



**Hosted Payload Alliance Capitol Hill Day
Talking Points
June 2014**

Purpose Statement:

- To educate and raise awareness among Members of Congress and their professional staff on the benefits and how to best address the challenges of hosting government payloads on commercial satellites

Executive Summary:

- **Business Revolution.** Commercial hosting is not a technical revolution; rather, this is a business revolution that is picking up momentum for three reasons:
 - First, commercially leveraged solutions initiated five years ago at NASA and the Air Force have proven to be successful.
 - Second, national space policy encourages increased use of the commercial space sector. Officials in NASA and Air Force are leading Government efforts to find ways to purchase and use commercial space capabilities and services that meet government requirements.
 - Third, the pragmatic need for more affordable and resilient solutions is a forcing function to overcome cultural barriers and previous procurement preferences in order to leverage the diversity and capacity of the commercial space industry sector.
- **Commercial Industry is Ready.** The commercial space sector stands ready to expand from mostly commercial endeavors to adjacent markets directly serving military and civil government customers with affordable hosting solutions.
 - Worldwide, there are approximately sixty GEO commercial satellites in manufacturing flow today, all on their way to GEO within the next 3 years. 65% of these commercial satellites are being manufactured in the United States.
 - Other U.S. commercial companies are procuring constellations of LEO satellites to replenish existing space-based communications services. These are also candidate platforms for commercial hosting.
 - It is gratifying that the Department of Defense and NASA are taking steps today to deliberately leverage the commercial space enterprise.
- We encourage Congress and committee staff members to seek inputs from federal departments and agencies regarding how to best overcome barriers for using America's resilient commercial space enterprise to affordably host government capability on commercial platforms.



Reference Material

Definitions:

- Hosted Payloads: “A sensor or instrument that is integrated to a host spacecraft and dependent upon one or more of the host spacecraft’s subsystems for functionality.”¹
- Commercial Programs: “Goods, services, or activities provided by private sector enterprises that bear a reasonable portion of the investment risk and responsibility for the activity, operate in accordance with typical market-based incentives for controlling cost and optimizing return on investment, and have the legal capacity to offer these goods or services to existing or potential nongovernmental customers.”²

Potential Benefits:

- U.S. Government can leverage significant commercial investments in space infrastructure and thereby procure more affordable, resilient and time-efficient space capabilities that the government agency can depend upon and adapt as mission needs evolve.
- By taking advantage of commercial hosting opportunities, U.S. Government can focus its attention on developing and procuring mission payloads designed to be supported by commercial bus capabilities.
- A payload-focused acquisition strategy can result in more consistent payload production rates, thereby stabilizing lower-tier suppliers and focusing development resources on maintaining intellectual capital needed for unique government capabilities.
- Procuring commercial hosting services leverages the highly competitive commercial satellite market while also supporting the U.S. commercial satellite industrial base.
- Saving taxpayer dollars.

Challenges:

- Synchronizing government procurement processes with the rapid pace of commercial ventures
- Adapting U.S. Government oversight practices to commercial industry best practices
- Integrating data streams from commercially hosted payloads into existing government mission architectures
- Assuring the U.S. Government that commercial networks offer appropriate information security protection
- Managing risk between multiple stakeholders, both commercial and government
- Developing and executing operational concepts during crisis periods

¹ White House, National Space Transportation Policy, 21 Nov 13, page 8

² White House, National Space Policy of the United States of America, 28 Jun 10, page 10.



Policy Enablers:

- U.S. National Space Policy (2010) encourages departments and agencies to:
 - “Purchase and use commercial space capabilities and services to the maximum practical extent when such capabilities and services are available in the marketplace and meet United States Government requirements;
 - Modify commercial space capabilities and services to meet government requirements when existing commercial capabilities and services do not fully meet these requirements and the potential modification represents a more cost-effective and timely acquisition approach for the government;
 - Actively explore the use of inventive, nontraditional arrangements for acquiring commercial space goods and services to meet United States Government requirements, including measures such as:
 - public-private partnerships,
 - hosting government capabilities on commercial spacecraft, and
 - purchasing scientific or operational data products from commercial satellite operators in support of government missions;
 - Develop governmental space systems only when it is in the national interest and there is no suitable, cost-effective U.S. commercial or, as appropriate, foreign commercial service or system that is or will be available;
 - Refrain from conducting United States Government space activities that preclude, discourage, or compete with U.S. commercial space activities, unless required by national security or public safety;
 - Pursue potential opportunities for transferring routine, operational space functions to the commercial space sector where beneficial and cost-effective;”
 - Minimize, as much as possible, the regulatory burden for commercial space activities and ensure that the regulatory environment for licensing space activities is timely and responsive;”³
- U.S. National Space Transportation Policy (2013):
 - “Encourages partnerships with private industry to put U.S. government instruments on nongovernmental spacecraft, which will increase scientific and other capabilities, facilitate access to space, and save taxpayer dollars using arrangements known as hosted payloads.”⁴

³ White House, “National Space Policy of the United States of America,” 28 June 2010, page 10-11.

⁴ White House, “Fact Sheet: 2013 National Space Transportation Policy,” 21 November 2013.



Actions Already Underway:

Various U.S. government departments and agencies have already recognized the value of leveraging the commercial space sector and have initiated space programs designed from inception to be commercially hosted. These departments and agencies are also working with commercial industry to create the interface definitions and contracting mechanisms necessary to synchronize government procurement processes with the streamlined management practices of commercial space ventures.

