Written Testimony of

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on

"FAA Reauthorization: Harnessing the Evolution of Flight to Deliver for the American People"

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Thank you for the opportunity to testify on behalf of BETA Technologies at today's hearing titled "FAA Reauthorization: Harnessing the Evolution of Flight to Deliver for the American People." Our nation is at a pivotal moment in aviation history where we have the chance to maintain – and expand – our global leadership in the race for innovative aviation technologies, so long as we have a clear regulatory pathway and support from the government to get there. I appreciate the chance to testify as Congress considers the role of new entrants in FAA Reauthorization, and look forward to sharing how Advanced Air Mobility will benefit communities across the country.

BETA Technologies ("BETA") is a leading developer and manufacturer of electric aircraft, electric motors, and multimodal vehicle charging infrastructure based in the United States. Burlington, Vermont is home to our R&D headquarters as well as our primary production and manufacturing facility. We currently have over 500 employees spread across a footprint that extends beyond Vermont, including: Plattsburgh, New York; Springfield, Ohio; Raleigh, North Carolina; and Washington, DC. We have raised significant capital from American investors to build our electric aerospace company and, in turn, develop American-made technology and the jobs to go along with it.

BETA is building a fully integrated electric aviation system that we're selling to many of the top aircraft operators in the world. Our products include: the CX300, an electric fixed-wing aircraft, or conventional takeoff and landing aircraft (CTOL); the ALIA-250, an electric vertical takeoff and landing aircraft (eVTOL); multimodal charging infrastructure; and, a program to train future pilots and maintainers. These Advanced Air Mobility (AAM) technologies will unlock connectivity for communities all over the United States, increasing access to healthcare, e-commerce, and passenger travel.

We have firm orders from operators including UPS, Bristow, United Therapeutics, BLADE Urban Air Mobility, and more. We are also partnering with the U.S. government to explore government use cases and accelerate the deployment of AAM aircraft and multimodal electric chargers to service both ground vehicles and aircraft.

BETA Technologies is developing two all-electric aircraft models

BETA's approach capitalizes on three major benefits of electric flight: significantly lower operating cost compared to jet- or turbine-powered aircraft, zero operational emissions, and a fundamentally safe and reliable option for aviation. Advances in aviation technology have often been hindered by regulatory hurdles, prolonged timelines for certification and commercialization, and a lack of ability for small businesses to contribute to the industry. But a surge in ingenuity, government partnership, and American investment has inspired a more economical and sustainable era of aviation.

Our country is at a defining moment in history to recognize the economic, healthcare, and environmental opportunities of Advanced Air Mobility. If our government can help us harness this innovation, the United States will remain uniquely positioned to become the global leader in emerging aviation technologies.

Electric Aviation is Here

BETA is focused on creating solutions that enable operators to bring the same expedient delivery, healthcare, and passenger capabilities available in urban areas to Americans in rural and hard-to-reach places, all while lowering cost and reducing emissions. Our simple,

reliable, and safe electric aircraft and charging infrastructure provides that solution. This technology has matured to a level that enabled BETA to fly our aircraft halfway across the country multiple times – using our charging infrastructure along the way – to introduce electric aviation to communities all over the country.

Eliciting Critical Thinking in Electric Aviation

BETA's initial aircraft design was driven by a desire from United Therapeutics (UT) to transport organs in a reliable, efficient, and environmentally friendly way. UT, a biotechnology company founded in Maryland, is developing an unlimited supply of organs for transplant by using advanced materials and 3D printing to repair organs for transplant, significantly increasing the availability of these life-saving products for patients in need. Initially, BETA and UT signed a contract to elicit critical thinking in electric aviation. This resulted in BETA's first eVTOL prototype, AVA, which we designed to demonstrate the ability to carry organs from manufacturing facilities to hospitals. We went from an initial concept to our first flight test in just ten months, ultimately completing over 100 record-setting flights.

UT became BETA's first customer and, since then, we have evolved our design by applying our learnings to create two highly-efficient, simple, and certifiable aircraft models that are advancing through the Federal Aviation Administration (FAA) certification process right now.

