## Topicality

[Topicality 1](#_Toc299400979)

[\*\*\*1nc—Exploration= Physically in space 3](#_Toc299400980)

[2nc—Physically in space 4](#_Toc299400981)

[2nc—Exploration= Physically ext 5](#_Toc299400982)

[2nc—Exploration= Physically—case list 6](#_Toc299400983)

[Development= physically in space 7](#_Toc299400984)

[\*\*\*1nc—Development= Only commercial 8](#_Toc299400985)

[2nc—Interp—Development=Only commercial ext 9](#_Toc299400986)

[2nc—Violation—Development=Commercial ext 10](#_Toc299400987)

[2nc—Predictable limits ext 11](#_Toc299400988)

[\*\*\*1nc—Exploration= Human colonization 13](#_Toc299400989)

[2nc—Exploration= Human colonization 14](#_Toc299400990)

[2nc—Exploration= Human colonization ext 15](#_Toc299400991)

[\*\*\*1nc—Development= resources 16](#_Toc299400992)

[2nc—Development= resources ext 17](#_Toc299400993)

[\*\*\*1nc— Development= new technology 18](#_Toc299400994)

[\*\*\*1nc—Development= pre-existing 19](#_Toc299400995)

[Increase= pre-existing tech 20](#_Toc299400996)

[New tech relies on old tech 21](#_Toc299400997)

[\*\*\*1nc—Exploration= astronomy 22](#_Toc299400998)

[2nc—Exploration= astronomy—interpretation ext 23](#_Toc299400999)

[\*\*\*1nc—“its” excludes private sector 24](#_Toc299401000)

[AT: Counter interpretation 25](#_Toc299401001)

[2nc—“its”—interpretation ext 26](#_Toc299401002)

[2nc—“its”—violation ext—commercial/ gov distinction 26](#_Toc299401003)

[2nc—violation ext—NASA contractors not T 26](#_Toc299401004)

[2nc—“its”—explodes limits 27](#_Toc299401005)

[Aff answers—“its”—W/m—commercial= gov responsibility 28](#_Toc299401006)

[Aff answers—“its”= association 30](#_Toc299401007)

[\*\*\*Exploration\*\*\* 31](#_Toc299401008)

[Exploration= robots 31](#_Toc299401009)

[Exploration= humans 31](#_Toc299401010)

[Exploration= new frontiers—human R&D 31](#_Toc299401011)

[Exploration= everything 32](#_Toc299401012)

[Exploration= NASA only 32](#_Toc299401013)

[Exploration= tech with aim to transport 32](#_Toc299401014)

[\*\*\*Development\*\*\* 33](#_Toc299401015)

[Development= military 33](#_Toc299401016)

[Development= colonization 33](#_Toc299401017)

[Development=launch, SBSP, tourism, satellites 33](#_Toc299401018)

[Development= production 34](#_Toc299401019)

[\*\*\*Substantial\*\*\* 35](#_Toc299401020)

[Substantial= Significance—Radars 35](#_Toc299401021)

[Substantial= Significance—Human presence 35](#_Toc299401022)

[Substantial= Significance— NOT human presence 35](#_Toc299401023)

[Substantial= public/private interest 35](#_Toc299401024)

[Substantial= budget increase—50% 36](#_Toc299401025)

[Substantial= budget increase—more than double 36](#_Toc299401026)

[Substantial= budget increase—62 billion 36](#_Toc299401027)

[Substantial= budget increase—12 million 36](#_Toc299401028)

[Substantial= budget increase—2.6 billion 37](#_Toc299401029)

[Substantial= budget total—400 million anual 37](#_Toc299401030)

[Substantial= budget total—185 million 37](#_Toc299401031)

[Substantial excludes commercialization 38](#_Toc299401032)

[Substantial= Commercial activity 38](#_Toc299401033)

[Substantial excludes space development 38](#_Toc299401034)

[Substantial= meaningful contribution—space exploration 38](#_Toc299401035)

[Substantial= SBSP 39](#_Toc299401036)

[\*\*\*Other\*\*\* 40](#_Toc299401037)

[Defining space is arbitrary 40](#_Toc299401038)

[Space-Based Weapons definition 40](#_Toc299401039)

[Commercial definition 40](#_Toc299401040)

\*\*\*1nc—Exploration= Physically in space

A) Interpretation and Violation—Only affirmatives that physically explore space from space are topical.

Space exploration is physical presence in space

Faith 9- G. Ryan Faith, Adjunct Fellow at the Center for Strategic & International Studies, Washington, DC, “Giving NASA a clear mission,” August 31, 2009, <http://www.thespacereview.com/article/1456/1>, The Space Review

If we wish to see NASA act effectively as a space exploration agency, then the most direct way to do this is to amend the Space Act to explicitly task the agency with the job of space exploration. However, before we do so, we must define what space exploration actually is.

Space exploration is the expansion of human influence in space. A mandate to explore that isn’t just understood, but is explicitly delineated in policy and law, will give the current and future NASA administrators a powerful leadership tool to restore NASA’s clear sense of purpose and mission. This definition of exploration is inherently one of capacity building. Human influence in space is a measure of our ability to do useful things beyond the Earth’s surface. In order to do something useful, there has to be some sort of human presence, either humans themselves or their robotic proxies. Once some measure of human influence has been established at some destination in space, there are two ways a space exploration agency can expand that influence. One, the agency can decrease the costs and increase the benefits of human influence at a given location until such influence becomes sufficiently useful that it is economically self-sustaining, at which point continued use of agency resources is unnecessary. Alternately, human influence can be extended to some new place that may in future become home to some form of self-supporting human influence. The key element is that such a mandate compels each step to build on past accomplishments and lay the groundwork for future missions.

B) Implications

 1. Predictable limits—our interpretation is the only way to prevent an explosion of affs that develop non-space technology, look up at the stars, search for extraterrestrial life on earth, and map the resources on the moon. This expands the research burden so much that going neg would be impossible.

 2. Fair division of ground—ground exploration robs the negative of links to generic DAs that are predicated off the launching into exploration of outer space. The distinction between space and the earth’s environment is critical in determining relevant literature.

2nc—Physically in space

Overview—Under the aff’s interpretation, any exploration and development that occurs from the earth’s crust is topical. This justifies affirmatives that mandate the use of telescopes, making it impossible for the negative to research all possible affs.

There is a topical version of their aff—they could do the plan physically in space

And Prefer our interpretation

 Limits—Affirmatives that allow individuals to look up at space in the name of exploration justify affirmatives that look at pictures of the stars. Means the aff could explore from infinite locations on which they could garner advantages.

 Ground—Unless the affirmative physically sends something into space, the negative can’t get links to perception DA’s and core international relations DAs.

2nc—Exploration= Physically ext

Even if the aff wins it’s bad to require humans to go to space, they should at least have to operate their equipment above the mesosphere

Federal Accounting Standards Advisory Board 7, “Federal Financial Accounting and Auditing Technical Release 7: Clarification of Standards Relating to the National Aeronautics and Space Administration’s Space Exploration Equipment,” June 20, 2010, FASAB: Pronouncements as Amended, Version 9, p. 1812, http://www.fasab.gov/pdffiles/handbook\_tr\_7.pdf

1 "Space exploration equipment" included items intended to operate above the atmosphere for space exploration purposes, and any specially designed equipment to aid, service, or operate other equipment engaged in the exploration of space. (See SFFAS 6, par. 52.)

Space exploration must be physical exploration

Kahn 9- Ather Khan, Director, On Demand Quality and Problem Management at Oracle Corporation, Past: Database Administrator at Kellogg Education: Western Michigan University, University of Mumbai “Space Exploration,” October 14, 2009, http://all-space-technology.blogspot.com/2009/10/space-explorationv.html

Space exploration is the use of astronomy and space technology to explore outer space.[1] Physical exploration of space is conducted both by human spaceflights and by robotic spacecraft. While the observation of objects in space, known as astronomy, predates reliable recorded history, it was the development of large liquid-fueled rocket engines during the early 20th century that allowed physical space exploration to become a reality. Common rationales for exploring space include advancing scientific research, uniting different nations, ensuring the future survival of humanity and developing military and strategic advantages against other countries. Various criticisms of space exploration are sometimes made, generally on cost or safety grounds.

NASA defines exploration as human exploration

NASA 7/1/11- “What’s Next for NASA?, July 1, 2011, ” <http://www.nasa.gov/about/whats_next.html>

Exploration NASA is designing and building the capabilities to send humans to explore the solar system, working toward a goal of landing humans on Mars. We will build the Multi-Purpose Crew Vehicle, based on the design for the Orion capsule, with a capacity to take four astronauts on 21-day missions.

We will soon announce the design for the heavy-lift Space Launch System that will carry us out of low Earth orbit. We are developing the technologies we will need for human exploration of the solar system, including solar electric propulsion, refueling depots in orbit, radiation protection and high-reliability life support systems.

Space exploration is beyond Earth—technology that explores from the earth’s surface is defined as study of space

Desai 3- Ankit Desai is, “The Cost Ethics of Space Exploration” October 20, 2003 <http://cseserv.engr.scu.edu/StudentAccounts/ENGR019Fall2003/ADesai/ADesai_ResearchPaper.pdf>

First, let me define what space exploration is. According to the Encarta Encyclopedia, space exploration is the quest to use space travel to discover the nature of the universe beyond Earth. Many centuries before space research began, many dreamt of flying into space and exploring unknown planets and solar systems. Although the technologies needed to explore weren't invented until the 20th century, tools were invented that allowed the study of space from the ground. Rockets were developed sometime in the 11th century. Fueled by gunpowder, these rockets were used as weapons. In the 17th century, Galileo used the telescope in order to study the moon as well as other planets in our solar system. He had mapped the major visible mountains and valleys of the Moon and concluded that it was a solid world. Another Scientist by the name of Johannes Kepler calculated the elliptical orbits of the planets using the telescope.(1)

Space exploration expands scientific discovery by advancing humans and robots across multiple worlds

NASA 4- “The Vision for Space Exploration,” February 2004, http://www.nasa.gov/pdf/55583main\_vision\_space\_exploration2.pdf

The President’s Vision for space exploration is bold and forward-thinking. It expands scientific discov- ery and the search for habitable environments and life by advancing human and robotic capabilities across multiple worlds. This plan provides the framework for fulfilling the President’s direction, guided by the principles on the facing page. It is responsive to recent science findings, the NASA Strategic Plan, the report of the *Columbia*Accident Investigation Board, and the new space exploration policy. It seeks to establish a sustainable and flexible approach to exploration by pursuing compelling questions, developing breakthrough technologies, leveraging space resources, and making smart deci- sions about ongoing programs. It will help drive critical national technologies in power, computing, nanotechnology, biotechnology, communications, networking, robotics, and materials. It will start exciting new programs now to inspire the next gen- eration of explorers.

