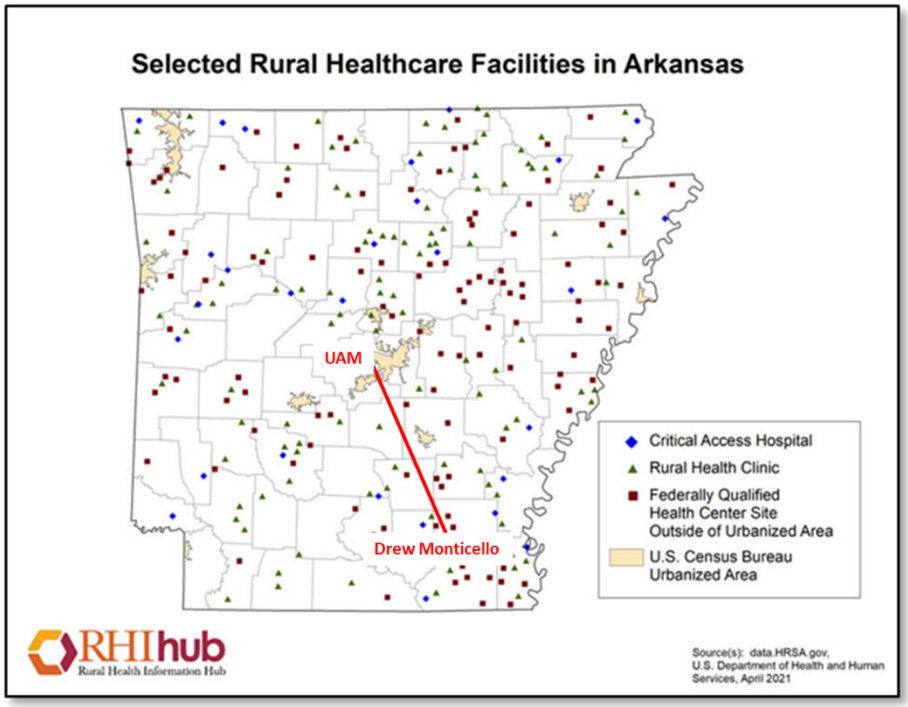


Figure 10 - In the map above, ground transportation between Little Rock U of Arkansas Medical Center (Level 1 Trauma) and Monticello, AR takes 1:29 one way while an eVTOL aircraft at 172 mph would take 27 minutes.

- Blood, plasma, isotopes, and organs
- Oxygen, tents, water, saline, etc.
- Medicines and vaccines, which have a close-in shelf life
- Needs of a surge event (local illness or accident which requires immediate concentrated intervention or follow-up)
- Pharmacies that may have a critical shortage where ground-based delivery would not be timely

Currently, there is a need for medical package deliveries to service far-flung communities. A principal mission of Walmart is to provide easier and less costly access to the everyday things that people need. With Zipline, an AAM drone company specializing in the delivery of small packages, Walmart is expanding its mission to include access to healthcare. Zipline will be partnering with Walmart to help provide goods and medicine via their drone aircraft.

According to Tom Ward, Senior Vice President of Customer Products, "Zipline will operate from a Walmart store and can service a 50-mile radius, which is about the size of the State of Connecticut. And not only does their launch and release system allow for quick on-demand delivery in under an hour, but it also eliminates carbon emissions, which lines up perfectly with our sustainability goals. The operation will likely begin early next year, and, if successful, we'll look to expand."[6] Incorporating Zipline's drone technology into Walmart's established store and pharmacy network will provide Arkansans with improved access to the medicine and treatments needed to improve health outcomes. The introduction of remote medical care services will be one the first of its kind, and it will begin in Arkansas.

[6] Walmart and Zipline Team Up to Bring First-of-its-Kind Drone Delivery Service to the United States

Passenger Use Cases for Arkansas

Detailed below are several use cases that will provide enhanced mobility options for Arkansas residents, businesses, and public safety providers.

Airport Shuttle Services

Airports will be among the first users of eVTOL aircraft as they already have most of the infrastructure required. Departing passengers will board a shuttle downtown or at carefully chosen locations throughout the region and arrive at the airport quickly, without the hassle of parking or taking a long taxi ride. Similarly, arriving passengers will take a shuttle from the airport to downtown or to a vertiport close to their home or office.

Figure 11 - Walmart and Zipline are working to bring medicine delivery and rapid laboratory testing to Arkansas residents through Walmart stores and pharmacies statewide. A Zipline facility built into a Walmart retail location is shown.

Shuttles could depart at scheduled times or could be on-demand. Airlines such as United, Delta, Virgin Atlantic, and many others are already in the early planning stages for airport shuttles to serve large metropolitan areas. Some airlines are already ordering prospective aircraft and making investments in those companies (Figure 12).

Figure 12 - American Airlines has pre-ordered over $1 billion of eVTOLs to serve customers between their remote locations and its airport terminals.

The Arkansas airport system has 90 airports, which includes eight airports with scheduled commercial airline service and 82 general aviation airports. The 90 airports generate billions of dollars in economic activity and create thousands of quality jobs. For instance, in 2019 Arkansas' commercial airports served 880,000 visitors, supported 26,000 jobs and a payroll of $907 million, and created a total economic output of $2.4 billion. The smaller general aviation airports—which serve business travelers, crop sprayers, and pilot training, among other things—saw 330,000 annual visitors, supported 5,200 jobs with a payroll of $167 million, and

generated a total output of $468 million. The introduction of eVTOL aircraft to Arkansas's 90 airports will greatly increase connectivity, revenues, jobs, and passenger satisfaction.

Figure 13 - Northwest Arkansas Regional Airport (XNA) in Bentonville employs about 100 full-time workers, over 200 airline and concession employees, and is the gateway commercial airport for access to three of the largest companies in the US: Tysons, Walmart, and JB Hunt.

Regional Air Mobility Services

Many cities find themselves at awkward travel distances from each other. Travelers ask if it is worthwhile to drive to the airport, park, take the bus to the terminal, go through security, wait, and hope the flight takes off on time. As a result, many people just drive two, three, or even four hours instead of flying. Cities could benefit greatly from reliable and ubiquitous eVTOL Regional Air Mobility services. For instance, downtown Little Rock is 194 miles from Fayetteville and 138 miles from Memphis (Figure 14). Imagine hopping on an eVTOL aircraft at a convenient location in downtown Little Rock and reaching the center of Memphis or Fayetteville in thirty minutes.

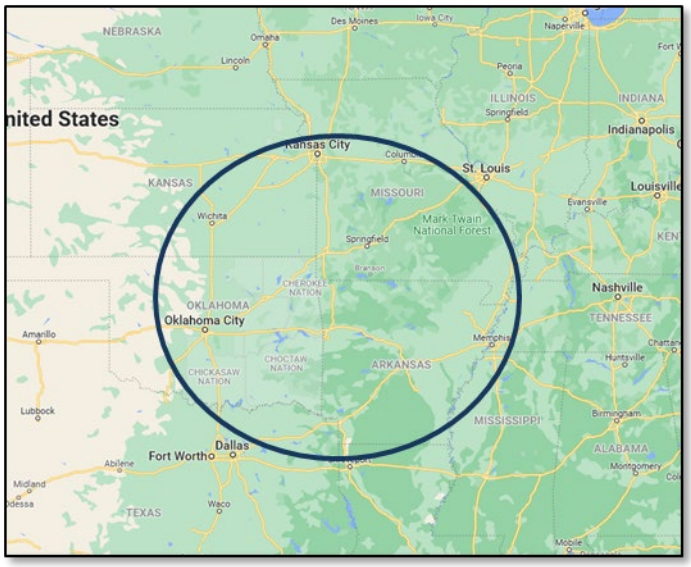


Figure 14 - In the near future, eVTOL electric aircraft will be able to cover distances of about 250 miles, giving Bentonville Airport non-stop access to Memphis, the suburbs of Dallas, and even St. Louis.

Corporate and Business Aviation Services

Arkansas has 431 private aircraft located mostly at executive airports across the State, particularly in NW Arkansas and the Little Rock area. eVTOL aircraft will solve the "last mile" or "door-to-door" challenge, complementing the flight department's existing aircraft with electric or hybrid aircraft capable of moving a team of key people quickly from the home office to a

meeting in the city center, or to an outlying airport to depart on a business aircraft or scheduled airline flight.

In addition to last mile trips, companies that have numerous business locations within Arkansas—trips within the limited range of eVTOLs—could use AAM aircraft between facilities, allowing greater coverage and more frequent visitation at reduced cost.

Figure 15 - Uber Elevate, now a division of Joby Aviation, has promoted a vision for eVTOL operation that caters to corporate travelers valuing convenient urban and regional mobility.

Companies across the nation have long benefitted from business aviation, as demonstrated by a host of studies, surveys, and other types of analysis. For example, a 2017 study from NEXA Advisors measured the effects of business aviation on shareholder value creation of the S&P 500. The report found that business aircraft make a substantial difference in how a company performs its mission, in many cases generating significant gains in shareholder value. Increased mobility was at the core of these gains—satisfying management's need for greater organizational agility, knowledge integration, and transaction speed. Profitable companies create jobs, stimulating the regional economy.

Another powerful business application of eVTOL aircraft would be for daily shuttle services between a company's own offices or facilities. The business aviation community is actively discussing adding Advanced Air Mobility options to their corporate flight departments[7].

On-Demand Air Taxi Services

While large cities have traditional public transportation systems such as metro, bus, taxi, and Uber/Lyft, AAM would provide similar services but with faster response and transportation time. Discussions with Walmart, Tysons and JB Hunt generally conferred strong interest in moving employees and top executives through on-demand AAM services within Northwest Arkansas, and regionally to adjacent factories, facilities and business centers.

[7] *Business Aviation Embraces Electric Flight - How Urban Air Mobility Creates Enterprise Value*, NEXA Advisors 2021

Figure 16 - As eVTOL aircraft emerge and become certified for operation above cities and regions, on-demand air taxi concepts will take hold. eVTOL aircraft will need landing pads called "vertiports" sited at convenient locations such as airports, hospitals, downtown, major trucking and distribution companies, and headquarters of large corporations.

One intriguing concept is the deployment of regional air taxis in a particular area of demand. Rather than being town or county specific, an AAM-based air taxi service could cover a 60-mile radius in a selected region and fly anywhere in that radius in less than 30 minutes for pick-up. These can be in rural areas, perhaps at the county seat, or suburban areas around the larger cities.

Tourism Services

The use of eVTOL aircraft for tourism will bring more visitors and their dollars to the State which is already a regional tourism center for its natural wonders. There are 52 State Parks in Arkansas, and the National Park Service manages seven properties. In 2019, 36 million people visited, generating $7.68 billion, $169 million in local taxes, $1.42 billion in travel-related payroll, and 69,000 travel-generated jobs.

Several existing helicopter-based tour operators are located near Fayetteville (the Ozarks and Branson, MO), North Little Rock, and West Memphis (Mississippi River tours). The one disadvantage of these operations are the noise profiles of both helicopters and airplanes. People enjoying the recreational areas on the ground are almost always annoyed by the constant noise of the aircraft flying over.

This annoyance can be greatly mitigated with AAM due to both the low noise and smaller aircraft size of these new electric aircraft. The lower cost of the aircraft compared to a helicopter should also bring down the passenger fares themselves, producing more customers and local acceptance. This would be a great advantage in these environmentally sensitive areas.

Remotely Piloted Aerial Systems Use Cases

Law enforcement, First Responder Support

The application of RPAS for local, State, and Federal Law Enforcement is obvious and presents many potential advantages that helicopters and airplanes do not:

- Much less cost and complexity
- Greater speed to crew and launch (perhaps as little as a minute or two)
- Less conspicuous due to smaller visible profile and lower noise levels
- Less environmental impact
- State-of-the-art electronic flight control and surveillance platforms (plug & play upgrades)
- Well suited for highway/road surveillance (speeding, unsafe drivers, accidents, hazards, etc.)
- If unmanned and electronic only—less physical threat from criminal activity as the aircraft would have no pilot
- Useful for event control (sports, concerts, natural disaster, hostage situations, etc.)
- Ideal to use in missing person/animal/escapee searches

Figure 17 – Both eVTOLs and RPAS can be configured for police and fire services to extend reach and better access remote locations quickly, ultimately saving lives.

