HUMANS TO MARS SUMMIT

Remarks by Administrator Charles Bolden

May 5, 2015

AS PREPARED FOR DELIVERY

Thank you all very much … I especially want to thank Artemis Westenberg and everyone at Explore Mars, Inc. for bringing us together today, along with our gracious hosts here at The George Washington University.

It's great to join you all again for another *Humans to Mars Summit*. You'll be hearing from a number of my NASA colleagues during the course of this summit. In fact, later this morning there is a phenomenal leadership panel scheduled with William Gerstenmaier, who leads our Human Exploration efforts; John Grunsfeld, who runs our Science Mission Directorate; and Steve Jurcyk, who runs Space Technology at NASA.

One of the reasons that we are such enthusiastic participants in this conference is that we strongly believe that it's important to raise the public's awareness about our nation's *Journey to Mars*.

There's great value in reminding our neighbors that landing astronauts on the Red Planet isn't just a pipe dream or merely something you see in the movies or read about in comic books. It's the culmination of years of planning and work and discovery and dreaming and – yes – at times discussion and debate.

So let me take this opportunity to thank you for what you are doing to remind our neighbors – here in the U.S. and around the world – that the Journey to Mars is real; it's attainable and it matters to humanity and the pursuit of human progress.

MARS MATTERS

When folks would ask the British explorer George Leigh Mallory why he chose to climb Mount Everest, he used to answer simply *"because it's there."* You and I know that we choose to go to Mars for much deeper and profound reasons.

I'm sure many in this room can recite these reasons in their sleep – but I'm going to repeat a few of them anyway, because, as Martin Luther King is purported to have said, sometimes it's important to preach to the choir … otherwise they might stop singing.

So I want you to repeat after me … "Mars matters."

Because its formulation and evolution are comparable to Earth's … Mars matters.

Because we know that at one time it had conditions suitable for life … Mars matters.

Because what we learn about the Red Planet may tell us more about our own home planet's history and future … and because it might just help us unravel the age-old mystery about whether life exists beyond Earth … Mars matters.

THE EMERGING CONSENSUS

Because Mars matters, we've embarked on a Journey to the Red Planet. It's a Journey NASA actually began not four weeks, four months, or even four years ago … it's a Journey we've been on for the better part of four decades – actually a little more than that.

It is my firm belief that we are closer to getting there today than we've ever been before in the history of human civilization.

As a result we are on pace to reach the goal that President Obama articulated five years ago at the Kennedy Space Center in Florida: to send American astronauts to Mars in the 2030s.

There is a new consensus that's emerging around this timetable, and around this goal.

There is also a consensus emerging around NASA's plan for getting there.
This plan is clear. This plan is affordable and this plan is sustainable.

Over the course of this conference, you'll be hearing a lot about reviews and studies of our *Journey to Mars*, including a new one done by the Jet Propulsion Lab, which further validates NASA's plan for putting American boots on Martian soil by the 2030s.

Each of these studies – including the JPL review you'll hear more about tomorrow – concludes that there are certain critical elements needed to carry out a journey to Mars. The JPL study says there are six building blocks needed – things like the Space Launch System, the *Orion* spacecraft, a Deep Space Habitat, along with new technologies like solar electric propulsion.

I'm pleased to report that work is already underway at NASA on four of the six critical elements and the fifth – advanced propulsion – is being moved forward through an innovative partnership with American industry we call "NextSTEP".

In fact today we're releasing details about the projects we're working on with a dozen industry partners at www.nasa.gov/nextstep.

Other elements needed to advance our *Journey to Mars* can be accomplished in conjunction with other commercial and international partners.

JOURNEY TO MARS

With this is mind, I thought I'd run through a few of the key elements of our plan, starting with robotic exploration; building upon the progress we've already been making – and making for decades – dating back to Mariner 4's flyby in July 1965.

America is still the only nation to successfully land a spacecraft on Mars. When our latest Mars spacecraft, *MAVEN*, arrived last September to study the Red Planet's upper atmosphere, it joined a fleet of orbiters and rovers that we already had on the surface – and have had on the surface since Viking I and II landed in the 1970s.

