

**Remarks for International Space Development Conference
Shana Dale
Deputy Administrator
National Aeronautics and Space Administration**

May 5, 2006

Thank you Hugh (Hugh Downs, Chairman of the Board of Governors and an ex-officio member of the Board of Directors for the National Space Society) for that very gracious introduction. It is indeed a great honor to be introduced by a gentleman who is a universally respected leader in the space community, and who also had the distinction as NBC Today Show host of broadcasting the drama of the first great era of lunar exploration. And Hugh, I can't wait for you to be able to provide expert commentary the next time an American astronaut renews the exploration of the moon. Thanks again Hugh for the honor of speaking today.

I'm excited to be here today and to be speaking to a group that is enthusiastic about space exploration and the endless possibilities that it promises. Another reason for my enthusiasm is the diversity that is represented here in the form of different

backgrounds and professional fields, from scientists, entrepreneurs, business people, broadcasters, government representatives, academics and many others all linked by a passion for space exploration and a drive to make space our own.

I just met with a group of space entrepreneurs yesterday, many of whom are in the audience, and it was impossible to walk away from that meeting with anything but the utmost respect at the commitment these individuals are making in their quest for space. They are risking their lives and fortunes to do something extremely complex and yes, dangerous. Not because it is the easy way or only for the money, although hopefully that will come later, but because it is hard, it is dangerous, it is unknown, and it is space. Their enthusiasm for space, and for the aspirations we all share, is inspiring and again, I have a lot of respect for them.

Some of you may know my background, but for those who don't please allow me to share how and why I am here and talking to you about this topic today. When I was in law school in San Diego, I was most interested in space and telecommunications law. During my third year in law school, I

applied for an attorney position in NASA but did not get it. I graduated and went into private practice, business litigation, in San Diego but never lost sight of the areas of law that really interested me.

I became intrigued by the idea that I could pursue my interests working for Congress. I pounded the pavement for a week and landed a job on the House Public Works & Transportation Committee. After a year there I got lucky when a job came open on the House Science Committee, which took me closer to my goal of working on space issues.

Eventually I moved up the ranks to become the staff director of the Space & Aeronautics Subcommittee. While in that position I became a passionate supporter of commercial space.

I do believe there is a critical role for the federal government – that of trailblazer and the entity that lays the infrastructure that enables commerce to follow and flourish. I co-authored the Commercial Space Act of 1998, which laid the groundwork for commercial data buys of Earth and space science data. There also were some provisions intended to help stabilize the foundation for the commercial remote sensing

industry. There were many hard-fought battles with DoD and the State Department and we did not get all we wanted but it was a start.

While on the Hill I also became concerned about the lack of a visionary strategy for human spaceflight after the era of the Shuttle and International Space Station ended. I left the Hill in 2000 and went to work for the University of Texas System.

In early 2001 I received a phone call from a former Science Committee colleague who had gone over to the Office of Science and Technology Policy in the White House. That call resulted in my going over to OSTP on a detail to help out for a couple of months and 4 ½ years later I left.

I was intensely engaged in homeland and national security work but during my time as Chief of Staff I got to glide over the top of all that as going on in the office. OSTP was a major player in the White House as the Vision for Space Exploration was being developed and the space guys would pull me in every once in awhile to use me as a sounding board, given my background in space. I was so excited that a truly visionary strategy for space exploration was being developed – it was what I had hoped for so many years ago.

When Mike Griffin called and asked me to join NASA and help him to fulfill the Vision for Space Exploration, it came as a surprise and I had to think it through as I was fully dedicated to the homeland security mission.

It was really a package deal for me and both elements had to be in place or I don't think I would be in this position today. Those two elements are: 1) the Vision for Space Exploration and 2) an Administrator with the skills necessary to make the Vision a reality – and that is Mike Griffin. At the end of the day, I couldn't turn down a once in a lifetime opportunity to fulfill that dream that began in law school many years ago.

While it is gratifying that I can finally have NASA on my resume, the real sense of excitement lies in the fact that we're embarking upon this great new adventure and it is frankly, intoxicating from time to time. From meeting with no-holds-barred space entrepreneurs to working with the can-do executive team at NASA, I am privileged to be here at this unique point in time.

I sense that you share this enthusiasm as well and we, as a community, are ready for this next step on the pathway to space in this new era of exploration. And there is much to be hopeful

about. We in the space community have been vested with a great opportunity with the Vision for Space Exploration that President Bush presented two years ago and which Congress has overwhelmingly endorsed with the NASA Authorization Act of 2005. The Vision is now national policy.

At this juncture let me share a video that captures where we have come on the road to human expansion into space and the promise that it holds for us and future generations. I'd like to thank Doc Horowitz and the Exploration Systems Mission Directorate for putting the plan together that makes this video possible.

There is great enthusiasm for what we can achieve in space, but I must caution against taking this Vision for Space Exploration for granted. This vision reflects our national character to explore the frontier, but we have a lot of hard work ahead of us if we hope to attain its goals—to advance U.S. scientific, security, and economic interests through a robust space exploration program.