Police departments around the country, including some in Arkansas such as Springdale, are already using remotely piloted aircraft to find missing persons, track suspects, and assist with crowd control. Such an aircraft covers more ground than an officer at greatly reduced risk.

In rural communities, these aircraft can quickly and efficiently cover large areas at very low cost. Police departments use them to find missing children, endangered adults, and criminal suspects, keep tabs on drug traffickers, search trails and parks for missing hikers, and cliffs and bluffs for fallen people. Sheriffs' offices use drones when deputies serve high-risk warrants to monitor any potential dangers to the officers.

Figure 18 - Public safety can be enhanced with remotely piloted aircraft.

First responder situations

AAM aircraft offer new tools to State regulatory authorities working with fire and rescue, HAZMAT, EPA, and weather emergencies:

- Monitor fire and hazardous cloud/vapor trajectories and dissipation
- Possible direct firefighting role if equipped (weight limitations may limit use)
- If unmanned (RPAS), they can fly into potentially toxic air environments for assessment, measurement, and mitigation (example, train derailment with leaking HAZMAT)
- Immediate post-disaster assessment (tornados, floods, earthquakes, fire, industrial)
- Overhead audio broadcast to public

Agriculture, Animal Husbandry, Forestry and Timber Management

One of the key industries in Arkansas is the production, processing, and distribution of various crops for both food and materials. Due to optimum soil quality, the east and southeast regions of Arkansas have a robust production of various crops from rice to corn. Arkansas is the number one producer of rice in the United States, and the crop contributes more than $4 billion to the state's economy each year. The state is also a large producer of soybeans, cotton, and cattle. RPAS aircraft will detect and pinpoint wildfires—which can quickly consume entire fields. They will monitor soil moisture, pests, and the movement of herds, as well as delivering pesticides to keep weeds and pests from destroying crops.

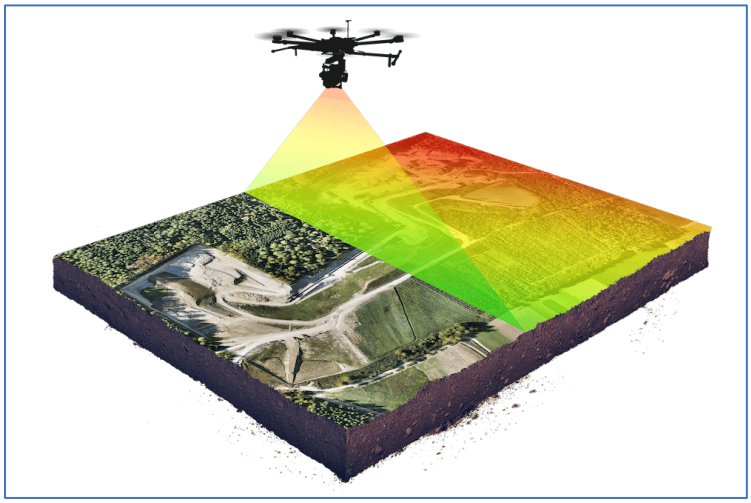


Figure 19 – An RPAS on a monitoring mission.

RPAS are already being deployed in various parts of the world for agricultural purposes (spraying, crop and planting management, and soil quality management). This is a natural evolution for the farming community, not unlike the high-tech planting and harvesting equipment now being widely used. Use of RPAS could actually replace the current manned-aircraft approach, offering greater precision at lower cost.

AAM will also serve the Arkansas forestry and timber industries. About half of the total land area of the State, some 19 million acres, is covered in timber. In 2017, the sector generated 27,000 direct jobs with an annual payroll of $1.5 billion. The new aircraft will quickly, quietly, and cost efficiently monitor forests for fires, tree health, illegal logging, and pests.

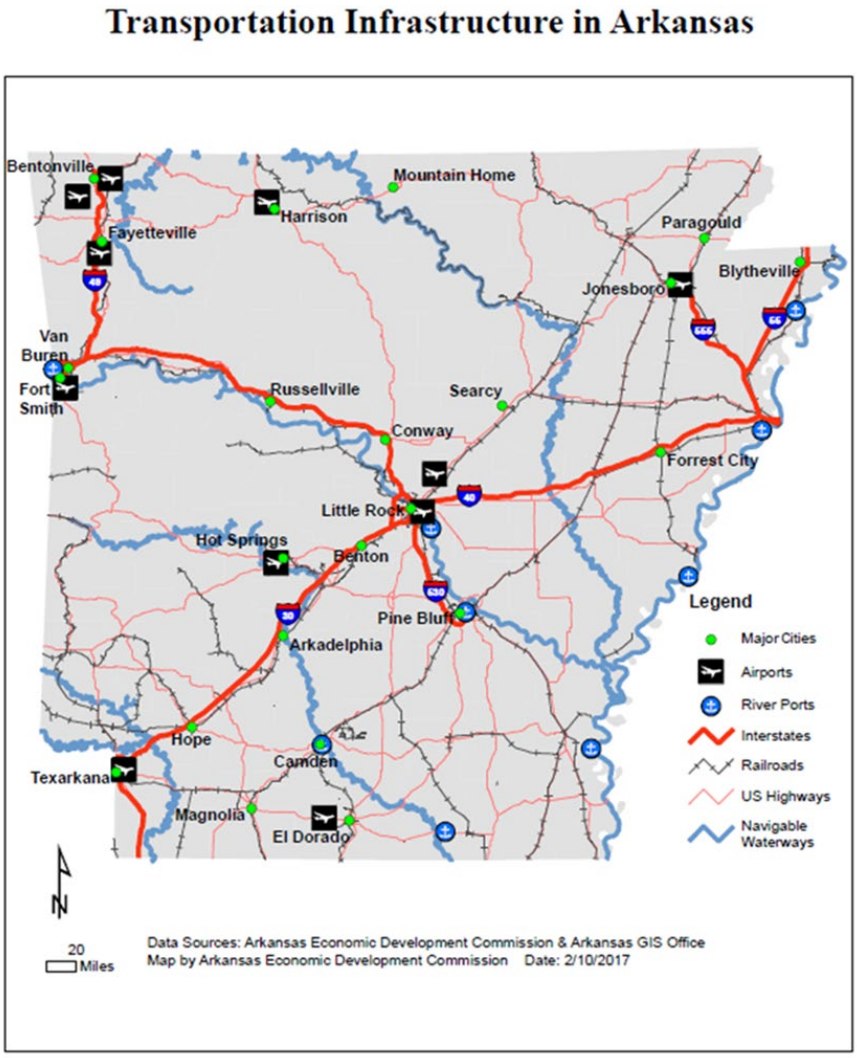
Infrastructure Inspections

RPAS are ideally suited to inspect bridges, highways, and tunnels, causing less traffic congestion and manpower than workers in a truck taking up a lane. Worker safety is also improved. Arkansas has 12,792 bridges that need to be inspected regularly by qualified ADOT personnel.[8]

RPAS are also quite efficient at inspecting airports for security purposes and to locate debris on the runways perimeters that might cause an accident. Workers no longer have to venture out onto the runway in between flights to search for debris.

Transport, Logistics, and Cargo

Arkansas enjoys an excellent cargo transportation infrastructure with a good highway system with truck terminals, multiple railroads with yards, and intermodal facilities, river ports, and good airports. The proximity to the FedEx Express main hub in Memphis is also advantageous. Currently, some 85,000 people work in more than 80 distribution centers around the State. There are 22 major trucking companies in Arkansas, including J.B. Hunt, a Fortune 500 company, which has some 15,000 employees and 10,000 trucks in Arkansas.



[8] https://www.ardot.gov/divisions/maintenance/heavy-bridge/arkansas-bridge-information/

Figure 20 – The Zipline drone readies for flight to deliver medical supplies to remote locations in Africa. Zipline and Walmart are jointly developing new methods to deliver high value goods throughout rural areas of Arkansas.

AAM offers an augmented ability to connect these transportation hubs and modes to one another and then to a local delivery point, especially for time-sensitive cargo, packages, and goods. These AAM services could be scheduled on-demand for immediate need—such as a spare part necessary to restart an assembly line—or perhaps on a regular schedule with perishable products or other time-sensitive supply chain commodities. AAM can fill in the gaps when there are disruptions with these other modes and where a base level supply needs to be maintained (bottled water, critical foodstuffs, medicines, lubricants, etc.). One gap that appears to be a particular opportunity are the river ports in Arkansas which are not as well connected to the transportation infrastructure.

In addition, AAM aircraft could solve the "last-mile" delivery problem. Instead of trucks taking packages all the way to their final destinations, one home or business at a time, one truck filled with small remotely piloted aircraft containing packages or medications could park and release them, saving carbon emissions, noise, and wear and tear on the roads. RPAS delivery would be especially beneficial in saving time and lowering carbon emissions in rural areas with homes spread out over a large geographic area.

Figure 21 - Walmart store in Arkansas with Zipline cargo port attached.

What are the Business and Economic Benefits of AAM?

Now that we have looked at AAM's numerous applications and social benefits, it's time to explore the business and economic benefits, and how we arrived at our quantitative forecasts.

Bringing Advanced Air Mobility into operational status will require four supply chains (Figure 21) to assemble and operate this new transportation system. Each one of these supply chains will create jobs and revenues:

- **Aircraft developers and Tier 1/2/3 Suppliers,** and the requisite ecosystem of manufacturers providing composites, precision machining, electrical systems, batteries, interiors, flight computers, simulators, and testing and training equipment, etc.
- **Vertiport (landing and takeoff area) and ground infrastructure developers,** and the necessary ecosystem to provide site preparation and construction, engineering, architectural services, lighting, beacon navigation nodes and passenger amenities, etc.
- **Air traffic management developers and operators** and the ecosystem needed to provide high density radar, network design automation systems, weather information, computers and equipment, and flight decision support tools, etc.
- **Air Service providers**, companies overseeing the operation of the aircraft, whether eVTOL passenger aircraft or RPAS. Those firms currently operating helicopters may be among the first AAM service providers as they already have certifications and routes and will gradually transition the new aircraft into their operational fleets.

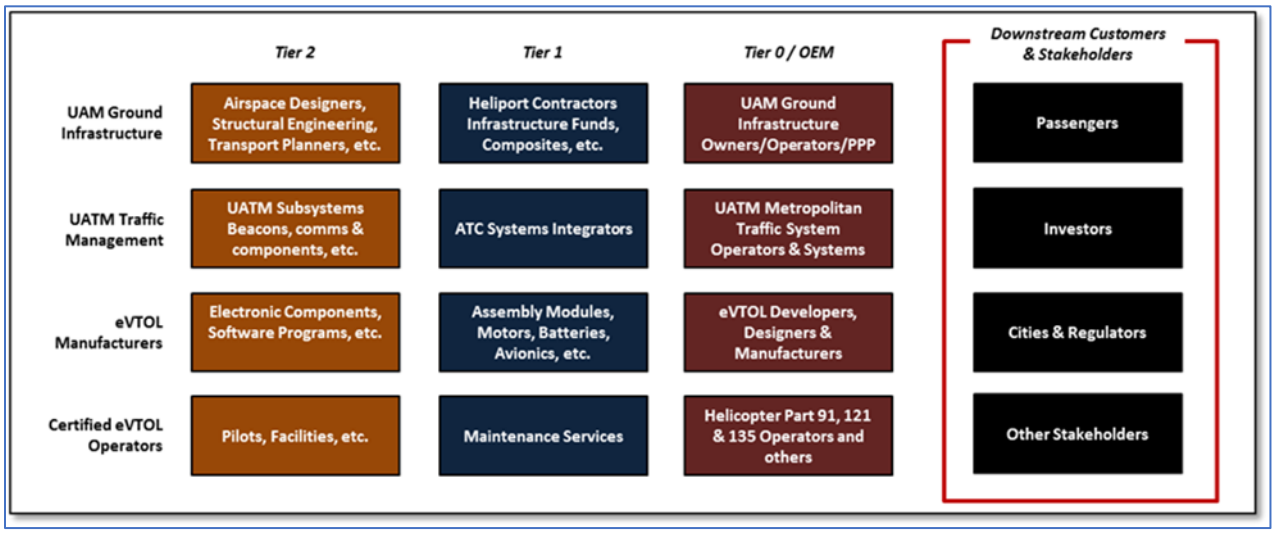


Figure 21 = The four key supply chains essential for AAM to come together

Supply Chain 1: Provisioning AAM Ground Infrastructure: Vertiports

The easiest way to create AAM vertiports is to remodel existing heliports. The basic elements of a heliport are clear approach/departure paths, a clear area for ground maneuvers, final approach and takeoff area (FATO), touchdown and liftoff area (TLOF), safety area, and a wind cone. This existing infrastructure can be updated for eVTOL aircraft by adding battery recharging stations and fuel stations

for hybrid aircraft, as well as perimeter security, shelters, and other amenities. Given the need to recharge batteries, the region's power grid becomes an essential factor in determining vertiport locations.

