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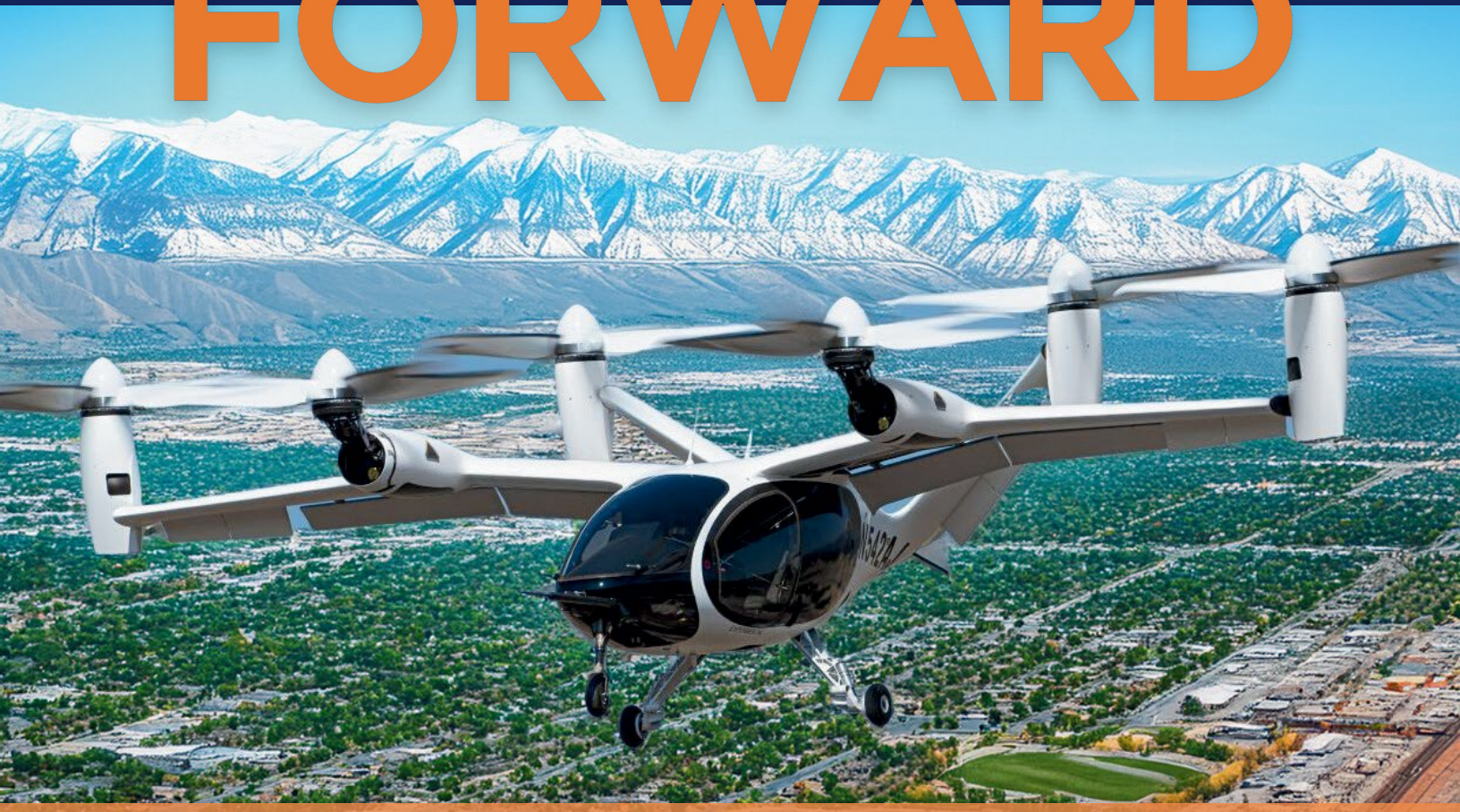
MOVING UTAH FORWARD



The Economic Impact and Community Benefits of Advanced Air Mobility

FEBRUARY 2025

Contents

Glossary

AAM	Advanced Air Mobility
A&D	Aerospace and Defense
A&P	Airframe & Powerplant
ABL	Atmospheric Boundary Layer
AIP	Airport Improvement Program
ALTA	Air Logistics Transportation Alliance
API	Application Programming Interfaces
ASOS	Automated Surface Observing System
ASTM	American Society for Testing and Materials
ATC	Air Traffic Control
AWOS	Automated Weather Observing System
BVLOS	Beyond Visual Line of Sight
C2	Command and Control
CAPEX	Capital Expenses
CNS	Communications, Navigation, and Surveillance
COOP	Cooperative Observer Program
DAA	Detect and Avoid
DOA	Division of Aeronautics
eCTOL	electric Conventional Take-Off and Landing
EIA	Economic Impact Analysis
eSTOL	electric Short Take-Off and Landing
eVTOL	electric Vertical Take-Off and Landing
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FATO	Final Approach and Take-Off Area
FBO	Fixed-Base Operator
FTE	Full-Time Equivalent
GA	General Aviation
GAO	Government Accountability Office
GDP	Gross Domestic Product
GOEO	Governor's Office of Economic Opportunity
GPS	Global Positioning System
ICE	Internal Combustion Engine
IFC	International Fire Code

ISO	International Organization for Standardization
KPI	Key Performance Indicator
LiDAR	Light Detection and Ranging
MMIWG	Missing and Murdered Indigenous Women and Girls
NAS	National Airspace System
NASA	National Air and Space Administration
NCSU	North Carolina State University
NFPA	National Fire Protection Association
NSF	National Science Foundation
NWS	National Weather Service
OEM	Original Equipment Manufacturer
OPEX	Operating Expenses
OSHA	Occupational Safety and Health Administration
POWDER	Platform for Open Wireless Data-driven Experimental Research
P3	Public Private Partnership
RIAC	Rapid Integration Acceptance Center
RTCA	Radio Technical Commission for Aeronautics
RAM	Regional Air Mobility
RWIS	Road Weather Information System
SLC	Salt Lake City International Airport
SAAS	Software As A System
SAE	Society of Automotive Engineers
sUAS	Small Uncrewed Aerial Systems
TLOF	Touchdown and Liftoff area
TRU	Talent Ready Utah
STEM	Science, Technology, Engineering , and Math
UAM	Urban Air Mobility
UAP	Utah Aerospace Pathways
UAS	Uncrewed Aerial Systems
UDOT	Utah Department of Transportation
UEOC	Unified Economic Opportunity Committee
UIPA	Utah Inland Port Authority
USHE	Utah System of Higher Education
USU	Utah State University
UTM	Uncrewed aerial systems Traffic Management or Urban air mobility Traffic Management
UTTR	Utah Test and Training Range
VLOS	Visual Line of Sight
VTOL	Vertical Take-Off and Landing
WIP	Weather Information Provider

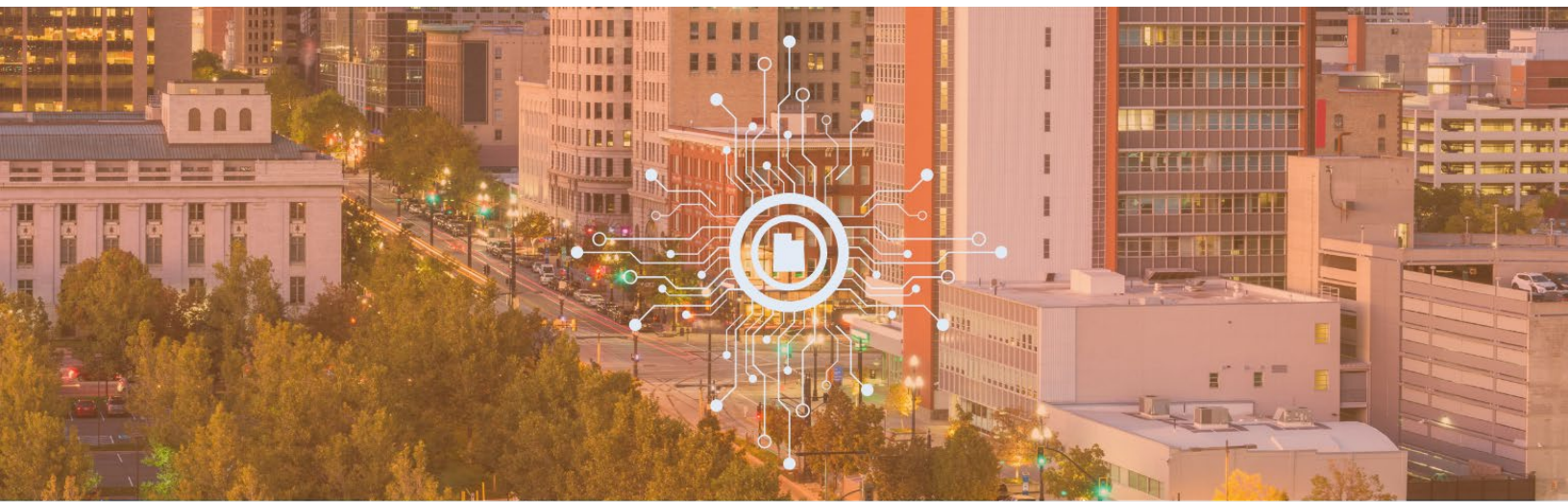
Executive Summary

Utah is one of America's economic powerhouses, ranking at or near the top of numerous national indexes for both business and social excellence. Utah is embracing innovative technologies like Advanced Air Mobility (AAM) to address transportation challenges while pursuing broader goals, including reducing emissions to improve air quality, supporting economic development, and enhancing quality of life through new mobility options and job creation.

> *"Air Mobility will unlock unprecedented access to our state's breathtaking beauty for both Utahns and visitors, and do so in a way that's efficient, quiet, and forward-thinking. By the time the world comes to Utah for the 2034 Olympics, our goal is to be ready with a state-of-the-art AAM network that includes robust infrastructure, seamless operational support, and a highly skilled workforce prepared to meet the demands of a new generation of air transportation.*
>
> *"This is about more than just transit; it's about showcasing Utah's innovation, our commitment to connectivity, and our drive to lead the way in transformative technologies."*
>
> **Utah Governor Spencer J. Cox**

AAM refers to state-of-the-art aircraft powered by advanced battery technology, lightweight electric motors, innovative composites, and enhanced autonomous flight systems. AAM encompasses a wide range of innovative aircraft, including eVTOLs (electric Vertical Take-Off and Landing), eSTOLs (electric Short Take-Off and Landing), eCTOLs (electric Conventional Take-Off and Landing), and Uncrewed Aerial Systems (UAS), often called drones. Some of the first aircraft may be hybrid, propelled by a combination of batteries and fuel for longer-range trips. At some point further in the future, hydrogen fuel cells will be an alternative.

These technologies support diverse use cases such as cargo and passenger movement, public safety, infrastructure management, and disaster response.



These low, or zero, emission aircraft can help address Utah's air quality challenges by offering an alternative to traditional internal combustion-based transportation. Operating within low-altitude airspace, they provide additional options for moving people and goods, potentially reducing the demand for new surface construction and the associated emissions.

IN UTAH, AAM WILL HAVE THE POTENTIAL TO:

- Create thousands of high paying full-time jobs and boost statewide GDP
- Provide rural areas with new economic opportunities, convenient delivery and transportation options, and greater connectivity to urban areas
- Revitalize small regional airports and their local communities
- Improve cargo and package deliveries along and between logistics corridors
- Improve healthcare outcomes statewide, particularly in remote areas
- Showcase the state's ingenuity at the 2034 Olympics by transporting athletes and visitors to Olympic sites
- Provide visitors with new and exciting experiences while increasing tourism expenditures
- Provide Utah industries with extraordinary, new, low-cost efficiencies
- Reduce greenhouse gases by replacing Internal Combustion Engine (ICE) vehicles with electric aircraft
- Provide a comprehensive testbed for AAM aircraft communications, navigation, and surveillance (CNS) solutions.

Figure 1 - California's Archer Aviation is a leading eVTOL manufacturer.

Market analysis performed by Morgan Stanley, Goldman Sachs, and others forecast a global opportunity for AAM worth more than $1 trillion through 2040 and $9 trillion through 2050.[1] Given the significant potential contributions of AAM to the state's economy, the Utah Department of Transportation Division of Aeronautics tasked NEXA Advisors to perform an Economic Impact Analysis (EIA) for Utah resulting from the introduction and operations of AAM technologies.

According to our findings, the potential economic impact and benefits to the State of Utah from the AAM industry and ecosystem from 2025-2045 could:

11,000 Create over 11,000 new full-time aerospace industry and other jobs in the State.

$8 BILLION Generate over $8 billion in new business activity and related stimulus.

$1.8 BILLION Produce $1.8 billion in local, state, and federal tax revenues.

If an eVTOL manufacturer opens shop in Utah, additional economic impact would:

2,000 Create an additional 2,000 new full-time aerospace industry and other jobs.

$2.7 BILLION Generate an additional nearly $2.7 billion in direct, indirect, and induced economic activity.

$535 MILLION Generate an additional $535 million in local, state, and federal tax revenues.

In terms of AAM passenger use:

- By 2045, some 31.6 million passengers are expected to have traveled within Utah using new AAM services over the forecast period.
- By the 2041-2045 time period, nearly 3 million passengers per year, or almost 8,200 passengers per day, are forecast, equivalent to 8.4% of future commercial air traffic in the state (assuming 1.5% annual growth).
- By 2045, the forecast cost per ticket could drop to under $90 on average, due to efficiency gains such as the introduction of flight automation and increased passenger volumes.

In terms of infrastructure development, Utah will need to establish and retrofit facilities to accommodate a range of Advanced Air Mobility operations, including eCTOL, eSTOL, and eVTOL aircraft, by 2045. According to our forecasts, the state will need to:

- Retrofit 23 existing airports, heliports, and supporting infrastructure, such as weather and CNS (Communications, Navigation, and Surveillance) upgrades to support eCTOL, eSTOL, and eVTOL operations.
- Construct 15 new vertiports strategically located throughout the state, including a new multiport terminal (a vertiport for multiple aircraft) at Salt Lake City International Airport.

> *"We move people—and the things they need—using more than just roads. As Utah's population grows and we face increasing demands on our ground transportation system, we know that Advanced Air Mobility offers innovative new solutions to address our evolving mobility needs."*
>
> **Carlos Braceras,**
> **UDOT Executive Director**

The business and economic models indicate that the capital required for new vertiport infrastructure is in the range of $116 million. The estimated capital expenditure (CAPEX) for developing an Advanced Air Mobility traffic management system across the State of Utah will cost about $140 million. Statewide AAM infrastructure will be a fraction of the cost of road expansion.

The costs for setting up and operating a statewide AAM system do not need to rely solely on taxpayer funding. Instead, they can be supported through a mix of funding mechanisms, including Public-Private Partnerships (P3s), FAA Airport Improvement Program (AIP) grants, and federal credit programs focusing on carbon reduction. P3s involve collaboration between a government agency and a private sector consortium that can be used to finance, build, and operate projects, mainly focusing on public transportation networks such as roads, bridges, and airports. The AIP provides grants between 75% and 95% of costs to public agencies for the planning and development of public-use airports. A simple change to federal regulations by Congress can unlock favorable incentives the private sector will find attractive.

> *"The Utah State legislature has a desire to see AAM become successful. We need to ask ourselves, 'How do we make sure we get the right processes in place to launch this new technology?'"*
>
> **Jefferson Moss, Majority Leader,**
> **Utah House of Representatives**

How Advanced Air Mobility Will Benefit Utah

From saving lives to transporting cargo to providing countless conveniences, AAM will benefit Utah residents in numerous ways. Let's look at the major use cases.

eVTOL and eSTOL Use Cases

Transport, Logistics, and Cargo

It is likely that cargo transportation will be the first widely used AAM use case in Utah and around the nation as passenger transportation will involve additional regulatory requirements.

> *"For manufacturers, logistics can make up to 67 percent of costs. The typical helicopter combustion engine has 30,000 moving parts while the BETA eVTOL electric engine has under 30 parts. With so few moving parts and low maintenance, you can move cargo and freight more affordably."*
>
> **Sebastian Abril, Director of Airfreight Strategy & Development, Utah Inland Port Authority**

AAM cargo flights will enable rapid transfers from distribution centers to key destinations, supporting the transport of high-value, critical just-in-time items for manufacturing facilities and Utah's energy industry. These operations will help expedite equipment repairs and ensure minimal downtime. Additionally, AAM cargo flights can complement existing logistics networks by connecting with commercial airline flights, which often carry significant amounts of cargo alongside passengers, further enhancing supply chain efficiency.

Utah's current cargo and logistics infrastructure is strategically positioned to support the state's growing role as a national and global logistics hub. Known as the "Crossroads of the West," Utah benefits from its geographic location at the intersection of major interstate highways, including I-15, I-70, and I-80, which facilitate connections to the entire United States. The state is also home to the Union Pacific Railroad's Salt Lake City Intermodal Terminal, which provides direct intermodal rail service to the ports of Los Angeles and Long Beach, with additional connections to the Port of Oakland.

Complementing this robust network is the Utah Inland Port, offering Foreign Trade Zone services and situated near Salt Lake City International Airport. Emerging AAM solutions have the potential to further enhance this multimodal freight ecosystem, providing rapid, low-emission transport options that can integrate seamlessly with existing road, rail, and air systems. Together, these elements position Utah as a critical hub in national and global supply chains.

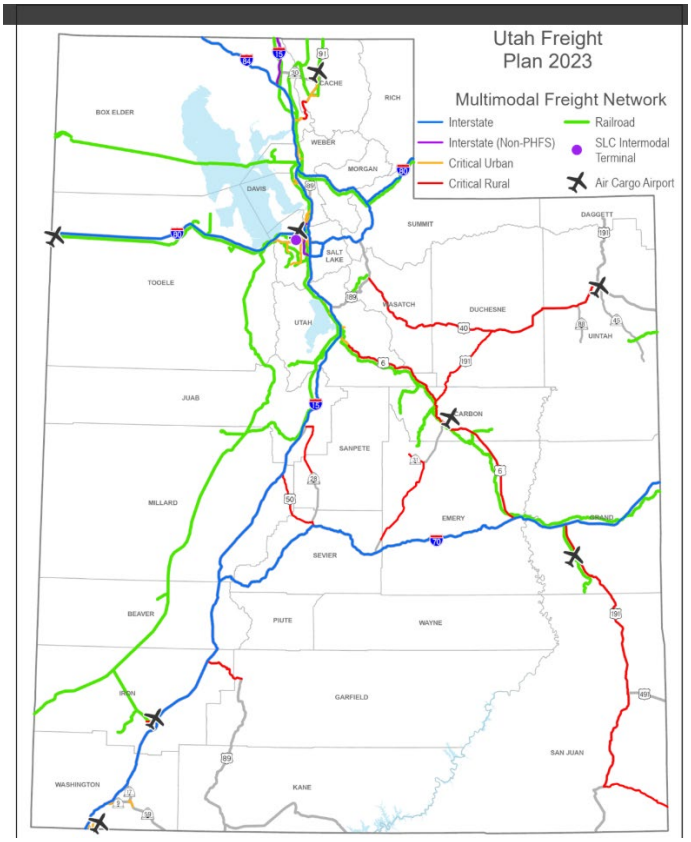


Figure 2 – Utah Freight Plan including roads, rail, and airports.

AAM will not replace rail, trucks, or commercial large aircraft but will add new capabilities to the cargo network as a complement and value-multiplier. It will increase the state's capabilities to reach remote and rural areas that rail cannot, reduce some reliance on road transport, and improve environmental sustainability by reducing emissions.

As the 2023 #1 State in Manufacturing Job Growth, Utah will continue to build out manufacturing and logistics infrastructure along its main cargo corridors**:** I-15, I-70, US-89, the Mountain View Corridor, and SR-162 and SR-262—dubbed the "Energy Corridor" as it supports freight movement related to the oil industry.

Initially, many AAM cargo operations will leverage existing airport infrastructure. Salt Lake City International Airport (SLC) occupies 8,000 acres that allows for continued air cargo expansion. The first Utah AAM cargo missions will likely fly between busy cargo nodes at SLC, Ogden, and Provo airports to logistics and manufacturing sites around the state and rural areas. These routes will see increasing demand for time-sensitive cargo to be flown to many destinations between factories, warehouses, and cities.

Cargo transportation companies have already placed orders for AAM aircraft. UPS will purchase up to 150 electric aircraft from Vermont-based Beta Technologies for time-sensitive deliveries that would otherwise fly on small conventional airplanes. In the future, rather than relying on airports, the eVTOL aircraft may take off and land on-property at UPS facilities, creating a micro air feeder network without the noise or operating emissions of traditional aircraft. The first-generation Beta aircraft will have a range of 250 miles--though it will initially only fly 125 on a single charge for safety reasons--and a cargo capacity of 1,400 pounds.

