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# \*\*\*Net-Benefits---General\*\*\*

## Spending/NASA Tradeoff Net-Benefit---Link---1NC

### Current NASA Programs are too expensive shifting to commercialization avoids cost overruns

Foust 5- Jeff, editor and publisher of The Space Review July 2005 “A vision for commercialization” The Space Review http://www.thespacereview.com/article/418/1

There’s just one problem with this approach: the money’s not there. Shank made that clear in his presentation as he outlined the overall exploration roadmap. “We’ve run the numbers, the budget numbers, and we can’t afford this plan—we simply can’t—if we follow the business-as-usual approach.” He didn’t go into the specifics of what made this unaffordable, although he later indicated that the problems were in the out-years beyond 2010 when NASA had to fund continued operations of the ISS and the new CEV while developing a heavy-lift launch vehicle and other systems needed for a human return to the Moon.

However, as Shank put it, “If there’s one thing about Mike Griffin that industry and stakeholders are learning about, it’s that he’s not a business-as-usual kind of guy… The NASA budget is only so much per year. It is just a matter of what it is you want to do with that money. So we, NASA, need to be smarter customers.”

That opens the door for alternative approaches, including the purchase of commercial services. “NASA needs commercial ISS crew and cargo operations,” Shank said. “If we assume CEV was the only vehicle, in a business-as-usual conservative costing approach, that if we didn’t take a firm fixed-price approach towards our acquisition practices on how we’re going to provide ISS crew and cargo, we could not afford to move on to the Moon. Therefore, we need to take this ISS crew/cargo procurement very seriously.”

That statement is the strongest yet about the role commercialization will play in the overall Vision, a position that has evolved even during the three months Griffin has been in the administrator’s office. In a speech at a Women in Aerospace event in Washington in early May, Griffin talked positively about commercialization but seemed reticent about using commercial services in the heart of the overall plan:

I cannot put public money at risk, depending on a commercial provider to be in my series path. He might decide not to show up for good and valid business reasons. Okay? I can't put return to the moon and crew exploration vehicle capability, I can't put the ability to send humans into low earth orbit on behalf of the government at risk, based on whether or not a commercial provider decides that he actually wants to do it that day. But I can provide mechanisms where if the commercial provider shows up, the government will stand down and will buy its service and its capability from the industrial provider and let them have the competition among themselves.

Now, though, instead of standing down a government service in favor of a commercial service, NASA is intending to rely primarily on commercial ISS resupply services once the shuttle is retired. “For servicing the International Space Station, the CEV is only intended as a backup capability,” Shank said. “That is a hard requirement from Mike Griffin. There were significant discussions on that. So we need to make the proper investments in order to incentivize the commercial industry to be there.”

## Private Sector CP---Politics Net-Benefit

### Commercialization is spun as job creation to generate popularity

Dyson 10-Esther, chairman of EDventure Holdings and an investor in a variety of start-ups, 2/8/2010, “Prepare for Liftoff,” Foreign Policy, <http://www.foreignpolicy.com/articles/2010/02/08/prepare_for_liftoff?page=0,1>

Politically, the fuss is mainly about jobs that can help politicians get elected, and not about space exploration itself. The simple solution is some promise that the jobs will not be lost; they will simply be transformed. If no commercial company is willing to hire these workers, then perhaps they could retrain as teachers, an area where the United States desperately needs more scientists and technical people, or in medicine, which requires the same meticulous attention to detail. But the commercial space market will need at least some of them. President Obama and all of us who want to focus on the future should not forget how good the private sector can be at creating both jobs and opportunities.

### There is bipartisan support for space commercialization

Morring 11- Frank,Writer for Aviation Week, 2/15/2011, “NASA Wants Commercial Crew, Technology,” Aviation Week, <http://www.aviationweek.com/aw/generic/story_channel.jsp?channel=space&id=news/awx/2011/02/14/awx_02_14_2011_p0-289550.xml>

In a bid to follow President Barack Obama’s overall science and technology policy, the new budget aims to create “a sustainable program of exploration and innovation,” according to Administrator Charles Bolden’s introduction to the strategic plan that accompanies the budget request. “This new direction extends the life of the International Space Station, supports the growing commercial space industry, and addresses important scientific challenges while continuing our commitment to robust human space exploration, science and aeronautics programs,” Bolden states. “The strong bipartisan support for the NASA Authorization Act of 2010 confirms our essential role in addressing the nation’s priorities.” The government’s effort to seed private development of commercial crew and cargo transportation to the ISS and other LEO destinations would be boosted to $850 million in the fiscal year that begins Oct. 1 — up from the $612 million authorized but not appropriated in the current fiscal year.

### Support for NASA doesn’t mean politicians will oppose the CP – supporters will see the CP as allowing NASA to preserve its resources

Leahy 6-Bart, technical writer and National Space Society member, 5/12/2006, “Space Access: The Private Investment vs. Public Funding Debate,” <http://www.space.com/2401-space-access-private-investment-public-funding-debate.html>

Meanwhile, in another part of ISDC, space law lecturers were discussing the best way to secure private property rights on lunar resources when a private landing happens. To settle that argument, lawyer Bill White suggested that someone should "just do it." And Peter Diamandis suggested that Mars itself could and would be settled by private citizens before NASA. He believes space enthusiasts should "give up on government." Virgin Galactic's Wil Whitehorn indicated that "It [the private sector] can't get hooked on government money." NASA's Clouded Future And yet, in the face of all this independent-mindedness, many of these same people object strongly to the cuts in NASA's space science budget and feel that the CEV, with its Shuttle-derived hardware, is not ambitious enough. Few people blame Administrator Michael Griffin for NASA's troubles, not even the more outspoken pundits like The Case for Mars author Robert Zubrin or Burt Rutan. There is widespread agreement that NASA does not have the resources to do all of the things it has been asked to do, but there is not much confidence that the political process within Washington will give NASA what it needs to succeed.

### The CP will be spun to get popular support

Dolman 2-, Everett C. Dolman, PhD in Political Science from the University of Pennsylvania, has taught international relations and international political economy at The College of William & Mary, Southern Illinois University-Edwardsville, and Berry College, Air Force's Educator of the Year Award for 2003/0 Frank Cass Publishers, “ASTROPOLITIK: Classical Geopolitics in the Space Age,” 2002 ch: 6 pg: 154

The Astropolitik plan could be emplaced quickly and easily, with just three critical steps. First, the United States should declare that it is withdrawing from the current space regime and announce that it is establishing a principle of free-market sovereignty in space (along the guidelines articulated in Chapter 5). Propaganda touting the prospects of a new golden age of space exploration should be crafted and released, and the economic advantages and spin-off technology from space efforts highlighted, to build popular support for the plan.

# \*\*\*Prizes CP\*\*\*

## Prizes CP---1NC

### Text: the United States Federal Government should establish a monetary prize for the first private-sector entity that\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

### Shifting to large scale prizes spurs innovation and solves

Sargeant 8-Benjamin, Subcommittee on Space and Aeronautics Committee on Science and Technology U.S. House of Representatives “The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development” 7/28/08 http://www.sts.virginia.edu/wip/docs/papers/Sargeant\_08\_r.pdf

Government use of innovation prizes is a viable, effective means of complementing traditional research and development activities. The National Aeronautics and Space Administration (NASA) currently holds innovation prize contests called Centennial Challenges with the goal of finding innovative research solutions to pressing technical challenges. Judged by the recent success of the Ansari X-Prize and the DARPA Grand Challenge, innovation prize competitions excite the public and media about space and attract talented teams that normally would not participate in government-funded research.

Although NASA’s initial innovation prize efforts are heading in the right direction, they limit their potential by focusing too much on teams that respond primarily for the notoriety of winning a NASA challenge. The current Centennial Challenges program offers medium-scale prizes with the goal of increasing public interest in space and attracting independent teams of skilled entrepreneurs to solve tough technical objectives. NASA should also study the benefits of expanding its program to include larger-scale prizes for major space exploration milestones, such as a robotic mission to the Moon, and should consider establishing private foundations, which would generate matching contributions from private sources and promote public interest in and excitement about the prize.

The agency should consider how to take advantage of the large international community of individual problem solvers who respond to cash prizes posted on the Internet by organizations such as InnoCentive. Taking these steps to expand and improve its innovation prize program will strengthen NASA’s research capability, increase public awareness about space, and provide the agency with valuable new support to carry out its missions in space.

### Large Scale Prizes solve

Sargeant 8-Benjamin, Subcommittee on Space and Aeronautics Committee on Science and Technology U.S. House of Representatives “The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development” 7/28/08 http://www.sts.virginia.edu/wip/docs/papers/Sargeant\_08\_r.pdf

Although the progress made thus far by the Centennial Challenges program is significant, NASA has only begun to tap the potential of innovation prizes. The agency has a number of options for improving its current innovation prize program. These include holding several large- scale prizes to generate public interest and spur major development, establishing private foundations that would conduct promotional efforts and seek private funding, and using the experience and knowledge of a worldwide community of individual problem-solvers. The program could be expanded to include several large-scale prizes between $10 million and $25 million for a robotic lunar landing, a return of a sample from a near-Earth asteroid, or a human orbital flight (Kalil, 2006, 8; NASA Contests and Prizes, 2004, testimony of Steidle, 23; Leary, 2005). Large-scale prizes often open up follow-on opportunities and new marketable technologies following the competition (Davidian, 2005, 3). These major challenges could spur additional interest in and commitment to developing a robust private spaceflight industry that is capable of assisting NASA with low-Earth orbit operations.

## Prizes CP---Politics Net-Benefit---1NC

### Congress supports and will continue to support prizes

Sargeant 8-Benjamin, Subcommittee on Space and Aeronautics Committee on Science and Technology U.S. House of Representatives “The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development” 7/28/08 http://www.sts.virginia.edu/wip/docs/papers/Sargeant\_08\_r.pdf

If the Centennial Challenges program continues on its present course, it will most likely continue to produce a steady number of solutions to small- and medium-scale prize contests. This is based on the demonstrated success of the program thus far and the high level of interest for each challenge from individual inventors, student groups, and outside teams. However, NASA should not expect every prize awarded through the current Centennial Challenges program to generate significant media or general public interest comparable to the X-Prize. Based on past congressional encouragement to use innovation prizes, the Congress would likely continue to support an NASA innovation prize program consisting of small- and medium-scale prizes (NASA Authorization Act of 2008 at 59 (2008)). Under the current program, NASA pays by funding the prize and benefits by receiving the innovation, whereas the participant benefits from the monetary prize and pays by relinquishing some of the intellectual property rights of the innovation. Both NASA and the inventor benefit through the publicity generated by the contest.

## Prizes CP---Solves the Case---General---2NC

### NASA hurts solvency

Gingrich 11-Newt, 58th Speaker of the United States House of Representatives from 1995 to 1999, 2012 Republican presidential candidate, fellow at American Enterprise Institute, fellow at Hoover Institution, New Hampshire GOP presidential primary debate, “Newt Gingrich on Space Exploration: 'NASA Is Standing in the Way'”, Fox News, <http://www.foxnews.com/scitech/2011/06/14/newt-gingrich-on-space-exploration-nasa-is-standing-in-way/>

Well, sadly — and I say this sadly, because I'm a big fan of going into space and I actually worked to get the shuttle program to survive at one point — NASA has become an absolute case study in why bureaucracy can't innovate. If you take all the money we've spent at NASA since we landed on the moon and you had applied that money for incentives to the private sector, we would today probably have a permanent station on the moon, three or four permanent stations in space, a new generation of lift vehicles.Andinstead what we've had is bureaucracy after bureaucracyafter bureaucracy, and failure after failure. I think it's a tragedy, because younger Americans ought to have the excitement of thinking that they, too, could be part of reaching out to a new frontier. You know, you'd asked earlier, John, about this idea of limits because we're a developed country. We're not a developed country. The scientific future is going to open up, and we're at the beginning of a whole new cycle of extraordinary opportunities. And, unfortunately, NASA is standing in the way of it, when NASA ought to be getting out of the way and encouraging the private sector.

### Prizes spur technological development and are cheaper than the plan

Rochon 6 -Laura Rochon, Johnson Space Center, "NASA encouraging space entrepreneurs, one Cup at a time", 11/20/06, www.jsc.nasa.gov/jscfeatures/articles/000000572.html

“We may not see the impacts for years to come, but private space delivery will benefit us all,” West said. “The market will develop, and NASA wants U.S. companies to be there to fill the need -- that way, the U.S. remains the world’s leader, and NASA can continue to push further into the unknown.” Modeled after the Orteig prize won by Charles Lindbergh for his non-stop flight from New York to Paris in 1927, the initial Ansari X PRIZE purse of $10 million was won by Burt Rutan in 2004 when SpaceShipOne became the first private human spacecraft to fly two suborbital flights in five days. At this year’s X PRIZE Cup, NASA put up $2.4 million total for three spotlight competitions -- the Lunar Lander, Tether and Beam Power Challenges. The funding comes from NASA’s Centennial Challenges. Ken Davidian, who has a management role in the program, explained that one of the goals is to stimulate fresh ideas and to identify new and non-traditional sources of these innovations. Another goal is to reach the public. “People are interested in the competition aspect because it’s dramatic, it’s unscripted -- it’s science theater,” Davidian said. The Lunar Lander Challenge, which accounts for the biggest slice of the prize at $2 million, was envisioned to spur on private development of the next-generation lunar landing system -- a space vehicle capable of ferrying humans or cargo back and forth between the moon’s orbit and surface. To win, a vehicle has to complete two flights between two concrete landing pads within 2.5 hours. NASA also committed $200,000 each for the Tether and Beam Power Challenges. In the Tether Challenge, teams must develop a new material that is 50 percent stronger than what is available today. In the Beam Power Challenge, or “space elevator games,” teams design and build a robotic vehicle that climbs a ribbon using power beamed to it from an external source. This year’s aim was about 55 feet, with a future goal of hundreds, then thousands of miles. Davidian believes NASA is interested in helping new space industries be competitive. “For a long time, private industry has been saying they can do that cheaper and more efficiently so NASA is willing to give them a chance,” he said. “We’re saying, ‘build a lunar lander and show us that it works and then you’ll win the prize.’ It’s incredible, but once you make it a game, it becomes popular. Centennial Challenge is ‘popular science.’” Foale agrees. “I think it’s a low-risk investment with the potential for large gains to NASA, if NASA is able to look at the new ideas produced,” he said. This year nobody scored the prize money, but NASA funds remain an inducement for next year’s contenders or until the conditions of the challenges have been met. And when it happens, Diamandis expects it will be a win-win for all. “NASA gets a new generation of entrepreneurial companies and potentially new breakthrough technology,” he said. “The competing teams get a prize which helps them raise money to fund their research and development, and X PRIZE gets great educational and inspirational content to drive attendance and viewership.”

### **Prizes stimulate effective tech development**

Bays & Janson 9- Jonathan, consultant in McKinsey's New York office; and Paul Jansen is a principal in McKinsey's San Francisco office, “Prizes: a winning strategy for innovation” 77/09 http://innovbfa.viabloga.com/files/McKinseyQuaterly\_\_\_Prizes\_a\_winning\_strategy\_for\_innovation\_\_\_july\_2009.pdf.

We see a bright future for prizes. Nearly a third of the sponsors we surveyed plan to increase their prize activity. The new generation of philanthropists are embracing prizes, and the entry of new kinds of sponsors, such as governments, may further expand the resources available. Prizes are also likely to become more professional, as the emergence of full-time facilitators such as Innocentive and the X-PRIZE Foundation shows. Greater attention to best practices will make prizes more economically productive. And we expect to see a greater understanding of—and better solutions to—tricky challenges, such as the protection of intellectual property and the proliferation of prizes. Are there limits to the effective use of prizes? Of course! Good ones require clear objectives, a rich field of potential problem solvers, and competitors willing to take risks. Prizes work best when a field isn’t already flooded with funded research and the challenge is more to create a clever application of technology than a technology itself.. These requirements, however, hardly limit the possibilities for the new prize forms and applications. A prize is an old idea that remains surprisingly powerful today. We believe that more institutions should harness the power of this flexible, expressive instrument in their efforts to generate social and business benefits.

