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Good afternoon! Thank you for giving me this opportunity to share my vision of the future of NASA with folks who share my enthusiasm for aeronautics and space. After all, the first "A" in NASA stands for "aeronautics." Our researchers and test facilities have made decades of contributions to improvements in aviation. Now we're playing a key role in the discovery, testing, and development of fundamental, core tools and technologies to realize the Next Generation Air Transportation System (NEXTGEN).

But before we talk more about that, I want to begin by sharing with you the details of several major developments that took place last week, and preview a few new exciting things today.

First, last Wednesday, we announced that NASA has selected the design for a new heavy-lift rocket for our Space Launch System (SLS) that will take American astronauts farther into space than ever before. This new rocket will provide the cornerstone for America's future human space exploration efforts, while helping to create good jobs right here at home.

No later than this Friday we will issue a synopsis of NASA's acquisition strategy for the SLS. This will be followed next Thursday, Sept. 29, with an industry day in Huntsville, Ala., at which we will be seeking input from the private business sector on how best to approach awarding contracts for our new heavy-lift launch system.

This is a watershed moment for NASA. It opens a new chapter in America's amazing story of space exploration. It is key to implementing the new direction set for NASA by the President

and Congress in the bipartisan 2010 NASA Authorization Act which the President signed last year. In addition to a new heavy-lift rocket, our plan calls for:

- A crew capsule that is already under development
- Increased support for the commercialization of astronaut travel to low Earth orbit
- An extension and enhancement of activities on the International Space Station until at least 2020; and
- A fresh focus on new technologies that build our nation's deep space capability, improve life on Earth and bolster the American economy.

This launch vehicle decision is the culmination of a months-long, comprehensive review of potential designs to ensure that the nation gets the best possible rocket for the investment—one that is not only powerful, but is also evolvable so it can be adapted to

different missions as opportunities arise and new technologies are developed.

For you rocket scientists in the audience, the rocket will use a liquid hydrogen/liquid oxygen fuel system, where RS-25D/E engines will provide the core propulsion and the J2X engine is planned for use in the upper stage.

There will be a full and open competition to develop the boosters based on performance requirements. Its early flights will be capable of lifting 70-100 metric tons before evolving to a lift capacity of 130 metric tons.

This launch system will ensure continued U.S. leadership in space, inspire millions around the world and create good-paying American jobs - the kinds of high-tech jobs that keep our nation competitive. While I was proud to fly on the space shuttle, tomorrow's explorers will now dream of one day walking on Mars.

The second thing I want to share with you is that today we are funding optional milestones to two of our commercial crew development partners – Sierra Nevada Corporation and Boeing – to accelerate their development of commercial crew space transportation systems to carry our astronauts to the International Space Station and other low-earth orbit destinations.

In another significant step forward, we are also issuing a draft RFP today that will allow us to take the next step in our commercial crew development efforts and actually begin purchasing space transportation services for our astronauts.

This is further evidence that we are committed to fully implementing our plan – as laid out in the Authorization Act – to outsource our space station transportation so that NASA can focus its energy and resources on deep space exploration.

Finally, earlier today, at ManTech International Corporation's Nexolve facility in Huntsville, Alabama, we began testing the five tennis-court sized sunshield layers that will protect the mirrors and instruments of NASA's James Webb Space Telescope from the heat of the sun. As many of you know, the Webb telescope, now in development, will be the most powerful telescope ever built and the world's next-generation space observatory.

It is the successor to the Hubble Space Telescope and it will observe the most distant, never-before-seen, objects in the universe, provide images of the very first galaxies ever formed and explore planets around distant stars, revealing some of the universe's deepest secrets. The tests we are beginning will tell engineers how the sunshield will behave in orbit and represent another milestone on the path to success for this ambitious program.

These exciting developments are indicative of the fact that NASA is not only alive and well...we are poised to take the next big leaps into both human space exploration and scientific discovery.

We've been talking about what's next for NASA in space. But we're also doing work to address what's next for our national air transportation system here at home. Why? Because aviation is of critical importance to the United States and to the rest of the world. This, hopefully, goes without saying to this audience. It is an irreplaceable part of the transportation system – an economic engine that provides high speed, second-to-none safety, and tremendous reliability.

You'll find NASA DNA in nearly every civilian and military aircraft flying today. Just a few examples: Winglets – vertical extensions on wingtips of civilian and military aircraft that decrease drag and help conserve fuel. Then there are composite structures, digital fly-by-wire, glass cockpits, and intelligent flight control systems.

