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As eIPP Launches, AAM Aircraft are Nearly Ready. The $16.6 Billion Infrastructure Gap Remains.

For the **"Vertical Mobility Economy"** to achieve commercial viability, infrastructure investment must advance alongside aircraft certification and regulatory development.

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Low-altitude airspace is emerging as the next frontier of innovation and economic activity. Drone services and use cases are rapidly developing. Advanced Air Mobility (AAM) is entering a decisive phase, as the **Vertical Mobility Economy** moves toward full commercial realization.

Aircraft certification programs are advancing, regulatory frameworks are rapidly evolving, and the Federal Aviation Administration has launched the eVTOL Integration Pilot Program (eIPP) to accelerate operational deployment across multiple regions of the United States.

Advanced Air Mobility will only become a profitable and safe transportation solution when ground and ATC systems are built to support high-frequency urban operations.

These developments represent critical progress for the sector. Yet they also highlight a parallel requirement that has received less attention: the infrastructure needed to support scalable AAM operations and the means to pay for it.

Aircraft certification and regulatory readiness alone will not produce a functioning transportation network. For AAM to move beyond demonstration flights and early pilot programs, the physical and operational systems that support high-frequency urban aviation must be developed concurrently.

Analysis conducted by UAM Geomatics indicates that through 2045 approximately $16.6 billion in infrastructure investment will be required to support peak demand across 62 key U.S. metropolitan locations, representing roughly sixty percent of the Nation's population.

The markets identified in this analysis overlap substantially with the regions now participating in the FAA's eIPP program (see Appendix for markets analyzed and eIPP map), creating a timely opportunity for infrastructure planning, operational testing, and regulatory development to advance together.

These CAPEX investments include (Figure 1):

- $11.2 billion in ground infrastructure including vertiports, charging systems, airport passenger processing facilities, and utility grid upgrades
- $5.4 billion in air traffic control modernization, surveillance, communications, and airspace management capabilities, strengthened by autonomous capabilities, specifically and safely supporting low altitude drone and eVTOL traffic management.

For the key 62 U.S. metro areas, the operator revenue opportunity for five use cases (regional air mobility, airport shuttle, on-demand air taxi, business aviation, and medical) is estimated by UAM Geomatics in the range of $210+ billion over the next 20+ years. This figure does not include the cargo and drone sectors. Against this backdrop, required infrastructure CAPEX remains relatively modest, unlocking what NEXA defines as the Vertical Mobility Economy. The total economic impact for this cohort is in the range of $330+ billion. Together, these elements create the operating environment required for predictable, safe, and efficient high-frequency operations moving passengers and cargo.

$11.2B	**Ground facilities**, vertiports, utilities, and charging systems
$5.4B	**Air traffic control**, surveillance, communications, and airspace upgrades
~ 60%	Share of the U.S. population represented by the 62 locations

Figure 1: Estimated infrastructure CAPEX requirements to accommodate peak demand across the 62 U.S. locations analyzed by UAM Geomatics.

Infrastructure development is therefore not a secondary phase of AAM deployment. It is one of the foundational conditions for the VME market to exist at scale.

Without infrastructure, AAM risks remaining a collection of demonstration projects rather than a functioning transportation system.

Elements of Infrastructure CAPEX

AAM infrastructure CAPEX is defined by a layered cost structure in which lower-cost vertiports provide network coverage, while higher-capacity multiports support operations in the most demanding markets.

The buildout considered here includes 2,570 vertiports coming online by 2045, of which 1,400 are remediated sites, existing heliports converted into vertiports. This is a notable feature of the CAPEX profile because remediation can reduce costs by leveraging existing aviation sites and infrastructure.

The ground infrastructure mix includes:

- 600 unserviced vertiports at an average cost of $1.5 - $2.2 million each
- 350 serviced vertiports at an average cost of $2.8 - $3.8 million each
- 150 urban multiports at an average cost of $17 - $23 million each
- 60 airport multiports at an average cost of $55 - $68 million each

This cost structure shows that total ground infrastructure CAPEX is driven not just by the number of sites, but by the local conditions of each facility (land prices and construction costs vary widely), along with the type and capacity of each asset.

AAM traffic management (UATM) CAPEX is best calculated through demand drivers because air traffic management requirements increase with operational density. As demand rises, more flights must be coordinated, monitored, and safely separated, increasing the need for surveillance, communications, routing, and traffic management systems. This is a sound planning approach because it:

- Aligns phasing of investment with actual operational complexity
- Avoids overbuilding infrastructure too early
- Allows systems to scale with market growth
- Improves capital efficiency during phased deployment

AAM CAPEX is therefore best understood as a phased investment strategy in which both ground infrastructure and UATM systems expand in line with network maturity and demand.