### Private sector key to successful space tech and quick implementation

Burk 4’ -James, vice president of Artemis Society International and staff writer, June 3, “What the Moon-Mars Commission's Report Should Say...” <http://www.marsnews.com/articles/20040603-what_the_moonmars_commissions_report_should_say.html>

NASA should get out of the way of the private sector. For too long, NASA has stifled creativity and entrepreneurialism on the part of non-governmental efforts to pioneer space. In the late 1990s, many firms such as Rotary Rocket and Beal Aerospace were working on bringing SSTO/RLV technologies to market, and NASA did everything to prevent their success. Firms like LunaCorp and TransOrbital were talking about private lunar missions and NASA did everything to stifle them, including spreading rumors of a new NASA moon probe, which ultimately amounted to nothing and caused their funding opportunities to dry up. Let the commercial sector do what it excels at, namely cutting through bureaucracy and accomplishing goals on a short timeframe. Instead of stifling private sector efforts, NASA should do everything they can to help them. NASA should enhance and expand their programs to transfer technologies & methods developed internally to start-up companies. During the Apollo days, most of the hardware and operations were conducted by private contractors. That model has worked before and should be returned to for future projects. Let NASA set the direction & goals, but let the private sector implement them and create wealth & commercial opportunities from them. That is a much faster way to get into space, and also much cheaper for the public.

Commercial Space development key now-huge capital investment while government can no longer fund large space projects

Reynolds 10- Jackie DeWayne Reynolds, professor with a degree in Science in Economics, “HOW FREE MARKET PRINCIPLES CAN ENABLE COMMERCIAL SPACE DEVELOPMENT”, Online: http://files.jackiedewaynereynolds.info/0410\_Renewing.the.Dream.pdf

Commercial space development is neither easy nor cheap, but it can no longer be funded by big government. Back when the nation‘s wealth was concentrated in a handful of American aristocrats, it made sense for the government to pick up the slack where the private sector simply wouldn‘t or couldn‘t fund projects themselves. While the govern- ment maintains its fundamental role in funding basic research and codifying appropriate policy and legal regimes to support economic commerce, the fact of the matter is it is no longer necessary for the government to fund large space development projects. In the last hundred years or more, the American economy has diversified and given rise to a huge investment class. Globalization has helped replicate that investment class in countries all over the world. Private investment capital flows more freely now than at any other time in our history.

Private sector key to Space development and new tech

Reynolds 10- Jackie DeWayne Reynolds, professor with a degree in Science in Economics, “HOW FREE MARKET PRINCIPLES CAN ENABLE COMMERCIAL SPACE DEVELOPMENT”, Online: http://files.jackiedewaynereynolds.info/0410\_Renewing.the.Dream.pdf

As commercial activities in space continue to increase, the current state of space law and policy must be revisited. Needed improvements in technology will flow from the developing market, but a new body of policies must be developed and codified to enable the continued commercial exploitation of space. NASA, for example, should refine its priorities, returning nonessential programs to the private sector for development, and fo- cus on its fundamental mission: space research and exploration. NASA is and should be strong, but its governance should be carefully monitored to advance space development without undermining private initiative. Government officials and industry leaders should finally define an appropriate post-Cold-War paradigm that shapes U.S. space policy around commercial space development as well as the nation‘s twenty-first century de- fense needs.

Commercial space development is cheaper-launch costs will go down due to competition and increases innovation.

Reynolds 10- Jackie DeWayne Reynolds, professor with a degree in Science in Economics, “HOW FREE MARKET PRINCIPLES CAN ENABLE COMMERCIAL SPACE DEVELOPMENT”, Online: http://files.jackiedewaynereynolds.info/0410\_Renewing.the.Dream.pdf

The arguments against commercial space development—namely that doing busi- ness in space is too expensive and it takes too long to provide an adequate return on the initial investment—are inconsistent with what we know about other high-capitalization, high-risk industries like oil and pharmaceuticals. Similarly, the role launch costs play in the perceived cost-prohibitiveness of commercial space development is overstated, as there are a number of ways launch and other costs can be reduced.

But reducing cost alone is unlikely to increase commercial space activity. Com- mercial space development requires the development of a product whose cost-effective manufacture is exclusive to the space environment. Space-based crystal growth and X-ray diffraction meets all the criteria for a good early space product and offers a significant advantage over other potential products because the true value of the space-grown crys- tals can be extracted in space, without the additional expense and risk of returning a phys- ical product to Earth. The bottom line is that space-based protein crystal growth and X- ray diffraction is feasible now.

An immutable law of economics is that business success begets competition, and this is particularly true in undeveloped or underdeveloped markets. In other words, suc- cess in space—any success—will increase competition. More competition drives up in- novation and drives down costs, which increases the quantity demanded. In the case of commercial space development, increased quantity demanded translates into larger launch manifests, more launch systems to meet the growing manifest, and, ultimately and most importantly, lower launch costs. As commercial space missions become increasing- ly profitable due to lower costs and increased efficiencies, even more businesses will clamor to enter the market, further driving down costs.

Government incentives is key to the Private Sector who holds the technical expertise for space exploration and development

Peter and Ehrenfreund 9-N. Peter, European Policy Space Institute; P. Ehrenfreund, Space Policy Institute at George Washington University, 22 October 2009, “Toward a paradigm shift in managing future global space exploration endeavors”, Online: http://www.sciencedirect.com/science/article/pii/S0265964609000976

The public is relatively uninterested in space activities in several of the spacefaring countries and thus does not signif- icantly influence governments. This is most evident for the younger generation (14e29), also known as Generation Y [21]. Statistics from past decades have shown that public awareness and public understanding do not correlate with public support or approval of large government spending for space endeavors [22]. However, when engaged in participatory ways the public could be a powerful stakeholder in terms of influencing governments to provide a long-term increase in the resources invested in the space sector and support decision makers’ choices.

When alliances are pursued, the interests and involvement of the major stakeholders have to be well balanced and coordinated at a national level. For this reason, stakeholders have to engage together in the decision-making process and converge toward agreed-upon objectives. Cross-fertilization and idea exchange among stakeholders must be encouraged. For the space industry, it is important to reinforce the link with the scientific community to have access to new ideas and breakthroughs. Governments must ensure a solid and innova- tive industrial base that can fulfill its ambitions and objectives: most of the technical expertise is now in the hands of the private sector. However, without sustained long-term financial support industry might lose competence and interest in the space sector.

While science and technology represent the core and often the driver for space exploration activities, public support is a vital element to ensure the viability of long-term exploration plans. It is necessary to raise the general public level of interest in space exploration and to foster a culture of explo- ration across generations and borders. Successful long-term planning and development for major space architectures can thus only be implemented when all stakeholders strive toward a common goal at both national and international levels.

## Prizes CP---Solves the Case---Innovation---2NC

### Prizes spur innovation in all fields and cause the tech to be developed better

Wagner 11 -Erika, Director of X-Prize Foundation, in an interview with Sander Olson, "X-Prize director describes incentive prizes in an interview with Sander Olson", 6/3/11, nextbigfuture.com/2011/06/x-prize-director-describes-incentive.html

Question: What is the return on investment for the prize? The Ansari X PRIZE provides a good example. **A $10 million initial investment led to $100 million in spending by teams, which in turn led to a $1.7 billion investment by private industry.** Now the field of private space exploration of space is about to grow exponentially, as a direct result of that initial $10 million investment. Question: Are there any prizes without any purse? Sure, a perfect example is the North American Solar Challenge, which was oriented towards college teams. Despite the fact that there was no financial purse for that prize, the winning team still invested about $4 million dollars in equipment and labor, and an entire ecosystem of technologies and engineers emerged in pursuit of the bragging rights. Question: What is the X PRIZE grand challenges course? Through the X PRIZE Labs program, we teach courses at MIT, the University of Washington and University of Southern California. The classes are designed to teach the theory and practice of prize design. We hope to also be teaching in Bombay and Delhi next year, and a number of other Universities have expressed an interest in training their students how to ask good questions around the world’s biggest problems. Question: Could you describe the process by which the foundation decides which prizes to offer? We primarily use three sources for inspiration. In our X PRIZE Labs, we like to ask our students "if you had $10 million to invest in an X PRIZE, what would you ask the world to achieve?". Second, we have an annual Visioneering event, in which we bring together 100 of the brightest minds that we know to help us understand what they see as the most pressing opportunities for innovative breakthroughs. Third, we have corporate clients suggest challenges to us. So for instance, we are now working with Qualcomm on a prize for an AI physician's assistant that can diagnose diseases as well as board-certified physicians. Question: What X PRIZE excites you the most? The X PRIZE Lab@MIT developed a competition several years ago in the field of global health. After deep dives into a number of pressing problems, our students identified tuberculosis diagnostics as an area that could benefit from an X PRIZE. The current method we have for identifying TB patients is 100 years old and only accurate about 50% of the time. A cheaper, more accurate TB test for use in the developing world could save hundreds of thousands of lives per year. I would love to see a competition that brought dozens of universities, biotech firms, and medical innovators to help address this challenge. Question: What are the operational costs of running an X PRIZE? The rough rule of thumb is that the operational costs are equal to the prize costs. So to have a $10 million prize costs us around $20 million total. This is because there are costs related to research, supporting infrastructure, judges, personnel, media attention, and so forth. Question: Who decides the terms of the prize? For each prize that we offer, we have a team of advisors. We are currently designing an X PRIZE for autonomous vehicles, and we have a team of experts from the auto industry, robotics, racing, and even public relations who are providing input. We don't want to create a prize that could be won tomorrow, but an impossible challenge won’t attract the world’s best innovators either. It’s finding that intersection of audacity and achievability that’s the key to a successful X PRIZE. Question: How many x-prizes are currently active? There are two X PRIZEs and one smaller X CHALLENGE that are active today. The Archon Genomics X PRIZE offers $10 million for sequencing 100 genomes in 10 days. The Google Lunar X PRIZE gives $30 million for the first private lunar rover broadcast back HD video from the surface of the moon. The Wendy Schmidt Oil Cleanup X CHALLENGE focuses on the next generation of oil spill cleanup technology. Question: So the funding for prizes comes from corporate and philanthropic sources? Funding comes from corporate, philanthropic, and Government sources. There are actually over $300 million in large prize purses up for grabs around the world. The Obama administration put out a policy directive last year stating that **Federal agencies should consider prizes as part of their incentive portfolio**. So federal agencies are now using prizes as well as grants and contracts. Corporations are using prizes for incentivizing internal innovation, as in the Cisco iPrize; for crowdsourcing solutions to pressing corporate challenges, as in the Netflix Prize; and for raising awareness around industry issues, as in the Progressive Insurance Automotive X PRIZE. Question: Is there any particular technology for which an —X PRIZE should be offered but isn't? There are many worthy candidates that we are currently exploring. We are looking at autonomous cars, deep sea exploration platforms, clean cookstoves for the developing world, brain-computer interfaces, carbon capture and reuse technologies, energy storage, and many others. There is no shortage of promising areas that could directly benefit from incentivized competition. Question: If you had a billion dollars to invest in any technology, how would you spend it? Prizes aren't good for stimulating basic science, and we need to have a strong science infrastructure in this country. I am a passionate advocate of human space exploration, especially when we ask in what ways these capabilities can directly benefit humanity. So I would invest in a mix of basic R&D, social entrepreneurship, and high-risk technology programs that push our frontiers of knowledge and physical exploration. Prizes would definitely be part of that portfolio. Question: Are there any foreign prizes offered? Yes, a perfect example is the Saltier Prize in Scotland. Scotland wants to be a leader in the field of wave and tidal energy, so they offered a large prize for advancements in that area. Another example is the Ibrahim prize, which is offered by the Mo Ibrahim foundation. This prize offers a multimillion dollar reward for effective African leaders who peacefully step down from office when their term ends. The X PRIZE Foundation has just opened an office in India, and there are plans for new X PRIZE Labs at foreign universities as well. Question: It seems as if the X PRIZE concept has grown exponentially over the last 10 years. The X PRIZE has grown from a single prize, the Ansari X PRIZE, to over $65 million in prizes. That number continues to grow. Industry is becoming increasingly interested in the concept of using prizes to spur technological innovation and to solve specific problems. Question: What do you see as the most disruptive technology to be developed during the next decade? I personally think the field of energy storage is critically important, because it in turn affects so many other fields. Half the prizes that I've examined are energy limited. In everything from exoskeletons to deep sea exploration to electric cars and aircraft, energy storage is a serious limiter to numerous innovations. In order to make renewable energy feasible, we have to devise better ways to store energy. But **the beauty of the X PRIZE is that we don't have to pick any particular technologies - we simply offer the prizes and let the competition begin**

### **Prizes are the best for NASA to acquire technology**

Sargeant 8-Benjamin, Subcommittee on Space and Aeronautics Committee on Science and Technology U.S. House of Representatives “The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development” 7/28/08 http://www.sts.virginia.edu/wip/docs/papers/Sargeant\_08\_r.pdf

Overall, innovation prizes present a robust and effective method of conducting NASA research and development. They offer new ways for producing innovative solutions, increasing non-traditional participation from independent teams and individual problem-solvers, and engaging and inspiring the public about space. Most of all, innovation prizes provide NASA with new valuable, cutting-edge research and technology in support of its aeronautics and space exploration missions. Based on the initial success of the Centennial Challenges program and considering the vast array of options for expanding the program, the use of innovation prizes by NASA has a bright future.

### Empirics Prove prizes are effective

Brunt et Al 11-Liam, Norwegian School of Economics and business administration, Josh Lerner, Harvard Business School Tom Nicholas, Harvard Business School, “Inducement Prizes and Innovation”

We have examined one of the longest available datasets of awards for innovation to determine the extent to which these prizes spurred technological development. We find that prizes induced competitive entry and that the largest effects are for prestigious medals. Consistent with competitive entry, we find important output effects of the prizes based on counts of quality-adjusted patents, which can only be partly explained by technology category substitution. Our quantitative evidence on the utility of prizes is supported qualitatively. The Scientific American remarked of the RASE prize system in 1867: “It is indisputable that these competitive trials have done, and are doing, much to raise agricultural engineering to the highest standards of efficiency and economy.” With respect to steam engines, which had the largest impact on productivity growth of any technology in the mid-to-late nineteenth century (Crafts, 2004), the role of the RASE was again noted by the Scientific American in 1874: “An investigation of the results obtained from year to year shows a most extraordinary improvement in the engines, as regards economy and workmanship, and there is little doubt that the effect of these tests has been most beneficial to the users of steam power.” An 1864 report by the Society of Arts noted: “Without the prize system the manufacturers would not have been guided to the production of the class of implements really required.”

### Prizes spur broader innovation

Kay 10-Luciano, School of Public Policy Georgia Institute of Technology “Modeling incentives, R&D activities, and outcomes in innovation inducement prizes” 3/12/10 Available Online

Overall, prizes may have significant effects on innovation. Some authors have suggested that prizes can accelerate innovation, that is, speed up technological development in certain fields (Anastas & Zimmerman, 2007; Masters & Delbecq, 2008). Others suggest that prizes may change the direction of innovation, that is, focus innovative efforts on problems for which solutions otherwise do not seem to be forthcoming (Davis & Davis, 2004). Moreover, it is often emphasized the capability of prizes to leverage R&D investment as well. For instance, X-Prize-like competitions are expected to multiply the prize reward by 10 in terms of team R&D expenditures and by 100 in terms of follow-on business and investment (King, 2008). In practice, multiple effects have been attributed to prizes, including technological impacts. For example, DARPA reported that the Grand Challenge 2005 led to many technical accomplishments and remarkable improvement in several technologies related to the prize challenge (DARPA, 2006). The NASA‘s Astronaut Glove Challenge 2007 led to technology commercialization, since the winner started a company and gained a contract to provide gloves to a spacesuits manufacturer (Stine, 2009). The privately-sponsored Ansari X-Prize, finished in 2004, sought to reduce access costs to space by offering a $10 million reward, yet led to a total estimate R&D investment by all prize participants of about $100 million and laid the basis for the commercialization of civilian space flights (Newell & Wilson, 2005). The $1 million Netflix Prize announced by Netflix formed a problem-solving community of more than 34,000 developers worldwide (McKinsey & Company, 2009).

