

## BUSINESS INNOVATION SYMPOSIUM (E6)

New space individuals, projects, programs, or business units: innovation, entrepreneurship & investment at the microscopic level of analysis (1)

Author: Mr. Jason Crusan  
NASA, United States

Ms. Carol Galica  
National Aeronautics and Space Administration (NASA) / Stellar Solutions Inc, United States

Ms. Shanessa Jackson  
National Aeronautics and Space Administration (NASA) / Valador Inc., United States

REDEFINING SPACE COMMERCIALIZATION, INNOVATION, AND ENGAGEMENT THROUGH  
PUBLIC-PRIVATE PARTNERSHIPS

**Abstract**

As NASA expands the frontiers of knowledge, capability, and opportunity in a new era of space exploration, the agency is working to foster the fullest possible commercial use of space and engage the broader community with its mission. NASA's Advanced Exploration Systems (AES) division is effectively leveraging public-private partnerships (PPP), which are mutually beneficial collaborations among entities from one or more public (in this case, federal) and private (international, academic, and industry) sectors. These relationships provide NASA with an avenue to infuse new ideas and technologies, transfer technologies to the marketplace, and stimulate economic growth and new industries.

AES continues to investigate strategies to enhance the implementation of its portfolio of rapid systems development projects that strengthen all of NASA's major human spaceflight programs. This includes utilizing NASA's existing contract and agreement mechanisms in new ways differing from standard NASA- or industry-driven decision-making, with a greater focus on maximizing both shared risk and gain. The NASA AES Innovative PPP Framework combines non-traditional implementation of contracts (cost-plus and fixed-price), Space Act Agreements (SAA), interagency agreements, Memorandums of Understanding (MOU) and Cooperative Research and Development Agreements (CRADA) with the following four models:

- *Commercial "Off-the-Shelf"* – industry bears nearly all development cost and risk for a service/product that NASA buys or consumes.
- *Shared Cost and Risk Commercial Development* – NASA invests in industry capabilities for further development and potential market delivery.
- *Incremental Commercial Research and Development* – NASA procures certain technical, schedule and cost risk at a fixed price on an incremental basis, with high risk and high potential reward for the commercial partner.
- *Incremental Shared Research and Development* – shared risk and variable cost sharing among NASA and industry related to high-potential emerging technologies with undefined application.

AES is finding new and creative ways to use existing mechanisms to spur innovation for human space exploration. Successful examples include Next Space Technologies for Exploration Partnerships (NextSTEP) and Lunar Cargo Transportation and Landing by Soft Touchdown, or Lunar CATALYST.

This paper presents: the full conceptual approach including risk, cost, benefit, and need/demand; details of productive collaborative projects and their impact on partners, technology development and

commercialization; and variations of the models as well as potential future application. This novel methodology is fostering innovation, new markets, and a growing commercial space industry, while transforming capabilities and accelerating technologies needed to achieve national strategic goals.