Globally, many cities have heliports that are rarely or no longer used. Helicopters are often seen as a nuisance by local communities due to their noise. Given the lower noise signature of eVTOLs, it is likely that some of the unused or underutilized heliports—particularly those near hospitals—may be renovated to utilize the new aircraft.

Figure 22 - Parking garages will make ideal facilities to locate future urban vertiports (Source: Robb Reports)

Fewer than half of the current inventory of heliports are in locations convenient to maximize AAM applications. Ground infrastructure will require expansion into network configurations, with each node, or vertiport, carefully located and built to ensure passenger convenience and value (Figure 22).

Integrating an eVTOL aviation network with the existing system of public transportation modes requires detailed planning and analysis. With the objective of implementing the greenest, most cost-effective, and commuter-friendly transit system possible, planners must consider the needs of all users when locating vertiports to enable practical end-to-end solutions for passengers. The State of Arkansas has 85 dedicated heliports, including at all 69 airports, and at a limited number of hospital centers. The NEXA Advisors/UAM Geomatics Urban Air Mobility Study projected that by 2045 Arkansas would need to remediate 36 existing heliports, construct 23 new vertiports and possibly one multiport (landing area for multiple aircraft), strategically placed throughout the metro region, in addition to those presently at airports and hospitals.

While the technology is available to upgrade heliports to vertiports, regulators have not yet finalized standards. These regulations may be dependent on the types of aircraft selected, their footprint, weight, and electric or hydrogen charging requirements.

What are the cost elements one must include in the estimates for building (CAPEX) and operating (OPEX) the vertiports? A list is provided in Figure 24. These elements have been forecasted for Arkansas' infrastructure improvements using specific intrinsic cost data unique to each city or region, such as land cost, labor cost, and so forth.

While certain aspects of vertiports remain to be determined, it is safe to say that the development of infrastructure to support an eVTOL network has significant cost advantages over heavy-infrastructure approaches such as roads, light rail lines, bridges, and tunnels. Compared to the billions of dollars required to extend lines, for instance, the estimate for the new vertiports projected to operate in Arkansas by 2045 (a mix of remediating existing heliports and building new ones) is in the range of $84.9 million total.

RTM Vertiport Components (CAPEX and OPEX)	
Network design studies	Airport commercial eVTOL terminals
Environmental study	Passenger shelters
Airspace flight design 3D visualization studies	Lighting systems
Concession agreements	CNS systems (ILS, beacons, etc.)
Secure project financing	IT and security systems
Purchase or lease land	Perimeter systems
Construction permitting	Parking
Architectural and engineering	Power grid updates
Site preparation	FAA (etc.) permitting and certification
Site construction	Recharging capability and systems
Foundation modifications	Fire suppression systems
Platforms	Aeronautical chart preparation
Egress, walkways	Operators, maintenance staff and related workforce
Elevators	

Figure 24 - Components of Ground Infrastructure CAPEX.

Supply Chain 2: RTM Safely Managing AAM Air Traffic Flows

The second AAM supply chain is that of air traffic management, known as RTM (Remote Traffic Management) or UATM (Urban Air Traffic Management), which ensures safe airspace coexistence for commercial and general aviation, RPAS (drones), and AAM aircraft. Currently, air traffic controllers guide airplanes and helicopters through the airspace. It is likely that the first passenger AAM use cases— those eVTOL aircraft replacing and/or complementing existing aircraft operations such as Medevac and helicopter operators—will rely on the FAA's existing system of air traffic controllers.

But the many new uses and routes of AAM aircraft—both passenger aircraft and drones—would add hundreds, perhaps thousands of movements to each ATC regional system each day, overloading the area's air traffic management capabilities.

RTM ATC Infrastructure Components (CAPEX and OPEX)	
RTM interoperability standards and drone/eVTOL agreements.	Flight Plan and Flight Operations Database
RTM one-time facilities planning	SCADA for Systems and Networks
Site/network optimization study	Power Grid and Backup Systems
Systems specifications	Network Design and Site Selection Studies
Power grid studies	Weather Information Systems - Areal
Cyber security architecture studies	Micro Weather Detection Sensors
Physical security architecture	Beacon Navigation Nodes
Facilities (offices) rental costs	Resilient Communications Nodes
Automation Systems and Stations	High Density Radar
Flight Decision Support Tools	
Computers and Equipment	

Figure 25 - Selected RTM Cost Elements.

Advanced Air Mobility will need its own air traffic management system working in conjunction with the current system. Human controllers in a new local RTM facility may become airspace managers, focused on supervising automated systems and aircraft operations, ensuring safety and, at all times, security. At such a facility, a single controller could

supervise many more aircraft movements than working in an airport ATC tower. A simple explanation is that aircraft will operate in layers of altitude with RPAS at the lowest level, eVTOL aircraft in the middle, and traditional aircraft at the highest, though they must also be guided through layers during take-off and landing.

Costs elements necessary to implement RTM capabilities are shown in Figure 25. While ensuring safe vehicle separation using fully staffed facilities, the costs for Arkansas are affordable when considering their amortization over a period of decades.

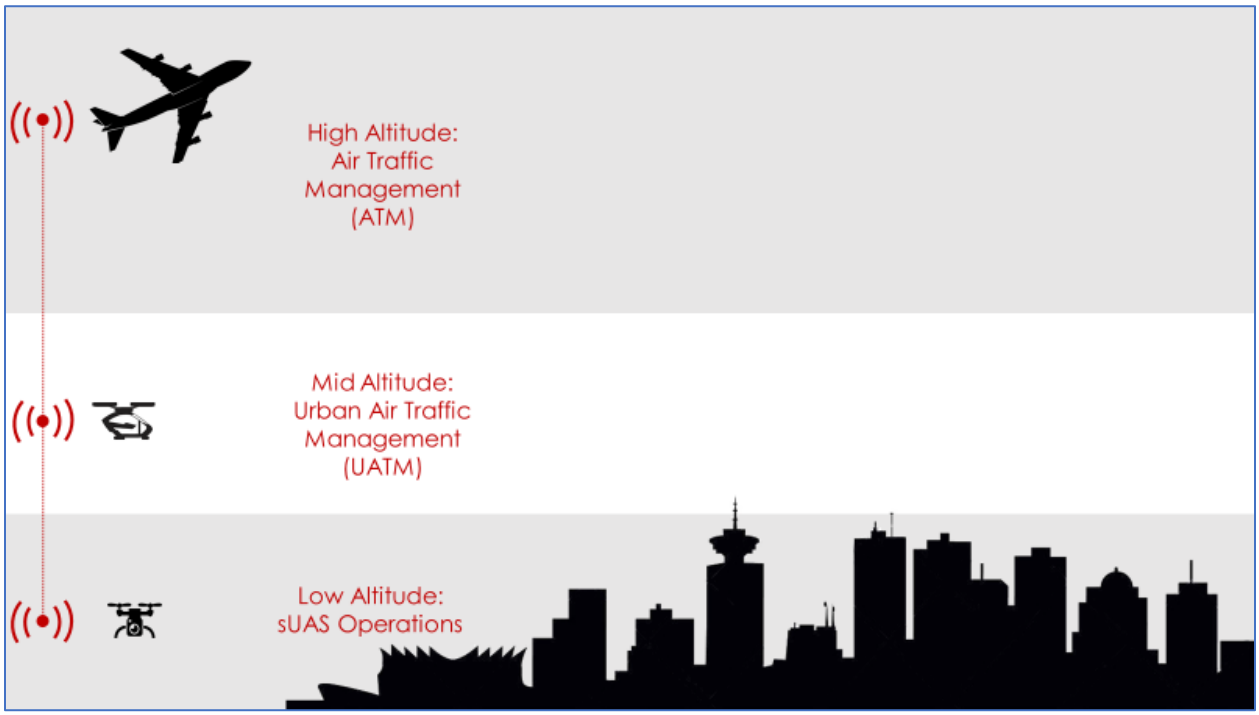


Figure 26 - Simplification of concepts for layering airspace above metropolitan areas.

According to the NEXA Advisors/UAM Geomatics study, the estimated cumulative cost for creating an Advanced Air Mobility Remote Traffic Management system (CAPEX) in Arkansas will start at around $37 million. This amount does not factor in the need for a fully staffed Network Operations Center or NOC, which would be overseen by FAA.

Supply Chain 3: Advanced Air Mobility Operators

Current operators of helicopters are today's vanguard for eVTOL services. Charter helicopter companies in Arkansas, the most familiar being FlyARH and Aerial Patrol, Inc., have excellent longstanding safety records, trained pilots, weather dispatching expertise and systems, and quality and safety programs. Governments are also significant operators (Figure 27). These operators are familiar with the regulations, terrain, and locations of the heliports and airports in the region. As an industry, their current services are medical/emergency services, airport shuttle services, regional transport, cargo delivery, tourism, and more.

Supply Chain 4: Advanced Air Mobility eVTOL Aircraft

Several eVTOL prototypes around the world are either in or nearing advanced stages of development and operational trials of one kind or another. Designs vary widely in terms of number of passengers, number of rotors, and distance traveled before recharging.

Figure 27 - Arkansas State Police helicopter.

Nearly all eVTOL aircraft currently in development are designed to be piloted, at least initially. The next two decades will see increasing use of automation and autonomy performing many functions traditionally performed by humans. Automation and autonomy offer the opportunity to reduce workload and enhance safety for critical aviation functions.

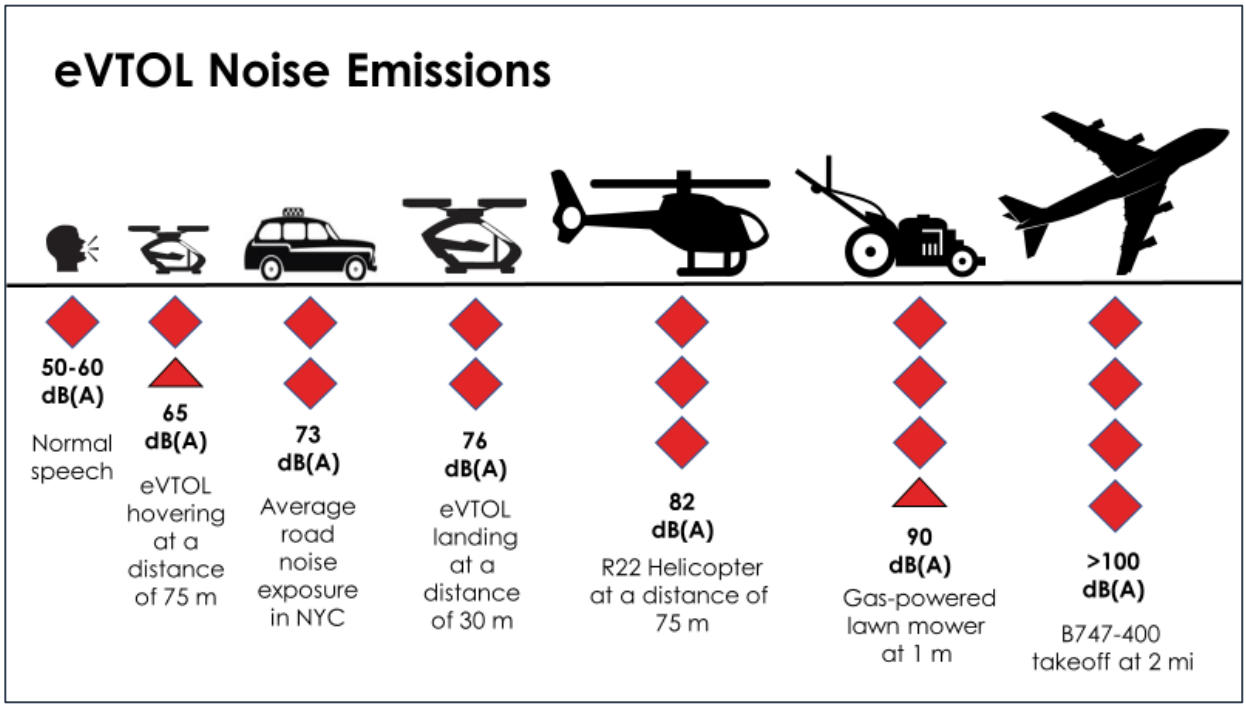


Figure28 - eVTOL noise will be a key determinant of public acceptance.