### Just the competition process of prizes spurs innovation

Bays & Janson 9- Jonathan, consultant in McKinsey's New York office; and Paul Jansen is a principal in McKinsey's San Francisco office, “Prizes: a winning strategy for innovation” 77/09 http://innovbfa.viabloga.com/files/McKinseyQuaterly\_\_\_Prizes\_a\_winning\_strategy\_for\_innovation\_\_\_july\_2009.pdf.

Just competing for a prize can improve the skills or behavior of entrants, so a few sponsors have made participation a primary objective, designing prizes for which the competitive process is at least as important as the outcome. The annual FIRST Robotics Competition, for example, puts tens of thousands of American high school students through a variety of robot building challenges, rewarding team spirit and professionalism as much as finished products. The focus on reinforcing motivation and building team skills is partly responsible for the fact that participants are three times more likely than peers from similar backgrounds to major in engineering—and twice as likely to perform community service. We found participation prizes to be one of the least-used prize types, but there are enough good examples of successful ones to suggest that they should be used more often as a broader social-change strategy.

Bays & Janson 9- Jonathan, consultant in McKinsey's New York office; and Paul Jansen is a principal in McKinsey's San Francisco office, “Prizes: a winning strategy for innovation” 77/09 http://innovbfa.viabloga.com/files/McKinseyQuaterly\_\_\_Prizes\_a\_winning\_strategy\_for\_innovation\_\_\_july\_2009.pdf.

A prize is a familiar and easily understood concept that has a long history of inspiring beneficial change. Besides the 18th-century Longitude Prize, for example, there was the French government’s food preservation prize that led to long-shelf life canned foods, and the 1858 Bréant Prize which, though never awarded, stimulated research into infectious diseases. As the patent and grant system matured, however, prizes seemed to become peripheral to innovation. Today, they are booming again. Since 2000, more than 60 prizes with a value greater than $100,000 have debuted around the world, representing almost $250 million in new prize money, and the total annual value of the large prizes that we tracked has more than tripled. At the same time, the use of prizes is shifting away from traditional areas, such as the arts and humanities, toward technologically complex ones—climate change, space travel, and biotechnology, to name just a few. Furthermore, innovative prize forms are emerging that have the power to build skills, strengthen networks, or even create markets. **This renaissance is driven by the simple fact that prizes work**—almost by definition, since they pay only for desired results, not noble failures. The power of prizes to stimulate innovation comes from their ability to mobilize resources, intellectual as well as financial, and to draw attention, which can influence the perceptions and actions of potential solvers or society at large. These attributes are often very attractive to companies and philanthropists looking for unconventional ways to solve tough problems that have resisted traditional approaches.

## Prizes CP---Solves the Case---Military Technology---2NC

Walker 11-Robert S. Walker is former chairman of the President’s Commission on the Future of Aerospace and former chairman of the U.S. House Science Committee. He is currently executive chairman of the Washington lobbying firm Wexler & Walker Public Policy Associates. “A Powerful Case for Commercial Space” <http://spacenews.com/commentaries/110502-powerful-case-for-commercial-space.html>

The Russians are giving us an excellent view of what to expect once the shuttle has been retired and they are the exclusive transport to the space station. Just recently they announced a new price increase from $56 million to $63 million per astronaut. Once American commercial launch providers have qualified their vehicles for crew delivery, the cost is thought to be on the order of $20 million per astronaut. And their anticipated timetable for achieving that capability is considerably shorter than the NASA heavy-lift vehicle, a rocket that would not really be very useful for low orbit activity anyway. So, for those in the Congress who worry about our reliance on the Russians for space station transport, the answer is more investment in the commercial option. What needs to be realized is that it is not only the civilian space programs that benefit from the growth of a commercial space industry. Our military needs also can be en hanced by competition. Fixed-price contracts for delivery of services can replace cost-plus contracts. Payloads hosted on commercial satellites can give the Pentagon lower-cost options for many of its missions. As launch costs come down because of the efficiencies that commercial providers bring to the market, traditional contractors will have to find ways to lower their costs as well. And vigorous competition among a wide range of providers, launch and satellite, will mean a broader industry with the capacity to contribute more to the national economy and the national defense. For those who worry about our ability to compete internationally in the space arena, the commercial option offers much hope. We already are beginning to see the cost curve favor American launchers over their foreign competition, including the Chinese. When we have affordable launch, the result will be a better business climate for our satellite manufacturers. That, in turn, will lead to the survival of third-, fourth- and fifth-tier industrial suppliers, meaning less need to purchase components offshore. What we know after 50 years of space history is that each time we have seen technology mature to the point the investors and entrepreneurs can see real business potential, the role of space in our lives has expanded and the benefits to our economy and our national security have been enhanced. Communication, GPS and remote sensing have all contributed significantly to our national well-being and have become more valuable the longer they have been market-driven. Today, commercial space entrepreneurs appear to have a better grasp of the complex formula of resources, risk, technology, vision and imagination that define space leadership than do government bureaucracies. Tapping that asset will carry us forward to remarkable new adventures and discoveries.

## Prizes CP---AT: Perm---2NC

### Perception of NASA involvement links to our bureaucracy arguments and guts solvency

Sargeant 8-Benjamin, Subcommittee on Space and Aeronautics Committee on Science and Technology U.S. House of Representatives “The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development” 7/28/08 http://www.sts.virginia.edu/wip/docs/papers/Sargeant\_08\_r.pdf

Prizes funded and administered by NASA alone could be perceived as being managed by a cumbersome bureaucracy that inhibits creative, outside-the-box approaches (What's Ahead in Aerospace and Defense, 2004, 2; NASA Contests and Prizes, 2004, testimony of Diamandis, 48- 49). The current approach of privately-managed prizes that are funded and sponsored by NASA strives for “transparent, simple, fair, and unbiased” contest rules, design, structure, and judging (National Academy of Engineering, 1999, 11; Stallbaumer, 2006, 125; NASA Contests and Prizes, 2004, testimony of Diamandis, 29-30). However, it limits NASA from obtaining funds from private sources, which has been congressionally authorized (NASA Authorization Act of 2005, Pub. L. No. 109-155, §104, 119 Stat. 2910-12 (codified at 42 U.S.C. § 2459f-1(i)); H.R. Rep. No. 109-173 at 12 (2005)).

### Duplication programs hurt solvency

Sargeant 8-Benjamin, Subcommittee on Space and Aeronautics Committee on Science and Technology U.S. House of Representatives “The Use of Innovation Prizes by the National Aeronautics and Space Administration: An Analysis of Future Possibilities for Fostering Research and Development” 7/28/08 http://www.sts.virginia.edu/wip/docs/papers/Sargeant\_08\_r.pdf

Taking into account the various benefits and tradeoffs of each alternative, a comprehensive blueprint for conducting the most effective innovation prize program at NASA begins to emerge. The best program will build upon the groundwork laid by the Centennial Challenges program and its recent accomplishments. NASA should continue to initiate medium- scale challenges that seek to develop innovative technologies that are helpful in meeting the agency’s engineering needs. In addition to producing valuable research, these challenges increase participation from independent teams of students, inventors, and companies and raise public interest in NASA’s activities and accomplishments. Given the success and substantial publicity of the X-Prize, NASA should seriously consider investing in a small number of major prizes that would develop new technologies vital to space exploration. A pilot program of two or three prizes on the order of $10 million to $25 million for the first privately-financed manned orbital flight or a robotic lunar landing and exploration mission on the Moon would spur broad innovations and new methods for exploring space. **NASA should carefully select and construct the prizes to fit within preexisting research and space exploration goals and agency practices. A duplication of effort between a preexisting program and the innovation prize program could be detrimental to both.** For example, an innovation prize focusing on the development of human spacecraft should be carefully designed and structured so that it supplements rather than duplicates the work carried out by the Commercial Orbital Transportation Services (COTS) program, which is fostering the development of private spacecraft capable of crew and cargo transport to the International Space Station.

### Having only the private sector act is key to innovation

Edwards 4-Chris, Director of fiscal policy studies at CATO, 6/2/04 “Downsizing the Federal Government” Policy Analysis No. 515 www.offnews.info/downloads/downsizing\_fedgov.pdf

Defenders of federal programs often argue that there are no private alternatives to a particular service offered by the government. But in many cases it is the existence of government programs and government regulations that prevents entrepreneurs from offering services in the first place. For example, NASA has discouraged entrepreneurship and competition with itself in the space business, and government has thrown numerous regulatory roadblocks in front of private space launches. 75 Another well-known example is federal law that makes it illegal for entrepreneurs to compete against the USPS on first-class mail service, even if the competitor would offer consumers better service at lower cost. When the government gets out of the way, there can be explosive private-sector growth. For example, growth in the U.S. venture capital industry was triggered by two policy changes. 76 First, the rules for pension plans under ERISA (the Employee Retirement Income Security Act) were loosened in 1978 to allow pension funds to invest in higherrisk investments including venture capital. Second, venture capital markets were stimulated by a cut in the capital gains tax rate from 49.5 percent to 28 percent in 1978, and to 20 percent in 1980. As a result of those policy changes, venture capital investments soared from under $1 billion per year in the late 1970s to more than $4 billion by 1983.77 Early recipients of venture capital funding included high-tech dynamos Apple Computer, Intel, and Genentech. Who needs business subsidy programs when private markets fuel the growth of such great companies?

## Prizes CP---AT: Doesn’t Pay Enough---2NC

### Prizes don’t have to cover the cost of development to be effective

Brunt et Al 11-Liam, Norwegian School of Economics and business administration, Josh Lerner, Harvard Business School Tom Nicholas, Harvard Business School, “Inducement Prizes and Innovation”

Taken together, our results suggest that prizes can be an important inducement for innovation. The contests organized by the RASE attracted large numbers of inventors and the competitions as public events encouraged the diffusion of useful knowledge across innovators. Competitive entry is associated with patenting activity in the priority areas with an especially large effect of the prizes on the quality of technological invention. While the monetary awards did not offset all the costs of technological development (we show that they covered on average only around one-third of the sale price of a single unit of an implement or machine exhibited by a successful entrant) winning a prize conferred additional intangible benefits, or a certification effect. Inventors were bestowed with “the Society’s mark of approval,” which was a powerful form of advertising (Jenkins, 1878, p.870). Although the shows were costly to organize, our evidence suggests they were associated with significant aggregate innovation effects.

## Prizes CP---AT: Only Solves Tech, Not Broader Goals---2NC

### **Prizes can be targeted at broader goals**

Morgan 8-Jaison G, lead manager of the Prize Development Department for the

X PRIZE Foundation “Inducing Innovation Through Prizes 2008www.usa.gov/.../reqs.../InnovationsJournalFall08PrizesJaisonMorgan.pdf

Another new frontier in the evolution of prizes is an attempt to break away from the notion that prizes are only effective for technological breakthroughs. Many prize designers are attempting to develop new models that will lead to behavioral changes and new social paradigms. Can we develop prizes that will have an impact on addictions without having to deliver a vaccine or some technological inoculation? Can we develop prizes to stem our dependence on environmentally damaging products, even when the alternatives are no more economically compelling? What can prizes do to offer a collective call to action for the world’s most pressing social problems? These are only some of the questions that prize designers are attempting to address.

# \*\*\*NASA Bad\*\*\*

## NASA Bad-Organization

### NASA Has fundamental flaws

Schreiber & Carly 5-Craig, Ph.D., Carnegie Mellon University Kathleen, professor in the School of Computer Science in the department - Institute for Software Research - at Carnegie Mellon University, “Ineffective Organizational Practices at NASA: A Dynamic NetworkAnalysis” February 2005 Avaliable Online

Organizational problems such as ineffective leadership, structural integration, communication barriers and practical drift have plagued NASA for many years. The concurrent existence and micro/macro nature of these problems makes analysis difficult. This whitepaper describes dynamic network analysis and how it can be applied to study ineffective organizational practices at NASA. Dynamic network analysis is a comprehensive methodology that can be used to model complex organizational problems. The methodology can handle multi-mode, multi-link networks therefore organizational risk can be modeled at various levels: team, department, divisional, and organizational. Analysis is done at several levels thus allowing for complex reasoning about the micro and macro co-evolution of the socio-technical system. Next, an example model of NASA's Team X is developed and analyzed. The model explores the implications of individual leadership style on structural integration. Results show that leadership style can effect structural integration within the team; an effect that has both team adaptive and performance implications. Modeling and analysis can be expanded to study other current organizational problems at NASA such as communication barriers and practical drift.

## NASA Bad- Accidents

### **Organizational problems in NASA make accidents inevitable**

Schreiber & Carly 5-Craig, Ph.D., Carnegie Mellon University Kathleen, professor in the School of Computer Science in the department - Institute for Software Research - at Carnegie Mellon University, “Ineffective Organizational Practices at NASA: A Dynamic NetworkAnalysis” February 2005 Avaliable Online

In 2003 many organizational problems within NASA were cited by the Columbia Investigation Board (CIB) as contributing to the Columbia disaster. Among the problems cited were barriers to communication, including information technologies, structural integration and databases, ineffective leadership and practical drift. Structural integration is assembling interdependent actions into coherent sequences and outcomes. Practical drift is local adaptation to demands that require work practices to fall outside the formal procedures of the organization. These same organizational problems were also cited as contributing factors of the Challenger disaster. As noted in the CIB report (2003), the ineffective institutional practices present at the time of the Challenger disaster re-emerged at the time of the Columbia disaster. Despite the recommendations of the Presidential Commission on the Space Shuttle Challenger Accident (1986) and the subsequent interventions to correct the organizational problems, the system retained the ineffective patterns. The seventeen year span indicates that these organizational patterns are a long-standing risk within NASA; a problem that has eluded a solution. The difficulty in addressing these risks lies in the fact that these are complex multi-level problems of the system. NASA programs are administered over a complex system of highly connected, interdependent but autonomous parts. These parts include the NASA centers, independent contractors and information technologies that connect the distributed environment. Several analyses have shown how organizational accidents and the associated ineffective organizational practices are due to emergent behavior in the socio-technical system as a result of interactions among the interdependent parts (Perrow 1999; Reason 1997; Snook 2000; Vaughan 1996; Weick and Sutcliffe 2001). In other words, organizational practices are system level behaviors due to the complex interactions at subsystem levels (work units, people, technologies…). Due to the complex nature of the NASA socio-technical system, new techniques for analyzing the problem need to be developed. Subsystems analysis and a reductionist approach will only partially address the problem. Although analysis of each unit is important the scope needs to include the complex relations and interdependencies that exist in NASA’s overall program structure. Likewise, analysis only at the system level will be incomplete. The emergent higher level organizational practices can only be understood by taking the lower level interactions into account.

