

Alliance for Space Development 2017 Objectives

Citizens' Space Agenda

1. Establish an Ultra Low Cost Access to Space (ULCATS) program based on public-private partnership
2. Ensure a gapless transition from ISS to private space stations in LEO, with NASA assisting with development and serving as an early customer (see DRAFT BILL)
3. Enable the development of a robust cis-Lunar economy based on commercial purchase of:
 - A. Transportation services for crew and cargo
 - B. Fuel and Consumables derived from Lunar and asteroid resources
4. Make space development and settlement part of NASA's official mission (see 2016 SUBMITTED BILL)

Seven Reasons *Ultra-Low Cost Access To Space (ULCATS)* is Critically Important

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- **National Security** — Currently, America is vulnerable to a Pearl Harbor style attack in space. Commercial reusable launch vehicles (RLVs) will enable a surge capability that can rapidly replenish our space assets. Just the existence of RLVs is a deterrent to a surprise attacks on our space assets. **RLVs are a stabilizing deterrent to war.**
- **Economic Growth** — Space is currently a \$300+ Billion per year revenue industry. With Ultra-Low Cost Access to Space (ULCATS), space development will accelerate, markets will grow, new industries and many thousands of jobs will be created. A trillion-dollar per year space industry is within our grasp.
- **Transforming People's Lives** — The internet transforms lives and communities, but more than 60% of humanity does not have it. Recent U.S. launch cost improvement has already spurred new ventures focused on developing broadband satellite constellations. Continued progress towards ULCATS will enable everyone in the world to be connected, informed, and empowered.
- **Environment** — ULCATS will enable affordable low Earth orbit constellations of satellites that can deliver 24-7, 365-day-per-year high-resolution measurements of the entire planet. The benefits of these constellations include:
 1. More accurate weather predictions (improving the lives of billions).
 2. Greatly improve major storm (hurricanes, tornados, tsunamis) tracking and warnings, saving lives.
 3. The ability to constantly and accurately monitor the Earth's environment, at high resolution, will significantly improve the scientific inputs used in our environmental models of the Earth.
 4. The ability to fuse many "big data" satellite sources, from remote sensing to machine-to-machine communications, will enable nations and industries to better utilize and protect their assets/resources as well as their borders.
- **Civil Space** — Today, our national space agenda is struggling. With ULCATS, America can lead the large-scale movement of humanity to Orbit, the Moon, to Mars, and throughout the Solar System, affordably & permanently.
- **Imagination & Inspiration** — If ULCATS reusable space vehicles lead to thousands of people orbiting the Earth every year, the world will be inspired by American leadership, ingenuity, and entrepreneurship.
- **American Leadership** — With the success of ULCATS, America has the potential to become the undisputed leader of the world in space well into the 21st Century, providing significant soft power benefits for American diplomacy and influence in the world.

Why ULCATS Development Makes Good Economic & Policy Sense

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- **The ULCATS Act** directs the U.S. Government to develop supportive relationships with American companies developing fully reusable launch vehicles. This support should include, but not be limited to, facilities, expertise, software, databases and partial funding for development delivered on the achievement of clearly defined milestones. Successful companies will also receive a contract for three launches using the same vehicle.
- **If Successful, It Quickly Pays for Itself:** The U.S. Government currently spends \$4-5 billion per year on space launch. RLVs will save U.S. taxpayers billions per year.
- **If Unsuccessful Valuable Technology will almost certainly be developed:** The American aircraft industries global success was and is due, in no small part, to NACA and later NASA supporting industry with technology development and other assistance.
- **We Finally Have the Technology:** In 2017 we have the technology to build fully-reusable two-stage-to-orbit RLVs, which was the original goal of the Space Shuttle program in the early 1970s.
- **Just Need to Close the Business Case:** The hard problem today is closing the business case. There is not a large enough proven market, with a high enough flight rate, to justify the large investment required for an RLV.
- **REQUEST: Will you be an original co-sponsor of the ULCATS Act?**

Ensure Gapless transition from ISS to Private Commercial Stations in LEO

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- **BACKGROUND:** The U.S. and our partners have invested over \$100B building and operating the International Space Station (ISS). The ISS is the foundation of American human spaceflight.
- **PROBLEM:**
 1. The White House and NASA have announced America will transition to commercially-owned and –operated stations after ISS in 2024, but NASA has no plan for managing this transition. Without a clear and viable transition plan, the U.S. risks foreign powers becoming world leaders in LEO, and losing the foundation we have for viable BEO exploration
 - Other nations are on course for Mir-class LEO stations by 2024. Consider the global impact if the ISS burns up in 2024 and countries flock to the stations of other nations to carry out research
 2. How can we expect scientists and commercial entities to invest in using the ISS when it has no assured future/transition plan? A gap interval like post-Apollo or post-Shuttle will be a disaster for US-led LEO commercialization and science
 - Without a credible transition plan, America will have yet another gap in human spaceflight, and many of the accumulated skills and capabilities generated by three decades of investment could be lost.

- **SOLUTION:**

1. Commit the U.S. government to continuing its basic research on using, and human adaptation to, the microgravity environment in low Earth orbit (LEO) as a customer of commercial LEO station providers, ensuring that no “gap” will exist in this critical research and development.
2. Encourage NASA to use the proven public/private partnership approach to stimulate rapid development of next-generation commercial application, propulsion, and habitation capabilities for LEO, including testing and demonstration of those capabilities at the ISS before transition to commercial stations.