## 2nc—Exploration= Physically—case list

These affirmatives are viable for the interpretation

Logsdon no date- John M. Logsdon, Director, Space Policy Institute, Elliott School of International Affairs, and Professor of Political Science and International Affairs, George Washington University, <http://www.britannica.com/EBchecked/topic/557348/space-exploration>, Britannica Academic Edition

Space Exploration, Investigation of the universe beyond Earth’s atmosphere by means of manned and unmanned spacecraft. Study of the use of rockets for spaceflight began early in the 20th century. Germany’s research on rocket propulsion in the 1930s led to development of the V-2 missile. After World War II, the U.S. and the Soviet Union, with the aid of relocated German scientists, competed in the “space race,” making substantial progress in high-altitude rocket technology (see staged rocket). Both launched their first satellites (see Sputnik; Explorer) in the late 1950s (followed by other satellites and unmanned lunar probes) and their first manned space vehicles (see Vostok; Mercury) in 1961. A succession of longer and more complex manned space missions followed, most notably the U.S. Apollo program, including the first manned lunar landing in 1969, and the Soviet Soyuz and Salyut missions. Beginning in the 1960s, U.S. and Soviet scientists also launched unmanned deep-space probes for studies of the planets and other solar system objects (see Pioneer; Venera; Viking; Voyager; Galileo), and Earth-orbiting astronomical observatories (see, for example, Hubble Space Telescope), which permitted observation of cosmic objects from above the filtering and distorting effects of Earth’s atmosphere. In the 1970s and ’80s the Soviet Union concentrated on the development of space stations for scientific research and military reconnaissance (see Salyut; Mir). After the dissolution of the Soviet Union in 1991, Russia continued its space program, but on a reduced basis owing to economic constraints. In 1973 the U.S. launched its own space station (see Skylab), and since the mid 1970s it devoted much of its manned space efforts to the space shuttle program and, more recently, to developing the International Space Station in collaboration with Russia and other countries.

Development= physically in space

Space development is the operation of outer space objects

Lee 5- Yoon Lee is adjunct assistant professor of international politics at the Fletcher School of Law and Diplomacy at Tufts University and an associate in research at the Korea Institute at Harvard University, Journal of Space Law, “SPACE DEVELOPMENT PROMOTION ACT OF THE REPUBLIC OF KOREA,” December 1, 2005, Vol. 33, p. 175, http://www.spacelaw.olemiss.edu/library/space/Korea/Laws/33jsl175.pdf

(a) The term “space development” means one of the following: (i) Research and technology development activities related to design, production, launch, operation, etc. of space objects; (ii) Use and exploration of outer space and activities to facilitate them;

\*\*\*1nc—Development= Only commercial

A) Interpretation and violation—The affirmative does not create incentives for private corporations to develop space

Space development is exclusively commercial opportunities

NASA ACADEMY 8- “ROADMAP TO A SPACE FARING CIVILIZATION,” August 7, 2008, <http://commercialspace.pbworks.com/f/NA08_GSFC_RSFC_VER_1.0.pdf>

Space development – private investment in space technologies, capabilities, and infrastructure such that commercial entities work in and profit from space.

B) Implications

 1. Predictable limits—If the resolution is interpreted to mean “do anything in space,” the list of possible affirmatives is massive. By forcing the affirmative to be commercially driven, the negative doesn’t have to be prepared for the thousands of potential satellite and military affs while still leaving plenty of options for the aff.

 2. Fair division of ground—Military and satellite affs are so drastically different from commercial expeditions. Instead the debate would devolve into generic spending and politics debates, which discourages topic specific research. Means 3 topics worth of research or no specific DAs and CPs.

2nc—Interp—Development=Only commercial ext

Development of space means privatization

Kosmo 88- Fred Kosmo, partner with Wilson Turner Kosmo. Former Chair of Lawyer Representative in Southern District Court of California, Lawyer Representative of Ninth Circuit Judicial Conference, “HE COMMERCIALIZATION OF SPACE: A REGULATORY SCHEME THAT PROMOTES COMMERCIAL VENTURES AND INTERNATIONAL RESPONSIBILITY,” 61 S. Cal. L. Rev. 1055, University of Southern California Law Review, p. 1067, lexis nexis

[\*1067] A fundamental issue affecting private enterprise is whether "exploration and use" includes the commercial development of space resources. To understand the implications of this language, the negotiations that led to its adoption must be examined. An analysis of the negotiation process which resulted in the "exploration and use" terminology indicates that it was intended to include the right of all states to engage in exploitative activities. In other words, all countries are considered to have an equal right, within the constraints of international law, to exploit space resources. n65

Space development is exclusively the private sphere

Fountain 3- Lynne M. Fountain, B.A., University of Rochester, 1987; M.L.S., San Jose State University, 1992; J.D. Candidate, University of Connecticut School of Law, 2004, “Creating Momentum in Space: Ending the Paralysis Produced by the "Common Heritage of Mankind" Doctrine,” Summer 2003, 35 Conn. L. Rev. 1753, [http://www.lexisnexis.com.turing.library.northwestern.edu/lnacui2api/results/docview/docview.do?docLinkInd=true&risb=21\_T12347497832&format=GNBFI&sort=RELEVANCE&startDocNo=1&resultsUrlKey=29\_T12347497819&cisb=22\_T12347497818&treeMax=true&treeWidth=0&csi=138398&docNo=2](http://www.lexisnexis.com.turing.library.northwestern.edu/lnacui2api/results/docview/docview.do?docLinkInd=true&risb=21_T12347497832&format=GNBFI&sort=RELEVANCE&startDocNo=1&resultsUrlKey=29_T12347497819&cisb=22_T12347497818&treeMax=true&treeWidth=0&csi=13), lexis nexis

While the Common Heritage doctrine as developed in the Moon Treaty is arguably beneficial for the developing states, the space powers see it as a hindrance to the development of space due to the restriction it places on property rights and ownership of resources. ... A space industry that fails to incorporate these goals, while potentially developing at phenomenal speeds, will be faced with issues of territorial disputes, over-exploitation of resources, potential saturation of world resource markets, and growing economic discrepancies between the developed and developing states with potentially catastrophic results to the global economy. ... To qualify for a license, the private entity would need to supply the agency with the following information: 1) a description of the proposed project and a specific list of all activities to be undertaken; 2) specifics on the proposed location; 3) a project schedule; 4) if mining or production is involved, a detailed description of the methods and technology to be used; 5) an estimate of expenditures and a list of sources of funding; 6) an environmental impact statement; and 7) proof of sufficient liability insurance.

NASA defines development of space as commercialization

Dale 8-Shana Dale, NASA Deputy Administrator, “The $17.6 billion 2009 NASA budget,” February 05, 2008, <http://www.ventureoutsource.com/contract-manufacturing/trends-observations/2008/the-17-6-billion-2009-nasa-budget>

As the International Space Station nears completion, the NASA budget provides funding to help spur development of commercial space transportation services to send cargo and possibly crews to the station after the shuttles retire in 2010. Without commercial providers, the United States will depend on the Russian Soyuz spacecraft to carry astronauts between Earth and the space station.

“The development of space simply cannot be ‘all government all the time,’ ” Dale said. “NASA’s budget for FY 2009 provides $173 million for entrepreneurs – from big companies or small ones – to develop commercial transport capabilities to support the International Space Station. NASA is designating $500 million toward the development of this commercial space capability.

“With over $2.6 billion in NASA funds available over the next five years to purchase cargo and crew services to support ISS operations, we would much rather be using this money to purchase cargo and crew services from American commercial companies than foreign entities” she added.

Space development is exclusively privatization

Weeks 10- Edythe E. Weeks, Professor of International Studies and Space Law at Webster University Worldwide, “Outer Space Development: Including Everyone in the Process,” July 9, 2010, http://www.e-ir.info/?p=4545

The term used herein, “outer space development” involves a culmination of forces – historical, legal, ideological, institutional, political, economic, psychological and structural all operating together in the post Cold War era so that space commercialization and privatization are widespread accepted norms.[i] Recently, a new trend is being set by U.S. policy. In 2004 a new policy was instituted in accordance with the President’s Commission Report which lays the foundation of U.S. development of the outer space territory[ii]. Also in 2004 a new U.S. law[iii] was passed facilitating the legality of private space travel as a new industry being called “space tourism”. In addition the NASA Authorization Act of 2005 made funding available to carry out the New Vision U.S. Space Exploration Policy.[iv] This policy, to a large extent calls for more participation from the private-sector in space exploration and other programs. Already a critical number of space entrepreneurs have paved the way towards new space industries, as they did during the satellite telecommunications revolution during the 1980s and 1990s. This is only the beginning of a new trend towards further space commercialization and privatization.

2nc—Violation—Development=Commercial ext

Commercial sector development of space is distinct from government development

NSPD 91- **U.S. Commercial Space Policy Guidelines by NASA**, “U.S. Commercial Space Policy Guidelines,” February 11, 1991, <http://www.fas.org/spp/military/docops/national/nspd3.htm>

United States space activities are conducted by three separate and distinct sectors: two U.S. Government sectors the civil and national security and a non-governmental commercial space sector. The commercial space sector includes a broad crosssection of potential providers and users, including both established and new market participants. There also has been a recent emergence of State government initiatives related to encouraging commercial space activities. The commercial space sector is comprised of at least five market areas, each encompassing both earth and spacebased activities, with varying degrees of market maturity or potential:

2nc—Predictable limits ext

Our interpretation is best for predictable limits—we include the core of the topic—NASA projects—because they are dependent on commercial development of space. Proves our interpretation allows plenty of affirmative ground.

NASA is completely dependent on private corporations

Valyn 10- Ferris Valyn, studier of Spacecraft, “NASA: Privatization vs Commercialization,” August 21, 2010, [http://www.dailykos.com/story/2010/08/21/895177/-NASA:-Privatization-vs-Commercialization](http://www.dailykos.com/story/2010/08/21/895177/-NASA%3A-Privatization-vs-Commercialization)

Finally, I am going to let you into the dirty secret of the situation. Right now, NASA is entirely dependent on the private sector. NASA doesn't build its rockets (Chrysler built part of the Saturn V, and Rockwell built the Space Shuttle), and it contracts out the operations of the Space Shuttle (to a joint venture between Lockheed Martin & Boeing). Something like 70-80% of the people who "work at NASA" are private contractors.

What this means is that major defense contractors will have to either start producing real hardware, that can serve both the government and the private citizen, or they'll go out of business.