### NASA failures are inevitable and reliance on Public space exploration makes accidents inevitable

Anderson 3-William, Teaches economics at Frostburg State College in Maryland “The Trouble With NASA” 2003 The Mises Institute http://mises.org/freemarket\_detail.aspx?control=434

Ever since the "success" of the Manhattan Project, in which an all-star cast of government scientists created the atomic bomb that killed hundreds of thousands of Japanese civilians in 1945 at the end of World War II, the US government has engaged in numerous crash programs to accomplish monumental goals. Following Manhattan was NASA; President Lyndon Johnson's "war on poverty"; Richard Nixon's "war on cancer"; Jimmy Carter's short-lived "synfuels" program; and the current "war on AIDS," which have consumed huge portions of the federal budgets under four presidents. All of these programs either have ended in abject failure or have eaten up hundreds of billions of tax dollars with questionable results. While any one of these programs—including the ostensibly "successful" Manhattan Project—can be clearly demonstrated to be disastrous in their own right, I would like to deal with NASA since it has managed to get back into the news by losing one of its vaunted spacecrafts and seven astronauts. When discussing NASA and its impact upon our society, one must deal with myths that have been spawned by the agency and its supporters over the last four decades, the first being that NASA, supposedly driven by technology, has created new technologies that have been easily transferred to civilian use. Thus, the argument goes, had not NASA existed, we most likely would not have had the modern computer system, microchips, transistors, and the like, or at least their development would have lagged far behind where they are today. The reality of modern space travel—in our case, the shuttles—is quite different. As Gregg Easterbrook noted in his recent commentary in Time, the shuttle vehicles, more than 20 years old and operating off of a 30-year-old design, are technologically inferior to nearly any computer driven consumer product, including children's video games. We have no evidence that the space program has created on its own any of the new technologies that make our material lives better; instead, the program has utilized existing technologies. The technological inferiority of NASA manned space gear is not unlike the situation that faces Federal Aviation Administration air traffic controllers every day, who must rely on obsolete equipment in order to safely guide passenger airliners through takeoff and landing. While Americans have been trained to think for decades that government is ahead of the technology curve, the nature of state operations guarantees that government sectors that depend upon high technologies are always going to lag behind private sector operations. The reason for this situation, in short, is politics. Equipment must be manufactured, and behind each manufacture stands an interest group that fights change. Interest groups develop ties with politicians, and politicians decide where allocation of tax monies will go. This is not just true in democratic systems. China, for example, manufactured and used steam-powered locomotives long after diesels were being utilized because entire regions where these steam engines were made were totally dependent upon the government's rail transportation decisions. The second myth is that we need NASA and manned space travel to "bring our nation together." These past few days I have read the glowing (and, sadly, predictable) tributes to "American heroes," along with the usual words of determination that "the show must go on." Now, I am not discounting the electrifying effect of certain events to unite people in a common interest. Like many middle-aged Americans, I remember when John Glenn orbited the Earth three times, and many of us can remember exactly where we were and what we were doing when we heard "the Eagle has landed." Likewise, I remember when Challenger exploded, and how schoolchildren watching a teacher being taken into space were devastated as the realities of the danger of space travel hit home. Yet, all of this desire for "national resolve" also reminds me of something else. In the cult movie Animal House, someone grabs the baton from a band director and marches the band into a blind alley that is blocked by a wall. However, when they reach the wall, the band members, instead of stopping, continue marching, oblivious to the fact that there is a wall in front of them. This has been the real symbol of manned space travel under a government regime. Were space travel a private, profit-seeking venture, owners would have the incentive to keep up with technologies and balance the risk of manned spacecraft with any benefits that might accrue from such activities. Instead, we have politicians giving eloquent but meaningless eulogies, refusing to admit they have been wrong when the evidence is overwhelming, and interest groups that are enriching themselves at the public trough, insisting that we not turn back. There are too many examples of this sort of thing to count, from the Vietnam quagmire to the endless military action in the Persian Gulf to the bogus "security" offered by government agents to Americans waiting fearfully for terrorists to strike us again. The real lesson of the Columbia disaster is that government enterprises are failures, and in the case of the space program, dangerous failures. Unfortunately, politicians and their worshipful pundits refuse to heed what is obvious. Last week, seven brave individuals were incinerated in a modern technological meltdown; we can expect more of the same in the future, but when it happens, don't look for anyone in power to learn anything constructive. .FM

## NASA Bad: Inefficient

DeHaven 10-Tad, CATO Researcher, “Can NASA Compete with SpaceX?” 12/28/10 http://www.downsizinggovernment.org/can-nasa-compete-with-spacex)

Can NASA Compete with SpaceX? That’s the question posed by the Orlando Sentinel’s Robert Block in an article comparing NASA with SpaceX, which is a private space transport company: Early this month, a private company called SpaceX launched an unmanned version of its Dragon capsule into orbit, took it for a few spins around Earth, and then brought it home with a splashdown in the Pacific Ocean. The total cost — including design, manufacture, testing and launch of the company's Falcon 9 rocket and the capsule — was roughly $800 million. In the world of government spaceflight, that's almost a rounding error. And the ability of SpaceX to do so much with so little money is raising some serious questions about NASA. Now compare with NASA: Over the past six years, NASA has spent nearly $10 billion on the Ares I rocket and Orion capsule — its own version more or less of what SpaceX has launched — and came up with little more than cost overruns and technical woes. In October, Congress scrapped the Constellation moon program and ordered the agency to start over to design a rocket and capsule capable of taking humans to explore the solar system. A Cato essay on cost overruns in government programs points out that NASA is one of the government’s worst offenders: The National Aeronautics and Space Administration has long had major cost overrun problems, such as on its space station program. A GAO report in 2009 found that 10 of 13 major projects examined had substantial cost overruns or schedule delays. Alan Stern, a former NASA associate administrator, recently noted that “our space program is run inefficiently, and without sufficient regard to cost performance,” and further noted that costs overruns are a “cancer” on the agency. Perhaps it’s a little unfair to use the word “compete” since SpaceX is receiving federal funds from NASA. That said, it seems clear that allowing the private sector to play a greater role in space is ideal, especially given NASA’s history of fiscal mismanagement. Whereas private companies are responsible to shareholders, NASA is responsible to policymakers who are often more concerned about maintaining space-related jobs in their districts rather than getting the best bang for the taxpayer buck.

### NASA is riddled with inefficiency only overarching changes solve

Houston Chronicle 8- Stewart Powell, 7/17/08 “Culberson taking shots at NASA's bureaucracy Congressman mulls legislation to fully restructure the 'failed' agency” http://www.chron.com/disp/story.mpl/space/5894467.html

Two days after telling an online town hall meeting that NASA had "failed us miserably" and "wastes a vast amount of money," Houston Rep. John Culberson said Thursday he was weighing legislation to overhaul the structure of the space agency, responsible for about 20,000 jobs in the Houston area. Culberson, a blunt-spoken conservative from a heavily Republican westside district, said his proposal would slash NASA headquarters' bureaucracy and enable scientists and engineers to rekindle visionary space exploration. "We need revolutionary change, a complete restructuring," Culberson told the Houston Chronicle. "NASA needs complete freedom to hire and fire based on performance; it needs to be driven by the scientists and the engineers, and it needs to be free of politics as much as possible." The fourth-term lawmaker said he was "kicking around" a proposal designed to make NASA more like the National Science Foundation, an independent federal agency led by a director and a 24-member board appointed by the president. Culberson, a member of the House Appropriations Committee, said that despite spending $156.5 billion over the past decade, NASA had surrendered "a 40-year advantage" in space exploration. He said the agency continues to rely on liquid-fueled rockets with technology dating back to "Robert Goddard-era rockets" in the 1920s. "I have always been a zealous advocate for the space program," said Culberson, who dates his interest in the subject to a childhood telescope. "But the setbacks are inexcusable and maddening — all because the magnificent men and women scientists and engineers have been frustrated by the bureaucracy, waste and duplication at headquarters." Culberson's remarks came two days after criticizing NASA during a call-in town hall meeting with constituents. "We've spent a fortune on NASA, and we don't have a whole lot to show for it," Culberson said in response to a question from a caller who harshly criticized NASA. "It's deeply disappointing, and it's because it's a government-run agency." Citing an essay by former House Speaker Newt Gingrich recently published in Aviation Week, the congressman said Gingrich is "quite right that NASA has failed us miserably." "There's a lot of wonderful people working there," said Culberson, "but NASA wastes a vast amount of money."

## NASA Bad Inefficient

### **NASA isn’t effective – it should retreat and let the free market in**

Taylor 11-Robert “The Case For Defunding NASA” April 2011 http://policymic.com/article/show?id=54

Taxpayers should be relieved as well. Some $17 billion a year is siphoned away from the American people to fund NASA, a bureaucratic mess of cost overruns and waste. These traits are very typical of all government programs, of course, because of what government's top-heavy, centrally-planning, and coercive structure lacks: the pricing and profit/loss mechanisms that only the market can provide. The best thing that could happen for the future of space exploration, discovery, and information would be for NASA to retire all of its shuttles, send those billions back to the American people, and open the sky up to the free market. Private entrepreneurs tend to produce and invest in a way that attempts to minimize costs in order to gain profit, while government programs work in the exact opposite manner. One of the best examples of this is when two MIT students, Justin Lee and Oliver Yeh, sent a camera into space to photograph the curvature of the Earth. For what it takes NASA millions of dollars to do, it took them $150. This is because Lee and Yeh, relying on private initiative and the incentive to minimize costs, filled a weather balloon with helium and hung a styrofoam beer cooler underneath to hold the camera. NASA, with the reverse incentives, uses rockets, boosters, and expensive control systems that may draw "oohs" and "ahs," but at the expense of the terrible opportunity costs of taxation. NASA and its defenders claim, however, that this constant stream of tax revenue has benefited the American public by introducing many inventions and technological advancements, ignoring the broken window fallacy - unintended consquences that accompany percieved production. Besides, most of these innovations have actually been the result of commercial markets. Telstar I, the world’s first telecommunications satellite, was a product of AT&T’s drive to provide a better communication service (only later to be used by the Defense Department). The telephone, personal computers, the Internet, Velcro, Tang, Tempur-Pedic mattresses, hand-calculators, and the hundreds of products created from the advantage of integrated circuits and semiconductors have advanced our lives through the mutual benefit of buyer and seller. Consumers, not bureaucrats, should decide where precious resources should go. NASA also inflicts us with a misallocation of labor. The market's profit/loss mechanism is the only way that the labor involved, like scientists, is being put to its most economic and productive use. And like all government programs, it has become increasingly less efficient as time goes by and its goals have become more and more hazy; the "mission creep" of the chaotic absence of market prices. If NASA were de-funded, the private sector could begin to deliver services that are actually valuable to consumers, things NASA barely emphasizes, like employing robot satellites that gather information about the Earth to supply the high commercial demand for more accurate weather forecasts and geological assessments. Robot satellites can also accomplish most of the things that more expensive manned flights do, just without the rah-rah, nationalistic PR.

### NASA has management problems and suffers cost overruns

Edwards 4-Chris, Director of fiscal policy studies at CATO, 6/2/04 “Downsizing the Federal Government” Policy Analysis No. 515 www.offnews.info/downloads/downsizing\_fedgov.pdf

NASA. The official report on the Columbia disaster in 2003 found that NASA suffers from ineffective leadership, flawed analyses, and a reactive and complacent approach to safety. It noted that the mistakes made on Columbia were “not isolated failures, but are indicative of systematic flaws” in the agency. 82 The 1986 Challenger disaster was also traced to flawed NASA management. 83 NASA’s poor management manifests itself in the large cost overruns of the International Space Station. The project’s estimated cost has skyrocketed from $17 billion in 1995 to $30 billion today, and the station is four years behind schedule. 84 A new GAO report in April called attention once again to NASA’s poor financial management. 85

## NASA Bad: Inefficient/Delay

### NASA Repeatedly bites off more than it can chew fails, and runs over-budget

Edwards 4-Chris, Director of fiscal policy studies at CATO, 6/2/04 “Downsizing the Federal Government” Policy Analysis No. 515 www.offnews.info/downloads/downsizing\_fedgov.pdf

National Aeronautics and Space Administration. NASA is one of the most mismanaged agencies in the government. The official report on the Columbia disaster in 2003 found that NASA management had ineffective leadership, flawed analysis, and a safety culture that was reactive and complacent. 423 It noted that the mistakes on Columbia were “not isolated failures, but are indicative of systematic flaws” in the agency. 424 The 1986 Challenger disaster was also traced to failed NASA management. 425 The Mars Polar Lander failure was caused by one NASA project team using metric and another NASA team using English measurements. 426 A big problem with NASA, which is common to many federal agencies, is that large projects go far over budget and lag far behind schedule. The GAO concludes that the agency has “debilitating weaknesses” in its management of large projects. 427 For example, the International Space Station’s construction costs have skyrocketed from $17 billion in 1995 to $30 billion today, and it is four years behind schedule. 428 Scrapping that project alone would save taxpayers $70 billion over the next 12 years. 429 Congress shares the blame for NASA’s waste, since it funds white-elephant projects, such as the space station, that have no clear policy goals. Americans do not need NASA in order to further advance the space age. Space should be opened up to private entrepreneurs eager to move forward with space tourism and other space businesses of the future. 430

## NASA Bad-Ineffective/Stifles Innovation

### **NASA Inhibits innovation and is ineffective**

Younkins 4- Edward, Professor of Accountancy at Wheeling Jesuit University “From NASA to Commercial Space Enterprise” 11/3/04 http://rebirthofreason.com/Articles/Younkins/From\_NASA\_to\_Commercial\_Space\_Enterprises.shtml

Unlike the trial and error approaches of private entrepreneurs, NASA’s program is run as a centralized bureaucracy. After carefully studying all of its options and considering the political aspects of the program, bureaucrats choose the one best approach to an opportunity or a problem and massively fund the program until it works. Space travel is not too costly for the private sector. The free market is capable of funding safe space exploration and tourism. For the last fifty years, advocates of a government run space program have maintained that the enormous amount of capital and resources required can best be obtained by government and that the cost was just too high for the private sector. Of course, it was the government’s emphasis of its space “program” that entailed a single concerted effort by a bureaucratic empire-building institution such as NASA that uses tax dollars to fund its projects. It was government that kept the cost high and that enhanced NASA’s monopoly through subsidization, legislation, and regulation. NASA has come to be viewed by many as a vast, nationalized, high-tech jobs program. NASA spends money that is taken from taxpayers. If space exploration had occurred in the private sector, funds would not have been diverted from uses that would have better met consumer preferences. The private sector understands the moneymaking nature of space travel. Free-enterprising people, spending their own money, would find cost-effective ways to get to space. In a free market, individuals search for and adopt the best methods. There would be more flexibility with competing private companies using a variety of approaches and launch vehicles. Space entrepreneurs view space as a place for people to work, vacation, study, and live. Manufacturing, tourism, and exploration in space can be better provided by the free market than by centralized planning by a bureaucratic machine. There can be an exciting future for science, business, and industry in space. Of course, for this to occur, we need to further remove bureaucratic barriers to private space development and to establish a system to secure and protect property rights and claims in space that is recognized by all nations.

### **Reliance on NASA will collapse space dominance**

Jou 2k-Ted, Associate in the Washington, DC office of Weil, Gotshal & Manges “The History of the Future of Space” 12/7/2000 www.ugcs.caltech.edu/~tjou/words/Space.pdf

At the present time, the United States has failed to achieve the dominance in this industry that one would expect to follow from its glorious NASA achievements. Instead, the centralized infrastructure of NASA is stifling innovation in the American space indus- try by restricting what is becoming an increasingly free marketplace. Of the three major American launch service providers only one, Orbital Sciences Corporation, uses rockets that were privately developed. McDonnell Douglas and Lockheed Martin are using Atlas and Delta vehicles, respectively that they originally developed for the military over a decade ago. NASA and the Air Force have been the sole patrons of space for so long that the American space industry looks much more like a government agency than a free mar- ket. Clearly, this must change to accommodate the growing demand for launch services; but it will require significant changes in policy, some of which are already in motion

### NASA involvement stifles innovation

Jou 2k-Ted, Associate in the Washington, DC office of Weil, Gotshal & Manges “The History of the Future of Space” 12/7/2000 www.ugcs.caltech.edu/~tjou/words/Space.pdf

There are several companies that are moving as fast as NASA’s Space Launch Initiative projects with private funding. Kistler Aerospace is in the later stages of testing for a two-stage reusable rocket. Kelly Space and Technology is developing its Astroliner to be launched from the atmosphere after being towed by a 747. Pioneer Astronautics is developing the Pathfinder spaceplane, which refuels in mid-air to launch a satellite into orbit. Rotary Rocket Company has raised more than $17 million from private investors to develop its Roton rocket, a single-stage-to-orbit rocket that returns to earth with the aid of rotary blades that deploy from its nosecone. In addition to these more heavily capital ized ventures are dozens of smaller companies with more exotic business plans, including One Stop Satellite Solutions’ plan to use Russian ICBM’s to launch 2.2-pound CubeSats and Lightcraft Technologies laser-boosted rocket. Any one of these technologies, if suc- cessful, could lead to the DC-3 of the space transportation industry. However, if the gov- ernment continues to subsidize its own projects over these other ideas, the economic po- tential will not be enough for these companies to continue operation. Several changes need to occur in space policy to foster innovation in this industry.

## NASA Bad-Obsolete

### NASA Is Obsolete and useless

Edwards 4-Chris, Director of fiscal policy studies at CATO, 6/2/04 “Downsizing the Federal Government” Policy Analysis No. 515 www.offnews.info/downloads/downsizing\_fedgov.pdf

NASA is also obsolete. In the 1960s it played a role in winning the Cold War by ensuring that the United States was the leader in space. In recent decades, private businesses, such as communications satellite firms, have gained a foothold in space. Meanwhile, NASA has floundered with poor management, cost overruns, and unclear goals, particularly in its manned space program. Congress should begin closing down NASA and opening up space to private entrepreneurs. Even manned space flight could be supported by the private sector if space tourism becomes viable in coming years. 73 NASA provides a good example of what can be called “policy by talking points,” by which obsolete programs are sustained because of simple retail politics. Casting about for an uplifting initiative for President Bush to discuss on the campaign trail, the White House recently announced an ambitious scheme to send a manned space mission to the moon and to Mars. With recent NASA failures, little demand for such a scheme from the public, and the government deep into red ink, that expensive initiative makes no practical sense.