"Air cargo will precede passenger travel," said Ben Kolender, Senior Fellow, World Trade Center Utah. "If we increase the competitiveness of air logistics through AAM, we can move goods regionally within Utah from Salt Lake City international Airport."

Regional Air Mobility

Utah is a vast state, comprising some 85,000 square miles. Residents of rural and remote areas often drive several hours to a destination because there are no nearby commercial flights available. The state has 46 public use airports, of which only eight are used by commercial airlines: Salt Lake City International (with 12.9 million enplanements in 2023)[2]; St. George Regional (136,000)[3]; Provo Municipal (415,000)[4]; Ogden-Hinckley, which is just resuming commercial service; Canyonlands (19,300)[5]; Cedar City (11,800)[6]; Vernal Regional (14,000)[7]; and Wendover, which hasn't seen commercial flight for a few years now.

Utah's remaining 38 public use airports are General Aviation (GA), used mostly for flight training, business aviation, cargo, emergency services, agricultural support, and recreational flying.

Thirty-three Utah airports support air ambulance operations, and 34 support aerial firefighting.[8] However, many of these small regional airports have additional capacity and untapped potential to support growing aviation needs. Regional Air Mobility (RAM)—on-demand and scheduled short AAM flights at smaller airports, including many currently without commercial operations—would offer travelers convenient new options.

According to AAM aircraft manufacturers, batteries on an electric aircraft could fly between 60 and 160 miles before requiring a recharge. These ranges will increase as battery density technology improves, which is currently occurring at about 7% a year.

Figure 3 – Utah residents living far from one of Utah's eight airports with commercial flights are forced to drive long distances to the nearest airport or bypass aviation entirely and drive several hours to their destination.

AAM aircraft will offer a complementary transportation option for city pairs and rural airports that are not served by airlines and not easily accessible via existing options like interstate freeways. This will provide faster and more flexible travel for trips such as those between Wendover, Tooele, Price, or Logan, and Salt Lake City or the Point for meetings, medical appointments, theater, or shopping. Or from Salt Lake City to rural Utah, such as Moab, for hiking in the national parks.

AAM has the potential to complement conventional airlines by expanding their networks. With lower operating costs, AAM may make it viable to offer affordable flights under 200 miles—a range that has historically been economically difficult for airlines to offer. Commercial airlines,

> *"This is a rare moment in time where industry and technology can meet the needs of the state, and right now some of those needs are to effectively manage the population boom and begin to eradicate inversion layers without the need to continue spending billions in the traditional way on other infrastructure."*
>
> **Chris Metts, International Aviation Transportation Executive, 47G and Project ALTA Lead**

including United, Delta, Virgin Atlantic, and American, are in the early planning stages for short regional flights and have already placed orders for eVTOL aircraft. Delta has invested in eVTOL manufacturer Joby Aviation; United has invested in Archer Aviation and Eve Air Mobility; and American Airlines has invested in the Vertical Aerospace aircraft. In fact, in North America airlines have placed firm or conditional orders for over 4,700 eVTOLs, a signal that value will be created as an unmet need finds new airline services and customers.[9]

Major airports already have infrastructure such as air traffic control and passenger handling facilities, with Fixed-Based Operators (FBOs) that could support AAM operations. But additional investments in vertiports, charging stations, and CNS upgrades may be needed to fully integrate these new aircraft. Airlines might establish regional hubs in Utah if market demand, economic incentives, or government partnerships create favorable conditions, though such developments will require further infrastructure advancements and regulatory approvals.

Airports are well known as economic drivers. In 2019, Salt Lake City International contributed $11.4 billion in annual economic activity and supported more than 124,000 jobs, including direct airport jobs, related sectors, tourism, and other services across the state. The other 45 airports contributed $1.3 billion and supported 11,600 jobs.[10]

Regional Air Mobility can generate significant benefits to small airports and their surrounding communities. While Utah is eager to support its small airports in offering Regional Air Mobility, the rollout will likely begin with airports that demonstrate sufficient demand for passenger or cargo operations to ensure profitability, such as those near major tourist destinations or manufacturing centers. Airports near flight training centers, such as Logan-Cache Airport, which supports Utah State University's Aviation programs, are also likely to be among the first airports to receive AAM service as the workforce talent pool will help to support operations.

According to the 2020 Utah Aviation Development Strategy Technical Report, 94.1 percent of Utah's population lives within a 30-minute drive of one of the state's public use airports. By developing a network of RAM services at General Aviation airports with additional capacity, the state could provide public convenience as well as significant regional economic development in terms of new jobs, improved workforce mobility, increased revenues, and overall economic productivity.

Medevac and Healthcare Missions

AAM—in the form of passenger-carrying electric aircraft—will improve healthcare outcomes and efficiencies across the State of Utah. While Medevac helicopters save countless lives, they can be expensive. The average Medevac flight in the U.S. costs between $12,000 and $55,000 per trip, and many insurance policies do not fully cover air ambulance services, leaving patients responsible for substantial out-of-pocket costs.[11] Helicopter noise limits their use at hospitals located in some residential neighborhoods.

Electric aircraft can transport critically ill or injured patients to major trauma centers. Utah has three Level 1 facilities, all in the Salt Lake City area (Intermountain Medical, Center University of Utah Hospital, and Primary Children's.) All the state's five Level II trauma centers are located between Ogden and Provo with the exception of St. George, located in the state's southwest corner. This leaves many Utahns hundreds of miles away from major trauma centers and at greater risk of serious consequences resulting from delays in accessing care.

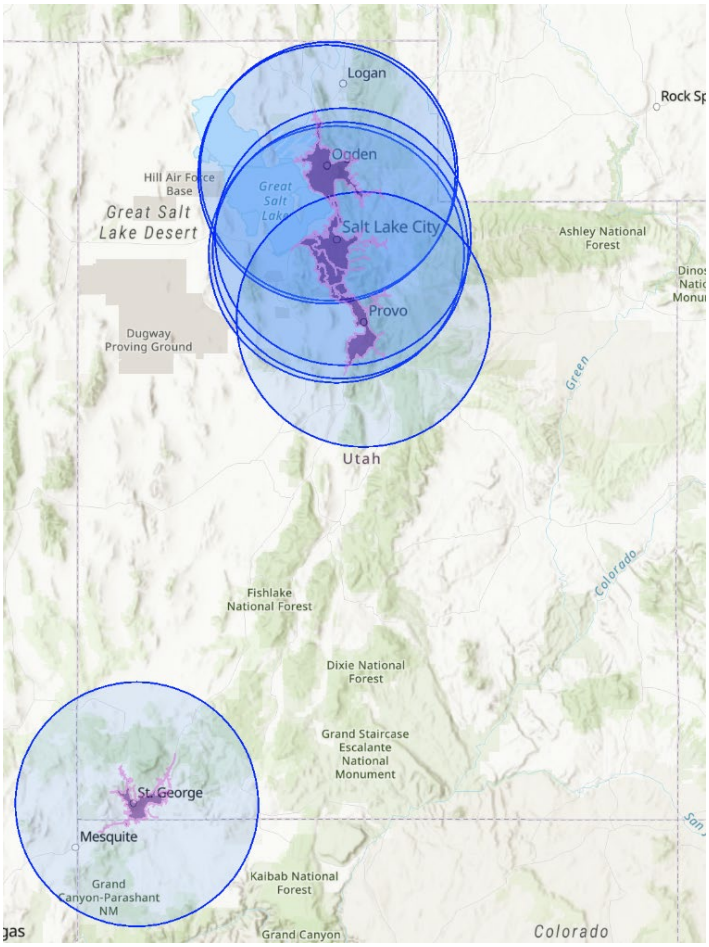


Figure 4 - The purple represents the area reachable by ground in thirty minutes from a Utah Trauma Center, and the blue regions represent the area reachable by air in 30 minutes, an increase of ten-fold. VTOLs and hybrids could complement existing Medevac fleets, reducing noise and costs and expanding access.

> *"Advanced Air Mobility presents intriguing opportunities for the life sciences industry. Timely resolution of supply chain challenges, transport of critical personnel to address urgent on-site situations, facilitating collaborations between industry sectors, and innovating ways of distributing life sciences products are all possible applications of AAM."*
>
> **Kelvyn Cullimore, CEO BioUtah**

A Medevac VTOL would need to carry the pilot, the medic, the nurse, and the patient, along with lifesaving medical equipment. eVTOL battery range would be a limiting factor for the state's remote areas, where hybrid VTOL aircraft could be used.

The larger facilities could fly lifesaving materials on a drone for on-site treatment or even fly medical personnel to the remote facility on an eVTOL. It is likely that electric aircraft such as eVTOLs—much quieter and less expensive than helicopters—will expand Medevac use.

Intermountain Health has 900 employees and 55 rotor and fixed-wing aircraft in their two Medevac systems: LifeFlight for urban areas and Classic Air for rural ones. In 2022, Classic Air Medical transported approximately 6,559 patients and LifeFlight transported 4,548.[12]

AAM also has the potential to significantly benefit Utah's life sciences and biotech industries. In 2022, the industries generated $21.6 billion in direct and indirect spending and supported 182,000 jobs across the state.[13] Salt Lake County alone accounted for over 73% of Utah's life sciences employment in 2023. With a focus on innovation and rapid transport, AAM can enhance this ecosystem by efficiently delivering critical medical supplies, just-in-time components, and specialized equipment, further strengthening Utah's leadership in life sciences and biotech.

Airport Shuttle

Airport shuttles are being planned to connect the traveling public to the airport for longer haul and international travel. Passengers heading from downtown Salt Lake City or surrounding communities to Salt Lake City International Airport—and later to airports at St. George, Provo, Logan, and Ogden-Hinckley—may board an AAM shuttle at a local airport or downtown vertiport and arrive at the commercial airport within a period measured in minutes. Similarly, passengers arriving at a large commercial airport will transfer to an AAM aircraft to get home or to arrive at a tourist destination. Shuttles may operate as a scheduled service or on-demand.

Tourism

In 2023, Utah's tourism industry generated an impressive $12.71 billion in direct visitor spending from multiple sources including business, meetings, conventions, sporting events, film, culture, outdoor recreation, and other leisure activities. This robust growth contributed significantly to the state's economy, generating around $2.35 billion in tourism-related tax revenue. The industry supported approximately 159,800 travel and tourism jobs across the state.[14] Record-breaking numbers of domestic and international tourists visited Utah's national parks and world class ski resorts.

Figure 5 – Utah's visitor economy is quite diverse. (Courtesy of the Utah Office of Tourism.)

Utah is home to five national parks, known as the "Mighty Five": Arches, Bryce Canyon, Canyonlands, Capitol Reef, and Zion. Additionally, Utah has eight national monuments, as well as numerous historic sites and recreation areas, and offers some of the most stunning Western landscapes and important geologic history within the National Park System. Today, it is time consuming for tourists to move between these parks. Visitors must fly into one of the commercial airports, rent a car, and drive long distances. AAM can make it possible to access multiple national parks on a shuttle system.

The use of AAM aircraft for tourism will bring more visitors and their dollars to the state, enhancing convenience, expanding the number of sites tourists visit, and providing travelers with new and exciting experiences.

Business Aviation

Companies across the nation have long benefited from business aviation. Increased mobility addresses management's need for greater organizational agility, knowledge integration, and transaction speed. Profitable companies create jobs, stimulating the regional economy.

Many large corporations already operate flight departments, but top executives must still drive to the airport to board their business aircraft. AAM aircraft, including eVTOLs, will provide business travelers with new options for seamless transportation. These aircraft could connect existing or repurposed land near airports to city centers or other destinations within their range, reducing travel time and increasing efficiency.

According to the National Business Aviation Association, many corporations are eager to explore AAM technologies for their fleets, highlighting the potential for these aircraft to complement traditional business travel. For instance, Utah's energy sector—which in 2023 accounted for more than 104,000 jobs and $15 billion in GDP—is spread far and wide across the state.[15] AAM may be used to transport key personnel efficiently from the oil fields in Uinta County to the refineries in Salt Lake, as well as deliver critical just-in-time components.

Many international businesses have chosen to establish headquarters or expand in Utah, including Adobe, Qualtrix, Pluralsight, BambooHR, Goldman Sachs, Amazon, Northrop Grumman, Microsoft, Overstock.com, Facebook, SkyWest Airlines, and eBay. Corporate aviation helps business leaders remain competitive, and business aviation flights contribute to the economy of the airports that serve them and their nearby communities.

On-Demand Air Taxi

While large cities rely on traditional public transportation systems such as metro, bus, taxi, and rideshare services, AAM has the potential to complement these systems by offering faster response times and reduced travel durations for specific use cases, particularly in regions with limited connectivity. By collaborating with public transportation authorities and regional planners, AAM can integrate into broader mobility and land use strategies, ensuring equitable access and enhancing overall transportation networks. It is likely that travelers will be able to order an aircraft on their phone, go to the nearest vertiport, and fly over city traffic to their destination in a few minutes. AAM flights operating in cities are called Urban Air Mobility (UAM,) which will roll out after the other use cases mentioned here as it will require greater levels of planning and public acceptance.

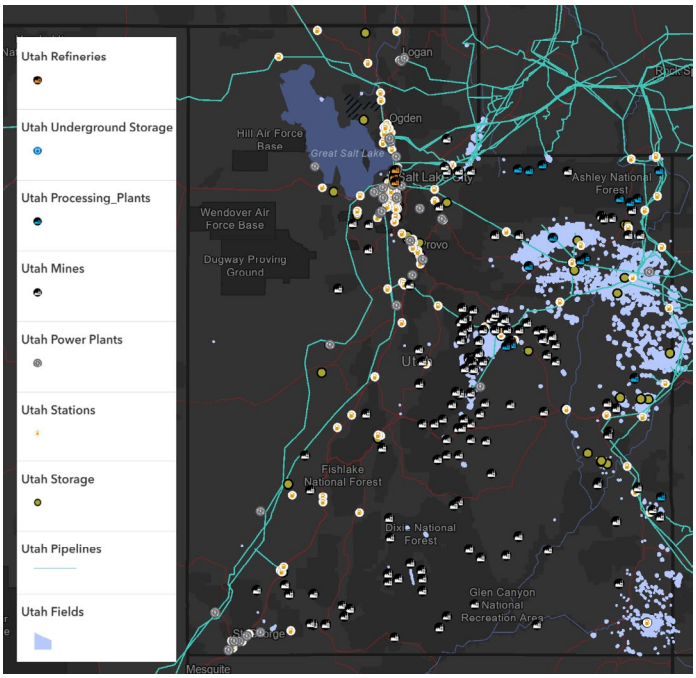


Figure 6 - ArcGIS map of Utah's widespread energy sector.

The Leading Utah Small Uncrewed Aerial Systems Use Cases

Drone operations in the U.S. currently fall into two categories. In VLOS (Visual Line of Sight) operations, the drone operator must always keep the drone within direct visual range, severely limiting the flight range. In BVLOS (Beyond Visual Line of Sight) flights, operators rely on onboard systems, sensors, or other technologies for navigation and monitoring. Currently, the FAA grants specific permissions for BVLOS applications but may establish comprehensive regulations greatly expanding BLVOS flights as soon as 2025-2026.

Small Package and Medical Delivery

In 2022, drone delivery operator Zipline received specific FAA approval to team with Utah's health services giant Intermountain Health for BVLOS delivery of specialty prescription goods to customers' homes in the South Jordan area, the first program of its kind west of the Mississippi. The drones deliver the items via parachuted package drops and have an initial service range of about 15 miles.

Services also include delivering lab materials and supplies between labs and Intermountain facilities. Intermountain is Utah's largest healthcare provider, with 25 hospitals and 39 clinics, compared to 39 hospitals and clinics operated by the other three providers combined.

Medications such as insulin and vaccines are packed in refrigerated containers and require quick delivery to the patient. To book a medical drone delivery, the patient uses the Intermountain app to get prescriptions and schedule delivery once insurance approval is given. Zipline then sends

> *"Drone delivery not only provides convenience, but it can improve lives and health outcomes. For example, one of our partner pharmacy patients used to take up to 4 hours off work to wait for a truck to bring their high value medication. Now with Zipline, they have a precise 10-minute delivery window, allowing them to receive their medication on their lunch break at home."*
>
> **Conner Wilkinson**
> **Community Lead, Zipline**

out the medications within ten minutes of notification, and customers can track the aircraft down to the second and arrange to be home to receive the items.

Zipline got its start in 2016 in Rwanda delivering blood to remote hospitals. They currently have expanded to ten hospitals in the country and—in areas with extremely poor roads where traveling a few miles by car or motorbike can take hours—have saved an estimated 38,000 lives and seen a 70% reduction in post-partum hemorrhaging. The company has medical delivery operations in Ghana, Ireland, and Japan, and will soon be up and running in India.

Infrastructure Inspections

UAS are ideally suited to inspect bridges, highways, tunnels, telephone lines and poles, electric transmission wires, substations, utility poles, pipelines, cell phone towers, smokestacks, and wind turbines. Loveland Innovations—headquartered in Pleasant Grove, Utah—provides services for property inspections, claims management, and construction planning throughout the U.S. DroneHive—in Park City—provides UAS services for aerial data collection, specializing in industries such as energy, agriculture, insurance, real estate, and environmental monitoring.

Figure 7 – Drone inspections of power infrastructure are safe, low cost, and efficient.

The Utah Department of Transportation is responsible for inspecting over 3,000 bridges across the state.[16] The state also has more than 7,000 miles of power transmission lines exposed to the weather which are typically inspected annually.[17] Traditionally, such inspections have been performed by crews of three using a cherry picker to lift the workers up, blocking a lane. The three-man crew would spend one to three hours doing each inspection. UAS inspection causes less traffic congestion, reduces costs, and improves worker safety.

In August 2024, Rocky Mountain Power began using drones to inspect power lines, substations, and distribution facilities. UAS capture high-resolution photos and infrared images to determine potential issues with equipment such as overheating or structural weakness. This initiative is part

of the company's broader efforts to improve safety and reliability, particularly in areas with heightened wildfire risk.

UAS are increasingly being explored as a tool to enhance airport operations by assisting with security inspections and identifying debris around runways, reducing the frequency of manual checks required by ground crews. As technology advances and operational guidelines evolve, UAS could play a larger role in improving efficiency and safety while allowing workers to focus on other critical tasks.

Agriculture, Natural Resources, and Timber Management

Utah has 17,400 farms, which cover 10.5 million acres, with a 2024 market value of agricultural products sold at $2.3 billion,[18] and some 15 million acres of forest, which covers almost a third of the state.[19]

AggieAir, a program operated by Utah State University, develops and deploys UAS to support environmental, agricultural, and natural resource management. It provides low-cost, high-resolution aerial imagery to address various scientific, engineering, and ecological challenges. AggieAir drones equipped with cameras and sensors gather data on crop health, soil conditions, and water usage. This data helps farmers optimize irrigation and monitor plant health efficiently. AggieAir also surveys wetlands, wildlife habitats, and forests for biodiversity surveys, reforestation assessment, illegal logging, vegetation changes, irrigation efficiency, and pest infestations.

Public Safety, Law Enforcement, and First Responder Support

There are currently 136 law enforcement agencies in Utah, 190 registered fire departments, and seven regional emergency management offices. The use of UAS for local, state, and federal public safety applications provides many advantages. They are far less costly and complex than helicopters or airplanes, can be launched much faster—in as little as a minute or two—are less conspicuous with lower noise levels, and have a much smaller environmental impact.

Around the U.S., more and more law enforcement agencies are using UAS to support wide area search and rescue and vehicle accident response, track suspects, assist with crowd control, assist with armed barricade situations and SWAT warrant serving, and find missing persons such as runaway juveniles, lost toddlers, and wandering dementia patients.

Figure 8 –The Silver King Fire was a lightning-caused wildfire that burned in the Fishlake National Forest of Utah in July 2024, consuming more than 18,000 acres.

Many callers reporting serious vehicle accidents provide the wrong location—either due to unfamiliarity with the roads or the stress of having seen a collision—causing potentially fatal delays in

> *"We use drones to assist in clearing crashes. Instead of having officers walking around an incident taking photos, the drone does it. We can clear a crash hours earlier and keep traffic moving without having another incident."*
>
> **Ben Kelly, Statewide Manager, Incident Management, UDOT Division of Aeronautics**

emergency response. UAS can quickly pinpoint the exact location and report it back to officers and EMT personnel.

For residents of remote communities experiencing emergencies, 911 operators can send a UAS with defibrillators or NARCAN as needed and provide instructions over the phone while EMS first responders are on route.

The Salt Lake City Police Drone Program officially began in the Summer of 2022 after years of community engagement to address privacy and noise concerns. The department presently has 26 drone pilots/officers who are licensed through the FAA. In 2023, the South Jordan Police Department integrated the Autel Robotics Dragonfish drone into its operations. The Dragonfish has been applied across a wide variety of operations ranging from accident reconstruction, search and rescue missions, public safety monitoring, and tactical operations.