Aircraft noise is a key determinant defining success and acceptance of eVTOLs that will operate in areas of higher population density at low altitudes. Smaller eVTOL aircraft are expected to fall well within current noise guidelines, and noise-reducing technologies hold promise for larger aircraft to be good neighbors as well.

The Business and Economic Case for AAM

Advanced Air Mobility must, within a few years, become economically viable to pay off investors as well as to pay recurring costs such as equipment maintenance and upgrades, and employee salaries, and maintain public safety and convenience.

NEXA Advisors/UAM Geomatics developed its business analysis tools illustrated in Figure 29 to assess AAM feasibility, and used them to study Arkansas, with its 6 major urban cities, in an exacting and comparative analysis. A key goal is for each of the four supply chains shown (the "City PPP Model," the "AAM Operating Model," the "RTM Model," and the "AAM eVTOL Supply Chain") to achieve a measure of commercial success.

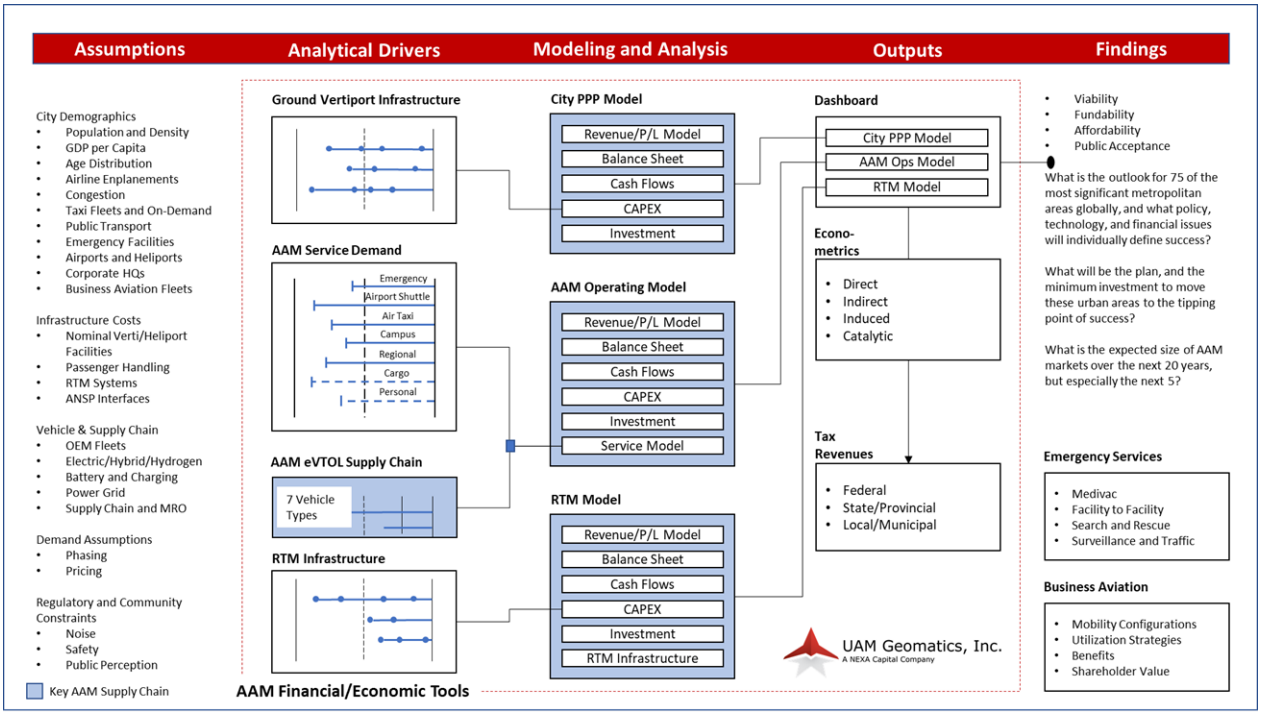


Figure 23 - NEXA Advisors/UAM Geomatics financial and economic tools analyze the four supply chains to assess AAM business viability, city by city. The entire State of Arkansas has been analyzed using the tool set.

For the purpose of this analysis, the four critical supply chains all achieved this success for the State of Arkansas, in turn attracting outside capital to fund each phase of the launch.

Business Opportunity: Revenue and GDP Growth

Using the five AAM use cases discussed above (medical, airport shuttle, business aviation, on-demand, and regional air mobility,) Figure 30 shows the results of the extensive analysis provided by the financial and economic tools used in the NEXA Advisors/UAM Geomatics Urban Air Mobility study and produced in five-year increments of 25-year revenue and capital investment estimates for the entire State. These financial estimates fall into four categories:

- CAPEX – Those capital expenditures funds used to acquire, upgrade, and maintain physical assets such as property, plants, buildings, and specialized facilities, technology, or equipment.
- OPEX – Costs that a business incurs through normal business operations. Operating expenses include rent, equipment, inventory costs, marketing, payroll, insurance, step costs, and funds allocated for research and development.
- Revenues – These represent per-passenger ticket revenues expected for eVTOL fleet operators and are based upon a rigorous demand elasticity model applied to the State.
- Aircraft – Fleet acquisition and maintenance costs to acquire and operate sufficient eVTOL aircraft to sustain the use cases identified.

	Year	2020-2024	*2025-2040*	2041-2045	SUM	Pillar Totals
Demand		58,057		13,508,627	21,673,104	
Ground Infrastructure	Ground Infrastructure OPEX	$7,984,229		$69,161,419	$192,379,619	$277,293,590
	Ground Infrastructure CAPEX	$21,122,300		$8,692,208	$84,913,971	
UATM	UATM Cost OPEX	$288,025		$20,579,141	$52,099,912	$89,374,175
	UATM Cost CAPEX	$4,341,001		$6,084,297	$37,274,264	
UAM Operators	Passenger Revenues	$14,546,342		$605,651,327	$1,265,554,192	$2,575,014,206
	MedEvac Revenues	$13,801,247		$202,240,124	$660,832,707	
	Cargo Revenues	$24,599,759		$245,807,792	$648,627,306	
Vehicles	Vehicle Purchases	$22,865,980		$182,595,038	$618,244,393	$618,244,393
Arkansas Grand Total		$109,548,883		$1,340,811,348	$3,559,926,364	$3,559,926,364

Figure 30 – Arkansas statewide AAM revenue, OPEX and CAPEX analysis, generating monetary inputs used to drive the IMPLAN input/output tool.

The pillar totals for the entire 25-year period are forecasted to generate $3.56 billion in direct new (and fully incremental) business activity across the State of Arkansas.

The ecosystem needs to provide excellent services to passengers at affordable prices at a point where the sector finds equilibrium, thereby becoming and remaining profitable. By definition, this equilibrium is achieved when for a given region such as Arkansas each of the four supply chains can reach and exceed cash flow profitability.

Estimated AAM Passenger Demand for Arkansas

Analysis of the major use cases' passenger demand first required separation into price-elastic (sensitive to price) and price-inelastic (less sensitive to price) forecasts. Clearly, on-demand air taxi, airport shuttle, and regional air transport services are highly price sensitive, while business aviation and Medevac are not. Many factors are considered as well, including the ability of the traveling public to afford such services. For these demand forecasts to be realistic, the analysis made use of ten factors—a method uniformly applied to the 84-city study undertaken by NEXA Advisors/UAM Geomatics earlier in 2021. These factors (Figure 31), adjusted to Arkansas' unique demographics, estimate that by 2045, the peak forecast year, some 4.3 million passengers are expected to travel using new eVTOL services annually.

Factor	Demand Input	Description
1	Airport O/D Traffic	Historic and projected Origination & Departing Passenger Traffic
2	Mobility Substitutes	Other options – Taxi, Public Transit, Private Vehicle Costs, Fuel
3	Per Capita GDP	Weighted input according to latest GDP (PPP) of each City
4	Distances & Congestion	Average travel distances, congestion, airports to city centers, road infrastructure
5	CIMI Human Capital Indicator	IESE Cities in Motion Index (CIMI) human capital score, 10 factors including education
6	Population Density	Weighted to population density and proximity to city employment areas (downtown, industry, factories)
7	Livability	Cost of living, disposable income, taxation all weighted and averaged
8	Fortune 1000 Presence	3 ranked scores to determine passenger demand and high value transportation
9	Business Aviation Activity	Business aviation activity weighted across various cities
10	Existing Heliports	IMPORTANT data point: This is the starting point for AAM infrastructure

Figure 24 - Passenger demand elasticity factors applied to Arkansas forecasts: 2021-2045.

Economic Benefits

To undertake a 25-year economic impact assessment of Advanced Air Mobility (AAM) for the state of Arkansas, NEXA used the IMPLAN input/output modeling tool (Figure 32) in combination with NEXA's business case analysis model featuring six regions of Arkansas: Northwest, North Central, Upper Delta, Lower Delta, Southwest, and Central. The combination depicts the most accurate possible impact assessment of the benefits AAM will deliver to Arkansas.

The results may be analyzed and carefully considered by policy planners and stakeholders, such as the Northwest Arkansas Council, the Arkansas Economic Development Commission, as well as state and local governments interested in job creation and general economic growth. These results help to mobilize Arkansas' resources to act on the AAM opportunity and seize a first-mover advantage in a $1 trillion global market meant to improve safety, mobility, and economic growth.