## NASA Bad-Funding

### Lack of Steady NASA funding guts solvency

Krombach 11-Leah, “Public or Private: How to Save NASA” Spring 2011 UMD Thesis, http://www.english.umd.edu/interpolations/2609

Although continued survival of NASA is essential for the reasons stated above, **it cannot stay afloat the way it is currently operating. Even if NASA eliminated waste, fraud and abuse, and ran a more efficient space program by prioritizing programs and getting rid of the ones that eat up the budget, it would not be enough**. In the end, Congress, which authorizes and appropriates a certain amount of money to NASA yearly to fund all its projects, has the ability to cut NASA’s funding at any time, and they do so because of the country‘s massive debt. The United States has fallen into a recession and the government has to fund hundreds of agencies who all need more money yearly; there is just not enough money to go around. Senator Richard Shelby of Alabama stated in a press conference, “If this budget is enacted, NASA will no longer be an agency of innovation and hard science. It will be the agency of pipe dreams and fairy tales" (Shelby). Senator Shelby warns that if NASA’s budget keeps getting cut, the agency will not be able to perform all of its scientific advancement, and there would be no point having NASA around at all. NASA needs to find a way to continue functioning by cutting back more of its programs.

## Ban NASA Advocate

### We should Terminate NASA

Edwards 4-Chris, Director of fiscal policy studies at CATO, 6/2/04 “Downsizing the Federal Government” Policy Analysis No. 515 www.offnews.info/downloads/downsizing\_fedgov.pdf

Row 1 in the table includes such programs and agencies as NASA, which is both obsolete and mismanaged. NASA’s activities should be privatized to the extent possible, then the rest of the agency should be terminated. This study focuses on programs that can be ended entirely and does not address program restructuring, which may be appropriate in some cases for proper federal functions such as defense.

# \*\*\*ITAR CP\*\*\*

## ITAR CP---1NC

### TEXT: The USFG should revise the U.S. Munitions List of the International Traffic in Arms Regulation by moving jurisdiction over commercial space activity from the Department of State to the Department of Commerce and reducing licensing process requirements.

### ITAR bars us from any form of space international cooperation and commerce denying U.S. economic and political leadership. Reform is necessary.

Abbey And Lane 9 – George Abbey, Baker Botts Senior Fellow In Space Policy; James A. Barker III Institute For Public Policy At Rice University, Neil Lane, Malcolm Grillis University Professor; Rice University, 2009, “United States Space Policy: Challenges and Opportunities Gone Astray,” American Academy Of Arts And Sciences, Online: http://amacad.org/publications/spaceUS.pdf

In 2005 we emphasized that the success of the U.S. space science and exploration programs is closely related to the success of the commercial space industry. We noted that revision of ITAR was essential for the United States to improve its competitiveness in space commerce, particularly in the satellite industry. Since then, European aerospace companies have continued to encounter problems with U.S. trade restrictions. In response, they are choosing to avoid dealing with U.S. export controls by not using American-made parts, by becoming “ITAR-free”—meaning that their products are not subject to ITAR’s numerous restrictions and the U.S. government’s licensing requirements. Indeed, non-U.S. aerospace companies are advertising “ITAR-free” as a major selling point. The European Aeronautic Defense and Space Company (EADS) and other European companies have been working to develop components that can replace comparable U.S.-made parts. EADS has developed a satellite motor that is completely ITAR-free and therefore not subject to U.S. export license restrictions, allowing competitive access to worldwide customers. France’s Alcatel Space has had a company policy since 2002 to build ITAR-free communications satellites in order to avoid U.S. control over sales. On April 12, 2005, Alcatel launched its first ITAR-free satellite on a Chinese rocket. The company also received two major satellite contracts from China in 2005. Marotta, a British maker of spacecraft propulsion and propellant management equipment, advertises that its products “are European and hold ITAR-free status.” And when Surrey Satellite Technology, another British firm, discusses its satellite propulsion systems, they make clear that their systems are “completely ITAR-free.” 3 China has also been successful in pursuing space technology on its own. A U.S. policy that bars China from launching satellites with U.S. components had left China seeking customers from second-tier operators in Asia, Africa, and South America. Recently, however, China has, in addition to its contracts with Alcatel, secured a contract to launch European-based Eutelsat Communications’ five-ton satellite. Made without any U.S. components, the Eutelsat satellite is scheduled for launch by China’s Long March rocket in 2010. China’s launch bid, estimated to be as much as 40 percent below Western competitors, gives it a cost advantage. Other potential launch customers for China are France’s Thales Group and Italy’s Finmeccanica, which build satellites without U.S. components. China now has a solid track record, with fifteen commercial satellite launches since 2002, the most recent being a communications satellite for Venezuela in October 2008. China has scheduled fifteen more commercial satellites to be sent into orbit in 2009. A 2007 Air Force Research Laboratory (AFRL)/Department of Commerce (DOC) report highlighted these and other problems being experienced around the world by the U.S. aerospace industry. The report, Defense Industrial Base Assessment: U.S. Space Industry, showed that complying with U.S. export control regulations carries a high price tag for U.S. companies and harms their global competitiveness. According to the report, export control compliance costs in the United States averaged $49 million per year industry-wide. Compliance costs grew 37 percent during the 2003–2006 period, with the burden of compliance significantly higher for smaller companies. 4 The report goes on to state that smaller companies feel that ITAR restrictions and limits are a major impediment to their ability to respond to proposal requests and subsequently sell products in foreign markets. Some smaller companies are starting to leave the space industry because of a sustained absence of profitability and a refusal of some foreign companies to deal with ITAR licensing issues. As a percent of foreign sales, the cost burden on smaller companies is nearly eight times that of major firms. These compliance costs include insurance costs, consulting services, compliance-training costs, and Defense Technology Security Administration monitoring costs. For companies that are operating on tight budgets, these accumulating costs can be devastating. According to the AFRL/DOC report, average net margins are thin and below average for the smaller suppliers, around 5 percent, compared to 9 percent in the high-technology manufacturing sectors in the general economy. A direct correlation exists between export policy, the cost of compliance, and the financial health of the smaller suppliers. For entrepreneurial companies, the net margins (if they exist) are even lower because of the cost of compliance. Entrepreneurial companies have had to restrict discussions with several foreign investors because the companies could not provide the information to perform a due diligence, and this has impacted the availability of investment capital. This exodus has significant implications for the U.S. industrial base. An Aerospace Corporation analysis published in 2007 expressed concern about the U.S. space supplier base, where in certain critical areas, there is only one domestic supplier left or one financially weak supplier. 5 A 2007 white paper published by the Space Foundation in Colorado Springs, Colorado, noted that an overly restrictive export control regime, such as ITAR, results in an enfeebled and uncompetitive domestic space industry and can ultimately do as much damage to national security as a lax regulatory system. The foundation expressed concern that the United States is effectively ceding the dominant position in space that it has enjoyed for some time by allowing the expertise of the U.S. space industry to deteriorate. At the same time, the United States’ stringent export policy has essentially allowed global competitors to catch up in the global aerospace marketplace and develop capabilities that, in many instances, are similar to those developed in the United States. In Europe, as demonstrated by EADS and Alcatel, U.S. components and technology are slowly but surely being designed out of systems from satellites to rocket motors. The present U.S. export controls are also negatively impacting scientific research. The Space Studies Board of the National Research Council (NRC) of the National Academies noted this issue in a report summarizing a September 2007 workshop that included participants from the space research, export control, and policy communities to discuss the application of ITAR to space science. 7 Their report made note of the conflict related to the present export control regulations and scientific research. Scientific research encourages and thrives on open and free discussions and the interchange of ideas and approaches. Solutions to the environmental problems facing today’s world also require international cooperative research. But the current export rules greatly constrain or inhibit such interactions. Much of the university research—basic research—leading to these solutions is government-sponsored and falls under ITAR jurisdiction. ITAR licensing is also required when students or researchers from other countries participate in research. Obtaining ITAR approval places an added burden on researchers and creates uncertainty as to when and if approval will be forthcoming. Additionally, other nations are reluctant to subject themselves to restrictions created by U.S. law and regulations. As a result, the report said, foreign researchers view cooperative research with the United States as less and less desirable. The current export control laws also raise diplomatic and military concerns. Gordon England, U.S. Deputy Secretary of Defense under President Bush, contends that technology exports should be encouraged because in this world of coalition warfare and building partnership capacity, it’s essential for us and our friends and allies to have greater interoperability . . . even with vastly different levels of investment. At every level of military activity, from discussions of interoperable hardware designs to battlefield support, the unintended consequences of ITAR can affect the ability of troops and their support personnel to carry out vital tasks. 8 The same is true of cooperative endeavors in human space exploration where a complete understanding, technically and operationally, of the spacecraft and its systems and the overall mission is critical. Looking back, had ITAR requirements been in place during the planning and operation of the space shuttle and ISS, with their multination crews and control centers, the result could have led to life-threatening situations. Indeed, substantive international cooperation probably would not have been possible. If placing space activities under ITAR yielded national security gains, then perhaps all the negative impacts on commerce and science, even military capability, would be worthwhile. But that is not the case. The current policy is simply the result of a “political football” being tossed around by policy-makers who assert that unfriendly nations will steal U.S. technology if the United States does not “lock it all down.” However, much of that technology is available for purchase in other parts of the world, and U.S. policies are encouraging countries to develop components and systems that are comparable or superior to U.S. technology, for their own use and for the world market and in lieu of using U.S. components and systems. The Obama administration needs to place a high priority on changing this policy and doing so quickly.

### ITAR can be reformed by policy action. New export control laws solve.

Sadeh 8 – Eligar Sadeh, Associate Director For The Center For Space And Defense Studies At The United States Air Force Academy; 25 Years Of Experience In The Space Community; Research Associate With The Space Policy Institute At George Washington University; Editor Of Astropolitics; Editor Of Space And Defense; Has A Number Of Publications In Space Policy, Astropolitics, And Peer-Reviewed Journal; Contributing Author To Space Power Theory Project And Space And Defense Policy Textbook, June 9 2008, “Space Policy Questions And Decisions Facing A New Administration,” The Space Review, Online: http://www.thespacereview.com/article/1146/1

<Support reform efforts for export control policies or mandate, in addition to political reform, that export control laws be updated by the United States Congress.

Act on behalf of space companies to create and ensure an open, free-market environment in global space commerce. The current approach to export control of commercial space technologies prevents this from taking place. The export control issue must be addressed at the level of policy by reforming the “rule set” for how ITAR is applied. The current January 2008 Presidential Directive on export control reform is a start, yet more is needed. This encompasses a reassessment of what technologies need to be controlled for export, and dealing with issues of timing, review, transparency, and cost in the export licensing process.

The United States Congress with the support of the President can address the issue of export controls by updating export control laws to better match the dynamics of global space commerce. This starts with reforming the current approach to ITAR by moving jurisdiction on all dual-use commercial space technologies from the Department of State to the Department of Commerce, to legislating new export control laws that update and replace the antiquated Cold War legislation that is still in place– Arms Export Control Act and Export Administration Act.>

## Solvency – General

ITAR can only be revised by legislation from the USFG.

Dinerman 8 – Taylor Dinerman, Author And Journalist Based In New York City; Syndicated Weekly Column For Space Review; Has Written On Space And Defense Issues For The Wall Street Journal, National Review, Ad Astra, National Space Society, Space News; Senior Editor At Hudson Institute’s New York Office; Author Of “Space Science For Students,” March 17 2008, “ITAR’s Failure, The Space Review, Online: http://www.thespacereview.com/article/1086/1

<While a new CoCom would be useful, the most important thing is for the US to find a way to trade with its close allies that treats them as trusted friends. The Validated End User program for a few highly reputable foreign firms is a small step in the right direction. However, much more is needed, and this can only be accomplished if the legislation is changed. It is doubtful that many foreign governments or firms are ready to spend any time or effort to help the US out of this dilemma. They are profiting—or at least they think they are profiting—from America’s mistake.

This time next year the new President should put in place a small task force on ITAR reform that will report directly to him or her. This task force should work closely with Congress to present comprehensive legislation that can be passed and signed during the first year of the new administration. Otherwise, the problem will just get kicked down the road. The US space industry will continue to suffer and good, high paying jobs will continue to be lost.>

### Congress can and should update ITAR.

Dinerman 8 – Taylor Dinerman, Author And Journalist Based In New York City; Syndicated Weekly Column For Space Review; Has Written On Space And Defense Issues For The Wall Street Journal, National Review, Ad Astra, National Space Society, Space News; Senior Editor At Hudson Institute’s New York Office; Author Of “Space Science For Students,” March 17 2008, “ITAR’s Failure, The Space Review, Online: http://www.thespacereview.com/article/1086/1

<In the long run only Congress, with strong support from the White House, can resolve this problem. The Bush Administration has run out of time, so it will be up to the next administration to attempt to resolve this problem. The question involves more than just helping US companies to sell their products in the global marketplace. It involves a deeper question: how does a superpower balance the needs of its national security system and its need to trade?

During the Cold War this question arose over and over again as the US attempted to wage economic warfare against the USSR and its empire. While it was often frustrated by the Europeans and Japanese and their mercantile philosophies, the US did raise the “hassle factor” for companies trying to sell high technology goods and services to Moscow. A similar campaign is now underway against Iran, but it will be many years before its full effects are felt by Tehran.

A rebalancing of the US government’s approach must take place. ITAR as it now exists was an overreaction to the Clinton Administration’s all-out embrace of a mercantilistic philosophy. If the new President and Congress simply free up the flow of technology in the name of export promotion, he or she will simply insure that at some future date Congress will re-impose ITAR-like restrictions, perhaps in an even more draconian form.>

### Returning jurisdiction to the Department of Commerce solves.

Mahon 8 – Colonel Steven G. Mahon, United States Army Reserve; Judge Advocate General’s Corps; U.S. Army War College, December 3 2008, “THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS: AN IMPEDIMENT TO NATIONAL SECURITY,” USAWC Program Research Project, Online: http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA489976&Location=U2&doc=GetTRDoc.pdf

<Recommendations To “Fix The ITAR”

In 2007, a group of U.S. companies joined together to create the Coalition for Security and Competitiveness (also referred to as “The Coalition”). This group, comprised of eighteen industry and trade organizations such as the Aerospace Industries Association (AIA), the Society for International Affairs (SIA) and the National Defense Industries Association (NDIA) is working to modify the current United States’ export control system. The Coalition has issued eleven recommendations to modify the export process and control for items on the USML. 54 The Coalition’s goals are a fine start in reforming the ITAR and returning competitiveness to the U.S. satellite industry. However, because of the political sensitivity of The Coalition members’ relationship with both Congress and the State Department, 55 its recommendations do not go far enough and, alone, will not save the U.S. space industry. The following recommendations, if implemented, will improve the export control system such that the U.S. is able to control and protect critical defense technologies but is not hindered in its ability to sell and export those commercial technologies that are not critical to our national defense and security. The desired end state is to preserve U.S. space industry superiority with an intended consequence of increased national security.