Figure 9 – The Salt Lake City Police Department and the South Jordan Police Department have UAS programs, as do many police departments across the U.S.

Weber County, too, uses drones for search and rescue and emergency response. "It's an absolute game changer," said Kyle Nordfors, drone team coordinator. "We're able to have the latest technology at our disposal, which enables us to find people faster and get them quicker and therefore save lives."

As of 2023, over 500 fire departments across the U.S. have incorporated UAS into their firefighting strategies. These drones provide real-time critical support for aerial reconnaissance, thermal imaging, and search-and-rescue missions, enhancing situational awareness and safety. Firefighting UAS are particularly useful in identifying hotspots, monitoring fire behavior, and locating trapped individuals. They can see through heavy smoke environments and in nighttime operations while minimizing risk of life to firefighters.

> *"UAS provides real-time information to decision makers on the fire line. We use them for reconnaissance and mapping. They not only save money compared to helicopters but provide greater safety for our aviators by not flying low and slow."*
>
> **Mike Melton, Deputy State Fire Management Officer-Aviation Department of Natural Resources**

Several Utah fire departments actively use UAS to enhance their operations, such as the Farmington Fire Department, which has a dedicated Drone Team, and Santa Clara-Ivins Fire & Rescue, which uses UAS for wildfire management, as does the Utah Department of Natural Resources. For example, during the 2018 Trail Mountain Fire, which burned 17,700 acres, UAS equipped with thermal cameras were used to locate and monitor burning coal waste sites safely and effectively.

The Utah Department of Natural Resources, Forestry, Fire, and State Lands has a UAS shop with 11 drones and 7 pilots. UAS provide real-time decision makers on the fire line with real-time reconnaissance and mapping data. The department is currently considering the purchase of a $100,000 UAS instead of a $2 million helicopter to drop incendiary devices to consume fuel in a fire's path, such as dry vegetation. Safety of personnel is also a significant advantage, as helicopters flying over fires can experience serious mishaps.

AAM Benefits for Utah's Native American Communities

Tribal communities struggle with transportation costs and geographic isolation that delay both emergency and non-emergency care. Limited access to specialists and closures of rural hospitals force patients to travel long distances. Seasonal weather, such as snowstorms, makes road travel dangerous, creating critical gaps in healthcare access. UAS can transport essential items such as lab samples, medications, and defibrillators. Passenger-carrying AAM aircraft in the future can use small regional airports to ensure regular transport of patients and specialists to remote clinics without the need for new infrastructure.

Drones can conduct real-time monitoring of air and water quality, providing early warnings of contamination from nearby mining projects. They can help enforce sovereignty over lands by monitoring for unauthorized activities, such as illegal mining or environmental violations.

Indigenous women are disproportionately affected by violence, and the lack of coordination between law enforcement agencies complicates efforts to address the MMIWG (Missing and Murdered Indigenous Women and Girls) crisis. Geographic isolation slows emergency response times, further endangering marginalized communities. UAS with infrared sensors can assist in locating missing persons, even in harsh terrain. They can monitor public gatherings and high-risk areas to deter trafficking and violence. AAM infrastructure can enhance connectivity between tribal, state, and federal agencies, improving coordination and response times.

Mining and infrastructure projects threaten culturally significant sites. Unauthorized UAS have violated sacred ceremonies, raising privacy and cultural sovereignty concerns. UAS can record and map sacred sites, creating digital records for preservation and protection. AAM infrastructure can equip tribes with enhanced tools to monitor aerial activities over their lands and coordinate with the FAA to address unauthorized or concerning operations, supporting efforts to protect their land use sovereignty and ensure responsible airspace practices. Ecotourism via AAM could promote education around Indigenous culture and heritage while minimizing environmental impact.

Finally, AAM can create new workforce opportunities and economic development for Utah's Native American communities. The Navajo, Choctaw, and Cherokee Nations and the Montana First Nation have programs in place using drones for healthcare delivery. In Oklahoma, the Choctaw Nation's Emerging Aviation Technology Center is preparing tribal communities for high-demand careers in UAS operations, eCTOL maintenance, and AAM logistics. By emulating such efforts, Utah can foster sustainable, inclusive economic development and social equity through AAM technologies, empowering tribal and rural communities while respecting their sovereignty and traditions.

"As the Utah Native American Chamber of Commerce, we recognize the critical role of transportation in supporting economic development and improving quality of life for Native Americans and tribal communities. Advanced Air Mobility offers promising solutions, such as enhancing access to healthcare, delivering essential goods, and creating workforce development opportunities. The Utah Native American Chamber of Commerce emphasizes the importance of prioritizing inclusive and practical technologies that leverage existing infrastructure and address the unique challenges of rural and tribal communities.

"AAM represents a significant opportunity for economic development, but its implementation must be thoughtfully aligned with the needs and aspirations of our communities to ensure meaningful and sustainable benefits. Outreach and engagement with Native American communities are critical to ensuring these benefits are accessible and tailored to the unique needs, priorities, and cultural values of each community."

Chelsea Nez, Executive Director,
Native American Chamber of Commerce

AAM Advantages for Utah's Ski Resorts

Utah's ski industry contributes significantly to the overall state economy. In the 2022-2023 season, the state's 15 ski resorts generated nearly $2 billion in nonresident visitor spending, and local skiers contributed almost $700 million more.[20]

Davy Ratchford, General Manager of Snowbasin Ski Resort, sees numerous efficiencies drones could provide. "We could use UAS for avalanche mitigation, for doing a sweep for guests who may have strayed off the paths and be lost, and for getting us time critical parts should a lift stop operations, impacting guests and overall operations," he said.

"Warehouses are quite a distance away, and a drone delivery of needed parts could restart operations much sooner. We are interested in any new transportation system that can help the Utah ski industry and believe that UAS usage is very much in our future."

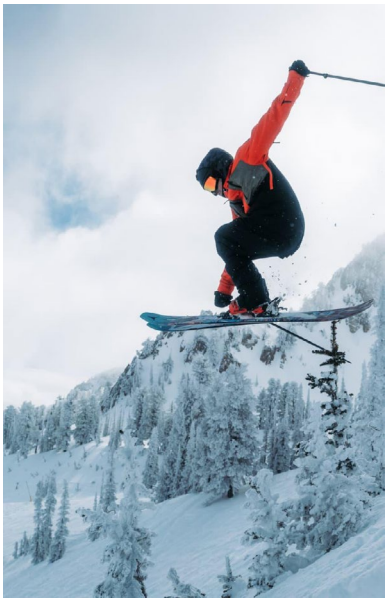


Figure 10 – Snow Basin is the #1 ski resort in the nation, according to Ski Magazine.

Improving Equity Between Rural and Urban Areas

Utah Governor Spencer Cox is dedicated to addressing the needs of all Utahns, no matter where they live. One of his priorities is including rural Utah in the economic future of the state. About 90% of Utah's population lives in urban areas, primarily concentrated along the Wasatch Front, which includes Salt Lake City, Provo, and Ogden. The remaining 10% of Utah's residents live in rural areas, which cover a significant portion of the state's geographic area, characterized by smaller towns and vast open spaces.

> *"Price is very rural, about 2.5 hours east of Salt Lake City, and economic growth is a challenge. If we could tie Price Airport to Provo or Salt Lake City, we could connect our community to the Wasatch Front. AAM could help grow rural communities like ours in terms of tourism and logistics."*
>
> **Mayor Mike Kourianos, Price**

In Utah, there is a notable difference in average income between urban and rural residents. The median household income in urban areas is more than $60,000, whereas in rural areas it is between $42,000 and $50,000, according to the Bureau of Labor Statistics. This gap reflects differences in economic opportunities, cost of living, and industry concentration in these regions. Urban areas benefit from more diversified job markets and higher-paying sectors such as technology, finance, and healthcare, while rural areas often rely on industries such as agriculture, mining, tourism, and recreation.

Bringing Regional Air Mobility to small rural airports will create efficient new transportation options that will attract new businesses to remote communities. Job opportunities will expand, and not only with new local businesses. Many residents enjoying the lower cost and slower pace of rural life can accept higher-paying jobs with urban companies, working remotely most days, and taking a quick flight into urban offices periodically for in-person meetings.

As mentioned earlier, AAM will improve health outcomes of rural residents. Trauma centers and advanced hospitals are impossible to cost-justify in rural and low-density areas. With the advent of Regional Air Mobility, rural residents will be able to access the best possible care without multi-hour drives, and Medevac services will expand.

Boosting Utah's Film Industry

Utah has such deep roots in the entertainment industry it is known as "America's film set." 2024 marked 100 years since the premiere of the first movies filmed in Utah—"The Covered Wagon" and "The Deadwood Coach"—and several thousand productions have followed.

Figure 11 - John Wayne filmed several of his Western classics in Utah.

Utah is an attractive film venue, with a competitive incentive program, trained crews, professional vendors, and tens of thousands of square miles of diverse and unique landscapes. UAS are already being used for cinematography to capture the bird's eye view and create special effects.

AAM could transport highly paid actors in minutes versus hours on remote roads to locations, saving production costs.

"The film industry is fast-paced and always primed to incorporate new technologies or time-saving solutions," said Derek Mellus, Utah Film Commission Production Manager. "Film, television and commercial productions could benefit from more efficient transportation options for actors, crew, and equipment as more projects seek to film in remote areas that span over 85,000 square miles of diverse landscapes in Utah."

Poised to Lead: Utah and AAM

Given its many remarkable achievements in business and social excellence, it is likely that Utah will continue to hold a leadership role in implementing a successful Advanced Air Mobility transportation system. With a 2023 population of only 3.4 million—30th in the country—Utah punches well above its weight.

In 2024, the American Legislative Exchange Council gave Utah the #1 spot in the nation for best economic outlook for the 17th year in a row.[21] U.S. News and World Report calls it the best state overall;[22] USA Today ranks Utah as the most affordable state;[23] and Forbes named Utah as having the best environment for social mobility—the ability to improve one's life—offering residents the greatest opportunities to live the American Dream.[24]

> *"We are positioned better than any county in America right now to integrate AAM technologies in all their forms to support passengers, cargo delivery, emergency services, and recreation. The future is now."*
>
> **Curtis Blair, President and CEO,**
> **Utah Valley Chamber of Commerce**

In October 2024, the U.S. Bureau of Labor Statistics reported that Utah leads the nation in manufacturing job growth—a nearly 12 percent increase between 2019 and 2023—surpassing pre-pandemic levels.[25] WalletHub ranks it as the best state in which to start a business[26] as well as the most charitable state in the nation.[27]

According to the World Population Review, Utah was the fastest-growing state in the U.S. from 2010 to 2023.[28] Moreover, Utah tops the list for Economic Dynamism, determined by the degree to which state economies are knowledge-based, globalized, entrepreneurial, information technology-driven, and innovation-based.[29] The Milken Institute named Salt Lake City and Ogden as two of the top three 2025 best-performing large cities in the nation.[30]

The state's indomitable spirit, grit, resilience, and common-sense hail back to the original 148 pioneers who in 1847 arrived in wagons and soon turned a desert into an oasis. And, indeed, Utah is called the Beehive State because the beehive symbolizes the values of industry, cooperation, and perseverance that Utahns hold dear. Let's look at specific reasons why Utah is poised to lead in the AAM sector.

Utah Department of Transportation Division of Aeronautics

The UDOT Division of Aeronautics (DOA) has been developing a robust program for UAS and AAM initiatives since 2014. Early on, DOA adopted the use of Uncrewed Aerial Systems and found a cost savings path using UAS to inspect infrastructure, pavement conditions, preconstruction design, survey, construction, as-builts, and much more. The DOA quickly developed internal policies for UAS to support these needs.

> *"Utah needs to move at the speed of business. Government isn't typically known for that, but in Utah the President of the Senate, the Speaker of the House, and the Governor work together to make sensible decisions to benefit the citizens of Utah for years to come."*
>
> **Lance Soffe, Director of Target Industries, Governor's Office of Economic Opportunity**

The UDOT Division of Aeronautics understood its unique position to develop and manage a comprehensive AAM Plan/Program for the State of Utah and has worked with the state legislature to develop the right regulatory framework to support Utah's goals and mission.

The mission is clear: Enhance quality of life through transportation. Enhancing this quality doesn't stop at surface transportation efforts; it also includes air travel. Under the direction of the DOA Director, the division supports and manages 46 public airports across the state, working closely with the FAA to support projects for Utah's airports. The DOA has been mandated through legislation to develop an AAM testing environment to support growth. Through this mandate, they created a new Advanced Air Mobility Program Manager position. This position is responsible for all aspects of AAM within the state. The AAM Program Manager works closely with other stakeholders to:

- Establish and participate in both statewide and national working groups
- Perform studies to understand:
  - Land-use planning for vertiports and location opportunities
  - Electrification consumption at several Utah airports
  - AAM infrastructure and regulatory needs
  - AAM operational advancements
  - Airports as connected activity centers
- Collaborate with the FAA on UAS and AAM, with the DOA as a UAS operator working with the FAA on BVLOS waivers
- Create public private partnerships for AAM
- Support local municipalities for AAM

- Oversee licensing of vertiports for the state
- Create an Aviation Electrification Plan
- Create programs for community engagement and public acceptance
- Obtain local government support

As the UDOT DOA continues to innovate and develop the necessary infrastructure to test and support AAM, they will work with stakeholders to support their goals.

Silicon Slopes

The Wasatch Front is home to a growing tech and startup community with companies such as Adobe, Qualtrics, Pluralsight, Domo, and Vivint. These companies, along with numerous others, have driven significant economic growth in the area and created thousands of jobs. Silicon Slopes attracts top tech talent and fosters innovation with a focus on software, SaaS (Software as a Service), cloud computing, and artificial intelligence. It is likely that, in addition to the state's aerospace and defense firms, many Silicon Slopes companies will contribute to the state's growing AAM industry.

Home of the 2034 Winter Olympics

In July 2024, Salt Lake City was awarded the 2034 Winter Olympic and Paralympic Games which will be held at locations across the state. The Kem C. Gardner Policy Institute estimates that these events will make a significant economic impact on Utah, generating new jobs, income, and $6.6 billion in economic output.[31]

Figure 12 – Utah will showcase its history, culture, and innovation in 2034.

The Games could serve as an additional impetus for AAM implementation in Utah, similar to the wildly successful evolution of the TRAX light rail system for the 2002 Games. Upon award of the event in 1995, the state created the new transportation mode, which opened in 1999 and quickly met ridership expectations. During the 17 days of the 2002 Olympics, TRAX saw 1.7 million boardings. The system has continued to expand. In 2022, some 15 million boardings occurred at over 50 stations across its three main lines.

> *"Utah has a decade to shape and implement its vision for the 2034 Winter Olympics, and transportation plays a crucial role in the state's overall economic growth and will be especially vital during the Olympics. With the world watching, we must ensure seamless travel, getting people where they need to be on time and efficiently."*
>
> **Kori Ann Edwards, Former Managing Director, Strategic Initiatives, Governor's Office of Economic Opportunity**

In 2034, AAM aircraft could carry athletes, the press, and spectators quickly and efficiently to Olympic events. Governor Cox envisions the Games including all of Utah with AAM transporting athletes to all 29 counties for community events.

The 2024 Paris Olympics were set to be the international debut of Advanced Air Mobility, an aspiration that did not take place due to lack of time to address public acceptance. Given the timing, Utah is in an excellent position to use its position as 2034 Olympic host to demonstrate its progress with Advanced Air Mobility. In 10 years, the market will be primed with certified aircraft, approved operational protocols, and several operational use cases. In that time, Advanced Air Mobility will likely evolve greatly, including longer battery range, larger aircraft, and enhanced automation.

The Point: Utah's Innovation Community

The Point, a 600-acre state-owned parcel in Draper (18 miles south of Salt Lake City), is widely recognized as one of the most significant development opportunities in Utah history. This vibrant new community will offer a balanced mix of jobs, housing, retail, and entertainment, centrally located at the heart of Utah's fast-growing technology industry. The site offers unprecedented potential to create an innovation hub that is both economically robust and environmentally sustainable, preserving parks and open space, and reducing the need for cars. The new city is expected to be served by a cutting-edge multimodal transportation network, including Advanced Air Mobility.

Figure 13 – Artist's rendition of the Point.

Developers are analyzing a variety of ways that air taxis and drone delivery services could be used at the Point, such as cargo and medical delivery, on-demand ridesharing, airport shuttles, and commuting. They are examining how AAM could integrate with existing ground transportation options to reduce congestion and travel time for commuters.

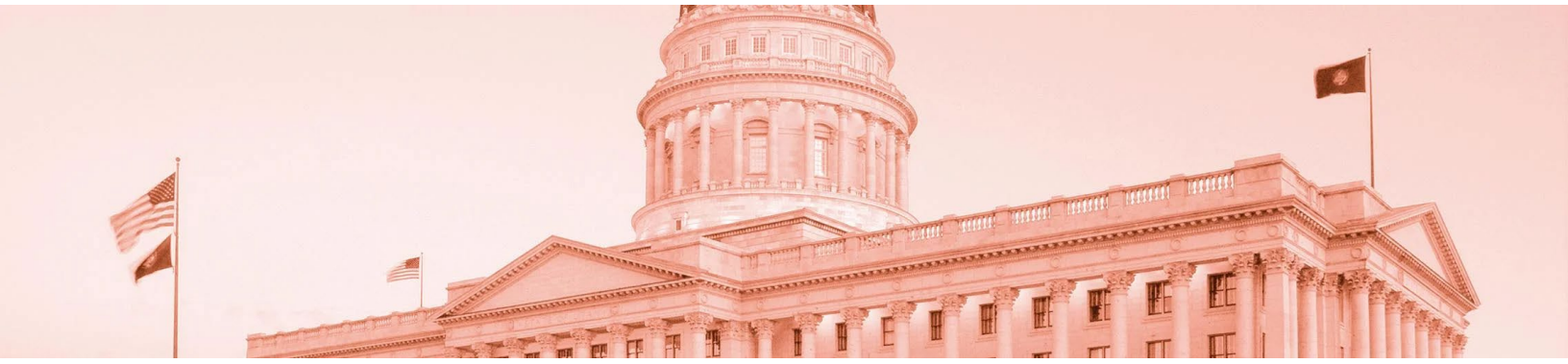
The Governor's Office of Economic Opportunity (GOEO)

The Utah Governor's Office of Economic Opportunity manages various programs and initiatives that are robust, diverse, and provide Utah entrepreneurs and businesses with distinct advantages. Such programs attract new businesses, keep the current ones prosperous, and expand the economy. GOEO's programs include:

- **Business Recruitment and Expansion:** Recommends financial incentives for local and out-of-state companies seeking to expand or relocate to Utah.
- **Center for Rural Development:** Works with businesses in Utah's rural counties, providing resources and programs to sustain businesses and improve employment opportunities.
- **Utah Innovation Center:** Catalyzes technology innovation and helps secure nondilutive funding for Utah startups.
- **Utah Office of Regulatory Relief:** Allows businesses to experiment with products, production methods, or services by temporarily waiving state law and allowing entrepreneurs to determine if customers value products that don't fit within the state's current regulatory framework.

The Unified Economic Opportunity Commission (UEOC)

The Unified Economic Opportunity Commission develops, directs, and coordinates Utah's statewide and regional economic development strategies. The commission informs policy decisions and builds consensus. UEOC is designed to be nimble, changing to meet the current year's needs. In 2024, UEOC was tasked with crafting strategic plans for each of Utah's Targeted Industries and creating Gameplan 2034, an economic vision for the state as it prepares to host the 2034 Olympics.



Utah Inland Port Authority (UIPA)

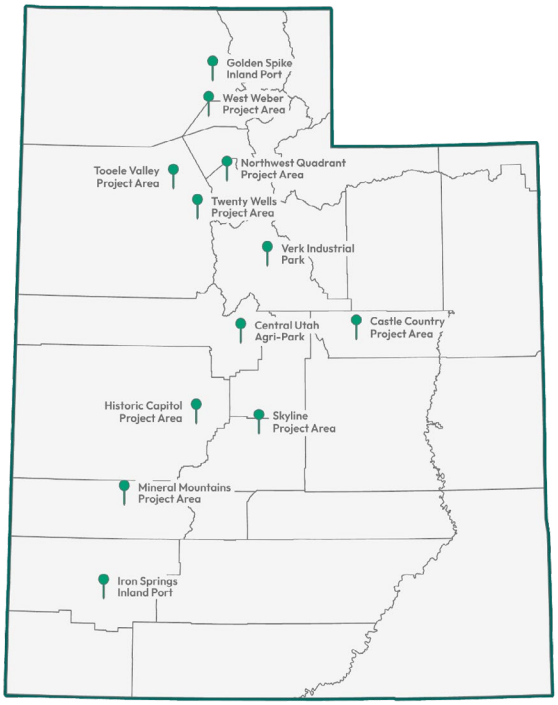


Figure 14 – The Utah Inland Port Authority's 12 project areas.

