Commercial Lunar Payload Services (CLPS)
Agency Priorities

To achieve a sustainable presence on the moon through innovative public-private partnerships with US commercial companies and international partners.
Phased Approach

- Gateway to Lunar Surface will facilitate
  - Human lunar landing by 2024
  - Sustainable missions by 2028
- New Lunar Science and Technology enabled by
  - Small commercial lunar landers as early as 2020
  - Medium-size landers and rovers by 2023
Commercial Lunar Payload Services

- NASA wants to be a marginal customer, one of many payload providers. NASA does not intend to manage or direct these commercial missions.

- Sponsored (programmatic and funding) by the Science Mission Directorate in support of NASA’s science, human exploration and technology goals.

- Master contract awarded to vendors to safely integrate, accommodate, transport, and deliver NASA payloads using contractor-provided assets, including launch vehicles, lunar lander spacecraft, lunar surface systems, Earth re-entry vehicles, and associated resources.
**Contract Details**

- **CONTRACT TYPE:** The Government awarded 9 fixed-price, indefinite delivery indefinite quantity contracts in November 2018 and added 5 more vendors in November 2019.
Contract cont’d

- **ESTIMATED VALUE:** Min $25k Max $2.6B per each contract awarded. The maximum ordering value of the firm fixed price contracts and associated task orders is $2.6B, individually and cumulatively.

- **CONTRACT PERFORMANCE PERIOD:** 10-year Effective Ordering Period.

- **ON-RAMPING:** Every two years, or as needed, the government will perform a market analysis to assess capability growth across the industry and space transportation sector.
  - If warranted, the government will issue requests for proposals to on-ramp additional vendors as industry emerges with new candidates and capabilities.
  - No further on-ramping will occur after Contract Yr. 8
  - First on-ramp completed in November 2019
Task Order Process

- Task orders will be issued on an “as needed basis”
- Vendors must respond to each task plan requested by NASA
- Task Order’s SOW will describe the specific requirements
- The period of performance shall be specified on each individual task order
- Mission success criteria will be defined for each task order
- Task orders will be competed among all vendors in the contract pool
Task Order History

• Task Order #1 – Payload User’s Guides
  • Received from first 9 companies; reissued to 5 new companies

• Task Order #2 – First Payload deliveries to the Moon
  • Selected 3 companies

• Task Order #3 – Study on mid-sized landers
  • Selected 2 companies and finished studies in July 2019

• Task Order 20A – VIPER Mission
  • Mid-size lander to deliver NASA rover and instruments to the South Pole
  • Draft task order released November 2019

• Task Order 19C/D – Collection of science instruments
  • One mission focused on lunar pole, second mission mid latitudes
  • Draft task order released December 2019
May 31, 2019 NASA selects first Commercial Moon landing delivery services for Artemis Program to deliver science and technology to the Moon

- Astrobotic of Pittsburgh awarded $79.5 million to fly as many as 14 payloads to Lacus Mortis, by July 2021
- Intuitive Machines of Houston awarded $77 million to fly as many as five payloads to Oceanus Procellarum by July 2021
- Orbit Beyond of Edison, New Jersey awarded $97 million to fly as many as four payloads to Mare Imbrium, by September 2020
VIPER (Volatile Investigation Polar Exploration Rover)

Overview:
- Directly characterize the nature/distribution of volatiles at the lunar poles
- Understand the lateral and vertical distribution and physical state/composition
- VIPER will build Lunar resource models, steering the future commercial resource marketplace

Specs:
- Mission: 75-100 earth days
- Rover + Payload Mass: 300 kg
- Rover Comm: X-band (300kbps directional / 2kbps omni)
- Rover Dimensions: 1.5m x 1.5m x 2m
- Rover Power (nom): 300W
- Max speed: 25cm/s. Prospecting: 10cm/s
- Lander + Launch Vehicle: CLPS commercial contract

Project Timeline:
- FY19: Phase A (Formulation) thru SRR
- FY20: Phase B/C: PDR (Implementation)
- FY21: Phase C: CDR (Critical design)
- FY22: Phase D: SIR/I&T (Integration & Test)
- FY23: Launch (targeted)
Lessons Learned

• NASA is a critical player in establishing early commercial capability
• The vendor pool is both capable and robust but future market projections are very incomplete
• To create the right partnership between NASA and commercial entities requires both sides to adapt and make adjustments
  • NASA has a very hard time sticking to a set of requirements
  • NASA has to approach mission concepts in a different way when using commercial services
• Areas such as Mission Assurance and cross payload responsibilities need a lot more discussion
• The opportunity to fly to the Moon multiple times per year will have a significant impact on both Lunar science and human exploration