For military aircraft, NASA DNA can be found in variable sweep wings, thrust vectoring, short takeoff and landing (STOL), and vertical short takeoff and landing technologies (VSTOL).

NASA DNA is also on board new aircraft entering service very soon. Our work in advanced composites, engine chevrons to reduce noise, laminar flow improvements and new simulation tools have contributed to fuel, emissions and noise reductions projected by Boeing for its 787 and 747-8 aircraft.

Our work in engine combustion, engine acoustic measuring tools, engine design, and new turbine blade materials and thermal coatings are contributing to fuel, emissions, and noise reductions projected by Pratt & Whitney for its Purepower 1000G Geared Turbofan engine, and by CFM for its LEAP-X turbine engine.

Now we're working on having as big an impact on the challenges facing our entire air transportation system -- improving capacity and mobility in our airspace; reducing fuel consumption, noise and emissions in really significant ways; and maintaining and improving safety. So here are just a few examples of some things we've already achieved and what's next from NASA aeronautics.

At San Francisco International Airport, fog conditions cause big delays nearly every day in summer. NASA just developed a decision support tool that helps air traffic managers achieve more efficient and accurate release of ground holds.

Expectations are that this tool will result in significant near-term reductions in ground delays and a savings of \$10 million per year.

We're starting an air traffic management technology demonstration campaign that will integrate NASA tools with the FAA and aircraft using automatic dependent surveillance-

broadcast (ADS-B) technology to improve aircraft arrivals at congested airports. As with the ground hold decision support tool, fuel savings are expected to be a big benefit of this work.

We've completed a series of studies with industry and academia into advanced vehicle concepts – subsonic through supersonic. These studies help us identify revolutionary technologies and sometimes revolutionary new aircraft shapes. They show us how we might achieve our ultimate goal of *simultaneously* reducing fuel use, noise, and emissions.

Finally, we're tackling problems at the system-level – the "big picture." An example of this approach is the work we're doing to reduce the technical barriers that prevent Unmanned Aircraft Systems (UAS) from getting routine access to the National Airspace System – barriers like separation assurance, communications, and certification.

The benefits of all of this work extend beyond environmental and energy impacts. We'll improve efficiency for today's fleet of aircraft, while providing tools that can scale up as traffic grows and more types of vehicles enter the system. We'll help make it possible for airlines to get maximum benefit out of new aircraft technologies. We'll provide tools and information needed by the FAA to certify new equipment and improve overall safety.

All of this we believe supports US competitiveness, the economy, and jobs. This is a national priority.

In fact in the President's American Jobs Act he proposes that one billion dollars be made available to the Federal Aviation Administration to carry out Next Generation advancements that will make air travel safer, faster, more efficient and easier.

The American Jobs Act will not only spur this kind of innovation, it will accelerate hiring and promote growth throughout all sectors of the American economy.

The United States Air Force has been a key partner in many of NASA's aeronautics achievements over the decades. Right now the Air Force Research Laboratory is part of our X-48 research team. The X-48 is a blended wing body configuration – no tail and a wing that blends into the fuselage. It has the potential to achieve that ultimate goal I mentioned earlier -- dramatically reduce noise, emissions, and fuel use *simultaneously*.

There's a 21-foot wingspan remotely piloted X-48 test vehicle out at NASA's Dryden Flight Research Center that's completed a first round of test flights. It's been modified based on what we learned in those tests; round two of testing has just begun.

At the hypersonic level, we're building a new legacy with the Air Force through development of the air-breathing scramjet propulsion technology. In 2004, flights of the X-43A uncooled

scramjet – each about ten seconds – broke speed records. One flight clocked in at Mach 9.6 or about 7,000 mph. For scramjets, though, it's as much about actual operation time as speed. In 2010, the X-51A fuel-cooled scramjet achieved an operation time of nearly 150 seconds. Right now work continues on developing a practical hypersonic vehicle, with more sophisticated technology flight experiments planned in the next few years.

Aviation is a critical part of the United States economy. Nearly every moment of a normal day, the FAA simultaneously controls more than 4,000 flights. In this time of continuing economic challenges, the aeronautics industry provides the kinds of jobs that Americans are proud to have. The U.S. Department of Transportation Bureau of Transportation Statistics identified nearly one million air transportation and domestic manufacturing jobs in 2009.

Our goal at NASA is to bring technologies out of the labs and into innovative products – that means strengthening our partnerships with industry, academia, and other government agencies. We can't do it alone. We also need to ensure that the next generation of engineers and scientists are at the forefront of aerospace. So we need to be bold, think big and do all we can to inspire and develop the greatest workforce in the world. We know we can count on your help.

Thank you.