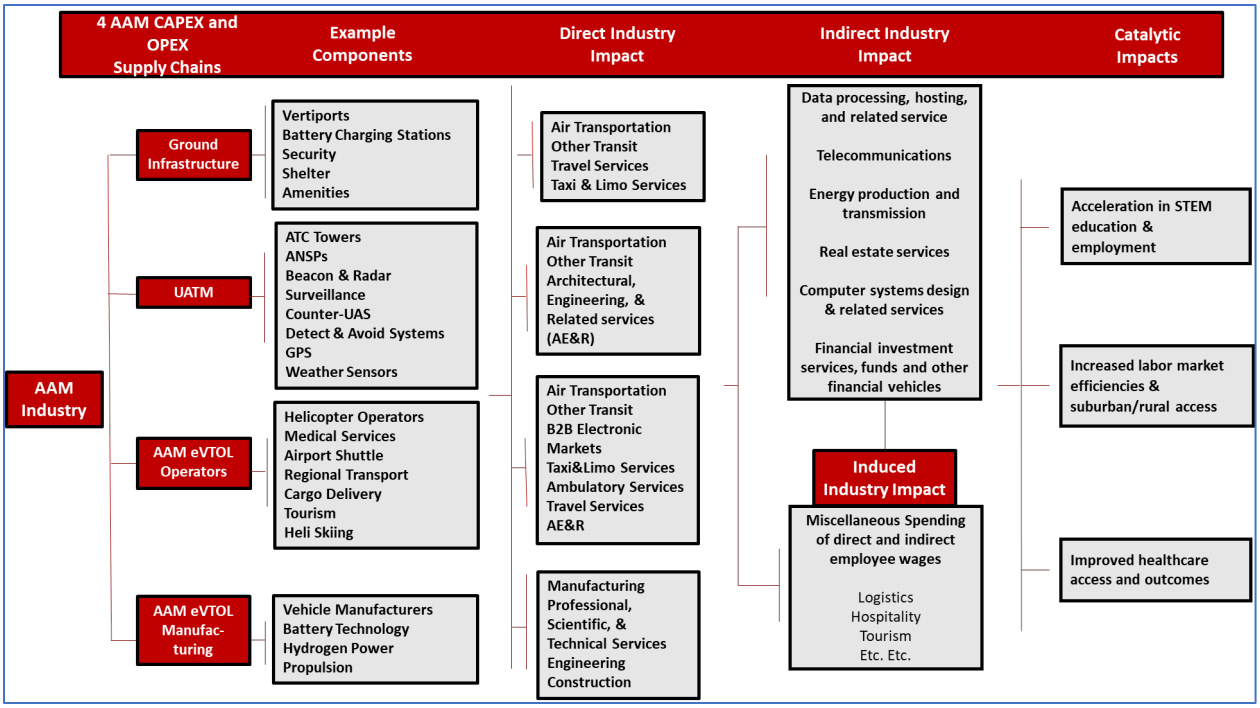


Figure 32 - Analysis Flow Diagram to process business case outputs (pillar totals) through IMPLAN economic impact model.

In economics, an input/output model is a quantitative methodology that represents the interdependencies between different branches of a national economy or of regional economies. The IMPLAN input/output model depicts inter-industry relationships, showing how output from one industrial sector may become an input to another industrial sector. In the inter-industry matrix, column entries typically represent inputs to an industrial sector, while row entries represent outputs from a given sector. This format shows how dependent each sector is on every other sector, both as a customer of outputs from other sectors and as a supplier of inputs. This inter-industry relationship is expressed in the form of industry coefficients, or multipliers, that depict the rate of change of output among a set of interdependent industries, from a one unit increase in output by one industry.

IMPLAN's definition of output is as follows: The Output Multiplier describes the total Output generated as a result of 1 dollar of Output in the target Industry. Thus, if an Output Multiplier is 2.25, that means that for every dollar of production in this Industry, $2.25 of activity is generated in the local economy: the original dollar and an additional $1.25.

Econometric and input-output models contain assumptions; after all, if every variable were known, we would have a list of facts and not a forecast. The most important assumption derived from NEXA's business forecast for Arkansas includes the insertion of an "inflection point," the introduction of highly automated flight systems requiring less human intervention. For example, an emerging view of AAM over the next 25 years is that cockpit automation will be necessary to improve the integrity and thus the safety of this new market sector. Automation should eliminate pilot error, enforce sense-and-avoid rules, and safely separate all aircraft, including eVTOLs and drones. Automation will reduce the cost of operations, as well as the demand for human operators. The cost structure of the entire industry will be dramatically impacted in synchronization with the expansion of vehicle and airspace capacity.

The economic impact assessment in this report accounts for the inflection point, as will be reflected in the economic charts examined later. This is done through the input phase, whereby the NEXA model factors in automation and its impact on the overall AAM business case.

IMPLAN's input-output model also comes with certain assumptions and limitations. The first is the constant returns to scale: the same quantity of inputs is necessary to produce the additional unit of output. So, if outputs increase 10%, so too will the inputs. Second, it assumes no supply constraints: there are no restrictions to materials or labor, which may otherwise affect production capacities and prices.

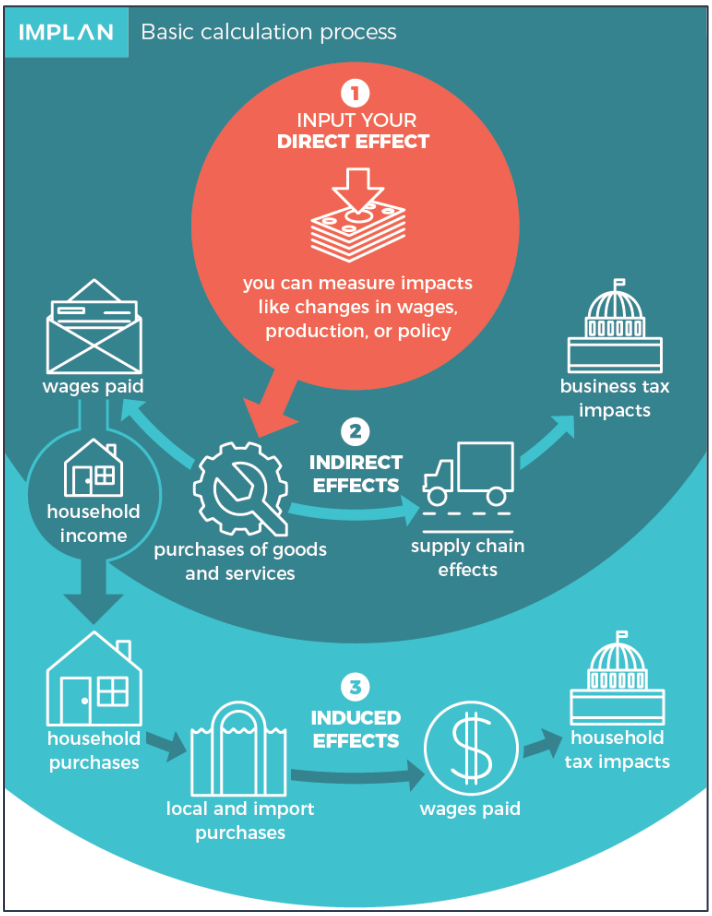


Figure 33 - IMPLAN basic calculation process

Third, the input structure is fixed: it will always require the same number and type of inputs to produce a certain output . Fourth, industries use the same technology to produce each of its products. Fifth, industry by-product coefficients are constant. This means that "an industry will always produce the same mix of commodities regardless of the level of production. In other words, an industry will not increase the output of one product without proportionately increasing the output of all its other products." Finally, it's important to note that IMPLAN as a modelling tool only reports impacts using the latest data year available, which is 2019. Data fed into IMPLAN works off of 2019 regional figures (e.g., 2019's total output for Arkansas is applied at every phase, despite expected growth year-over-year), and do not forecast economic indicators beyond it.

Understanding IMPLAN Impacts

EIAs assess the impact of an "exogenous shock"—new economic activity that stimulates growth—exploring its impact on a number of indicators such as GDP, job creation, and tax revenues (Figure 33). Some of these indicators will be further evaluated at three levels of analysis: direct, indirect, and induced effect. Direct effects calculate the economic value that a business or industry generates by its own means through direct hiring of its own employees, revenue generation from sales, and the portion of its business activity that contributes to regional output. Direct effects include the initial change in expenditures by consumers/ producers – the exogenous shock – producing the first round of economic activity in the form of new output, jobs, and revenues.

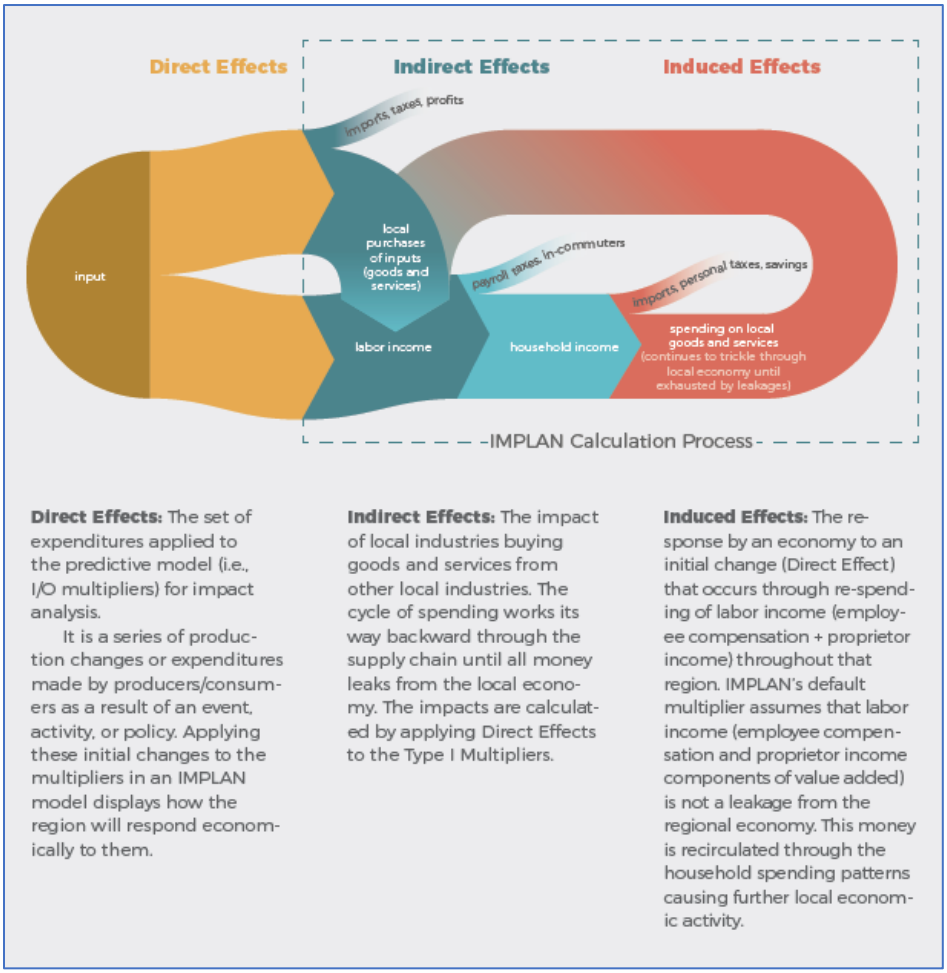


Figure 25 - How IMPLAN calculates direct, indirect and induced activity.

Indirect effects gauge the economic impact that results from demand created by the direct impact. Products and services are bought to support this new activity (i.e. supply chain companies).

Finally, there's the induced effect, which measures the economic impact on the broader economy resulting from demand created by employees of the new activity (direct component) and its supporting businesses (indirect component). IMPLAN defines the induced impact as follows: "the values stemming from household spending of Labor Income, after removal of taxes, savings, and commuter income. The induced effects are generated by the spending of the employees within the business supply chain."[9]

In this instance, the direct effect of the AAM multi-industry exogenous shock or direct impact to the state of Arkansas over 25 years will produce a number of direct jobs, revenues, and expenditures that

[9] https://blog.implan.com/understanding-implan-effects

will further produce inter-industry demand (indirect impact). Additionally, the induced impact will capture unrelated excess economic activity (e.g., consumer spending in the general economy from increased income provided by AAM). Based on the EIA numbers, we go one step farther in identifying AAM's catalytic effects for the state. Growth in AAM will improve labor market efficiencies and suburban/rural access and accelerate STEM education and funding. These effects are discussed later as an extension to the EIA.

The IMPLAN I/O model was our model of choice in studying AAM for Arkansas. IMPLAN is a recognized modeling tool used to study impacts on all sectors and at all levels of an economy. Some relevant examples include a 2017 study conducted by the University of Arkansas assessing the state impact of its forestry industry[10], and a 2019 report on the impact of the University itself on the state's economy.[11] IMPLAN was also used last year to assess the national and state economic impact of NASA's Moon to Mars Program.[12]

IMPLAN allows users to combine regions to assess overall impact to a study area. In this study we analyzed the business case for six regions across the state, with each region comprising a set of counties. Together, the six regions capture every county in the state, allowing us to distribute the outputs for the state as whole. As a result, the IMPLAN industry multipliers used in this scenario are state averages, with total impact represented at the state level.