Demonstrated Technical Progress

BETA has been flying electric aircraft for more than five years, and in that time we've reached a number of technical milestones. Currently, we have two full-scale pre-production aircraft that we fly nearly every day, logging more than 22,000 miles on our fixed-wing airplane to date. Last year, we completed a successful hover campaign on our current eVTOL pre-production aircraft, and test pilots from the FAA, U.S. Air Force, and U.S. Army have flown our fixed-wing airplane. A market survey certificate from the FAA has put our engineering to the test, allowing us to fly our fixed-wing prototype on multiple real-world flights, stopping

at municipal airports along the way in New York, Ohio, Indiana, Illinois, Missouri, Kentucky, and Arkansas to introduce this technology to both rural and urban communities.

Real-World Use Cases with Real-World Partners

AAM marks a transformative era not only for the aviation industry but the entire U.S. transportation system. It unlocks access and new capabilities, shifting the paradigm in how we move goods and people within and between our communities. For BETA's customers, this means quickly delivering organs for transplant for patients in Missouri, a quiet, clean transportation option for passengers between rural and urban areas in the Pacific Northwest, additional disaster response in hurricane-prone areas in Louisiana, and increased e-commerce capabilities in hard-to-reach places in Tennessee.

Showing the real-world use cases for electric aviation has garnered firm orders for our aircraft from commercial customers. **Bristow**, a leader in global vertical flight solutions currently offering helicopter transportation for civil and government services, will use both versions of BETA's aircraft to safely and reliably move passengers and time-sensitive cargo to strategic locations between regions in Louisiana, Texas, and Florida. **UPS** will use BETA's eVTOL for point-to-point logistics to transform the middle mile express cargo industry, drastically reducing the risk, complexity, and handling for missions and provide relief for over-loaded systems, extend drop-off and pick-up times, and enable more Premium Direct service to rural areas. **United Therapeutics** will use both versions of BETA's aircraft to deliver organs safely and quickly between its facilities and hospitals. **BLADE Urban Air Mobility** will use BETA's eVTOL to quietly and safely transport passengers in a sustainable way.

We're also gaining traction with our government partners as they work to meet modern-day challenges. We're partnering with the **Administration for Strategic Preparedness and Response (ASPR)**, an agency within the U.S. Department of Health and Human Services (HHS), to deploy multimodal charging infrastructure that will support public health preparedness along the gulf coast, including Mississippi, Georgia, Florida, Arkansas, and

Alabama. This will enable eVTOLs to transport medicine, patients, and equipment in a disaster-response role in hurricane-prone areas.

Our contracts with the **U.S. Air Force** and **U.S. Army** through the **Agility Prime** program allow DOD to exercise military use cases for electric aircraft and multimodal charging infrastructure to support critical resupply and strategic personnel transport. Agility Prime has been an essential part of BETA's success to date, accelerating our progress and spurring commercial investment as we seek FAA certification for our aircraft. The practical features of BETA's eVTOL – including runway and fuel independence and a low noise profile – make it a valuable and versatile solution in defense applications.

Building a Nationwide Charging Network

What good is an electric airplane if you have nowhere to charge it? To ensure access to widespread, publicly available charging, BETA is developing rapid charging stations that are nonproprietary and use an existing electric vehicle (EV) standard in use by other Original Equipment Manufacturers (OEMs). BETA is partnering with airports, Fixed Base Operators, and our customers to deploy this technology and make the future of electric transportation a reality. Moreover, we're working with other electric aircraft OEMs to collaborate on infrastructure deployment early in the commercialization of electric aviation.

BETA is installing publicly accessible multimodal chargers at general aviation airports across the nation. We currently have sixty five sites permitted, under construction, or online and charging. The first route is already built and operational – spanning from Vermont to Arkansas – and this year we'll complete the east coast network and connect Florida to Missouri.

BETA's Charge Cube, equipped with a 50-ft retractable charging reel

Multimodal and Interoperable

To prepare to meet the demands of electric aviation, BETA has designed the Charge Cube, which safely and efficiently charges electric aircraft as well as ground-based EVs including cars and buses. This charger abides by universal charging standards so that it can be utilized on any EV that is Combined Charging System (CCS1) compliant.

BETA's charging stations are already being used in both on- and off-airport environments to help electrify critical segments of our nation's transportation system. For our fleet customers like UPS, it gives them the option to charge their electric ground fleet (i.e., delivery trucks and vans) and meet their emission reduction targets. This technology, especially in mobile, "deployable" form, is also being explored by the DOD to meet its energy demands at military bases and installations and provide flexibility in austere locations.