The Utah Inland Port Authority plays a vital role in revitalizing rural Utah and ensuring all communities benefit from the state's economic growth. One aspect of this effort involves improving the efficiency of existing logistics infrastructure, including optimizing connections, diversifying transportation modes, and leveraging opportunities in its 12 project areas to attract businesses.

UIPA promotes intermodal transportation options, such as a combination of trucking and rail, and is exploring the use of autonomous vehicles and other innovative technologies, including Advanced Air Mobility, to create jobs and foster prosperity. UIPA facilitates between government agencies, businesses, and other stakeholders to support rural development projects, and pursues public-private partnerships to finance them.

Utah Rising: A Free Enterprise Vision for Utah's Economy

The Salt Lake Chamber, in collaboration with Chambers of Commerce throughout Utah, has crafted a statewide, business-led plan to ensure a prosperous future for all Utahns, with the ultimate goal of becoming and remaining the top performing economy in the nation. Since Utah's private sector drives the economy—comprising nearly nine of every ten dollars in the Utah economy—Utah Rising believes it should also guide the economy, collaborating with public sector partners for statewide prosperity.

> *"Ogden is proud to be the home city for events at Snowbasin, and we are excited to see our community thrive with new opportunities. As we move forward, it's important that our airspace supports both the airport and other key locations, like the Ogden Union Station, to ensure everyone benefits from these innovations."*
>
> **Mayor Ben Nadolski, Ogden**

Successful implementation of the plan will require a model partnership between the business community and the public sector to develop the workforce, support the business environment, enhance livability, optimize natural resources and the environment, and achieve signature projects to become and remain the top performing economy in the nation. A major focus of the program is streamlined and accessible reliable transportation modes.

Founding Member of the AAM Multi-State Collaborative

In 2023, Utah was one of the eight founding members of the AAM Multi-State Collaborative, along with Alaska, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, and Virginia. As of January 2025, there were 35 state members. The collaborative is made up of State DOTs and Aviation Bureaus.

The group will engage with the FAA and industry to ensure that states create harmonized laws and regulations and shared infrastructure goals that both complement established policies and standards and align with commercial needs. Their goal is for authorities to complement the FAA's airspace jurisdiction with a consistent regulatory framework.

Utah's Robust Aerospace & Defense Industry

Some 1,500 aerospace and defense (A&D) companies call Utah home, supporting more than 31,000 jobs, with an average direct wage of more than $84,000. In 2023, the industry contributed some $9.4 billion in total state economic output.[32] Aerospace and defense are projected to grow more than 12% in the next decade. These companies have the decades of technical manufacturing experience necessary to support Utah's AAM industry.

Key players with offices or operations in the state include:

- **Northrop Grumman:** A global leader in technology and national security solutions, Northrop Grumman employs more than 5,100 people in Utah, making it the largest private sector aerospace and defense employer in the state.
- **Lockheed Martin:** Another international A&D leader, the company has a significant presence in the state, contributing to various aerospace and defense initiatives.
- **L3Harris Technologies:** Focused on advanced communications, surveillance, and aerospace systems.
- **Boeing:** Known for its contributions to aerospace and defense systems.
- **General Atomics:** Known for the Predator, now the Reaper, a military drone.
- **Red Cat/Teal Drones:** UAS for military applications.

Several Utah companies are already actively involved in Advanced Air Mobility, including:

- **Intergalactic:** The manufacturer of thermal management systems for Embraer's Eve aircraft, with an expected 3,000 units a year at scale
- **Zipline:** Partnered with Intermountain Health to deliver medicine to homes via drone
- **Fortem Technologies:** Provides low altitude radar for AAM surveillance and navigation
- **Hexcel:** Leading aerospace composites producer in the world, supplies carbon fiber for aircraft made by Archer Aviation
- **Electric Power Systems:** Provides cutting-edge batteries to various electric aircraft manufacturers
- **Albany Engineered Composites:** Develops structural components for air taxis made by Beta Technologies
- **Loveland Innovations**: Provides UAS services for insurance, roofing, solar, and other industries
- **DARTDrones:** Winner of *The Shark Tank*, provides professional UAS pilot training for commercial drone operations.

47G

47G, Utah's Aerospace and Defense Association, is a comprehensive initiative aimed at advancing the state's aerospace, defense, and advanced manufacturing industries. It acts as a collaboration platform for businesses, government entities, and educational institutions, promoting innovation and economic growth.

> *"Utah has an incredible ability to advance AAM. Twenty percent of our economy is aerospace and defense. We have geographic diversity allowing for testing in both urban and rural environments. We can speed up supply chains and close the gap between rural and urban environments. We are highly innovative. We are right at the center for creating success not only for Utah but also for the country."*
>
> **Mayor Julie Fullmer, Vineyard**

In 2024, Utah launched Project ALTA, the Air Logistics Transportation Alliance, in collaboration with 47G, the Governor's Office of Economic Opportunity, the Utah Department of Transportation, and the Utah Inland Port Authority, with the mission to establish an Advanced Air Mobility system for Utah.

Project ALTA will oversee several phases of AAM integration in Utah by 2034 that include expanding existing UAS package delivery,

instituting reliable cargo transport, and moving people. The overarching goal is to leverage the state's entrepreneurial spirit and cutting-edge technologies to attract investment, accelerate development of critical infrastructure, and enable deployment of AAM aircraft to create a multi-modal transportation system.

By 2034—the year of the Salt Lake City Olympics—Project ALTA intends to create a seamless and sustainable air-ground transportation network and position Utah as a global hub for aerospace innovation and sustainable transportation systems.

Utah Defense Installations

Utah has four primary defense installations: Hill Air Force Base (HAFB), Tooele Army Depot, U.S. Army Dugway Proving Ground (DPG) and the Utah National Guard. HAFB does not have a focus on AAM but is a major economic and innovation driver for Utah; it is the largest single-site employer in Utah, with more than 26,000 military and civilian employees. HAFB has an annual economic impact of $11 billion, with approximately $5.6 billion in indirect jobs. [33]

The Rapid Integration Acceptance Center (RIAC) uses the restricted airspace and facilities at Dugway Proving Ground to test unmanned aircraft systems. RIAC was set up to be a center for the Army's UAS testing but has been scaled back and by June 2025 will support Grey Eagle flights from California. The Utah Test and Training Range (UTTR), is a Department of Defense designated area for testing aircraft and weapons, including uncrewed aircraft.

Enabling Technologies

Utah State University Pioneering Charging Systems for AAM

Utah State University (USU), in partnership with North Carolina State University (NCSU), Navajo Tech, and others under a grant funded by the National Institute of Standards and Technology (NIST) through the NCSU PowerAmerica program, is developing wireless charging systems, which enables UAS to recharge quickly without manual intervention. Utah State's AggieAir team provided the UAS systems design, and worked on autonomy, ensuring they can land and take off from charging pads reliably without human intervention. By utilizing advanced technologies such as LiDAR, GPS, and cameras for precise navigation, USU AggieAir and NCSU proved that it is possible and practical to employ wireless charging technology for UAS missions such as medical delivery and other critical supplies. While this program is currently focused on UAS, it is pioneering new technologies for charging electric aircraft in remote locations for BVLOS and AAM missions.

University of Utah Trailblazing 5G and Beyond Networks for Future AAM

The University of Utah is conducting fundamental research for the future of wireless communication with uncrewed aircraft. Under a grant from the National Science Foundation (NSF), the University of Utah—in collaboration with Rice University and Salt Lake City—launched POWDER (the Platform for Open Wireless Data-driven Experimental Research). Widely supported by community, municipal, and state leadership, POWDER is a flexible infrastructure enabling a wide range of software-defined experiments on the future of wireless networks. This "living laboratory" will revolutionize the nation's wireless ecosystem while sustaining U.S. leadership and economic competitiveness for decades to come.

POWDER focuses on fundamental research for advanced wireless applications for government programs, academic research, and industry testing, providing an advanced wireless testbed to support future intelligent transportation systems such as connected vehicles and uncrewed aircraft. The University of Utah has submitted to NSF a multi-institutional proposal in partnership with other universities, including NCSU, for drone command and control using the POWDER 5G Test Bed.

Initiative for Electrified Transportation System

Guided by 2024 Senate Bill 125, Utah is actively electrifying its airport system. An aviation subcommittee was formed with experts from Utah Valley University, UDOT Division of Aeronautics, and Harper4D Solutions to examine the issue. The team recommended Logan, Provo, South Valley, and Ogden airports as initial focus areas. These airports have excellent electric aircraft potential due to an operational tempo high enough to support charging infrastructure operations and maintenance costs. UDOT Division of Aeronautics is developing a matrix for prioritizing future airport electrification investment needs with research support from Utah State University's ASPIRE program.

Mapping Utah's Existing AAM-Related Infrastructure

Before the state can calculate the costs and revenues of an AAM network, it must first understand existing AAM-related infrastructure and what efforts are needed to retrofit and upgrade the system. Planning an AAM network also requires geospatial understanding of how infrastructure nodes relate to other nodes: locations and distances between major trauma centers and distant communities, for instance. The first step in performing an Economic Impact Analysis is a systematic inventory of such data.

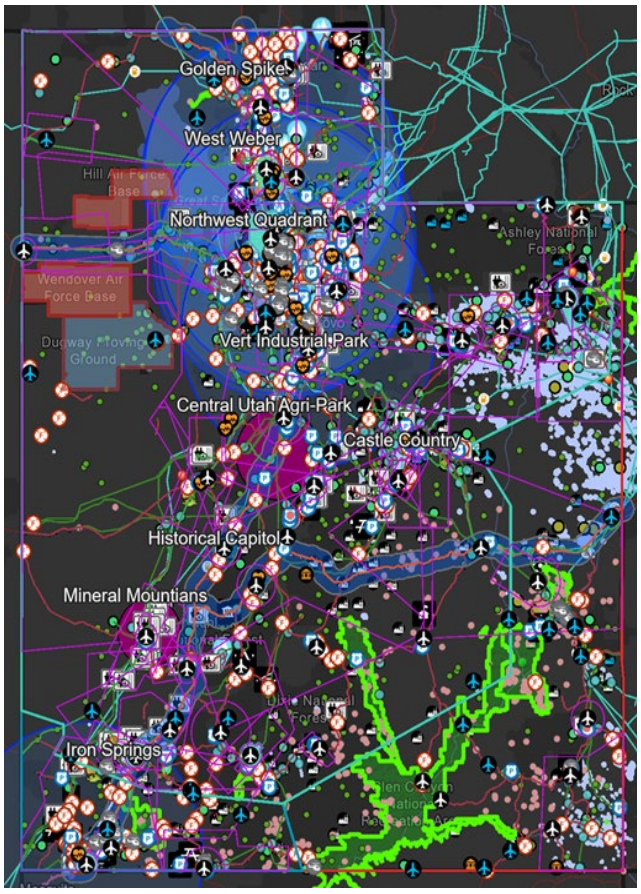


Figure 15 - ArcGIS map of Utah showing selected inventory relevant to AAM.

The NEXA team inventoried existing transportation infrastructure available throughout the State of Utah using ArcGIS, combined with geocoded features to complete the basic asset library. In developing the mapping layers for our report, we utilized a robust set of data sources to ensure comprehensive and accurate coverage.

The FAA Aviation Facilities Database served as a cornerstone, offering detailed information on airport infrastructure, airspace classifications, and navigational aids. This dataset provided critical insights into existing aviation facilities, enabling precise spatial mapping and analysis for aviation-related applications. Complementing this, we leveraged data from the U.S. Department of Homeland Security's Geospatial Management Office via the Homeland Infrastructure Foundation-Level Data (HIFLD). This source enriched our mapping with essential details on transportation networks, critical infrastructure, and public safety assets, which are vital for understanding the broader spatial context.

Additional layers of demographic and geographic detail were sourced from Esri Demographic Data and OpenStreetMap. Esri's datasets offered valuable insights into population density, socioeconomic characteristics, and urban development patterns, helping us to integrate human and environmental considerations into the mapping process.

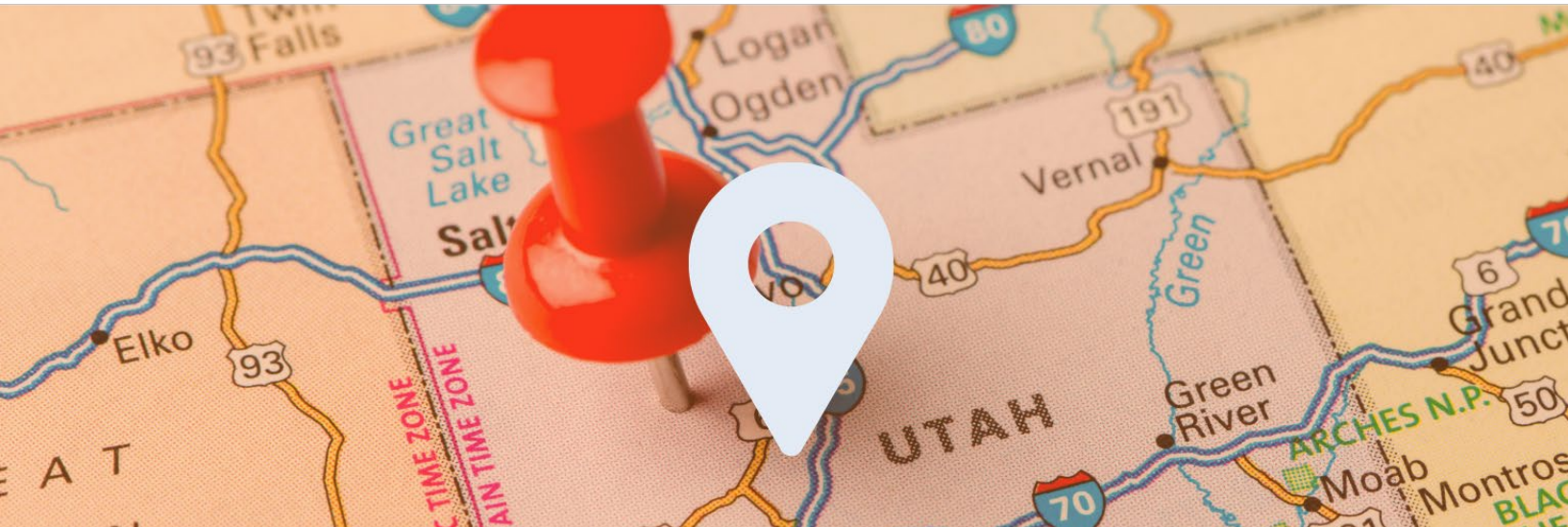
> *"Utah is an innovative, forward-thinking state in all that we set out to do. Advanced Air Mobility is no different; we will continue to lead the nation and push the boundaries of AAM."*
>
> **Matthew Maass**
> **Director, UDOT Division of Aeronautics**

Meanwhile, OpenStreetMap provided highly granular, crowd-sourced geographic data, contributing to the accuracy and relevance of land use patterns and points of interest. Lastly, existing data from the Utah Geospatial Resource Center was instrumental in adding localized depth and precision. This included specialized inputs such as tribal lands, tourism features, existing projects, and state-specific infrastructure, enabling a tailored approach to map the unique geographic and administrative features of Utah. Combined, these sources allowed us to create a detailed, reliable, and versatile geospatial foundation for the report.

This geospatial mapping and physical inventorying tool provides unique capabilities for applying location-based analytics. Contextual tools are also able to visualize and analyze geospatial data via maps, datasets, algorithms, and reports. The team documented more than 60 layers of information that will become indispensable when designing and operating new airborne systems within the state. These layers were researched, compiled, and loaded into the ArcGIS software to be mapped onto the state.

With those layers, the ArcGIS analysis tools provide insight into critical infrastructure within given parameters. For example, we can determine how many helipads are within an urban area's Metropolitan Statistical Area (MSA) or how many manufacturing and logistics centers are within five miles of a key cargo logistics corridor. The tool provides myriad analysis options that offer the most accurate inputs for the business case model. ArcGIS is heavily used today by multiple Utah agencies.

Figure 15 shows major roads, logistics corridors, transmission lines, hospitals, airports, heliports, public transit nodes, police and fire stations, and many more layers, so many, in fact, that it is difficult to decipher. However, in ArcGIS, the user can turn layers on and off for a clearer picture of desired attributes.



The Business Case for Utah's Advanced Air Mobility

Advanced Air Mobility must, within a few years, become economically viable to pay off investors for CAPEX (Capital Expenditure) investments as well as to support recurring OPEX (Operational Expenditure) needs such as equipment maintenance and upgrades and worker salaries.

> *"If the OEM aircraft build rates reach their projected numbers in the next five years, the composite materials industry, of which Hexcel is a leader, will likely need to expand capacity in terms of new employees and capital investments."*
>
> **Bob Yancey,**
> **Business Development Director, Hexcel**

A "Business Case" is a plan carefully developed to assess the financial outcome of a given project. It involves revenue forecasting based upon anticipated demand for a product or service, the use of financial and cost models (CAPEX and OPEX), and other facets to determine investment requirements, assessing returns across the value chains that make up the project. For this analysis we seek to understand whether or not Advanced Air Mobility for the State of Utah will produce a "Profitable Business Case," justifying upfront investment and generating a fair return for its investors.

The mapping data described above, along with many other input assumptions, have been incorporated into NEXA's proprietary AAM business case models to estimate passenger demand, operating costs, passenger and cargo revenues, number and type of vertiports, infrastructure CAPEX and OPEX, and ticket prices—the AAM Business Case. We seek at this stage to ascertain overall ecosystem profitability that will ensure sector growth and health.

The Business Case forecasts then inform our third and final step—a statewide Economic Impact Analysis, which will project through 2045 new permanent jobs, job categories, new tax revenues, and overall GDP boost.

AAM Business Case Forecasting

The Business Case forecast is founded upon three distinct considerations:

- Examination of AAM use cases—cargo, medical, and passenger—the likely timing of their introduction and their potential for economic expansion. Each use case has an anticipated revenue stream based upon demand for new services.

- Estimates and schedules for development of critical new infrastructure such as vertiports, new airport facilities, and low altitude air traffic control systems, especially the capital expenditures (CAPEX) required to facilitate AAM operations.

- Analysis of the four AAM supply chains required to assemble and operate this new transportation system, all of which must become viable and eventually profitable for the new sector to succeed, with each one creating jobs and revenues.

These three considerations are intricately inter-connected: Revenues collected from AAM transportation of people and cargo must be apportioned to pay off infrastructure CAPEX and keep the supply chains operating, thereby creating new jobs, building and operating new infrastructure, boosting GDP, and earning new local and state revenues to pay for police, roads, and schools.

AAM's Four Supply Chains

Bringing Advanced Air Mobility into operational status will require four value or supply chains (see Figure 16 below) to assemble and operate this new transportation system. Each one of these supply chains will create jobs and revenues and should be fully sustainable through passenger revenues for the Business Case to be viable. These four supply chains are:

- **Vertiport (landing and take-off area) and ground infrastructure developers**, and the necessary ecosystem to provide site preparation and construction, engineering, architectural services, lighting, beacon navigation nodes, charging networks and passenger amenities, etc.

- **Air traffic control 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.

- **Aircraft developers and Tier 1/2/3 suppliers** (those companies selling products that end up in the final product) and the requisite ecosystem of manufacturers providing composites, precision machining, electrical systems, batteries, interiors, flight computers, simulators, and testing and training equipment, etc.

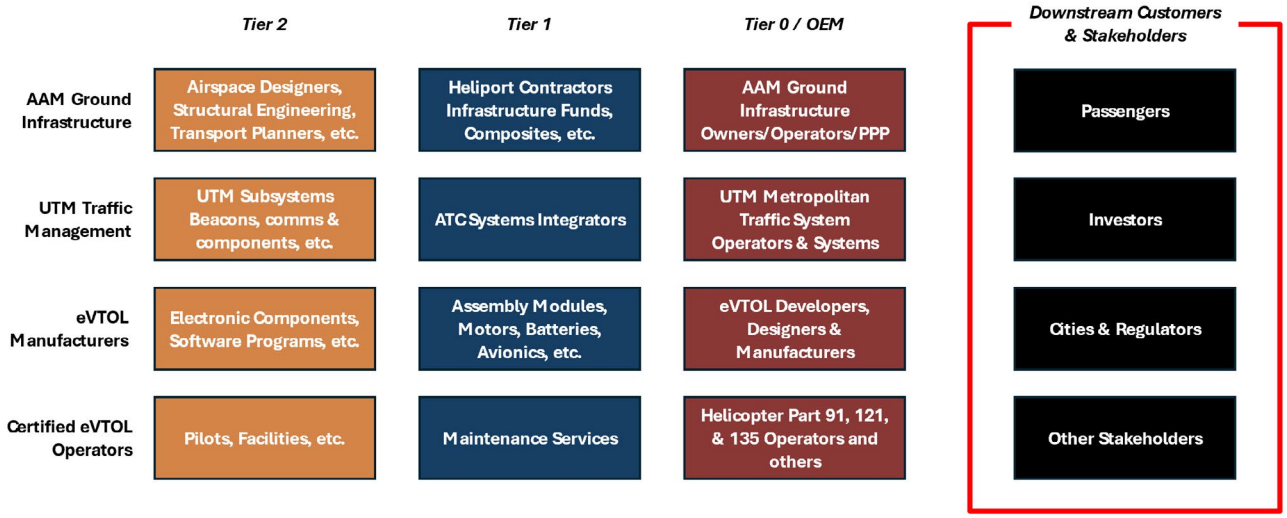


Figure 16 - The four key supply (or value) chains are essential for AAM to come together within Utah.