It is now up to us, and when I say “us” I’m not just talking about NASA. I’m talking about every part of the aerospace community and other communities we have yet to tap into. This

community must be the vanguard for making the Vision for Space Exploration a reality by laying a strong and enduring foundation through demonstrable progress with programs and hardware and through effective delivery of our message to the American public and to citizens of other nations.

A simple fact is that NASA cannot do this alone. A strong and vibrant commercial sector is essential to fulfilling the long-term aspirations of the vision. As Mike Griffin has said, “An explicit goal of our exploration systems architecture was to provide an avenue for the creation of a substantial space economy by suitably leveraging government investment to meet its stated mission requirements.”

A good analogy that demonstrates Mike’s point is the laying of the transcontinental railroad. An enterprise long dreamed of, but thought impossible to carry out without government support given costs required, not to mention the near insurmountable engineering challenges that loomed in its path.

In the spring of 1863, with a rebel army heading into Pennsylvania, President Abraham Lincoln, one of the great railroad lawyers of the West, called Grenville Mellen Dodge, the

most accomplished railroad builder of his day to Washington D.C. to discuss the location for a terminus for the Union Pacific to begin its pathway to the West Coast. Lincoln had met Dodge in 1859 in Council Bluffs, Iowa where after an extended grilling from the then presidential candidate on the best route for a railroad to the West, Dodge advised that the best starting point was right there in Council Bluffs.

A railroad to the West Coast was already very much on the minds of Americans by that time. A year before this meeting, Henry V. Poor, the editor of the American Railroad Journal wrote, “In a railroad to the Pacific we have a great national work, transcending, in its magnitude, and in its results, anything yet attempted by man. By its execution, we are to accomplish our appropriate mission, and a greater one than any yet fulfilled by any nation.”

On July 2, 1864, as the Civil War raged on and with Confederate General Jubal Early bearing down on Washington, President Lincoln signed the Pacific Railroad Act into law creating a vehicle to fund the construction of the railroad by two competing railroads coming from the East and the West, the Union Pacific and the Central Pacific.

President Lincoln understood two things that made this a priority in the face of a catastrophic civil war. The first being the transformational qualities that a railroad provided to new settlements in the form of commerce and communication.

Lincoln was distinctly aware of these benefits from his experience in Illinois. With the railroad came opportunity, enterprise, innovation and a broader connection to the world.

The second was to completely fulfill America's link to the West and extend our presence into a land largely unknown up to that time. He also recognized that while there is a role for government, this project could not be completed without private industry. Thus a competition was created that pitted two great rail lines against one another in a race to create the single overland pathway to the West.

We all know how it turned out. The Union Pacific and Central Pacific met in Promontory Summit, Utah and the final golden spike was driven on May 10, 1869. The history of the West was cast that day when the two great railroads joined, linking the nation East to West, and creating a path for enterprise, expansion and development never before seen.

So why am I telling this story? Not to give you a history lesson, but to impart to you that government has a role, and that precedents in history show that commercial enterprise must be prepared to build on the government investment to sustain the activity and make it viable and vibrant, whether it's building a pathway to the West or enabling access to space.

I think it is a fitting analogy also because past rationales for space exploration have often focused on the scientific advances that we can gain, and they are significant and very important. Another vital component is represented by the people in this room who have true commercial aspirations for space that can be realized once the "track" is laid.

I also believe that the lessons learned and innovations developed to create the transcontinental railroad were critical to overcoming other large-scale engineering challenges that stood in the way of American economic expansion in the post-Civil War era.

So it will be said of Space Exploration. NASA has a long history of developing innovations that have contributed to our economic competitiveness. And I'm not talking about spin-offs, which are great in their own right. I'm talking about innovation

and the development of new technologies in a high-tech industry – the aerospace industry – that has been and can be a major driver of the U.S. economy. As a shared exercise in the exploration of space, we can contribute exponentially to American economic competitiveness. The same is true for other space-faring nations and the investments they make in space.

I also like the railroad analogy because it was a race, a competition between the most brazen and forward-looking commercial entities in the world, not unlike some of the entrepreneurs I met with yesterday. Market forces are very powerful indeed, and if we can sufficiently enable them, I am confident that we will see the same ingenuity and drive that sped the rail out West applied to making all of space a viable and profitable human commercial zone.

So what can NASA do to enable commercial participation in this grand quest? Well we're taking several unprecedented steps to help the commercial sector contribute to space exploration in a meaningful and hopefully profitable way.

Just last week we wrapped up the Lunar Exploration Strategy Workshop that saw international partners, business, academia and government come together to explore ways to

leverage resources and build on synergies to use access to the lunar surface to benefit commercial, scientific and international interests. Feedback from the participants deemed this workshop to be very successful. This early dialogue among all stakeholders is critical to ensuring a successful global strategy and building an infrastructure that takes into account the needs and desires of all sectors.

