



Network & Space Systems  
Space Exploration

# Incremental Steps from Earth to Lunar Commerce: How to Do It, and How to Pay for It, One Step at a Time

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LEAG Annual Meeting  
3 October 2007

# Progressive Product Diversification



# *Incremental* Technology Applications

Application  
1



**Core  
Technologies**

**Propulsion**

**Cryogenic Fluid  
Management**

**Robotics/Imaging/Lidar**

**Simulation/Multimedia**

**Seismology/Geology**

**Communications**

**Energy**

**Information/Archiving**

Application  
2



Images Courtesy of NASA



# ***Transitional & Equitable Public Private Partnerships***

- **Neither participant can shift disproportionate risk to the other; risk must be *equitably* shared to achieve success.**
- **Government role as anchor tenant is to meet its *own* need for lower cost, greater availability, etc.**
- **Industry role as co-financer and risk sharer is to meet its *own* need for an assured initial market, etc.**
- **Both parties can collaborate on a *transition* from government as primary customer to government as one customer among others.**
- **Government Roles: R&D, Infrastructure, *Purchase***
- **Industry Roles: Design, Pricing, Etc. for *Sales* to Market**

The background of the slide is a space-themed image. On the left, a portion of the Earth is visible, showing green landmasses and blue oceans. On the right, the reddish-orange surface of Mars is shown. The background is a dark blue space filled with numerous small white stars.

# LEAG 2007 Commercial Panels

## ▪ Progressive Infrastructure Development

- Transportation/Mining – Tom Taylor, Lunar Transportation Sys.
- Propellant Depots – Dallas Bienhoff, Boeing
- Robotics – Frank Teti, MDA
- Energy, etc. – Klaus Heiss, High Frontier / Jamestown Group
- Maneuvering, etc. – Bob Richards, Optech

## ▪ Incremental Application Development

- Virtual Presence – Manny Pimenta, Lunar Explorer
- Meteorite Detection – Luke Erikson, Colorado School of Mines
- Communications – Steve Durst, ILOA / Space Age Publishing

## ▪ Transitional Government Facilitation

- New Approach – Ken Davidian, NASA/ESMD