- **Air Service Operators**, such as FAR (Federal Aviation Regulations) Part 135 companies operating the aircraft, whether eVTOL/eSTOL passenger aircraft or UAS. Those firms currently operating helicopters may be among the first AAM service providers as they already have operating certificates, safety programs, and trained pilots, and who will gradually transition the new aircraft into their operational fleets.

Supply Chain 1: AAM Ground Infrastructure: Urban Vertiports, New Airport Facilities

The easiest and most cost-effective way to create vertiports is to remediate existing heliports. Most commercial airports have facilities for helicopter operations, and Salt Lake City International has a dedicated heliport. It is likely that these airports will become the first adopters of AAM operations.

The basic elements of a heliport are clear approach/departure paths, a clear area for ground maneuvers, final approach and take-off 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 for passenger/cargo processing.

Given the need to recharge batteries, the availability and capacity of the regional power grid will play a critical role in determining vertiport locations. At the same time, the lower noise signature of eVTOLs presents an opportunity to repurpose underutilized heliports, particularly those near potentially high demand centers, where helicopters have traditionally faced community opposition due to noise concerns. Renovating these existing sites could provide an efficient and community-friendly foundation for AAM operations.

AAM Sample Vertiport Components (CAPEX & OPEX)

- Network Design Studies
- Environmental Studies
- Airspace Flight Design 3D Visualizations Studies
- Concession Agreements
- Secure Project Financing
- Purchase or Lease Land
- Construction Permitting
- Architectural and Engineering
- Site Preparation and Construction
- Foundation Modifications
- Platforms, Egress, Walkways
- Elevators
- Airport AAM Passenger Facilities
- Airport Commercial eVTOL terminals
- Passenger Shelters
- Lighting Systems
- CNS Systems (ILS, Beacons, etc.)
- IT and Security Systems
- Perimeter Systems
- Parking
- Power Grid Updates
- FAA (etc.) Permitting and Certification
- Recharging Capability and Systems
- Fire Suppression Systems
- Aeronautical Chart Preparation
- Operators, Maintenance Staff and Related Workforce

Figure 17 – Selected ground infrastructure components.

To support AAM operations, infrastructure will need to expand into a connected network of vertiports. Each vertiport must be strategically placed and designed to optimize passenger convenience, operational efficiency, and overall value. Fewer than half of the existing heliports are located in areas that align with the needs of AAM applications.

Integrating an eVTOL aviation network with the existing system of public

transportation modes, especially in urban areas, requires collaboration, 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.

Utah has 80 documented heliports: one military-owned, four publicly owned, and the remainder privately-owned. All 80 heliports are designated for private use. While some public airports include heliport infrastructure, they are not always listed separately in the FAA database. Additionally, many undocumented heliports exist on private properties. A comprehensive inventory analysis should assess whether these facilities meet current heliport design standards and identify the extent of upgrades needed to make them viable as vertiports.

Figure 18 – Zion Helicopters' heliport.

While the technology is available to upgrade heliports to vertiports today, regulators have not yet finalized the policies and standards for VTOL infrastructure geometry, airspace, and safety. The FAA issued an interim Vertiport Design Engineering Brief (EB), EB-105, in September 2022. This was followed up with revision EB-105(A) in December 2024. The FAA, under Congressional mandate, is expected to incorporate this information into the existing Heliport Design Advisory Circular (AC) 150/5390 before the end of 2025, thereby classifying vertiports as a type of heliport with distinct specific requirements. The geometry and design of a vertiport are dictated by the characteristics of the largest referenced VTOL that a vertiport is expected to support. Criteria includes aircraft Maximum Takeoff Weight, aircraft dimensions, and aircraft performance capabilities. These interim standards consider factors such as electric, hybrid-electric, and hydrogen powered aircraft in conjunction with charging systems and referenced standards published by the NFPA (National Fire Protection Association), IFC (International Fire Code), OSHA (Occupational Safety and Health Administration), UL (Underwriters Laboratories), SAE, Society of Automotive Engineers, and ISO (International Organization for Standardization).

According to NEXA projections based on forecast passenger demand, by 2045 Utah would need to remediate 23 existing heliports and construct 15 new vertiports in densely populated areas, strategically placed throughout the metro regions, in addition to those presently at airports and hospitals. The state could possibly benefit from one multiport (landing and parking areas for multiple aircraft) located within a centralized area of operations.

A limited list of cost elements included in the estimates for building (CAPEX) and operating (OPEX) the vertiports is provided in Figure 17. These elements have been forecast for Utah's 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, investments in AAM infrastructure offer cost advantages compared to heavy-infrastructure projects like roads, bridges, and tunnels.

Rather than replacing existing infrastructure, AAM serves as a complementary solution that enhances the efficiency of existing transportation networks. By optimizing current infrastructure and reducing the need for costly capacity-expansion projects, AAM can help extend the life of the transportation system while potentially lowering long-term operations and maintenance costs. Compared to the billions of dollars required to extend highways or subway lines—and the hundreds of millions for a single bridge—developing vertiports, through a mix of upgrading existing heliports and building new facilities, offers a cost-effective option to complement Utah's transportation system. The estimate for the new vertiports projected to operate in Utah by 2045 is in the range of $116 million total.

Supply Chain 2: UTM Traffic Management Systems

The second AAM value or supply chain is that of low or mid-altitude air traffic control. In an industry with rapidly evolving acronyms, this is referred to as UTM (either for Uncrewed Traffic Management for drones or Urban air mobility Traffic Management for passenger-carrying aircraft.)

Air traffic management ensures the safe coexistence of commercial and general aviation, drones, and AAM aircraft within shared airspace. Currently, air traffic controllers guide airplanes and helicopters through controlled airspace using systems often surveilled by radar. It is likely that early AAM operations—such as AAM aircraft supporting Regional Air Mobility, Medevac, and helicopter services—will integrate into the FAA's existing air traffic management system. These operations will rely on today's air traffic controllers while leveraging new technologies and procedures to accommodate the unique characteristics of AAM aircraft.

UTM Sample ATC Infrastructure Components (CAPEX & OPEX)

- UTM Interoperability Standards and Drone/eVTOL Agreement selection
- Site/Network Optimization Study
- Development of Performance Baselines and Systems Specifications
- Power Grid Studies
- Cyber Security Architecture Studies
- Physical Security Architecture
- Facilities (offices) Rental Costs
- Automation Systems and Stations
- Flight Decision Support Tools
- Computers and Equipment
- Network Design Studies
- Flight Plan and Flight Operations Database
- Network Operations Center
- RemoteID Systems
- Power Grid and Backup Systems
- Weather Information Systems
- Micro Weather Detection Sensors
- Beacon Navigation Nodes
- Resilient Bi-directional Communication Network
- General Awareness Sensors
- High Density Radars

Figure 19 – Selected AAM air traffic management components.

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 every day, overloading the FAA's air traffic management capabilities. In May 2024, the FAA Reauthorization Act opened the door to independent UTM companies to "manage increased operations in controlled airspace to support, supplement, and enhance the work of air traffic controllers."

The FAA Reauthorization Act of 2024 also calls on the agency to develop a comprehensive UAS integration strategy and to establish a performance-based regulatory pathway for UAS to operate once the FAA approves widespread BVLOS operations. These independent UTM operators will likely utilize human staff and operators as airspace managers, focused on supervising automated systems and aircraft operations, ensuring safety and security. A single operator could supervise many more aircraft movements than working in an airport ATC tower. According to our forecasts, the capital costs for creating an AAM UTM system across the State of Utah could be $140 million over the 21-year forecast period.

Supply Chain 3: Advanced Air Mobility Aircraft

In addition to eVTOLs, which take off and land vertically like helicopters, other AAM aircraft include eSTOLs (electric Short Take-Off and Landing) and eCTOLs (electric Conventional Take-Off and Landing.) eSTOLs need very short runways, about 150 feet, and because much of the battery charge on an eVTOL is used during vertical lift and landing, eSTOLs have much longer battery life. Electro Aero in Virginia is developing an eSTOL designed to fly some 500 miles on a charge. Heart Aerospace in Sweden is working on an eCTOL regional airplane designed for conventional take-off and landing with a range of about 125 miles, and up to 600 miles in its hybrid configuration carrying 25 passengers.

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. Some aircraft may be hybrid, propelled by a combination of batteries and fuel for longer-range trips.

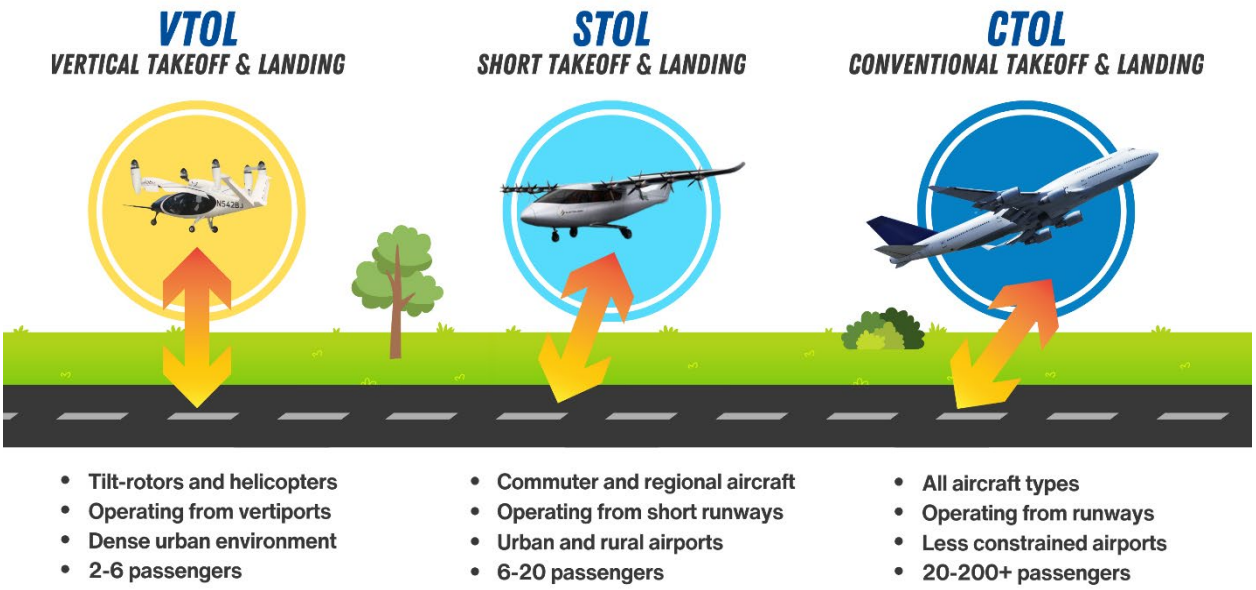


Figure 20 – New AAM electric aircraft come in different forms. VTOLs operate like a helicopter; STOLs need a short runway about the size of a soccer field; and CTOLs require standard runways.

> *"AAM is not a replacement for helicopters, but we believe that the legacy of Bristow—which operates 225 helicopters globally—makes it well positioned to introduce new technology such as eVTOLs for cargo and passenger carrying operations. And Utah is leaning in, right up there in terms of use cases, leadership, and support."*
>
> **Amanda Nelson, Director, Business Development Advanced Air Mobility, Bristow**

Most 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, lower costs of operations, and enhance safety for critical AAM missions and functions.

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 innovations hold promise for larger electric aircraft to be good neighbors as well.

The State of Utah does not currently have an eVTOL manufacturing presence. An initiative supported by stakeholders, however, is taking root and discussions are underway to attract one or more companies to set up shop in the state. Attracting an OEM (Original Equipment Manufacturer) remains a high priority and would add thousands more new jobs to the state's AAM economic forecasts.

Supply Chain 4: Advanced Air Mobility Operators

Current Utah-based FAR Part 135 helicopter operators are today's likely vanguard for AAM services with trained pilots, weather dispatching expertise and systems, and quality and safety programs. Helicopter operators are familiar with the regulations, terrain, and locations of the existing heliports and airports in the region.

Utah has 195 active registered helicopters in service with 25 companies including Mountain West, FlexAir Aviation, Provo Helicopters, Moab Heli-X, Blade, and Pinnacle, according to JetNet, a leading aviation market intelligence company. These companies provide services including tourism, Medevac, heavy lift, cargo delivery, regional charter transport, and search and rescue. In the future, some of these operators will train their pilots to operate eVTOLs for passenger and cargo missions.

The Bristow Group, a leader in vertical flight solutions offering helicopter offshore energy transportation and search and rescue services, operates a fleet of 225 helicopters globally and is exploring opportunities in Utah that would likely include incorporating some eVTOLs into their fleet.

UAS operators can be independent individuals, small companies, state and federal agencies, real estate companies, and large players such as Zipline, Amazon, DroneUp, and Wing. Their missions are diversified and range from medical deliveries (isotopes, vaccines, COVID test kits, and blood)

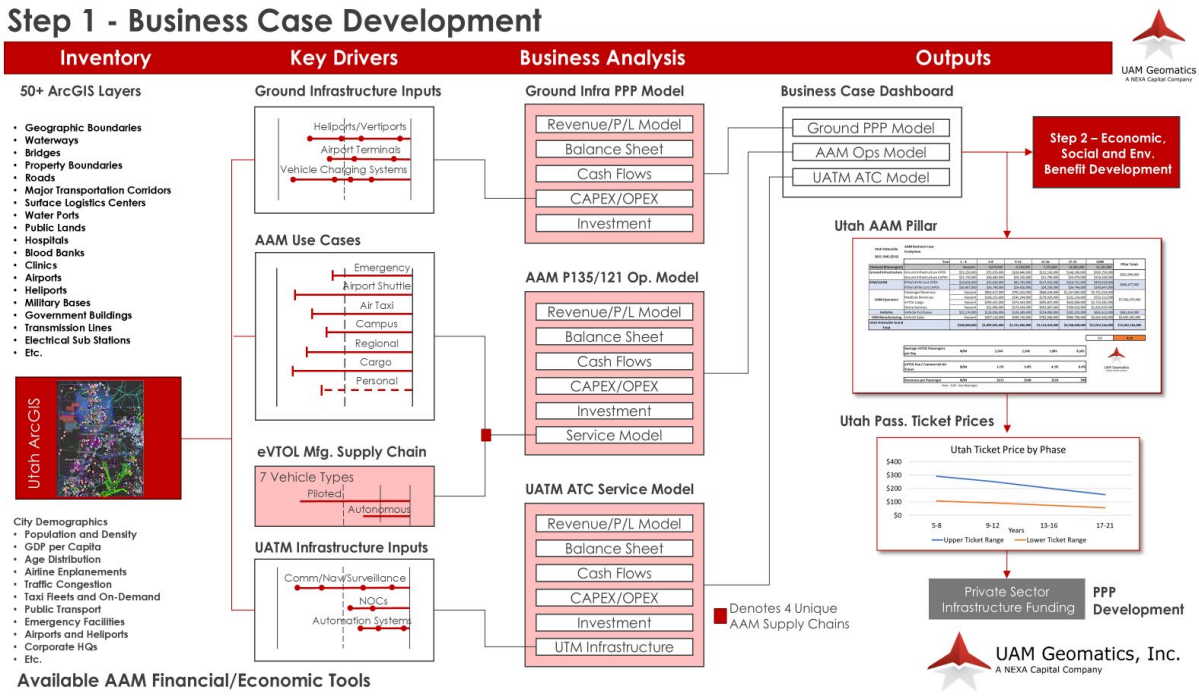


Figure 21 - NEXA Advisors financial and economic tools analyze the four supply chains to assess AAM business viability, city by city. The entire State of Utah has been analyzed using the tool set.

to package delivery (64 packages on average were shipped to every US resident in 2023, or an estimated 217 million in Utah, some 595,000 every day).[34] Drones are already being used for agricultural monitoring, road and power line inspections, real estate promotion, and safe, low-cost intelligence gathering for police and fire fighters.

NEXA Advisors incorporated the four AAM supply chains into the business analysis tools illustrated in Figure 21 above to assess AAM feasibility for the State of Utah, examining its four major regions from north to south in an exacting and comparative analysis. A key goal is for each of the four supply chains to achieve a measure of commercial success.

According to our forecasts, the four critical supply chains all achieved this success for the State of Utah, which will attract outside capital to fund each phase of the launch.

Estimated AAM Passenger Demand for Utah

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, regional air mobility, and tourism 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 methodology uniformly applied to all studies undertaken by NEXA Advisors (Figure 22).

These factors, adjusted to Utah's unique demographics, estimate that by 2045, the peak forecast year, some 31 million passengers are expected to have traveled using new eVTOL services over the 21-year forecast period. About 3 million passengers per year, or over 8,200 passengers per day, are forecast by the 2041-2045 time period. Affordability is a key factor when projecting passenger demand. Forecast cost per ticket for the price-elastic use cases—Regional Air Mobility, airport shuttle, and on-demand air taxi—could drop to under $90 on average.

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 22 - Passenger demand elasticity factors applied to Utah forecasts: 2025-2045.

The forecasts of demand are then used to estimate what infrastructure requirements are needed to safely and efficiently support this demand. The Business Case method requires that we assess each supply chain for its cash flows, their complex interdependencies with one another, and in the end, ecosystem profitability.

To answer the question "Will AAM make business sense in Utah?" we must determine:

- The number and type of vertiports in the state and the economic incentive zones required to support the demand.
- The number and type of eVTOLs to be deployed for each use case.
- The complexity and cost of UTM needed to safely surveille all traffic.
- The levels of workforce to manage the infrastructure.
- The revenues, costs, and activities of the Part 135 operator(s) operating the new mobility services.

Forecasts of Passenger Ticket Prices

Key forecast assumptions used to produce the Utah passenger revenues are:

- Forecasts make use of collected geospatial data to account for Utah's existing aviation and related infrastructure
- FAA-Certified and available eVTOLs/eSTOLs from at least some OEMs are available by 2026
- Industry and FAA agreement on CONOPs (Concept of Operations) and standards for UTM by at least the end of 2026

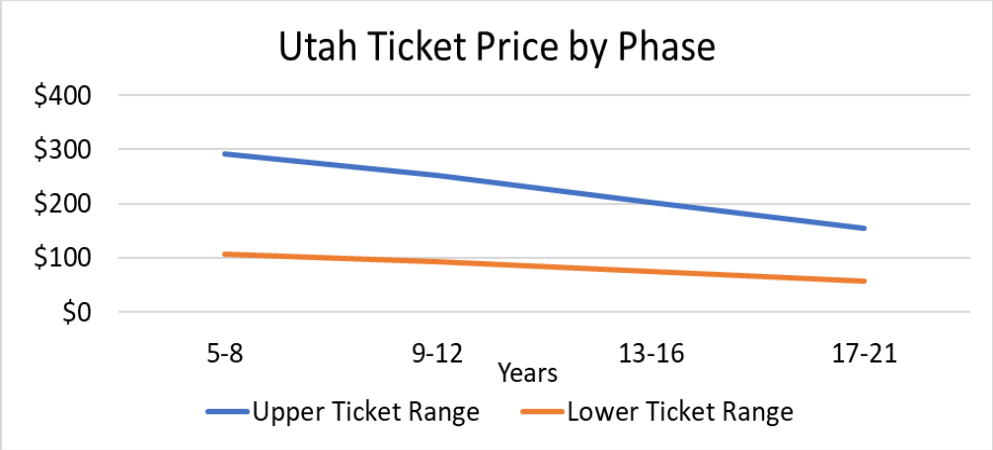


Figure 23 - Forecasts of Passenger Ticket Prices.

- Planning for multi-year CAPEX investment in urban ground and ATC infrastructure begins in 2025
- Operators begin limited services in Regional Air Mobility and cargo delivery by 2026
- Operators begin services in all other AAM use cases, including Medevac, business aviation, tourism, airport shuttle, on-demand air taxi, and heavy cargo, by 2028
- Significant impact from flight automation takes hold within the 2035 timeframe, driving sector costs, and passenger tickets, much lower

Applying these assumptions to the model results in ticket prices in Figure 23. The upper price range reflects longer flights such as Regional Air Mobility, while the lower range reflects short trips such as Airport Shuttle and On-Demand air taxi.

