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# \*\*\*Neg\*\*\*

## 1NC Shell – Tax Incentives 1/2

### Text: The United States Federal Government should pass the Commercial Space Jobs and Investment Act of 2010.

### CP solves – spurs investment in space exploration and avoids political opposition to spending on NASA.

Leroy Baker, Tax-News.com, 8/19/2010, “Tax Breaks to Boost Private Space Exploration,” http://www.usa-tax-news.com/story/Tax\_Breaks\_To\_Boost\_Private\_Space\_Exploration\_\_\_\_44876.html

United States Senator Bill Nelson has announced legislation that would offer major tax and other incentives to encourage growth in the private space exploration industry. Nelson's plan would create up to five regional business enterprise zones around the country as "magnets for commercial space ventures." As it grapples with record federal deficits, the Obama administration no longer perceives the funding of space exploration a priority and is cancelling the space shuttle program. One more shuttle flight is scheduled for next year after the Senate approved a bill to provide additional funding to the program, but a cloud of uncertainty currently hangs over the US space industry, not to mention the hundreds of high technology firms supplying equipment to the US space program. Nelson's bill, known as the Commercial Space Jobs and Investment Act of 2010 would create a new 'commercial space capital formation credit' allowing investors to claim a tax credit worth 20% of their equity investment in a business producing equipment such as launch vehicles and re-entry vehicles. The equity investment would have to be held for a minimum of five years for the investor to qualify for the tax credit.

### Tax incentives solve – boost private investment and doesn’t link to our budget DA.

Edward Aldridge Jr. et al, Under Secretary for Acquisition, Technology, and Logistics, at the Department of Defense, June 2004, “A Journey to Inspire, Innovate, and Discover,” Report of the President’s Commission on Implementation of United States Space Exploration Policy, 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.

1NC Shell – Tax Incentives 2/2

### Private enterprise solves – market barriers won’t prevent exploration.

Naveen Jain, chief executive officer and co-founder of Intelius, 4/20/2011, “Our Sputnik Moment: US Entrepreneurs Needed for the "Space Race”,” TFD News, http://www.tfdnews.com/news/2011/04/20/93401-naveen-jain-our-sputnik-moment-us-entrepreneurs-needed-for-space-race.htm

To re-launch our space program, we need private enterprise to step into the void. Government funding only needs to take us to the point where the technology has been developed to get us to the Moon -- and we already have that. It's a model that's been used successfully in the past: the military first developed the Internet, and private enterprise then seized on its commercial potential; the same thing occurred with GPS technology. Naturally, there are barriers to entrepreneurs leading the charge to the Moon. For one thing, ownership is always a point of discussion -- but the fact is that "everyone" and "no one" owns the Moon. Much like when mining resources from international waters (as in fishing), entrepreneurs would need to respect the rights of other business and government players. There is legal precedent for explorers finding and keeping resources that they have uncovered via private investment. There's also the question of whether we can transport resources from the Moon in a cost-effective manner. Perhaps the cost of rocket launches -- by far the greatest expense for a Moon mission -- will come down as more entrepreneurs move into this market, or new technology will make them cheaper. It's even possible to create rocket fuel from resources on the Moon, which would slash return costs and even lower launch costs from Earth. On the other hand, mining and transporting these resources back to the Earth could depress prices as supplies grow, making such ventures less appealing to entrepreneurs. As with all private market endeavors, many will want to take a wait-and-see approach to the Moon's market potential. But therein lies the opportunity for early movers who apply entrepreneurship to the opening of whole new markets, and in the case of the Moon, a whole new world.

## 1NC Shell – State Prizes 1/3

### Text: The governments of the fifty states of the United States of America should offer a prize of $100 million to the first private organization to \_\_\_\_\_insert plan goal\_\_\_

### State prizes spur new technology – solves exploration.

Edward Aldridge Jr. et al, Under Secretary for Acquisition, Technology, and Logistics, at the Department of Defense, June 2004, “A Journey to Inspire, Innovate, and Discover,” Report of the President’s Commission on Implementation of United States Space Exploration Policy, http://www.nasa.gov/pdf/60736main\_M2M\_report\_small.pdf

The U.S. government need not shoulder the entire cost for implementation of the vision. The Commission believes there will be significant private sector and international investment, if the recommendations made herein are adopted. For example, we are persuaded that the award of significant monetary “prizes” tied directly to the vision plan will spark entrepreneurial investment globally and accelerate the development of technologies and systems that enable travel to the Moon and Mars. In our hearings, the Commission also heard from state governments that are prepared to invest in America’s space infrastructure, if those investments can be appropriately tied to their own economic growth. Proper coordination with other nations will also yield alignment of missions for mutual scientific advantage and will bring cost savings that benefit all parties. America’s direct financial investment should be designed to leverage all such private and public investments. These monies, when added to what the federal government can afford, will indeed get us to the Moon, Mars, and beyond.

1NC Shell – State Prizes 2/3

### Expanded prize program solves technology development and exploration.

Edward Aldridge Jr. et al, Under Secretary for Acquisition, Technology, and Logistics, at the Department of Defense, June 2004, “A Journey to Inspire, Innovate, and Discover,” Report of the President’s Commission on Implementation of United States Space Exploration Policy, http://www.nasa.gov/pdf/60736main\_M2M\_report\_small.pdf

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 nurture 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 through 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 technology. 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 advancement 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.

1NC Shell – State Prizes 3/3

### Prefer our specific literature – state incentives proven to boost private investment.

Federal Aviation Administration (FAA), 2009, “State Support for Commercial Space Activities,” http://www.faa.gov/about/office\_org/headquarters\_offices/ast/media/State%20Support%20for%20Commercial%20Space%20Activities.pdf

Every state in the union offers a range of incentives to encourage businesses to locate or increase their activities within that specific state. The vast majority of these incentives are financial, most commonly resulting in a lower tax burden or otherwise reducing the costs of conducting business critical activities. Sometimes these incentives target specific industries or even components of specific industries. Incentives of this kind are generally available at both the state and local level. Any business considering locating in a particular state would likely be eligible for benefits from the state, county, or local municipality. The motivation for most states and localities to offer these types of incentives is to promote job growth and development. Given this, there is often a substantial bias in the types of incentives offered towards industries that pay high salaries and employ large numbers of people. This report lays out the different general types of incentives that states employ to try and guarantee that aerospace companies, particularly emerging commercial space transportation companies commit to locating within that state. To that end, the report includes an examination of the advent of regulatory incentives within Virginia and Florida, the different types of incentives that states have at their disposal, the incentive-like impact of certain types of infrastructure (such as spaceports and tracking facilities), and a state by state summary of the assets and incentives in place within each state.

## 2NC Resource Trade-Off Net Benefit – Both Versions 1/2

### Government investment in exploration trades off with consumer spending.

Robert Murphy, adjunct scholar of the Mises Institute who teaches economics at Hillsdale College, January 2005, “A Free Market in Space,” The Free Market, http://mises.org/freemarket\_detail.aspx?control=525

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. This is just another example of what Frédéric Bastiat described in his famous essay, "That Which Is Seen, and That Which Is Not Seen." Whenever the government creates some public work, everyone can see the obvious benefits. For example, everyone can appreciate the fact that we put a US flag on the moon, and listened as Neil Armstrong apparently flubbed his memorized line. Or to use a more mundane example, everyone can see a beautiful new sports stadium financed (in part) by tax dollars. What people can’t see are the thousands of other goods and services that now won’t be enjoyed, because the scarce resources necessary for their production were devoted to the government project. Politicians may break moral laws, but they can’t evade economic ones: If they send a man to the moon (or build a new stadium), consumers necessarily must curtail their enjoyments of other goods.

### That’s key to economic growth

Daniel Indiviglio, Daniel Indiviglio is an associate editor at The Atlantic, 4/28/2011, “Chart of the Day: How Slower Consumer Spending Stifles GDP,” The Atlantic, http://www.theatlantic.com/business/archive/2011/04/chart-of-the-day-how-slower-consumer-spending-stifles-gdp/238026/

The American consumer drives the U.S. economy. Consumer spending generally makes up around 70% of the nation's GDP. So when spending grows, the nation grows. But when spending slows, so does overall growth. Unfortunately, spending growth wasn't as strong in the first quarter of 2011 as it was in the final quarter of 2010. That's one of the big reasons why the U.S. economy grew at a weak rate of just 1.8%.

## 2NC Resource Trade-Off Net Benefit – Both Versions 2/2

### Lack of economic growth causes global war.

Walter Russell Mead, Henry A. Kissinger senior fellow for U.S. foreign policy at the Council on Foreign Relations, 2/4/2009, “Only Makes You Stronger,” The New Republic, <http://www.freerepublic.com/focus/f-news/2169866/posts>

So far, such half-hearted experiments not only have failed to work; they have left the societies that have tried them in a progressively worse position, farther behind the front-runners as time goes by. Argentina has lost ground to Chile; Russian development has fallen farther behind that of the Baltic states and Central Europe. Frequently, the crisis has weakened the power of the merchants, industrialists, financiers, and professionals who want to develop a liberal capitalist society integrated into the world. Crisis can also strengthen the hand of religious extremists, populist radicals, or authoritarian traditionalists who are determined to resist liberal capitalist society for a variety of reasons. Meanwhile, the companies and banks based in these societies are often less established and more vulnerable to the consequences of a financial crisis than more established firms in wealthier societies. As a result, developing countries and countries where capitalism has relatively recent and shallow roots tend to suffer greater economic and political damage when crisis strikes--as, inevitably, it does. And, consequently, financial crises often reinforce rather than challenge the global distribution of power and wealth. This may be happening yet again. None of which means that we can just sit back and enjoy the recession. History may suggest that financial crises actually help capitalist great powers maintain their leads--but it has other, less reassuring messages as well. If financial crises have been a normal part of life during the 300-year rise of the liberal capitalist system under the Anglophone powers, so has war. The wars of the League of Augsburg and the Spanish Succession; the Seven Years War; the American Revolution; the Napoleonic Wars; the two World Wars; the cold war: The list of wars is almost as long as the list of financial crises. Bad economic times can breed wars. Europe was a pretty peaceful place in 1928, but the Depression poisoned German public opinion and helped bring Adolf Hitler to power. If the current crisis turns into a depression, what rough beasts might start slouching toward Moscow, Karachi, Beijing, or New Delhi to be born? The United States may not, yet, decline, but, if we can't get the world economy back on track, we may still have to fight.

## 2NC Coercion Net Benefit – Tax Incentives 1/3

### NASA funding destroys freedom and liberty – we should let the free market drive space travel

Mark Nameroff, MD and a PhD in anatomy & developmental biology, editor of the South Puget Sound Libertarian, 2006. “Abolish NASA,” http://laceylibertarian.us/?p=1034

A number of private businesses are attempting space travel. Whether or not they succeed should be up to their ingenuity and the free market. Yet the US government, through NASA, has decided to spend half a billion of your tax dollars to support two of these companies. Four other companies, equally anxious to get your money, were not chosen by the government to receive the funds to develop commercial spaceships. First off, why should the government spend your money on private businesses? If they can’t make it in their own, they deserve to fold. Second, who in the government has a crystal ball that enables them to determine in advance which businesses will be successful? But, just by handing out your money to certain companies and not others, the government stacks the economic deck in favor of the recipients of your involuntary largesse. Such decisions by government are purely bureaucratic and politicial. In a free country, the government would not be able to regulate the economy and pick winners and losers. The market would decide. But here in the USA, the government picks winners and uses your money to subsidize them. Not only are those companies, that did not receive these welfare handouts, made into losers but, in the end, the big losers are you. Your money is expropriated by the government (aka taxation) and handed over to other people whose economic ventures may still fail. In case you don’t get it, this kind of a system is socialism. It is unfair, unfree and economically unsound. Instead of trying to control the commercialization of space travel by spending your money, NASA should be abolished.

