

Medical Delivery Drones and Advanced Air Mobility

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Report Summary

U.S. medical drone delivery has crossed from demonstration into procurement, and the direction it takes from here is being set outside the health sector. Eight operators held Part 135 certification in 2026, Cleveland Clinic began flying prescriptions to patient homes, a hospital campus route has run at WakeMed since 2019, and North Carolina signed a $41 million statewide contract in March 2026, the first purchase large enough to be called a program rather than a pilot. Every one of those flights still moves a few pounds a few miles under an approval granted route by route, and the timetable for anything larger belongs to Part 108, powered-lift certification, vertiport and spectrum infrastructure, and autonomy approval, none of which healthcare controls.

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Medical Delivery Drones and Advanced Air Mobility:

Executive Summary

Last-mile delivery is both the most expensive and volatile leg of the supply chain. In fact, estimates show it can swallow up to half of the total shipping cost. In healthcare, this cost structure carries clinical consequences. Where diagnostic specimens, vaccines, and blood products cannot be moved within clinically relevant timeframes, the result is higher morbidity and mortality, with maternal health and infectious disease management the most affected.

The pressure on ground-based delivery infrastructure is intensifying rapidly. Driven by the continued expansion of same-day and quick-commerce delivery, segments growing at roughly 20% and 28% annually, World Economic Forum and Accenture analysis projects that, under a business-as-usual scenario, the number of delivery vehicles on urban roads will rise by more than 60% globally by 2030. Logistics-related emissions would climb by a comparable 60% over the same period, accounting for around 13% of total city carbon emissions, alongside a 14% increase in congestion, a 12% rise in healthcare costs, and an additional five minutes on every daily commute. The rural picture is the inverse problem: not congestion, but the disappearance of the delivery endpoint itself. In United States, The Center for Healthcare Quality and Payment Reform reports that more than 100 rural hospitals have closed over the past decade, leaving over 4 million Americans without a local emergency room or inpatient care, and estimates that 700 more, one-third of the national total, are at risk of closing on current financials. Chartis, working from a separate vulnerability model, counts 206 rural hospitals that have closed or dropped inpatient care since 2010, 417 currently vulnerable to closure, and 41.2% operating at a loss.

Against this unsustainable baseline, autonomous aerial delivery introduces a structurally superior logistics framework. By enabling direct point-to-point routing, aerial networks are not bound by road conditions and ground congestion. Furthermore, they offer a radically lower environmental footprint, consuming roughly 30 times less energy than gasoline-powered vehicles and over 10 times less energy than electric cars per delivery.

Medical delivery drones sit inside a wider category that federal policy now treats as a single program. Congress defined Advanced Air Mobility in the Advanced Air Mobility Coordination and Leadership Act as a transportation system that moves people and property by air between two points in the United States using aircraft with advanced technologies, including electric aircraft and electric vertical take-off and landing aircraft (eVTOL), in controlled and uncontrolled airspace. The FAA uses AAM as an umbrella term for aircraft that are typically highly automated eVTOL, many of which fall into the powered-lift category and are often called air taxis. Small delivery drones are the lowest tier of that system and the only tier operating commercially today. The tiers are expected to carry the same medical missions at greater payload and range, and the federal strategy governing them names rural medical response, organ delivery and search and rescue among the missions it expects them to perform.

The United States as a distinct case

The published evidence on medical drone delivery is dominated by deployments in Rwanda, Ghana, India, Malawi and Madagascar. This creates an analytical hazard for U.S. decision-makers, because the value proposition in those settings is categorically different.

In Rwanda, approximately 75% of roads were unpaved as of 2012 against roughly 35% in the United States; roads deteriorate during rainy season, producing transport delays that impede medical supply; and only about one third of Africans live within one mile of a road that functions year-round. In these conditions the drone substitutes for absent infrastructure.

In the United States the drone augments a functioning courier network. The distinction is not semantic. It determines whether the business case rests on cost reduction or on service quality, whether the counterfactual is "no delivery"

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or "delivery in ninety minutes by van," and whether observed health outcome improvements can be expected to replicate. A 51% reduction in postpartum-hemorrhage deaths at drone-served Rwandan hospitals is a measure of what happens when blood becomes available where it previously was not; it is not a forecast of what happens when blood arrives faster where it already arrived, as per Wharton / Song study of Zipline-served Rwandan hospitals.

1. United States Regulatory Architecture

Regulation is the dominant variable in U.S. medical drone delivery, and the evidence base supports a strong causal claim about its historical effect.

1.1. The historical constraint and its competitive consequence

Drones have been subject to substantially the same rules as airplanes despite differences in autonomy, passenger capacity and risk. Under standard FAA rules, an unmanned aerial vehicle (UAV) must weigh under 55 lbs., remain within visual line of sight, and operate below 400 ft above ground level (AGL) at under 100 mph ground speed. Since December 2015, drones weighing between 0.55 and 55 pounds require FAA registration and marking. Historically, commercial drone use required a Section 333 exemption, and exemptions were granted for surveillance applications rather than delivery.

The competitive consequence is documented and striking: Zipline, Wing and Matternet are all U.S.-headquartered, yet all began operations outside the country because of complex and slow domestic regulatory processes. Amazon, which announced drone delivery in 2013 with a four-to-five-year promise, was operational in only two U.S. locations as of September 2023. Amazon has since named a much larger 2026 expansion (Chicago, Cleveland, Atlanta, Syracuse, Boise among others). Medical relevance is still limited. Dr. Catherine Cahill, Director of the Alaska Center for Unmanned Aircraft Systems Integration, characterized permission delays as "*a major roadblock in the commercial use of drones and its development a tremendous gap, something we should have had permission for years ago*".

Contemporary reporting in 2022 confirmed the structural position: "*No drone delivery company in America is currently yet fully certified to fly everywhere, without human controlling or at least monitoring the aircraft*," with the FAA required to approve each new drone delivery project individually.

1.2. Part 135: The current operating foundation

Part 135 air carrier certification is "the legal foundation for commercial drone delivery, without it, operators cannot conduct paid package delivery over populated areas at any meaningful scale," requiring demonstrated airworthiness, operational procedures, maintenance systems and pilot qualifications meeting commercial aviation standards. The FAA uses Part 135 as the route for compensated BVLOS (Beyond Visual Line of Sight) property carriage in the United States.

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Eight U.S. drone delivery operators held Part 135 certification as of Mid-2026:

Operator	Logo	Medical relevance
Wing (Alphabet)	Wing	Pharmacy and convenience items; Apian, NHS and Medtronic medical work
UPS Flight Forward	UPS Flight Forward	WakeMed campus supplies via Matternet; BVLOS M2 flights in Florida
Amazon Prime Air	prime air	Limited; not medically focused
Zipline	Zipline	Cleveland Clinic; $41M NC contract
Causey Aviation Unmanned	CAUSEY AVIATION UNMANNED	Operates Flytrex aircraft; food-focused
DroneUp	DroneUp	Virginia rural and island medical routes
Drone Express (DEXA)	DRONE EXPRESS	Limited; retail and grocery focus (Kroger, Papa John's), pharmacy items tested
DoorDash Air	DOORDASH	Restaurant and local commerce delivery

1.3. Why Part 135 is not sufficient

Operators additionally require FAA approval for BVLOS flights at each operating location, currently via waivers, exemptions or operation-specific authorizations. The practical effect: "companies with Part 135 and strong regulatory relationships can operate. Companies without them cannot, regardless of how capable their aircraft are".

The converse is equally true and is demonstrated by DroneUp: it holds the certification but lost its principal customer, and "regulatory approval alone does not sustain a drone delivery business".

BVLOS routes may require risk assessment, operational authorization, aircraft and operator approvals, communications evidence, contingency procedures and local coordination before a paid service can begin and "each change in route, airspace, payload, or operating condition can reopen part of that review". Medical urgency does not remove aviation obligations.

1.4. Type and Production Certification - the higher bar

Distinct from operator certification, aircraft-level certification remains rare. Matternet's M2 was the first non-military unmanned aircraft to receive FAA Type Certification (September 2022), followed by a Production Certificate (November 2022), and remains the only delivery drone holding both.

For medical payloads this matters disproportionately, because chain-of-custody and pharmacy handling requirements attach to the physical integrity of the transport as well as to the operator's procedures.

1.5. The proposed BVLOS rule (Part 108)

The FAA's BVLOS Aviation Rulemaking Committee submitted final recommendations in March 2022, calling for a new Part 108-style framework, risk-based acceptable levels of safety, and updated pilot qualification pathways; the process "has moved slowly". The FAA proposed dedicated BVLOS rulemaking in August 2025, with finalization still pending into August 2026.