In combining the business case totals, NEXA produced consolidated operational expenses (OPEX), capital expenses (CAPEX), and revenues along the four NEXA-defined supply chains, with OPEX and CAPEX for vertiports, Remote Traffic Management, and aircraft, in addition to revenue for the operators. These totals, or economic outputs, have been forecasted for each phase of AAM's development in Arkansas, until 2045.

The OPEX and revenue outputs were then apportioned out to seven inter-linked industries defined by the National American Industry Classification System (NAICS), a "standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy."[13] These industries were analyzed for best-fit as it pertains to the infrastructure and businesses necessary to support and maintain AAM operations. These are:

- Air transportation
- Other transit and ground passenger transportation, scenic and sightseeing transportation, and support activities for transportation
- Taxi and limousine services
- Architectural, engineering, and related services
- Travel arrangement and reservation services
- Miscellaneous ambulatory services, and
- Business-to-business electronic markets, and agents and brokers.

[10] https://cdn.ymaws.com/www.arkforests.org/resource/resmgr/2018_forestry_economic_contr.pdf

[11] Jebaraj, Frandson, and Galen, "The Economic Impact of the University of Arkansas," Sam M. Walton College of Business. February 2019 https://www.uark.edu/about/economic-impact/resources/Economic-Impact-of-University-of-Arkansas.pdf

[12] ASRC Federal Analytical Services, "National Aeronautics and Space Administration & Moon to Mars Program," August 2020

[13] https://www.census.gov/naics/

The CAPEX outputs were apportioned in similar fashion to the OPEX, using the same method and classification system, except in this case distributing along NAICS-classified commodities. The distribution for CAPEX was more complex and included 17 distinct commodity types determined to be necessary for AAM operations. Examples of these commodities include electric motors and generators, computers, computer peripherals and parts, and navigational and guidance instruments, among many others.

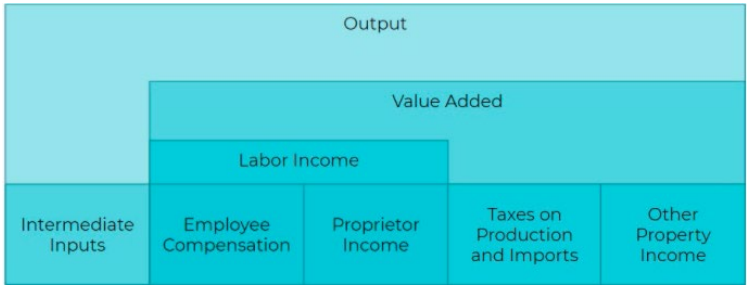


Figure 35 - Importance between output and value-added impacts.

All of these OPEX industry and CAPEX commodity types are assigned a portion of the value produced by the four supply chains in the business case analysis, for each phase of development. These values are inputted into IMPLAN, applying the industry coefficients embedded in the system to produce economic impact values specific to industry and region (Arkansas). Impacts of interest include GDP growth, jobs, and tax revenue.

Economic Impact – GDP

GDP, or Gross Domestic Product, is defined as the total value of all domestic final goods and services produced within a specified period of time (typically a year). It is also known as value added which, according to IMPLAN, is defined as the difference between total output and the total value of intermediate inputs throughout an economy during a specified period of time. It is the total output minus intermediate outputs.[14] In the case of AAM, total output over 25 years, calculated using NEXA's business case analysis model, is $3.6 billion (Figure 36). IMPLAN calculated the value added of this output at $2.62 billion. $1.2 billion is attributed to the direct impact; $779 million is attributed to the indirect impact, and $631 million is attributed to the induced impact. Together, this total represents a GDP increase of approximately 2% for the state of Arkansas, measured against the state's 2019 GDP of

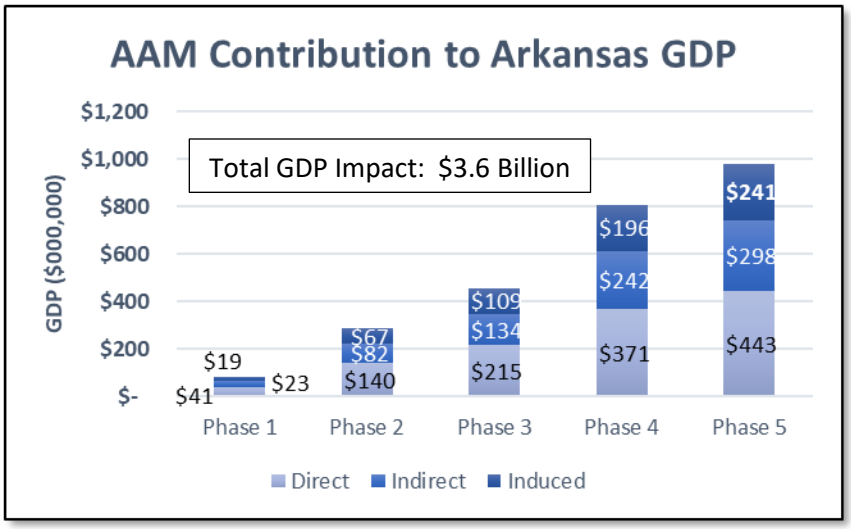


Figure 36 - Total AAM Contribution to Arkansas GDP

[14] https://implanhelp.zendesk.com/hc/en-us/articles/360017144753-Understanding-Value-Added-VA-

$132.9 billion. Note that the contribution of the direct impact to GDP is 46% of the total. Direct and indirect make up the remaining 54%.

Economic Impact – Jobs and Occupations

Jobs were calculated first in terms of employment, which IMPLAN defines as including both part-time and full-time annual employment.[15] In this study, employment was derived from the total output produced by AAM at the direct, indirect, and induced levels. Since the employment count does not differentiate between type of employee, a conversion to full-time equivalent (FTE) is necessary to capture a tangible estimate of the labor count. IMPLAN provided a conversion sheet to identify the corresponding FTE count.

The jobs captured in the impact come in three tranches: the direct (jobs gained directly from AAM,) the indirect (jobs gained indirectly by the supply-chain industries supporting AAM,) and the induced (the subsequent jobs gained from induced spending in all sectors of the economy.) Together, they represent the total impact on jobs for the state of Arkansas.

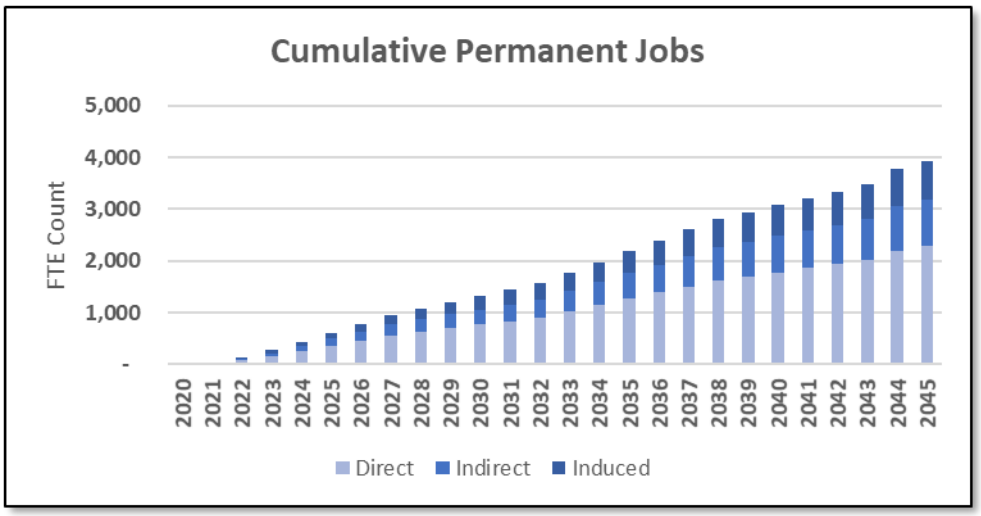


Figure 37 - Contribution of AAM to full time permanent job creation for Arkansas

The job numbers in Figure 37 reflect cumulative permanent jobs gained year over year. As the value of AAM increases every year, so does the labor required to support it. This means that by 2030 the value of AAM at the direct, indirect, and induced levels will require roughly 1,320 jobs to support it. In 2045, that number reaches nearly 4,000. Note that this job forecast does not account for jobs that could be replaced by AAM jobs.

Since the direct and indirect effects of AAM account for roughly 80 percent of the impact, we see that job types, or occupations, closely align with the industries tied to AAM. Some of these occupations are reflected in the US Bureau of Labor Statistics' Standard Occupational Classification system, such as business and financial operations. Other categories, like "Engineering, Intelligence Transportation Systems," reflect an evolving technology sector that more accurately describes the type of jobs AAM will create.

The first two phases, or ten years of development, will see a focus in infrastructure development. This means jobs created to build vertiports, aircraft parts, software, and more. They will support both white-

[15] https://implanhelp.zendesk.com/hc/en-us/articles/115009510967-Employment-Data-Details

collar and blue-collar occupations such as software developers, mechanical engineers, electricians, construction laborers, technicians, and welders.

As the infrastructure to support and maintain AAM gets built out, the industry will then experience its takeoff through operation of AAM services. In the latter three phases of expansion, therefore, we will see sustained growth in the flagship positions of aerospace. These include pilots (both commercial and cargo), freight handlers, travel agents, operation managers, and so forth.

Together, these jobs make up the entire AAM sector, reflecting impacts at both the direct and indirect level. Jobs were also created at the induced level but are less related to AAM and result from overall growth of the regional economy. A summary of the top ten occupation categories is listed in Figure 38 below, with example occupations that were produced in IMPLAN. They capture the wide array of jobs produced at the direct, indirect, and induced levels.

Engineering, Intelligent Transportation Systems	**Quality Control and Safety Engineering**
Architectural and Civil Drafters	Aircraft Mechanics and Service Technicians
Computer and Information Research Scientists	Software Developers and Software Quality Assurance Analysts and Testers
Computer Hardware Engineers	Computer Systems Analysts
AAM Operations	**Medical and Supporting Services**
Pilots (includes emergency)	Paramedics
Cargo Pilots	Emergency Dispatchers
Air Traffic Controllers	Registered Nurses
AAM Operational Support	**Travel Support Services**
Laborers and Freight, Stock, and Material Movers	Travel Agents
Security Guards	Tour and Travel Guides
First-Line Supervisors of Transportation	Reservation and Transportation Agents
Vehicle Design and Manufacturing	**Hospitality**
eVTOL Mechanics and Electric Engine Specialists	Waiters and Waitresses
Electrical Engineers	Cooks, Restaurant
Airline Pilots, Copilots, and Flight Engineers	Food Preparation Workers
Business and Financial Operations	**All Other**
Retail Salespersons	Clergy
Accountants and Auditors	Animal Caretakers
Financial Managers	Teachers

Figure 38 - Job Creation Categories Applicable to AAM Sector.

Economic Impact – Taxes

IMPLAN captured tax revenues at the local, State, and Federal level. The local level in particular represents totals for townships, cities, and counties for the entire State. Increased government revenues generally translate into additional government expenditures, which offers the state more investment opportunity into state infrastructure, economic and social programs, and so forth. Figure 39 depicts these revenues at the local, State, and Federal levels over each phase of growth. These values are additive, with total revenue of $629 million gained over 25 years. The local and State governments account for $62 million and $200 million in revenue respectively, totaling approximately $260 million. Federal revenues account for about $368 million.