Support for NASA is support for the commercial sector

Committee on Science and Technology 9- HOUSE OF REPRESENTATIVES ONE HUNDRED ELEVENTH CONGRESS FIRST SESSION “Decisions on the Future Direction and Funding for NASA: What Will They Mean for the U.S. Aerospace Workforce and Industrial Base?” DECEMBER 10, 2009, Serial No. 111–69, http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg54449/pdf/CHRG-111hhrg54449.pdf

Contracts with the commercial sector account for more than 80 percent of NASA’s budget. Those contracts encompass work done by large established aerospace firms, work done by emerging companies that offer the promise of new capabilities to meet the agency’s needs, and products and services provided to NASA by non-aerospace companies both large and small. Given that, it is clear that support for NASA is also support for the commercial sector and for the jobs that sector creates and the innovations that it makes possible.

NASA provides plenty of affirmatives

NASA 11- “Exploration Technology Development Program” May 23, 2011, <http://www.nasa.gov/exploration/acd/technology_dev.html>

The Exploration Technology Development Program (ETDP) develops long-range technologies to enable human exploration beyond Earth orbit. ETDP also integrates and tests advanced exploration systems to reduce risks and improve the affordability of future missions. Exploration Technology Development Projects The projects in the ETDP were formulated to address the high priority technology needs for human spaceflight. All technology projects are managed at NASA Centers.

Advanced In-Space Propulsion: This project develops concepts, technologies, and test methods for high-power electric propulsion and nuclear thermal propulsion systems to enable low-cost and rapid transport of cargo and crew beyond low Earth orbit.

Autonomous Systems and Avionics: This project develops and demonstrates integrated autonomous systems capable of managing complex operations in space to reduce crew workload and dependence on support from Earth. Technologies will address operations in extreme environments, efficient ground-based and on-board avionics systems and operations, and cost-effective human-rated software development.

Cryogenic Propellant Storage and Transfer: This project develops technologies to enable long-duration storage and in-space transfer of cryogenic propellants. Technology development includes active cooling of propellant tanks, advanced thermal insulation, measurement of propellant mass, liquid acquisition devices, and automated fluid couplings for propellant transfer between vehicles.

Entry, Descent, and Landing (EDL) Technology: This project develops advanced thermal protection system materials, aerothermodynamics modeling and analysis tools, and concepts for aerocapture and atmospheric entry systems for landing large payloads safely and precisely on extra-terrestrial surfaces and returning to Earth. › Read about the Mars Science Laboratory Entry, Descent, and Landing Instrument (MEDLI) Suite.

Extravehicular Activity Technology: This project develops component technologies for advanced space suits to enable humans to conduct "hands-on" surface exploration and in-space operations outside habitats and vehicles. Technology development includes portable life support systems, thermal control, power systems, communications, avionics, and information systems, and space suit materials.

High-Efficiency Space Power Systems: This project develops technologies to provide low-cost, abundant power for deep-space missions, including advanced batteries and regenerative fuel cells for energy storage, power management and distribution, solar power generation, and nuclear power systems. A major focus will be on the demonstration of dual-use technologies for clean and renewable energy for terrestrial applications.

Human Robotic Systems: This project develops advanced robotics technology to amplify human productivity and reduce mission risk by improving the effectiveness of human-robot teams. Key technologies include teleoperation, human-robot interaction, robotic assistance, and surface mobility systems for low-gravity environments. Early demonstrations will focus on human teams interacting with multiple robotic systems. Longer-term demonstrations will focus on enabling operations in remote, hostile environments with limited support from Earth. › About Robonaut, NASA's dexterous humanoid robot.

In-Situ Resource Utilization: This project will enable sustainable human exploration by using local resources. Research activities are aimed at using lunar, asteroid, and Martian materials to produce oxygen and extract water from ice reservoirs. A flight experiment to demonstrate lunar resource prospecting, characterization, and extraction will be considered for testing on a future robotic precursor exploration mission. Concepts to produce fuel, oxygen, and water from the Martian atmosphere and from subsurface ice will also be explored. › About in-situ resource utilization (ISRU) field testing in Mauna Kea, Hawaii.

Life Support and Habitation Systems: This project develops technologies for highly reliable, closed-loop life support systems, radiation protection technology, environmental monitoring and control technologies, and technologies for fire safety to enable humans to live for long periods in deep-space environments.

Lightweight Spacecraft Materials and Structures: This project develops advanced materials and structures technology to enable lightweight systems to reduce mission cost. Technology development activities focus on structural concepts and manufacturing processes for large composite structures and cryogenic propellant tanks for heavy lift launch vehicles, and on fabric materials and structural concepts for inflatable habitats.

\*\*\*1nc—Exploration= Human colonization

A) Interpretation and Violation—space exploration is sustainable presence in space colonies

Exploration is sustainable presence

Peter 8- Nicolas Peter, Research Fellow - European Space Policy Institute (ESPI), August 14, 2008, p. 32, ESPI, “SPACE EXPLORATION 2025: GLOBAL PERSPECTIVES AND OPTIONS FOR EUROPE,” http://www.espi.or.at

Using ESA definition from the document entitled “European Objectives and Interests in Space Exploration. ESA 2007”, space exploration is defined as to “extend access and a sustainable presence for humans in Earth- Moon-Mars space, including the Lagrangian Points and Near-Earth objects.” In the context of this study it encompasses therefore both robotic and human exploration activities.

B) Reasons to Prefer

 1. They explode the topic—Our interpretation limits the topic to affs that only expand to other planets. Their interpretation allows for us to send anything into space for an infinite amount of reasons.

 2. Fair division of ground—They justify affs that do just about anything in space—Means the neg can’t run specific case arguments because we can’t predict their aff. Human colonization is the core of the topic, so all other activities in space are neg CP ground.

2nc—Exploration= Human colonization

Overview—Our interpretation is that space exploration must support sustainable living on other planets. Under their interpretation, affs could do literally anything in space.

And Reasons to Prefer—

 1. Limits—We have the best internal link to clash. Under their interpretation the negative will never be prepared to debate the many affirmatives.

2. Ground—under their interpretation we are unable to run specific case negs to unpredictable affs or links to colonization DA’s.

2nc—Exploration= Human colonization ext

Exploration must make sustainable living for humans

Chung et al 10- S.Y. Chung and P Ehrenfreund are members of the Space Policy Institute, Elliott School of International Affairs, The George Washington University, J.D. Rummel, Institute for Coastal Science and Policy, East Carolina University, N. Peter, European Space Policy Institute, January 4, 2010, Vol. 45, Issue 1, p. 155-168 “Synergies of Earth science and space exploration,” <http://www.sciencedirect.com/science/article/pii/S0273117709006887>

The term “space exploration” encompasses both robotic and human exploration activities. Using ESA’s definition from the document entitled: European Objectives and Interests in Space Exploration (ESA, 2007), space exploration is defined as to “extend access and a sustainable presence for humans in Earth–Moon–Mars space, including the Lagrangian Points and near-Earth objects.”

\*\*\*1nc—Development= resources

A) Interpretation—The affirmative must extract and use resources from space

Development means development of resources from space

Curtis, et al. 3- Dr. Steven A. Curtis, Head of the Planetary Magnetospheres Branch in the Laboratory for Extraterrestrial Physics at Goddards Space Flight Center, Dr. Michael L. Rilee, scientist with L-3 Communications, EER, Walt Truszkowski, Senior Technologists in the Advanced Architectures and Automation Branch, Dr. Pamela E. Clark, scientist with L-3 Communications, EER, “ANTS for the Human Exploration and Development of Space,” 2003, <http://ants.gsfc.nasa.gov/documents.d/ieeeac03%20paper1248.pdf>

The mission of NASA's Office of Human Exploration and Development of Space (HEDS) is to expand the frontiers of space and knowledge by exploring, using, and enabling the development of space [1]. The aim is to discover and develop the resources of Space, transforming them into economic factors for the benefit of human enterprise. To this end, HEDS has established five goals for its Strategic Plan.

B) Violation—the affirmative doesn’t extract and use resources from space

C) Implications

 1. Predictable limits— If the aff can do anything in space the list of possible affirmatives is unreasonably huge. By forcing the affirmative to exploit resources from space, the negative doesn’t have to be prepared for the tiny affs that just put up a few satellites.—there are only so many potentially exploitable space objects which proves our limits are best.

 2. Key neg ground—We can’t run kritiks that are based off of the idea of commodifying space. That cuts the core of the topic because the basic question of the resolution is whether or not viewing space as a commodity is valuable.

2nc—Development= resources ext

Overview—Our interpretation is that the affirmative must extract resoruces from space. Prefer our definition because it’s peer reviewed and the article has the intent to define what development in space is. Under the aff’s interpretation, any exploration and development that just sends some sort of hardware into space is topical.

There is a topical version of their aff—they could do the plan with the intention of developing the resources of space and using them to benefit humans.

And Prefer our interpretation

 Limits—Affirmatives that allow individuals to send anything into space for an infinite number of motivations. Only our interpretation offers a finite amount of aff cases because there are only so many resource abundant objects in space.

Ground— Kritiks of commodification are key to the topic—the resolution begs the question of whether viewing outer space as a resource is good or bad.

\*\*\*1nc— Development= new technology

A) Interpretation—Affirmatives that develop a new technology are topical

Development requires new tech

Curtis, et al. 3- Dr. Steven A. Curtis, Head of the Planetary Magnetospheres Branch in the Laboratory for Extraterrestrial Physics at Goddards Space Flight Center, Dr. Michael L. Rilee, scientist with L-3 Communications, EER, Walt Truszkowski, Senior Technologists in the Advanced Architectures and Automation Branch, Dr. Pamela E. Clark, scientist with L-3 Communications, EER, “ANTS for the Human Exploration and Development of Space,” 2003, <http://ants.gsfc.nasa.gov/documents.d/ieeeac03%20paper1248.pdf>

With the ANTS architecture in mind, we turn to NASA's Enterprise for the Human Exploration and Development of Space (HEDS). Referring to the HEDS five strategic goals mention above, the first two items concern developing an understanding of the space environment. On this knowledge the skills and technologies of the next two items will be built. The fifth item bespeaks HEDS's intention that the rewards of the development of Space are brought broadly to the American people and the world, through education and research at first and eventually commerce.

These goals require the development of new systems and new technologies that extend human capabilities and functions. Space is vast, and human presence is scarce. Therefore, one of the most important set of tools to be developed, involve those tools that operate themselves, even if in only a limited way. HEDS has identified the integration of human and robotic elements for safe, effective, affordable exploration and other mission functions as a key development theme [5].