AAM Deployment Requires Three Parallel Pillars

A sustainable AAM ecosystem requires three systems to mature simultaneously to deliver the economic outcomes sought by policymakers and investors:

1. Aircraft Certification
Manufacturers must obtain FAA approval for safe commercial operations.

2. Operational Frameworks
Regulations, airspace procedures, and safety standards must allow integration with existing aviation traffic.

3. Infrastructure Deployment
Vertiports, energy systems, passenger facilities, and airspace technology must support safe, reliable, repeatable operations.

If infrastructure development lags behind the other two pillars, certified aircraft will enter markets that lack the network facilities required for meaningful passenger and cargo volumes to achieve required profitability.

The result would be a widening infrastructure readiness gap that delays commercialization and reduces investor and public confidence.

Why Urban Infrastructure Deployment Should Lead the Market

If early AAM networks cannot demonstrate profitability in the nation's largest metropolitan markets, investors will have little confidence in the sector's long-term scalability. While the existence of a national airport network is helpful, most airports exist in less densely populated areas of the country, and therefore will not support use cases such as airport shuttle, on demand air taxi and other important use cases.

Therefore, the infrastructure buildout required to accommodate peak demand should be concentrated first in major metropolitan regions. Urban markets offer several advantages that make them the most practical starting point for Advanced Air Mobility deployment.

Strong demand concentration
High-value trips, such as airport transfers, business travel, medical transport, and time-sensitive logistics, are concentrated in large metropolitan economies and generate the willingness to pay for early AAM services while delivering meaningful time savings.

Operational density
Urban regions create the traffic base necessary to support recurring routes and frequent operations. Regular service between airports, business districts, and regional hubs allows operators to schedule aircraft efficiently and maintain consistent passenger demand.

Network effects
Once multiple nodes exist within a metropolitan region, every additional vertiport increases the usefulness of the network. As connectivity expands, more origin–destination pairs become viable, strengthening both utilization and customer value.

Early profitability and investor confidence
Perhaps most importantly, dense metropolitan markets offer the clearest path to early profitability and long-term sustainability. Investors and infrastructure partners must see that AAM can generate reliable revenue and support durable business models. Demonstrating profitable operations in high-demand urban corridors will help establish the financial credibility needed to attract the capital required for broader national deployment.

The **62 geographic markets identified in this study** capture the most populous regions where these dynamics are strongest. These locations represent the areas where AAM can most quickly demonstrate sustainable operations, reliable utilization, and a credible return on infrastructure investment. Together, they form the initial geographic platform from which a national AAM network can emerge.

Ground Infrastructure Is the Largest Requirement

Of the $16.6 billion in AAM infrastructure CAPEX costs through 2045, approximately $11.2 billion is associated with ground infrastructure. This includes:

- Vertiport development
- Charging and energy systems
- Passenger processing areas
- Maintenance and staging facilities
- Utility upgrades and power supply improvements
- Surface transportation connections

A vertiport is not simply a landing pad. It must function as a transportation asset capable of supporting rapid aircraft turnaround, predictable passenger flow, and reliable charging cycles.

Without efficient ground operations, operators will struggle to achieve the utilization levels required for sustainable economics.

Airspace and Traffic Management Modernization

The remaining $5.4 billion in estimated infrastructure investment relates to airspace and traffic management modernization.

Existing air traffic control systems were designed primarily for conventional aircraft operating at high altitudes, moving between centralized airports. AAM introduces a fundamentally different operational environment.

Future operations will involve:

- More distributed landing nodes
- Lower altitude urban routes
- Higher frequency of takeoffs and landings
- Integration with helicopters, drones, and fixed-wing aircraft

Supporting these operations will require upgrades in four areas:

- Digital weather, surveillance and communications capable of managing dense urban traffic.
- Operational procedures that integrate AAM flights into existing FAA frameworks.
- Network management tools to coordinate arrivals, departures, and route sequencing.
- Data infrastructure and software systems that support repeatable operations across multiple vertiports.

These systems are largely invisible to passengers, but they are critical to safety, reliability, and public confidence. These requirements add operating costs that must be recovered through user fees or other mechanisms, that are not included in our estimates of CAPEX.

Profitability Depends on Utilization

The long-term success of Advanced Air Mobility will be determined by economics rather than novelty.

Operators must achieve:

- High fleet utilization
- Predictable turnaround times
- Reliable route structures
- Consistent passenger demand

These outcomes depend directly on infrastructure readiness.