Business Opportunity: Revenue and Pillars of GDP Growth

Using the six AAM use cases discussed above (medical, airport shuttle, business aviation, on-demand, tourism, and Regional Air Mobility,) Figure 24 below shows the results of the extensive analysis provided by the financial and economic tools used in the NEXA Advisors Urban Air Mobility study and produced in multi-year increments of revenue and capital investment estimates for the entire state.

These financial estimates fall into five categories:

- **CAPEX:** Those capital expenditures funds used to build, 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.

Utah Statewide 2025-2045 ($US) — **AAM Business Case EcoSystem**

	Year	1 - 4	5-8	9-12	13-16	17-21	SUM	Pillar Totals
Demand (Passengers)		Nascent	4,679,000	4,738,000	7,273,000	14,902,000	31,591,000	
Ground Infrastructure	Ground Infrastructure OPEX	$53,150,000	$75,870,000	$106,840,000	$121,530,000	$148,360,000	$505,750,000	$622,098,000
	Ground Infrastructure CAPEX	$21,710,000	$28,440,000	$29,330,000	$11,790,000	$25,070,000	$116,340,000	
RTM/UATM	RTM/UTM Cost OPEX	$19,638,000	$33,026,000	$62,782,000	$127,432,000	$216,751,000	$459,629,000	$600,477,000
	RTM/UTM Cost CAPEX	$30,407,000	$36,746,000	$14,420,000	$24,530,000	$34,744,000	$140,847,000	
UAM Operators	Passenger Revenues	Nascent	$802,617,000	$702,416,000	$868,636,000	$1,347,885,000	$3,721,554,000	$7,582,475,000
	MedEvac Revenues	Nascent	$168,155,000	$145,294,000	$176,929,000	$231,134,000	$721,512,000	
	eVTOL Cargo	Nascent	$299,423,000	$373,443,000	$409,847,000	$630,868,000	$1,713,581,000	
	Drone Services	Nascent	$31,606,000	$173,434,000	$435,867,000	$784,918,000	$1,425,825,000	
Vehicles	Vehicle Purchases	$23,174,000	$116,026,000	$124,289,000	$154,890,000	$183,233,000	$601,612,000	$601,614,000
OEM Manufacturing	Vehicle Sales	Nascent	$307,118,000	$599,710,000	$782,968,000	$965,706,000	$2,655,502,000	$2,655,502,000
Utah Statewide Grand Total		**$148,068,000**	**$1,899,041,000**	**$2,331,966,000**	**$3,114,424,000**	**$4,568,668,000**	**$12,062,166,000**	**$12,062,166,000**

R/I	4.16

Average eVTOL Passengers per Day	**N/M**	**2564**	**2596**	**3985**	**8165**
eVTOL Pax / Commercial Air Travel	**N/M**	**3.1%**	**3.0%**	**4.3%**	**8.4%**
Upper Ticket Range		**$292**	**$252**	**$203**	**$154**
Lower Ticket Range		**$107**	**$92**	**$74**	**$56**

Note: N/M - Not Meaningful

UAM Geomatics
A NEXA Capital Company

Figure 24 - State of Utah pillar forecast for four supply chains, their CAPEX and OPEX costs, through 2045.

- **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 Purchases:** Fleet acquisition and maintenance costs to acquire and operate sufficient eVTOL and eSTOL aircraft to sustain the use cases identified.

- **Aircraft Manufacturing:** Should an OEM program land in Utah, jobs created will number in the low thousands, and production revenues can be added to pillar totals.

The pillar totals for the entire 21-year forecast period estimate over $12 billion in direct new (and fully incremental) business activity across the State of Utah. The R/I (Return on Infrastructure), center right in Figure 24 is 4.16, where a ratio above 3 generally speaks to commercial viability and investor participation.

The pace of CAPEX investment over time shown in Figure 25 underscores the need for a carefully planned and orchestrated capital program. Once demand begins to pick up over the 2025-2030 timeframe, funding of infrastructure can proceed to match system and network capacity with traffic.

Note that cumulative CAPEX for both ground infrastructure and UTM reaches the 50% mark in or around the 2032 forecast year. It will be important for operators to choose initial services carefully to demonstrate resilience for the business model.

The passenger demand forecasts are a percentage of those enplanements from commercial airlines in the range of 8.4 percent by the end of the period. These figures will be discussed shortly; however, the investments required to build out necessary AAM infrastructure total about $257 million. In perspective, this investment is equivalent to the average cost to construct five freeway overpasses in 2024 dollars.

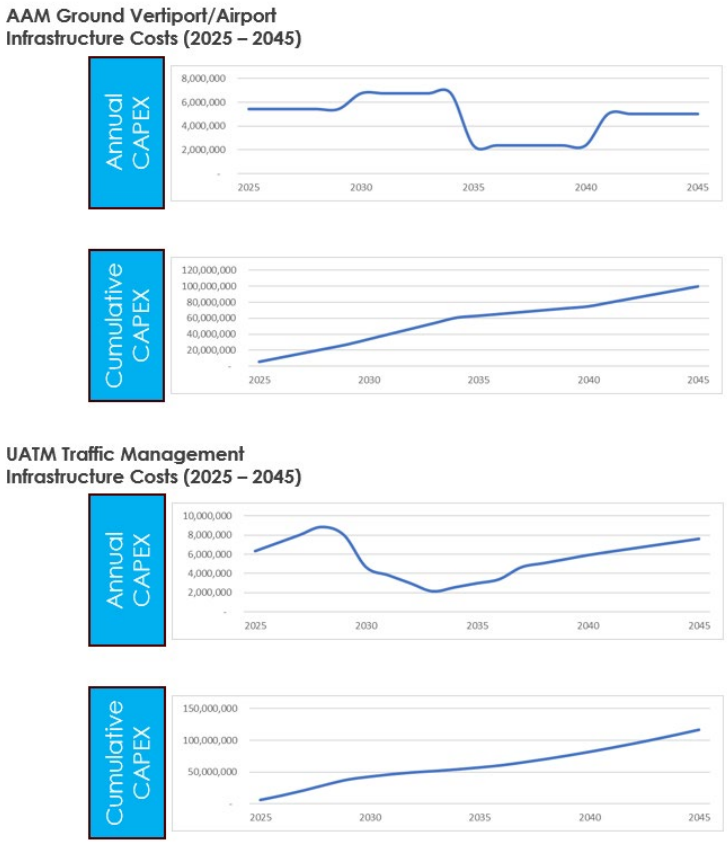


Figure 25- Projected ground and UTM infrastructure costs through 2045.

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 Utah each of the four supply chains can reach and exceed cash flow profitability. In this report's 21-year forecasts, the NEXA team used the following macro assumptions while estimating the cost and schedule for AAM ground infrastructure:

- A large percentage of existing public, private, and unregistered heliports are first remediated to provide a baseline to support early eVTOL or eSTOL services before expansive new construction is undertaken.

- A certain number of heliports and vertiports are built or retrofitted to provide hybrid aircraft refueling, electric charging, or fuel cell charging. The estimated costs of such charging facilities or services are rolled into the ground infrastructure costs.

- All airports within a major city's economic catch basin, whether commercial air transport or general aviation/business aviation, will receive investment in vertiport facilities and AAM traffic management services to permit safe passenger handling and eVTOL traffic volume.

From our work in generating the pillars of revenue and cost in the prior analysis, a waterfall that examines the entire AAM ecosystem for the State of Utah is presented below. Ecosystem project profitability is forecast to achieve over 16% of outlays.

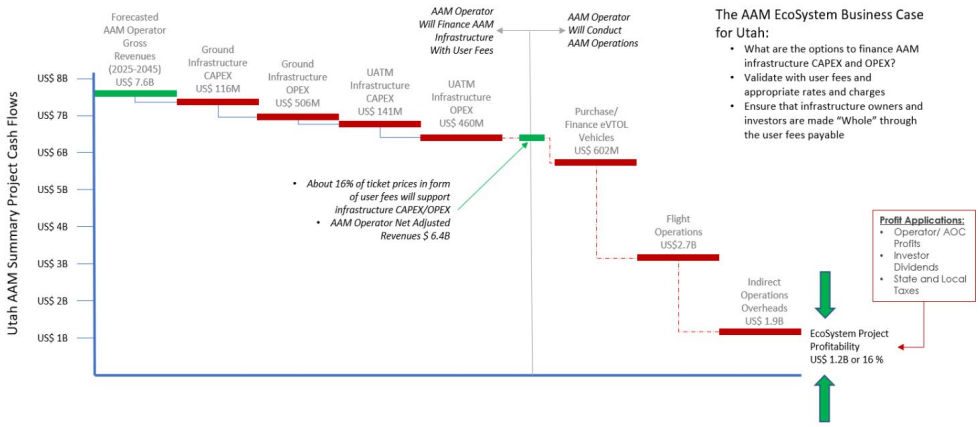


Figure 26 - Utah AAM Ecosystem: business case project revenue/cost waterfall (2025-2045).

From this graphic waterfall presentation of the entire AAM ecosystem, Figure 26 identifies an overall projected profit of $1.2 billion within which surplus can be allocated to the key stakeholders including investors, operators, and the state. We note that the project will become profitable by virtue of three critical assumptions:

- Infrastructure is developed incrementally, meaning that the project has adequate facilities for passenger services at all times and at the appropriate level, in order to accomplish services in accordance with demand.

- eVTOL fleets are right-sized for passenger services and within the ranges and frequencies contemplated, achieving better than 50% load factors on average at all times.

- Flight automation takes hold in the 2035 to 2040 timeframe, delivering new efficiencies and resulting cost benefits and with greater levels of safety.

We conclude here that with careful planning and execution, the State of Utah will create an Advanced Air Mobility ecosystem that will thrive and deliver substantial benefits to residents and businesses.

Modeling Economic Benefits

The Business Case forecasts described in the previous section informed our third and final step—a statewide Economic Impact Analysis (EIA), which projects through 2045 new permanent jobs, job categories, new tax revenues, and overall GDP boost.

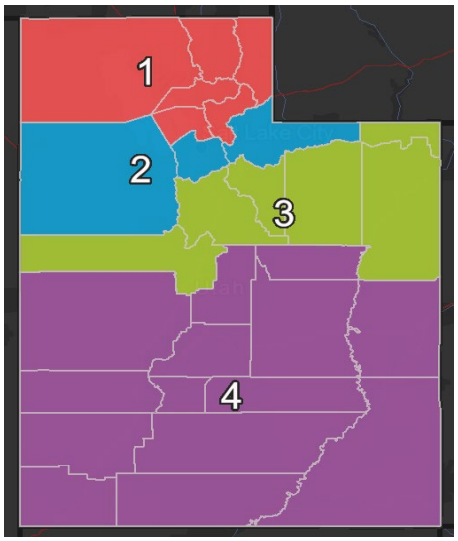


Figure 27 – The four regions analyzed.

To undertake a 21-year Economic Impact Analysis of Advanced Air Mobility for the State of Utah, NEXA used the IMPLAN input/output modeling tool[35] in combination with NEXA's business case analysis model featuring four regions of Utah from north to south. The combination depicts the most accurate possible impact assessment of the benefits AAM will deliver to the state.

The results may be analyzed and carefully considered by policy planners and stakeholders, as well as state and local governments interested in job creation and general economic growth. These results will help to mobilize public sector resources to act on the AAM opportunity and possibly seize a first-mover advantage in a $1 trillion global market meant to improve mobility and drive economic growth.

Figure 28 explains the inter-relationships between direct, indirect, induced, and catalytic economic impacts for the AAM sector, driven by the revenue, cost, and CAPEX and OPEX pillars of business activity.

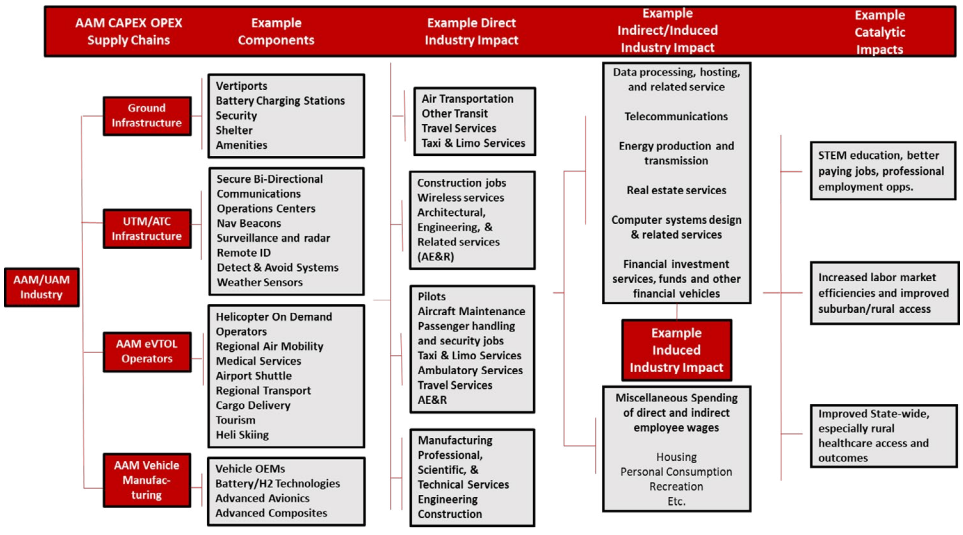


Figure 28 - Process flow diagram tying AAM business case outputs (pillar totals) through IMPLAN economic impact model.

In economics, an input/output model is a quantitative methodology that represents the inter-dependencies between different branches of a national economy or of regional economies. The IMPLAN I/O model was our model of choice in studying AAM for Utah. IMPLAN is a recognized modeling tool used to study impacts on all sectors and at all levels of an economy. 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, which depict the rate of change of output among a set of interdependent industries, from a one unit increase in output by one industry.

> *"At full maturity, our primary contracted eVTOL program projects 2,000-3,000 of our thermal management units shipped a year. We have hired quite a few new people for this program and plan to hire considerably more mechanical, electrical, and software engineers next year. Once this urban air mobility program enters production, we will hire many more engineers and technicians for the crucial ongoing work of assembly, integration, and testing in St. George, Utah."*
>
> **Brad Plothow, Chief Growth Officer, Intergalactic**

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 Utah includes the insertion of an "inflection point," the introduction of highly auto-mated flight systems requiring less human intervention. For example, an emerging view of AAM over the next 25 years is that cockpit auto-mation 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.

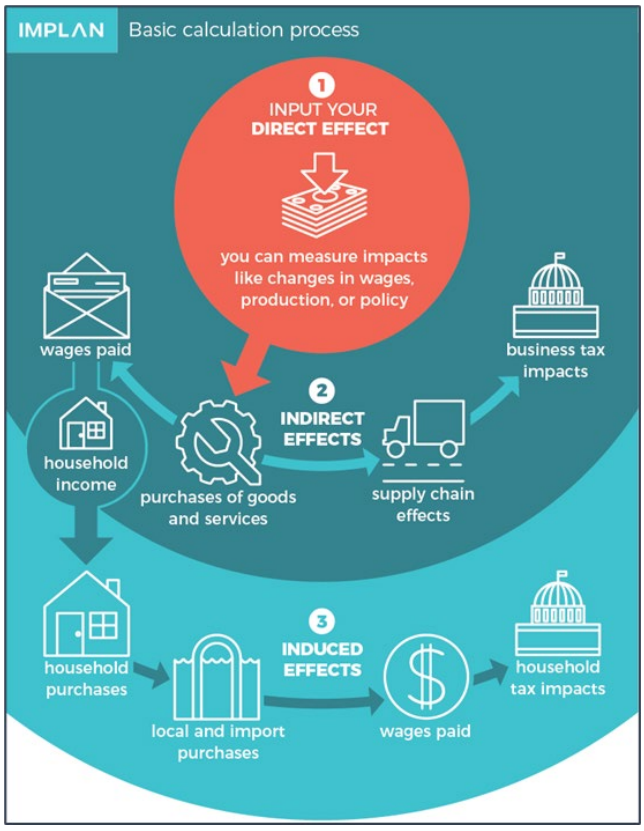


Figure 29 – IMPLAN's calculation process of economic impacts.

The EIA 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.

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. 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.

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."[36]

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, UTM, and aircraft, in addition to revenue for the operators. These totals, or economic outputs, have been forecast for each phase of AAM's development in Utah through 2045.

Economic Impact – Gross Domestic Product

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. In the case of AAM, total output over 21 years, calculated using NEXA's business case analysis model, is $8.073 billion. $3.731 billion is attributed to the direct impact; $2.079 billion is attributed to the indirect impact, and $2.262 billion is attributed to the induced impact.

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. 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 (full time or part time), 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.

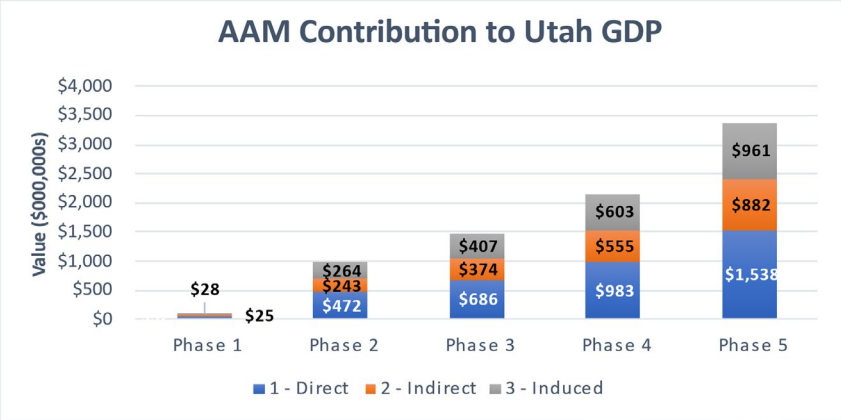


Figure 30 - Total AAM contribution to Utah GDP.

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 Utah.

The permanent FTE job numbers in the figure below reflect cumulative permanent full-time positions gained year over year. As the value of AAM increases every year, so does the labor required to support the increasing business activity. This means that by 2030 the value of AAM including UAS at the direct, indirect, and induced levels will require roughly 3,200 FTE jobs to support it. By 2045, that number reaches over 11,000 FTE jobs. An OEM manufacturer would add another 1,000 direct jobs, and an additional 1,100 indirect and induced jobs.

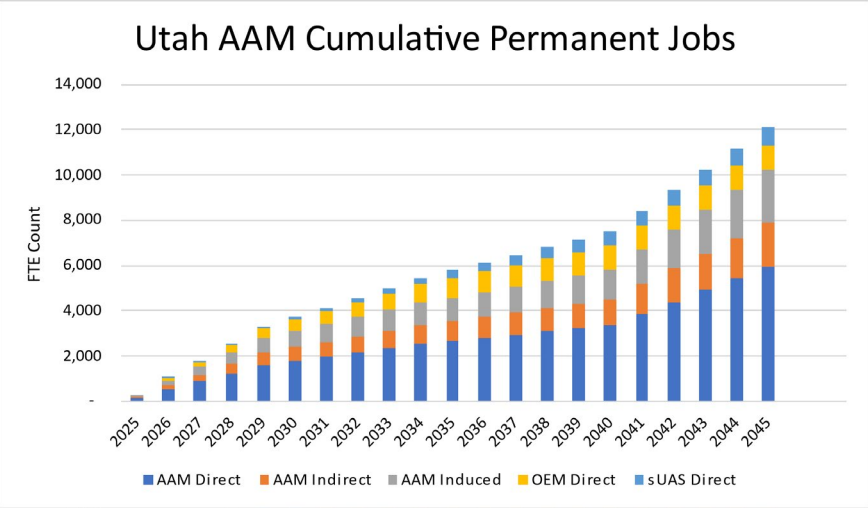


Figure 31 - Contribution of AAM to full-time permanent job creation for Utah.

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 U.S. 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.

These jobs will include the following occupations: pilots, traffic management, engineers (electrical, mechanical, software, systems), passenger handling, aircraft schedulers and handlers, aircraft loading, aircraft maintenance, manufacturing, welding, cybersecurity, safety inspectors, concession management, and more.

> *"When I think back to gilded age of aviation, the pioneers who blazed trails faced huge risks, placing their own lives, or those of their test pilots, in jeopardy. Visionaries like Orville Wright, Amelia Earhart, and Howard Hughes paid a major price for innovation.*
>
> *In Utah, we're taking a different approach. I'm encouraged by the thoughtful steps being led by UDOT Division of Aeronautics, with the support of partners like 47G and UIPA, to ensure we get the technology right. After all, the most precious cargo is human life. Advanced Air Mobility will be a vital part of how our communities connect 30 years from now, and it's crucial we lay the right foundation today."*
>
> **Ben Hart, Executive Director, Utah Inland Port Authority**

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

AAM services. In the latter three phases of expansion, therefore, we will see sustained growth in the flagship positions of aircraft operations. These include pilots (both commercial and cargo), freight handlers, travel agents, operations managers, and so forth.