B) Violation—The affirmative does not develop new technology

C) Reasons to Prefer

 1. Fair division of ground—current technology doesn’t link to any space race or militarization disads because old tech affirmatives aren’t perceived as weaponizing space. Under their interpretation affirmatives can just boost funding a tiny amount that avoids all politics disads. And their interpretation robs the negative of core CP ground like

 2. They explode the topic—Continuing and changing existing technology unlimits the aff by multiplying the number of old tech affs by an infinite number of small alterations. Our interpretation limits the number of affirmatives because developing new technology requires a first step of research and development.

\*\*\*1nc—Development= pre-existing

A) Interpretation and Violation: The affirmative must add to existing technologies, not develop new ones.

Development must use mature technologies

GAO Report to Congressional Commitees 9- “Assessments of Selected Large-Scale Projects,” March 2009, http://www.gao.gov/new.items/d09306sp.pdf

When a project begins development, the customer’s needs should match the developer’s available resources—mature technologies, time, and funding. An indication of this match is the demonstrated maturity of the technologies needed to meet customer needs—referred to as critical technologies. If the project is relying on heritage—or pre-existing— technology, that technology must be in appropriate form, ﬁ t, and function to address the customer’s needs within available resources.

B) Implications

 1. Predictable limits—The affirmative justifies affs that develop programs that have not actually taken place and have only affirmative evidence. Prefer our interpretation because there is a finite number of cases that are topical as opposed to the infinite that the aff justifies.

 2. Ground—They justify affirmatives that develop programs with little to no literature base, which makes it impossible to garner links off of actions that do not exist yet. We can’t run politics because there’s no evidence about how congress or other nations would react to programs that don’t exist.

Increase= pre-existing tech

Increase requires preexisting development

Buckley et al. 6- Jeremiah S. Buckley is a founding partner of BuckleySandler LLP, former has chaired the Subcommittee on RESPA of the American Bar Association Consumer Financial Services Committee, Joseph M. Kolar is a member of the Consumer Financial Services Committee of the American Bar Association where he is a past co-Chair of the Housing Finance and RESPA Subcommittee and a member of the American College of Consumer Financial Services Lawyers, Mathew P. Previn, former Senior Counsel at HSBC Finance Corporation, “Brief of Amici Curiae Mortgage Insurance Companies of America and Consumer Mortgage Coalition in Support of Petitioners,” November 13, 2006, http://supreme.lp.findlaw.com/supreme\_court/briefs/06-84/06-84.mer.ami.mica.pdf

First, the court said that the ordinary meaning of the word “increase” is “to make something greater,” which it believed should not “be limited to cases in which a company raises the rate that an individual has previously been charged.” 435 F.3d at 1091. Yet the definition offered by the Ninth Circuit compels the opposite conclusion. Because “increase” means “to make something greater,” there must necessarily have been an existing premium, to which Edo’s actual premium may be compared, to determine whether an 26 “increase” occurred.

Congress could have provided that “ad-verse action” in the insurance context means charging an amount greater than the optimal premium, but instead chose to define adverse action in terms of an “increase.” That def- initional choice must be respected, not ignored. See *Colautti*  *v. Franklin*, 439 U.S. 379, 392-93 n.10 (1979) (“[a] defin- ition which declares what a term ‘means’ . . . excludes any meaning that is not stated”).

New tech relies on old tech

Development on new technology relies on pre-existing technology—Mars Express proves

NASA 11-“Technology for Mars Express,” April 8, 2011, <http://marsprogram.jpl.nasa.gov/express/technology/>

The development of technology makes Mars exploration possible. Current missions are links in a chain of innovation from the past to the future. They rely on previous technologies created for other spacecraft and in turn contribute new technologies for missions of tomorrow.

The European Space Agency named this mission Mars Express because engineers were able to pioneer faster and more flexible ways building the spacecraft and producing other technologies that make the mission possible. Mars Express is making maximum use of pre-existing technologies and technologies developed for Rosetta, a mission that will explore a comet at close quarters by orbiting it and sending a lander onto the comet to understand its icy nucleus. By using these technologies, the European Space Agency was able to cut mission design and development time from about six years to four years.

\*\*\*1nc—Exploration= astronomy

A) Interpretation and Violation—Only affirmatives that explore space from earth are topical

Space exploration includes astronomy and focus on the origin and evolution of life.

Sutton no date- Alexander Sutton has worked in the telescopes profession for nearly 11 years. For more information please visit telescopes, “Space Exploration,” http://www.contour2002.org/article/space-exploration

Space exploration is defined as the use of astronomy and space technology to explore outer space. Exploration has taken space by human spaceflight and robotic space craft. The observations of objects in space, which is known as Astronomy, is one of the oldest known scientific studies, pre-dating reliable recorded history. Fuel Rockets developed in the early twentieth century allowed space exploration to broaden and become a reality. Space exploration often creates political competition, pushing individual countries to pace themselves faster in an attempt to gain exploration first, such as the "Space Race" between the Soviet Union and the United States.Space exploration has shifted from singular flights to reusable hardware which allows for greater exploration. Private interest has began in space exploration creating the urge for more competition and larger government missions. The first orbital launch was made in 1957. A Soviet, unmanned launch named Sputnik, it orbited the earth at about 150 miles. Following the Soviet's success, the United States unsuccessfully launched Vangaurd 1 two months later. In 1958 The Unites States successfully launched and orbited Explorer 1. In 1961 the first human spaceflight took place on the Vostok 1, carrying a 27 year old man. The spaceflight completed one orbit around the globe in around two hours. This triumph urged the world to continue space exploration. The US followed in the Soviet's footsteps within six months. The Mercury flight orbited the Earth six times on February 20, 1962. In 1963 the first woman orbited the Earth 48 times aboard the Vostok 6. One of the main targets of space exploration is astrobiology which is the focus of the study of life in the universe. Astrobiology is primarily focused on the origin and evolution of life. It is also often referred to as exobiology. Astrobiologists consider the possibility of life that is entirely different from any other life discovered in the past.

B) Implications

1. Limits—The affirmative justifies affirmatives that do the plan on one random asteroid or a distant part of space about which there is no literature. They justifies affirmatives that do the plan anywhere in the vastness of space—this makes it impossible to research all possible locations for the plan because there is no literature base.

2. Education—our interpretation promotes learning about the origin of life and human thought that only astronomy accesses.

Baily 6-Mark Baily, Director of the Armagh Observatory, “Dark Skies for All,” December 2006, http://www.arm.ac.uk/preprints/491.pdf)

As the constituency of parties involved in light pollution has grown, so the subject has become a "calling card" for astronomers. It provides a vehicle for education and outreach, and a reason to contact decision-makers at all levels to convey the importance of astronomy and related scientific issues. Eighty years ago the French Nobel physicist Jean Perrin (1870-1942) wrote "It is indeed a feeble light that reaches us from the starry sky. But what would human thought have achieved if we could not see the stars?" Similarly, Robert Key emphasized the unique cultural importance of access to dark skies, fully half of our night time field of view. It is the one part of our environment that we have shared with all cultures in all periods of human history, and is a key part of mankind's cultural inheritance. Professional astronomers have an important responsibility to advance wider public understanding of science; the BAA Campaign for Dark Skies should be widely and strongly supported.

2nc—Exploration= astronomy—interpretation ext

Space exploration is for scientific research and observation

OSR Articles- http://osr.org/en-us/articles/the-history-of-space-exploration/

Space exploration refers to outer space travel for the purpose of scientific research and observation. Until 1958 space exploration was considered purely a military venture, but in 1958, the United States Government launched the National Aeronautics and Space Act to regulate all activities that pertain to space exploration.

Space exploration includes looking into space

Vega Space 11- VEGA is one of the leading names in the European Space sector, working with Space agencies, satellite operators and manufacturers worldwide. “Space Exploration,” 2011, http://www.vegaspace.com/newsroom/in\_focus/space\_exploration.aspx

What is Space exploration? Space exploration missions are about looking outward from Earth towards the Sun, other planets the universe and beyond. Mission objectives include seeking to shed light on the evolution of our solar system, our place in the universe, what the future may hold and the origins of life.

\*\*\*1nc—“its” excludes private sector

A) Interpretation—it’s means all exploration and development must be done by the federal government.

Its means possession

The American Heritage Dictionary of the English Language 9- Fourth Edition, Updated in 2009, [Houghton Mifflin Company](http://www.eref-trade.hmco.com/), http://www.thefreedictionary.com/its

its  (ts) adj. The possessive form of [it](http://www.thefreedictionary.com/it). Used as a modifier before a noun: The airline canceled its early flight to New York. *Its* is the possessive form of the pronoun it and is correctly written without an apostrophe. It should not be confused with the contraction *it's* (for *it is* or *it has*), which should always have an apostrophe.

B) Violation—the affirmative uses private companies to implement the plan.

Privatization is the sale of enterprises that no one owns—means the government doesn’t have responsibility

Savas 2k- E. S. Savas, a Presidential Professor at the School of Public Affairs at Baruch College and an authority in the field of privatization, “PRIVATIZATION AND PUBLIC-PRIVATE PARTNERSHIPS,” 2000, http://cesmadrid.es/documentos/Sem200601\_MD02\_IN.pdf

There is also a whimsical ninth definition that is simply too delicious to pass up: Janusz Lewandowski, post-Communist Poland’s first privatization minister (“Minister of Ownership Transformation,” to be exact) defined privatization in his country as “the sale of enterprises that no one owns, and whose value no one knows, to people who have no money.”

C) Implications

 a. They explode the topic—our interpretation prevents explosion of the topic by allowing anyone working with the government to be topical. The aff justifies any of a million companies to fund the plan, which the negative can never predict.

 b. Fair division of ground—they rob the negative of private actors CPs, which are key to test the necessity of USFG action. The status quo is currently developing private sector alternatives proves that private action and federal action are not intertwined and thus the aff can’t advocate commercial activity.

AT: Counter interpretation

“Its” is possessive and grounded in literature—prefer our American Heritage Dictionary of English Language evidence, it indicates that the preceding noun, the USFG possesses the action of the exploration and/or development of space.

Even if “its” means “associated with,” the aff can’t win that their commercial activities are associated with the USFG if the USFG doesn’t even have responsibility for private endeavors.

The counter interpretation is worse than our interpretation—

1. Limits—allowing the affirmative to have private companies carry out the plan allows for an infinite number of actors that the negative has to predict. This explodes the literature base which makes it impossible to research every potential commercial space company.

2. Ground—their interpretation robs the negative of core CPs—private actors are negative ground. And we don’t get links to DAs based off of the perception of the USFG doing the plan which are a core of the topic.