Publicly Accessible Chargers at Airports

The footprint of BETA's Charge Cube is minimal yet effective, making it sought-after by other electric aircraft OEMs and a seamless integration into existing airport infrastructure. At four feet tall, this charger is designed to fit underneath an aircraft wing and offer an immediate touchless experience to users. It quickly powers aircraft by providing continuous 350 kilowatt output which will enable BETA's aircraft to charge in just 50 minutes.

A pilot plugs the all-electric ALIA aircraft into BETA's Charge Cube

Because it is multimodal, BETA's charging infrastructure gives airports an edge as they seek to electrify. It powers their EV ground fleets today while giving them the tools necessary to adopt the next generation of aviation technology. Moreover, multimodal charging allows airports to offer additional services and amenities to their surrounding community. In the future, it will help attract more pilots and air traffic.

Perhaps the best demonstration of this dual purpose is BETA's charging installation at the Springfield-Beckley Municipal Airport in Ohio: a charger in the parking lot provides the only Level 3 fast charging between Dayton and Columbus, seeing frequent use from electric cars and trucks, while the charger located on the airport apron powered BETA's electric aircraft during several missions that passed through Springfield. In these cases, both aircraft and ground vehicle chargers are able to use the same power source and converter.

Airports like the one in Springfield are vital to connecting our nation's communities. The local airport is an essential way for people and businesses to stay commercially connected to the rest of the country and serves as a lifeline for medical response, cargo, and other critical services. By placing chargers at airports in rural and suburban areas, airports can become part of the adaptation to EVs and residents can gain access to services otherwise nonexistent in the area. On a broader scale, these installations enable the FAA to point to existing locations where electric aircraft can safely land and charge — a critical first step for AAM integration into the National Airspace System (NAS).

BETA recognizes that we're charting new waters when installing electric aircraft charging on airports. We are working closely with the FAA Office of Airports to ensure installations do not face unnecessary permitting delays or regulatory barriers that will impede the electrification of transportation. BETA has encouraged the FAA to develop standard operating procedures for infrastructure installations to streamline approvals and reap the benefits for airports, communities, and businesses alike.

Government Investment in Charging Infrastructure

BETA's charging network has laid the groundwork for electric aviation adoption. However, in order to further support the industry, partnerships between industry and the government will be necessary to bring this infrastructure to scale. To that end, BETA supports measures that will assist in and accelerate the planning and deployment of AAM infrastructure. We appreciate Chairman Graves (R-LA) and Ranking Member Rick Larsen (D-WA) for their work

on the Advanced Aviation Infrastructure Modernization (AAIM) Act, an important first step to securing federal support for AAM infrastructure.

Additionally, as funding from the bipartisan Infrastructure Investment and Jobs Act (IIJA) is spent to build a nationwide network of EV charging, our government cannot afford to miss this opportunity to build for the future. The United States is just now adapting our ground infrastructure to catch up to the technological innovations of the automotive industry and fully realize its benefits. As we look to the future, we are in a rare and fleeting moment where the next advances in technology are clear. We have the tools to have a broad and seamless adoption of electric aviation when the time comes; now we need to build.

To enable this, BETA is paying close attention to the IIJA's National Electric Vehicle Infrastructure (NEVI) Formula Program, where the bulk of EV infrastructure dollars are coming from. This program provides state funding to deploy EV charging infrastructure for automobiles along designated Alternate Fuel Corridors. However, this program misses the opportunity to allow states to install multimodal, on-airport charging infrastructure that supports both EV ground vehicles and aircraft. Without tapping into this unique capability, many states will miss the chance to gain additional services, like cargo and medical transport from EVs, to their communities. To this end, BETA has encouraged the U.S. Department of Transportation (DOT) to consider the economic and equity impacts of multimodal charging availability at airports in rural areas across the country.

We look forward to working with Congress to ensure that our nation can best leverage multimodal charging infrastructure by making investments in today's transportation system that will set us up for success in the future.

Leveraging Existing Infrastructure

There are more than 5,000 public airports in the United States, but more than 70% of domestic travel is conducted through less than 1% of airports[1]. Electric aviation can utilize existing infrastructure at general aviation (GA) airports, which is especially helpful to reach rural communities. With its improved efficiency and affordability, this technology can help revitalize these airports. BETA's fixed-wing electric aircraft will leverage this infrastructure to provide increased access to underserved communities and bring new opportunities for job growth and economic stimulation.