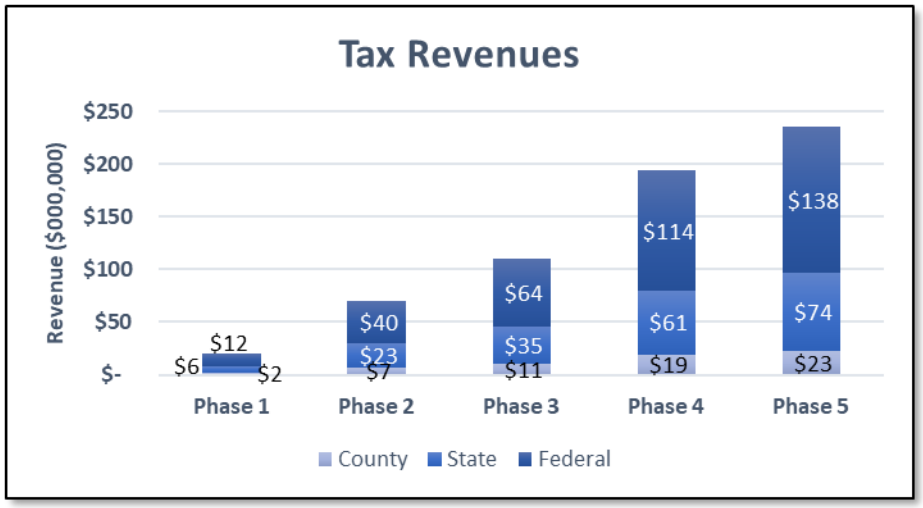


Figure 39 - Estimate Tax Revenues from new AAM activities in Arkansas.

Catalytic Business and Economic Impacts for Arkansas

Catalytic impacts include those effects such as spill-over that can benefit other areas of an economy, and that are not easily captured by input output models such as IMPLAN. In air transport, catalytic impacts can sometimes create more jobs than direct employment. For example, employment and income generated in the local economy of an airport can boost the productivity of local businesses and attract economic activities such as inward investment and inbound tourism.

Increased STEM Education and Employment

The driving force for growth and prosperity in any country is the advancement of science and technology, and here the United States continues to lead the world. The US invests heavily in STEM – Science, Technology, Engineering, and Math programs. In 2016, there were 163 federally funded STEM programs, totalling just about $3 billion.[16] During the 2019-2020 academic year, the country saw over 5.1 million postsecondary degrees awarded. Of these degrees, over 1.8 million, or 37%, were in a STEM-related subject.

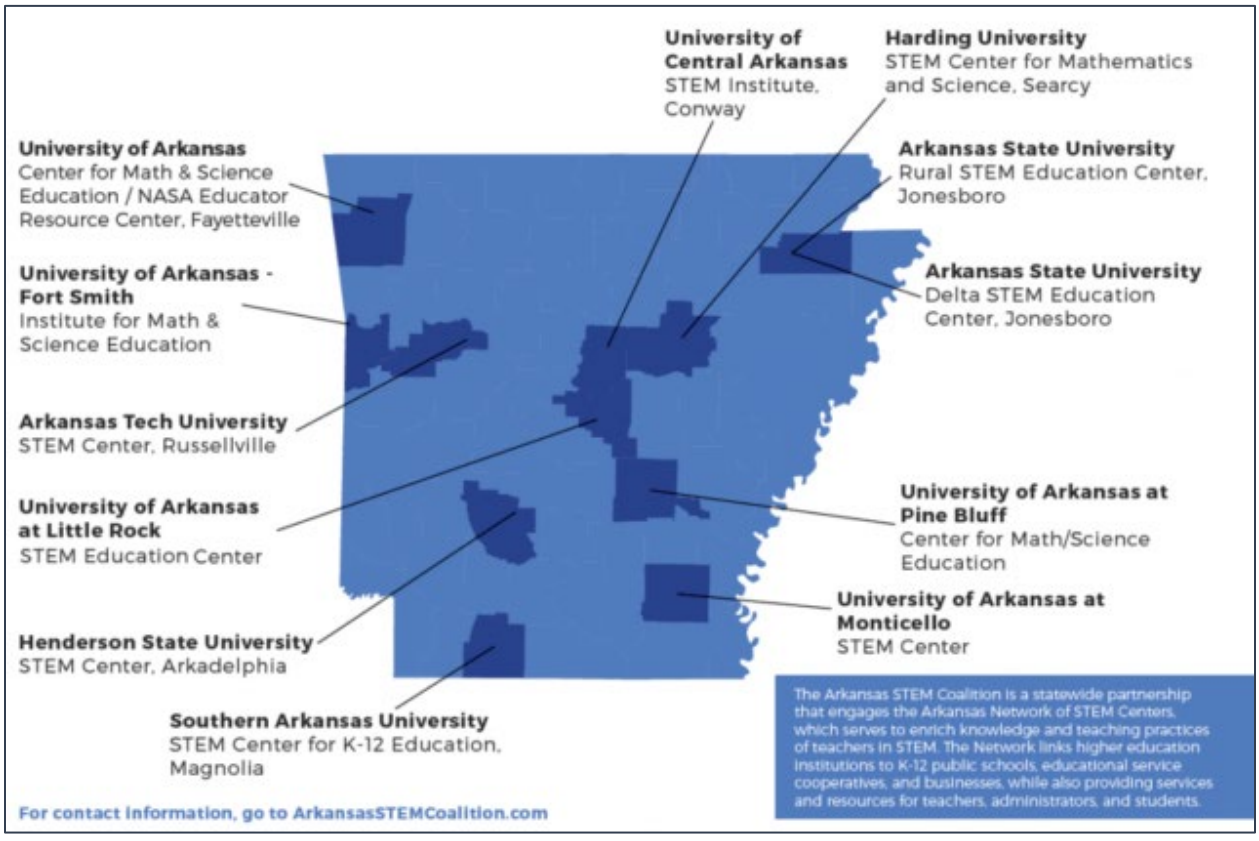


Figure 40 - Arkansas STEM Centers.

The significance of a STEM-oriented workforce for Arkansas cannot be overstated (Figure 40). Graduates with diplomas in STEM are responsible for creating revolutionary technologies and scientific discoveries that improve our quality of life and move civilization forward. According to a 2013 Brookings Report, a

[16] https://www.gao.gov/products/gao-18-290

survey found that "94 percent of U.S. patent inventors between 2000 and 2003 held a university degree. . . of those, 95 percent of their highest degrees were in STEM fields, including more than half in engineering."[17]

Advanced Air Mobility will require a steady stream of young, trained, and educated talent to fill the thousands of new jobs it will bring over the next few decades. Unsurprisingly, most of the leaders in the AAM industry come from technical and STEM backgrounds. More STEM education means more STEM jobs, and more STEM jobs mean more patent potential. Logically, what coincides with increased patent rates is the subsequent creation of a regional innovation hotbed (which would be considered an additional catalytic impact). Places like Northwest Arkansas could become the Silicon Valley of the South.

STEM jobs also pay very well. The national average annual salary for all STEM careers in 2017 was $87,570, versus an average of $45,700 for non-STEM careers.[18] According to Indeed, a leading job search aggregator, fifteen of the most lucrative STEM jobs range in salaries of $73,000/year to nearly $200,000 (national averages).[19] A number of these jobs are relevant to aerospace, such as data analysts, along with mechanical, chemical, materials, and software engineers. With more jobs like these, the introduction of AAM will undoubtedly increase the Arkansan's average per capita salary. As it stands, the state average salary in 2019 stood at $49,913.[20]

STEM/Aerospace Bachelor and Graduate Degrees & Related Universities	
Engineering	University of Arkansas
Electrical Engineering	Harding University
Industry Engineering	John Brown University
Mechanical Engineering	Saint Francis University
Microelectronics-Photonics	University of Arkansas at Little Rock
Systems Engineering	Arkansas State University
Applied Technology	Southern Arkansas University
Aviation	University of Central Arkansas
Professional Pilot	Arkansas Tech University
Aviation Management	University of Arkansas at Fort Smith
Aviation Maintenance Management	Henderson State University

Figure 41 - Arkansas STEM Specializations at Arkansas Universities

Implicit in the supply of high paying jobs is an easily matching demand for those jobs. If Arkansas invests in AAM technologies, it will attract a skilled workforce from all over the country; talent will want to relocate to Arkansas to take advantage of these new cutting-edge job opportunities. These high paying jobs will also synergize extremely well with Arkansas' existing attractive business environment.

[17] https://www.brookings.edu/wp-content/uploads/2016/06/thehiddenstemeconomy610.pdf
[18] https://www.learnhowtobecome.org/career-resource-center/careers-in-stem/#:~:text=STEM%20positions%20appeal%20to%20many,for%20all%20non%2DSTEM%20positions.
[19] https://www.indeed.com/career-advice/finding-a-job/highest-paying-stem-jobs
[20] https://datausa.io/profile/geo/arkansas#economy

Northwest Arkansas currently ranks fourth in the country in terms of best places to live.[21] It is also the tenth most affordable place to live, which means workers in the burgeoning industry will have an outsized proportion of spending power relative to other cities and regions around the country. Fueled by AAM, the quality of life for many Arkansans will improve.

Currently, agriculture is the largest Arkansas employer sector in terms of workforce, but aerospace is the biggest employer sector in terms of dollar value. STEM education should keep pace with the ever-growing significance of the technology sector, and preparing the state for the deployment of AAM is a logical way to do this. Arkansas is already doing very well for itself in this regard. Out of the 50,000 post-secondary diplomas conferred in 2019-2020, nearly 19,000 of them were in a STEM-related field, including health sciences.[22] That translates to 37.6% of all conferred degrees coming from STEM. The national average for STEM diplomas is 36.7%, which means Arkansas is above average.

The State has 26 four-year colleges and universities—University of Arkansas being the largest with 25,000 students—and 22 two-year colleges. The University of Arkansas offers a wide range of excellent engineering programs, including Electrical, Computer Science, Industrial and Mechanical Engineering with the option of an aerospace concentration.

There are also many training programs for careers in aerospace shown in Figure 42:[23]

Aerospace Career Training Programs Include:	
Aviation Maintenance Technician	Aviation Management
Aviation Airframe Maintenance	General Aviation Air Frame Maintenance
Aviation Power Plant Maintenance	Electronics/Avionics Technology
Sheet Metal (Aircraft)	Computer Aided Three-Dimensional Interactive Application (CATIA) design and engineering
Aviation Technology	
Airframe/Power Plant	

Figure 42 – Aerospace career training programs in Arkansas today.

The state's existing aerospace sector is poised to begin work on AAM immediately, as long as STEM graduates are available to fill the jobs:[24]

- Arkansas' aerospace, aviation, and defense industry employs nearly 10,000 Arkansans
- There are approximately 180 aviation and aerospace-related companies in the State
- Aerospace is Arkansas's number one export, accounting for more than $1.8 billion
- Commercial airports generate $2 billion to Arkansas' economy each year,
- General aviation alone creates an economic impact on Arkansas of almost $500 million annually

[21] https://realestate.usnews.com/places/rankings/best-places-to-live

[22] Analysis conducted using the U.S Department of Education's National Center for Education Statistics. https://nces.ed.gov/ipeds/TrendGenerator/app/build-table/4/24?rid=71&cid=6&cidv=1%7C2%7C4%7C5%7C6%7C8%7C9%7C10%7C11%7C12%7C13%7C15%7C16%7C17%7C18%7C19%7C20%7C21%7C22%7C23%7C24%7C25%7C26%7C27%7C28%7C29%7C30%7C31%7C32%7C33%7C34%7C35%7C36%7C37%7C38%7C39%7C40%7C41%7C42%7C44%7C45%7C46%7C47%7C48%7C49%7C50%7C51%7C53%7C54%7C55%7C56

[23] Education (arkansasaerospace.com)

[24] Aerospace Facts (arkansasaerospace.com)

Bringing AAM into the state will catalyze the growth of STEM education and employment, creating an even more diverse and technically savvy workforce, raising wages, and bringing in new opportunities that will attract students globally, nationally, and regionally to study the latest developments in aerospace technology and, in many cases, remain in the state for aerospace jobs.

Arkansas Governor Asa Hutchison stands firmly behind initiatives to encourage schools to offer Science, Technology, Engineering and Math (STEM) programs and students to take them. The Arkansas STEM Coalition matches educational goals to the state's business needs and provides future talent to Arkansas. The coalition also encourages the recruitment and retention of highly effective STEM teachers.

The Arkansas STEM Coalition collaborates with Walmart's Arkansas initiative for Million Women Mentors, focused on engaging 5,000 Arkansas STEM mentors to increase the interest and confidence of girls and women to persist and succeed in STEM programs and careers. The state also has a consortium—the Arkansas Aerospace and Defense Alliance — dedicated to growing the industry and to ensuring a highly qualified workforce.