Next year, we will send the *InSight* lander to study the planet's core and in 2020, a new rover called *Mars 2020* will build on the success of *Curiosity* and help us prepare for human arrival at Mars and, for the first time ever, it will cache a sample for later return to Earth.

We're also working with our European partners on ExoMars – their mission to search for biosignatures of Martian life. We're providing several components for the ExoMars Orbiter that is set to launch in 2016 as well as the rover that will launch in 2018.

So robotic exploration is an important part of this – and so too is human exploration; it has to be if the end goal is putting American feet on the surface of Mars.

The human journey to deep space begins in low Earth-orbit aboard the International Space Station (ISS).

In March, I had the opportunity to attend the launch of American astronaut Scott Kelly and his Russian cosmonaut counterpart, Mikhail Kornienko, into space as they began their historic year in space. It's the first time an American astronaut will live and work in space for an entire year and it's an important stepping-stone on our journey to Mars.

Scott joined a team of dedicated American astronauts who, aboard the ISS, are helping us learn how to safely execute extended missions deeper into space.
The human research will help us prepare for long-duration crews, while other experiments help us better understand things like habitability; how much space a crew needs for a long-duration mission.

Now, as for the ISS, we are guaranteed this unique orbiting outpost for at least another decade by President Obama's commitment to extend the ISS until at least 2024. This means an expanded market for private space companies, more groundbreaking research and science discovery in micro-gravity and opportunities to live, work and learn in space over longer periods of time.

As most of you know, we've already returned cargo resupply missions for the ISS to the United States and the result is that we're insourcing jobs and creating a whole new private market in low earth orbit.

The next step is commercial crew launch capability: Just a few weeks ago, astronauts aboard the Space Station undertook three successful spacewalks. They were helping configure the Station to accept commercial vehicles that are currently being developed by SpaceX and Boeing – in just a couple years, these vehicles will transport American and partner nation astronauts to the Space Station from American soil.

Our next step is deep space, where NASA will send the first mission to capture and redirect an asteroid to orbit the moon. Astronauts aboard the *Orion* spacecraft will explore the asteroid in the 2020s, returning to Earth with samples. This experience in human spaceflight beyond low-Earth orbit will help NASA test new systems and capabilities – such as advanced, high power solar electric propulsion – we'll need to support a human mission to Mars.

To get to deep space, we're continuing to develop *Orion* and the Space Launch System (SLS) rocket. Recently, we fired up the largest, most powerful booster ever built, in a ground test for SLS - at the Orbital-ATK test facilities in Utah.

As for *Orion* … when the President laid out his vision for the *Journey to Mars* at the Kennedy Space Center, he stood in front of a mock-up of *Orion* and pledged that the spacecraft would be readied for flight in the years ahead.

This past December, *Orion* had a highly successful test flight that took it farther into space than any spacecraft built for human passengers has flown in more than four decades. When she returned home, she brought with her critical data that we'll be able to use as we plan future crewed missions to deep space.

Meanwhile, because technology drives exploration, engineers and scientists around the country are working hard to develop the technologies astronauts will use to one day live and work on Mars and safely return home … from space suits … to habitats … to advances like Low Density Supersonic Decelerators that will allow heavier spacecraft to land safely on places like Mars.

In order to pioneer space – as President Obama put it, to push out into the Solar System "not just to visit, but to stay" – these new technologies are critically important. The further we advance and learn and discover, the more our technologies will need to evolve, be upgraded and grow. They are what will allow us to establish a sustainable human presence on Mars.

The great news is that in many cases, technological advances are "two-fers" or even "three-fers" because they also provide spin-off benefits and create high-paying jobs here on Earth.

CONCLUSION

In short, we're firmly on a *Journey to Mars* and we're counting on you to join us. Many of you already have.

As President Obama has said, "*Our goal is the capacity for people to work and learn and operate and live safely beyond the Earth for extended periods of time, ultimately in ways that are more sustainable and even indefinite. And in fulfilling this task, we will not*

only extend humanity's reach in space -- we will strengthen America's leadership here on Earth." End quote.

Thank you for joining us here today. Thank you for the courage of your convictions and for spreading the word about the possibility and promise that flow from our Journey to Mars.

I wish you all the best throughout this summit and beyond …