### Socialism in any form expunges freedom and makes extinction possible

Rockwell Jr., president of the Ludwig von Mises Institute, 5/19/2008

(Llewellyn, “Everything You Love You Owe to Capitalism,” http://mises.org/story/2982)

And yet, sitting on the other side of the table are well-educated people who imagine that the way to end the world's woes is through socialism. Now, people's definitions of socialism differ, and these persons would probably be quick to say that they do not mean the Soviet Union or anything like that. That was socialism in name only, I would be told. And yet, if socialism does mean anything at all today, it imagines that there can be some social improvement resulting from the political movement to take capital out of private hands and put it into the hands of the state. Other tendencies of socialism include the desire to see labor organized along class lines and given some sort of coercive power over how their employers' property is used. It might be as simple as the desire to put a cap on the salaries of CEOs, or it could be as extreme as the desire to abolish all private property, money, and even marriage. Whatever the specifics of the case in question, socialism always means overriding the free decisions of individuals and replacing that capacity for decision making with an overarching plan by the state. Taken far enough, this mode of thought won't just spell an end to opulent lunches. It will mean the end of what we all know as civilizationitself. It would plunge us back to a primitive state of existence, living off hunting and gathering in a world with little art, music, leisure, or charity. Nor is any form of socialism capable of providing for the needs of the world's six billion people, so the population would shrink dramatically and quickly and in a manner that would make every human horror ever known seem mild by comparison. Nor is it possible to divorce socialism from totalitarianism, because if you are serious about ending private ownership of the means of production, you have to be serious about ending freedom and creativity too. You will have to make the whole of society, or what is left of it, into a prison. In short, the wish for socialism is a wish for unparalleled human evil. If we really understood this, no one would express casual support for it in polite company. It would be like saying, you know, there is really something to be said for malaria and typhoid and dropping atom bombs on millions of innocents.

2NC Coercion Net Benefit – Tax incentives

2NC Coercion Net Benefit – Tax Incentives 2/3

### NASA is coercive and bad

Laurence Ludlow, free lance writer based in San Diego, 2008. “NASA, the Aerospace Welfare Queen,” http://www.strike-the-root.com/81/ludlow/ludlow2.html

The National Aeronautics and Space Administration (NASA) is a textbook example of how to quash free scientific inquiry. It also is a lesson in transforming potentially useful citizens into high-speed drains on the U.S. Treasury. Instead of perpetuating its gold-plated make-work projects and revering its state-sponsored 'official heroes,' we should recognize NASA for what it is'a resuscitated Roman coliseum that stages useless spectacles that hypnotize taxpayers while bleeding them dry. Or is it just a vampire with a bad case of hemophilia? Take your pick. Populus optat panem et circenses. The Race to Bankruptcy Free-market businesses are ethically sound because they are funded voluntarily by willing customers. In contrast, NASA is a coercive shakedown. First, there is no market for what it sells. There are no eager buyers spending their own money on NASA's goods and services. Instead, NASA's annual budget of $16.8 billion (2007) is taken from taxpayers'under threat of violence by the government's hold-up men, the IRS. It is a case of naked exploitation that benefits politically connected companies and a government bureaucracy that exists for its own sake. It should not surprise us that NASA is the Cold War stepchild of the military-industrial complex, an offshoot of the arms race between the U.S. and U.S.S.R. Rather than the achievement of a free people, it is the collectivist response of the U.S. government to the Soviet launch of Sputnik 1 in 1957. At the same time, it is an example of chest-thumping worthy of juvenile delinquents playing a game of 'mine is better than yours.' Even President Kennedy's decision to go to the Moon was a public-relations stunt that mortgaged America 's future in exchange for the emotional 'high' of winning a technological spending spree. In essence, the 'space race' is part of a nationalistic race toward bankruptcy. While the United States won the first lap of this race by reaching the Moon in 1969, the Soviet Union ultimately won the contest by bankrupting and dissolving itself in 1991. With its tiresome catalog of budget-busting boondoggles, the United States will finish a poor second. Nonetheless, with NASA's help, it will eventually bankrupt itself with the same certainty as a red giant in outer space. The only question is when.

2NC Coercion Net Benefit – Tax Incentives 3/3

### Government space programs are a waste of taxpayer dollars – private investment solves better

Wes Messamore, Editor of the Humble Libertarian, 2010. “NASA Budget Cuts are a Good Thing,” http://www.humblelibertarian.com/2010/02/nasa-budget-cuts-are-good-thing.html

I'm afraid you've lost me here. America's technological prowess and innovating spirit are chief among her assets- but those blessings don't come to us from her government programs. They are a result of her enterprising people and private businesses. NASA will waste millions of tax payer dollars to send a robot to Mars to see if it has water. While that may be interesting to NASA scientists, it hardly creates value for the American people- especially when the robot breaks. Your tax payer dollars at work**.** Private investors on the other hand**, like Mike Markkula** will find two hippies in a garage in California putting together desktop computers for a small business they started called Apple. Mike invested $250,000 of his money in their vision and these two hippies, Steve Jobs and Steve Wozniak ended up revolutionizing how we view information, creating billions of dollars of value for Americans, and untold thousands of jobs. That's technological progress. Meanwhile, private startups funded with private money are even conquering the frontiers of space, promising to deliver commercial space flights for the recreation of wealthy customers. As with the private development of any new technology throughout history, wealthy patrons will pioneer its use with their abundance of surplus wealth, funding the discovery of cheaper methods, allowing the technology to become more widely available. This happened with the plane, the car, the computer, and the television. We don't need NASA or any other government program to help us succeed. Small business, not big government is the fountainhead of American prosperity. The only thing we need the government to do is to stay the hell out of our way. I agree with you whole-heartedly that Mr. Obama's policies are detrimental to our country's development, but not because of this one exception to his usual rule of expanding government.

## 2NC Competitiveness Net Benefit – Tax Incentives

### New tax credits solve US competitiveness.

R.D. Atkinson, Information Technology and Innovation Foundation, July 2007, “Expanding the R&E tax credit to drive innovation, competitiveness and prosperity,” Journal of Technology Transfer, http://www.itif.org/files/AtkinsonRETaxCreditJTT.pdf

The debate over the R&E tax credit needs to be broadened from the question of does it cost-effectively stimulate more research to does it cost-effectively stimulate more research in the United States. In other words, the R&E credit has potential to become a central policy tool for ensuring that the United States is an internationally attractive location for research activities.

### Competitiveness is critical to US leadership

Bruce Jentleson, Professor of Public Policy and Political Science at Duke University, 8/6/2007, The Globalist, http://www.theglobalist.com/storyid.aspx?StoryId=6364

The Business Roundtable tellingly uses the term “atrophy” to express its concern about what has been happening to U.S. scientific and technological superiority. And the National Intelligence Council points to science and technology as the key uncertainty for whether the United States will remain the world’s “single most important actor.” The declining competitiveness of the U.S. automotive industry — which for a century was a driving economic engine and the country’s defining cultural symbol — is telling. 2007 has been the year Toyota ended General Motors’ reign as first in worldwide sales.

### US leadership is key to prevent global nuclear war.

Zalmay Khalilzad, Program director for strategy, doctrine, and force structure of RAND's Project AIR FORCE, Spring 1995, “Losing the Moment?” Washington Quarterly, p.84

Under the third option, the United States would seek to retain global leadership and to preclude the rise of a global rival or a return to multipolarity for the indefinite future. On balance, this is the best long-term guiding principle and vision. Such a vision is desirable not as an end in itself, but because a world in which the United States exercises leadership would have tremendous advantages. First, the global environment would be more open and more receptive to American values - democracy, free markets, and the rule of law. Second, such a world would have a better chance of dealing cooperatively with the world's major problems, such as nuclear proliferation, threats of regional hegemony by renegade states, and low-level conflicts. Finally, U.S. leadership would help preclude the rise of another hostile global rival, enabling the United States and the world to avoid another global cold or hot war and all the attendant dangers, including a global nuclear exchange. U.S. leadership would therefore be more conducive to global stability than a bipolar or a multipolar balance of power system.

## Solvency - Tax Incentives Solve Investment

### Tax incentives overcome investment fears.

David M. Livingston, business consultant, financial advisor, and strategic planner, 8/10/2000, “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 key to overcome market barriers – solves innovation.

Robert D. Atkinson, President of the Information Technology and Innovation Foundation, July 2009, “Effective Corporate Tax Reform in the Global Innovation Economy,” http://www.itif.org/files/090723\_CorpTax.pdf

Because markets don’t always allocate resources to optimize productivity and innovation, government has a key role to play in providing better incentives for private actors to increase investments that drive innovation and productivity. This means that effective corporate tax reform strengthens, not weakens, incentives for firms to invest in these activities. As discussed below, it is clear what these activities are: investment in new generations of capital equipment (including computers and software), conduct of research and development, and training the workforce with skills needed to develop and use innovations.

### Research proves – tax incentives effectively spur research.

R.D. Atkinson, Information Technology and Innovation Foundation, July 2007, “Expanding the R&E tax credit to drive innovation, competitiveness and prosperity,” Journal of Technology Transfer, http://www.itif.org/files/AtkinsonRETaxCreditJTT.pdf

In contrast, almost all scholarly studies conducted since the early 1990s, including newer analyses conducted in the last 5 years, have found that the credit is an effective tool and that at minimum it produces at least one dollar of research for every tax dollar forgone. The former Congressional Office of Technology Assessment concluded that, ‘‘for every dollar lost in tax revenue, the R&D tax credit produces a dollar increase in reported R&D spending, on the margin.’’ (Hall 1995). Bloom, Griffith and Van Reenen found that in the long run the credit stimulates $1.10 of research for every dollar of lost tax revenue. Other studies have found even greater benefits, with the research investment to tax-cost ratio between 1.3 and 2.9. (Coopers and Lybrand 1998) For example, Hall examined the credit from 1981 to 1991 (when it was more generous) and found that approximately two dollars in research were generated for every one dollar in tax expenditure. (Hall 1992) Klassen, Pittman and Reed found that the R&D tax credit induces $2.96

## Solvency – Tax Incentives Key to Competitiveness

### Tax credits are the single biggest variable for competitiveness – key to spur innovation in the US.

R.D. Atkinson, Information Technology and Innovation Foundation, July 2007, “Expanding the R&E tax credit to drive innovation, competitiveness and prosperity,” Journal of Technology Transfer, http://www.itif.org/files/AtkinsonRETaxCreditJTT.pdf

Addressing the new competitiveness challenge will require policy makers to take a host of steps, including improving education and significantly increasing funding for research (Atkinson 2007). Yet while these steps are necessary, they are not sufficient to win the competitiveness challenge. Policy needs to do more than boost the supply of innovation resources (e.g., a better trained workforce and increased basic research discoveries); it must also spur demand by companies to locate more of their innovation-based production in the United States. If the United States is to remain the world’s preeminent location for technological innovation (and the high paying jobs that result), Congress will need to significantly expand and reform the Research and Experimentation Tax Credit.

### US falling behind in tax incentives – hurting competitiveness.

R.D. Atkinson, Information Technology and Innovation Foundation, July 2007, “Expanding the R&E tax credit to drive innovation, competitiveness and prosperity,” Journal of Technology Transfer, http://www.itif.org/files/AtkinsonRETaxCreditJTT.pdf

Among nations with a tax incentive for research, the United States now provides one of the weakest incentives, below our neighbors Canada and Mexico, and behind many Asian and European nations (see Fig. 2). It’s ironic that at a time of increased concern about America’s growing competitiveness challenge, our credit, until just last year, had been getting weaker, both in absolute terms and relative to other nations in part because of changes made by Congress over the years that have diminished its generosity.10 In fact, by 2006 credit was about half as generous as it was in the early 1980s (Whang 1998). Moreover, in the last decade, all other nations with R&D tax incentives (with the exception of Canada) have boosted the generosity of their R&D tax incentives, particularly since 2000 (Falk 2005). As a result, companies can receive significantly more generous tax incentives if they invest in R&D in these other nations.