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1.5.1. Provisions Proposed

DOMAIN	PROVISION
Enabled operations	Package delivery, agriculture, aerial surveying, civic interest including public safety, recreation, flight testing
Altitude and origin	At or below 400 ft AGL, from pre-designated and access-controlled locations
Area approval	FAA approval for intended flight area; operator identifies boundaries, approximate daily operations, takeoff/landing/loading areas; must ensure adequate communications coverage and lost-link procedures; must review NOTAMs and identify and mitigate hazards
Multiple aircraft	FAA evaluates proposals to fly multiple drones' case-by-case
Separation	Automated Data Service Providers (ADSPs), FAA-approved and regulated, conforming to industry consensus standards after vetting and testing; operator may self-provide or contract
Detect and avoid	Automatic detection and avoidance of cooperating aircraft; drones yield to all manned aircraft broadcasting ADS-B; no interference with airports, heliports, seaplane bases, space launch/reentry sites or eVTOL facilities
Aircraft weight	Certain aircraft up to 1,320 lbs. including everything carried
Airworthiness	No traditional airworthiness certificate: acceptance based on industry consensus standards - "a streamlined approval process that would reduce costs and speed up advancement"
Authorization tiers	Permits for lower-risk limited fleet size, weight and scope, issuable promptly; Certificates for higher-risk operations, requiring thorough review, greater oversight, a safety management system and a training program.
Personnel	Operations supervisor (overall safety and security) and flight coordinator (direct oversight and intervention). Neither requires an FAA-issued airman or remote pilot certificate
Security	Physical and cybersecurity policies; protection from intentional electronic interference; TSA security threat assessment up to level 3 including watchlist, immigration and fingerprint-based criminal history checks; TSA limited security program for package delivery operators

Three provisions favor medical deployment disproportionately:

I. The 1,320 lbs. aircraft ceiling far exceeds any current medical payload requirement opening headroom for temperature-controlled containment, redundant systems and multi-payload configurations without weight-class reclassification.

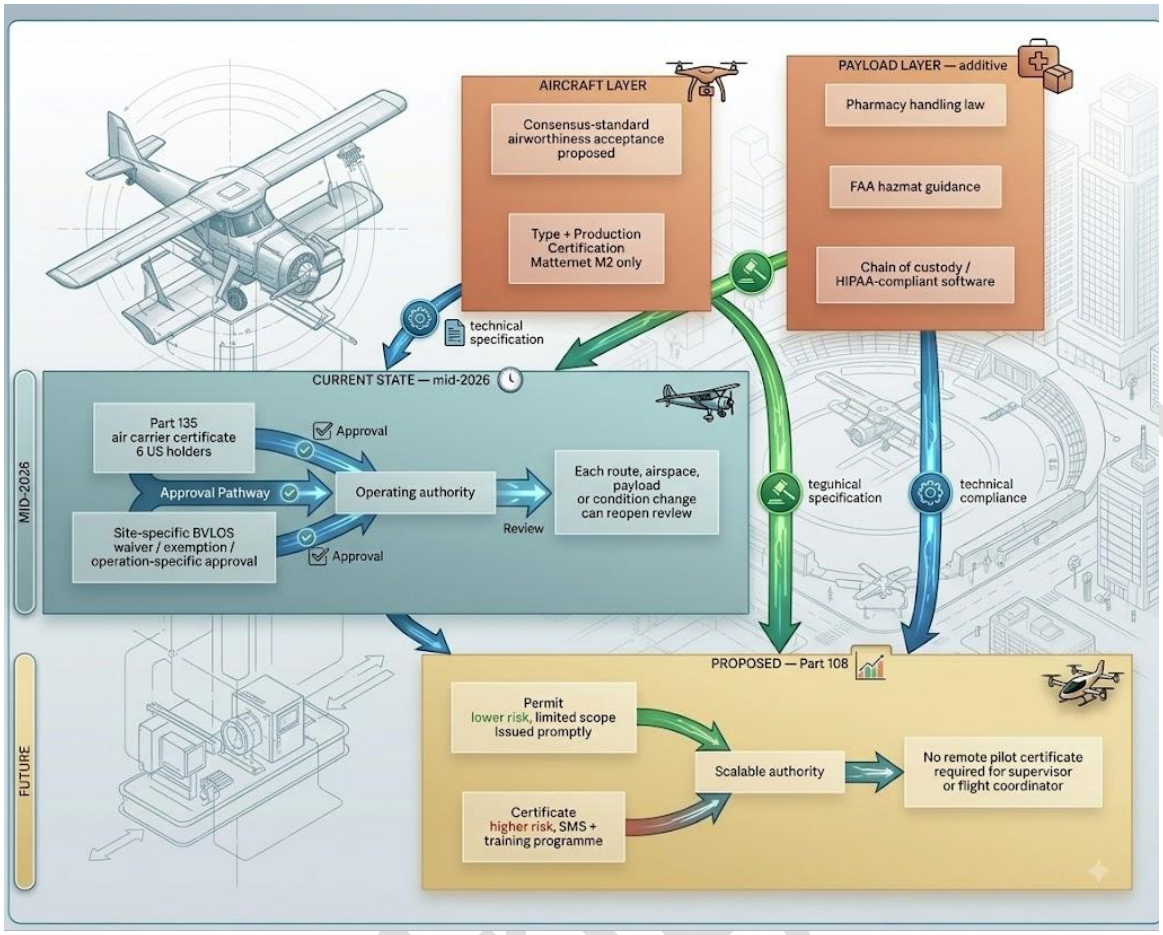
II. The removal of the remote pilot certificate requirement for operations supervisors and flight coordinators attacks the sector's dominant cost line directly. Labor accounted for 95% of drone delivery direct operating cost as of January 2023, driven by regulations limiting one drone per operator and requiring visual observers; McKinsey & Company projects personnel costs falling to roughly half of OpEx by 2034 as a 1:20 pilot-to-drone ratio becomes standard. This is a cost-structure event as much as a regulatory one.

III. The graduated permit/certificate structure creates a realistic entry path: a single hospital-campus route can begin under a permit before scaling to a certificated network.

Three provisions constrain it:

The rule remains a proposal, unfinalized as of August 2026. Operations over people are capped by population density category, constraining the dense urban hospital corridors where inter-facility routes are most valuable. And the FAA's case-by-case evaluation of multi-drone proposals directly limits the fleet ratios on which the economics depend - the 1:20 ratio is an assumption, not an entitlement.

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1.5.2. Timeline of Commercial BVLOS drone developments

DATE	DEVELOPMENT
AUG 2023	FAA issues first-ever approval for commercial BVLOS operations
SEP 2023	Exemption to UPS Flight Forward, uAvionix, Phoenix Air Unmanned, Zipline to fly their drones BLVOS
NOV 2023	Zipline receives FAA approval to commercially operate detect-and-avoid - "a key step toward drone deliveries in the U.S. without visual observers"
DEC 2023	Exemption to Wing to fly their drones BLVOS
JAN 2024	Exemption to DroneUp to fly their drones BLVOS
DEC 2024	FAA approves DroneUp for Part 135, permitting routine BVLOS flights
AUG 2025	FAA proposes dedicated BVLOS rulemaking
FEB 2026	FAA reopens the public comment period for the proposed BVLOS Part 108 drone rule
MAR 2026	Wing receives FAA approval for after-sunset deliveries in Charlotte and Dallas-Fort Worth - among first night-operation clearances
APR 2026	FCC opens drone spectrum review as BVLOS exposes limits of shared consumer frequency bands
AUG 2026	The proposed Part 108 framework undergoes review by the White House Office of Information and Regulatory Affairs (OIRA), one of the final steps before publication

2. Advanced Air Mobility: Scope and Federal Policy Architecture

The regulatory account above concerns small delivery aircraft under Part 135 and the proposed Part 108. Those rules sit inside a larger federal program with its own certification path, its own infrastructure standards and its own timetable. For a medical logistics buyer, the practical question is which tier a given mission belongs to, because the tier determines which rule set applies and how far the approval work has progressed.

2.1. What the term covers

NASA divides AAM into three operational categories

- Urban Air Mobility is point-to-point transport of passengers and cargo inside metropolitan areas, and it carries the heaviest technical, regulatory and infrastructure burden because of urban density.
- Regional Air Mobility covers intraregional distances of 50 to 500 miles and aims to connect rural or underserved communities to economic hubs.
- Low-Altitude Mobility covers the current small, unmanned aircraft category, under 55 lbs. and below 400 ft, doing last-mile delivery, inspection and public service work.

Every U.S. medical program described earlier in this document is Low-Altitude Mobility. The distinction has direct clinical consequences: the published payload limit for carrying essential medical supplies for Zipline aircraft is 4-6 lbs., or two units of blood, which is the binding constraint in high-demand situations, while the regional and powered-lift tiers are the only ones that could move clinicians or larger consignments.

2.2. The Advanced Air Mobility National Strategy

The Advanced Air Mobility Interagency Working Group published The Advanced Air Mobility National Strategy: A Bold Policy Vision for 2026-2036. The working group was required by the Advanced Air Mobility Coordination and Leadership Act and drew more than 100 subject matter experts from more than 25 federal agencies over nearly three years, with input from Congress, industry and state, local, tribal and territorial governments. The Strategy sets the policy vision; a companion Comprehensive Plan assigns agency roles and sequencing.

The Strategy sets three dated milestones.