- **Australian Defence Force (ADF) Ultra-High Frequency (UHF) Satellite Communications (SATCOM).** Launched in 2012 on a commercial geosynchronous communications satellite, the ADF UHF SATCOM hosted payload provides operational military communication channels to Australian and U.S. military forces deployed in the Indian Ocean Region, to include the Middle East Area of Operations. The ADF stated that hosting their payload on a commercial satellite saved the Government of Australia \$150 million over the life of the payload in comparison to building their own satellite.
- **NASA Laser Communications Relay Demonstration (LCRD).** Demonstrates the use of lasers to encode and transmit data at rates ten to a hundred times faster than radio using significantly less mass and power; laser communication is considered ideal for sending data back to earth from long-distance interplanetary probes. LCRD will be hosted on a commercial geosynchronous communication satellite to be launched in the 2017 timeframe.
- **NASA Tropospheric Emissions: Monitoring of Pollution (TEMPO).** In November 2012, NASA awarded a contract to design and manufacture the first space-based instrument to monitor major air pollutants across the North American continent. NASA intends to contract for hosting TEMPO on a commercial geosynchronous communication satellite using the HoPS IDIQ contract managed by USAF SMC.
- **NASA Deep Space Atomic Clock (DSAC).** In June 2012, NASA awarded a contract to host a miniaturized, ultra-precise mercury ion atomic clock for demonstration of precision timing and navigation capabilities on a commercial low Earth orbiting satellite. Launching in 2015, DSAC will demonstrate system capabilities essential for NASA's future deep space exploration missions requiring higher-precision data collection and autonomous radio navigation for time-critical events such as orbit insertion or landing on distant planets or asteroids.
- **NASA Global-scale Observations of the Limb and Disk (GOLD).** In 2013, NASA funded an ultraviolet instrument that will study Earth's upper atmosphere to learn more about the disruptive effects of space weather caused by the sun and the space environment. GOLD will be hosted on a commercial geosynchronous communication satellite to be launched in the 2017 timeframe.
- **USAF Commercially Hosted Infrared Sensor (CHIRP).** Launched on a commercial GEO satellite in September 2011, CHIRP demonstrated modern wide field-of-view infrared



sensors using large format focal plane arrays. The Air Force is planning follow-on WFOV OPIR hosted payloads as part of the Overhead Persistent Infrared (OPIR) Space Modernization Initiative (SMI) to explore sensor technologies and evolve the OPIR architecture.

- **USAF Hosted Payload Solutions (HoPS) Contract.** In mid-2014, the Air Force plans to award multiple Indefinite Delivery Indefinite Quantity (IDIQ) contracts that will facilitate matching Government payloads currently in development with commercial satellites using commercial timelines. The HoPS contract will procure a fully functioning on-orbit hosted payload system and integrated ground system equipment and interfaces that deliver payload data to the Government end user(s).

Update: On July 10, 2014, the Air Force awarded 14 contracts to satellite operators and space hardware manufacturers including the following HPA members: Boeing, Eutelsat America, Harris Corporation, Intelsat, Lockheed Martin, SES Government Solutions and SSL.

- **USAF Commercial Pathfinders Program.** The Space and Missile Systems Center (SMC) is leveraging Space Modernization Initiative (SMI) funding to explore reasonable acquisition approaches that will expand the commercial transponder coverage that is capable of meeting current and future military needs. The DoD currently leases over 10 GHz of commercial SATCOM bandwidth annually, of which approximately 3 GHz is enduring demand and the rest is for specific needs related to crisis or wartime contingencies. To address gaps, SMC has initiated a pathfinder effort to procure an ownership stake in commercial transponders. Eventually, the DoD's incremental procurement of additional commercial transponders could result in a full satellite's worth of transponders within an owner/operator's fleet in exchange for portable bandwidth within the global commercial fleet. While not specifically a "hosted payload," the USAF is looking at this as a hosted function or capability on a commercial communications satellite.
- **DARPA Phoenix Program.** The Defense Advanced Research Project Agency (DARPA) is researching ways to service and extend the life of high-value satellites in the geostationary orbit, more than 22,000 miles above Earth. Phoenix's goal is to develop and demonstrate technologies that make it possible to inspect and robotically service cooperative space systems in GEO and to validate new satellite assembly architectures. One of the areas of research is to develop a standardized mechanism designed to safely carry a wide variety of separable mass elements to orbit—including payloads, special small spacecraft being developed for the mission, and electronics—piggybacking on commercial communications satellites. DARPA has stated that this approach would take advantage of "hosted payloads" services and the tempo that commercial satellites now provide for enabling lower-cost delivery to GEO.
- **Internet Router in Space (IRIS).** Launched in November 2009, IRIS was a Department of Defense Joint Capability Technology Demonstration (JCTD) showing the utility of packet-



switched internet routing in space on a commercial geosynchronous communication satellite.

- **FAA Wide Area Augmentation System (WAAS).** WAAS is an extremely accurate navigation system developed for civil aviation to provide service for all classes of aircraft in all phases of flight including en route navigation, airport departures, and airport arrivals. From the commissioning of WAAS service over North America in 2003, the WAAS payloads have been hosted on commercial geosynchronous communication satellites.
- **Aireon Automatic Dependent Surveillance-Broadcast (ADS-B) System.** Aireon will provide air traffic control organizations with the benefits of global air traffic surveillance in arctic, oceanic and remote regions of the entire planet. The capability to monitor worldwide air traffic will provide significant safety and efficiency benefits to the airlines and the traveling public. The Aireon payload will be hosted on sixty-six commercial low Earth orbiting communication satellites to be launched from 2015 to 2017.

For additional resources, please visit

www.hostedpayloadalliance.org

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