2nc—“its”—interpretation ext

Its means possession or ownership

UsingEnglish.com 11- “Term: Possessive Pronoun,” Modified July 2, 2011, http://www.usingenglish.com/glossary/possessive-pronoun.html

Mine, yours, his, hers, its, ours, theirs are the possessive [pronouns](http://www.usingenglish.com/glossary/pronoun.html) used to substitute a [noun](http://www.usingenglish.com/glossary/noun.html) and to show possession or ownership. EG. This is your disk and that's mine. (Mine substitutes the word disk and shows that it belongs to me.

2nc—“its”—violation ext—commercial/ gov distinction

Commercial activities in space are distinct from government responsibility

Smitherman and McClure 97- David Smitherman, Technical Manager at NASA Marshall Space Flight Center, Wallace McClure, MonoTouch developer and book author, “SPACE TRANSPORTATION AND DESTINATION FACILITIES,” February 21, 1997, <http://www.spacefuture.com/archive/general_public_space_travel_and_tourism_volume_2.shtml>

Standards, codes, and certification need to be modeled after existing Earth- and space-based facilities and transportation systems. In general, these are not Government-driven, but are recognized business standards that have been promoted by the private sector as a means to promote safety and provide bases for arriving at acceptable insurance liability. A similar approach needs to be taken for the establishment of safety codes for space transportation and destination facilities. For transportation, the aviation industry may serve as the initial model, but for destination facilities, surface building codes would be applicable, as well as the codes that govern the development of passenger ships at sea. For example, any space vessel should have a captain with the same authority as a sea captain. It is debatable as to whether escape provisions for large space structures should be the same as for sea vessels where there is life boat capacity for every person, or whether it should be like building construction where there is a safe haven or fire wall that divides the facility up internally to provide for safety. These issues are being explored in the ISS program.

The government does not regulate private sector activities

Fought 98- Bonnie E. Fought serves as Chief Operating Officer and General Counsel of Connectix Corp., “Legal Aspect of the Commercialization of Space Transportation Systems,” Berkeley Technology Law Journal 3, no. 2, Spring 1988, http://www.law.berkeley.edu/journals/btlj/articles/vol3/fought.html

A similar standard is utilized by NASA with regard to the private users of the shuttle. There the Government has also adopted an attitude of minimal regulation in order to encourage private sector activities in space. As a result, it is NASA's policy not to acquire data unless there is an identifiable need; corporations are only required to supply NASA with enough information such that NASA can verify that the project is for peaceful purposes and that NASA and the Federal Government are in compliance with international and domestic laws. When it does become necessary for NASA to acquire "protected data" it does so under a policy of "restricted rights" "under an express agreement orunderstanding not to use or disclose it in any way which would compromise it as in [sic] intellectual property right." [FN302]

2nc—violation ext—NASA contractors not T

NASA contractors are not under the government’s control—they’re probited from operated commercial enterprises

Space Island Group 11- a commercial organization based in West Covina, CA that is dedicated to the development of commerce, research, manufacturing and tourism in space. “Vehicles & Launch Systems,” 2011, http://www.spaceislandgroup.com/vehicles-systems.html

As a government agency, NASA is prohibited from operating a commercial enterprise. Their mandate is to develop the hardware, then let private industry take over. But the firms that built the shuttles and ETs for NASA, the space divisions of Boeing and Lockheed Martin, only work on government-funded projects. They have no contact with commercial companies who could buy or lease these shuttles and stations. Their design, construction and purchasing procedures, geared to complex government requirements and very small production runs, can't mass-produce the dozens of shuttles and thousands of ETs this project will need. Our management structure will have far more in common with the auto and computer industries than with the defense industry.

We can and will work closely with the current aerospace firms who'll help to develop our commercial space ship and launch components. Many other relationships will be developed with major commercial companies who will lease these stations as research facilities, space hotels, hospitals, factories or entertainment centers to let them profit from their involvement long before our first station is operational.

## 2nc—“its”—explodes limits

Limits—Allowing privatization explodes the topic to include countless aerospace companies

All Star Network 4- Aeronautics Learning Laboratory for Science, Technology and Research, “The Aerospace Industry” March 12, 2004, http://www.allstar.fiu.edu/aero/carrers4.htm

The companies whose names are synonymous with big-time space are General Dynamics, Hughes, Lockheed, McDonnell Douglas, Boeing, Martin Marietta, IBM, and Rockwell. Arianespace which builds and markets the Ariane launch vehicle, is the major non-U.S. player. Rockwell hires more electrical engineers, mechanical engineers, and computer specialists than aerospace engineers. Materials scientists, civil engineers, and chemical engineers also are in demand. General Dynamics Space Systems Division and other aerospace companies follow a similar hiring pattern. They also seek safety engineers, manufacturing engineers, test and evaluation engineers, and quality control engineers. You don't need a technical degree to work in the aerospace field. Some positions, In fact, don't require a degree at ail, At the Space Systems Division of Boeing Aerospace & Electronics Company, engineers and technicians are only one-third of the work force. The remaining two-thirds are nontechnical support personnel. For companies specializing in design, the percentage is slightly higher For production companies that turn out pieces of hardware, the percentage of technical types may be as low as 10 to 15 percent.

The nonengineering staff of a typical space company is composed of 10 to 20 percent professional employees, such as managers, salespeople, and contract administrators. Technical, nonprofessional employees, such as mechanics, electricians, and drafters, account for another 5 to 10 percent. Usually, at least half of an aerospace employer's work force is nom technical, nonprofessional staffers—personnel specialists, engineering records employees, secretaries, and assembly workers.

Some of the other aerospace companies are Pratt & Whitney, Hamilton Standard, Sikorsky Aircraft, Norden Division, Vector, North American Aviation, inc., Rocketdyne Division, Atomics International Division, Martin Company, Aerojet-General, United Technology, Ralph M Parsons Company, and Northrop Corporation.

Aff answers—“its”—W/m—commercial= gov responsibility

We meet—Privatization uses the private sector for service delivery but allows the government to retains responsibility and oversight

Savas 2k- E. S. Savas, a Presidential Professor at the School of Public Affairs at Baruch College and an authority in the field of privatization, “PRIVATIZATION AND PUBLIC-PRIVATE PARTNERSHIPS,” 2000, http://cesmadrid.es/documentos/Sem200601\_MD02\_IN.pdf

The remainder of this paper presents a dynamic analysis, describing how to change from an arrangement that relies heavily on government to one that relies relatively more on the private sector. Drawing on earlier work, this section presents a simple classification taxonomy that encompasses three broad methods that result in privatizing government-run services and functions and government-owned enterprises and assets2: (1) delegation, where government retains responsibility and oversight but uses the private sector for service delivery, for example, by contracting for services, or outsourcing; (2) divestment, where government relinquishes responsibility; and (3) displacement, where the private sector grows and displaces a government activity.3 Each of these incorporates several specific approaches that are identified in Table 1 and discussed in turn.

Privatization allows the government to retain responsibility for the operation

Savas 2k- E. S. Savas, a Presidential Professor at the School of Public Affairs at Baruch College and an authority in the field of privatization, “PRIVATIZATION AND PUBLIC-PRIVATE PARTNERSHIPS,” 2000, http://cesmadrid.es/documentos/Sem200601\_MD02\_IN.pdf

The first broad privatization strategy discussed here is delegation, which calls for a positive act by government. Sometimes called partial privatization, delegation requires a continuing, active role for government, which retains responsibility for the function while delegating the actual production activity to the private sector. The “tools of governance”4 most suitable for delegation are contracts, public-private competition, franchises, public-private partnerships, subsidies—by grants or vouchers for example and mandates.

NASA will oversee the commercial activity—active in research and redevelopment

Fought 98- Bonnie E. Fought serves as Chief Operating Officer and General Counsel of Connectix Corp., “Legal Aspect of the Commercialization of Space Transportation Systems,” Berkeley Technology Law Journal 3, no. 2, Spring 1988, http://www.law.berkeley.edu/journals/btlj/articles/vol3/fought.html

One of the primary concerns of the domestic launch industry is the future role of NASA in the provision of space transportation. A return to the days of competition between NASA and private industry would be disastrous to the nascent space launch industry. NASA's role has already been defined by statute to be developmental and not operational, [FN241] and its future operations should be limited by this crucial distinction. Responsibility for the provision of routine access to space should rest with private sector launch services. NASA should focus its efforts on research areas, keeping America in the forefront of advancedtechnology development [FN242] with a pass- through of applicable technology to the private sector.

A similar approach was successfully adopted by the National Advisory Committee for Aeronautics (NACA), NASA's predecessor, during the developmental years of the aerospace industry. Established in 1915 to "supervise and direct the scientific study of the problems of flight, with a view to their practical solution," [FN243] NACA was active in research and development for the purpose of fueling the commercial aircraft industry.

The Government is readily involved in research and development of the aerospace industry

Fought 98- Bonnie E. Fought serves as Chief Operating Officer and General Counsel of Connectix Corp., “Legal Aspect of the Commercialization of Space Transportation Systems,” Berkeley Technology Law Journal 3, no. 2, Spring 1988, http://www.law.berkeley.edu/journals/btlj/articles/vol3/fought.html

Concurrent with the redirection of NASA to research and development, is the transferring of Government-developed technology to private industry. The National Space Policy, for example, calls for the "timely transfer of Government-developed space technology to the private sector in such a manner as to protect its commercial value, consistent with national security." [FN264] As discussed above, this type of cooperative relationship between government and private industry was one of the keys to the successful development of the aerospace industry.

Two approaches are currently available for private firm access to Government-developed technology: (1) firms may purchase surplus hardware from the Government [FN265] or (2) private firms may manufacture launch vehicles developed under Government contract. [FN266] These approaches provide distinct advantages to private companies, not the least of which is a vehicle which has been through the design and development process and has an established performance record. [FN267] In situations where the company was also involved in the original Government contract, the company may already have trained personnel familiar with the system.

The transfer of transportation systems is just one example of the potential for information exchange between NASA and private industry. NASA currently operates the Office of Commercial Programs which serves as an advocate within NASA for sponsoring commercial space activities, including the access of private ELV companies to NASA facilities. [FN268] This type of program should continue to be encouraged to assist in the funneling of technology from NASA research efforts to the private sector whenever possible.

