

Congress of the United States

Washington, DC 20510

February XX, 2023

President Joseph R. Biden
The White House
1600 Pennsylvania Avenue NW
Washington, D.C. 20500

Director Shalanda Young
Office of Management and Budget
1650 17th St NW
Washington, DC 20500

Administrator Bill Nelson
National Aeronautics and Space Administration
300 E. Street SW
Washington, DC 20546

Dear President Biden, Director Young, and Administrator Nelson:

As members of the Ohio Congressional delegation, we write to encourage you to provide robust support for the programs critical for the National Aeronautics and Space Administration's (NASA) mission and especially those efforts at the Glenn Research Center (Glenn or GRC) – both the Lewis Field campus and the Armstrong Test Facility (ATF), Ohio, in the President's Fiscal Year 2024 (FY24) budget request.

NASA showcases many of America's greatest strengths, from technological innovation and engineering excellence to a boundless scientific curiosity about the universe around us. Despite the challenges of a global pandemic, NASA successfully landed the Perseverance rover on Mars, sent Lucy to the Trojan asteroids of Jupiter, launched the James Webb Space Telescope, redirected an Asteroid with the Double Asteroid Redirection Test (DART), and launched Artemis 1 when the Orion spacecraft and the Space Launch System (SLS) rocket lifted off for the first time. Each of these missions, and many others, relied on the unique engineering expertise and testing capabilities of Ohio's NASA Glenn Research Center. With the support of a strong FY24 budget, Glenn is prepared to lead in the following areas of significance: surface power; electric propulsion; space communications; flight hardware testing; and aeronautics, including hypersonics and sustainable aviation. We encourage you to include robust funding support for NASA as part of your FY24 President's budget proposal in each of the following areas:

Infrastructure: We ask that you increase the FY24 budget request to \$500 million for Construction and Environmental Compliance restoration to address urgent infrastructure investment needs at GRC and other NASA facilities. GRC is in critical need of additional resources for overall upkeep of horizontal infrastructure at the Lewis Field campus as well as increased funding to prevent corrosion; the demolition of obsolete facilities at ATF and the

Lewis Field campus to reduce environmental impacts and increase efficiency; safety inspections required to re-activate mothballed facilities; and the burial of ATF electrical grid components to protect against lightning strikes. Additional resources are also necessary to complete road re-surfacing across the ATF campus as well as construction of permanent storage and readiness facilities for pre-test staging of space hardware. Testing greatly reduces risk for challenging and expensive missions, but test facilities require upkeep and maintenance. Maintenance of shared infrastructure like roads and electrical grids are often neglected in annual appropriations but are key to keeping GRC as the world leader in development and testing for the future.

Additionally, we ask that you request \$50 million in Microgravity Facilities upgrades. This includes the 2.2 Second Drop Tower which has been used for nearly 50 years by researchers from around the world and the premier Zero Gravity Research Facility.

Surface Power: We ask that you request \$100 million to be allocated for use by GRC to develop special test capabilities and a Fission Power Center of Excellence for Space. GRC specializes in surface power technology, especially the conversion of diverse power sources to electricity and power distribution. A reliable source of surface power is essential to support NASA's human and robotic exploration of the Moon and Mars. While conventional solar power is suitable for the short surface missions of Apollo, the Agency's more ambitious plans, like the Artemis missions to sustain a human presence on the Moon, will require other power sources. Fission Surface Power (FSP), technology being developed at GRC is essential for these mission classes. Increased support is urgently needed for FSP to be operational when Artemis missions bring humans back to the Moon to stay.

Electric Propulsion: We ask that you request \$530 million for the Technology Demonstration for ground and flight testing and \$250 million for NASA Glenn's research in electric aircraft propulsion. We also request that you designate GRC as a Level II Program Lead in this field. Advancements in propulsion are opening new mission concepts, and much of this ground-breaking work is being done at GRC, including Nuclear Electric Propulsion and Solar Electric Propulsion. Every electrical propulsion device of U.S. origin has come through the center's testing facilities and relied on the expertise of Glenn engineers. In some cases, these thrusters are employed on NASA missions, but often the technology supported by Glenn benefits commercial partners, aiding in the development of advanced thrusters that NASA can then simply purchase. This is just one example of government expertise at GRC serving as a catalyst for the growth of U.S. industry and support of local economic development.

Additionally, we ask that you request \$60 million through the Space Force's "Space Control & Technology" line item for the research and development of high thrust ion engine technologies at NASA Glenn such as the NASA Evolutionary Xenon Thruster (NEXT).

Nuclear Thermal Propulsion: We ask that you request \$50 million for Nuclear Thermal Propulsion (NTP). GRC leads in NTP, which is used in reference to in-space propulsion systems that rely upon a low molecular weight fuel that flows through a reactor to generate heat due to the nuclear fission processes and eventual thrust.

Space Communications: We ask that you request \$50 million for NASA Glenn's research in the communication services program (CSP) and to designate GRC as a Level II Program Lead for in this field. GRC is at the forefront of leveraging the growing private space industry through CSP. Glenn has a long history of pioneering space communications making it well-suited to ensure commercial satellite companies can meet NASA mission requirements and lead a smooth transition away from the legacy systems owned and operated by the government. This new approach will be more versatile and responsive to rapidly evolving communications technology and provide significant cost savings.