I. By **2027** it expects demonstrations and initial operations for contemporary aircraft, using and modifying existing airport infrastructure.
II. By **2030** it expects new air operations in multiple urban and rural areas, including quiet powered-lift flights and short-takeoff-and-landing flights from vertiport infrastructure funded mostly by private sources, reaching transportation gaps such as over-water and rural routes.
III. By **2035** it expects fully autonomous flight in geographies where labor shortages or harsh conditions would otherwise prevent operation.

The Strategy is organized under seven pillars: *airspace, infrastructure, security, community planning and engagement, workforce, automation, and a set of overarching recommendations*.

Medical missions appear in the Strategy as expectations rather than as programs. Its mission map states that AAM can expand medical response to rural areas, assist in search and rescue, aid natural disaster relief and expedite organ delivery. Recommendation 4.4 asks federal agencies to identify mission-critical use cases supporting public safety, disaster response and medical transportation and to publish case studies, each describing a specific use case in a realistic location, an analysis of existing costs, a projection of implementation costs, and the anticipated benefits and impacts. The recommendation exists because that evidence has not been assembled. The Department of Veterans

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Affairs held an observational role in the working group with the stated intent of assessing how AAM could affect its health care provision services, which is the only direct federal health-system involvement named in the document.

On airspace, the Strategy states that the FAA expects AAM aircraft to operate within the current regulatory and operational framework in the near term, and that a mature AAM operating environment is estimated at 2035 or later. The evolution it describes is the introduction of cooperative areas, defined portions of airspace supported by multiple FAA-approved service providers operating under FAA rules and oversight, with operators using approved services to meet defined performance requirements. This is the same architecture as the Automated Data Service Providers in the proposed Part 108 rule described earlier, applied at a larger scale. Four infrastructure recommendations bear directly on medical route reliability: aviation spectrum needs and spectrum bands for future airspace management (2.6), complementary positioning, navigation and timing options for use where GPS coverage is inconsistent (2.7), enhanced weather detection, forecasting and reporting network capabilities (2.8), and energy infrastructure research with joint demonstrations (2.5).

2.3. Certification and operating rules for the larger aircraft

The FAA has completed updating its regulations to allow powered-lift aircraft to operate in the National Airspace System. The October 2024 final rule set pilot and instructor certification requirements together with operational rules written on a performance basis, so that the applicable regulation depends on the flight characteristics of the aircraft. July 2023 final rule added powered-lift to the air carrier definition, which is what allows operators to be certificated for commercial powered-lift flights alongside airlines, charters and air tours. Aircraft certification runs through the existing framework, with the FAA determining requirements by evaluating design, production, airworthiness and operation, and establishing additional airworthiness criteria where a project requires them.

On infrastructure, the FAA expects initial AAM vehicles to use existing helipads, routes and air traffic control services where possible. It issued vertiport design standards in September 2022 as Engineering Brief 105, later revised as Engineering Brief 105A, supplemental guidance to the heliport design advisory circular, with a consolidated advisory circular planned. An updated blueprint for AAM operations in and around urban areas followed in May 2023.

Two current programs matter for timing. Transportation Secretary Sean P. Duffy and FAA Administrator Bryan Bedford announced the selection of eight partners for the eVTOL Integration Pilot Program. Separately, human-in-the-loop simulations examine how eVTOL aircraft share airspace and airport facilities with traditional aircraft, and reports from Orlando and Los Angeles airports have been published. Existing noise regulations apply to powered-lift aircraft, with the FAA examining each aircraft to determine whether the existing requirements are appropriate. Preparation is also running at state level: the Florida Airports Council describes Florida airports writing vertiports into their master plans and working with developers on high-power charging, dedicated passenger hubs and digital airspace management, backed by state funding and new legislative frameworks, with Orlando International already running airspace simulations and awarding contracts.

2.4. International harmonization of type certification

The National Aviation Authorities Network published Edition 1.0 of its Roadmap for Advanced Air Mobility Aircraft Type Certification in April 2025. The Network comprises the civil aviation authorities of Australia, Canada, New Zealand, the United Kingdom and the United States. The roadmap sets six principles, among them a three-phase approach to harmonized type certification using performance-based requirements and mutually accepted means of compliance, collaborative multi-authority validation of aircraft undergoing certification by one member, and an incremental sequence that builds first on piloted AAM and then on remotely piloted AAM with increasing levels of autonomy. The FAA has also signed declarations of cooperation with Japan and South Korea and works with the European Union Aviation Safety Agency on aligning certification processes. The roadmap does not address medical

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use cases, and the incremental sequence it describes places the fully autonomous configurations most relevant to unattended medical logistics at the end of the queue.

2.5. Medical air mobility demonstration outside the United States

One research program has been built explicitly around medical air mobility at the passenger-aircraft tier, and it is European. SAFIR-Med, for Safe and Flexible Integration of Advanced U-space Services for Medical Air Mobility, was funded under the European Union's Horizon 2020 program and run within the SESAR Joint Undertaking's U-space work, coordinated by Helicus with 17 partners from eight countries and an advisory board that included EASA and the Red Cross. Its objective for over two years was to demonstrate advanced U-space services at the highest achievable operational safety level, specifically detect-and-avoid as a service, dynamic geofencing and air traffic prioritization rules. EHang joined in February 2021 as the only passenger eVTOL partner, using its two-seat EH216 and its medium-sized Falcon aircraft to move medical supplies in urban settings, working with hospitals and medical sites in Antwerp, Aachen, Heerlen and Maastricht across the MAHHL cross-border region, with further demonstrations planned in Athens and Prague and a de-risking exercise first at the Drone Port BVLOS test facility in Belgium.

Two things about that design read across to the U.S. position. The services being demonstrated are the same class of capability the FAA proposes to license through Automated Data Service Providers under Part 108, and the same cooperative-areas architecture the National Strategy sets out for a mature AAM environment, but the European project tested them inside a healthcare use case rather than a generic delivery one. And the payload was medical supplies, not patients, even with a passenger-rated airframe in the fleet.

2.6. The research base

NASA runs the federal research programs for AAM in coordination with the FAA, the Department of Defense and industry and academic partners, with the stated objective of an aerial transportation network for passengers and cargo integrated into low-altitude airspace by 2030. The work is split across sub-projects: Air Mobility Pathfinders on reference architectures for integrating electric air taxis, Air Traffic Management eXploration on digital traffic management for high-density operations, Revolutionary Vertical Lift Technology on aero-propulsive technologies for air taxis and cargo eVTOLs, Transformational Tools and Technologies on computational and experimental modelling, System-Wide Safety on predictive analytics, Convergent Aeronautics Solutions on high-risk concepts, and Advanced Capabilities for Emergency Response Operations on remotely piloted wildland fire work. Progress is benchmarked on the UAM Maturity Level scale, running from UML-1 to UML-6 across aircraft density, operational complexity and reliance on automated systems, with individual metropolitan markets expected to advance at different rates rather than together.

NASA has identified 11 application categories containing 42 use cases for public good deployment, defined as capabilities that increase access to critical services without passing additional costs to the end beneficiary. Named examples include small, unmanned aircraft in search and rescue during obscured wildland fires and larger eVTOL aircraft carrying specialized medical personnel past congested urban traffic to time-critical trauma events. Its AAM Playbook covers 12 focus areas, of which Episode 1 addresses emergency response and Episode 2 addresses healthcare logistics.

2.7. Public acceptance and the unresolved problems

In the EASA (European Union Aviation Safety Agency) study cites, 83% of respondents view urban air mobility positively and 71% are ready to try it, with emergency uses seen as the most valuable application, ahead of delivery drones. A separate European study found a more cautious profile: 59% moderately positive on deployment, 56% willing to try aerial delivery services and 32% willing to use air taxis. Noise remains the main community exposure. Measurements

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across New York, Denver, Dallas and San Francisco indicate that at least 49% of flights would occur in areas with background noise under 50 dB, where added noise would work against acceptance. The same review concludes that substantial research is still required across infrastructure, societal impact, acceptance, weather, economics, affordability, regulation, certification, competition with other transport modes and air traffic management.

3. The United States medical Drone Delivery Operational Landscape

Every operating U.S. medical program in this space is either (a) a single-radius pilot, (b) a single-campus inter-facility route, or (c) a demonstration, except for The North Carolina contract. The U.S. medical drone sector in mid-2026 is at the transition point from demonstration to program and has not yet completed it.