- **REQUEST: Please consider being a primary sponsor of ASD's draft legislation to ensure a seamless low-risk transition from ISS to private commercial stations.**
- **REQUEST: Please consider being the primary signer of our letter to the Administration requesting the 2019 budget submission include a transition plan.**

Why *Cis-lunar Commercialization* is Critically Important

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- **cis-Lunar space includes:**
 - The area between the Earth and Moon including Earth orbit, Lunar surface, Lunar orbits, L-points.
 - Transport of asteroid material to cis-Lunar space for processing extends reach to NEO asteroids.
- **What is cis-Lunar Commercialization?**
 - The usage of public/private partnerships to supply cargo and crews to cis-Lunar government stations, including those on the Lunar surface.
 - The purchase and storage in cis-Lunar of vital resources from commercial entities, including rocket fuel, oxygen, and water.
 - Enabling both lunar mining and asteroid mining on an equal basis
 - A way of enlisting the private sector in lowering the cost of a journey to Mars
- **Why Now is the Time for cis-Lunar Commercialization:**
 - Companies are seriously pursuing asteroid and lunar mining
 - NASA has begun the process via NASA's **Next Step** of developing a cis-Lunar base in the vicinity of the Moon
 - The cost of access to LEO is being addressed by multiple companies, but the cost of access to cis-Lunar space remains high
 - The U.S wishes to pursue a humans to Mars program, but costs remain high and needed technology is not readily available.
 - The experience base of LEO COTS/CRS is available as a foundation
 - The prospective availability of new vehicles for reaching cis-Lunar space
 - SLS/Orion, Falcon Heavy, New Glenn, Vulcan

Making *Cis-Lunar Commercialization* a Reality

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- **Benefits of Cis-Lunar Commercialization (CLC):**
 - **Economic Growth** — has the potential, as outlined by ULA, to support massive growth in the space economy.
 - **Civil Space** — Today, our national space agenda is struggling. With CLC, America has the opportunity to lead the way to the development of Lunar and asteroidal resources while building the foundation of an affordable journey to Mars.
 - **Imagination & Inspiration** — If CLC leads to profitable companies mining the Moon and asteroids, the world will be inspired by American leadership, ingenuity, and entrepreneurship.
 - **American Leadership** — With the success of CLC, America has the potential to become the undisputed leader of the world in space well into the 21st Century, providing significant soft power benefits for American diplomacy and influence in the world. CLC is more affordable for international participants with more short term practical returns than efforts focused on more distant goals.
- **Cis-Lunar Commercialization Heritage**
 - The draft Bill is based on the Launch Services Purchase Act of 1990 and the 1998 Commercial Space Act, but extended into Cis-Lunar Space
- **REQUEST (not on space subcommittee)**
 - Are you willing to sign a letter to the space subcommittee urging them to take up the Cis-Lunar Commercialization Act of 2017?
- **REQUEST (space subcommittee)**
 - Are you willing to be the primary sponsor of Cis-Lunar Commercialization Act of 2017 draft legislation?
- **DRAFT legislation can be found at:**
 - URL for text on ASD website

- It gives American space policy a truly long-term goal.
- Permanent human space settlement is an idea that inspires — from Jeff Bezos, to Elon Musk, to many other private citizens — and so it will inspire a new generation to go into STEM related fields.
- It will drive an exponentially growing space-based economy, and lead to economic growth and abundant resources for people on and off planet Earth.
- It will provide humanity with a better chance for long-term survival.
- **Space settlement is in the long-term strategic interest of America, and will influence the future of human freedom**
 1. Consider how the U.S. role in the world could be altered if other countries lead in mining lunar resources and dominate the development and settlement of the Moon.
 2. Consider the impact of such a loss of American leadership on the long-term values of human civilization far into the future.

SEDS Act & Request

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- The Space Exploration, Development and Settlement Act (SEDS) bill would amend the law governing the activities of NASA, known as the NASA Act of 1958, to include this statement:
 - *“Exploration, Development and Settlement of Space.—The Congress declares that expanding permanent human presence beyond low-Earth orbit in a way that enables human settlement and a thriving space economy will enhance the general welfare of the United States and requires the Administration to encourage and support the development of permanent space settlements.”*
- The SEDS Act has been introduced as H.R. 4752 by Rep. Dana Rohrabacher (R-CA) in the House:
 - **REQUEST (not on House Subcommittee on Space)**
 - Are you willing to sign a letter to the space committee urging them to take up H.R. 4752 in 2017?
 - **REQUEST (House Subcommittee on Space)**
 - Are you willing to a co-sponsor of H.R. 4752?
- SEDS-like language appeared in the Senate reported 2017 Authorization Bill
 - **REQUEST (not on Senate Commerce Subcommittee on Space, Science, and Compettiveness)**
 - Are you willing to sign a letter to the space committee urging them to take up the SEDS Bill 2017?
 - **REQUEST (Senate Commerce Subcommittee on Space, Science, and Compettiveness)**
 - Are you willing to sponsor or co-sponsor the SEDS Bill in the Senate?