However, in certain locations, BETA's eVTOL aircraft will need vertical infrastructure for takeoff and landing in certain locations. Our aviation system already has a robust network of airports and heliports that can help ensure a successful entry-into-service for eVTOLs. However, the FAA is currently working to draft design guidance for "vertiports" that eVTOLs will be required to use. To provide interim guidance for vertiport design, the FAA published Engineering Brief (EB) No. 105[2] in September 2022. BETA appreciates the time and resources FAA has dedicated to this effort; however, we are concerned by the limitations it places on the integration of eVTOLs into the NAS. BETA has encouraged the FAA to create a design standard that is consistent with what the industry needs and can use, while ensuring safety remains the priority. We hope that the FAA will accelerate and prioritize this in time for type certification of eVTOLs and, in the meantime, allow eVTOLs to use existing infrastructure.

Importance of Maintaining Global Leadership in Aviation

The United States is currently the world leader in aviation. We applaud the Administration for its efforts to support and enable AAM, recognizing that this moment provides a significant opportunity to maintain – and expand – American leadership. In recent years, AAM has attracted over $7 billion in new investment[3]. This investment has given the United States a

[1] National Aeronautics and Space Administration Report "Regional Air Mobility: Leveraging our National Investments to Energize the American Travel Experience" (2021)

[2] Federal Aviation Administration Memorandum "Engineering Brief No. 105, Vertiport Design" (2022)

[3] Axel Esqué and Robin Riedel, "A milestone year for future air mobility," Future of Air Mobility, McKinsey & Company, February 8, 2022.

leg up to become a global leader in the electric aviation industry. Yet we are in the midst of a global race for innovative aviation technologies and many countries in Asia and Europe, through regulatory clarity, are positioned to progress more quickly, putting our leadership at risk. Developing and scaling AAM in a way that enables the United States to be first to market is critical for our economy, national security, and global leadership.

AAM Unlocks Domestic Industry

AAM provides us with a unique opportunity to foster American leadership and ingenuity with 21st century technology. BETA has created more than 500 high-paying jobs across North America since our creation five years ago, primarily in non-urban locations. As we grow and advance, we will continue to scale our business with hiring that supports a domestic supply chain, an engineering corps, and a manufacturing operation.

But AAM is more than a company or a product — it is an industry. As the domestic AAM industry reaches commercialization, it is expected to create hundreds of thousands of high-skilled manufacturing, design, and infrastructure jobs by 2040, all while placing a renewed emphasis on domestic manufacturing. This economic growth and job creation will echo through the entire supply chain.

AAM Strengthens United States' Global Competitiveness

Innovation in aviation leads to additional capabilities for our military and ensures that technologies can be developed domestically before our global competitors beat us to it. DOD has recognized this and established the Agility Prime program in 2019 to accelerate development of new technologies.

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https://www.mckinsey.com/industries/aerospace-and-defense/our-insights/future-air-mobility-blog/a-milestone-year-for-future-air-mobility

BETA has participated in the Agility Prime program since its inception. It has helped us to accelerate our path to FAA type certification, gain access to U.S. Air Force engineering expertise and test infrastructure, and evaluate use cases for military missions. The first crewed flight of an Agility Prime electric aircraft was in BETA's fixed-wing prototype in March 2022, a milestone for the program and for the AAM industry. It was another proof point that electric aviation is real and it's here.

U.S. Air Force Test Pilot Maj. Jonathan Appleby and BETA Test Pilot Camron Guthrie fly ALIA

The investment Agility Prime has made in our industry has propelled us from developers to companies now entering production, and has given us a competitive edge globally. A report by the Department of the Air Force transmitted to Congress on August 3, 2022, titled "Report to Congressional Committees[4]," cites the many successes of the program, including the acceleration of R&D, leverage for commercial investment, and collaboration with the FAA on aircraft certification and flight standards for operators, maintainers, and levels of autonomy.

Perhaps most notably, though, is Agility Prime's support for a domestic AAM industry that will ensure our nation remains dominant in the race to build electric aircraft. Agility Prime's investment in AAM so far has been a display of American leadership that will allow the AAM industry to outpace our global competitors.

Utilizing a Whole-of-Government Approach to Ensure Success of AAM

The success of the AAM industry requires cooperation from all levels of government. With all relevant parties working together, AAM will be best positioned for seamless integration into our communities. BETA applauds enactment of the Advanced Air Mobility Coordination and

[4] Department of the Air Force "Report to Congressional Committees," August 3, 2022.