PROGRAM	MODEL	ENDPOINT	PAYLOAD	STATUS
Cleveland Clinic - Zipline	Health system, P2	Patient home	Prescriptions	Operating, 5-mi radius
UPS Flight Forward - Matternet	Carrier, M2	Hospital campus	Medical supplies	Operating, WakeMed
Zipline - Novant Health, Cardinal Health, Magellan Rx Management	Health system	Emergency	Medical products	First U.S. emergency operation, 2020 and 2022
Zipline - North Carolina	State contract	Multi-site	Rx, lab samples, urgent supplies	$41M contract, Mar 2026
Drone Up - Virginia	Operator pilot	Rural/island	Prescriptions, samples	Demonstration programs
Arrive AI - LifeSpan	Infrastructure +carrier	Arrive Point	Pharmacy	Non-binding LOI, Aug 2026
Ameriflight - Matternet	Carrier	Healthcare Customers	Medical	Approved

3.1. Cleveland Clinic's Zipline Drone Delivery Program

The Cleveland Clinic's partnership with Zipline serves as the anchor case for the first long-term deployment of a prescription drug drone delivery program by a U.S. health system. Operating out of the Beachwood Administrative Campus, the system utilizes autonomous drones that hover up to 300 feet and release a tethered pod to precisely deliver eligible medications within an initial five-mile radius in approximately ten minutes, all at no cost to the patient. The workflow relies on pharmacy technicians placing medications into secure drop boxes for the drones to autonomously retrieve, culminating in the first successful deliveries in August 2026 after years of preparatory compliance work. While clinic leadership framed the initiative as a cost-effective, environmentally favorable way to augment existing home delivery services rather than an emergency response tool, the current implementation remains a carefully scoped pilot that addresses onfly a very small fraction of the massive health institution's overall logistics volume.

3.2. Inter-facility logistics: Matternet - UPS Flight Forward

Matternet holds the strongest U.S. regulatory position in medical drone logistics, focusing its business model on inter-hospital and specimen routing rather than consumer deliveries like groceries or patient home delivery. The company operates the M2 aircraft, which can carry up to a 2 kg payload over 20 km, and is the only delivery drone to hold both FAA Type and Production certifications. This dual certification guarantees that both the aircraft and its manufacturing process have passed rigorous FAA review, providing a materially stronger position for securely transporting chain-of-custody payloads such as diagnostic samples, lab specimens, and pharmaceuticals. Following a 2019 partnership with UPS Flight Forward that established the first regular U.S. commercial drone delivery route at the WakeMed hospital campus, the M2 system has completed tens of thousands of commercial flights worldwide. Matternet continues to expand its durable healthcare logistics operations through significant milestones, including true Beyond Visual Line of Sight (BVLOS) flights in Florida, additional U.S. authority for operators like Ameriflight, and an April 2026 strategic partnership with SoftBank Robotics America.

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3.3. Emergency operations precedent: Zipline - Novant Health

Zipline entered the United States in 2020 through a partnership with Novant Health in North Carolina, establishing the country's first emergency drone operation. The company achieved major regulatory milestones when it became the first to receive FAA Part 135 approval for long-range drone delivery in 2022, followed by FAA authorization in September 2023 to deliver commercial packages beyond an operator's line of sight. Today, Zipline partners with major U.S. health systems, including Intermountain Health, Michigan Medicine, Cleveland Clinic, Mayo Clinic, MultiCare, and Memorial Hermann, to provide prescription home delivery, transport lab samples, and support decentralized patient care.

3.4. Contract scale: Zipline - North Carolina statewide

In March 2026 Zipline won a $41M statewide medical logistics contract in North Carolina to transport prescriptions, lab samples and urgent healthcare supplies by drone. This is the largest single U.S. medical drone contract value in the evidence base and the strongest signal that U.S. procurement is moving from pilot to program.

3.5. Rural and island access: DroneUp - Virginia

DroneUp's Virginia healthcare work "has tested prescription and sample movement across rural and island routes", documented in the Virginia Eastern Shore Drone Medical Delivery Program showcased for the U.S. Department of Transportation (March 2024) and a medicine-by-drone demonstration on Tangier Island (October 2024). DroneUp holds Part 135 certification obtained in late 2024, operating the Prism V2(55 lb. maximum takeoff weight, 5-mile delivery range) from a Murphy, Texas base. Its commercial position is precarious: Walmart, its primary customer, ended the relationship after earlier hub closures and cost issues, shifting investment to Wing and Zipline. Total disclosed funding is approximately $8–14M, well below every other Part 135 operator.

3.6. Emerging architecture: Arrive AI - LifeSpan Pharmacy

On 4 August 2026, Arrive AI (NASDAQ: ARAI) and Indianapolis-based LifeSpan Pharmacy announced a non-binding letter of intent to explore a collaborative autonomous drone pharmacy delivery program. The architectural significance lies in the separation of infrastructure from aircraft. Arrive AI does not manufacture drones; it pairs licensed drone carriers with the Arrive Point, a smart secure receiving station deployed at each destination site, handling identity verification, chain of custody, temperature protection, and recipient notification. The company describes itself as solving "the last inch of the last mile." The phased plan runs from a live demonstration flight from LifeSpan's facility delivering actual pharmaceuticals and validating the corridor, through pilot corridor buildout and expansion across priority delivery zones, to potential full deployment. The parties also intend to explore autonomous ground robots for intra-facility medication transport, controlled-substance delivery with chain-of-custody logging, medical supply restocking between locations, and specimen logistics. CEO Dan O'Toole framed the problem in operational rather than clinical terms: "Traditional pharmacy delivery faces well-documented constraints, manual routing, traffic delays, variable staffing, and rising patient expectations."

4. Medical Use Cases Across the Advanced Air Mobility Tiers

The U.S. programs described above move pharmacy items, specimens and supplies on scheduled or on-demand routes. The published clinical evidence points at a different mission, one that no U.S. operator currently runs at scale: emergency delivery to the scene of a call. That evidence is worth separating from the logistics case, because it is where the measured effect sizes are largest and where the deployment gap is widest.

4.1. Prehospital emergency delivery

Many studies have reviewed what the evidence shows about using drones in emergency medical care, and the picture is consistent across payload types: the case is strong on paper and thin in practice.

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The demand side is straightforward. Calls for EMS in the United States have grown faster than funding and staffing, and response times have suffered. Cardiac arrest is the clearest example of what those costs are. Roughly 350,000 out-of-hospital cardiac arrests happen each year, survival is under 10%, and that figure has not moved in thirty years. Defibrillation within the first couple of minutes saves most patients; by ten minutes, almost none. Public defibrillators exist but bystanders rarely find and use them. Simulations of drone-delivered defibrillators are uniformly favourable. Across studies in Sweden, Canada and Germany, drones beat ground ambulances, with time savings ranging from about two minutes to well over fifteen depending on how the launch sites were placed. Cost analyses put the intervention comfortably within the range health systems normally accept as good value.

Real-world results are much smaller in number. One prospective study covered a dozen cases, and although the drone usually arrived first, no patient was shocked before EMS got there. A single case is reported as the first real shock delivered by a drone-carried device ahead of the ambulance. Study mentions plainly that simulation probably overstates the benefit, and that gap is the central caveat of the whole field. Bystanders are not the obstacle. In testing, people retrieved the device and used it within seconds, preferred staying with the patient rather than running to find equipment and raised few safety worries. What they asked for was better dispatcher instruction, a clearer signal when the drone lands, and simpler labelling on the device.

Other payloads have less behind them. Naloxone has been modelled and tested in simulation with encouraging results, and one demonstration in Virginia had a bystander administer it within two minutes of the 911 call, but no drone system has yet responded to a real overdose. Antiepileptics have only been modelled and controlled-substance rules complicate them. Epinephrine auto-injectors survive the flight, and that is roughly all that is known. Blood products travel well in a cooled, monitored container and arrive faster than by road, though no one has yet delivered blood by drone to a scene for use by trained personnel, and payload weight remains the constraint at any real volume.

The barriers list is mostly not clinical: FAA regulation, security, funding, licensure, training and insurance costs. They also note that moving and dispensing medication across a state may bring in state pharmacy boards or the FDA, a second layer of regulation on top of the aviation approvals.

4.2. Rural hospital closure as a demand driver

More than 100 rural hospitals have closed over the past decade, leaving more than 4 million Americans in those communities without an emergency room, inpatient care and other hospital services. Since the beginning of 2023, a further 53 hospitals have eliminated inpatient services to qualify for federal grants available only to Rural Emergency Hospitals; more than 11,000 rural residents a year had received inpatient care in those hospitals and now face transfer to a distant facility. Seven hundred rural hospitals, one third of the national total, are at risk of closing on financial grounds, and over 260 are at immediate risk. Over 40% of rural hospitals lose money delivering patient services, almost one third lost money overall in 2024-25, and in 11 states half or more are at risk. In many of these communities the hospital is the only place to obtain laboratory tests or imaging and may be the principal source of primary care.

Chartis tracks the same safety net by a different method and lands in the same territory. Its 2026 analysis of 2,081 rural hospitals puts 41.2% in the red against 46% a year earlier, with a national median operating margin of 2.0%; in the ten states that did not expand Medicaid, 52.2% are in the red and the median margin is negative. It counts 206 hospitals that have closed or converted to a model without inpatient care since 2010, led by Texas at 27, Tennessee at 18, Oklahoma at 13, and Kansas and Mississippi at 12 each, and its vulnerability model identifies 417 hospitals at risk of closure. By share of a state's rural hospitals, Tennessee is highest at 61%, then Arkansas at 55%, Florida at 52% and Kansas at 44%. Kansas also has the highest proportion operating at a loss, at 86.2%.