In addition to this workshop, a Request for Information has been issued to solicit input from the broader community, so I strongly encourage anyone with an interest to weigh in and let us know what you are thinking. The deadline is May 12.

In January, NASA issued a challenge to U.S. industry, both the established aerospace companies and the emerging entrepreneurial companies. Through our COTS announcement – more well-known as the commercial crew/cargo initiative – we are challenging all interested parties to demonstrate through competitive proposals that they can establish capabilities and services to safely and reliably support the Space Station’s cargo and crew transportation needs.

This initiative establishes a precedent. For the first time ever, NASA is seeking non-government vehicles and

commercial services to provide these capabilities for human space flight.

For what we hope will result in a Space Act agreement or agreements, we are putting up about a half-billion dollars over the five years of our current budget run out for those companies that have the best proposals for Earth-to-orbit space flight demonstrations of any one or combination of four capabilities: first, external un-pressurized cargo delivery and disposal; second, internal pressurized cargo delivery and disposal; third, internal cargo delivery and return, and fourth, crew transportation.

Given the probable need for (1) logistics support during International Space Station assembly, (2) the need for cargo and crew transport during the time between Shuttle retirement in 2010 and the Crew Exploration Vehicle coming online, and (3) the ongoing need for this capability even after the CEV comes online, this is a substantial opportunity for the commercial sector.

NASA has structured a business arrangement that will promote genuine competition and one that is good for the private sector as well as the public interest.

NASA also recently issued a Request for Information from its Innovative Partnership Program to explore the idea of a venture capital project with the working title “Red Planet Capital.” The concept is an investment vehicle used to support innovative, dual-use technologies that will help NASA achieve its mission and help better position these technologies for future commercial use.

Red Planet looks to address several challenges that are not being met through the traditional procurement process, or through less traditional mechanisms like prizes, license agreements, and space act agreements, specifically:

- To attract and motivate private sector innovators and investors who have not typically conducted business with NASA, including tapping more efficiently into the pool of small, leading-edge, organizations which are responsible for much of the innovative hi-tech thinking and research in the US;
- To leverage existing external venture capital to encourage development of technologies and products likely to be of future use to NASA’s mission;

- To improve and expedite public/private partnership formation, through the redesign of administrative, management, and legal processes and procedures.

We received a strong response to the RFI and hope to have a selection made in May.

Another approach that NASA is taking to harness the power of the free market is the new Centennial Challenges Program, which will use the tool of prize competitions, so successfully demonstrated by the X PRIZE, to plant the seeds for future commercial activities. While this is a new program, there is a history of prize competitions in aeronautics that goes back much further. For example, Charles Lindbergh made his famous flight across the Atlantic to win a prize. In fact, NASA's predecessor organization, the National Advisory Committee on Aeronautics, was created because prizes were advancing early aeronautical technologies in Europe faster than they were developing here in the United States. This legacy of success lead NASA to create the Centennial Challenges Program to spur innovation after the Vision for Space Exploration was announced.

To date, all of NASA's competitions have been limited to prizes that are worth \$250,000 or less. Within this limit, we've been able to start some great small prizes in key areas of technology like lunar resource utilization, wireless power transmission, and advanced astronaut gloves. We now have eight upcoming prizes competitions, five of which are currently open for team registration. We're getting a great response to these prizes.

On two prizes, 20 teams have already registered to compete. On two more prizes, potential competitors have sent in about 200 indications of interest.

These competitions are administered by five non-profit organizations at no cost to NASA. You'll get an introduction to four of these organizations – the California Space Education and Workforce Institute, the Florida Space Research Institute, the Comparative Aircraft Flight Efficiency Foundation, and the Spaceward Foundation -- and the prizes they're running at a panel later today. And on Saturday, the NASA managers running our Centennial Challenges program will be taking suggestions from the audience on ideas for future prize competitions.

But NASA has wanted to do more and we've been limited only by the absence of legislation that would allow us to pursue more ambitious prize competitions. This January, Congress passed the 2005 NASA Authorization Act. In addition to endorsing the Vision for Space Exploration, this legislation provided a number of important authorities for NASA, including the authority to conduct large prize competitions. Thanks to Congress, NASA can now sponsor prize competitions worth millions or even tens of millions of dollars.

Today, I am pleased to announce that NASA is formally starting its first large, multi-million dollar prize competition. The \$2 million Lunar Lander Analog Challenge is designed to stimulate the development of the kinds of rockets and landing systems that NASA needs to return to the Moon, while also accelerating the development of the private suborbital space flight industry.

I am also pleased to announce that NASA will be collaborating with the X PRIZE Foundation to manage this competition as part of their annual X PRIZE Cup event.

The first Lunar Lander Analog competition will take place this October in Las Cruces, New Mexico. I look forward to the competition and to seeing all of you there.

With that let me conclude my talk and introduce Dr. Peter Diamandis, the founder of the X PRIZE Foundation, who will discuss the rules of the competition.

Thank You.