The Government will maintain control over private launch companies—they assume responsibility for misconduct of employees

Fought 98- Bonnie E. Fought serves as Chief Operating Officer and General Counsel of Connectix Corp., “Legal Aspect of the Commercialization of Space Transportation Systems,” Berkeley Technology Law Journal 3, no. 2, Spring 1988, http://www.law.berkeley.edu/journals/btlj/articles/vol3/fought.html

While private launch companies should be held responsible for their own negligence and willful misconduct, the Government should assume responsibility for the negligence and willful misconduct of its employees and subcontractors. Most of the functions to be carried out by the Government are "routine industrial and technical functions in which the Government has every opportunity to maintain full control over its operations." [FN274] Holding the company liable for damages resulting from Government actions will not increase safety if the Government, and not the private company, has control over these operations. Furthermore, placing this type of liability risk on the domestic launch industry will only stifle its growth.

The cooperation between private launch companies and the government is inevitable

Fought 98- Bonnie E. Fought serves as Chief Operating Officer and General Counsel of Connectix Corp., “Legal Aspect of the Commercialization of Space Transportation Systems,” Berkeley Technology Law Journal 3, no. 2, Spring 1988, http://www.law.berkeley.edu/journals/btlj/articles/vol3/fought.html

As the space shuttle program returns to active operations, America must not loose sight of the value of a viable commercial sector space launch industry. The opportunity exists now for the development of new and better American space policy which will result in joint Government and industry cooperation toward the provision of assured access to space. Initial steps in this direction were taken by Congress with the passage of the Commercial Space Launch Act and in President Reagan's National Space Policy. Further encouragement of the development of private sector commercial launch services should be forthcoming from Congress, regulatory agencies, NASA, and the investment community.

Aff answers—“its”= association

Its means associated with

Dictionary.com- “its,” http://dictionary.reference.com/browse/its

Its, determiner a. of, belonging to, or associated in some way with it: its left rear wheel b. ( as pronoun ): each town claims its is the best

Its means related to

Merriam-Webster 11-America's leading and most-trusted provider of language information. http://www.merriam-webster.com/dictionary/its

of or relating to it or itself especially as possessor, agent, or object of an action <going to its kennel> <a child proud of its first drawings> <its final enactment into law>

\*\*\*Exploration\*\*\*

Exploration= robots

Space exploration is sustainable and requires the use of robots

Fong and Nourbakhsh 11-Terrence Fong and Illah Nourbakhsh, Intelligent Systems Division, NASA Ames Research Center, “Interaction challenges in human-robot space exploration,” April 2005, Vol. 12, Issue 2,

http://www.cs.cmu.edu/afs/cs/Web/People/illah/PAPERS/ACMInteractions2.pdf

A key difference from previous exploration efforts is that future space exploration activities must be sustainable over the long- term. Experience with the space station has shown that cost pressures will keep astronaut teams small. Consequently, care must be taken to extend the effectiveness of these astronaut well beyond their individual human capacity. Thus, in order to reduce human workload, costs, and fatigue-driven error and risk, intelligent robots will have to be an integral part of mission design.

Exploration= humans

Space exploration must be human presence

Logsdon 11- John M. Logsdon, Director, Space Policy Institute, Elliott School of International Affairs, and Professor of Political Science and International Affairs, George Washington University, “Fifty Years of Human Spaceflight,” 2011, Chapter 11, <http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20100025875_2010028362.pdf> p. 283

To the layman, manned space flight and exploration will represent the true conquest of space. No unmanned experiment can substitute for manned exploration in its psychological effect on the peoples of the world.

Space exploration is accomplished by direct human presence

Logsdon 11- John M. Logsdon, Director, Space Policy Institute, Elliott School of International Affairs, and Professor of Political Science and International Affairs, George Washington University, “Fifty Years of Human Spaceflight,” 2011, Chapter 11, <http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20100025875_2010028362.pdf> p. 283

Many believe that the only sustainable rationale for a government-funded program of human spaceflight is to take the lead in exploring the solar system beyond low- Earth orbit.20 The MIT white paper provides an insightful definition of exploration: Exploration is a human activity, undertaken by certain cultures at certain times for particular reasons. It has components of national interest, scientific research, and technical innovation, but is defined by none of them. We define exploration as an expansion of the realm of human experience, bringing people into new places, situations, and environments, expanding and redefining what it means to be human. What is the role of Earth in human life? Is human life fundamentally tied to the earth, or could it survive without the planet? Human presence, and its attendant risk, turns a spaceflight into a story that is compelling to large numbers of people. Exploration also has a moral dimension because it is in effect a cultural conversation on the nature and meaning of human life. Exploration by this definition can only be accomplished by direct human presence and may be deemed worthy of the risk of human life.21

Exploration= new frontiers—human R&D

Space Exploration is human R&D to reach new frontiers

Hsu and Cox 9-Feng Hsu, Ph.D. Sr. Fellow, Aerospace Technology Working Group, Ken Cox, Ph.D., Founder and Director, Aerospace Technology Working Group, “Sustainable Space Exploration and Space Development—A Unified Strategic Vision,” March 29, 2009, Version 2.1.1 <http://www.spacerenaissance.org/papers/A-UnifiedSpaceVision-Hsu-Cox.pdf>

In contrast, space exploration involves human scientific research and development (R&D) activities that require exploring the unknown, “pushing the envelope” to reach new frontiers, and taking higher risks with full government and public support, and these need to be invested in 5solely by taxpayer contributions.

Exploration= everything

3. Exploration= pretty much everything

UK Space Agency, http://www.bis.gov.uk/ukspaceagency/what-we-do/exploring-the-universe

Space exploration is defined as the exploration using both robotic and human means of planetary destinations upon which humans could one day live and work. At present, most experts think that the feasible destinations for space exploration are restricted to the Moon, Mars and certain asteroids. It is at present hard to conceive of human missions to Jupiter, Saturn or beyond owing to the formidable challenges of providing power, food and water, long term protection from the radiation environment of deep space, and propulsion to make the missions possible within a reasonable time. The European Mars exploration programme has now been expanded to become a long-term collaboration with NASA.

The reasons for undertaking space exploration can involve scientific, technological, commercial and inspirational goals. Space exploration also contributes to international stability by encouraging many nations to work together

The science goals in exploration (e.g. the solar system’s history, geology, conditions and distribution of life) overlap with ‘pure’ space science, but wider goals may include applied science such as the behaviour of humans in extreme environments and the development of life support systems that minimise the use of resources.

In the longer term, commercial goals of space exploration may include exploitation of mineral resources (perhaps for rocket propellant production or titanium metal production) or the provision of transportation and telecommunication services to both the public and private sectors.

Exploration= NASA only

Space exploration must be NASA

Spudis 10- Paul D. Spudis, Senior Staff Scientist at the Lunar and Planetary Institute in Houston, Texas. Former Deputy Leader of the Science Team for the Department of Defense Clementine mission to the Moon in 1994, “Have We Forgotten What Exploration Means?” January 15, 2010, <http://blogs.airspacemag.com/moon/2010/01/have-we-forgotten-what-exploration-means/>

<As long as we are navel-gazing during this policy hiatus, I want to examine a topic that many think is self-evident: what activities do we mean by the word “exploration?” NASA describes itself as a space exploration agency; we had the Vision for Space Exploration. The department within the agency developing the new Orion spacecraft and Ares launch vehicle is the Exploration Systems Mission Directorate. So clearly, the term is tightly woven into the fabric of the space program. But exactly what does exploration encompass?>

Exploration= tech with aim to transport

Space exploration is the build up of infrastructure backed by the motivation to transport humans

Spudis 10- Paul D. Spudis, Senior Staff Scientist at the Lunar and Planetary Institute in Houston, Texas. Former Deputy Leader of the Science Team for the Department of Defense Clementine mission to the Moon in 1994, “Have We Forgotten What Exploration Means?” January 15, 2010, <http://blogs.airspacemag.com/moon/2010/01/have-we-forgotten-what-exploration-means/>

This is our current model of space exploration. I contend that it is not exploration as historically understood and practiced. Traditionally, science (knowledge gathering) was a tool in the long process of exploration, which included surveys, mining, infrastructure creation and settlement (all advanced and protected with military assistance). This was the model of national exploration prior to the 20th Century and it is readily applicable today – if we change our business model for space. What is needed is the incremental, cumulative build-up of space faring infrastructure that is both extensible and maintainable, a growing system whose aim is to transport us anywhere we want to go, for whatever reasons we can imagine, with whatever capabilities we may need.

\*\*\*Development\*\*\*

Development= military

Space development means military

Crawford 99- I. A. Crawford, Department of Physics and Astronomy, University College London, Gower Street, London,“Space development: social and political implications,” November 1999, [Volume 11, Issue 4](http://www.sciencedirect.com/science?_ob=PublicationURL&_tockey=%23TOC%235774%231995%23999889995%23141571%23FLP%23&_cdi=5774&_pubType=J&view=c&_auth=y&_acct=C000052790&_version=1&_urlVersion=0&_userid=1458830&md5=b0817997d307efd0cdb97c3965b45f66), November 1995, Pages 219-225, <http://www.sciencedirect.com/science/article/pii/0265964695000188>

Even allowing for international coop- eration, there are few sectors of the world economy from which it would be politically realistic to divert the resources envisaged here for space investment. One of the few is military spending, which worldwide is current- ly about US$900 billion annually. Resources of the required order of magnitude could be taken from this source without adversely affecting the rest of the world economy. Moreover, as we noted above, space development is especially suitable as an alternative outlet for the energies of the military- industrial complex.

Development= colonization

Space development is development of spaceflight capability for purpose of colonization

Crawford 99- I. A. Crawford, Department of Physics and Astronomy, University College London, Gower Street, London,“Space development: social and political implications,” November 1999, [Volume 11, Issue 4](http://www.sciencedirect.com/science?_ob=PublicationURL&_tockey=%23TOC%235774%231995%23999889995%23141571%23FLP%23&_cdi=5774&_pubType=J&view=c&_auth=y&_acct=C000052790&_version=1&_urlVersion=0&_userid=1458830&md5=b0817997d307efd0cdb97c3965b45f66), November 1995, Pages 219-225, <http://www.sciencedirect.com/science/article/pii/0265964695000188>

Far-reaching social and pofitical issues are implicit in any discussion of large-scale space development. This Viewpoint argues that the evolution of appropriate political institutions to deal with these issues is likely to be at least as important as the development of new technology. If large-scale space development is to take place, global international cooperation will be essential and such cooperation will have to be underpinned by enhanced institutional and legal structures. In the shorter term, an appropriate insti-tutional response may be the creation of a World Space Agency. However, in the longer term, we should probably view a world space programme as falling within that class of global con- cerns that would be most appropriate- ly managed by a federal world govern- ment. In this essay I wish to explore some of the social and political issues likely to lie behind any large-scale future programme of space exploration and development. For the purposes of this discussion, I intend 'large-scale' to mean a programme of space development on a scale sufficient to make possible, over the next few centuries, the economic utilisation of the Solar System, the colonisation of other planets, and, eventually, the development of an interstellar spaceflight capability. I am aware that many self-styled 'realists' will react against such an apparently utopian agenda but it seems to me that something along these lines must be the ultimate aim of any meaningful future human space programme. After all, we already have most of what we need for satel- lite communications, earth resource surveys, and space astronomy, so discussion of major new technical and institutional initiatives makes sense only if we acknowledge that the ultimate aim of space development is something much more ambitious - the expansion of human civilisation into the Solar System and beyond.