The service-line data matters more to a transport argument than the closure count does, because they describe demand that outlives the service. Between 2011 and 2024, 331 rural hospitals stopped offering obstetrics, roughly 27% of the country's rural OB units, with Florida losing 71% of their own. Between 2014 and 2024, 448 stopped offering

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chemotherapy. Of the 48 states with rural hospitals, 40 have at least one that stopped offering general surgery. A community that loses chemotherapy still has oncology patients and a community that loses obstetrics still has pregnancies, so each of these losses converts a service into a journey, either for the patient or for the drugs, specimens and blood products that used to move inside the building.

Two further findings bear on whether aerial logistics can be paid for and flown in these places. The Rural Health Transformation program is putting $50 billion into rural healthcare over five years, with $10 billion allocated by CMS for calendar year 2026 across all fifty states, Texas receiving the largest share at $281.3 million and New Jersey the smallest at $147 million. Provider payments are capped at 15% of a state's budget each year and capital expenditure and infrastructure at 20%, so the money available for physical delivery infrastructure is bounded but real. Across the 47 state applications Chartis reviewed, the recurring technology themes are telehealth, artificial intelligence and interoperability; aerial logistics is not among them. The second finding is a constraint rather than an opening: broadband access in rural hospital service areas ranks at the 30th percentile nationally against the 69th for urban residents, and adequate communications coverage is a condition of area approval under the proposed Part 108 rule.

Taken together, that is the demand curve the aerial case rests on. Every closure and every REH conversion turns a service that used to be available locally into a transport problem, and transport is what an aircraft solves: a community without inpatient beds still has patients who need blood drawn, prescriptions filled and specimens read. The payment arithmetic points the same way. Rural hospitals lose money because fixed costs are spread over too few patients, and the same problem applies to an on-site laboratory or pharmacy inventory as to a 24/7 emergency department. A route that moves a sample to a central lab in twenty minutes lets a rural site keep a draw station and a clinician without keeping a full laboratory, which lowers the standby cost the payment system currently fails to cover. The Center for Healthcare Quality and Payment Reform puts the cost of preventing closures at about $4 billion per year, one tenth of one percent of national health spending, most of it supporting primary and emergency care; anything that reduces the underlying fixed cost reduces the size of that subsidy. The at-risk map is also a route map. The 260 hospitals at immediate risk sit in the isolated communities where flight time beats drive time by the widest margin, and where an operator can carry pharmacy, laboratory and blood bank volume on one route rather than depending on any single line of business. For AAM more broadly, the interfacility transfers created by REH conversions are a defined and recurring mission rather than a speculative one.

4.3. The crewed air-medical baseline

Moving patients by air is not a capability waiting on AAM. It is a century-old service with established equipment standard, and that standard is what an AAM patient-carriage aircraft would have to meet. The first recorded British ambulance flight was in 1917 in the Sinai, carrying a soldier shot in the ankle on a journey that took 45 minutes by air against about three days by land. Organized military services followed in the 1920s, helicopters entered the mission in Burma during the Second World War and with U.S. forces in Korea from 1950, and the volumes became large early: more than 1.3 million patients moved worldwide during the Second World War with fewer than 60 in-flight deaths, 310,000 within and from the Korean peninsula by July 1953, more than half a million during Vietnam, and more than 48,000 U.S. service members since October 2001 across the Afghan and Iraq wars.

One detail of the current U.S. military structure is worth carrying forward. Aeromedical evacuation is coordinated by Air Mobility Command at Scott Air Force Base; there are four active-duty squadrons and most of the remaining units sit in the Air Force Reserve and Air National Guard. Crews fly the mission on general-purpose airframes, principally the C-130, C-17, KC-135 and Learjet C-21, rather than on dedicated ambulance aircraft, which went out of service with the C-9 Nightingale. The medical crew is self-contained: it carries its own oxygen and needs only the aircraft's electrical system. That is a role-fit kit on a multi-purpose aircraft, and it is the arrangement an AAM airframe would inherit, since it does not require a purpose-built medical aircraft type.

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On the civil side the service splits into two tiers by patient stability. An air ambulance is a jet or turboprop configured to work as an intensive care unit in flight, staffed by flight nurses, paramedics or physicians, equipped with monitors, ventilators and infusion pumps, and sold as a bed-to-bed service including the ground ambulance legs at both ends. A medical escort puts a stable patient on a scheduled commercial flight with a trained clinician who monitors vital signs, provides oxygen or mobility support and handles transfers, at lower cost. Price is set by flight distance and destination, aircraft type, level of medical care, the ground ambulance legs and the urgency of the request. The conditions that trigger the service are the ones that would also define an AAM patient-carriage case: stroke and cardiac events, severe infection, trauma, respiratory failure needing oxygen or ventilation, post-surgical transfer where commercial flying is unsafe, and frail patients who cannot travel alone.

Demand for the equipment is rising, and the reason given is fleet age. Bob Gibbs of Textron Aviation says the market has continued to grow, with much of the demand coming from operators replacing aircraft 30 and 40 years old that have become expensive to operate, less reliable and short of the necessary equipment. Jan Sebastian Kuehlsen of Lufthansa Technik attributes the trend to rising international travel and, after COVID, to the value placed on rapid evacuation capability in the VVIP and business jet segment and expects it to hold. AMAC Aerospace reports the same direction. Recent deliveries show what is being bought. Fargo Jet Center completed a dedicated air-medical Learjet 45 for the Canadian operator Airmedic in March 2026, with satellite flight following and cabin handsets, a composite sidewall with stainless steel overlay for sanitation, an upper medical sidewall carrying oxygen, air, vacuum and power, a dedicated medical cabin power system, overhead tracks for equipment mounting and an electric patient loader outlet; Airmedic runs six Pilatus PC-12 NG and two Learjet 45XR and holds EURAMI accreditation. Spectrum Aeromed delivered a fourth Challenger to Redstar Aviation fitted with its dual-patient intensive care system, alongside earlier work on the Learjet 45XR, which can be configured for two patients under full intensive care, and the Leonardo AW139, which takes multiple stretchers in EMS configuration.

The constraints the completion centres describe are the specifications an AAM patient aircraft would inherit. Power comes first: Textron installs larger starter generators or at minimum a separate electrical bus, and Lufthansa Technik runs its patient transport unit on a dedicated electrical system with an alarm for oxygen or power failure. Oxygen is second, with supply durations of 15 hours and beyond for intensive care patients and strict safety requirements attached to carrying that quantity aboard. Heat is third, since added electrical equipment loads the air conditioning. Connectivity is now assumed rather than optional, with satellite voice and data standard and telemetry sending an EKG to the receiving hospital in flight. Cabin materials have to survive hospital-grade cleaning agents, floors as well as beds are specified for it, and isolation units such as Epiguard's EpiShuttle exist so an infectious patient can be moved without decontaminating the aircraft afterwards. Cabin and door dimensions are driven by the ergonomics of the medical crew rather than by the patient. Jet Aviation has delivered a modification that converts a VIP cabin to a double medical bay in a little over 90 minutes.

4.4. Patient carriage remains a concept

Against that baseline, the AAM contribution to patient carriage is still at concept stage. The drone ambulance is a concept by Argo Design, covered in a design publication rather than an engineering or clinical one. Its cabin is sized for the injured person alone, which leaves out the qualified medical staff many patients need during transport, and rules against flying large drones over city areas would have to be revisited before any urban use. Measured against the power, oxygen, cooling, cleaning and crew-space requirements described above, a cabin sized for the patient alone is not an air ambulance. It is a design study and not engineering or clinical work. Vita Inclinata is a separate case. The company develops a helicopter rescue hoist system that counteracts cable swaying to make patient extractions safer, and it went public through a reverse merger with Tavia Acquisition at $450 million in July 2026. That is rotorcraft equipment, not an AAM aircraft.

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5. United States Market Structure and Growth

The United States serves as the primary growth engine for medical drone delivery, driven by a structural shift from isolated demonstrations toward governed, scheduled healthcare logistics networks. Although market valuations diverge based on analytical scope, *Global Market Insights* projects global revenue reaching $2.1 billion by 2035 (29.1% CAGR) versus *Fact. MR's* broader service-based estimate of $15.8B by 2036 (with U.S. growth at an 18.93% CAGR) both confirm strong, converging growth logic. The primary economic driver is dramatic operational efficiency, notably replacing typical hours of ground courier waits with few minute point-to-point deliveries for blood products, lab samples, and pharmaceuticals across short-range routes. Dominant operators led by Zipline, Matternet, and Alphabet's Wing are integrating directly into major health networks like WakeMed and Cleveland Clinic under FAA Part 135 authorization. While Beyond Visual Line of Sight (BVLOS) rulemaking serves as the principal unlock for nationwide scaling, long-term commercial adoption depends on navigating key operational constraints: route-specific airspace re-approvals, rigorous per-payload clinical validations, weather exposure, and proving clear cost-per-movement value over raw flight speed alone.