1. Return Jurisdiction Over Commercial Satellites To The Commerce Department Given the statistics and data presented above, it almost goes without saying that removing commercial satellites from the United States Munitions List and returning them15 to Commerce Department oversight is the first step in correcting the U.S. export control system. Since 1999, when all satellites were placed on the USML and export control was returned to the State Department, the U.S. satellite industry has undergone a substantial and dramatic decline. Removing commercial satellites from the USML and returning them to EAR oversight at Commerce is the first necessary step in encouraging and supporting the U.S. industry’s return to competitiveness.>

### Cleaning up the licensing program will speed the export of major commercial systems.

Mahon 8 – Colonel Steven G. Mahon, United States Army Reserve; Judge Advocate General’s Corps; U.S. Army War College, December 3 2008, “THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS: AN IMPEDIMENT TO NATIONAL SECURITY,” USAWC Program Research Project, Online: http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA489976&Location=U2&doc=GetTRDoc.pdf

<5. Develop a Licensing Triage Program to Separate Routine and Complex Applications Currently there is no process in place at State or Commerce to triage applications. License and agreements are assigned and staffed as received. This permits routine applications to clog the processing pipeline while more critical19 applications sit idle pending assignment. Because staff time is at such a premium, a four-level category designation, with very clear guidelines, should be established. For example, a level one application would require immediate attention both because of the technology involved, and the status of the end-user/purchaser. 67 Each application would note which category it fits within, citing the criteria satisfied for inclusion in the category. Coupled with the new category designations should be a set of mandatory processing timelines, which would vary based on the category level. One of the biggest problems with the current USML export system is that exporters have no certainty as to how long the application process will take. This makes commercial transactions extremely difficult. Mandatory processing times would solve this issue. 68

6. Implement Pre-Approval, Program-Level, Licensing Currently a program license (one all-encompassing license) can be granted for major systems programs. Such a license permits the prime contractor to submit one application for a single license covering all USML hardware, technical data and technical assistance on the program. In reality, however, the process is ineffective and, therefore, rarely used. Because of the voluminous paperwork required for a program license, contractors typically submit individual licenses for the underlying components because it is far more efficient. Additionally, a program license, once granted, has little flexibility so that if there are changes in the program, separate amendments must be filed for each change. To correct this deficiency, we should grant pre-approval, at a program level, for large systems that would not otherwise be prohibited at a component level. A key20 element of this recommendation would be permitting industry to implement minor, documented changes, without having to submit a new license application. This change alone would encourage industry to use this process. The U.S. currently sells prior generation weapons and communications systems around the world. There is no reason that a pre-approval process could not be implemented that would rapidly speed the export of major commercial systems for all but the most advanced systems.

7. Permit Expanded, Pre-Approved Licensing Of Prior Generation Commercial Satellite Technology Satellite technology and manufacturing processes that are currently available to, or in use by, foreign competitors are not treated any differently (more leniently) than cutting-edge, U.S.-only technology. This standard puts U.S. manufacturers at a decided economic disadvantage. If a commercial satellite customer (foreign or domestic) can buy the same or similar technology from a foreign source, at equivalent or better pricing, without the uncertainty created by ITAR review and approval, why would they buy from a U.S. source? The answer is simply that they will not. 69 Any technology that is currently in commercial use by foreign entities, available for commercial sale by foreign entities, or is prior generation technology compared to the current U.S. technology, (in other words, is fungible technology) should be immediately placed on a list of “readily marketable technology” that would not be listed on the USML and would be subject only to EAR review and approval.21>

## Solvency – Space Race/Hegemony Advantage

### ITAR harms national security and ruins U.S. leadership.

Sadeh 8 – Eligar Sadeh, Associate Director For The Center For Space And Defense Studies At The United States Air Force Academy; 25 Years Of Experience In The Space Community; Research Associate With The Space Policy Institute At George Washington University; Editor Of Astropolitics; Editor Of Space And Defense; Has A Number Of Publications In Space Policy, Astropolitics, And Peer-Reviewed Journal; Contributing Author To Space Power Theory Project And Space And Defense Policy Textbook, June 9 2008, “Space Policy Questions And Decisions Facing A New Administration,” The Space Review, Online: http://www.thespacereview.com/article/1146/1

<The United States has fallen behind and has lost leadership status in global space commerce competition due to its export control regime.

Export controls are an impediment to United States competition in the international marketplace. International competition in space commerce is stiff and growing, and ITAR harms United States industry and limit the ability to access and make use of the best capabilities. Globalization of space is desirable and ITAR is a barrier.

ITAR damages national security by placing legal and bureaucratic restrictions on the United States military use of commercial space assets that rely on a robust satellite industry and space industrial base. The fact is that the United States military is dependent on commercial space services.

ITAR directly impacts approaches to national security space whereby the United States is denying allies access to warfighting and space protection capabilities.>

### Our export control system must be modernized to respond to evolving security issues.

Mahon 8 – Colonel Steven G. Mahon, United States Army Reserve; Judge Advocate General’s Corps; U.S. Army War College, December 3 2008, “THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS: AN IMPEDIMENT TO NATIONAL SECURITY,” USAWC Program Research Project, Online: http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA489976&Location=U2&doc=GetTRDoc.pdf

<THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS:

AN IMPEDIMENT TO NATIONAL SECURITY

The United States currently faces unprecedented threats to its security both at home and abroad. In confronting these threats, we must be able to exploit the full advantage we derive from our economic strength and technological prowess. To that end, the U.S. export control system must be modernized so that it is better able to respond quickly and effectively to evolving security threats, and promote our nation’s continued economic and technological leadership. — Coalition for Security and Competitiveness

Export control systems serve several important national security functions. They prevent critical military and defense technologies from falling into the wrong hands, they can create and help preserve economic and technology leadership, and they can be useful tools to implement cooperation and sharing amongst allies thereby improving collective security. Controlling exports, and in particular defense trade exports, through a rigorous export control system is more than a mere regulatory function; it is an important element of most nations’ foreign policies and is a critical element of the United States’ national security policy.>

### ITAR reform is key to protecting U.S. space control for network centric warfare.

Mahon 8 – Colonel Steven G. Mahon, United States Army Reserve; Judge Advocate General’s Corps; U.S. Army War College, December 3 2008, “THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS: AN IMPEDIMENT TO NATIONAL SECURITY,” USAWC Program Research Project, Online: http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA489976&Location=U2&doc=GetTRDoc.pdf

<The U.S. National Security Strategy

The future of U.S. war fighting doctrine is network centric warfare (NCW), and NCW is heavily dependent upon the ability to communicate rapidly, requiring the extensive use of comsats. According to the DoD Office of Force Transformation, “All of the Service and Joint Transformation Roadmaps are based on this central principle. This is helping to create and maintain a decisive war fighting advantage for U.S. forces. In the Information Age, power is increasingly derived from information sharing,8 information access, and speed, all of which are facilitated by networked forces.” 28 Access to space is a key element of NCW and, therefore, of the United States’ national security. Continued commercial satellite technology development is a critical element to guaranteeing that access.

In furtherance of these goals, and in response to the attacks of September 11, 2001, President Bush issued a new National Security Strategy of the United States (the “NSS”). 29 While the National Security Strategy is a grand strategy document—by its very nature broad and all encompassing—it does specifically address the issue of both preserving America’s technological advantages while encouraging and advocating the future development of technology. In the National Security Strategy introductory letter, President Bush states, “We will cooperate with other nations to deny, contain, and curtail our enemies’ efforts to acquire dangerous technologies.”

30 Certainly the ITAR helps prevent acquisition of leading U.S. technology by our enemies, but to date, we have spent very little time “cooperating with other nations,” a policy that has hindered sharing technology with our friends and has forced even our allies to develop their own competing space and satellite capabilities. While preventing the acquisition of current technology by U.S. adversaries is a primary goal of the ITAR, the National Security Strategy recognizes that defense trade technology is not a static field and that the U.S. must be actively and dynamically involved in future development in order to retain technology leadership. “Investing in future capabilities while working to protect them through a more vigorous effort to prevent the compromise of intelligence capabilities” 31 is an important goal of the NSS.9>

## Uniqueness – Aerospace Industry

### NASA brain-drain happening now.

Press Trust Of India 8 – Press Trust Of India, The Largest Nonprofit Cooperative News Agency In India, October 26 2008, “India Considers Employing NASA Scientists,” Online: http://www.liveleak.com/view?i=905\_1225022958&comments=1

<Bangalore: Several NASA scientists — of Indian origin and foreigners alike — are knocking the door of Indian Space Research Organization looking for opportunities to work in future Indian space missions following the success of Chandrayaan-1 launch, a senior ISRO official said on Saturday.

Project Director of Chandrayaan-1, India's first unmanned lunar mission, Mayilsamy Annadurai says he definitely sees a "small trend" of what he calls "reverse brain-drain".

"Some of my friends and juniors working there (NASA) are looking for opportunities for working in ISRO," Annadurai said.

He said at least half-a-dozen of them had approached him seeking openings in the Indian space agency and he knew that "a good number of foreigners" were also looking for such jobs.

Other senior ISRO officials sure would have got similar calls, he said. The question they are all asking is: "Is there any opportunity for working in future missions of ISRO".>

### Skilled returnees are driving Indian and Chinese development now.

Wadhwa 9 – Vivek Wadhwa, Executive In Residence/Adjunct Professor; Pratt School Of Engineering, Duke University; Senior Research Associate; Labor And Worklife Program, Harvard Law Schol, Spring 2009, “A Reverse Brain Drain,” SpringerLink, Online: http://www.springerlink.com/content/b347n7m36r6q4565/fulltext.pdf

<An inhospitable immigration policy environment in the United States would not be enough by itself to discourage a large number of high-skill workers. They would also need to have alternative venues for challenging and rewarding work. We therefore decided to visit a cross-section of companies that would employ skilled workers in India and China. In particular, we wanted to learn more about how technology companies in these countries were progressing up the value chain from low and medium value-added information technology services to significantly higher-value services in core R&D, product development and design, and the creation of patents and intellectual property. We met with senior executives of more than 100 local companies and multinationals operating in these countries, toured their R&D labs, and interviewed employees. Although the information we collected is obviously anecdotal, it nevertheless is noteworthy and deserving of further exploration.

We learned that India is rapidly becoming a global hub for R&D outsourcing and is doing so, in part, by leveraging the knowledge and skills of returnees. In the pharmaceutical sector, a number of Indian companies, including Aurigene, Dr. Reddy’s, and Ranbaxy, have significant product development or basic research contracts with major multinational drug companies. These three Indian companies are also recruiting top scientists from the United States for their R&D teams. Dr. Reddy’s hired approximately 100 returnee scientists in 2006 alone. We also found evidence of startup activity in the pharmaceutical industry, with Indian startups relying on research or executive teams with experience working for major U.S. drug companies. For example, Advinus Therapeutics, an early-stage drug discovery company based in Bangalore, was founded by Indiaborn former employees of Bristol-Meyers Squibb.

Technology outsourcing companies such as India’s HCL and TCS are no longer performing only system administration tasks. They are also moving into product design and core R&D in a number of areas, including semiconductor design and aerospace. For example, HCL and TCS teams are designing the interiors of luxury jets, in-flight entertainment systems, collision-control/navigation-control systems, and other key components of jetliners for U.S. and European corporations. These technology companies are also hiring U.S.- educated engineers. For example, HCL hired 350 U.S.-educated engineers between 2000 and 2006. IBM, Cisco, Microsoft, and many other leading U.S. technology companies maintain sizeable operations in India. These facilities are directly competing with the United States for talent and have been successful in luring top-notch professionals who have been trained or educated in the United States. In IBM India’s advanced research labs, half of the Ph.D.’s are returnees from the United States. In General Electric’s Jack Welch Technology Center in Bangalore, where they are designing some of the company’s most advanced technologies, 34% of the R&D staff are returnees.

The Chinese situation is somewhat different. China is already the world’s biggest exporter of computers, telecommunications equipment, and other high-tech electronics. Multinationals and government-backed companies are pouring billions of dollars into next-generation plants to turn China into an export power in semiconductors, passenger cars, and specialty chemicals. China is lavishly subsidizing stateof- the-art labs in biochemistry, nanotech materials, computing, and aerospace. Despite these efforts, we found that China was far behind India in the size and scope of R&D outsourcing. Rather, multinationals were using Chinese workers to perform significant customization of their technologies and to develop new products for the Chinese market.

In all of the companies we visited in China, returnees from the United States were performing the most sophisticated R&D. Returnees were usually in senior-level management and R&D positions in engineering, technology, and biotech companies. China appears to be in desperate need of Western- educated R&D and management talent and is offering substantial incentives for returnees with these skills.>

### Space sector brain drain has left development in need of improvement now.

Sadeh 8 – Eligar Sadeh, Associate Director For The Center For Space And Defense Studies At The United States Air Force Academy; 25 Years Of Experience In The Space Community; Research Associate With The Space Policy Institute At George Washington University; Editor Of Astropolitics; Editor Of Space And Defense; Has A Number Of Publications In Space Policy, Astropolitics, And Peer-Reviewed Journal; Contributing Author To Space Power Theory Project And Space And Defense Policy Textbook, June 9 2008, “Space Policy Questions And Decisions Facing A New Administration,” The Space Review, Online: http://www.thespacereview.com/article/1146/1

<A qualified and energized workforce is a priority for the current National Space Policy put forward by President Bush in 2006. There are many other studies supported by government and industry that support this priority.

A robust industrial base depends on addressing educational and workforce development issues. As capability in the industrial sector erodes, due to issues related to export controls, a lack of education in technical and scientific disciplines, and insufficient workforce development, the government sector erodes as well.

Close to 30% of all graduate students in science and engineering disciplines in universities and colleges in the United States are foreign nationals. At the post-doctorate level, the percentage of foreign nationals in science and engineering disciplines climbs to 60%.

There is “brain drain” across the space sectors. Approximately 30% of the engineering and science workforce in the United States is eligible to retire.

Space professional development is in need of improvement.>

### Uniqueness – The US is experiencing uncontested brain drain now from Chinese and Indian skilled workers.

Wadhwa 9 – Vivek Wadhwa, Executive In Residence/Adjunct Professor; Pratt School Of Engineering, Duke University; Senior Research Associate; Labor And Worklife Program, Harvard Law Schol, Spring 2009, “A Reverse Brain Drain,” SpringerLink, Online: http://www.springerlink.com/content/b347n7m36r6q4565/fulltext.pdf

<Although most of the national immigration debate originates with those who want to limit immigration, U.S. policymakers should be focusing on the more important task of attracting and keeping more highly skilled foreign-born scientists and engineers. The future strength of the nation’s economy will depend on the creation of vibrant new companies, and the development of innovative products and services will be produced by well-paid workers. In recent years, immigrants have been playing a rapidly expanding role as high-tech entrepreneurs and inventors, providing an essential service to the country.

The danger is that the United States is taking this immigrant contribution for granted at a time when changes in the global economy are providing alternative career opportunities for the most talented people. In the past, the United States was clearly the best place for the most talented scientists and engineers to work, and there was no need to do anything special to attract them. Those days are gone, and the United States must begin paying more attention to what is necessary to attract foreign talent and taking steps to eliminate barriers to immigration.

Even as the immigrant contribution to U.S. high technology grew steadily from 2000 to 2008, anecdotal evidence began to surface in the popular media and in the professional electronic networks of the emergence of a countertrend. Immigrants with technology and science skills were becoming more likely to leave the United States. Encouraged by the development of high-technology industries in their home countries and by the prospects for rapid economic expansion, they began to see their homelands as places of equal if not greater promise.

When immigrants recognized that they could pursue their career objectives outside the United States, they were able to consider other factors such as closeness to relatives, cultural appeal, and quality of life when deciding where to work. They were also able to think more about the U.S. immigration policies that keep over 500,000 highly skilled immigrant workers in limbo for years with little opportunity to advance or change jobs. With the current economic crisis darkening job prospects and evidence of growing U.S. xenophobia, it is no surprise that many immigrants who came to the United States for school and short-term jobs are heading home. President Obama even signed an economic stimulus law that includes a provision that makes it harder for some companies to hire non-U.S. citizens.

During the closing decades of the 20th century, roughly 80% of the Chinese and Indians who earned U.S. Ph.D.s inscience, technology, engineering, and mathematics (STEM) fields have stayed in the United States and provided a critical boost to the nation’s economy. Perversely, now that China and India are becoming formidable economic competitors, the United States seems inclined to enhance their economic productivity by supplying them with an army of U.S.-trained scientists and engineers. These returnees are spurring a technology boom in their home countries, expanding their capacity to provide outsourcing services for U.S. companies, and adding increasingly sophisticated primary R&D capability in knowledge industries such as aerospace, medical devices, pharmaceutical research, and software design.>

## Solvency – Aerospace Industry

### ITAR has prevented widespread commercial development and allows external global player to gain ground.

Wainscott Sargent 11 – Anne Wainscott-Sargent, Communications Director, International Association of Business Communicators, Atlanta Chapter, January 1 2011, “COMMERCIAL SATELLITE SECTOR SEES UPSIDE TO NEW SPACE POLICY HOPEFUL OF ITAR REFORM, GREATER STAKE IN U.S. ROADMAP FOR SPACE,” SATELLITE TODAY, Online: http://www.satellitetoday.com/via/cover/35808.html

<Crippling Effects of ITAR

More than a decade ago, the U.S. mandated by legislation that exports of all satellites and related components and technology be controlled by the U.S. State Department and licensed pursuant to ITAR. The decision kept many U.S. companies out of the international space market, allowing Europe and other global players to gain ground, developing so-called ITAR-free spacecraft with no U.S. components that can launched on Chinese vehicles. “Before these policies, the United States had about three-quarters of the world market, and we’re now about 40 percent to 50 percent annually for the world market for satellites,” says Cooper.