### Tax incentives are the most effective government tool for spurring innovation.

R.D. Atkinson, Information Technology and Innovation Foundation, July 2007, “Expanding the R&E tax credit to drive innovation, competitiveness and prosperity,” Journal of Technology Transfer, http://www.itif.org/files/AtkinsonRETaxCreditJTT.pdf

In an environment where R&D investments are increasingly mobile, R&D tax incentives have become a more important policy tool. Of 27 OECD nations examined, 70% had R&D tax incentives in place in 2005, up from 50% in 1996 (Warda 2006). Moreover, other nations have boosted their R&D tax credits. In the late 1980s the United States provided the most generous tax treatment of R&D in the world (Hall 2000). By 1996, we had fallen to seventh most generous among OECD nations, behind Spain, Australia, Canada, Denmark, the Netherlands, and France (Guellec et al. 1997). By 2004, we had fallen to 17th in generosity for general R&D; 16th for machinery and equipment used for research; and 22nd for buildings used for research (see Fig. 1).7 In 2006 Congress added a new Alternative Simplified Credit (ASC). While clearly a step in the right direction, it is important to note that the addition of the ASC increased our rank only to 15th in tax generosity for R&D (assuming that other nations did not increase their R&D incentives last year).

## Solvency – Prizes Solve Incentives 1/2

### Monetary prizes solve incentives for new research.

Bruce G. Charlton and Peter Andras, Editor-in-Chief and Editorial Advisory Board, Medical Hypotheses, Newcastle University, 2008, “Stimulating revolutionary science with mega-cash prizes,” Medical Hypotheses, http://medicalhypotheses.blogspot.com/2008/03/mega-cash-prizes-for-revolutionary.html

Given that revolutionary science is a high risk endeavour which usually fails; it is likely to thrive only when the incentives rewarding the rare instances of success are greater than for normal science. Therefore we would argue that it is insufficient for successful revolutionary scientists merely to get the usual rewards of prestigious professorships, respect from within the scientific profession, and a modestly high level of reasonably secure income. Something more is needed: lots of money. The money incentive in science To compensate for the intrinsically greater risk of failure, successful revolutionary science requires greater rewards than normal science; rewards such as higher prestige, better jobs and/or more money. We suggest that more money is the most promising incentive to encourage revolutionary science, because it is the factor which is most-controllable.

### Prize of $100 million solves these incentives.

Bruce G. Charlton and Peter Andras, Editor-in-Chief and Editorial Advisory Board, Medical Hypotheses, Newcastle University, 2008, “Stimulating revolutionary science with mega-cash prizes,” Medical Hypotheses, http://medicalhypotheses.blogspot.com/2008/03/mega-cash-prizes-for-revolutionary.html

Traditional science prizes (such as Nobels) therefore constitute a zero sum game in which the more prizes are awarded the less prestige attaches to each prize – because there is only a fixed amount of status to be shared. But this does not apply to monetary rewards – a prize of one hundred million dollars remains well-worth winning whether it is unique or whether 10 or 100 other people also get a 100 million dollar prize. This is important because there need to be enough prizes for revolutionary science that competitors should feel they have a realistic chance of winning one of these prizes so long as their research succeeds in its aims. This would enable there to be a significant incentive to do revolutionary science across as many scientific disciplines as there are mega-cash prizes. Our feeling is that mega-prizes to stimulate revolutionary science would need to be of the order of magnitude of tens of millions of US dollars in order to replicate the kind of incentives seen in popular creative activities such as music and sports.

Solvency – Prizes Solve Incentives 2/2

### History proves – prizes spur technological innovation and commercialization.

Jaison G. Morgan, lead manager of the Prize Development Department for the X PRIZE Foundation, Fall Fall 2008, “Inducing Innovation through Prizes,” Innovations, http://www.usa.gov/webcontent/reqs\_bestpractices/challenges/documents/InnovationsJournalFall08PrizesJaisonMorgan.pdf

Over the course of eight years, the Ansari X PRIZE led to important developments in private space travel. Twenty-six teams from seven nations registered to compete,4 and the combined value of their efforts exceeded $100 million.5 The care-free reentry and cantilevered hybrid rocket motor technology developed by the winning team have both since evolved into commercial applications, and preflight sales of suborbital space tickets are showing promising interest. The winning spacecraft, SpaceShipOne, now hangs in the Smithsonian National Air and Space Museum next to the Spirit of St. Louis. Whether or not private space travel will achieve the commercial success found in other civil aviation sectors has yet to be determined, but we can attribute many critical developments in the early formation of this new industry to the Ansari X PRIZE.

## Solvency – Prizes Solve Better than Government 1/2

### Prizes solve better than government programs – spurs more effective and cost efficient research.

Thomas Kalil, Special Assistant to the Chancellor for Science and Technology at UC Berkeley, December 2006, “Prizes for Technological Innovation,” http://www.brookings.edu/views/papers/200612kalil.pdf

Prizes can also address some of the problems that are associated with government support for applied R&D. As Kremer and Glennerster (2004, p. 49) note, “researchers funded on the basis of an outsider’s assessment of potential rather than actual product delivery have incentives to exaggerate the prospects that their approach will succeed, and once they are funded, may even have incentives to divert resources away from the search for the desired product.” Inducement prizes avoid this problem by paying only if someone meets the predefined objective. By comparison, if the government provides a grant or a contract, it pays even if the recipient is unsuccessful, on the condition that the scope of work was completed. For example, NASA gave Lockheed Martin more than nine hundred million dollars to build the X-33, a technology demonstrator for NASA’s next-generation reusable space-launched vehicles (David 2001). When the program was cancelled because of problems associated with the X-33’s composite fuel tanks, no one expected Lockheed to give the money back.

### Prizes attract larger body of researchers – government regulations deter the best and brightest.

Thomas Kalil, Special Assistant to the Chancellor for Science and Technology at UC Berkeley, December 2006, “Prizes for Technological Innovation,” http://www.brookings.edu/views/papers/200612kalil.pdf

Prizes can attract teams with fresh ideas who would never do business with the federal government because of procurement regulations (e.g., accounting and reporting requirements) that they may find burdensome. This effect is important because, as Baumol (2004, p. 5) notes, “the independent innovator and the independent entrepreneur have tended to account for most of the true, fundamentally novel innovations. In the list of the important innovative breakthroughs of the twentieth century, a substantial number, if not the majority, turn out to be derived from these sources rather than from the laboratories of giant business enterprises.” As examples of small-firm innovations, Baumol cites the airplane, air conditioning, the electronic spreadsheet, FM radio, the high-resolution CAT scanner, and the microprocessor.

### Prizes solve student innovation and public attention.

Thomas Kalil, Special Assistant to the Chancellor for Science and Technology at UC Berkeley, December 2006, “Prizes for Technological Innovation,” http://www.brookings.edu/views/papers/200612kalil.pdf

The two most compelling advantages of prizes, for NASA, are the potential to increase public interest in science and technology, and the possibility of attracting a broader range of researchers and entrepreneurs to work on innovation related to NASA’s work. For example, Team Snowstar, a team of undergraduates from the University of British Columbia who performed the bulk of their work in a dorm room, was voted “most likely to succeed” on the basis of their performance in the 2005 space elevator competition. Given that students have been responsible for Netscape, Yahoo!, Google, Napster, and many other successful technology companies, it is vital to engage students and other nontraditional performers. In the short run, of course, NASA is unlikely to rely on prizes for innovations that are on their critical path for important missions, and will need more experience with prizes before making them a mainstream tool.

Solvency – Technology/Innovation

Solvency – Prizes Solve Better than Government 2/2

### Private development key to innovation and technology development – solves your inspiration arguments.

Joseph N. Pelton, Space & Advanced Communications Research Institute, George Washington University, May 2010, “A new space vision for NASA—And for space entrepreneurs too?” Space Policy, p.78

XPrize Founder Peter Diamandis has noted that we don't have governments operating taxi companies, building computers, or running airlines-and this is for a very good reason. Commercial organizations are, on balance, better managed, more agile, more innovative, and more market responsive than government agencies. People as diverse as movie maker James Cameron and Peter Diamandis feel that the best way forward is to let space entrepreneurs play a greater role in space development and innovation. Cameron strongly endorsed a greater role for commercial creativity in U.S. space programs in a February 2010 Washington Post article and explained why he felt this was the best way forward in humanity's greatest adventure: “I applaud President Obama's bold decision for NASA to focus on building a space exploration program that can drive innovation and provide inspiration to the world. This is the path that can make our dreams in space a reality”

### Private leadership boosts innovation and jobs.

Esther Dyson, 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

But in the long run, the new approach will create more jobs -- and more value -- because the United States will end up with both an innovative, long-term government space program and an energetic, fast-growing private-sector market that will transport people and cargo for the U.S. government, space tourists, and non-U.S. governments. Ultimately, the costs and risks of space transport will come down, flights will increase, and markets will grow. As with the Internet, we can't predict all the uses to which commercial innovation will put this infrastructure.

### Space tourism proves – private sector capable of pushing innovation.

Thomas Brannen, J.D. Candidate, Southern Methodist University Dedman School of Law, Summer 2010, “Private Commercial Space Transportation’s Dependence on Space Tourism and NASA’s Responsibility to Both,” Journal of Air Law and Commerce, p.652

With the simplifications of regulatory requirements, the success of space prizes, and the gains in technology and innovation, space tourism is now finally building momentum. New spaceports are being built, old airports are being transitioned into spaceports, new RLVs are rapidly being developed, environmental regulations are being streamlined for simpler and quicker licensing procedures, and NASA is finally handing the reins of suborbital human transportation over to private entrepreneurs so it can focus on grander missions. Most importantly, the combination of efficiency, competition, and economies of scale has finally translated into lower prices for commercial launches, extending space access beyond merely the wealthy.

## Solvency – NASA Fails 1/3

### NASA empirically fails – budget overruns and failure to commercialize.

Edward L. Hudgins, director of The Objectivist Center and editor of the Cato Institute book, Space: The Free-Market Frontier, 1/28/2004, “Move Aside, NASA,” http://www.cato.org/pub\_display.php?pub\_id=2514

But after the triumphs of Apollo, NASA failed to make space more accessible to mankind. There were supposed to be shuttle flights every week; instead, there have been about four per year. The space station was projected to cost $8 billion, house a crew of 12 and be in orbit by the mid-1990s. Instead, its price tag will be $100 billion and it will have only a crew of three. Worse, neither the station nor the shuttle does much important science. Governments simply cannot provide commercial goods and services. Only private entrepreneurs can improve quality, bring down the prices, and make accessible to all individuals cars, airline trips, computers, the Internet, you name it. Thus, to avoid the errors of the shuttle and space station, NASA's mission must be very narrowly focused on exploring the moon and planets, and perhaps conducting some basic research, which also might serve a defense function. This will mean leaving low Earth orbit to the private sector.

### Track record proves – NASA not able to accomplish exploration goals.

Joseph N. Pelton, Space & Advanced Communications Research Institute, George Washington University, May 2010, “A new space vision for NASA—And for space entrepreneurs too?” Space Policy, p.79

One might think that, since Muskwas seeking to develop his own launch capability, he was exaggerating; but a review of the record suggests otherwise. Today nearly 25 years after the Rogers and Paine Commission reports that followed the Challenger disaster, we find that the recommendations for NASA to develop a reliable and costeffective vehicle to replace the Shuttle is somewhere between being a disappointment and a fiasco. Billions of dollars have gone into various spaceplane and reusable launch vehicle developments by NASA over the past 20 years. Spaceplane projects have been started by NASA time and again amid great fanfare and major expectations and then a few years later either cancelled in failure or closed out with a whimper. The programs that NASA has given up on now include the Delta Clipper, the HL-20, X-33, the X-34, X-37, X-38, and X-43 after billions of US funds and billions more of private money have been sacrificed to the cause.