Development=launch, SBSP, tourism, satellites

Development includes launch vehicles, SBSP, tourism and satellites

Hsu and Cox 9-Feng Hsu, Ph.D. Sr. Fellow, Aerospace Technology Working Group, Ken Cox, Ph.D., Founder and Director, Aerospace Technology Working Group, “Sustainable Space Exploration and Space Development—A Unified Strategic Vision,” March 29, 2009, Version 2.1.1 <http://www.spacerenaissance.org/papers/A-UnifiedSpaceVision-Hsu-Cox.pdf>

 Even with adequate reform in its governance model, NASA would not be the right institution to lead or manage the nation’s business in Space Development projects. Human space development activities, such as creation of affordable launch vehicles, RLVs, space-based solar power, space tourism, communication satellites, and trans- Earth or trans-lunar space transportation infrastructure systems are primarily commercial development endeavors that are not only cost-benefit-sensitive in project management, but also subject to fundamental business principles related to profitability, sustainability, and market development.

Development= production

Space Development is production phases—engineering, integration inspection and tests

Alve 1- Péricles Gasparini Alve, Director, Center for Nations United for Peace, Universite De Geneve, “Outer Space Technology Transfer: The Present Dilemma,” http://www.unige.ch/cyberdocuments/theses2001/GaspariniP/these\_body.html

Category I of the Annex includes a long section on definition of terms in order to avoid misinterpretation of the items subject to control. For example, the term development covers a large realm of possibilities ranging from research design to projects, pilot production schemes and mounted and test prototypes. Production is understood to be all production phases: e.g., production engineering, integration inspection, test, etc. Most interesting is the attention paid to define the term technology: described to be the specific information required for the development, production, or use of a product, which can be technical data or assistance. Here too the Decree is very meticulous and describes technical data to include diagrams, formulas, diskettes, tapes, instruction manuals, and others, while technical assistance consists of training, consulting, and etc.

\*\*\*Substantial\*\*\*

Substantial= Significance—Radars

Space Based Radars are substantial in their contribution

Morris 4- Jefferson Morris, Editor at Aerospace Daily & Defense Report, “DSB: ‘Substantial contributions’ could come from SBR,” September 3, 2004, Aerospace Daily and Defense report, Pg. 6 Vol. 211 No. 46, lexis

A recent report by the Defense Science Board (DSB) concludes that the U.S. Air Force's Space Based Radar (SBR) program has the potential to make "substantial contributions" to ballistic missile defense.

SBR would be a constellation of satellites providing global ground moving target indication (GMTI) radar data for warfighters and the intelligence community. Before Congress slashing the fiscal year 2005 budget for the program, the Defense Department had planned to commit to a formal SBR acquisition program in 2006 and begin deploying the system in 2010-2012.

"The task force believes that the Space Based Radar has the potential for substantial contributions to ballistic missile defense, providing capabilities and access that are difficult to achieve with surface-based sensors," the DSB report says. SBR's GMTI and Synthetic Aperture Radar (SAR) sensors could make a "major contribution" to locating and monitoring missile installations of interest and tracking mobile launch systems, according to the report.

A rudimentary capability of nine satellites in low-Earth orbit could provide coverage of North Korea 55-60 percent of the time, the report says. With less than a 21-satellite constellation, a mix of space-based and other systems will be needed to provide continuous coverage, it says. "The Department needs to explicitly define the evolving system of systems that will provide near-continuous access during times and in places of high interest," according to the report.

The Missile Defense Agency said its only comment on the report is that "we agree with the DSB's assessment that space-based radar has the potential to make a substantial contribution to missile defense capabilities. ...," according to spokesman Rick Lehner.

The Air Force is in the process of restructuring the SBR program following a severe budget cut intended by lawmakers to slow the program. Fearing the possibility of ballooning development costs, a House-Senate appropriations conference committee granted only $75 million of the Air Force's $352 million FY '05 budget request for SBR (DAILY, Aug. 2).

Substantial= Significance—Human presence

Human presence in space is substantial

Logsdon 98-John M. Logsdon, director of both the Space Policy Institute and the Center for International Science and Technology Policy at George Washington University in Washington. He wrote this article for Aviation Week & Space Technology, “Building a Space Station Still Makes Sense,” November 30, 1998, Vol. 149, No. 22, Pg. 78, lexis

The space station represents a logical step if there is an intent to continue sending people into space. But why orbit humans in the first place? Answering that key question -- whether long-duration human presence in Earth orbit has substantial instrumental value -- provides the second logical reason for building an orbital lab.

Scientific critics of the station, adapting what seems to be a rather unscientific approach, have decided -- in advance of its being performed -- that multidisciplinary research in a well-equipped laboratory operating in a microgravity environment will have no substantial payoffs.

Substantial= Significance— NOT human presence

Human presence in space is not substantial

Logsdon 98-John M. Logsdon, director of both the Space Policy Institute and the Center for International Science and Technology Policy at George Washington University in Washington. He wrote this article for Aviation Week & Space Technology, “Building a Space Station Still Makes Sense,” November 30, 1998, Vol. 149, No. 22, Pg. 78, lexis

To me, it makes more sense to wait for those research results before deciding they do not justify the investment to obtain them. Perhaps there will be no substantial discoveries or other results justifying the costs of supporting humans in orbit; the station would then become a dead-end project in scientific terms, although it might still serve as a vehicle for U.S. leadership.

Substantial= public/private interest

Substantial means public and private sector interest in human space exploration

Logsdon 98-John M. Logsdon, director of both the Space Policy Institute and the Center for International Science and Technology Policy at George Washington University in Washington. He wrote this article for Aviation Week & Space Technology, “Building a Space Station Still Makes Sense,” November 30, 1998, Vol. 149, No. 22, Pg. 78, lexis

It is possible, however, that there will be significant payoffs from station research, leading to substantial growth in public and particularly private sector interest in orbital activities involving human presence. Perhaps in 20 years we will look back and wonder why there was any doubt that having an initial space station was worthwhile. This, of course, is a very optimistic scenario, but to me it is no less plausible than an a priori judgment that space station research will have no significant value. We should build and operate the facility, and let the results speak for themselves.

Substantial= budget increase—50%

65. A substantial increase in space budget is 50%

Shifrin 87- Carole A. Shifrin, writer for Aviation Week & Space Technology, “Soviets Consider Possible Mars Rover, Sample Return Missions,” March 23, 1987, Space Technology Pg. 26, http://www.lexisnexis.com.turing.library.northwestern.edu/hottopics/lnacademic/

Allen cited the space station science program and Earth and ocean sciences as areas in which there are sound programs that are not adequately budgeted. "It is clear that to do the sound plan that NASA already has, at a reasonable pace, would require a very substantial increase in the NASA budget, perhaps as much as 50%," he said. "But that seems somewhat unlikely, under the kind of budget pressures that existed in the past."

Substantial= budget increase—more than double

Substantial is more than double in budget

Interfax 8- AVN military news adgency website, “Russia to double space budget,” July 14, 2008, transcript, lexis

Text of report in English by corporate-owned Russian military news agency Interfax-AVN website

Farnborough, UK, 14 July: In 2009 Russian state spending on space activities will more than double compared with 2008, Federal Space Agency Deputy-Director Vitaliy Davydov has told Interfax-AVN at the Farnborough air show.

"The Finance Ministry has informed us of budgetary allocations planned for the federal space programme in 2009. I am glad to say that the allocations will more than double," he said.

The agency managed to convey to the government the need for worthy funding of space exploration plans, Davydov said. "Larger funds will be assigned not only for manned space programmes. We will make substantial progress in the Earth's distant probing and hydrometeorology. We will fully implement our plan for space launches for the next three years," he said. Substantial funds will be assigned for the development of a new spaceship, which will eventually replace the Soyuz, Davydov said.

Substantial= budget increase—62 billion

Substantial means increase in the space budget by 62 billion

Aviation Week and Space Technology 87- “NASA Budget Needs Exceed CBO Spending Levels by $14 Billion,” April 6, 1987, Space technology, Pg. 25, lexis

NASA will need $ 62 billion during Fiscal 1988-92, a substantial increase over the $ 48-billion five-year space budget planned by the Congressional Budget Office, just to carry out programs planned before the Challenger accident, according to a recent CBO report analyzing the accident's effect on NASA's budget and future.

The pre-Challenger program cannot be accomplished without large budget increases. However, the CBO plans to allow NASA only modest increases over the next five years, rising from $ 8.9 billion in 1988 to $ 10.5 billion in 1992. Congress will have to decide which elements of the NASA budget will receive large increases and which will be deferred or canceled, the CBO said.

Substantial= budget increase—12 million

Substantial means at least an increase of 12 million in funding

Covault 80- Craig Covault, editor at Spaceflight Now, “Shuttle Boosts NASA Budget to Record,” January 28, 1980, Space Technology, Pg. 21, lexis

Space shuttle increase of nearly $1 billion has pushed the National Aeronautics and Space Administration's Fiscal 1981 budget request to $5.736 billion, a level $1.14 billion higher than Office of Management and Budget's projection last year on what the agency should receive in Fiscal 1981 (AW&ST Jan. 29, 1979, p. 24). A $300-million Fiscal 1980 shuttle supplemental request also is included in the new budget.

The agency's aeronautics program was a big loser in the new budget. Even though the aeronautics research and technology base was increased by $12 million over Fiscal 1980, the project office will be unable to continue with the desired substantial growth or new activity in the general aviation, alternate fuels and avionics and control areas.

NASA's Fiscal 1981 budget being submitted to Congress this week is the second highest in dollar figures ever requested by the agency, exceeded only by the Fiscal 1966 $5.933-billion obtained at the height of the Apollo program buildup. Purchasing power of the Fiscal 1981 money is far less than in 1966, however.

NASA's new budget also contains far less new program start funding than OMB had projected would be available in Fiscal 1981, even though OMB had anticipated a $129-million decrease in Fiscal 1981 compared to NASA's Fiscal 1980 initial request of $4.725 billion. Congress eventually provided NASA $5.296 billion for Fiscal 1980, with space shuttle increases accounting for a large part of that growth.