U.S. Secretary of Transportation sits in BETA's ALIA aircraft at UPS WorldPort

Leadership Act (Public Law 117-203), which will ensure efforts to integrate new technologies into the aviation system are coordinated across the government. We thank Chairman Graves (R-LA) and Ranking Member Larsen (D-WA) for their leadership on this legislation, and the DOT as it works with other departments and agencies to secure continued leadership in this industry.

Important first steps have been taken, including the FAA's establishment of the type certification basis and its work to develop a Special Federal Aviation Regulation (SFAR) for pilot training and operating rules for eVTOLs. But we still have a lot of work to do to get AAM "off the ground" here in the United States.

Maintaining the Safest Airspace in the World

We believe that the FAA can and should ensure a predictable regulatory framework that supports innovation and global competition while maintaining safety in the national airspace as the priority. As a company of aviators, we share the FAA's goal to preserve our national standing as the safest environment in the world for aviation. That's why BETA is intensely focused on creating the safest aircraft possible.

BETA's aircraft endure full-scale piloted flight tests on an almost daily basis. The success of our flight test program has won us an FAA market survey certificate that allows us to put our products to the test in real-world flights outside of our test facility and is why the first crewed flights of an electric aircraft by Air Force and Army test pilots was in BETA's fixed-wing aircraft. In 2023, the FAA's very own test pilots also conducted a qualitative evaluation of the aircraft, following nearly a year of safety assessments.

BETA has also partnered with the National Institute for Aviation Research (NIAR), located at Wichita State University in Kansas, to conduct the industry's first FAA-sponsored drop test of a full-scale battery pack. The results of this test not only provided data to refine NIAR's simulation model for future testing for the AAM industry, but also proved that BETA's full-scale battery pack design can safely withstand the impact of a 50-foot drop, which is an important step in the certification process.

BETA partners with NIAR and FAA to conduct first-ever 50ft drop test of full-scale battery system

We recognize that our engineering rigor and safety orientation will keep us on target for FAA certification. Moreover, we believe this paves the way for the rest of our industry's success as electric aircraft developers go down the same path. As such, a clear pathway to certification is needed to not only support innovation, but help maintain the safest airspace in the world.

Committing the Necessary Resources and Staffing

As aviation enters a new era, the FAA is experiencing an influx of applications from new entrants who are introducing new and novel technologies and systems to the FAA. BETA recognizes this and has chosen to take a stepwise approach to the certification process, beginning with our electric motor, then our fixed-wing airplane, and ultimately our vertical takeoff aircraft. Because electric aviation has strict energy and power-density requirements for flight, it brings a new and unique set of requirements for the FAA to consider for certification, including high energy-density batteries, high torque-density electric motors, distributed electric propulsion systems, and fly-by-wire flight controls. Because the FAA has never certified electric propulsion for commercial use, a body of specialized subject matter experts (SMEs) that understand the technology is necessary to advance type certification applications.

Further, as the FAA determines the airworthiness criteria to establish the level of safety performance for AAM aircraft, coordination, collaboration, and communication across its teams is paramount. This requires additional staff in FAA's policy and certification offices and on the teams responsible for implementing airworthiness criteria. We encourage the FAA to hire and train additional technical experts who will keep pace with advancements in technology and support new entrants' certifications and operations in the NAS.

Conclusion

Our nation is on the cusp of a new era of flight, and BETA is eager to bring the economic, healthcare, and environmental benefits of AAM to communities across the United States. This year's FAA Reauthorization comes at a critical time, giving Congress the chance to provide the additional direction to the FAA that will get electric aircraft certified and into the airspace in a safe, reliable way. The following items require swift progress in order to bring AAM to fruition in the United States:

- Continued progress toward the type certifications of the aircraft, including adequate staffing and appropriate technical resources for AAM;
- Transparency and certainty in the regulatory process, including timely promulgation of an SFAR that ensures the broadest pool of eligible pilots;
- Common infrastructure that enables accessible and efficient charging for all AAM aircraft; and,
- Global harmonization among international aviation authorities to allow AAM to scale at a global level.

If the United States can make progress on these key issues, our AAM industry will be positioned to deliver benefits of this innovation to your diverse communities across the country. BETA appreciates the Subcommittee's leadership and willingness to engage with industry, and for the opportunity to testify. We look forward to working with you to ensure that the United States remains the leader in aviation for decades to come.