Solvency – NASA Fails 2/3

### Budget battles make NASA exploration unsustainable.

Edward Isarevich, Principal at ETA Consulting, 7/25/2008, “The Real Cost of Space Exploration,” http://knol.google.com/k/the-real-cost-of-space-exploration#

Ever since Apollo 11's landing on the moon, the government's interest in space started to decline. Did we win the space race or did we uselessly spend billions of dollars? It is doubtful if anyone will ever have a clear answer to this question. NASA's ambitious lunar plans became bogged down in the incoherence of the annual funding battles in Congress. A few more Apollos were indeed completed but the ideas to pursue numerous scientific experiments on the moon got "lost in space." The moon base and space station projects were completely abandoned to the next generation of space explorers. Not until the Bush administration were they touched upon once again. President Bush proposed to undertake a large project that would involve the construction of both a moon base and a space station that would mainly serve as assembly, test, and departure points for piloted missions to Mars and beyond. However, estimates nearing $300 billion made it obvious why this ambitious idea was never mentioned in Congress. History clearly shows, tells us Robert A. Frosch, former NASA Administrator, that "society gets its money back from science programs, but not immediately. That's why science programs can be tough to sell to political people, who aren't terribly interested in what's going to happen 10 or 15 years from now."

### Private efforts solve better – NASA missions will take longer and suffer cost overruns

Robert Taylor, Contributing writer for Policymic, 2011. “The Case for Defunding NASA,” http://www.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.

Solvency – NASA Fails 3/3

### Private sector solves best – NASA will fall prey to misallocations and mission creep

Robert Taylor, Contributing writer for Policymic, 2011. “The Case for Defunding NASA,” http://www.policymic.com/article/show?id=54

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.

### NASA will fail – bureaucracy and wasteful spending

Stewart Powell, Houston Chronicle, 2008. “Culberson Taking Shots at NASA’s Bureaucracy,” http://www.chron.com/disp/story.mpl/space/5894467.html

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."

## Solvency – Private Exploration Comparatively Better 1/2

### Private-led exploration key to more efficient allocation of investment.

Robert Murphy, adjunct scholar of the Mises Institute who teaches economics at Hillsdale College, January 2005, “A Free Market in Space,” The Free Market, 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.

### NASA led exploration risks disasters tanking the whole program – privatization solves.

Martin Rees, Britain's astronomer royal and a Royal Society research professor at Cambridge University's King's College, 7/1/2003, “Mars Needs Millionaires,” Foreign Policy, http://www.foreignpolicy.com/articles/2003/07/01/mars\_needs\_millionaires

But the speed of communication will not make probing the universe any less dangerous. Machines fail. Visitors to Mars, or the long-term denizens of a lunar base, will confront an environment far more inhospitable than anything they knew before. When nations send people to space, space disasters become national traumas -- and nations lose some of their will to explore. By contrast, were a private adventurer like Fossett to come to a sad end in space, we would mourn a brave and resourceful man, but his death would not be considered a catastrophe on the scale of the Columbia or Challenger accidents. Nor would it provoke nearly as much hand-wringing. It would be seen for what it was: a personal tragedy. To reach Mars and points beyond will require a certain ruthlessness of spirit, and swashbuckling individuals possess this quality much more than civilized nations do.

Solvency – Private Exploration Comparatively Better 2/2

### Private leadership key to large-scale space exploration – NASA can’t keep up.

Zach Meyer, J.D. Candidate, 2010, Northwestern University School of Law, Winter 2010, “Private Commercialization of Space in an International Regime: A Proposal for a Space District,” Northwestern Journal of International Law & Business, pp.242-3

NASA has sent limited numbers of astronauts into space over the last five decades, including landing a dozen astronauts on the Moon. Other national space agencies have or are poised to develop the ability to send astronauts into space. However, private commercial space enterprise promises to be a more powerful catalyst to the full development of the Space Age. Consider that NASA is due to retire its space shuttle fleet in 2010, leaving the national space agency without the ability to transport supplies or a crew to the International Space Station ("ISS"). To cover this gap, NASA will temporarily rely on the Russian Space Agency's Soyuz rockets to fulfill its ISS commitments. In addition, NASA has awarded commercial contracts to Space Exploration Technologies Corporation and Orbital Sciences Corporation ("SpaceX") for the development of a domestic, commercial alternative to reliance on the Russians. SpaceX has been rapidly developing a new space vehicle capable of reaching high orbit, docking with the ISS, and transporting supplies and crew at a more reasonable cost and within a more concrete schedule than NASA's own proposed new space transportation architecture. Through the accomplishments of SpaceShipOne and SpaceX, private commercial space enterprise has made a case for itself as the best-suited candidate for pioneering the space frontier.

## AT: Permutation – Do Both 1/2

### Permutation doesn’t solve – including government programs trades off with private investment – key to solve.

Declan McCullagh, chief political correspondent for CNET, 10/3/2007, “Do we need NASA?” CNET News, http://news.cnet.com/Do-we-need-NASA/2009-11397\_3-6211308.html

The difference? Critics say it's the National Aeronautics and Space Administration. Aviation's youth and adolescence were marked by entrepreneurs and frenetic commercial activity: Lindbergh's trans-Atlantic prize money was put up by a New York hotel owner, and revenue from the airlines funded the development of the famous DC-3. The federal government aided aviation by paying private pilots to deliver air mail. Space, by contrast, until recently has remained the domain of NASA. Burt Rutan, the aerospace engineer famous for building a suborbital rocket plane that won the Ansari X Prize, believes NASA is crowding out private efforts. "Taxpayer-funded NASA should only fund research and not development," Rutan said during a recent panel discussion at the California Institute of Technology. "When you spend hundreds of billions of dollars to build a manned spacecraft, you're...dumbing down a generation of new, young engineers (by saying), 'No, you can't take new approaches, you have to use this old technology.'"

### Perm forces NASA resource trade-off – prevents solutions to warming and asteroids.

Joseph N. Pelton, Space & Advanced Communications Research Institute, George Washington University, May 2010, “A new space vision for NASA—And for space entrepreneurs too?” Space Policy, p.79

With much less invested in a questionable Project Constellation enterprise we can do much more in space astronomy. We can invest more wisely in space science to learn more about the Sun, the Earth and threats from Near Earth Objects. David Thompson, Chairman and CEO of Orbital Sciences said the following in a speech that endorsed the new commercial thrust of the NASA space policies on Nine February 2010: “Let us, the commercial space industry, develop the space taxis we need to get our Astronauts into orbit and to ferry those wanting to go into space to get to where they want to go. We are in danger of falling behind in many critical areas of space unless we shift our priorities”. With a change in priorities we can deploy far more spacecraft needed to address the problems of climate change via better Earth observation systems. We can fund competitions and challenges to spur space entrepreneurs to find cheaper and better ways to send people into space. We can also spur the development of solar power satellites to get clean energy from the sun with greater efficiency. We can deal more effectively with finding and coping with “killer” asteroids and near earth objects. We may even find truly new and visionary ways to get people into space with a minimum of pollution and promote the development of cleaner and faster hypersonic transport to cope with future transportation needs.

AT: Permutation – Do Both 2/2

### Runaway warming causes human extinction.

Bill Henderson, Frequent Contributor to online news source CounterCurrents, 8/19/2006, “Runaway Global Warming,” http://www.countercurrents.org/cc-henderson190806.htm

The scientific debate about human induced global warming is over but policy makers - let alone the happily shopping general public - still seem to not understand the scope of the impending tragedy. Global warming isn't just warmer temperatures, heat waves, melting ice and threatened polar bears. Scientific understanding increasingly points to runaway global warming leading to human extinction. If impossibly Draconian security measures are not immediately put in place to keep further emissions of greenhouse gases out of the atmosphere we are looking at the death of billions, the end of civilization as we know it and in all probability the end of man's several million year old existence, along with the extinction of most flora and fauna beloved to man in the world we share.

## AT: Prize is Too Small 1/2

### One large prize solves best.

Bruce G. Charlton and Peter Andras, Editor-in-Chief and Editorial Advisory Board, Medical Hypotheses, Newcastle University, 2008, “Stimulating revolutionary science with mega-cash prizes,” Medical Hypotheses, http://medicalhypotheses.blogspot.com/2008/03/mega-cash-prizes-for-revolutionary.html

This could be accomplished by a change in behaviour of the large grant awarding bodies – a shift from funding research programs with grants and towards rewarding successful revolutionary science with prizes. For example, a research foundation working in a specific scientific field might at present spend 100 million dollars per year – and might spread this money among ten 10 million dollar program grants. In all likelihood, this money will at present be spent on normal science, and will produce modest incremental progress. We are suggesting that such a research foundation might instead spend 100 million dollars in a single prize, awarded to a relatively young scientist or a few scientists in recognition of a significant success in revolutionary science.

### Establishing one government prize spurs private sector investment and prizes – counterplan will get modeled.

Thomas Kalil, Special Assistant to the Chancellor for Science and Technology at UC Berkeley, December 2006, “Prizes for Technological Innovation,” http://www.brookings.edu/views/papers/200612kalil.pdf

Under some circumstances, prizes can stimulate philanthropic and private sector investment that is greater than the cash value of the prize. For example, the ten million dollar Ansari X PRIZE was financed by a one million dollar insurance policy, and the X PRIZE Foundation reports that the prize stimulated at least one hundred million dollars in private sector investment (Diamandis 2006). This leverage can come from a number of different sources. Companies may be willing to cosponsor a competition or invest heavily to win it because of the publicity and the potential enhancement of their brand or reputation. Private, corporate dollars that are currently being devoted to sponsorship of America’s Cup or other sports events might shift to support prizes or teams. Wealthy individuals are willing to spend tens of millions of dollars to sponsor competitions or bankroll individual teams simply because they wish to be associated with the potentially historical nature of the prize. Most areas of science and technology are unlikely to attract media, corporate, or philanthropic interest, however.

AT: Prize is Too Small 2/2

### CP solves incentives for innovation – empirically proven by the X Prize.

Peter Diamandis, Chairman & CEO, X Prize Foundation, 4/7/2010, “Big Think Interview With Peter Diamandis,” <http://bigthink.com/ideas/19450>

When you put up a large incentive prize, you get the entire world. So it pulls out of the woodwork all hundred companies and you get to see them all. And you automatically back the winner. So, for me it’s a very logical, it’s highly leveraged, typically 10 to 50 fold the amount of money you put up, you got spent by the teams to win it. You are creating brand new industry and you have full industry insight. And in the winning of the prize you create a brand new marketplace. Instead of just buying the product that you incentivized in the first place. You know, Paul Allen, who backed Burt Rutan in a recent interview with Dave Moore, who ran Paul Allen’s venture here. Dave said that Paul Allen invested somewhere between $20 and $30 million and that he got probably 5 or 10x the money back by backing it in terms of the licensing rights and the tax deferrals and the technology they developed and the media and so forth. So, in this time when money is tighter and tighter and tighter, we believe that incentive prizes are extraordinarily efficient way for companies to drive breakthroughs in their industry. You’ve got companies like Netflix, and Cisco and others creating incentive prizes inside their company or in their area to drive. You have to ask yourself the question, do you have the smartest people in the world working for your company? And if you do, you’re lucky. But if you don’t, put up the incentive. We get what we incentivize and cast it out to the world. And have someone who is absolutely brilliant who’s a 22-year old in India who says what about this way? And who revolutionizes the way you do business.

