

TESTIMONY OF MS. PATTI GRACE SMITH
MEMBER OF THE BOARD OF DIRECTORS FOR THE SPACE FOUNDATION
HOUSE SCIENCE AND TECHNOLOGY COMMITTEE
SUBCOMMITTEE ON SPACE & AERONAUTICS
“ENHANCING THE RELEVANCE OF SPACE TO ADDRESS NATIONAL NEEDS”

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Good morning Chairwoman Giffords, Ranking Member Olson, and distinguished members of the subcommittee. My name is Patti Grace Smith and I am one of the Board of Directors for the Space Foundation. On behalf of myself and Space Foundation CEO, Elliot Pulham, I want to thank the subcommittee for providing the Space Foundation the honor to sit before you today to talk about enhancing the relevance of space to address national needs.

I applaud the subcommittee for picking today to hold this hearing, on the 40th anniversary of Apollo 11 lifting off the pad on its historic mission to the moon.

Background

Before I begin to address the questions the subcommittee asked me to discuss today, I'd like to provide the subcommittee with a little background on the Space Foundation.

Our mission: *To advance space-related endeavors to inspire, enable, and propel humanity.*

In 1983, a small group of visionary leaders in Colorado Springs saw a need to establish an organization that could, in a non-partisan, objective and fair manner, bring together the various sectors of America's developing space community and serve as a credible source of information for a broad audience - from space professionals to the general public. The Space Foundation was founded March 21, 1983, as an IRS 501 (c)(3) organization "to foster, develop and promote, among the citizens of the United States of America and among other people of the world ... a greater understanding and awareness ... of the practical and theoretical utilization of space ... for the benefit of civilization and the fostering of peaceful and prosperous world."

As the global space community has evolved, so has the Space Foundation - embracing all facets of space - commercial (including telecommunications and other satellite-based services), civil, and national security. In fact, the Foundation is one of a few space-related organizations that embrace the totality of this community rather than focusing on a narrowly defined niche.

In the 26 years since its founding, the Space Foundation has become one of the world's premier nonprofit organizations supporting space activities, space professionals and education. The Foundation's education programs have touched teachers in all 50 U.S. states and Germany. It sponsors and conducts the premier events for space professionals anywhere in the world today: the National Space Symposium, the Strategic Space Symposium in Omaha and the Space Business Forum in New York City.

Outside of Colorado Springs, the Space Foundation's largest presence is in Washington DC. This is where our government affairs team and our Research and Analysis (R&A) team reside. Our government affairs team are not lobbyists, but rather work to promote and educate decision makers about space *writ large*. They hold informational and educational briefings on a variety of civil, commercial and national security space issues. The R&A team works year-round in producing white papers and most prominently, the annual *Space Report*. *The Space Report* is the Space Foundation's "flagship" publication. *The Space Report* is a snapshot of the global space economy.

As I mentioned earlier, my role with the Space Foundation is as a member of the Board of Directors. Our current chairman is retired General Tom Moorman Jr. USAF (Ret.), our vice chairman is Dr. Bill Ballhaus, our treasurer is Mr. Lon Levin and our secretary is Mr. Marty Faga. I'd like to point out to this committee that its one-time chairman, Bob Walker, was also on our board and even served as its chairman.

Now, that I've provided some information for those of you who may be new to the Space Foundation and what we do, I will begin to address the questions presented to me.

How relevant is space to addressing important national needs, and what noteworthy benefits have been achieved as a result of past space-related investments?

I am not saying anything new when I say to you that space is absolutely essential to all facets of modern human existence. Space is the bedrock of America's economic and strategic power. According to *The Space Report 2009*, the global space economy has grown to \$257 billion, a number that is not insignificant.

In the macro-sense, *The Space Report 2009* cites in-depth how space enables a variety of important national needs:

- National security: The U.S. military could not fight as effectively and efficiently as it does today without the aid of space systems. Other nations seek to emulate this capability because they have seen how powerful it is. With each new generation of military space systems, troops farther down the chain of command are given access to powerful space-enabled tactical capabilities that were once only available to senior commanders.
- Governance: Policy makers need accurate data on a variety of issues ranging from climate to urban planning to resource monitoring. Remote sensing from space has provided this data and will continue to do so as long as the investment is made in new

space systems for this purpose. When natural disasters such as Hurricane Katrina occur, satellite communications are often the only way for emergency responders to coordinate their efforts in the absence of terrestrial infrastructure. Technology developed to detect stresses in the frame of the Space Shuttle has been adapted for use on Earth and is now helping to monitor the structural integrity of bridges and other structures to ensure public safety.