5.1. Growth Drivers

i. **Healthcare willingness to pay**: Growth is driven by the healthcare sector's willingness to pay a premium for urgent deliveries and guaranteed chain-of-custody. This makes healthcare the highest-value per-delivery segment, with forecasts showing a 28.35% CAGR through 2031.

ii. **Time-critical clinical transfer:** The highest commercial value is achieved when drones are used to replace urgent, time-sensitive medical trips rather than executing routine, low-priority parcel deliveries.

iii. **Rural and seasonal access:** Demand for long-range drone services is strongly anchored in geographies where traditional road access is seasonal or difficult, such as in Alaska, Appalachia, and various desert counties.

iv. **Labor cost and shortage**: Drones offer a cost-effective substitute for driver labor in high-wage markets. This advantage is significantly amplified by ongoing labor shortages, particularly in North American and European cities.

v. **Bidirectional route economics:** To achieve economic viability, operators need high route density and bidirectional payloads. By combining outbound medical supply deliveries with inbound specimen collections, operators can effectively double their fleet utilization.

vi. **Regulatory liberalization**: The regulatory shift from existing Part 135 rules to the proposed Part 108 framework acts as a foundational mechanism for expanding drone operations.

vii. **Congestion and emissions**: As traditional ground last-mile logistics continue to degrade, drones provide a necessary alternative. The World Economic Forum projects that by 2030, there will be a 78% increase in delivery demand, leading to 36% more vehicles, a 30% rise in emissions, and 11 extra minutes added to average commutes.

viii. **Physician shortage and mature cost base**: The combination of inherently high transportation costs and a scarcity of healthcare providers in rural areas creates a highly compelling economic justification for deploying autonomous drone solutions.

ix. **Federal policy alignment**: The Advanced Air Mobility National Strategy commits federal agencies to a dated program through 2036, directs them to incorporate its recommendations into budget requests from Fiscal Year 2027, and asks for published case studies covering medical transportation. Public sector demand signals of this kind preceding procurement.

x. **Rural hospital closure**: One third of rural hospitals are at risk of closing and over 260 are at immediate risk on the Center for Healthcare Quality and Payment Reform count. Each closure and each dropped service line lengthens the remaining routes for specimens, pharmacy and supplies, which is the geography where long-range aerial delivery competes best against road transport.

xi. **Emergency response as the accepted application**: In the EASA acceptance study, emergency uses rank as the most valuable application of urban air mobility, ahead of delivery. Community consent is a gating factor for route approval, and the medical mission is the one the public already supports.

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xii. **Air-medical fleet renewal**: Operators of crewed air ambulances are replacing airframes 30 and 40 years old that have become expensive to run and are short of current equipment, and completion centres report sustained demand for intensive-care interiors. That is the installed base an AAM patient aircraft would compete with, and the replacement cycle sets the window in which a new airframe type can be specified into a fleet.

5.2. U.S. competitive structure

OPERATOR	FOCUS	VOLUME	CAPITAL POSITION
Zipline	Medical +retail	>2M autonomous commercial deliveries; >135M Autonomous commercial miles; >20M items	$600M Series H Jan 2026 at $7.6B valuation, +$200M March 2026; total >$1.7B
Wing (Alphabet)	Retail reach	>750,000 residential deliveries, 3continents	Alphabet-funded; Walmart to 270 locations by 2027, >40M Americans
Matternet	Medical logistics	"Tens of thousands" commercial flights	$80–134M; FAA Type +Production Certification
Amazon Prime Air	Internal fulfillment	~16,000 flights	Internally funded; ~$2B invested
Flytrex /Causey	Suburban food	>200,000 U.S. deliveries	~$59–60M; Uber strategic investment Sept 2025
DroneUp	Seeking partner	Not disclosed	~$8–14M; lost Walmart

5.3. Capital formation across drone delivery and Advanced Air Mobility

The venture record of 2026 shows capital concentrating on aircraft, autonomy and airspace infrastructure rather than on medical delivery services.

DATE	TYPE	TARGET	INVESTORS	SIZE ($ M)
Jan & Mar 2026	Later Stage VC	Zipline	Baillie Gifford, Fidelity, Fidelity Management & Research, Evolution VC Partners, Gaingels and others	800
Apr 2026	Later Stage VC	Reliable Robotics	Coatue Management, Eclipse Capital, AE Ventures, Calm Ventures, Gaingels and others	160
Jul 2026	Later Stage VC	BRINC	Index Ventures, Motorola Solutions Venture Capital, Dylan Field	125
Apr 2025	Later Stage VC	Electra.aero	Honeywell, Lockheed Martin Ventures, Safran, Prysm Capital and others	120
Dec 2025	Later Stage VC	Airbound	Greenoaks, Lightspeed Venture Partners	30
Aug 2026	Later Stage VC	AURA	Undisclosed	29
Oct 2025	Later Stage VC	Odys Aviation	Climate Capital, Giant Ventures, Makai VC, Gaingels and others	26
Jan 2025	Seed	Skyway Technologies	Undisclosed	25
Mar 2025	Later Stage VC	Alpine Vertical	Undisclosed	20
Jun 2026	Seed	Haast Autonomous	Undisclosed	1.85
Jun 2025	Early-Stage VC	Avol	Draper Associates, Cultivation Capital, C2 Ventures, Blue Impact Supply Chain Ventures, Arch Grants and others	Undisclosed
Jul 2026	Seed	HUBVERY	Undisclosed	Undisclosed
Jun 2026	Early-Stage VC	HoverSafe	BRIDGE Angel Investors, CitySide Ventures	Undisclosed

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Four of these are medical by description. Avol is an autonomous medical drone delivery service moving critical supplies, blood and samples between healthcare facilities, which is the inter-facility model Matternet and UPS Flight Forward already operate. Haast Autonomous develops hybrid VTOL aircraft for medical logistics and organ transport, the mission the National Strategy names. HUBVERY optimizes autonomous drone and ground robot deliveries for healthcare, logistics and retail providers, the mixed aerial and ground architecture Arrive AI also intends to test with LifeSpan. BRINC builds public safety drones for emergency response. Only BRINC raised at scale, and its buyers are public safety agencies rather than health systems.

The larger rounds fund the layer underneath. Reliable Robotics builds autonomous flight control software for pilotless cargo aircraft, which is the capability that removes the pilot cost line identified earlier as 95% of drone delivery direct operating cost. AURA develops aviation communications infrastructure for autonomous crewed and uncrewed operations, and HoverSafe builds low-altitude software for safety, zoning, licensing and monitoring; both address the communications coverage and airspace management requirements that the Part 108 proposal and the National Strategy both make conditions of approval. Skyway Technologies builds vertiport operations technology. Electra.aero builds hybrid-electric short takeoff and landing aircraft for regional mobility, backed by Honeywell, Lockheed Martin Ventures and Safran, and Alpine Vertical builds a hybrid VTOL aimed at emergency response and personal aviation. Airbound builds lightweight blended wing body drones for zero-infrastructure last-mile delivery.

Private equity and public market activity

DATE	TYPE	TARGET	INVESTOR / ACQUIRER	SIZE ($ M)
Feb 2026	Public secondary	Joby Aviation (NYS: JOBY)	Not disclosed	600
Jul 2026	Reverse merger	Vita Inclinata	Tavia Acquisition (NAS: TAVI)	450
Feb 2026	PIPE	Eve Holding (NYS: EVEX)	Embraer, Brazilian Development Bank	230
Mar 2026	Merger / acquisition	ESAero	AeroVironment (NAS: AVAV)	200
Jun 2026	PIPE	Elroy Air	Not disclosed	165
Feb 2026	Public secondary	AIRO Group Holdings (NAS: AIRO)	Not disclosed	77.7
Aug 2026	PIPE	Archer Aviation (NYS: ACHR)	Boeing	55
Feb 2026	PIPE	Arrive AI (NAS: ARAI)	Streeterville Capital	40
May 2026	PIPE	Matternet	Edward Eisler, Mark Tompkins	33
Aug 2026	Merger / acquisition	Wisk Aero	Archer Aviation	Not disclosed
Aug 2026	Merger / acquisition	SkyGrid	Archer Aviation	Not disclosed
Jun 2026	Joint venture	Joby Toyota Aero Manufacturing Preparation Company	Joby Aviation, Toyota Motor	Not disclosed
Jan 2026	PE growth	EVA (Air)	MicroVentures	Not disclosed

Arrive AI raised a $ 40 million PIPE from Streeterville Capital in February 2026, six months before announcing its letter of intent with LifeSpan Pharmacy, which puts a funded balance sheet behind the receiving-station architecture rather than an aircraft. Matternet took a $33 million PIPE in May 2026 from Edward Eisler and Mark Tompkins, which sits between its April 2026 partnership with SoftBank Robotics America and its existing position as the only holder of both FAA Type and Production Certification. EVA (Air) develops high-throughput drone docking stations for healthcare, disaster relief and critical logistics, which is the same ground-infrastructure layer.