## AT: Private Exploration Links to Politics 1/2

### CP doesn’t link to politics – government can spin it as job-creating.

Esther Dyson, 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.

### New budget proves there’s bipartisan support for financing private space travel.

Frank Morring Jr, 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.

AT: Private Exploration Links to Politics 2/2

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

Bart Leahy, 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.

## AT: Jobs Turn 1/2

### US tech development not key to competitiveness.

David Attis, Senior Consultant in the higher education practice at the Advisory Board Company, 2008, “Higher Education and the Future of U.S. Competitiveness,” The Tower and the Cloud, http://www.educause.edu/thetowerandthecloud/PUB7202h

While most people accept (and econometric evidence supports) the contention that federal R&D funding contributes to U.S. economic growth, in a global innovation environment it is no longer true that basic research performed in the United States will necessarily benefit American firms or American workers. Rather, the economic benefits depend on the degree to which universities (together with entrepreneurs, venture capitalists, and corporations) can translate the results of basic research into marketable innovations. The benefits now also depend on how corporations choose to commercialize and produce those innovations through global networks. Doing the research here no longer necessarily means that the technologies, the factories, or the jobs will be created here.

### Health care costs tank solvency.

Elizabeth Carpenter, Senior Program Associate with the Health Policy Program at the New America Foundation, March 2008, “What Hill staff should know about health care,” Health Policy Program Issue Brief, http://www.newamerica.net/files/What\_Hill\_Staff\_should\_Know\_about\_Health\_Care.pdf

No health reform proposal will be sustainable over time without serious efforts to control health care cost growth. Rising health care costs are the most pressing economic challenge facing our nation and have left many Americans simply unable to afford health insurance. In addition, the cost of health care threatens the competitiveness of U.S. businesses and the solvency of the Medicare program. Americans Can No Longer Afford Health Care In 1987, the average health insurance premium accounted for 7.3% of the median family income in the U.S. In 2006, that had risen to 17%. The Business Case Health care costs threaten the competitiveness and profitability of many U.S. businesses. In 2005, employers spent $440 billion on health care, which represents 24% of all national health expenditures. The average U.S. employer spends 9.9% of payroll on health care compared to 4.9% for major competitors. Employer health costs put U.S. firms at a competitive disadvantage compared to foreign firms and result in more and more “good jobs” being lost overseas.

AT: Jobs Turn 2/2

### Hegemony doesn’t cause a net decrease in conflict – ongoing wars prove.

Daniel Larison, Ph.D. graduate from the University of Chicago and contributing Editor, 4/5/2010, “A Bright Post-Hegemonic Future,” The American Conservative, http://www.amconmag.com/larison/2010/04/05/a-bright-post-hegemonic-future/

In other words, unsustainable U.S. hegemony will not be as great as it was, and that will mean that other major and rising powers will be able to exert something more like the normal influence in their regions that such powers have exerted throughout most of modern history. Will there be conflicts in such a world? Of course, there will be, but we already have a number of conflicts in the world that have either been deemed irrelevant to the maintenance of Pax Americana or they are the products of policies designed to perpetuate Pax Americana. In practice, securing this “peace” has involved starting several wars, the largest and most destructive of which has been the war in Iraq, as well as supporting proxies and allies as they escalated conflicts with their neighbors.

## AT: Space Control Turn 1/3

### Weapons not key to protect space assets – other mechanisms solve.

Theresa Hitchens, vice president of the Center for Defense Information, October 2003, “Space Weapons: Are They Needed?” http://www.gwu.edu/~spi/assets/docs/Security\_Space\_Volume.Final.pdf

It is obvious that the United States must ensure the integrity of its increasingly important space networks, and find ways to defense against threats to space assets. Still, there is little reason to believe that it is necessary for the U.S. to put weapons in space to do so. Space warfare proponents are making a suspect leap in logic in arguing that space-based weapons are, or will soon be, required to protect the ability of the United States to operate freely in space. One could argue much more rationally that what is needed most urgently is to find ways to prevent computer network intrusion; to ensure redundant capabilities both at the system and subsystem level, including the ability to rapidly replace satellites on orbit; to improve security of ground facilities (perhaps moving to underground facilities); and to harden electronic components on particularly important satellites.

### Space weaponization collapses US heg – undercuts US ground and space capabilities.

Theresa Hitchens, vice president of the Center for Defense Information, October 2003, “Space Weapons: Are They Needed?” http://www.gwu.edu/~spi/assets/docs/Security\_Space\_Volume.Final.pdf

Karl Mueller, now at RAND, in an analysis for the School of Advanced Airpower Studies at Maxwell Air Force Base, wrote, “The United States would not be able to maintain unchallenged hegemony in the weaponization of space, and while a space-weapons race would threaten international stability, it would be even more dangerous to U.S. security and relative power projection capability, due to other states’ significant ability and probably inclination to balance symmetrically and asymmetrically against ascendant U.S. power.” Spurring other nations to acquire spacebased weapons of their own, especially weapons aimed at terrestrial targets, would certainly undercut the ability of U.S. forces to operate freely on the ground on a worldwide basis – negating what today is a unique advantage of being a military superpower. U.S. commercial satellites would also become targets, as well as military assets (especially considering the fact that the U.S. military is heavily reliant on commercial providers, particularly in communications). Depending on how widespread such weapons became, it also could even put U.S. cities at a greater risk than they face today from ballistic missiles.

AT: Space Control Turn 2/3

### Space arms control can be effective – maintains US leadership – even the military agrees.

Theresa Hitchens, vice president of the Center for Defense Information, October 2003, “Space Weapons: Are They Needed?” http://www.gwu.edu/~spi/assets/docs/Security\_Space\_Volume.Final.pdf

The potential for strategic consequences of a space race has led many experts, including within the military, to tout a space arms control regime as an alternative. A ban on space weapons and ASATs could help preserve – at least for some time – the status quo of U.S. advantage (especially if coupled with U.S. moves to shore up passive satellite defenses). In a recent article in Georgetown Journal of International Affairs, Jeffrey Lewis, a graduate research fellow at the Center for International Security Studies at the University of Maryland, makes a good case for an arms control approach, arguing: “If defensive deployments in space cannot keep pace with offensive developments on the ground, then some measure of restraining offensive capabilities needs to be found to even the playing field.”

### Space isn’t a high ground – targets are sitting ducks, and there’s no strategic advantage over terrestrial assets

Captain David Hardesty, U.S. Navy, teaches at Naval War College’s Strategy and Policy Department, 2005. “Space Based Weapons: Long Term Strategic Implications and Alternatives,” http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA521114&Location=U2&doc=GetTRDoc.pdf

Space is frequently referred to as the “ultimate high ground.” While few would dispute that space provides an excellent vantage point, “high ground” implies a great deal more, and in fact space is far from being the “ultimate high ground.” On earth, high ground has physical resources near at hand for shielding and hiding behind. In space, the “high ground” has nothing: it’s a vacuum and there is nothing there that you don’t bring with you. On earth, high ground is often a peak with a casetle on it like the Krak des Chevaliers, a choke point, a symbol of power. In the “high ground” of space, you’re a thin-skinned sitting duck with a bull’s-eye painted on your side. Anybody has a chance to shoot at you whenever they feel like it. High ground on earth provides you with a view of everything below you, while the people down below can’t see you, because you’re up over the edge of the fortification. In space, everybody can see you and people on the ground can hide from you, so all those advantages are gone. On earth, from high ground you can strike anywhere around you while those below are limited in reaching you. In space, the attacks that you might make, the trajectories that your vehicles might follow, follow paths that are predictable in advance, predictable in both space and time. Ground attacks, meanwhile, on a point in space can be almost random; they are highly variable in time and space and are unpredictable. On earth, on the high ground, you have weapons that are more effective when you aim downward, but the “high ground” in space is the easier target, being unprotected. Attacking uphill involves difficulty and delay on the ground but in space, uphill and downhill attacks take about the same amount of time and your “high ground” is very much harder to resupply and rearm. Lastly, on earth, high ground allows a permanent control over some strategic road or territory, a choke point that interdicts all hostile traffic around it. In space, the so-called high ground is a shifting Maginot line that is easily avoided, outwaited and circumvented.

AT: Space Control Turn 3/3

### Adversaries will shift to terrorism and submarine strikes – renders space power irrelevant

Nader Elhefnawy, contributing writer for the space review, 2003. Parameters, “4 Myths About Space Power,” http://naderelhefnawy.blogspot.com/2010/04/four-myths-about-space-power.html

While space power is crucial to the unprecedented military capability the United States now enjoys, the space-based infrastructure is its nervous system. The muscle is in its air, land, and sea forces, and will remain there for many decades to come. Supporting those forces is the first mission of the military space program.13 Nonetheless, the tail in space counts for little if the planetary teeth can be neutralized. Some of the ways in which potential adversaries can go about doing this are reasonably obvious, such as the construction of facilities underground, the targeting of ground control and downlink stations, or the use of electronic warfare to cut off American military forces from their supporting space assets. However, they also can fight American forces in ways which diminish the value of their presently unmatched capacity to monitor the battlespace and strike with precision. One way is through special forces actions. Given the growing power of small groups of people to inflict destruction, states may turn to developing massive special operations forces for spreading chaos behind an enemy's lines. The Soviet Union had a force of 25,000 Spetsnaz troops who would have been unleashed en masse against Western targets from communications and transport systems to nuclear weapons facilities in the event of a third world war.14 North Korea has over 100,000 soldiers in its own special forces units, presumably intended to wreak havoc behind South Korean lines in a future conflict.15 It goes without saying that the chaos created by the most destructive attack a terrorist group like al-Qaeda could stage pales compared to what such robust forces could accomplish given the chance. A second method is to emphasize submarine forces. The undersea world remains impervious to aerospace surveillance, the sea surface presenting a barrier that cleaves the battlespace in two. Short of a breakthrough in non-acoustic submarine detection, space power will be incapable of defeating submarines. The result is that the submarine, once it has been deployed, may retain much of its ability to attack ships and even fire missiles at targets inland. Consequently, powers seeking to challenge US space power could concede superiority on the surface to the Americans, build up their submarine force, and unleash it on shipping lanes and coastlines much as Germany did in the world wars. The advent of underwater "arsenal ships," supercavitating cruise missiles that will minimize flight times by "popping up" out of the water near their targets, and facilities and weapons based on the seabed will only enhance such prospects.

## AT: Regulation Turn 1/2

### New policy development solves space regulation.

Molly K. Macauley, senior fellow at Resources for the Future, Summer 2003, “Regulation on the Final Frontier,” Regulation, http://www.cato.org/pubs/regulation/regv26n2/v26n2-6.pdf

Policymaking has also been insular — another problem on an isolated frontier. Seldom have space legislators and regulators taken into account lessons learned from other policy experiences, be they the ills of price regulation, government competition, or command-and-control management. In June 2000, President Bush asked the National Security Council and the White House Office of Science and Technology Policy to begin a review of national space policies including those pertaining to space transportation and earth observation. The reviewers do not start with a clean slate, but if they are willing to entertain new perspectives like market-based approaches and fully appreciate the legacy of innovative policy regulation, the space future looks bright.

### This is a DA to the plan – space development more unpredictable under government model.

Peter Diamandis, Chairman & CEO, X Prize Foundation, 4/7/2010, “Big Think Interview With Peter Diamandis,” http://bigthink.com/ideas/19450

Peter Diamandis: One of the precepts of the X Prize is you get what you incentivize; a very simple concept, but extraordinarily powerful. And if you look to the root of what the problems are, you always find out, well we don’t incentivize that. Well today what we incentivize, we incentivize a Congressman being elected every two years, a President being elected every four years, and a Senator every six years. So, it’s what’s going to affect people right now. What can I promise and delivery in two years. Space is not a two-year objective. It used to be, in the early ‘60’s, we had this eye candy of Mercury and Gemini and Apollo and every year we would do something more and more and it met those needs. But the easy stuff has been done. And today, NASA calls stuff nominal instead of phenomenal, like it really is. So I have given up that there is going to be a balance and NASA is going to do certain things and we are finally in a state of existence where small groups of individuals can do extraordinary things, funded by single people. Today, a group of 20 individuals empowered by the exponential growing technologies of AI and robotics and computers and networks and eventually nanotechnology can do what only nation states could have done before.