Without sufficient vertiport capacity, charging infrastructure, and airspace coordination, aircraft utilization will remain too low to support a viable business model.

Infrastructure investment should therefore be viewed as market-enabling capital, not solely a cost burden to be minimized.

The eIPP Opportunity

The FAA's eVTOL Integration Pilot Program (eIPP) represents an important step toward accelerating operational deployment of AAM technologies.

The program brings together states, regions, and industry partners to test operational concepts, regulatory frameworks, and real-world use cases.

Many of the metropolitan regions participating in eIPP fall within the 62 markets identified in this infrastructure analysis.

*The **Vertical Mobility Economy:** "Reframing Low Altitude Airspace as the Next Frontier of Economic Activity in the Aerospace Sector"*

This alignment creates an opportunity for operational testing, infrastructure planning, and regulatory development to move forward together.

If coordinated effectively, eIPP regions will serve as the initial proving grounds for scalable AAM infrastructure.

Who Has $16.6 Billion? Public-Private Partnerships Are the Practical Path Forward

The scale of infrastructure investment required makes clear that neither the public sector nor private industry can build the system alone.

Public-private partnerships (PPPs) provide the most realistic path forward.

A successful partnership model should:

- Align cities, states, airports, utilities, and operators around coordinated deployment strategies
- Use public participation for planning, concept of operation identification, zoning, permitting, environmental and public engagement studies, and utility coordination
- Encourage private capital and operational expertise in facility development and network operations

This approach reduces the burden on government budgets while ensuring infrastructure is developed first in commercially viable locations, followed by additional use cases that will emerge over time and benefit both urban and rural communities.

Application of federal credit programs will also greatly assist. Use of Federal Loan Guarantees, tax-assisted instruments and Private Activity Bonds will make it easier for funding sources to participate.

Affordability

The proposed $16.6 billion investment required to build foundational infrastructure for the emerging **Vertical Mobility Economy** is modest relative to comparable U.S. transportation investments. Individual airport redevelopments such as JFK (~$19 billion) and LaGuardia (~$8 billion), along with Denver International Airport's multi-phase expansion exceeding $10 billion, demonstrate that similar levels of capital are routinely deployed at a single airport.

Major highway and tunnel projects, including Boston's $14.6 billion Big Dig, reinforce this pattern. High-speed rail provides an even clearer benchmark: California High-Speed Rail is estimated at $88–128+ billion, while a single corridor such as Brightline West approaches $12 billion.

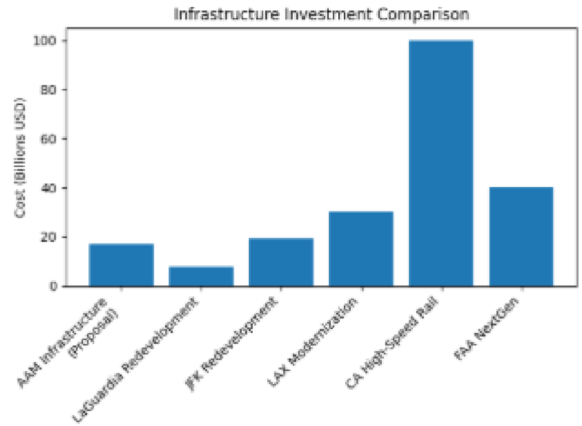

Figure 2: Comparable Large Transportation Infrastructure Projects.

Against this backdrop, $16.6 billion represents a distributed, system-wide investment enabling an entirely new transportation layer, a nationwide, digitally integrated airspace system supporting drones, eVTOLs, logistics, public safety, and defense applications, rather than a single large-asset expenditure.

Conclusion

Advanced Air Mobility is approaching a critical transition.

Aircraft certification programs are advancing, and regulatory frameworks are evolving. The FAA's eIPP program demonstrates growing national momentum toward operational deployment.

The next step is ensuring that infrastructure development keeps pace with technological progress.

UAM Geomatics estimates that approximately $16.6 billion in infrastructure investment will be required to support peak demand across 62 key U.S. locations representing roughly half of the national population.

These investments are not optional enhancements. They are the foundational systems that allow AAM to function as a transportation network rather than a collection of isolated demonstrations.

At $16.6 billion, this CAPEX investment is comparable to a single major airport redevelopment and a fraction of large-scale rail or highway megaprojects, yet it enables an entirely new national transportation layer.