Together, these jobs make up the entire AAM sector, reflecting impacts at both the direct and indirect level. Jobs are also created at the induced level but are less related to AAM and result from overall growth of the regional economy.

Economic Impact – Taxes

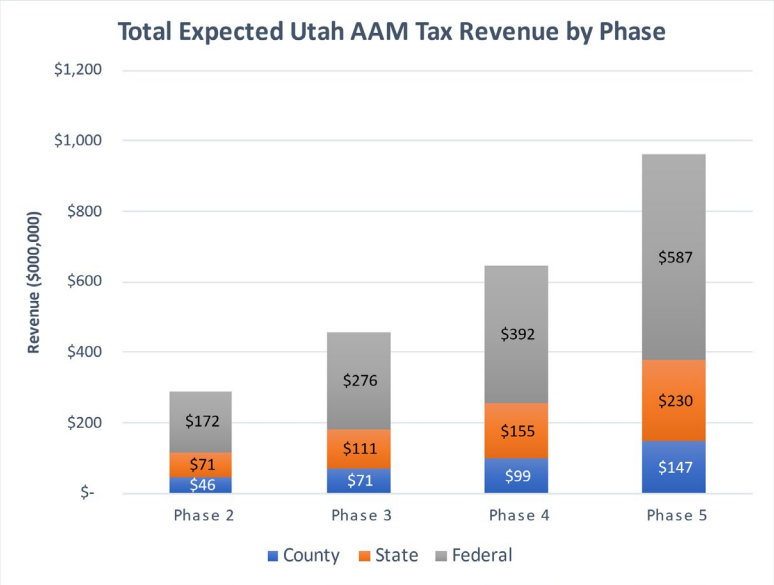


Figure 32 – Estimated future tax revenues from new AAM activities in Utah. Phase 1 is nascent, or negligible, and not shown.

IMPLAN captures 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 allows the state to invest more generously in state infrastructure, schools, social programs, police, and so forth.

Figure 32 depicts these revenues at the local, state, and federal levels over each phase of growth. These values, when additive, reflect total revenue of $2.3 billion gained over 21 years. The local and state governments account for $368 million and $573 million in revenue, respectively. Federal revenues account for about $1.4 billion.

The most important take-away of this analysis is that Advanced Air Mobility, including UAS operations that encompass all use cases discussed throughout this report, will provide many returns, including a large contribution to the state's tax base.

Catalytic Business and Economic Impacts for Utah

Catalytic impacts include those spill-over effects that can benefit other areas of an economy but 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 investment and tourism.

Catalytic impacts are notoriously difficult to quantify, such as increased labor market efficiencies and suburban/rural access. While 97% of Utah's square mileage is considered rural, only 10% of

Utahns live in rural areas. Almost 80% of Utahns live along the Wasatch Front, an area some 120 miles long that includes Salt Lake City, Provo, and Ogden. Ease of transportation from outlying areas to urban centers will expand job opportunities and increase the customer base for urban businesses, which in turn will generate revenues and help grow the economy. Securing America's Future Energy (SAFE), an energy policy research organization, cited the following in its 2018 study:

> *"AAM in Utah means opportunities for entrepreneurs and businesses. Our Black businesses will be involved in contracting, workforce, and infrastructure around AAM systems. The overall community of Utah will be involved in AAM implementation, Blacks being a subset."*
>
> **Marshall Wright**
> **Utah Black Chamber of Commerce**

- 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%.

Another catalytic impact is improved healthcare access and outcomes. A healthier population contributes more to the economy, working, running businesses, and spending money.

Increased STEM (Science, Technology, Engineering, and Math) education is another catalytic result difficult to quantify in economic terms. With the rise of new tech industries like AAM, state and local educational systems provide more STEM courses, and industry steps in with partnerships, internships, and mentorships. STEM workers can earn two to three times what non-STEM workers earn, contributing far more to the economy.

Advanced Air Mobility and Weather

Precipitation, aircraft icing, turbulence, extreme temperatures, wind and wind shear, low visibility, and gusts will adversely affect lightweight AAM aircraft and drones more than conventional aircraft. AAM vehicles will operate closer to the ground and in greater proximity to structures like high-rises, within the atmospheric boundary layer (ABL)—a region of the atmosphere characterized by turbulence and instability influenced by surface features and temperature variations.

Figure 33 – Lightweight AAM aircraft will be more sensitive to weather than traditional aircraft and will require new weather reporting and forecasting systems.

Utah has diverse geography and wide-ranging elevations: the Wasatch Front is between 4,000 and 12,000 feet above sea level. Mountainous regions have significant snowfall, and summer temperatures can exceed 90 degrees. Pollution trapping atmospheric inversions in the winter increase uncertainty about wind speed, fog development and dissipation, and aircraft icing conditions.

In contrast to traditional aircraft operating at higher altitudes, AAM aircraft will be affected by "microweather," atmospheric conditions at "neighborhood scale," about a square kilometer or less. For instance, drones and AAM aircraft operating in a city may be subject to the "wind tunnel effect," which occurs when wind increases its velocity as it moves through confined space. Similarly, the natural topography of the Wasatch Range can produce localized wind effects, such as canyon winds, which occur when air is funneled through mountain passes or valleys. Such microweather at low altitudes is not usually captured by traditional aviation weather sensors.

Due to AAM aircraft reliance on electric power, uncertain wind speeds and precipitation may make power use projections less certain, impacting distances traveled, weight the aircraft can carry, and aircraft recharge times. The uncertainty about what wind is occurring or will occur at flight altitude and during landing may occasionally impact service reliability and client comfort.

The cancellation of AAM flights due to weather, and the resulting loss of income, is called the "weather tax." A carefully considered network of advanced weather sensors tailored for urban and low-altitude aviation will reduce the weather tax by helping operators navigate and schedule flights more effectively.

> *"The current aviation weather system wasn't built for the needs of lighter, autonomous drones and eVTOLs. The new ASTM Weather Standard provides a framework to deploy new weather equipment that will support safe autonomous flight, and lower costs, enabling scalable, efficient operations."*
>
> **Don Berchoff, TruWeather Solutions**

The most advanced network of weather sensors in Utah includes 33 active Automated Surface Observing Stations/Automated Weather Observing Stations (ASOS/AWOS) at airports across the state. These sensors provide high-fidelity, low-altitude weather data critical for supporting flight operations at airports. However, UAS and AAM operations will not be limited to airport environments, where traditional weather systems like AWOS are typically available, highlighting the need for expanded weather monitoring infrastructure in other areas.

While traditional aviation weather sensors like AWOS provide high-fidelity data for airports, they do not adequately address the unique needs of low-altitude operations typical of AAM. The broader National Weather Service (NWS) infrastructure, which focuses on higher altitudes and larger areas, leaves critical gaps in localized weather monitoring for the atmospheric boundary layer.

To address these challenges, the ASTM F3673-23 standard establishes new performance requirements for Weather Information Providers (WIPs), enabling the integration of high-resolution weather sensing and reporting tailored to AAM operations. These advancements promise enhanced safety and operational efficiency in areas currently underserved by traditional systems.[37]

Once the state has identified locations and use cases for initial AAM operations, it might consider funding infrastructure upgrades to support advanced weather sensing within UDOT's Division of Aeronautics's AAM test sandbox. This sandbox could facilitate the development of micro-weather aviation forecasts and generate urban and suburban street-scale wind and weather data sets tailored to AAM needs.

Community Engagement

Advanced Air Mobility requires not only technological advances and new regulations, but also the support and feedback of the communities it will serve. Historically, any new technology—from the printing press to generative AI—has faced pushback. Some people leap eagerly into technological advances, while others fear the uncertainty of change, possible job losses, and resulting social inequalities.

There are two parts to successful community engagement: education and consultation. In terms of education, the state should work with the media on unbiased, educational AAM stories, hold community forums, and demonstrate drone deliveries at public events, highlighting AAM's numerous community and economic benefits.

As for consultation, local legislatures, city councils, and community organizations should hold town hall meetings, webinars, and open forums to listen to the community's questions and concerns, just as they would for other transportation related projects such as a new toll road or highway expansion.

Such forums should address public concerns about equity, noise, privacy, and safety. In terms of equity, there is some concern that only the rich will be able to afford AAM passenger flights. While initial on-demand ticket prices are expected to be high, advancements in automation and increased industry scale could enable significant cost reductions by 2045. If achieved, these efficiencies may bring ticket prices closer to the cost of a premium rideshare trip, such as an Uber Black, estimated at around $90 in 2024 dollars. The realization of these price points will depend on factors such as technological progress, operational efficiencies, and market demand; all factors that rely on community support.

> *"With anything new, the public will raise concerns, and we must be thoughtful in terms of developing policy to reflect that. We will need to address issues of privacy and noise so Utah residents can embrace this new technology which offers so many economic and social benefits."*
>
> **Senator Ann Millner**
> **Utah State Senate**

Additionally, AAM Medevac flights are expected to cost exponentially less than traditional helicopters for passengers of every economic status experiencing a medical emergency. Regional Air Mobility flights connecting to larger airports for follow-on flights may be included in a single ticket price, the same way conventional connecting flights are charged. As for tourism, AAM flights are modeled to be less expensive than helicopters.

Within aviation, noise is a major community concern. The closest aircraft to eVTOLs—

helicopters—produce a thwomp-thwomp sound that causes stress and irritation to people and wildlife, which is why many locales have imposed restrictions on their use. But recent noise tests—such as the one NASA conducted with eVTOL manufacturer Joby—show that eVTOLs' noise signature is dramatically less and will barely be noticeable among the ambient sounds of urban areas. The lower noise signature is due to two reasons: 1) eVTOLs use electric motors instead of a noisy combustion engine, and 2) the aircraft have multiple small rotors rather than a single large rotor to provide vertical lift. These noise characteristics make eVTOLs more adaptable to urban environments, where higher ambient background noise can help mask their sound.

Privacy is a particular community concern with regards to drones. FAA's Remote Identification (Remote ID) requirements aim to enhance transparency and accountability for drone operations while addressing privacy concerns for both operators and the public. In addition, states can enact their own legislation to address the matter. Utah Code 72-14-103 prohibits the use of drones to conduct surveillance or photograph/record an individual without their consent, with exceptions for law enforcement and emergency services, and establishes penalties for violations.[38] House Bill 217 prohibits drone operators from intentionally harassing livestock by reckless flying activities. Amended Senate Bill B 111 (2017) prohibits using drones for the purpose of voyeurism.

In terms of safety, eVTOL aircraft are the first new category of civil aviation since the introduction of helicopters eight decades ago. As such, they are undergoing rigorous testing to meet FAA aircraft certification standards, upholding the high safety standards of commercial aviation while accommodating the novel aspects of eVTOL technologies. The FAA recently issued a final rule to establish pathways for pilot certification, training, and operations of powered-lift aircraft, including eVTOLs. This rule provides updated frameworks for pilot qualifications, type ratings, and operational standards to safely integrate these new aircraft into the National Airspace System (NAS).

Ensuring Utah Has the Tech Talent Required for AAM

Literacy and workforce competency in technical fields are essential to any state's financial prosperity. STEM capability is an essential economic driver. According to the U.S. Bureau of Labor Statistics, in 2022 the aggregate average salary for all STEM workers nationwide was $101,650, compared with $46,680 for non-STEM jobs.[39]

Utah has consistently posted low unemployment rates, with a high demand to fill technical jobs, primarily due to the critical need for a defense workforce to support the programs at Hill Air Force Base. As of October 2024, Utah's unemployment rate was 3.5%**,** well below the national average of 4.1%.

In NEXA's dozens of personal interviews for this study, stakeholders across the board expressed the need for the availability of qualified applicants to fill the thousands of new jobs that AAM will create in Utah. There is already a national shortage of pilots, mechanics, air traffic controllers, and engineers. The U.S. Bureau of Labor Statistics forecasts that more than a million new STEM jobs will be added to the economy through the 2020s, and our models forecast more than 7,000 technical jobs in Utah by 2045, out of more than 12,000 new jobs overall. Fortunately, Utah is in a strong position to meet AAM's future workforce demands.

Utah's Post-Secondary Aviation Programs

New AAM jobs will require employees skilled in aerospace engineering, aviation maintenance, Airframe and Powerplant (A&P) Certification, pilot training, and a variety of technical skills.

Seven Utah educational institutions of higher learning offer specialized programs in aerospace.

Utah State University (USU), Utah's land-grant university with campuses throughout the state, offers degrees in Aviation and Aerospace Engineering, including undergraduate, master's and Ph.D. programs. Their programs prepare students for careers in aviation, aircraft and spacecraft manufacturing, defense, and space industries. USU has 30 statewide locations, including the main campus in Logan, USU Eastern (Price), and USU Blanding, and offers more than 60 online degrees. A new aviation campus was recently opened at the Brigham City Regional Airport.

Figure 34 – Working with industry, Utah schools create STEM curricula to make students workforce ready for jobs of the future.

Three B.S. degrees are offered in the Aviation Technology program — Professional Pilot for fixed wing and rotorcraft (helicopters), Maintenance Management, and Aviation Management with an emphasis in Unmanned Aerial Systems or Airport Operations.

Additionally, USU was one of the first universities to offer a degree with a minor in UAS. This minor prepares students to complete the FAA UAS Commercial Drone Pilot certification. Students develop a working knowledge of design, maintenance, and control of unmanned aerial systems and learn how UAS skills can enhance other majors and careers. Students will learn about the history, rules, and remote pilot license preparation for drones, as well as UAS design, construction, maintenance, guidance, control, sensors, aerial photography, and applications in agriculture.

All UAS Minor students earn the Part 107 (commercial drone operator) certificate from the Federal Aviation Administration and participate in coursework related to UAS operations and logistical concerns.

University of Utah: "The U" is a Tier 1 research institution and has received a wide range of grants to conduct primary research in support of AAM. The POWDER 5G testbed (the Platform for Open Wireless Data-driven Experimental Research), provides a national testing center for communication, navigation, and surveillance of AAM aircraft. The Department of Aerospace Studies offers three- and four-year programs for students interested in the Air Force Reserve Officer Training Corps (AFROTC). These programs provide students with the education and training necessary to commission into the United States Air Force (USAF).

> *"Is Utah going to be workforce ready for AAM? Yes! The question is, 'How are we going to be ready?' We need to identify the fields that get students excited and the courses to prepare them. Working with industry to identify required skills, we need to close the awareness gaps about the future of Air Mobility to younger kids, parents, and counselors."*
>
> **Vic Hocket, Associate Commissioner USHE (Utah System of Higher Education) and TRU (Talent Ready Utah)**

Brigham Young University (BYU): BYU offers programs through its Mechanical Engineering Department, where students can focus on aerospace applications, particularly in design and propulsion systems. As a Tier 1 research institution, they also offer opportunities for research and internships related to the aerospace industry.

Utah Valley University (UVU) has a School of Aviation Sciences which offers an Aerospace Technology Management Bachelor's degree and various aviation-focused programs that are recognized nationally. The university also operates a fleet of aircraft for flight training and maintains partnerships with multiple airlines.

Salt Lake Community College (SLCC): SLCC provides an Aviation Maintenance Technology program and Airframe and Powerplant Certification training. This is a hands-on program for those seeking to work in aircraft maintenance.

Southern Utah University (SUU): SUU offers aviation programs through their Aviation Science Department. This includes pilot training, as well as courses in aviation management and related fields.

Weber State University: Weber offers Aviation Maintenance and Flight Technology programs that prepare students for careers in aircraft operation and maintenance.

Secondary School Programs

As impressive as these aerospace programs are, technical education must start well in advance of post-secondary school. Most of those who will be entering the AAM workforce in our peak forecast year of 2045 are wearing diapers today. As technological complexity increases exponentially year to year, students must begin science, math, and technology courses in elementary school. Fortunately, Utah has numerous STEM-focused programs to inspire, encourage, and prepare K-12 students for aviation-related careers. Much of Utah's work to address workforce demand involves engaging industry—those who will do the hiring—in the development of programs especially for technical skills.

> *"Utah is lucky to have the largest base of youth in the nation. Industry tells us what it needs for the workforce. Do we want kids to go into AAM? Then we need to start in elementary school, especially for low-income kids. Thirty-three percent of experienced mechanics make over $150K a year. The power of Utah is that people work together."*
>
> **Sandra Hemmert, Career & Technical Education Specialist, Granite School District**

In December 2014, Boeing approached the Utah Governor's Office to create a workforce development program to build its talent pipeline and fill high-demand jobs shared across multiple Utah aerospace companies. As a result, **Talent Ready Utah** began in 2015 as an initiative of the Governor's Office of Economic Opportunity and now is part of the Utah System of Higher Education. Talent Ready Utah has evolved into a workforce development initiative launched by the State of Utah to align education with industry needs. It aims to ensure that students and workers are prepared for high-demand careers in industries such as defense, aerospace, technology, advanced manufacturing, healthcare, and more. The program emphasizes partnerships between businesses, educational institutions, and government agencies to create a skilled workforce that meets the needs of Utah's growing economy.

The Talent Ready Apprenticeship Connection (TRAC) provides high school students with apprenticeship opportunities while earning a college degree. This approach was adapted from the Swiss Apprenticeship model, allowing students to start career training earlier by splitting their

time between the classroom and the workplace to maximize their learning experience and get a head start in earning their college degree.

Through a unique partnership of numerous government agencies, technical and higher education organizations, and employers, Utah launched the **Utah Aerospace Pathways** (UAP) program in September 2015 under the Utah System of Higher Education. UAP offers high school students the opportunity to gain specialized skills in aerospace manufacturing through a combination of classroom learning and hands-on externships with leading aerospace companies such as Albany, Boeing, Hexcel, and Northrop Grumman. Students who successfully complete the program receive an industry-recognized certificate and are guaranteed an interview with participating employers. The program also supports further education by offering stackable credentials and tuition reimbursement options, making it an accessible pathway to both immediate employment and long-term career advancement.

"When I go to high schools and show students the Archer, Beta Technologies, and Joby Aviation eVTOLs, when they see the art of the possible and how we can create an intermodal transportation system, they are leaning forward and are fascinated. They are inspired."

Stephen C. Ley
Associate Professor, School of Aviation Sciences, Utah Valley University

The **Utah Works program** provides short-term skills training to individuals looking to start their careers. Individuals looking to skill up in a matter of a few short weeks can do so as they participate in a fully paid, streamlined program, while employers see an immediate return on their investment to build their workforce.

In addition to the Talent Ready Utah programs, Utah has extensive Career and Technical Education (CTE) programs, which provide all secondary school students access to high-quality, rigorous career-focused programs that result in attainment of credentials with labor market value. These students can earn concurrent credit in one of Utah's Technical Schools while still in high school.

Utah STEM Action Center

The Utah STEM Action Center is a state-supported initiative aimed at advancing science, technology, engineering, and mathematics (STEM) education and workforce readiness in Utah. Established in 2013, the center focuses on equipping Utah's students—from K-12 to higher education—with the skills necessary to succeed in high-demand STEM careers, fostering innovation, and supporting the state's

"Is Utah workforce ready for this new tech? Yes, we are! We have the structure in place to be nimble and responsive to emerging needs by providing education pathways that turn into career pathways for companies that need the talent."

Tami Goetz, STEM Executive Director Governor's Office

growing economy. The Center aims to increase access to STEM programs for underserved communities, including rural areas and minority populations. It builds workforce pipelines by aligning STEM education with workforce needs by partnering with businesses to create clear pathways to careers.