AT: Regulation Turn 2/2

### The process of prizes is sufficient to solve – overcomes private regulation.

Eric R. Sterner, George C. Marshall Institute, April 2010, “Worthy of a Great Nation? NASA’s Change of Strategic Direction,” George C. Marshall Institute Policy Outlook, http://www.marshall.org/pdf/materials/797.pdf

True support for the burgeoning commercial human spaceflight industry would significantly limit the amount of government intervention in the infant marketplace, lest the distortions created by real-, or near-monopsonistic government domination of demand and capital markets swamps free market signals. In the long run, the best approach may be to follow the X-Prize model and create an award for the first company that meets certain very simple mission goals, such as carrying three people to the ISS orbit and demonstrating the ability to rendezvous and dock with another space object. Such an approach would theoretically reduce the cost of private capital by improving the possible returns on an investment. At the same time, it would reduce government risk by withholding cash until a winner had actually earned the prize. This differs from the COTS program in that the goal of COTS is to meet NASA-unique requirements for access to the space station, which requires intensive government oversight, whereas the prize program’s goal is to foster private sector innovation for its own sake, mandating considerably less government oversight. (The FAA would still be involved to regulate safety of passengers and the public.)

# \*\*\*Aff\*\*\*

## Aff – Perm Solves 1/2

### Perm – Do Both

### Perm solves best – combination of NASA deep-space exploration and burgeoning private industry key to solve.

Thomas Brannen, J.D. Candidate, Southern Methodist University Dedman School of Law, Summer 2010, “Private Commercial Space Transportation’s Dependence on Space Tourism and NASA’s Responsibility to Both,” Journal of Air Law and Commerce, p.661

Three steps by which NASA can remedy the budgetary problems are: (a) focusing on the exploration of deep outer space, such as efforts to the moon and Mars; (b) encouraging growth in the private U.S. commercial space transportation industry; and (c) returning to the age where NASA was the premiere developer of cutting-edge technologies that enabled human space exploration. n163 HSFPC suggests that the latter two steps can be achieved by merely focusing on the exploration of deep outer space. n164 In simpler terms, NASA should leave the "burgeoning" suborbital and orbital space flight industries behind to private businesses while NASA pushes to beyond-earth regions. Additionally, HSFPC suggests that NASA utilize resources made available by the global efforts of various countries interested in space exploration, such as Russia's launch services. This contrasts with the current nationalistic focus of having the United States conquer Mars on its own. The following five questions provide a framework in which to plan for future U.S. human spaceflight:

### Perm solves their budget arguments – incentivizing private development saves NASA resources for the plan.

Thomas Brannen, J.D. Candidate, Southern Methodist University Dedman School of Law, Summer 2010, “Private Commercial Space Transportation’s Dependence on Space Tourism and NASA’s Responsibility to Both,” Journal of Air Law and Commerce, p.664

While NASA can refuse to learn from its mistakes and continue to insist on controlling all aspects of space exploration, despite its budgetary constraints, the most mutually beneficial option is to require NASA to rely on private commercial providers. The recertification of the Shuttle would require large increases in or reallocations of NASA's budget and could potentially lead to the same inefficiencies that have plagued NASA throughout its history. Instead, NASA should follow the Committee's suggestion, learn from the success of prize-encouraged innovation, and "strengthen ... incentives to the commercial providers" in their development of suitable services to utilize in its ISS operations. By implementing a potentially government-sponsored prize coupled with guaranteed contracts, NASA would serve its own purposes of shortening "the Gap" and would produce additional incentives for innovation in the private commercial space transportation industry. Likewise, by ensuring that orbiting refueling centers are developed, NASA would incentivize and improve propositions of space transportation and space tourism services such as space hotels and private orbital spacecraft, allowing NASA to focus instead on deep space exploration.

Aff – Perm Solves 2/2

### Hybrid model solves best.

C.A. Carberry, Artemis Westenberg, and Blake Ortner, Executive Director, Explore Mars, Inc., President, Explore Mars, Inc, and Project Leader, ISRU Challenge, Explore Mars, October-November 2010, “The Mars Prize and Private Missions to the Red Planet,” Journal of Cosmology, http://journalofcosmology.com/Mars139.html

This is not to say that an entirely private program is better than the traditional approach or a public-private hybrid version. On the contrary, the hybrid method is probably the path that stands the best chance of mission success, but it is also subject to far more political turbulence concerning funding and the overall balance and focus of the program. In order to alleviate some of this turbulence, there must be more unity between the traditional and the "new space" companies. NASA and the established aerospace community should not fear or dismiss these new approaches to space exploration. The new space companies, and their advocates, need to recognize that there is strong value in how the traditional space community approaches mission design. Both need to think about new and efficient methods of designing missions, whether by reducing launch costs or embracing technologies like in situ resource utilization.

## Jobs Turn

### Shift to private leadership tanks NASA jobs – key to US competitiveness.

James Bacchus, former member of congress, 2/9/2010, “Obama's Plan for NASA and Reaffirming Our Commitment to Space Exploration,” Huffington Post, http://www.huffingtonpost.com/james-bacchus/obamas-plan-for-nasa-and\_b\_455074.html

The retirement of the shuttle fleet at yearend will jeopardize 7,000 jobs at the Kennedy Space Center and all along the "Space Coast" of Central Florida in my former Congressional district. We must do all we can to save those jobs. For me, the simple fact that many of those jobs are held by my friends and my former constituents is reason enough to do everything possible to save them. But much more is at stake for our entire country. Overall U.S. industrial capacity fell by an estimated one percent in 2009 -- the largest yearly decline ever. Goods-producing businesses shed more than 2.3 million jobs last year. At such a time, do we really want to throw away the critical mass and the critical skills of thousands of space workers in Florida, Texas, California, and elsewhere in this country whose labors have secured and sustained America's comparative advantage in what will surely be one of the key global industries of the twenty-first century?

### Competitiveness is critical to US leadership.

Bruce Jentleson, Professor of Public Policy and Political Science at Duke University, 8/6/2007, The Globalist, http://www.theglobalist.com/storyid.aspx?StoryId=6364

The Business Roundtable tellingly uses the term “atrophy” to express its concern about what has been happening to U.S. scientific and technological superiority. And the National Intelligence Council points to science and technology as the key uncertainty for whether the United States will remain the world’s “single most important actor.” The declining competitiveness of the U.S. automotive industry — which for a century was a driving economic engine and the country’s defining cultural symbol — is telling. 2007 has been the year Toyota ended General Motors’ reign as first in worldwide sales.

### US leadership is key to prevent global nuclear war.

Zalmay Khalilzad, Program director for strategy, doctrine, and force structure of RAND's Project AIR FORCE, Spring 1995, “Losing the Moment?” Washington Quarterly, p.84

Under the third option, the United States would seek to retain global leadership and to preclude the rise of a global rival or a return to multipolarity for the indefinite future. On balance, this is the best long-term guiding principle and vision. Such a vision is desirable not as an end in itself, but because a world in which the United States exercises leadership would have tremendous advantages. First, the global environment would be more open and more receptive to American values - democracy, free markets, and the rule of law. Second, such a world would have a better chance of dealing cooperatively with the world's major problems, such as nuclear proliferation, threats of regional hegemony by renegade states, and low-level conflicts. Finally, U.S. leadership would help preclude the rise of another hostile global rival, enabling the United States and the world to avoid another global cold or hot war and all the attendant dangers, including a global nuclear exchange. U.S. leadership would therefore be more conducive to global stability than a bipolar or a multipolar balance of power system.

## Space Control Turn 1/2

### Ceding control to the private sector allows Russian/Chinese control of space.

Charles Krauthammer, weekly columnist for the Washington Post, 2/12/2010, “Closing the new frontier,” Washington Post, http://www.washingtonpost.com/wp-dyn/content/article/2010/02/11/AR2010021103484.html

This is nonsense. It would be swell for private companies to take over launching astronauts. But they cannot do it. It's too expensive. It's too experimental. And the safety standards for getting people up and down reliably are just unreachably high. Sure, decades from now there will be a robust private space-travel industry. But that is a long time. In the interim, space will be owned by Russia and then China. The president waxes seriously nationalist at the thought of China or India surpassing us in speculative "clean energy." Yet he is quite prepared to gratuitously give up our spectacular lead in human space exploration.

### Exploration key to expand the military presence in space.

Efstathios T. Fakiolas and Tassos E. Fakiolas, Department of Political Science and International Relations, University of Peloponnese, and Special Advisor on Russian and East European Affairs, Greece, June 2009, “Space control and global hegemony,” The Korean Journal of Defense Analysis, http://kida.re.kr/data/kjda/RKJD\_A\_387383\_P.pdf

At present the United States is determined not only to protect its right to use space for military and civilian purposes and ensure freedom of action, but also to deter potential enemies from having access to or using space. It identifies space operations conducted by state or non-state opponents or adversaries as a ‘‘disruptive challenge’’ to its military capabilities and national interests.50 It considers space, in addition to the land, sea, air, and cyberspace, a domain of the battle-space and space capabilities as an essential component of the application and projection of military force.51 Having founded the Pentagon’s Executive Agent for Space, it pursues a policy to ‘‘enjoy an advantage in space capabilities across all mission areas’’ and ‘‘develop responsive space capabilities in order to keep access to space unfettered, reliable and secure.’’ It intends to achieve this goal by ‘‘staying at least one technology generation ahead of any foreign or commercial space power.’’52 Thus, for instance, in February 2008 the U.S. military destroyed the defunct and out-of-control USA 193 spy satellite with a specially designed SM-3 ballistic missile.53

Space Control Turn 2/2

### Space control prevents escalation of collapsed states and great power war.

Charles H. Cynamon, Colonel, USAF, 2/12/2009, “Defending America’s Interests in Space,” https://www.afresearch.org/skins/rims/display.aspx?rs=enginespage&ModuleID=be0e99f3-fc56-4ccb-8dfe-670c0822a153&Action=downloadpaper&ObjectID=236c0cec-26d6-4053-ab82-19a783259606

In the future, the primary sources of trans-regional, interstate and intra-state conflict are non-globalized, failed nations and ideologically motivated non-state actors. Even though sporadic tensions between major globalized nations have occurred, the resulting violent clashes have not lead to high-intensity conflicts. US conventional military power supported by wellprotected space systems has remained the key deterrent against major power war. In space, the United States retains preeminence for support to the world’s sole global expeditionary military. Over the course of 20 years, the United States bolstered its commercial and civil space industrial base with foreign space system exports and international cooperative programs. Joint ventures in manned space flight with the major spacefaring nations returned mankind to the moon for scientific exploration investigating extraction of key minerals, energy sources, and launch bases for more ambitious space travel opportunities. Despite orbiting US anti-ballistic missile systems, a space arms race never materialized with respect to ASAT weapons. The confluence of interagency efforts shaped the strategic environment in which the world perceives the United States as the enforcer of peaceful uses of space.

## Regulation Turn 1/2

### Perm is net beneficial - Complete shift to the private sector causes imposition of new government regulation – collapses innovation and tech.