ITAR compliance costs the commercial satellite industry an average of $50 million per year, with licensing issues costing as much as $600 million per year of lost revenues, according to a 2008 study from the Center for Strategic and International Studies (CSIS), “Health of the U.S. Space Industrial Base and the Impact of Export Controls.” Cooper says space component subcontractors are feeling the brunt of the effects of not being able to compete on the global stage. “The effect isn’t necessarily the loss of significant prime contracts. The effect is on our smaller companies that don’t have huge ITAR licensing departments. They can’t afford to sell outside the United States, so many leave the marketplace.”

TeleCommunication Systems (TCS), a secure satcom and wireless communications applications systems integrator, sees the new space policy as a positive momentum driver for ITAR reform. “I think it solidifies the need for faster reform,” says retired U.S. Army Col. Allen Green, TCS Government Solutions Group vice president for strategic programs. Allen notes that the loss of leadership in U.S.-led innovation in the worldwide satellite market has a trickledown effect on “our ability to innovate at the ground network level as well.”

Current export controls have also proven burdensome for larger companies. Kalpak Gude, vice president and deputy general counsel of Intelsat, says ITAR restrictions have created many challenges, most notably when Intelsat pursues joint venture agreements with third parties. “It also creates problems with our customers in providing them health information on our satellites and in dealing with insurers because the insurance community wants to know the technical information.”

Gude hopes the ITAR reform will lead to more commercial launch options. He says current rules limit commercial U.S. operators to a pair of providers, France-based Arianespace and Russian Proton rockets procured through U.S.-based International Launch Services. “While (U.S.-based) Space-X hopes to get there, they are years away from launching satellites of the size that communications companies require. Being limited to what are effectively two providers is problematic and risky given how integral satellites are to overall communications networks and national security,” he adds, noting that a launch failure could derail commercial launches. “People have not paid attention to what’s happened in the launch marketplace and today how reliant we are on other foreign suppliers — and not even diversified the foreign suppliers,” he says. Gude remains optimistic that change is coming, though he declined to predict how soon due to uncertainty on what position the new U.S. Congress will take on the issue.>

### ITAR prevents commercial space development with bureaucratic red tape.

Sadeh 8 – Eligar Sadeh, Associate Director For The Center For Space And Defense Studies At The United States Air Force Academy; 25 Years Of Experience In The Space Community; Research Associate With The Space Policy Institute At George Washington University; Editor Of Astropolitics; Editor Of Space And Defense; Has A Number Of Publications In Space Policy, Astropolitics, And Peer-Reviewed Journal; Contributing Author To Space Power Theory Project And Space And Defense Policy Textbook, June 9 2008, “Space Policy Questions And Decisions Facing A New Administration,” The Space Review, Online: http://www.thespacereview.com/article/1146/1

<The United States government’s approach to export control of commercial space technologies places political, legal, and bureaucratic restrictions on the aerospace industry in the United States. These restrictions posit a cost to the United States satellite industry and the space industrial base.

Export controls of commercial space technologies are governed through the International Traffic in Arms Regulations (ITAR), which is administered by the Department of State. These Regulations prevent international partnerships in commercial space by making it more difficult and bureaucratic to implement.

As a result of ITAR, domestic manufacturing capabilities for vital space-related hardware and components are reduced. The regulations, in contrast to the intended goal of retaining preeminence for the United States in the aerospace and defense fields, brings about the opposite effect.>

### ITAR sacrificed our high tech economy to slow-moving bureaucrats.

Dinerman 8 – Taylor Dinerman, Author And Journalist Based In New York City; Syndicated Weekly Column For Space Review; Has Written On Space And Defense Issues For The Wall Street Journal, National Review, Ad Astra, National Space Society, Space News; Senior Editor At Hudson Institute’s New York Office; Author Of “Space Science For Students,” March 17 2008, “ITAR’s Failure, The Space Review, Online: http://www.thespacereview.com/article/1086/1

<ITAR (International Traffic in Arms Regulations), which since 1999 has included not only weapons but communications satellites and virtually all spacecraft and most detailed information about them, has been one of the most spectacular “own goals”, as they say in soccer, in US history. Reduced to its essentials, it was a declaration of economic and technological war by the US government against the US national interest.

ITAR handed over control of an important part of the US high tech economy to a set of hyper-cautious, hyper-legalistic, and slow-moving bureaucrats. In response to a critical GAO report in January of this year, the late Congressman Tom Lantos (D-CA) complained about “years and years of fundamental mismanagement at the Directorate of Defense Trade Controls (DDTC).” He was right: the problem goes back to 1999, when Congress passed the regulatory power from the Department of Commerce to the State Department.

Big companies, large organizations such as NASA, and the big universities have the time and the resources to overcome these obstacles. However, small companies or individual researchers do not. Even large companies have seen their profit margins reduced by the need to waste their recourses coping with these regulations.>

### Large and small companies will spur innovation in private space industry.

Wainscott Sargent 11 – Anne Wainscott-Sargent, Communications Director, International Association of Business Communicators, Atlanta Chapter, January 1 2011, “COMMERCIAL SATELLITE SECTOR SEES UPSIDE TO NEW SPACE POLICY HOPEFUL OF ITAR REFORM, GREATER STAKE IN U.S. ROADMAP FOR SPACE,” SATELLITE TODAY, Online: http://www.satellitetoday.com/via/cover/35808.html

<Commercial Industry Engaged

Without question, large and small companies see the policy’s overall direction as very positive for the commercial space industry. TCS hopes this will open up even more opportunity for the company’s government business, which today accounts for more than 50 percent of revenues. TCS currently has 200 staff deployed in Afghanistan and Iraq to support the company’s products and services. “The new policy will open up the government market to greater competition and will spur innovation in the overall private sector to compete for that business, so that’s a good thing,” says Allen. While TCS is mostly U.S.-focused, the company hopes in the next few years to leverage export control reform to look increasingly at global opportunities, especially at applications for remote monitor using machine to machine and SCADA networks, including global rail systems that rely on machine-to-machine interfaces to manage train services, Allen says.>

### ITAR is the primary cause for a dwindling U.S. space market share – Experts prove.

Mahon 8 – Colonel Steven G. Mahon, United States Army Reserve; Judge Advocate General’s Corps; U.S. Army War College, December 3 2008, “THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS: AN IMPEDIMENT TO NATIONAL SECURITY,” USAWC Program Research Project, Online: http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA489976&Location=U2&doc=GetTRDoc.pdf

<Impact of the ITAR on the U.S. Space Industry

Worldwide, the U.S. has long been seen as the leader in all technical aspects of space and satellite technology. Unfortunately, the ability of the U.S. to maintain a technological lead is directly related to the success of its commercial space market, and never has that market been so weak. Before the shift in export control policy in 1999, the U.S. dominated the commercial satellite-manufacturing field with an average annual market share of 83 percent. Since then, market share has declined to less than 50 percent. 36 While the plummeting market share cannot be blamed solely on tightened export regulations, 37 they have surely played a significant part in the decline. 38 For example, since the change in export policy, “no Chinese satellite operator has chosen to purchase any satellite that is subject to U.S. export regulation and have instead selected European and Israeli suppliers,” at an estimated loss to U.S. manufacturers of $2-3 billion.” 39 Commentators have cited the U.S. export control system as the primary cause for dwindling market share. “American companies that produce satellites have great difficulty competing in the world market due to a rigid interpretation of ambiguous statutory requirements and a cumbersome and confusing licensing process that leads to long delays and uncertain outcomes.” 40 “The most serious barrier to U.S. competitiveness in space commerce, particularly in the satellite industry, is U.S. policy on export controls. Export control policies have already seriously damaged the U.S.11 commercial satellite industry and promise to do the same to the ability of the United States to conduct space operations with international partners.” 41>

# \*\*\*Affirmative Answers---ITAR CP\*\*\*

## Non-Unique

### The House is pushing for ITAR reform now – We are closer than ever.

Wainscott Sargent 11 – Anne Wainscott-Sargent, Communications Director, International Association of Business Communicators, Atlanta Chapter, January 1 2011, “COMMERCIAL SATELLITE SECTOR SEES UPSIDE TO NEW SPACE POLICY HOPEFUL OF ITAR REFORM, GREATER STAKE IN U.S. ROADMAP FOR SPACE,” SATELLITE TODAY, Online: http://www.satellitetoday.com/via/cover/35808.html

<While it’s too soon to determine how the policy ultimately will roll out, many space sector observers expressed optimism that the policy also signals a willingness to look at export control reform. The U.S. House of Representatives passed an International Traffic in Arms Regulations (ITAR) reform bill removing commercial telecommunications satellites and related components from the U.S. Munitions List, however, the Senate is delaying any action until the release of a U.S. Department of Defense report outlining which space items it recommends be eliminated from the Munitions List. “I think we are closer to reform than we’ve ever been over the last 12 years, and we’re gratified to see how much interest there is in revisiting legislation, particularly out of concern for the health of the space industrial base,” says Cooper.>

## Internal Link Turn

### ITAR is the lynchpin of our military power.

Broniatowski Et Al 5 – David Broniatowski, Nicole Jordan, Andrew M. Long, Matthew G. Richards, Roland E. Weibel, Massachusetts Institute Of Technology Research Group, September 2005, Massachusetts Institute Of Technology, Online: <http://web.mit.edu/mgr/www/Portfolio/Balancing%20the%20Needs%20for%20Space%20Research%20and%20National%20Security%20in%20the%20ITAR.pdf>

The United States enjoys primacy in military affairs around the globe due in large part to the relative strength of its scientific and engineering establishment. The U.S. military is able to apply a wide array of technologically enabled tools in conventional engagements and nuclear deterrence. This technological superiority today stems from the World War II era experience that investment in scientific research and development can win wars. Recent conflicts in the Persian Gulf, Kosovo, and Afghanistan dramatically illustrate the prowess of the United States military against conventional military forces. The United States’ ability to leverage technology enables the U.S. to outmatch potential adversaries in military capability while committing far fewer troops to the conflict. Globally, the U.S. National Security Council is provided unmatched power projection capabilities by stealth aircraft, global positioning system (GPS) guided munitions, unmanned aerial vehicles, nuclear submarines, and ten carrier battle groups. 1 The relative scientific advantage enjoyed by the United States is a critical enabler of our military capabilities. Space technology in particular has become a vital component of the United States military. The U.S. military utilizes space for many key aspects of military operations: communications; navigation; missile warning; weather forecasting; and intelligence, surveillance, and reconnaissance. Satellites are efficient means to collect, transmit, and distribute information to the warfighter. 2 Foreign entities employ a variety of techniques to glean militarily applicable knowledge from the United States. Knowledge transfer may occur through covert actions as well as overt methods. Whether channeled through illegal purchases of equipment from third party nations and industrial espionage by foreign agents or through academic exchanges and open literature, technology transfers can be militarily significant. Regulations must, therefore, uphold the national security interests of the United States. Four steps compose the process of diffusion of technology to a state’s potential adversaries: 3 1. Development of an awareness of existing information and/or hardware 2. Transfer of information and/or hardware 3. Absorption of knowledge into indigenous innovation 4. Improvement of foreign entity’s military strength Given the synergies between commercial and civil space activities, and military and intelligence space activities, space research institutions are rich targets where foreign nations may acquire critical U.S. scientific knowledge, hardware designs, and technical skills. Furthermore, by monitoring the status of U.S. progress in various space system technologies, foreign nations are better able to allocate resources to counter U.S. space capabilities. 4 In addition to the diffusion of national security technology to foreign nations, the September 11 th attacks introduced a new security environment in which the asymmetric threats of terrorism became a fixture in U.S. society. Although terrorism had struck the United States before, 9/11 increased the consequences of the threat by several orders of magnitude. This event fundamentally changed the risk preferences of decision makers in government and, in doing so, the enforcement of U.S. export control policy. Terrorism may or may not alter the underlying rationale for ITAR restrictions. 5 Proponents of the reactionary perspective point out that ITAR covers weapons that terrorists have not used to date and may not ever use due to the complexity entailed in creating, transporting, and deploying them successfully. Proponents of the precautionary perspective respond to 9/11 by demanding more stringent ITAR regulations. From the precautionary perspective, the threat of terrorist organizations buying or stealing weapons of mass destruction underscores the need to curb proliferation, including more stringent export control policy. In contrast to rogue states, terrorist regimes are unlikely to develop indigenous technologies. However, terrorists are certainly capable of buying or stealing technologically enabled weapons systems and then gaining training in those systems through the export of information. As such, it is in the interests of the United States to limit the proliferation of weapons technology and training. Over the last decade the United States has fought brilliant military engagements against conventional military forces in the Persian Gulf, Kosovo, and Afghanistan. The success in these conventional conflicts can be traced to the revolution in military affairs (i.e., the application of modern science and engineering to weapons technology). The military importance of scientific superiority is now recognized both in the U.S. and by potential adversaries around the world. The rise of the threat of terrorism increases the scope of technologies applicable to protecting American citizens but does not alter the need for export controls. Protecting a strong, technologically enabled innovation system in the United States is necessary to maintaining primacy in global military affairs.

# \*\*\*Tax Incentives CP\*\*\*

# \*\*\*TAX CREDITS CP

## 1nc—counterplan

### Tax incentives empirically spur private involvement

Alridge 4 – Peter Alridge Jr., Under Secretary for Acquisition, Technology, and Logistics, at the Department of Defense, June 2004, “A Journey to Inspire, Innovate, and Discover,” http://www.nasa.gov/pdf/60736main\_M2M\_report\_small.pdf

Tax Incentives. A time-honored way for government to encourage desired behavior is through the creation of incentives in the tax laws. In this case, an increase in private sector involvement in space can be stimulated through the provision of tax incentives to companies that desire to invest in space or space technology. As an example, the tax law could be changed to make profits from space investment tax free until they reach some pre-determined multiple (e.g., five times) of the original amount of the investment. A historical precedent to such an effort was the use of federal airmail subsidies to help create a private airline industry before World War II. In a like manner, corporate taxes could be credited or expenses deducted for the creation of a private space transportation system, each tax incentive keyed to a specific technical milestone. Creation of tax incentives can potentially create large amounts of investment and hence, technical progress, all at very little expense or risk to the government.

## 2nc—tax incentives solve

### Tax incentives are comparatively better than NASA

Gessing 4 – Paul J. Gessing, Director, Government Affairs, National Taxpayers Union, January 16, 2004, “Give tax incentives to investors of space ventures,” http://articles.chicagotribune.com/2004-01-16/news/0401160354\_1\_ideal-policies-space-agency-manned

No matter how much money is poured into the space agency, NASA will always be hampered by the fact that it hires some of the finest technical minds in the world and then burdens them with useless and contradictory rules that are the product of Congress' need for political expediency and tendency to meddle.

Manned space flight may or may not be the most efficient and cheapest means of exploring outer space, but the contrast between the Spirit rover's success in photographing Mars and the agency's checkered history with manned missions is striking.

NASA's government-sponsored space research monopoly, however, makes both learning from past mistakes and financial prudence a challenge.

Before digging the nation further into debt with a costly mission to Mars, President Bush and Congress should embark on significant legislative reforms that will make space exploration safer and more cost-effective. The Invest in Space Now Act is one initiative that would provide tax incentives to investors willing to back private space ventures.

While tax credits aren't always ideal policies, this proposal is a far better alternative than pumping more funds into the federal space monopoly.