Substantial= budget increase—2.6 billion

Substantial is 2.6 billion

Asker 93- James Asker is the Managing Editor of Aviation Week & Space Technology, former science reporter for the Houston Post, former managing editor of Electronic Business magazine, “Sort Out the Space Station Mess,” February 22, 1993, Vol. 138, No. 8, Pg. 72

In his speech to Congress last week, the president singled out aerospace (and the airlines) as ''troubled industries'' requiring ''special attention.'' He wants to expand research in aeronautics, particularly short-haul aircraft. He would spend substantial sums ($ 2.6 billion over five years) to invest in new technologies for NASA and recast the space station program -- which brings us to his Administration's biggest space problem.

While it seems impossible to simultaneously frighten, offend and confuse everyone concerned with the station -- industry, Congress, overseas allies and NASA itself -- in the span of a few weeks, that is just what the Administration has done (see p. 20). White House officials have mixed terms such as ''redesign'' and ''restructure'' carelessly, and expressed commitments variously to ''a space station'' and ''the space station.''

Substantial= budget total—400 million anual

Substantially is 400 million a year (wrong context)

Henderson 92- Breck W. Henderson, Military Electronics Editor at Aviation Week & Space Technology Magazine, “Tacitron Research Upgrades Under Way; SDIO Officials Deny Link to Topaz Delays,” May 18, 1992,

The U. S./Russian tacitron switch research program, which experienced a financial glitch and appeared to be canceled, instead is being moved into a second phase with a larger budget and higher visibility, Strategic Defense Initiative Organization officials said.

Maj. Fred Tarantino, head of SDIO's power division, said responsibility for the tacitron program is being transferred from the Wright Laboratories at Wright-Patterson AFB, Ohio, to the Air Force's Phillips Laboratory in Albuquerque, N. M. Funding is being increased substantially to about $ 400,000 per year. Physically, the research will be moved from the main campus of the University of New Mexico to the New Mexico Engineering Research Institute, into the same building that will house both of the Russian Topaz 2 space nuclear power systems that the U. S. has procured. They arrived in Albuquerque last week.

Substantial= budget total—185 million

Substantial is 185 million (shitty)

The board recommended that NASA undertake an immediate reexamination of the strategy for exploration of the outer solar system planned for the next decade.

The Academy's ideas concerning the Jupiter and Uranus missions are based on its recommended program mix for new Fiscal 1976 and 1977 NASA program starts.

"The fiscal year 1976-1977 recommended new starts have funding patterns stretching over several years that exceed the [NASA] Office of Space Science planning wedge in subsequent fiscal years. While the precision with which funding requirements can be estimated and the confidence one has in budgetary ceilings are both uncertain, the excess is substantial -- $185 million -- and illuminates a conflict that will have to be resolved at an early stage," the board said.

Substantial excludes commercialization

Commercialization is not substantial—net reduction in funding

Collins 93- Dr. Patrick Collins, Researcher with the Institute for Space & Astronautical Science, an exceptionally well known and respected authority on space economics, space tourism, reusable launch vehicles, and space solar power., “Towards Commercial Space Travel,” 1993, *Journal of Space Technology and Science* Vol.9 No.1, pp 8-12..

It is not uncommon for members of companies building expendable rockets to state that VTOVL SSTO rockets are impossible, but their feasibility has been demonstrated incontrovertibly by [Hudson](http://www.rotaryrocket.com/) (5)(Appendix). The only interesting question is how much it would cost, and how much mass is required, to make an SSTO vehicle fully reusable. In this context it is interesting that, despite government funding of some hundreds of $ billions to date, the space industry has not yet tried to do this in any country.

Cost reduction is one of the continual driving forces in commercial industry, since every reduction in cost is a direct addition to profit, and reducing prices below those of competitors is one of the major forms of commercial competition. However, the possible cost of passenger space travel is controversial, with published estimates ranging from $400,000 in 2012 (6); $60,000 in the year 2050 (7); to $10,000 in the 2000s (8). An experienced figure such as Ruppe doubts whether low-cost launch is possible.

Substantial= Commercial activity

Commercial space activity requires a substantial investment

Smitherman and McClure 97- David Smitherman, Technical Manager at NASA Marshall Space Flight Center, Wallace McClure, MonoTouch developer and book author, “SPACE TRANSPORTATION AND DESTINATION FACILITIES,” February 21, 1997, <http://www.spacefuture.com/archive/general_public_space_travel_and_tourism_volume_2.shtml>

The strengths of this scenario are that it is purely commercial, very focused, does not need incremental developments, and uses nontraditional approaches-a committed, large "leap of faith" investment would support the vehicle development. With enough money, this could be the fastest way to create a large-scale general PST and tourism business; and once one company proves the market, others will follow.

The major weakness to this approach is that it is hard to justify such a large investment with the apparent lack of a convincingly large market in this area. Large investors usually look for more secure markets for such substantial investments, ones where the return on investment is to be associated with a proven track record.

Substantial excludes space development

Space development is a negligible fraction of the GDP

Crawford 99- I. A. Crawford, Department of Physics and Astronomy, University College London, Gower Street, London,“Space development: social and political implications,” November 1999, [Volume 11, Issue 4](http://www.sciencedirect.com/science?_ob=PublicationURL&_tockey=%23TOC%235774%231995%23999889995%23141571%23FLP%23&_cdi=5774&_pubType=J&view=c&_auth=y&_acct=C000052790&_version=1&_urlVersion=0&_userid=1458830&md5=b0817997d307efd0cdb97c3965b45f66), November 1995, Pages 219-225, <http://www.sciencedirect.com/science/article/pii/0265964695000188>

Thus, while undeniably expensive in absolute terms, even a very ambitious programme of space development would cost a small fraction of the GDP of a major economic power, and an almost negligible fraction of the GWP.

Substantial= meaningful contribution—space exploration

Space exploration must contribute substantially to society

Spudis 10- Paul D. Spudis, Senior Staff Scientist at the Lunar and Planetary Institute in Houston, Texas. Former Deputy Leader of the Science Team for the Department of Defense Clementine mission to the Moon in 1994, “Have We Forgotten What Exploration Means?” January 15, 2010, <http://blogs.airspacemag.com/moon/2010/01/have-we-forgotten-what-exploration-means/>

These changes do not require that an ever-increasing amount of new money be spent on space. Instead, true exploration requires only the understanding that it must contribute more to society than it consumes. And the American people have every right to expect as much in return for their years of supporting NASA.

Substantial= SBSP

Space based solar power is a substantial capital investment

Collins 98- Dr. Patrick Collins, Researcher with the Institute for Space & Astronautical Science, an exceptionally well known and respected authority on space economics, space tourism, reusable launch vehicles, and space solar power, “Tourism in Low Earth Orbit: The Trigger for Commercial Lunar Development?,” April 27, 1998 <http://www.spacefuture.com/archive/tourism_in_low_earth_orbit_the_trigger_for_commercial_development.shtml>

The LEO price at which LOX supplies would be attractive to Kankoh-maru operators is much higher than the price on Earth, due to the high cost of transportation from Earth. However, it should be noted that delivery of LOX from the lunar surface to LEO using chemical propulsion is not likely to be competitive with launch from Earth, due to the cost of delivering fuel to the lunar surface from Earth (5). Consequently launch using solar-generated electricity driving a linear-motor launch system will be required. This will itself be a substantial capital investment, raising the initial cost of starting such a supply, but enabling very low operating costs to be achieved due to the absence of fuel costs. In order to illustrate the potential scale of this business opportunity, Figure 1 shows the demand for LOX in LEO based on the JRS scenario of LEO tourism development.

\*\*\*Other\*\*\*

Defining space is arbitrary

Defining the boundaries of space exploration and development is arbitrary and worthless

THE DELEGATION OF THE UNITED STATES OF AMERICA 1- “DEFINITION AND DELIMITATION OF OUTER SPACE AND THE CHARACTER AND UTILIZATION OF THE GEOSTATIONARY ORBIT” AGENDA ITEM 6, 2001, http://www.state.gov/s/l/22718.htm

Mr. Chairman, my delegation wishes to express its general views on agenda item 6, matters relating to the definition and delimitation of outer space and to the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union (ITU).

With respect to the question of the definition and delimitation of outer space, we have examined this issue carefully and have listened to the various statements delivered at this session. Our position continues to be that defining or delimiting outer space is not necessary. No legal or practical problems have arisen in the absence of such a definition. On the contrary, the differing legal regimes applicable in respect of airspace and outer space have operated well in their respective spheres. The lack of a definition or delimitation of outer space has not impeded the development of activities in either sphere.

We have not been persuaded by the reasons put forth for undertaking such a definition or delimitation. For example, some delegations support the notion of such a definition for its own sake. But without a practical problem to address, undertaking such a definition would be a risky exercise, as explained more fully below. Other delegations suggest that a definition or delimitation is somehow necessary to safeguard the sovereignty of states. However, we are aware of no issue of state sovereignty that would be solved by defining outer space.

Even if there were a problem the resolution of which a definition or delimitation of outer space would help to address, the Legal Subcommittee should still proceed with all due caution. Whatever definition or delimitation were ultimately agreed upon would by its nature be arbitrary at worst, or, at best, be constrained by the current state of technology. For example, technological advances have increased the height at which aircraft can sustain flight, while they have decreased the height at which the orbital flight of space vehicles is possible. These technological advances will likely continue. It would be dangerous for the Legal Subcommittee to agree to an artificial line between air space and outer space, when it cannot predict the consequences of such a line.

Space-Based Weapons definition

Space- based weapons are solely used to destroy objects in space or on Earth

The Outer Space Security & Development Treaty 11- The Outer Space Security & Development Treaty establishes a framework and procedures to assure that space will be a neutral realm from which all classes of weapons are banned and from which no hostile action shall be taken toward Earth or the surrounding Cosmos,” 2011, <http://www.peaceinspace.com/2-19-2011OuterSpaceTreaty.pdf>

Space-based weapons are defined as being anything that is based in space that can be used to damage or destroy objects or beings in space or on Earth from a location based in space.

Commercial definition

Commercial development of space means development and/ or the operation of vehicles and related equipment

Commercial Space Jobs and Investment Act of 2010- This bill never became law. This bill was proposed in a previous session of Congress September 15, 2010, 11th Congress, 2nd Session, S.3785, <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_bills&docid=f:s3785is.txt.pdf>

The term ‘commercial development of space’ means— ‘‘(A) the development of private space launch vehicles, reentry vehicles, and related equipment, ‘‘(B) the development, provision, and operation of private space launching, reentry, and related services, and ‘‘(C) other specific activities identified by the Secretary in rules, regulations, or formal guidance consistent with the purposes of this section.