A Challenge to Sector Participants

If infrastructure planning, regulatory development, and operational testing move forward together, the United States will have a clear path toward a scalable, reliable, and economically sustainable Advanced Air Mobility system—unlocking the full potential of the **Vertical Mobility Economy.**

The business case analysis, forecasting and econometric models developed for this effort by UAM Geomatics are under constant review and improvement. A significant number of analyses and forecasts performed for the FAA, DOT, GAO, and numerous state departments of transportation, confirm the fidelity of the AAM and drone sector promise.

We welcome and encourage review, critiques and inputs of our analysis of the **Vertical Mobility Economy** from stakeholders. Please contact co-author Benjamin Zevin here:

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About UAM Geomatics

UAM Geomatics, a NEXA Capital company, is a global leader in Advanced Air Mobility (AAM) economic analysis and forecasting. The firm provides data-driven assessments of passenger demand, infrastructure investment requirements, capital and operating costs, and regional economic impacts associated with AAM deployment.

UAM Geomatics has conducted geospatially based AAM market and economic impact studies for states, metropolitan regions, airports, and national aviation authorities. Its work supports planning for vertiport infrastructure, network development, and policy frameworks that enable scalable AAM deployment.

Go to www.uamgeo.com for further information.

Appendix 1: AAM CAPEX Cost Methodology

UAM Geomatics employs a bottom-up, city-by-city geospatial cost methodology rather than a top-down industry forecast. The study evaluates more than 100 metropolitan areas and regions worldwide across seven use cases: cargo, medical, regional air mobility, airport shuttle, on-demand air taxi, business aviation, and tourism - with each use case applied selectively based on local market conditions. Passenger demand serves as the core driver of the broader business case and is modeled using ten city-specific inputs, including airport origin-destination traffic, mobility alternatives, per capita GDP, congestion and travel distance, human capital, population density, livability, corporate presence, business aviation activity, and existing heliports. Importantly, these forecasts are directional and regularly updated, reflecting the rapidly evolving nature of the AAM sector and the need for the model to remain agile as market conditions, technologies, and assumptions change.

This demand forecast, in turn, drives the infrastructure outlook. UAM Geomatics compiled a comprehensive inventory of heliports across each metropolitan area and region, drawing from FAA and other datasets, identified gaps and inconsistencies in official records, and assessed which existing sites could be remediated into vertiports.

The model then estimates the number, type, and timing of new vertiports, airport facilities, charging and fueling infrastructure, and related systems required to support future operations. A central assumption is an industry inflection point after 2035, when increased aircraft automation, improved airspace access, and greater interoperability reduce costs and accelerate adoption, leading to a broader infrastructure buildout through 2045 and beyond.

The methodology also incorporates forecasts for UATM costs (CAPEX and OPEX), revenues from ticket sales, and aircraft costs. UATM is modeled as a layered, service-based traffic management system that interoperates with existing air traffic systems while enabling increasingly automated eVTOL operations. Revenue projections are derived from expected passenger volumes and pricing assumptions, while aircraft cost inputs draw on industry interviews and prior public studies suggesting price elasticity coefficients for passenger tickets.

Overall, the methodology is designed not as a static prediction, but as a living model continuously refined to reflect the fast-evolving realities of the emerging AAM market.

Appendix 2: 62 U.S. Cities, MSAs and Regions Analyzed

34 Major MSA's and 28 Regions containing additional MSA's.

CITY	EIPP	CITY	EIPP	CITY	EIPP	CITY	EIPP
Atlanta	×	Miami	✓	San Jose	✓	Dayton	×
Baltimore	✓	Minneapolis	×	Seattle	✓	New Orleans	✓
Boston	✓	Nashville	✓	Syracuse	✓	Orlando	✓
Chicago	✓	New York	✓	Tampa	✓	Toledo	×
Dallas	✓	Philadelphia	✓	Washington DC	✓		
Denver	×	Phoenix	✓	Wichita	×		
Detroit	×	Portland	✓	Akron	×		
Houston	✓	Reno	×	Cincinnati	×		
Las Vegas	×	San Diego	✓	Cleveland	×		
Los Angeles	✓	San Francisco	✓	Columbus	×		

STATE	UTAH (EIPP STATE)	MAINE (EIPP STATE)	NORTH CAROLINA (EIPP STATE)	VIRGINIA (EIPP STATE)	ARKANSAS	OKLAHOMA (EIPP STATE)
STATE REGIONS	Northern	Southern	Western	Northern	Northwest	North Central
	Salt Lake Area	Central	Central	Central	North Central	Northeast
	Central	Eastern	Raleigh Area	Western	Upper Delta	Northwest
	Southern		Eastern	Southern	Lower Delta	South Central
			Charlotte Area		Southwest	Southeast
					Central	Southwest

Figure 2: FAA eIPP states (courtesy of U.S. DOT.)