### Tax incentives encourage private sector development of space

SSI 4 – Space Settlement Institute, think tank dedicated to finding ways to make space settlement possible, June, “A Journey to Inspire, Innovate, and Discover,” http://www.space-settlement-institute.org/Articles/rec52.htm

Section III - B. Encouraging Commercial Activities Although many companies exist and more are emerging in the field of space, an increase in both the number and variety of such businesses would vastly increase the processes and materials available for space exploration. The private sector will continue to push the envelope to succeed competitively in the space field. It is the stated policy of the act creating and enabling NASA that it encourage and nuture private sector space. The Commission heard testimony on both positive incentives and potential bottlenecks encountered by the private sector as they attempt to exploit these commercial opportunities.

A space industry capable of contributing to economic growth, producing new products throught the creation of new knowledge and leading the world in invention and innovation, will be a national treasure. Such an industry will rely upon proven players with aerospace capabilities, but increasingly should encourage entrepreneurial activity.

Prizes. The Commission heard testimony from a variety of sources commenting on the value of prizes for the achievement of technology breakthroughs. Examples of the success of such an approach include the Orteig Prize, collected by Charles Lindbergh for his solo flight to Europe, and the current X-Prize for human suborbital flight. It is estimated that over $400 million has been invested in developing technology by the X-Prize competitors that will vie for a $10 million prize - a 40 to 1 payoff for technolgy.

The Commission strongly supports the Centennial Challenge program recently established by NASA. This program provides up to $50 million in any given fiscal year for the payment of cash prizes for achievement of space or aeronautical technologies, with no single prize in excess of $10 million without the approval of the NASA Administrator. The focus of cash prizes should be on maturing the enabling technologies associated with the vision. NASA should expand its Centennial prize program to encourage entrepreneurs and risk-takers to undertake major space missions.

Given the complexity and challenges of the new vision, the Commission suggests that a more substantial prize might be appropriate to accelerate the development of enabling technologies. As an example of a particularly challenging prize concept, $100 million to $1 billion could be offered to the first organization to place humans on the Moon and sustain them for a fixed period before they return to Earth. The Commission suggests that more substantial prize programs be considered and, if found appropriate, NASA should work with the Congress to develop how the funding for such a prize would be provided.

Tax Incentives. A time-honored way for government to encourage desired behavior is through the creation of incentives in the tax laws. In this case, an increase in private sector involvement in space can be stimulated through the provision of tax incentives to companies that desire to invest in space or space technology. As an example, the tax law could be changed to make profits from space investment tax free until they reach some pre-determined multiple (e.g., five times) of the original amount of the investment. A historical precedent to such an effort was the use of federal airmail subsidies to help create a private airline industry before World War II. In a like manner, corporate taxes could be credited or expenses deducted for the creation of a private space transportation system, each tax incentive keyed to a specific technical milestone. Creation of tax incetives can potentially create large amounts of investement and hence, technical progress, all at very little expense or risk to the government.

### NASA fails—tax incentives create profit-motive and market innovation6

Hopkins 1 – Mark Hopkins, led the legislative efforts of the L5 Society and, later, NSS and its affiliated organizations. He has been an officer of L5 /NSS for 20 of the previous 24 years and was instrumental in the merger, which created the National Space Society in 1987. Hopkins, a California Institute of Technology and Harvard educated economist, has written numerous articles concerning space economics, January/February 2001, “Economic Barriers to Space Settlement,” http://www.nss.org/settlement/roadmap/economic.html

One way to advance the cause of space settlement is by removing economic barriers. Often the cost to society of removing an economic barrier is minor or at least much lower than the costs of more direct methods of advancing the day of space settlements, such as technological improvements.

Supporting the removal of economic barriers through legislative action and other member activities can be an extremely cost effective way of using NSS resources to reach our goals.

The Barriers

No Long-term Government Funding Mechanism

Under current law Congress is not allowed to make financial commitments for more than one year. This is a major economic barrier. It forces the management of space projects to worry about next year's funding in every year of a project. This is true even if the project is on schedule and under budget.

Companies can sign contracts that commit them to purchase a large number of items over a long period of time. This approach is frequently used when airlines purchase aircraft or communications satellite companies purchase launch vehicles. Block buying, as it is called, is a win-win way of doing business. It creates economies of scale and reduces the risk for both the supplier of the items (i.e., airplanes or launch vehicles) and for the company that purchases these items. It is also something the U.S. government is currently not allowed to do.

Much worse than the inability of the government to do block buys are the implications for the design stability of major space projects. The early history of the International Space Station is a classic example of this problem. When the level of funding from year to year for a project becomes unstable and unpredictable, project plans must be frequently changed. The cost of redesign becomes a large fraction of the project expenses. Morale of employees can also become a problem. Who wants to spend a year of his or her life helping to design something, only to have most of his or her work thrown away?

The program also becomes politicized. A savvy prime contractor needs to spend significant resources keeping the program sold in Congress. Decisions need to be made not only for technical, cost and efficiency reasons, but for political reasons as well. Selecting subcontractors so that they are located in the politically optimal congressional districts can become more important then selecting them on the basis of who can do the best job.

Few other democratic nations are doing business this way. They have multi-year funding. Why hasn't the United States already dealt with this problem? In a word, politics.

There is a broad consensus in the industry that a change to multi-year funding would substantially improve the efficiency of major space projects. However, it would also reduce congressional power. Members of Congress would give up a great degree of control and sacrifice campaign fundraising leverage. Asking any legislative body to vote to reduce its influence is asking a lot. Overcoming this economic barrier will require making a strong and persistent case based on international precedent, long-term savings, and more efficient results.

Lack of Incentives for Capital Investment

There are clear and widely accepted advantages to having the private sector run the parts of the space program where economic efficiency is important. Where markets exist, such as in communication satellites, private enterprise can do this without help from the government. In others, there may be insufficient incentive for capital investment without special help from the government.

Unless a reasonable profit can be made, commercialization will not occur. High risk levels and unproven market size are factors that frequently pose problems to making profits and thus to attracting capital investment contributing to commercialization. A traditional approach is for the government to fund research and development that can be transferred to the private sector. This can greatly reduce risk. If the government also funds early operations, then risk can be reduced even further. In recent years there has been discussion of stronger government-sponsored incentives for capital investment. This has been particularly true in the context of how to commercialize potential reusable launch vehicles (RLVs).

One suggestion is loan guarantees. In this proposal, the government would guarantee to an aerospace company the loans needed to build an operational RLV. This would cost the government nothing, unless the company failed to repay the loans. In this case the government would repay and thus lose the amount of the loans.

This approach can suffer in varying degrees from the fact that it requires the government to make decisions about which technology, design, and business plan would be best for the task at hand. Helping one company finance its plans for an RLV, for example, makes it more difficult for all other companies to compete. It is possible that help for one idea will prevent the development of a better idea and hence be counterproductive.

Another possibility is a tax incentive. At least two proposals are currently being discussed in Congress. One would provide tax credits for start-up and small companies investing in commercial space transportation companies. The other, proposed by Rep. Dana Rohrabacher (R-CA) and dubbed "zero-gravity, zero-tax," would provide a ten-year tax holiday for companies operating in space. If implemented, these incentives could have an impact far greater than loan guarantees because of their appeal and availability to individual investors and companies of all sizes.

### Free enterprise proves quicker and less tax heavy

Murphy 5 – Robert Murphy, adjunct scholar of the Mises Institute and teaches economics at Hillsdale College, January 2005, “A Free Market In Space,” The Mises Institute Monthly, Vol. 26, No. 1, http://mises.org/freemarket\_detail.aspx?control=525

Beyond the obvious implications for sci-fi buffs and other space enthusiasts, the episode sheds light on the versatility of free enterprise. Most obvious, we see that the government is not necessary for space exploration; engineers and pilots do not suddenly become smarter when they are hired by NASA. Indeed, because a free market in space industries would be open to all competitors, we have every reason to expect technological innovation to be much quicker than in a monopolized space program. In a free market, the maverick pioneer just needs to convince one or a few capitalists (out of thousands) to finance his revolutionary project, and then the results will speak for themselves. In contrast, an innovative civil servant at NASA needs to convince his direct superiors before trying anything new. If his bosses happen to dislike the idea, that’s the end of it. Prior to the exploits of SpaceShipOne, the standard justification for government involvement in space was that such undertakings were "too expensive" for the private sector. But what does this really mean? The Apollo moon program certainly didn’t create labor and other resources out of thin air. On the contrary, the scientists, unskilled workers, steel, fuel, computers, etc. that went into NASA in the 1960s were all diverted from other industries and potential uses. The government spent billions of dollars putting Neil Armstrong on the moon, and consequently the American taxpayers had billions fewer dollars to spend on other goods and services

### Incentives to private companies solve satellite launching best

Musk 11 – Elon Musk, CEO of SpaceX, May 4, 2011, “Why the US Can Beat China: The Facts About Space-X Cost,” http://www.spaceref.com/news/viewpr.html?pid=33457

As noted last month by a Chinese government official, SpaceX currently has the best launch prices in the world and they don't believe they can beat them. This is a clear case of American innovation trumping lower overseas labor rates. I recognize that our prices shatter the historical cost models of government-led developments, but these prices are not arbitrary, premised on capturing a dominant share of the market, or "teaser" rates meant to lure in an eager market only to be increased later. These prices are based on known costs and a demonstrated track record, and they exemplify the potential of America's commercial space industry. Here are the facts: The price of a standard flight on a Falcon 9 rocket is $54 million. We are the only launch company that publicly posts this information on our website (www.spacex.com). We have signed many legally binding contracts with both government and commercial customers for this price (or less). Because SpaceX is so vertically integrated, we know and can control the overwhelming majority of our costs. This is why I am so confident that our performance will increase and our prices will decline over time, as is the case with every other technology. The average price of a full-up NASA Dragon cargo mission to the International Space Station is $133 million including inflation, or roughly $115m in today's dollars, and we have a firm, fixed price contract with NASA for 12 missions. This price includes the costs of the Falcon 9 launch, the Dragon spacecraft, all operations, maintenance and overhead, and all of the work required to integrate with the Space Station. If there are cost overruns, SpaceX will cover the difference. (This concept may be foreign to some traditional government space contractors that seem to believe that cost overruns should be the responsibility of the taxpayer.) The total company expenditures since being founded in 2002 through the 2010 fiscal year were less than $800 million, which includes all the development costs for the Falcon 1, Falcon 9 and Dragon. Included in this $800 million are the costs of building launch sites at Vandenberg, Cape Canaveral and Kwajalein, as well as the corporate manufacturing facility that can support up to 12 Falcon 9 and Dragon missions per year. This total also includes the cost of five flights of Falcon 1, two flights of Falcon 9, and one up and back flight of Dragon. For the first time in more than three decades, America last year began taking back international market-share in commercial satellite launch. This remarkable turn-around was sparked by a small investment NASA made in SpaceX in 2006 as part of the Commercial Orbital Transportation Services (COTS) program. A unique public-private partnership, COTS has proven that under the right conditions, a properly incentivized contractor--even an all-American one--can develop extremely complex systems on rapid timelines and a fixed-price basis, significantly beating historical industry-standard costs.

### Private sector incentives resolves colonization

Livingston 00 – David M. Livingston, Space Future, August 10, 2000, “From Earth to Mars: A Cooperative Plan,” http://www.spacefuture.com/archive/from\_earth\_to\_mars\_a\_cooperative\_plan.shtml

For the private-sector companies participating in the manned mission to Mars, the government can initiate policies that provide them with noncash tax and other incentives, which can certainly minimize or buy down the risk and add to the expected rate of return for their investment. Such use of economic incentives to support private-sector investment has long been a tradition in opening up new industries-the development of the railroads and civil aviation are primary examples.

### Tax incentives fuel private investment

Wingo 7 – Dennis Wingo, CEO of the Huntsville, Alabama-based Skycorp Inc. and the author of the book Moonrush, Spring 2007, “Zero G, Zero Tax,” Ad Astra, Vol. 19, No. 1, <http://www.nss.org/adastra/volume19/wingo.html>

Money! Money is the true rocket fuel of the commercial Space Age. There is a quote in the movie The Right Stuff that one of the astronauts getting ready for the Mercury mission says: "No bucks, no Buck Rogers!" This statement has become an axiom in both government and commercial space. No bucks killed the Apollo program when the money was shifted away from space in the early 1970s. The space shuttle's development was constrained by money, and the vehicle we have today is the result. The space station? Same story. How about the first Space Exploration Initiative under President George H.W. Bush? No bucks, no lunar base! These are the facts of life regarding space.

With the Congress telling NASA it must live with the same budget that they had last year, the first ominous clouds of future lack of congressional interest in the Vision for Space Exploration are on the horizon. If this is the case, then what can be done by our community to support private space efforts?

Since the dawn of the Space Age, there has been very little movement toward private markets for human spaceflight. NASA has always been the 900-pound gorilla in that market, and the perception has always been to avoid the market like the plague by the investment world. It took the risk capital from Paul Allen, who funded the technically brilliant Burt Rutan, to build the first prototype of a mass-market suborbital space tourism system. However, Allen probably would not have invested had there not been some form of return in the form of the Ansari X Prize. Allen is what we in the space business call a visionary investor, or VI. A VI, while looking for an economic return, does have an agenda beyond pure return on investment. Yet the vast majority of the risk capital out there sees human-related space as too great of a risk, with too little return to invite their participation.

We cannot tell today what will be the "killer app" of the commercial Space Age. However, we do know what works to enable the growth of new industries. There is a long history of this in the development of America as a capitalist society. It was a mixture of a granted state monopoly and private investment that enabled Robert Fulton to build the world's first practical steamship. It was a mixture of government bonds and private investment by names like Stanford, Huntington and Crocker that enabled the nation to be united by the transcontinental railroad.

In 2000 the first serious effort to address this issue was undertaken with the introduction of the Zero G, Zero Tax (ZGZT) legislation. Here is a short history of the legislation provided by Alex Gimarc as part of a white paper on the subject:

First introduced in 2000. Provided for 20-year tax holiday for new space products and services. To attempt to maintain revenue neutrality, existing profitable industries were excluded; thus the definition of eligible products and services excluded "any telecommunications service, any service provided by a weather or other Earth observation satellite and any service of transporting property to or from outer space."

Reintroduced in 2001. Exclusions changed to "any telecommunications service provided from Earth orbit, any service provided by a weather or other Earth observation satellite, and any other service provided on or before the date of the enactment of this section of transporting property to or from outer space."

The 2005 version incorporates some tax-credit concepts from the former Calvert-Ortiz tax bill (i.e., Invest in Space Now Act). Can be seen as merger of two bills.

The ZGZT legislation has had many sponsors and actually almost passed in the House of Representatives in 2001. The bill failed because the congressional budget office examined the tax consequences of the bill at $10 billion over its 20-year life. This was not examined for its positive aspects. Today there is zero revenue by any company that would be covered under the ZGZT legislation. In order to cost the government $10 billion, the companies have to make a profit of $28.57 billion over that time period (assuming the standard 35% corporate tax rate). If we use a conservative 10% profit margin for these companies, this implies that the aggregate revenue over the 20-year period is $285.7 billion!

Let's take this a little further. It is typical for companies in the high-tech engineering world to have a cost of labor of 30-50% of revenue. This means that the salaries for all of the people who work for the ZGZT-enabled companies are between $86 billion and $143 billion. Most of these folks have mid- to high-paying jobs, meaning that we can take a conservative 18% of their salaries for federal taxes and 15.3% for social security and Medicare taxes. This brings a total tax revenue into the federal treasury as follows:

What the table above clearly shows is that even using very conservative numbers for salaries as a percentage of revenue and taxes as a percentage of salaries, the net gain to the federal treasury is between $18 billion and $37 billion over the life of the bill. This is pretty good for an industry that did not exist before the passage (potential) of the bill. This is called dynamic scoring in congressional legal terms, something that Congress did not do when they considered the ZGZT bill previously. It is this type of argument that has to be made for Congress to really understand how this bill enables space commerce.

What about the investor? The investment community well understands the effect of tax policy on the growth of industry. The tax holiday on the Internet was one of the crucial factors enabling its growth from a few hundred academic computers in the 1980s to the global force that it is today. This is also the potential for space. We as space advocates know the value of opening the solar system for economic development. We have not done a good job over the years in communicating this vision. We have an opportunity with ZGZT and similar legislation to let dollars speak for us with the result that Buck Rogers takes on a whole new meaning!