Deep Technology Talent

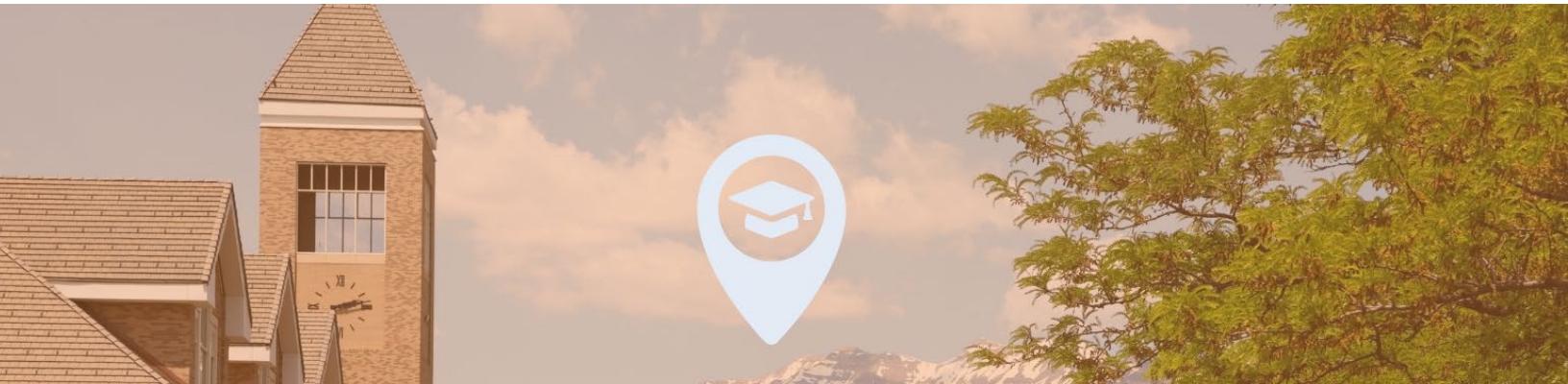
Utah's Deep Technology Talent Initiative is designed to foster the development of highly specialized talent in cutting-edge fields such as artificial intelligence, cybersecurity, robotics, and biotechnology. The initiative, spearheaded by the Governor's Office of Economic Opportunity and educational institutions, aims to address the growing demand for experts in these advanced sectors, which are critical to Utah's economic future. By offering targeted education, training programs, and partnerships with industry leaders, the initiative seeks to build a robust talent pipeline that can support the state's booming technology ecosystem. The Deep Technology Talent Initiative not only prepares individuals for high-paying, future-focused jobs but also positions Utah as a leader in tech innovation on both national and global stages.

Return-to-Work/Talent Ready Utah (Utah System of Higher Education)

Utah's Return-to-Work program is designed to help individuals re-enter the workforce after an extended absence, providing them with the resources, skills, and support needed to transition back into employment. Whether someone has taken time off for caregiving, health reasons, or other personal circumstances, the program offers career coaching, job search assistance, and training opportunities to update skills and regain confidence. Return-to-Work also partners with employers to create flexible work opportunities and bridge any skill gaps, ensuring that returning workers can seamlessly reintegrate into the job market. By offering this support, Utah's Return-to-Work program strengthens the labor force and helps individuals re-establish successful, long-term careers.

Utah Apprenticeship Program

The Utah Apprenticeship Program is a state-supported initiative under the Utah Department of Workforce Services, designed to connect individuals with employers offering apprenticeship opportunities across various industries. The program provides on-the-job training combined with classroom education, allowing participants to earn wages while gaining practical skills and certifications. Apprenticeships cover sectors like manufacturing, healthcare, construction, and technology, helping to create a skilled workforce while addressing the needs of local businesses. The program is open to a wide range of applicants, including high school graduates, career changers, and veterans. There are currently roughly 5,000 active apprentices and almost 300 programs.



Stakeholder Interviews

NEXA conducted 64 personal interviews with Utah AAM stakeholders to ascertain their opinions on the industry's future in the state, their hopes and expectations, and their questions and concerns. We spoke with stakeholders at the Utah Department of Transportation, in the Governor's Office of Economic Opportunity, both sides of the aisle in the State Legislature, workforce development organizations, firefighting, natural resources, the Utah Inland Port Authority, 47G, the Utah World Trade Center, the Office of Tourism, metropolitan planning agencies, economic development districts, and academia. Numerous mayors and Chambers of Commerce also shared their thoughts with us.

In terms of industry, we interviewed individuals in aerospace, the Utah Film Commission, ski resorts, helicopter charter operators, Intermountain Health, the Petroleum Association, BioUtah, Part 135 operators, and aviation parts manufacturing. We also interviewed key manufacturers and others, such as those in the insurance industry, who are currently supporting the AAM industry.

Almost universally, our respondents believe that the same factors that have propelled Utah to the top of countless "Best Of" charts—the state's unique culture, history, and character—will ensure success in implementing Advanced Air Mobility. They pointed to Utah's business friendly environment, knack for innovation, legislative support, inclusion of industry in workforce programs, numerous agencies and programs supporting economic development, strong university research programs, and the ability of Utahns to collaborate, which facilitates working together to meet common goals.

They mentioned the state's young population, its robust aerospace and defense industry, and the success of tech companies on the Silicon Slopes. They believe the 2034 Olympics will be an added incentive to develop a successful AAM network and look forward to understanding how AAM could be integrated into projects like the Point development.

> *"Will Utah be ready for AAM? We will be. Any type of challenge we faced in the past we have stepped up to in a big way. We punch above our weight. Our tech savvy people want to innovate. We have a young population. We Utahns are willing to try new things. Utah is having its moment."*
>
> **Ryan Starks, Executive Director, Governor's Office of Economic Opportunity**

The petroleum, helicopter charter, film, biotech, and ski industries are eager to see what role AAM will play in providing safety, convenience, and lower transportation costs. The respondent from tourism is interested in offering new experiences and convenient travel options to visitors.

Most of our respondents stressed the importance of economic development in Utah's rural areas, supporting Governor Cox's goals of bringing prosperity to all Utahns. Regional

Air Mobility and eVTOL cargo services at rural airports could bring operators and other businesses to the area. Economic development of these communities would also attract residents from urban areas who are having difficulty finding affordable housing. Those interviewed are eager to see improved emergency healthcare response in those communities far from major hospitals and often from Medevac helicopters, where victims of car accidents, heart attacks, and strokes are more likely to die than those in urban areas.

Our respondents had varying opinions on whether Utah will have the tech talent needed to fill the thousands of new AAM jobs. Some gave a decided "no, not now." Others indicated Utah would be ready when the time came: "Utah is ready to be ready for Advanced Air Mobility," said one, and "We can do whatever we put our mind to," said another. Interestingly, respondents arguably in the best position to judge—those involved in STEM education—are absolutely certain that the state's workforce will be ready.

"I am confident in saying that every sector of the economy has the potential of being positively impacted by the use of AAM here in Utah."

Nick Holt, Economic Aviation Development Manager, UDOT Division of Aeronautics

Utah's education stakeholders emphasized the need to adapt to and pivot along with industry's constantly changing needs as technology increases in complexity and, working with industry, to update school curricula accordingly. They stressed the importance of continuing to work with industry in terms of internships, mentorships, and apprenticeships, and the need for students who do not go onto university to be prepared for good technical jobs. Education for a technical workforce begins in kindergarten, the experts agreed, with students obtaining stackable credentials throughout high school and beyond.

Many spoke with pride of Utah's welcoming immigrant and refugee families and preparing children and adults alike with skills for the workforce. They stressed the importance of providing technical education throughout the state, even in the most rural and remote locations, to provide "opportunities agnostic of zip codes."

While excitement among our respondents was high, some had concerns, such as the regulatory burden. As Advanced Air Mobility is the first new category of civil aviation to emerge in 80 years, the FAA is focusing on safety rather than alacrity in issuing aircraft certifications and new regulations. Several mentioned the requirements of new airspace design for low-altitude flights—especially over urban areas—and new air traffic control requirements.

Several mayors and leaders of Chambers of Commerce said they will need to deal with issues of permitting, planning, and zoning for vertiports. They expressed confidence in finding appropriate solutions but added that the processes may take time and will require extensive community engagement.

Some interviewees had questions about funding. Utah is fiscally conservative, unwilling to burden the taxpayer, and unlikely to fund much of AAM's required infrastructure. State government officials expressed concern that the passenger demand will not support the costs of building and operating an extensive AAM network and cautioned against depending on state funding. Funding, they noted, must come from private investors or a Public Private Partnership.

Several respondents mentioned their concerns about a possible lack of public support, either from residents who are anti-growth and anti-change in general or who are concerned about privacy, equity, noise, and safety. They felt that community engagement is crucial well before AAM operations begin.

One former airport manager is concerned about delays caused by environmental studies required for airport projects, noting they could take several years and cost upward of half a million dollars each. Some respondents noted the difficulties with battery range for the initial eVTOL aircraft for both Medevac use and transporting passengers from remote parts of the state to urban locations.

Many interviewees had questions about weather and agreed that the state will need a new network of weather sensors to stand up a successful AAM system. Some spoke of Utah's weather extremes: ice and snow, wind, and both high and low temperatures. They worried that if bad weather cancels AAM flights too frequently, the public might see the industry as an unreliable form of transportation.

Another question is how to set insurance premiums for a type of aviation that is not yet operational. Premium costs are based on risks, the number of accidents compared to safe flights—and these figures are unknown for AAM. NEXA interviewed Alistair Blundy of Advanced Technology Assurance (ATA) in London, arguably the world's top AAM insurance company, who has been visiting OEMs and meeting with engineers to understand new risks, obtaining all possible data to assist with underwriting. Setting initial AAM premiums will require a careful balancing act, he said. They must be affordably priced so that AAM operators can begin operations, yet they must be high enough to allow the insurer to pay out claims and still remain profitable.

Recommendations

For numerous reasons already discussed at length, Utah is currently well-positioned to continue its leadership role in AAM implementation. There is, however, much work to do to ensure this leadership continues. Below is a list of recommendations NEXA suggests the state undertake.

Develop AAM Community Engagement Program

To ensure successful adoption and integration of AAM operations in Utah, a proactive and inclusive community engagement strategy must be developed. This approach will build trust, address concerns, and foster collaboration with local stakeholders. The following actions are recommended:

Develop a Transparent Communication Framework:

- Establish clear and consistent messaging to inform the public about AAM benefits, challenges, and implementation timelines.
- Provide accessible resources, such as public meetings, online dashboards, and outreach materials, to ensure all communities have opportunities to engage and stay informed.

Partner with Local Stakeholders, Education Outlets, and Nonprofits:

- Collaborate with regional planners, local governments, and community leaders to address location-specific concerns and ensure equitable access to AAM infrastructure. Utilize resources mentioned above such as public meetings, online dashboards, and outreach materials, to ensure all communities have opportunities to engage and stay informed.
- Partner with established educational organizations and nonprofits, such as the Leonardo Museum in Salt Lake City—which focuses on science, technology, art, and creativity—and its permanent flight exhibit, to support outreach and education initiatives that inspire public interest and highlight AAM opportunities.

Conduct Educational and Awareness Campaigns:

- Support STEM-focused programs and educational initiatives to build public awareness about AAM technology, safety, and career opportunities.
- Prioritize agnostic, unbiased information in education and outreach efforts, ensuring a clear distinction from industry PR or marketing. Use workshops, listening sessions, and demonstration events to engage the public, answer questions, and address misconceptions about AAM operations.

These actions will foster trust, promote equitable integration, and ensure that AAM solutions reflect the needs and priorities of Utah's diverse communities while providing transparent and objective information.

Secure One or More AAM eVTOL Manufacturers

Utah is already home to a thriving AAM innovation ecosystem. With diligent preparation, the state should attract eVTOL and eSTOL OEM manufacturers, in turn securing significant investment capital from around the country. Through GOEO and other state organizations with an economic development mandate, we recommend that the state offer the country's most comprehensive incentive package—with meaningful fiscal incentives, including cash grants, land, facilities, and tax credits—to attract an Advanced Air Mobility OEM, as several of them are seeking partnerships right now. Once these few aircraft developers have made their choices, the selected states will reap significant economic advantages for decades to come.

The time for securing a major AAM manufacturer is now. A well-funded OEM would create thousands of full-time permanent jobs in the state, would result in new businesses opening and moving to the state, capital investment, income tax revenues, and a significant overall induced economic boost. An OEM manufacturer would also contribute a multiplier effect for direct investment, supporting the aerospace supply chain already thriving in Utah, attracting new Tier 1 and 2 suppliers and skilled workers. Additionally, manufacturing facilities either near or on a public access airport can incentivize local government add-ins.

Form a Utah AAM Public Private Partnership

Utah's AAM initiative, structured through a P3 model, continues to present opportunities and position the state as a national leader in advanced mobility technologies and demonstrates a business approach that will resonate powerfully throughout the ecosystem's stakeholder community. By establishing additional goals for each stakeholder—state government, infrastructure investors, Utah AAM industry (manufacturers and Part 135 operators), universities, and the public—Utah can be more resilient, innovative, and create a sustainable AAM ecosystem that aligns with the state's long-term economic, environmental, transportation, and community goals.

Operational Framework of PPP:

- **Phased Implementation:** Start with high-demand use cases (e.g., cargo logistics and airport shuttles) before scaling into broader urban and regional mobility.

- **Investment:** Secure project financing for AAM making use of staged approach with privately sourced equity and bonds backed by a user fee regimen.

- **Performance-Based Contracts:** Align incentives across stakeholders to ensure accountability and measurable outcomes.
- **Monitoring and Evaluation:** Establish key performance indicators (KPIs) to track progress and ensure compliance with safety, sustainability, and community impact goals.

Stakeholder Goals:

- **State Government:** Establish a supportive regulatory and policy environment to enable efficient AAM operations.
- **Infrastructure Investors:** Facilitate private-sector phase-by-phase financing and risk-sharing models for CAPEX-intensive AAM infrastructure.
- **Utah AAM Manufacturing Industry:** Drive innovation, manufacturing, and operational excellence in AAM services.
- **Utah AAM Operators:** Drive operational excellence to the highest safety standards using established Part 135 helicopter operators resident in Utah.
- **Universities:** Build a pipeline of skilled talent and advance research for AAM technologies.
- **The Public:** Ensure community engagement, equity, and acceptance of AAM operations.

The P3 will be organized by UDOT Division of Aeronautics and will involve necessary stakeholders with shared goals and visions.

Airport Electrification Assessment

Continue the energy assessment framework being developed to evaluate Utah's airports and their readiness to support electrified AAM operations. Building on current efforts in support of Utah S.B. 125 regarding Transportation Infrastructure, this assessment will prioritize airports based on the following criteria:

Existing Energy Infrastructure:

- Review existing reports and work completed to assess the availability and capacity of current power infrastructure, including grid connectivity and existing energy demand.
- Identify airports with sufficient capacity for near-term electrification and those requiring upgrades to accommodate high-capacity charging systems.
- Assess the introduction of hydrogen fuel cells along with refueling capability adequate to support such hybrids.

This energy assessment framework will ensure Utah's airports are equipped to meet the demands of electrified AAM operations while supporting sustainability, resilience, and long-term transportation goals.

Weather Capability and Infrastructure

To support safe and efficient AAM operations, Utah should prioritize improving localized weather monitoring and forecasting capabilities. The following actions are recommended:

Conduct a Weather Capability and Sensor Gap Analysis:

The state must establish a robust weather infrastructure that addresses low-altitude weather gaps, enhances situational awareness, and ensures safe AAM integration statewide.

Assess existing weather infrastructure, including the Automated Weather Observing System (AWOS), to identify gaps in low-altitude weather monitoring, particularly in urban corridors, mountain passes, and rural areas.

Deploy High-Fidelity Weather Sensors and Partner with WIPs (Weather Information Providers):

- Install advanced weather sensors to capture low-altitude atmospheric boundary layer (ABL) data, such as wind, turbulence, and temperature.
- Collaborate with WIPs to generate high-resolution, street-scale wind and weather datasets, adhering to ASTM F3673-23 standards.

Utilize UDOT Division of Aeronautics AAM Test Sandbox:

- Validate new weather technologies and forecasting tools.
- Encourage collaboration between state agencies, private industry, and research institutions to advance weather solutions tailored to AAM operations.

Communications, Navigation, and Surveillance (CNS) Assessment

To ensure the safe and efficient integration of AAM operations into Utah's airspace, the state should prioritize advancements in CNS infrastructure that address the operational needs of all future aircraft and align with emerging technologies. Emphasis should be placed on adhering to RTCA standards and ensuring CNS systems meet critical performance requirements, such as availability, latency, and reliability, to support scalable and safe operations of multiple aircraft by types, large and small.

The following actions are recommended:

Assess and Enhance CNS Infrastructure:

- Conduct a comprehensive evaluation of existing CNS systems, including radar, navigation aids, and communication networks, to identify coverage gaps in low-altitude airspace within UDOT Division of Aeronautics' AAM Test Sandbox.
- Prioritize upgrades to ground-based infrastructure to support reliable Command and Control (C2) communications and surveillance for AAM operations.

Support Resilient Low-Altitude CNS Solutions:

- Invest in modernized, performance-based CNS systems, such as voice and data communications and Detect and Avoid (DAA) technologies, to ensure safe AAM operations in complex environments.
- Address spectrum management needs to enable consistent and secure communications for AAM aircraft across urban, suburban, and rural areas.

Within UDOT Division of Aeronautics's AAM Test Sandbox, Create a CNS Testbed:

- The testbed should evaluate emerging technologies, such as advanced navigation systems and integrated surveillance solutions, in collaboration with federal agencies and industry stakeholders.
- Use the testbed to validate CNS performance requirements for low-altitude operations, ensuring seamless integration with the National Airspace System (NAS).

These actions will address critical CNS gaps, support safe and scalable AAM operations, and position Utah as a leader in advancing low-altitude airspace infrastructure.

2034 Olympics Preparation

The 2034 Winter Olympics provide a unique opportunity to accelerate the implementation and integration of AAM systems in Utah. AAM encompasses a range of aircraft types and technological innovations that, over the next decade, can form a fully functioning transportation system—not just a demonstration. The following actions are recommended:

Prioritize Community-Centered Solutions:

- Ensure AAM development focuses first on the needs of Utah's residents, particularly during the disruption of the Olympics, by maintaining access to essential services, daily commutes, and reliable transportation.

- Augment AAM capabilities to support Olympic-specific demands, such as efficient athlete and visitor movement, without compromising the quality of service for local communities.

Integrate AAM into Existing Transportation Infrastructure:

- Focus on airports and the surrounding land to serve as key nodes for AAM operations, complementing the state's existing transportation strategies.
- Leverage and enhance the existing transit network, including rail, bus, and road systems, to ensure seamless multi-modal connectivity with AAM services.

Develop Long-Term Infrastructure to Support Utah's Future:

- Invest in permanent vertiport infrastructure and supporting systems to ensure AAM integration leaves a lasting transportation legacy for Utah beyond the Olympics.
- Plan AAM operations to align with statewide mobility goals, economic development initiatives, and sustainability priorities, ensuring long-term benefits for both residents and visitors.

Workforce Development for AAM

To ensure Utah is prepared for the future of AAM, a comprehensive workforce development strategy must be implemented. While STEM-focused programs are essential for funding and innovation, this strategy should acknowledge the full range of aviation careers required to support AAM operations and prioritize diverse, inclusive, and accessible pathways. The following actions are recommended:

Promote Vocational and Non-Traditional Pathways:

- Expand vocational training programs and apprenticeships to prepare workers for roles such as aircraft mechanics, technicians, dispatchers, and operations specialists.
- Partner with trade schools, community colleges, and industry to create certifications and short-term training programs that provide practical skills without requiring traditional four-year degrees.

Broaden Career Outreach Beyond STEM Roles:

- Highlight the full spectrum of aviation careers, including pilots, air traffic controllers, planners, customer service staff, tourism professionals, and support personnel critical to AAM operations.

- Develop targeted outreach campaigns to attract underrepresented groups into these roles, ensuring Utah's AAM workforce reflects the state's diverse communities.

Build Collaborative Workforce Pipelines:

- Partner with schools, nonprofits, and local organizations to develop early education and career awareness programs that inspire interest in aviation-related careers.

- Work with industry stakeholders to establish workforce pipelines that align training opportunities with the projected needs of AAM operations, emphasizing collaboration across urban, rural, and tribal communities.

This approach will create a robust and diverse workforce capable of supporting all aspects of AAM operations, from technical and STEM-based roles to vocational, operational, and customer-facing careers, ensuring equitable opportunities for Utah's future workforce.

Conclusion

Utah has, since its inception, been known for its pioneering heritage, resilience, and innovation, a proud heritage which continues today. With only 3.4 million residents, the state is a national leader in numerous business and community achievements. It is highly likely that the same factors that have placed Utah on the top of the "Best Of" lists will ensure that it continues its leadership role in Advanced Air Mobility.

Utahns from all walks of life will benefit from new transportation options. AAM will create thousands of new jobs, boost GDP, and increase state revenues while reducing carbon emissions. The high-tech applications for Utah's AAM network will energize businesses, universities, and students in technical fields. New AAM Regional Air Mobility and cargo operations will revitalize small regional airports and their communities. AAM will reduce the urban-rural divide, opening up new possibilities for rural residents. Healthcare outcomes across the state will be improved, and tourism will be boosted by exciting new travel and sightseeing experiences. Residents and businesses alike will enjoy numerous conveniences from drones.

With the diligent preparation underway today, Utah will become a center for multi-dimensional mobility, boosting its current aerospace and drone industry, leading to attracting manufacturers and investment, and creating new opportunities and a brighter future for all Utahns.

> *"By embracing advanced air mobility, we can 'Keep Utah Moving'—reducing congestion, connecting rural communities to more opportunities, and paving the way for a future where innovation in transportation takes flight."*
>
> **Paul Damron, Advanced Air Mobility Manager,**
> **UDOT Division of Aeronautics**

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