Improvements to the Existing Urban-Rural Divide

The Arkansas economy is sharply divided along urban and rural lines, and much of the State is distanced from business opportunities. In 2019, Arkansas' GDP was $132 billion, and its population approximately 3 million. According to the U.S. Health Resources and Services Administration, of Arkansas' 75 counties, 54 are considered rural (or 72%), the rest urban or suburban. Despite the rural majority, these 54 counties have 1.1 million people, or 36% of the State's population. The urban and suburban portions have 1.9 million people, or 64%. Unsurprisingly, the urban and suburban economy makes up 69% of GDP, with the rural economy contributing the remaining 31%.

Often, the rural community is excluded from opportunities present in the more prosperous 69% of the economy. Due to the geographic isolation of the two disparate economies, people are compelled to work within their defined economic bubbles.

Of the six regions NEXA assessed, just two contain the lion's share of economic activity: central Arkansas, which includes Little Rock, and Northwest Arkansas, which includes Bentonville and Fayetteville. Together, these MSAs consist of nine counties, accounting for 49% of the state's annual GDP. Put another way, 12% of state counties are responsible for 50% of the state's added value. While these commercial centers are well served from a standpoint of business and opportunity access, the rest of Arkansas is virtually cut off. The interstate and freeway network inadequately serve the more remote counties beyond central and northwestern Arkansas. In fact, today in southeast Arkansas, some residents still go about their daily lives without running water or electricity; roughly a quarter of the state is underserved.

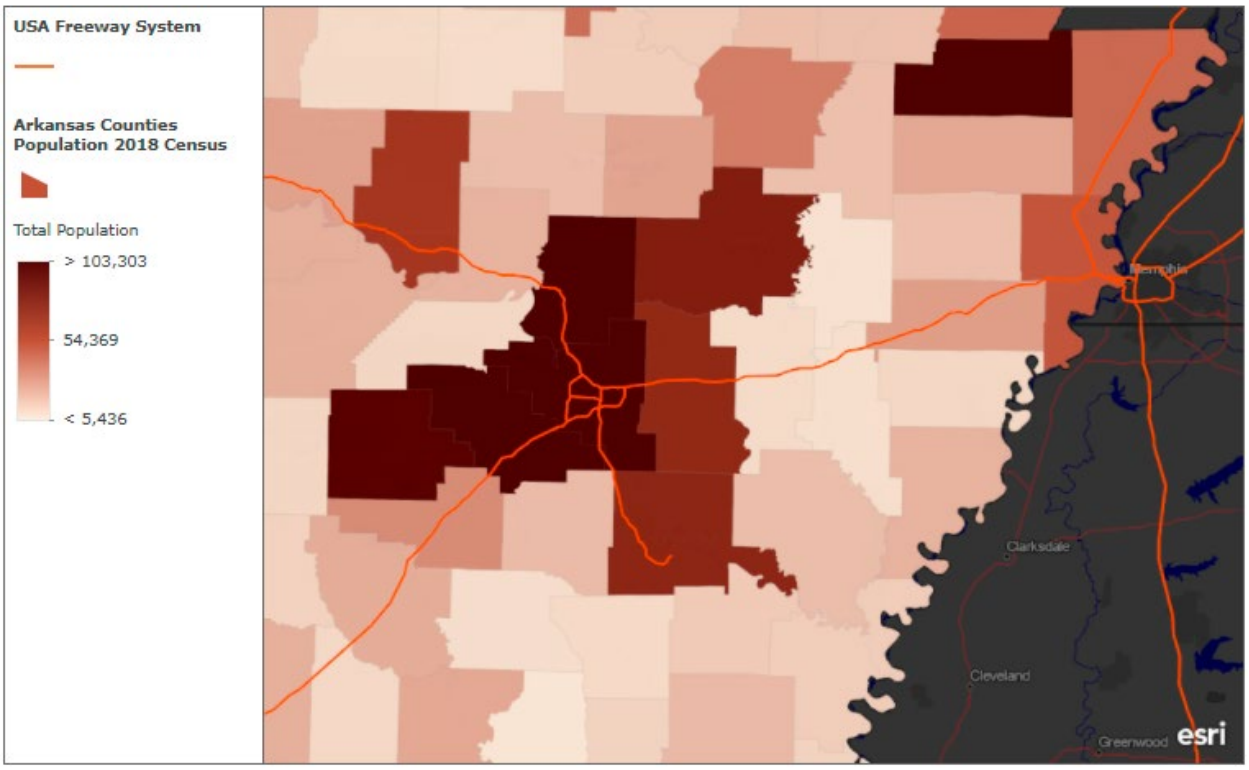


Figure 43 - A map produced by NEXA using the ArcGIS mapping tool showing the interstate freeway and population density by county. Little Rock is at the center.

However, once the state begins to build out AAM technologies, Arkansas will be able to leapfrog infrastructure development and connect all regions at a relatively low cost, bringing access to goods and services for everyone. When convenient and affordable AAM travel is available, someone from Newport, Arkansas (Jackson County in the upper delta), who would otherwise be limited to job prospects within roughly 10 miles of his or her hometown, can find gainful employment in cities across the state, such as Little Rock. Essentially, AAM will bridge the geographic gap between the two economies, creating a synergy that will improve employment prospects for all. Lower-income communities will also benefit from more rapid transportation to prospective employers. Employers will have a wider pool of talent to choose from.

A diversified labor pool and expanded economic geography allow for wealth to be created in one part of the state and spent in another part: employees will be able to work in the urban economy and spend in the rural economy. Increased consumer spending in the rural economy will necessarily attract new businesses and opportunities, thus contributing to rural expansion, and improving income for Arkansans across the state.

Ease of transportation from outlying areas will also expand the customer base for urban businesses, increasing revenues and helping to grow that economy. Securing America's Future Energy (SAFE), an energy policy research organization, cited the following in its 2018 Autonomous Aircraft Study:

- A 1% improvement in accessibility to a region's central business district improves regional productivity by 1.1%.

- A 10% increase in average speed of transportation, all other factors being constant, leads to a 15-18% increase in the labor market size, resulting in a 2.9% increase in productivity.
- A 10% improvement in access to labor increases productivity and regional output by 2.4%.

Clearly, improved transportation plays an essential role in enhancing economic growth and overall productivity. Affordable, quiet, low-emission AAM aircraft and systems will allow for residents to live further from their workspace, both decongesting inner-city traffic and diversifying labor in a cost-efficient, environmentally friendly, and equitable manner.

It is important to note that the reduction of commuting times only begins in the sixth mile from departure. In 2020, NEXA conducted a study comparing eVTOL flight times to ground vehicle commute times using ArcGIS real-time traffic analytics. At around the fifth mile of a commute in average traffic congestion (the average between peak and minimal congestion hours), it takes both cars and eVTOLs between 15-20 minutes to get to their destination. At the sixth mile, car commute times begin to increase at a faster rate than eVTOLs, reaching 20 minutes. If the commute is 10 miles—the average commute in the United States—it will take cars in average congestion just over 30 minutes to arrive at the destination. By comparison, an eVTOL would take approximately 20 minutes, as shown in Figure 44.

The 10-mile commute shows a 33% time reduction, which is three times larger than the 10% speed increase suggested in the SAFE study. It follows, then, that the labor market size for the impacted region could increase 45-54%, which then translates to a roughly 8.7% increase in regional productivity.

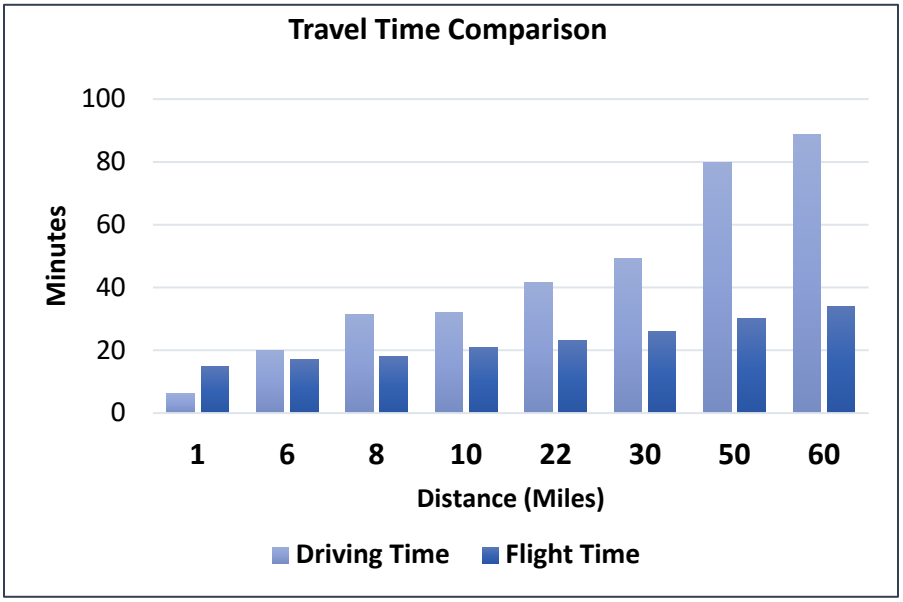


Figure 44 – Nominal Drive and eVTOL Flight Time Comparisons.

While members of the working public may not take an eVTOL to shave 10 minutes off their commute, those living further out would have a compelling reason to do so. Current AAM technology would allow for travel distances up to 200 miles and, as the graph shows, the time gap between cars and eVTOLs continues to grow exponentially with every additional mile, showcasing the potential of AAM to efficiently connect every region of the state.

In short, the potential to improve Arkansas' labor market and connect its two economies into one highly efficient and equitable economy is an extremely attractive prospect that AAM is uniquely capable of accomplishing.

Next Steps

While a major effort will be required to bring AAM to Arkansas, the social and economic benefits are numerous: thousands of new jobs supporting billions of dollars of new economic activity. Arkansas is home to a thriving innovation ecosystem, experiencing a renaissance in manufacturing, entrepreneurship, and knowledge creation. We can begin the journey with these next steps.

Assemble a Business Consortium using Public Private Partnership (PPP) constructs

Since AAM is a new and unique capability which is now visible on the horizon, how it is designed and implemented in Arkansas becomes a critical timely discussion. This capability is not a typical government run transportation program, it is a mobility program similar to the evolution of Uber/Lyft and others which will require the Government, Corporations and the Public to work together. Note that Uber/Lyft have never needed the infrastructure and certifications that AAM will require and this will need new approaches to funding the various AAM project elements. This looks like a perfect opportunity to consider using Public Private Partnerships (PPP) to create the financial facilities needed to fund what will be billions of dollars of development capital. High level initial conversations are needed to consider how a PPP could be structured and formed, using numerous examples particularly under the US Department of Transportation and Department of energy.

Energize the Arkansas Aerospace Supply Chain to Lead AAM Advocacy

The Aerospace supply chain is already well energized at developing the AAM/Drone capabilities. The vehicles, vertiports, charging stations, Air Traffic infrastructure are all under various levels of development and conceptualization. Most if this activity is occurring outside of Arkansas at present at the typical and historic high-tech/aerospace locations in the US and overseas. A discussion with those Aerospace companies doing business in Arkansas is a critical next step as it would signal both the interest and willingness to develop this business

Begin Legislative Advocacy

While there are many deep elements of AAM which will ultimately need political support, at this point step one would be to enlighten key political bodies of what AAM is and what it can do to create jobs, social benefit and expansion of commerce in Arkansas. At this step, job one is simply “AAM 101” to begin the early discussion of what is coming, and how Arkansas can be a leader in this new endeavor.

Research Catalytic Benefits of AAM-Supported Healthcare Outcomes for Arkansas Residents

It was clear from this report and analysis that the catalytic benefits of AAM and RPAS delivery of goods and services could positively and materially alter healthcare outcomes for Arkansas’ rural residents. Further studies should be undertaken, as this benefit is likely to deliver significant economic impact and job creation as well.