The rest is airframe consolidation. Archer took a $55 million PIPE from Boeing and on the same day acquired Wisk Aero and SkyGrid, an AI and blockchain platform for integrating autonomous air vehicles into airspace with dynamic routing. Joby raised $600 million in a secondary offering and formed a manufacturing joint venture with Toyota. AeroVironment bought ESAero, a manufacturer of unmanned systems and urban air mobility designs, for $ 200 million. Elroy Air raised $165 million for hybrid-electric VTOL middle-mile cargo and defense resupply.

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6. Conclusion

The United States medical drone sector in mid-2026 is a working service at small scale sitting inside a federal program that has not yet arrived. The operating layer is real: eight Part 135 operators, a hospital campus route running since 2019, a prescription program at Cleveland Clinic, and a $41 million statewide contract in North Carolina that is the first procurement large enough to be called a program rather than a pilot. Every one of these moves small payloads over short distances under location-specific approvals.

The wider Advanced Air Mobility system is where the aircraft, the airspace architecture and most of the capital are. The National Strategy sets 2027 for initial operations, 2030 for urban and rural service from vertiports, and 2035 or later for a mature operating environment; the FAA has completed the powered-lift rules and issued vertiport design guidance; the NAA Network has agreed a harmonized certification path that puts autonomous configurations last. Where patients do move by air today, they move on crewed aircraft fitted with intensive-care interiors whose power, oxygen, cooling and cleaning requirements no announced AAM cabin has been shown to meet.

The clinical evidence points in a direction the current U.S. deployments are not pursuing. The largest measured effects are in emergency delivery to the scene of a call, where response time gains to minutes and the cost per quality-adjusted life year sits well inside conventional thresholds. Existing evidence relies heavily on simulations: the sole prospective real-world series covers only twelve cases, and no commercial U.S. operator currently runs a full emergency dispatch service. The scheduled logistics model being built instead is easier to approve, easier to price and clinically less consequential.

The capital record makes dependency explicit. Outside of Zipline, medical drone startups secured modest capital in few deals, whereas airframe, autonomy, and airspace infrastructure companies raised hundreds of million each. Medical operators will fly on aircraft and through airspace systems that passenger and cargo missions paid for. That is not a weakness in the medical case, but it does set the sequence: the timetable for medical Advanced Air Mobility is the timetable for Part 108, for powered-lift certification, for vertiport and spectrum infrastructure, and for autonomy approval, none of which the health sector controls.

Three things would change the assessment. Publication of the Part 108 final rule would convert location-by-location authorization into a standing framework and remove the largest single constraint on route economics. Federal case studies under Recommendation 4.4 would give buyers the cost and benefit evidence that currently does not exist for medical AAM. And a funded emergency dispatch program, rather than another scheduled pharmacy route, would test the one application where the clinical literature already shows a large effect. Until then the sector's growth rates describe a small base expanding quickly under approvals granted one route at a time.

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7. M&A AND PE TRANSACTIONS

Deal Date	Deal Type	Target	Investor/Acquirer	Target Description	Deal Size MM
Aug 10, 2026	PIPE	**Archer Aviation (NYS: ACHR)**	Boeing (NYS: BA)(Brian Yutko)	Archer Aviation develops electric vertical takeoff and landing aircraft for sustainable urban air mobility networks.	$55.00
Aug 10, 2026	Merger/Acquisition	**SkyGrid (Aerospace and Defense)**	Archer Aviation (NYS: ACHR)(Adam Goldstein)	AI and blockchain platform integrating autonomous air vehicles safely into global airspace with dynamic routing.	NA
Aug 10, 2026	Merger/Acquisition	**Wisk Aero**	Archer Aviation (NYS: ACHR)(Adam Goldstein)	Manufacturer of autonomous, all-electric vertical takeoff and landing air taxis for safe, everyday urban flight.	NA
Jul 13, 2026	Reverse Merger	**Vita Inclinata**	Tavia Acquisition (NAS: TAVI)	Develops a helicopter rescue hoisting system that counteracts cable swaying to ensure safer patient extractions.	$450.00
Jun 30, 2026	Joint Venture	**Joby Toyota Aero Manufacturing Preparation Company**	Joby Aviation (NYS: JOBY)(JoeBen Bevirt), Toyota Motor (TKS: 7203)(Akio Toyoda)	Manufacturer of electric vertical takeoff and landing aircraft for commercial urban air mobility services.	NA
Jun 26, 2026	PIPE	**Elroy Air**	NA	Developer of autonomous hybrid-electric VTOL aircraft for middle-mile cargo logistics and defense resupply.	$165.00
May 28, 2026	PIPE	**Matternet**	Edward Eisler(Edward Eisler), Mark Tompkins(Mark Tompkins)	Manufacturer of commercial drones providing fully automated, battery-powered package delivery and logistics networks for goods.	$33.00
May 20, 2026	PE Growth/Expansion	**PteroDynamics**	LEONID, ONE Bow River(Kevin O'Neil)	Developer of folding-wing vertical takeoff aircraft optimizing long-range cargo efficiency for military and commercial sectors.	NA
May 14, 2026	Public Investment 2nd Offering	**Red Cat Holdings (NAS: RCAT)**	NA	Drone technology company providing hardware and software solutions for military, government, and commercial operations.	$225.00
Apr 29, 2026	Merger/Acquisition	**Inertial Sense**	Hexagon (STO: HEXA B)	Provides inertial sensors and full-stack autonomy to automate mobile robotic vehicles and outdoor commercial vehicles.	NA
Mar 16, 2026	Merger/Acquisition	**ESAero**	AeroVironment (NAS: AVAV)(Wahid Nawabi)	Manufacturer of unmanned aerial systems and urban air mobility designs, offering engineering, testing, and development solutions.	$200.00
Feb 13, 2026	Merger/Acquisition	**MAVRIK (Aerospace and Defense)**	HavocAI(Paul Lwin)	Manufacturer of autonomous aerial systems for logistics, intelligence, defense, and counter-unmanned aviation missions.	NA
Feb 02, 2026	Public Investment 2nd Offering	**Joby Aviation (NYS: JOBY)**	NA	Joby Aviation develops an all-electric vertical take-off and landing air taxi for commercial passenger service.	$600.00
Dec 16, 2025	IPO	**Boumarang**	NA	Developer of long-range, AI-enabled, hydrogen-powered drones for logistics, security, and environmental surveillance.	$0.25
Nov 12, 2025	PIPE	**XTI Aerospace (NAS: XTIA)**	Unusual Machines (ASE: UMAC)	XTI Aerospace develops unmanned aircraft systems for various sectors and builds commercial vertical lift aircraft.	$25.00

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7. M&A AND PE TRANSACTIONS - CONTINUED

Deal Date	Deal Type	Target	Investor/Acquirer	Target Description	Deal Size MM
Feb 23, 2026	PE Growth/Expansion	**Peregrine Industries (Aerospace and Defense)**	Otter & Co. Capital Holdings(Tom Kaiman)	Developer of autonomous unmanned systems for defense and commercial clients, prioritizing operator safety and survivability.	NA
Feb 13, 2026	Public Investment 2nd Offering	**AIRO Group Holdings (NAS: AIRO)**	NA	Aerospace and air mobility platform offering drones, avionics, pilot training, and electric vertical takeoff aircraft.	$77.70
Feb 13, 2026	PIPE	**Eve Holding (NYS: EVEX)**	Brazilian Development Bank, Embraer (BVMF: EMBJ3)	Eve Holding Inc provides Urban Air Mobility solutions, developing eVTOLs, maintenance services, and air traffic management.	$230.00
Feb 02, 2026	Merger/Acquisition	**Woot Tech**	Wakeb	Manufacturer of defense, security, and industrial drones providing surveillance, cargo transport, and mapping solutions.	NA
Feb 02, 2026	PIPE	**Arrive AI (Logistics) (NAS: ARAI)**	Streeterville Capital	Arrive AI provides an autonomous last-mile delivery platform featuring smart, AI-powered mailboxes for frictionless goods exchange.	$40.00
Feb 01, 2026	Joint Venture	**Joint Venture (Mitsui & Company / Terra Drone)**	NA	US company developing air mobility drones and flying cars.	NA
Jan 30, 2026	Merger/Acquisition	**Kaman Air Vehicles (KARGO UAV Program)**	Piasecki Aircraft(John Piasecki)	Intellectual property and assets of an unmanned aerial vehicle program in Bloomfield, Connecticut.	NA
Jan 28, 2026	Merger/Acquisition	**Vayu Aerospace**	Dynamic Aerospace Systems (OTCM: BRQL)	Manufacturer of drones for automated aerial intelligence used in defense, security, and rescue operations.	NA
Jan 28, 2026	PE Growth/Expansion	**Launchpoint**	LEONID(Christopher Lay)	Developer of electric propulsion and motor control systems for aerospace, defense, and air mobility solutions.	NA
Jan 26, 2026	PE Growth/Expansion	**EVA (Air)**	MicroVentures	Developer of high-throughput drone docking stations for healthcare, disaster relief, and critical logistics.	NA

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8. VENTURE AND OTHER TRANSACTIONS