Eric R. Sterner, George C. Marshall Institute, April 2010, “Worthy of a Great Nation? NASA’s Change of Strategic Direction,” George C. Marshall Institute Policy Outlook, http://www.marshall.org/pdf/materials/797.pdf

The Obama administration’s approach will undo that balance. While it has retained and expanded COTS, in many ways to its credit, its cancellation of Constellation raises the stakes for COTS and commercial human spaceflight in general. It will no longer be an experiment in promoting innovation with the potential to evolve into something more comprehensive. Instead, it will become the government’s primary means of sending people to space. As such, there will be strong pressure on the government to exercise increased oversight and accountability, undermining, if not eventually eliminating, the very flexibility built into the COTS concept. Indeed, this is already happening. A Congressional hearing revealed an already extant conflict over responsibilities between the Federal Aviation administration, which has legal responsibility for regulating commercial human spaceflight, and NASA, which is responsible for the safety of its astronauts. Given the nature of bureaucratic politics, it is quite likely that both agencies will impose different sets of standards on commercial human spaceflight service providers. Those regulatory burdens may well flow down to suborbital service providers as well, since NASA has raised the possibility of using those service providers to enable government research. A mature industry with a healthy demand for its services may be able to respond to and carry such burdens. The commercial human spaceflight industry, which is still in its infancy, may be stifled by them. Of equal concern, it should be noted that the Congress imposed several non-mission related requirements on Constellation, such as maintaining the workforce and using as much shuttle-heritage hardware as possible. These kinds of requirements do not usually contribute to performance or cost-effectiveness, but serve other legitimate public policy goals. There is some indication that leading members of Congress will seek to impose them on the commercial industry if the industry becomes the primary means of carrying Americans to orbit.

Regulation Turn 2/2

### Congressional opposition guts long-term solvency for the counterplan – and tanks other space exploration.

C.A. Carberry, Artemis Westenberg, and Blake Ortner, Executive Director, Explore Mars, Inc., President, Explore Mars, Inc, and Project Leader, ISRU Challenge, Explore Mars, October-November 2010, “The Mars Prize and Private Missions to the Red Planet,” Journal of Cosmology, http://journalofcosmology.com/Mars139.html

The question therefore is, would the private sector? Companies and private individuals are very much susceptible to political pressure and public outcry. Once it became known that a consortium or individual was going to send someone on what could be a suicide mission to Mars (even if the person funding the mission was the person making the trip), there would be a massive national and international debate on the topic. While this could have positive aspects, it could also present some very negative consequences, particularly if Congress and other bodies create legal and regulatory roadblocks – this could also hinder other space exploration efforts.

### Incentives don’t overcome legal regulation – X Prize proves.

Alan Boyle, Science Editor, 5/28/2004, “Private spaceships caught in political fog,” MSNBC, http://www.msnbc.msn.com/id/5085384/ns/technology\_and\_science-space/

But since then, the bill — known as the Commercial Space Launch Amendments Act of 2004, or H.R. 3752 — has languished without Senate action. And some in the infant space travel industry are increasingly worried the measure might just fizzle out. Without the legislation, private spaceflight could be left in "legal limbo," said XCOR Aerospace, a California-based company that received a suborbital launch license just last month. Such a scenario could leave unclear whether suborbital spaceships should be regulated like rockets, as the Federal Aviation Administration is doing now, or like airplanes, which would involve far tighter regulations. There would be no legal framework for taking on paying passengers. And perhaps most importantly, investors would lack legal assurances that the industry in which they were investing will actually take off. Ironically, the uncertainty comes even as privately funded rocketeers are poised to break the space barrier and win the $10 million Ansari X Prize.

## No Solvency – NASA Mission Key 1/2

### NASA leadership crucial to investment and technology – key to solve Mars mission.

David M. Livingston, business consultant, financial advisor, and strategic planner, 8/10/2000, “From Earth to Mars: A Cooperative Plan,” http://www.spacefuture.com/archive/from\_earth\_to\_mars\_a\_cooperative\_plan.shtml

When the private sector does participate in a manned mission to Mars, the investment should be based on standards that are used for a terrestrial investment of similar risk and character. There will be stringent requirements for any company to earn an acceptable return on investment, net present value, internal rate of return, and a payback on the investment. The existence of a suitable exit strategy is also important. Delay factors will also need to be included in the financial analysis. Furthermore, without NASA leadership or policy advocating a manned mission to Mars, companies will have difficulty raising capital for the project. Still another financial barrier for the private sector is the fact that there is no clear profit potential for a Mars mission. There is entertainment, media, sponsorship, and advertising potential for the trip to and from Mars as well as for the stay on Mars; however, the market and expected revenues from these activities is largely uncertain. The absence of a more certain profit potential adds to the difficulty in raising investment capital for such a mission, but on a more basic level it simply thwarts most private-sector interest in the mission as businesses focus their attention on more realistic and potentially profitable ventures. Investment capital appears to be plentiful at the beginning of the twenty-first century, but it is still a finite resource. Unless a company or individual decides to invest in the Mars mission regardless of all other factors, investment capital will most likely go to the venture with the most profit potential for the least amount of risk. Terrestrial investments will almost always have the advantage in attracting investment capital. In addition, terrestrial investments have the least amount of risk since the infrastructure already exists on Earth for business ventures and transportation, the political risks are usually known, the legal environment is more certain, and, in most cases, new technology and engineering requirements are unnecessary.

### Government leadership crucial to Mars mission.

David M. Livingston, business consultant, financial advisor, and strategic planner, 8/10/2000, “From Earth to Mars: A Cooperative Plan,” http://www.spacefuture.com/archive/from\_earth\_to\_mars\_a\_cooperative\_plan.shtml

Government support for the manned mission to Mars is essential, even if the private sector is a significant participant in all aspects of the project. Whether NASA's and the government's influence on space matters is deserved or not, the fact is that everyone looks to these entities to approve new space projects. A space mission that is not endorsed by the government or its primary space agency, NASA, is extremely difficult to plan, finance, market, and initiate. At the present time, there is no support from the government or NASA for a manned flight to Mars.

No Solvency – NASA Mission Key 2/2

### Private sector can’t fill in fast enough – risks collapse of US space leadership.

David Kushner, award-winning journalist, September 2010, “Launching Into the Era of Private Spaceflight,” Discover, http://discovermagazine.com/2010/sep/18-launching-into-age-of-private-spaceflight/article\_view?b\_start:int=0&-C=

To start flying humans into space, Sierra Nevada (or any other private firm) will have to reach many milestones in development, testing, and financing. Not only do the companies need to pass NASA’s safety standards with unproved spacecraft, but they must train astronauts on the new equipment as well. Even the most optimistic estimates suggest it will be three to five years before a commercial vehicle is ready to reach the International Space Station. In other words, the United States faces the exact same gap in space access that got Sirangelo motivated to begin developing the Dream Chaser five years ago. “The shuttle will stop flying next year, and we’re not going to have a human-rated vehicle to take to station. That problem is our fault,” Olson admits. The problem could get worse. If the commercial companies cannot deliver the vehicles on the anticipated schedule, NASA will have no back-up other than the Soyuz. Even Voss questions the timing of NASA’s sudden conversion to a free-market philosophy. “I think they made a mistake by canceling the Constellation program without having an alternative in place,” he says.

## No Solvency – No New Missions 1/2

### Private sector investment won’t spur new missions – no leadership capability.

David M. Livingston, business consultant, financial advisor, and strategic planner, 8/10/2000, “From Earth to Mars: A Cooperative Plan,” http://www.spacefuture.com/archive/from\_earth\_to\_mars\_a\_cooperative\_plan.shtml

Regarding the private sector, some of the same components are missing, such as leadership, education, commitment, and acceptance. Unfortunately, the private sector has been conditioned to believe that our space program is the proper function of government. This is to be expected since the commercial space industry of today, while highly profitable and successful, was initiated by government policy and acts of Congress. In addition, space commercialization developed on a dual track with the military's usage of space and communication satellites, even to the extent of using military rockets for all commercial satellite launches. The private sector simply is not prepared to lead the way with something as unique, costly, risky, and new as putting humans on Mars. It still looks to the public sector for leadership, support, and encouragement. Thus, there is no private-sector leadership that can do what public sector leadership has the opportunity to do. While the opportunity does exist for developing private-sector leadership in this field, it is not within the culture of the private sector at this time to do so. This fact needs to change before the private sector can help lead the way to putting people on Mars.

### No private sector lead on new missions – even potential monetary gains don’t solve..

David M. Livingston, business consultant, financial advisor, and strategic planner, 8/10/2000, “From Earth to Mars: A Cooperative Plan,” http://www.spacefuture.com/archive/from\_earth\_to\_mars\_a\_cooperative\_plan.shtml

It is also important to realize that the private sector does not yet agree that a manned mission to Mars might offer potential benefits and profits. The private sector is simply unable to convincingly move past the cost and risk factors, the technical and engineering issues, and the precedent that an important space mission is the responsibility of the government, though the private sector may obtain lucrative government contracts for work on the project. Finally, just as government leaders must convince taxpayers, leaders in the private sector must convince their shareholders of the mission's value. The high cost of the mission will make this all the more difficult. Shareholder value is of paramount importance, especially in our current economic climate. While it is possible to demonstrate how investing in a manned mission to Mars can contribute to shareholder and public value, such efforts are not underway at this time, largely because there is no manned mission to Mars on the planning board.

No Solvency – No New Missions 2/2

### Private sector lacks the technology for new space exploration – comparisons to previous tech are wrong.

Eric R. Sterner, George C. Marshall Institute, April 2010, “Worthy of a Great Nation? NASA’s Change of Strategic Direction,” George C. Marshall Institute Policy Outlook, http://www.marshall.org/pdf/materials/797.pdf

First, developing a spacecraft capable of safely launching people into orbit, operating there, and returning them safely to the planet is extraordinarily difficult, with extremely low tolerances for risk. For comparison purposes, launching SpaceShip 1, a privately-developed and revolutionary spacecraft capable of carrying people to suborbital space, requires roughly 2% of the total energy required to take the same mass to low-earth orbit. Solving such complex problems is not beyond the wherewithal of the private sector. After all, the bulk of NASA’s spacecraft were developed by contractors, and the private sector developed, owns and operates much of the nation’s infrastructure. Human spaceflight to LEO is different, however, than developing or operating the complex terrestrial systems frequently created by the private sector. It requires the development of entirely new technologies and capabilities, for which there has been no private demand or commercial reward. So, there have not been sufficient incentives for the private sector to bring its otherwise healthy abilities to mobilize massive amounts of capital or solve complex problems to bear. There simply is no useful comparison between the public and private sector interests when it comes to human spaceflight. Indeed, to date, only three governments have been able to organize the financial, organizational, scientific, and technical resources to achieve this task. At the time, two of them were superpowers and the third appears to be on the verge of becoming one.

## No Solvency – Leadership Advantage 1/2

### Only government leadership solves – also proves they can’t solve our leadership advantage.

David M. Livingston, business consultant, financial advisor, and strategic planner, 8/10/2000, “From Earth to Mars: A Cooperative Plan,” http://www.spacefuture.com/archive/from\_earth\_to\_mars\_a\_cooperative\_plan.shtml

The opportunity to set a national priority or goal for placing humans on Mars rests with the public sector. Yet there is simply no national leadership or will to energize and mobilize toward such a purpose. Without the support of national leadership, such a mission would be virtually impossible to undertake. Inspiring leadership can make possible extraordinary results. In the case of the public sector, an entire economic powerhouse can be directed toward this mission if its leadership is effective and convinced of the project's value. Such leaders would clearly explain the purpose, the why's and how's of the mission and with the people by his side, see the mission through to its conclusion. President Kennedy inspiringly led the nation in seeing that there was value in going to the Moon. Later, toward the end of the Apollo program, other national issues took priority over continuing with Apollo and the national leadership of the time no longer connected Moon trips with value for the country and the people. Thus, the Apollo program disappeared as its previously strong support waned. In the years since the end of Apollo, our political leadership has not even attempted make a case that there is any value in returning to the Moon. Putting humans on Mars is even more abstract for most people than returning people to the Moon.