- Economy: Financial systems rely on GPS satellites for accurate timing of transactions. Satellite-based Internet connectivity offers a practical way to bring rural populations into the Internet age and join the information economy – one of the administration’s goals.
- Transportation: I personally know that space is integral to the Next Generation Air Transportation System being implemented by the FAA, which will enable cleaner, safer, more efficient air travel. On a local scale, metropolitan authorities in several cities have implemented systems like the one now in place for D.C.’s Metrobus service, which allows passengers to check on the internet or by telephone to see when the next bus will arrive. Innovations like this encourage the use of public transportation, thereby reducing pollution and traffic.

Additionally, *The Space Report 2009* enumerated an exhaustive list of ‘everyday’ space products, services and benefits. Some of the most prominent:

- Weather prediction/disaster mitigation
- Resource exploration/exploitation
- Erosion monitoring and management
- Global communications
- Guidance/navigation/timing
- Population forecasting
- Attaining a better understanding of our place in the universe
- The numerous spin-offs that have directly enriched the lives of people all over the world. Investment in space constantly generates new products and spinoff technologies that U.S. companies can build and market.

In *The Space Report 2009*, one new emerging area that more and more Americans are using via their iPhones and other hand-held PDAs is that of “geoinformatics.” This is a very unique convergence of GPS, and remote sensing to enable the user to have real-time location-based content. The average user of such capabilities will be blissfully unaware that space-based systems helped him find a flower shop at the last minute on his anniversary, he’ll just be glad he has it and soon will take it, much like all other space enabled capabilities, for granted.

I would posit to the subcommittee that a “day without space” - - a day without space generated benefits for American consumers, would be a shocking, if not, traumatic experience for most Americans.

The inspirational value of space activities is equally important, but I will address that point later in my testimony.

What does the Space Foundation recommend be done to maximize the benefits to be realized from the nation's space activities and the relevance of those space activities? How important is it for those activities to be aligned to national goals and objectives?

First off, I want to commend President Obama on his decision to review the entire US space policy. Like each of his predecessors since President Eisenhower, the President realizes the importance of space and is making space a priority.

Secondly, I feel that most of our space activities are pretty well aligned with our national goals and objectives. Whether decision makers realize it or not, many of our goals and objectives depend on and are enabled by space assets.

Thirdly, however, I feel I must touch upon a larger problem in order to address this question. In order for the US government to maximize the benefits of its investment in space, it needs to improve the acquisition of those systems. They should be developed faster and with more management discipline. We all know of space systems that have been over budget and behind schedule.

Currently we are facing a number of gaps across the entire range of the civilian and national security space systems. From human spaceflight, to solar radiation detection, to next generation GPS, to missile warning, to climate and weather monitoring, there are, or soon will be gaps in coverage and capability that will hamper our ability to derive benefits from space. These gaps will also force us to be reliant on foreign space systems. I also would say that it is beyond a coincidence that we are seeing such a systemic gap problem in so many areas. Once we get back to better management of space systems, we can deploy more systems more often and accrue more benefits from them.

Fourthly, we need to modernize the export control regime to allow U.S. space companies to compete effectively in the global marketplace. This is one area in which the U.S. already generates a positive trade balance, but it could be significantly larger and would provide more funds for U.S. companies to develop new jobs and innovations that help both the domestic space industry and the broader U.S. economy. *The Space Report 2009* shows that the commercial sector now makes up 68% of the global space economy, so regulatory changes have the potential to generate considerably more R&D funds than direct investment by the government.

How important is the inspirational component of the nation's space activities, and what would be the most effective ways to use space activities to motivate emerging generations of Americans to pursue studies and careers in science and engineering?

In one word: essential.

Let me put this in perspective for the members of the subcommittee. While most of you have vivid memories of the Apollo moon landings, I am willing to bet you that the vast majority, if not all your staffers do not. Let alone were they even alive when the landings occurred. The post-Baby Boom generations do not have the memory of the Apollo, but instead the Challenger or Columbia disasters.

Furthermore it is not like the 20 and 30 somethings of today do not care about space. They do. These people are the most hi-tech infused generation in the history of humanity. However, being active or even somewhat participatory in the US government's space enterprises do not feel like a viable option. Instead they are going to other places where they can feel like they are making a difference. For example the amount of young people who are involved with Burt Rutan's spaceship developments on behalf of Virgin Galactic and future customers, the early Gen Y workforce Space X has assembled or elsewhere like the Google Lunar XPrize show that space is relevant and is important to young adults.