Deal Date	Deal Type	Target	Investor/Acquirer	Target Description	Deal Size MM
Aug 10, 2026	Later Stage VC	**AURA**	Undisclosed	Developer of aviation communications infrastructure enabling safe, autonomous crewed and uncrewed flight operations.	$28.76
Jul 21, 2026	Seed Round	**HUBVERY**	Undisclosed	A platform optimizing autonomous drone and ground robot deliveries for healthcare, logistics, and retail providers.	NA
Jul 01, 2026	Later Stage VC	**BRINC**	Dylan Field(Dylan Field), Index Ventures, Motorola Solutions Venture Capital	Developer of public safety drones featuring sustainable flight, cellular communications, and interchangeable sensors for emergency response.	$125.00
Jun 26, 2026	Later Stage VC	**DEXA**	Undisclosed	Autonomous drone delivery platform managing flight routing and logistics to provide fast, low-cost local shipping.	$2.70
Jun 10, 2026	Later Stage VC	**LIFT Aircraft**	Undisclosed	Developer of electric multi-rotor aircraft offering accessible, personal vertical flight experiences for recreational use.	$1.20
Jun 08, 2026	Seed Round	**Haast Autonomous**	Undisclosed	Developer of autonomous hybrid VTOL aircraft for medical logistics and efficient organ transport.	$1.85
Jun 01, 2026	Early Stage VC	**HoverSafe**	BRIDGE Angel Investors, CitySide Ventures	Low-altitude aviation software platform for drone safety, zoning, licensing, monitoring, and ecosystem management.	NA
May 11, 2026	Later Stage VC	**Airborne Motorworks**	Undisclosed	Developer of electromagnetic propulsion technology and motor designs for more efficient and stable electric vehicles.	NA
Apr 30, 2026	Early Stage VC	**Starling**	Ace Capital Partners, Fresh.Fund, Impatient Ventures	Manufacturer of advanced fixed-wing eVTOL drones for precise, long-range professional and defense reconnaissance missions.	$3.00
Apr 23, 2026	Later Stage VC	**Skydio**	Bridgespan VC, R+VC	AI-powered drone developer creating safe, obstacle-avoiding flying cameras for complex tasks using computer vision.	$110.00
Apr 21, 2026	Later Stage VC	**Reliable Robotics**	AE Ventures, Calm Ventures, Coatue Management(Jaimin Rangwalla), Eclipse Capital, Gaingels, Island Green Capital and Others	Developer of autonomous flight control software and systems for pilotless commercial and defense cargo aircraft.	$160.00
Apr 13, 2026	Early Stage VC	**Unmanned Aerospace**	Undisclosed	Manufacturer of gyrocopter-based VTOL aircraft offering high-performance, low-maintenance UAV platforms.	NA
Mar 23, 2026	Later Stage VC	**Zipline**	Baillie Gifford (LON: BGS), Evolution VC Partners, Fidelity, Fidelity Management & Research Company, Gaingels and Others	Developer of autonomous electric aircraft and distribution systems for fast, drone-based aerial logistics delivery.	$800.00
Mar 17, 2026	Seed Round	**Voltair**	Convective Capital, Founder Factor, Pioneer Fund	Developer of autonomous drone systems for power utility inspection and infrastructure monitoring using geospatial data	NA
Feb 06, 2026	Later Stage VC	**Robot.com**	Undisclosed	Developer of autonomous, on-demand delivery robots and drones optimizing urban logistics, advertising, and inspection services.	$18.08

8. VENTURE AND OTHER TRANSACTIONS - CONTINUED

Deal Date	Deal Type	Target	Investor/Acquirer	Target Description	Deal Size MM
Jan 01, 2026	Early Stage VC	**Dynamo**	Intuition(Paris), Mana Ventures, Outsized Ventures, Rolling Fun	Developer of autonomous heavy-lift skycrane quadcopters for moving heavy loads to hard-to-reach locations.	NA
Jan 01, 2026	Seed Round	**Titan Dynamics (Aerospace and Defense)**	Arrow Fund, Cherubic Ventures, Discipulus Ventures, Epakon Capital(Diego Salas), Justin Caldbeck(Justin Caldbeck) and Others	Manufactures autonomous commercial and defense aerial systems using additive manufacturing for rapid, scalable deployment.	$9.00
Dec 11, 2025	Later Stage VC	**Airbound**	Greenoaks, Lightspeed Venture Partners	Indian developer of lightweight blended wing body drones for energy-efficient, zero-infrastructure last-mile delivery applications.	$30.00
Nov 21, 2025	Later Stage VC	**Vertiq**	Ben Franklin Technology Partners of Southeastern Pennsylvania, HAX, Robin Hood Ventures, SOSV(Cyril Ebersweiler)	Developer of high-performance propulsion systems with precise control and health monitoring for unmanned aerial vehicles.	$1.00
Nov 17, 2025	Seed Round	**Bone**	Bass Investment, KNET Investment Partners, Kolon Industries (KRX: 120110), The Ventures, TheVentures Company and Others	Full-stack autonomous robotic AI systems for defense, infrastructure inspection, public safety, and logistics operations.	$12.00
Oct 09, 2025	Later Stage VC	**Odys Aviation**	Climate Capital, DealBench, Gaingels, Giant Ventures, Knighthood Capital, Kyle Vogt(Kyle Vogt), Makai VC and Others	Manufacturer of quiet electric vertical takeoff and landing aircraft for sustainable urban air mobility.	$26.00
Sep 27, 2025	Seed Round	**Emelody**	Undisclosed	Develops advanced unmanned aerial vehicle technology with optimized fixed-wing and rotary-wing flight dynamics.	NA
Sep 18, 2025	Seed Round	**Morgan Geospatial**	Undisclosed	Developer of long-range, high-speed VTOL fixed-wing airframes for efficient commercial and defense UAS missions.	$3.50
Sep 18, 2025	Later Stage VC	**Point One Navigation**	Alumni Ventures, Coral Capital., IA Ventures, Khosla Ventures(Kanupriya Gulati), UP.Partners	Provides location and mapping systems using sensor fusion to assist autonomous vehicles, drones, and robotics.	$35.00
Aug 25, 2025	Later Stage VC	**Inspired Flight**	Tri-Valley Ventures(Gregory Hitchan)	Developer of next-generation drones providing unmanned aircraft systems and fleet management for industrial use cases	$12.00
Jun 26, 2025	Early Stage VC	**Avol**	Arch Grants, Blue Impact Supply Chain Ventures, C2 Ventures, Cultivation Capital, Draper Associates and Others	Autonomous medical drone delivery service for transporting critical supplies, blood, and samples between healthcare facilities.	NA
May 30, 2025	Seed Round	**SiFly Aviation**	The First Thirty Ventures	Developer of long-endurance, autonomous VTOL drones for efficient agronomic data collection and tasks.	$2.56
Apr 21, 2025	Later Stage VC	**Electra.aero**	Honeywell (NAS: HON), Lockheed Martin Ventures, Prysm Capital(Jay Park), Safran (PAR: SAF) and Others	Manufacturer of hybrid-electric short takeoff and landing aircraft for sustainable urban and regional mobility.	$120.00
Apr 15, 2025	Later Stage VC	**HopFlyt**	Undisclosed	Developer of eco-friendly, electric vertical take-off and landing aircraft for fast, safe urban passenger and cargo transport.	$0.50
Apr 14, 2025	Later Stage VC	**Silent Arrow**	Undisclosed	Developer of autonomous drones and aerospace vehicles for transporting heavy cargo and disaster relief payload.	$3.20

8. VENTURE AND OTHER TRANSACTIONS - CONTINUED

Deal Date	Deal Type	Target	Investor/Acquirer	Target Description	Deal Size MM
Apr 01, 2025	Later Stage VC	**Electric Power Systems**	AE Industrial Partners(Beckett Jackson)	Manufacturer of modular energy storage and battery systems for commercial, aerospace, and defense electric vehicles.	$29.00
Mar 18, 2025	Later Stage VC	**Alpine Vertical**	Undisclosed	Developer of a hybrid VTOL aircraft offering lower operating costs for emergency response and personal aviation.	$20.00
Mar 01, 2025	Later Stage VC	**Kyte (Logistics)**	BonAngels Venture Partners, GS Futures, Seoul National University Technology Holdings	Aerial delivery robotics and logistics system providing drone delivery services from warehouses and restaurants.	NA
Feb 10, 2025	Later Stage VC	**Maglev Aero**	Undisclosed	eVTOL aircraft management platform optimizing urban air mobility with high-performance, quiet vertical flight systems.	$2.50
Jan 15, 2025	Seed Round	**Skyway Technologies**	Undisclosed	Vertiport operations and technology platform integrating eVTOL aircraft into urban air mobility networks.	$25.00
Jan 01, 2025	Seed Round	**Zurons**	South Park Commons	Developer of residential security robotics integrating mobile robots, drones, and humanoids to reduce crime.	NA
Oct 09, 2024	Seed Round	**General Hypersonics**	Intbox Ventures	Developer of a hypersonic velocity platform offering test, evaluation, drone deployment, and payload delivery.	$0.13

Working Draft