### NASA leadership key to US leadership – private sector can’t solve.

Eric R. Sterner, George C. Marshall Institute, April 2010, “Worthy of a Great Nation? NASA’s Change of Strategic Direction,” George C. Marshall Institute Policy Outlook, http://www.marshall.org/pdf/materials/797.pdf

The United States can only continue to set a global agenda in space by challenging countries to work together in pursuit of a unifying purpose. It took decades after the Apollo program and the stunning loss of seven astronauts aboard the space shuttle Columbia for U.S. policymakers to establish a bipartisan, bicameral consensus on the future of the human exploration program. The fiscal year 2011 budget proposal has already undone that consensus, dividing proponents of a forwardleaning civil space program from advocates of space commercialization, human spaceflight from robotic exploration, and one state from another. In retreating from an exploration program focused on establishing a permanent presence on the moon and reaching Mars within a specific timeframe, the United States will create uncertainty about its plans, leaving others to take the initiative, lay moral claims to a leadership role, and increase their influence in establishing the formal and informal norms that will govern human space exploration for decades. Leadership requires the reverse.

No Solvency – Leadership Advantage 2/2

### NASA leadership key to solve STEM education and US leadership.

Eric R. Sterner, George C. Marshall Institute, April 2010, “Worthy of a Great Nation? NASA’s Change of Strategic Direction,” George C. Marshall Institute Policy Outlook, http://www.marshall.org/pdf/materials/797.pdf

Such a situation will blunt NASA as a tool of national policy. While it will continue to contribute to a range of national interests, from astronomy, astrophysics, and earth science to aeronautics, and life sciences, it will not inspire future generations of students to study science, technology, engineering or math any more than NASA did in its pre-Columbia incarnation, when it conducted a range of similar programs. Similarly, other countries will continue to partner with NASA on the International Space Station, in the robotic exploration of space, and in earth science. But, NASA will not set a global agenda. Others well might. China plans to launch its second lunar probe later this year, a rover by 2013, a sample return mission thereafter, and is studying a Saturn-class heavy lifter ideally suited for lunar exploration just as the United States cancels its comparable Ares V.36 India will launch its second lunar probe in 2013 and has announced plans to begin training its own astronauts and building the infrastructure for human spaceflight. They may be announcing more modest ambitions, but these countries will demonstrate a constancy and reliability as a partner that the administration’s change of course will take away from the United States. None of these facts indicate a “space race,” but they do suggest international interest in a mission area from which the United States is stepping back.

## No Solvency – Investment 1/2

### Lack of property rights regime prevents private investment.

Edward Aldridge Jr. et al, Under Secretary for Acquisition, Technology, and Logistics, at the Department of Defense, June 2004, “A Journey to Inspire, Innovate, and Discover,” Report of the President’s Commission on Implementation of United States Space Exploration Policy, http://www.nasa.gov/pdf/60736main\_M2M\_report\_small.pdf

Because of this treaty regime, the legal status of a hypothetical private company engaged in making products from space resources is uncertain. Potentially, this uncertainty could strangle a nascent spacebased industry in its cradle; no company will invest millions of dollars in developing a product to which their legal claim is uncertain. The issue of private property rights in space is a complex one involving national and international legal issues. However, it is imperative that these issues be recognized and addressed at an early stage in the implementation of the vision, otherwise there will be little significant private sector activity associated with the development of space resources, one of our key goals.

### Private firms will focus on terrestrial investments.

David M. Livingston, business consultant, financial advisor, and strategic planner, 8/10/2000, “From Earth to Mars: A Cooperative Plan,” http://www.spacefuture.com/archive/from\_earth\_to\_mars\_a\_cooperative\_plan.shtml

Investment capital appears to be plentiful at the beginning of the twenty-first century, but it is still a finite resource. Unless a company or individual decides to invest in the Mars mission regardless of all other factors, investment capital will most likely go to the venture with the most profit potential for the least amount of risk. Terrestrial investments will almost always have the advantage in attracting investment capital. In addition, terrestrial investments have the least amount of risk since the infrastructure already exists on Earth for business ventures and transportation, the political risks are usually known, the legal environment is more certain, and, in most cases, new technology and engineering requirements are unnecessary.

No Solvency – Investment 2/2

### NASA incentives not enough to large-scale private investment.

Eric R. Sterner, George C. Marshall Institute, April 2010, “Worthy of a Great Nation? NASA’s Change of Strategic Direction,” George C. Marshall Institute Policy Outlook, http://www.marshall.org/pdf/materials/797.pdf

Second, solving those technical challenges is extraordinarily expensive, creating a high barrier to entry into the market segment by new, potential suppliers, assuming there is an expectation of an adequate payoff after such market entry. Arguably, NASA’s initial expenditures may offset this by providing “seed” money that enables private entrants to raise more private capital at a lower cost, while its demand for services theoretically creates a payoff. Still, for reasons discussed below, that “seed” money will likely be wholly inadequate. According to a study commissioned by the Commercial Spaceflight Industry, total cumulative investment committed to the commercial human spaceflight through the fall of 2009 was $1.46 billion—including government funding— of which just $838 million remained available.25 While this may seem like a significant amount of money, in aerospace development programs it is not. For comparison purposes, Boeing (a commercial company using commercial practices to develop a commercial product for mature markets and using well understood technology) pegged the cost of developing the first three Boeing 787 Dreamliners at roughly $2.5 billion.26 Meanwhile, revenue for actual commercial spaceflight services offered by the industry between 2006 and 2008 (inclusive), totaled $117.6 million. (Any revenue for an industry that cannot currently provide the services it offers reflects confidence on the part of those paying customers in the industry’s ability to do so in the future.) The industry derives significant other revenue from selling hardware, engineering services, and other non-commercial services, in which case they may differ insignificantly from aerospace firms not focused on commercial human spaceflight.

## No Solvency – Prizes Fail 1/2

### Prizes fail – don’t spur sufficient investment or innovation.

Thomas Kalil, Special Assistant to the Chancellor for Science and Technology at UC Berkeley, December 2006, “Prizes for Technological Innovation,” http://www.brookings.edu/views/papers/200612kalil.pdf

Prizes have significant limitations. In most circumstances, they should not be the policy instrument of choice for science and technology. Since only winning teams receive prizes, and only after they have won, all entrants must have or raise the funds necessary to compete. Most researchers and small and medium-sized companies find it difficult to self-finance or raise external funding. For example, offering a prize for a breakthrough in high-energy physics would not work if it required physicists to raise billions of dollars to build a new particle accelerator. Furthermore, it may be impossible to clearly specify in advance what the victory conditions are, since the outcomes of fundamental research are, by definition, unknowable or difficult to quantify in advance. Many of the most interesting discoveries in science are serendipitous. Even when the goals of a prize are generally understood, it may be difficult to develop appropriately specific proxies for those goals, such as an improvement in the price-to-performance ratio of a given technology, or widespread market acceptance. Finally, prizes are more likely than traditional funding mechanisms to lead to duplication of effort, although this effect can be mitigated through careful program design (Newell and Wilson 2005).

### Prizes aren’t large enough to sustain space exploration – Mars example proves prize would need to be at least $1 billion.

C.A. Carberry, Artemis Westenberg, and Blake Ortner, Executive Director, Explore Mars, Inc., President, Explore Mars, Inc, and Project Leader, ISRU Challenge, Explore Mars, October-November 2010, “The Mars Prize and Private Missions to the Red Planet,” Journal of Cosmology, http://journalofcosmology.com/Mars139.html

Could this concept be applicable to sending humans to Mars? In 2008, X-Prize founder, Peter Diamandis proposed Mega X-prizes including a human mission to Mars. However, in a recent interview, Diamandis stated that it was unlikely there would be a Mega X-Prize geared to a human mission to Mars. "I don't see a Mars Mega-X PRIZE… An incentive prize works when there's a long-term business model and the prize can drive numerous teams to spend the money to play. A private Mars mission is likely a $5B - $10B endeavor and you won't see multiple teams each raising this level…If we ever re-invented launch technology to reduce the cost by 100-fold, then I think a "humans to Mars prize" would make a lot of sense" (Diamandis 2010). While not likely to reduce launch costs by 100-fold, if SpaceX can deliver on its goal of dramatically reducing launch costs, it may bring a Mars mission down to the level where an X-Prize may be viable. In a September 7, 2010 email interview with the first author (Carberry), Elon Musk said he thought a privately financed mission would only cost $2 billion and that a prize would only have to be $1 billion. He added that it would take "ten years from starting fundraising to landing back on Earth." If Musk is correct, not only would hundreds of individuals in the United States alone have the means to fund such a prize, but hundreds would also be able to fund teams to compete.

No Solvency – Prizes Fail 2/2

### Prizes can’t make large missions profitable.

C.A. Carberry, Artemis Westenberg, and Blake Ortner, Executive Director, Explore Mars, Inc., President, Explore Mars, Inc, and Project Leader, ISRU Challenge, Explore Mars, October-November 2010, “The Mars Prize and Private Missions to the Red Planet,” Journal of Cosmology, http://journalofcosmology.com/Mars139.html

Even if such a mission did succeed in profitably landing humans on Mars, what would the sustainability of the profits be? Unless new profit variables present themselves, it would be difficult for a private entity to maintain a profit for more than a few years, unless NASA or other government agencies began to pay the winning consortium for access to launch services, facilities on Mars, and other resources.

## CP Links to Politics

### CP links to politics – private space exploration controversial.

John M. Logsdon, Space Policy Institute, Elliott School of International Affairs, George Washington University, February 2011, “A new US approach to human spaceflight?” Space Policy, p.15

The Obama proposal came under immediate attack from members of Congress whose districts would be affected by the new strategy, firms that were threatened by the cancellation of their Constellation contracts, and spaceflight veterans, including several Apollo astronauts. The criticisms focused on the viability of relying on the private sector for crew transport to the ISS and the lack of specific goals and schedules for deep space exploration missions. Senator Richard Shelby (R-AL) succeeded in getting a provision written into law that prohibited NASA from cancelling any Constellation contracts and from starting the new programs proposed by the president until the Congress completed action on the FY2011 budget proposal and had either approved, rejected or modified the new human spaceflight strategy.

### Congress opposes private leadership of space exploration.

Esther Dyson, 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

However, common sense doesn't always rule in politics. When the Internet opened up to commerce, there were objections from the high priests of the cyberspace, who didn't want anyone to turn their holy calling into a business. In the case of space, there are jobs at stake and, more importantly, politicians' careers at stake. Obama is proposing to cancel some $25 billion in NASA programs -- with most of the cuts affecting jobs in Alabama, Utah, and Texas, whose congressional delegations are now up in arms.

### CP controversial – powerful politicians oppose moves to privatize exploration.

David Kushner, award-winning journalist, September 2010, “Launching Into the Era of Private Spaceflight,” Discover, http://discovermagazine.com/2010/sep/18-launching-into-age-of-private-spaceflight/article\_view?b\_start:int=0&-C=

But many politicians and pundits do not trust that private companies can get the job done safely and effectively. Their concerns range from the technological challenges to the economics of putting people into space: If NASA downsizes, where will the money come from to finance the development of a whole new industry? And if other customers do not materialize, can NASA alone keep that industry afloat? The attacks have been especially swift and sharp from senators Barbara Mikulski (D-MD) and Richard Shelby (R-AL), who represent states that currently get substantial NASA investment, as well as from former Apollo astronauts Neil Armstrong and Eugene Cernan. Armstrong called the cancellation of Constellation "devastating." More surprising, even major aerospace companies have expressed doubt. John Karas, vice president and general manager of human spaceflight at Lockheed Martin, recently declared, “I don’t think there is a business case for us.”