Flight Hardware Testing: We ask that you request full funding for all the missions that use GRC's Flight Hardware Testing facilities. Upgrading and re-activating existing equipment would bring GRC's test facilities up to their original design specifications and capitalize on decades of investment. Maintenance of shared infrastructure, like electrical grids and roads, would allow industry, NASA, and the Department of Defense (DoD) to fully utilize Glenn's testing capabilities. But it is not enough to merely sustain current testing infrastructure; a combination of consolidation and improvement of facilities is necessary to purposefully evolve and meet the Agency's future needs.

Our nation's civil, commercial, and national security space sectors all rely on GRC facilities for testing space flight hardware. These facilities, and the experts who operate them, are each unique. These include the world's only facility capable of testing full-scale, upper-stage launch vehicles and rocket engines under simulated space conditions; the world's largest space environment simulator; and the world's most powerful vibrate table and most powerful reverberant acoustic test chamber. Many of these testing facilities were constructed over sixty years ago but remain unmatched in their capabilities.

Runway at Armstrong Test Facility: In the FY22 Omnibus Appropriations bill, Congress directed that \$10 million from the Space Force budget be used to begin building a runway at NASA Armstrong. We ask that you request an additional allocation of funding to continue this 9,000' runway project, which is estimated to cost \$45 million over an 18-month construction period. ATF is a world class testing facility, but it is limited by transportation access. Mansfield Lahm Airport is the nearest facility that can accept oversized payloads, like spacecrafts, to test at Armstrong. That means trucking sensitive cargo over 60 miles of roads, a costly, disruptive, and sometimes technologically prohibitive endeavor. The addition of a 9,000' runway at ATF will generate additional testing for fragile cargoes too large or sensitive to move over the road, that are currently going elsewhere or not being tested at all, as well as open the facility to classified military tests and direct travel for DoD personnel to conduct sensitive hypersonic research and other projects. An enhanced runway will help ensure ATF can be utilized to its fullest, which is why completing this project in a timely manner is essential.

Aeronautics: We ask that you request \$1 billion in aeronautics funding in the FY24 budget, as Glenn is one of the Agency's four aeronautics research centers. Ohio is the birthplace of aviation with the Wright Brother to, now, leading on improving engine efficiency, electric aircraft propulsion at transport scale, and Advanced Air Mobility (AAM). AAM will revolutionize the way we travel and transport goods, from military capability to organ transport. The National

Advanced Air Mobility Center of Excellence, a center for innovation and collaboration in the AAM community, at the Springfield-Beckley Municipal Airport partners with NASA.

Aeronautics is another fast-changing area benefitting from the close partnership between GRC and industry. For example, nearly all ice protection technologies in use today were developed at GRC, with its Icing Research Tunnel and on-site pilots and research aircraft. Glenn's wind tunnels are used by every engine manufacturer to test aircraft propulsion systems and parts over a wide range of altitude and speed conditions up to Mach 4 and 90,000 feet. Clients span private, civil, and national security aeronautics, and testing facilities are fully booked for the next three years; requests extend into the late 2020s.

Aeronautics – Hypersonics: We ask that you request \$125 million for hypersonic research and testing in the Aerosciences Evaluation and Test Capabilities budget proposal. Glenn is a leader on hypersonics research, encompassing materials, and other technology for flight above Mach 5, which is increasingly important to U.S. national security.

Additionally, we ask that you support continued cooperation between NASA and DoD to fully resolve and activate United State Air Force (USAF) utilization of the Hypersonic Tunnel Facility (HTF) at ATF, along with the release of \$41 million previously allocated by DoD for hypersonic testing at HTF. HTF and subject matter experts are an invaluable asset to NASA, the DoD, and other researchers.

Aeronautics – Sustainable Aviation: We request you include \$250 million for NASA Glenn's research in electric aircraft propulsion in the FY24 budget proposal and designate GRC as a Level 2 facility. GRC is leading on transformative developments in aircraft power and propulsion that will make aviation more sustainable. As the administration pursues technology investments to lower emissions, aviation must be a priority. A transition to Sustainable Aviation Fuels (SAF) will provide near-term improvements, but meeting long-term goals requires the technologies where Glenn leads, like engine efficiency gains through HyTEC, electric aircraft propulsion at transport scale via the NASA Electric Aircraft Testbed (NEAT).

Ohio is the ideal place to advance the technologies discussed here. The birthplace of aviation and home to more than twenty astronauts, Ohio is also one of the largest suppliers of airplane components and a national leader in manufacturing. With fourteen public universities and a dozen federal research labs, the state has long been engaged in cutting-edge research and has a robust pipeline for training an innovative science, technology, engineering, and mathematics (STEM) workforce. NASA Glenn's current areas of leadership are only the beginning of what GRC can do.

Every federal dollar spent at NASA Glenn is estimated to result in three dollars spent by private companies, but organizations across the state are eager to multiply this impact if given the opportunity. Strengthening of NASA Glenn's procurement authority to increase support for Ohio-based suppliers and to incentivize aerospace industry investment in Northeast Ohio is key for the growth of NASA and its economic impact in Ohio. To this end, we urge you to take full advantage of the expertise and capabilities of NASA Glenn and the Ohio aerospace industry and

include robust funding proposals in the FY 24 budget request to help NASA keep up with the world's demand in the aerospace industry and FutureTech jobs.

Investing in NASA and cutting-edge technology is what puts us ahead. Thank you for your consideration and for your support of the NASA Glenn Research Center. We look forward to your FY 24 budget request.

Sincerely,