AS PREPARED

REMARKS FOR ACTING ADMINISTRATOR

ROBERT LIGHTFOOT

AERONAUTICS AND SPACE ENGINEERING BOARD

AERO 2050

Oct. 12, 2017

Thank you, Marcia (McNutt, NAS President) and Alan (Epstein, ASEB Chair), and thank you all for inviting me. Congratulations to the ASEB on 50 years. Certainly during that time, the ASEB has supported the country by "focusing talents and energies of the

engineering community on significant aerospace policies and programs."

ASEB has served the community as one of the most respected technical authorities, with an ability to assemble experts from all corners of the community, and we appreciate all of the insight you've given us.

Not only is Aeronautics the first A in NASA, it's especially applicable to our first letter as well, which is "National." Which means it's broad in scope, carries out work around the nation, and affects people no matter where they live. It's work that benefits

the whole country as well as really the entire aviation system across the globe.

Our aeronautics research program is addressing emerging aviation challenges and opportunities that we've identified with the help of many different voices from the aviation community.

Trends are converging to benefit the flying public including:

- ultra-efficient flight
- supersonic over land flight
- electric aircraft propulsion
- on-demand mobility

- urban air mobility, and
- fully autonomous flight

I think the average person boarding a plane at this moment probably has no idea about all of this work – the comprehensive and complex systems that we are evaluating over the entire air transportation system, and the cutting edge technologies that are on the verge of coming online.

NASA looks forward to the ASEB's continuing to be one of those voices that ensures our nation's continue leadership in transforming aviation.

From its first days in 1967, the ASEB recognized the vital importance of our nation's air transportation system. In one of its first products – the "Assessment of Federal Government Involvement in Civil Aviation Research and Development," the ASEB identified the need for NASA to "continuously consider air transportation as an essential mode in our national and international transportation network."

We've never forgotten.

NASA's vision for air transportation is compelling and relevant.

Most of you are aware of the economic impact of aerospace, but I

want to remind us all of some of the powerful facts. In the U.S. today, aviation-related goods and services provide a $90.5 billion positive trade balance, 10.6 million direct and indirect jobs, and $1.6 trillion in overall U.S. economic activity. And there is NASA-developed technology on board every U.S. commercial aircraft and in every U.S. control tower.

So this work is vital and essential on a lot of levels.

ASEB studies have shaped many policies and guided the direction of federal research in aviation, including wake turbulence, commercial aircraft propulsion and energy systems,

flight research capabilities, and autonomy in civil aviation, to name just a few. And it has provided signposts for long-term planning in dynamic times, such as the Decadal Survey.

The ASEB has indeed supported the country through its charter, which is dedicated, as I mentioned, to “focusing talents and energies of the engineering community on significant aerospace policies and programs.”

You’ll hear more about the intersections of ASEB’s work with that of NASA’s from Dr. Jaiwon Shin, our associate administrator for aeronautics research, during the next session.

The global aviation community is facing a number of significant challenges, while also balancing on the tipping point of transformational opportunities.

Challenges like rising international competition for the United States, more stringent regulations for noise and emissions, cybersecurity, privacy, and autonomy.

Opportunities like growing passenger demand leading to need for more new aircraft, robotics, and new technologies made possible through the digital revolution, such as additive manufacturing.

NASA Aeronautics is responding with research to address key challenges where we have a unique role to play.

In aeronautics, our strategy focuses on the advances we can bring for the next 25 years and beyond, and encompasses a broad range of technologies to meet future needs for safe, efficient, flexible, and environmentally sustainable air transportation.

Our role is going to take advantage of our ability to bridge worlds. For example, bringing together the standard aviation safety

culture with that of the newcomers – the “new kids on the block” who are racing to plant their flags in the “drone” economy. Safety is the key as we continue our work on urban air mobility and fully autonomous flight.

NASA is conducting field demonstrations of an “ecosystem” we developed in which small drones can safely operate in unregulated airspace. – The third round – this time over moderately populated areas - will start in January 2018. We invite industry and the FAA to participate in these increasingly complex demonstrations to test out their innovations, and to learn how these future systems might be broadly deployed in the future.

This bridge building also translates in our ability to convene industry, federal agencies and academia to stage complex demonstrations of new technologies for more traditional passenger and cargo traffic. For example, the NASA ATM Technology Demonstration (or ATD-2) field demonstration currently under way at Charlotte Douglas International Airport, uses new technology to connect airport, control tower, ramp tower and air traffic control centers to streamline traffic scheduling. American Airlines is our industry partner, along with the airport, the FAA, and the National Air Traffic Controllers Association. So far, the demo is running better than expected.

ATDs are part of the NextGen work for enhancing existing technologies so that traffic moves more efficiently through every point in the system. Which means more efficient arrivals, on-time departures, and less surface congestion. Things I think we can all support.

Then there's our ability to partner with industry to reduce the risk in considering revolutionary aircraft configurations. For example, in a few months we will award a contract to build the first low-boom supersonic demonstrator for flight over land. At stake is

data that could enable the creation of an entirely new manufacturing industry and faster transportation option.

Subscale models of the first of our New Aviation Horizons X-planes – a quiet supersonic technology demonstrator -- have been tested for airworthiness data in our wind tunnels. One model was in the 8x6 tunnel at Glenn a few months ago, and a second model is in the 14x22 tunnel at Langley right now. Additional research related to the coming demonstrator is the sonic boom data collection flight campaign flown in August near Kennedy Space Center, called “SonicBAT.”

All of this work supports that Low-Boom Flight Demonstrator, which is slated to have its first flight in 2021.

We expect to begin the preliminary design phase for an ultra-efficient subsonic demonstrator in late 2019 or early 2020.

NASA also has responded strongly to the growing interest in electric propulsion for aircraft. Right now we're completing phase one modifications of a general aviation aircraft to make it fully electric. One of its experimental electric cruise engines is undergoing testing on a new electric motor test rig right now at NASA's Armstrong Flight Research Center. This all-electric

aircraft, the X-57 “Maxwell,” is scheduled to fly in spring 2018 with those two experimental engines in their standard inboard positions. In October 2018 the X-57 will fly with those engines moved outboard to the wing tips. The final phase of flight tests will add 12 electric motors to the leading edge of the wing. All along the way, we’re gaining knowledge about electric propulsion that we will share with the community, and eventually apply to a large-scale electric propulsion X-plane.

So, NASA is fully committed to advancing the vitality and capabilities of aeronautics as part of our overarching mission to

increase our technical capacities and to improve life for everyone on the planet.

We're just a little bit older than you – next year NASA celebrates its 60th anniversary. And we just recently celebrated the 100th anniversary of our predecessor, the National Advisory Committee for Aeronautics. So I can say with some certainty, the best of ASEB is yet to come.

Today, the things you all are working on and the technology advancements NASA has been able to achieve over the decades

since our formation, have transformed the way we fly and look at what is possible for the next generation.

You may not see our logo on aircraft fuselages or in Air Traffic Control computer displays or on engine nacelles, but NASA's aeronautics research is with you when you fly.

And ASEB has been with NASA for the lion's share of our existence.

So we congratulate you and look forward to the amazing breakthroughs we know are coming, which are going to have an

impact on every citizen who travels, and those who depend on a vital and dynamic aviation system.

And we look forward to our continued partnership with ASEB.

Thank you.