I am also happy to report to the subcommittee that The Space Foundation employs a variety of programs and initiatives that educate and raise awareness about the importance and impact of the space industry:

Space Foundation education programs support teachers and PreK-12 students with standards-based curriculum that integrates science, technology, engineering, and mathematics (STEM) into all content areas:

- *NEW HORIZONS Space Education Program*, a community-centered, science enrichment program that infuses STEM education into a community through student enrichment programs, teacher workshops, field trips, town-hall meetings, and astronaut and space professional visits.
- *Space Discovery Institute*, week-long, intensive, graduate-level, in-residence courses that provide PreK-12 educators with space-related STEM education knowledge and content that is instantly transferable to the classroom; participants can earn continuing education credits, graduate credits, or work toward a master's degree in multiple related disciplines.
- *STARS Program (Science, Technology, and Academic Readiness for Space)*, a hands-on science enrichment program based on each school's academic needs.
- National Science Standards Lesson Bank, free downloadable PreK-12 national science standards-based lessons.
- *Teacher Liaisons*, advocates for space science education who: receive Space Foundation training and resources to further integrate space into their classrooms; participate in workshops and education programs at the National Space Symposium; and can receive specialized Space Foundation and NASA training with optional graduate-level credit, exclusive professional development experiences with optional continuing education credit, and special space-oriented student programs created just for them.
- *Space Career Fair*, an annual event in conjunction with the *National Space Symposium* that provides students and transitioning military personnel opportunities to network with the largest employers in the space industry, to submit resumes, and, occasionally, to interview for jobs.
- *Jack Swigert Aerospace Academy*, an aerospace-focused public middle school created and managed in conjunction with Colorado Springs School District 11 that drives STEM proficiency through a space-related curriculum, enhanced onsite laboratories and learning opportunities, and involvement with Space Foundation programs.

How well does the public understand the relevance of the nation's space activities to meeting national needs and realizing societal benefits? Is there a need to "get the message out" on the relevance of those space activities and the benefits to be derived from our space-related investments? If so, how can that message be most effectively communicated?

Not very well. Far too many audiences are made up of the "space choir."

One of the ways the Space Foundation communicates this message to the larger public is by means efforts such as the Space Foundation's Space Certification Program, which enables companies to show that their product has a space technology heritage. This provides benefits in both directions, enabling the company to show off its high-tech space pedigree and by illustrating in a tangible manner the way in which space activity improves the lives of the ordinary consumer.

At the end of this month, your colleagues on the Aviation Subcommittee will be holding a hearing on next generation navigation. Undoubtedly there will be a major portion of this hearing focused on satellite-based capabilities. I think this highlights just how almost invisible and ubiquitous space has become.

I think the public at a very basic, fundamental level "gets it", but not much beyond that. The public gets understandably frustrated when they hear of budget and schedule problems. On the other hand, one only has to look at the interest from the general public in the Mars rovers, or the recent, and final, Hubble mission or to have witnessed the thousands, young and old, that assembled in the Mojave desert in 2004 to witness the historic first private human space flight as evidence that there is a thirst and an interest in what we do in space.

Honestly, I'm not sure a message campaign is the best way to move forward. We live in an age of almost constant message barraging. From pop-ads on the internet, to seemingly constant political campaigning, I think a "command and control" ad campaign would not do much. If anything it could have the opposite reaction.

These younger generations are so technologically saturated, the space industry needs to take advantage of that and utilize these new channels to reach out and get kids excited about space. If kids get excited about it, the rest of the public will follow. I would also mention that you'd be surprised how much things like Facebook can help spread enthusiasm about space. The peer-to-peer discussions and sharing of information and enthusiasm for space is something that can surpass an ad campaign. Witness astronaut Buzz Aldrin's recent use of web 2.0 technology when he teamed with rapper Snoop Dogg to create "Rocket Experience" message about space.

For the larger public, not to sound flippant, but I think simply executing missions successfully will do more to help than anything else. I must paraphrase Arianespace CEO Jean Yves Le Gall, when he said recently, "launches speak louder than words." After all this is a generation that is about achieving things that have never been done, working as hard as necessary to achieve a breakthrough and talking less and doing more.

Conclusion

I again want to express on behalf of the Space Foundation our deep appreciation for allowing us to come before you today. I stand ready to answer any your questions.

Thank you.

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