

NASA and Caterpillar

An Innovative Partnership

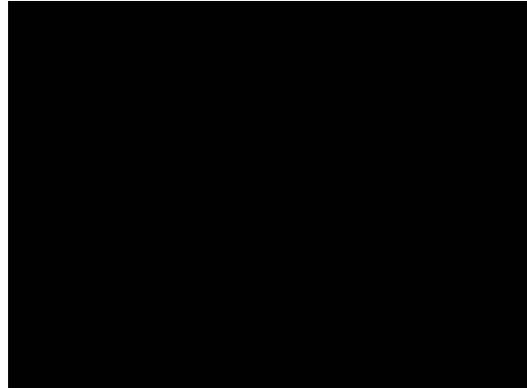
- NASA's interest in automation
- NASA's IPP Seed Fund Program
- Summary of value of CAT Relationship to NASA

NASA's Interest In Automation

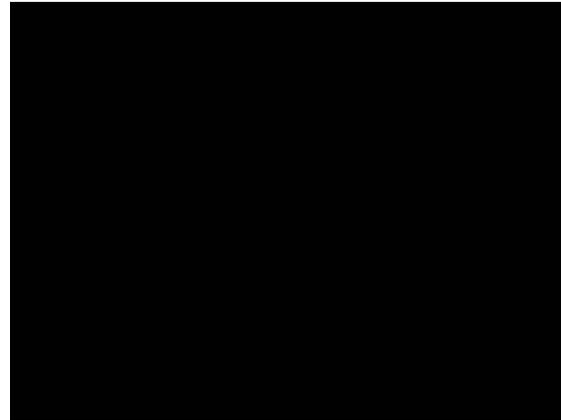
- NASA's goal is to develop and implement remote supervised surface operations.
- Placement and set up of lunar surface elements
- Regolith moving operations that are important to lunar site preparation such as leveling, berming, trenching, strip-mining, boring, habitat-shielding, load-haul-dumping, and excavating.

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Example Placement And Set Up Of Lunar Surface Elements Video



Example Regolith Moving Operations Video



Chariot



Chariot

- What is Chariot?
 - Chariot is a first generation, 1g, prototype vehicle designed to fulfill the many of the requirements for Lunar surface mobility as specified by the Constellation Program
 - Chariot will participate in many Lunar Surface Analog scenarios to assist in the development and evaluation of Lunar Surface mission planning.

CHARIOT

- Designed to fulfill the needs for most Lunar Surface Transportation (human and cargo)
- Incorporates lessons learned from Apollo Lunar Roving Vehicle



NASA's IPP Seed Fund Program

- Innovative Partnerships Program (IPP)
- *Providing leveraged technology for Mission Directorates, Programs and Projects*
- *Partnerships with Industry, Academia, Government Agencies and National Laboratories.*
- <http://www.ip.nasa.gov/>

NASA's IPP Seed Fund Program

- The IPP Partnership Seed Fund has been established as a new initiative to enhance NASA's ability to meet mission technology goals by providing seed funding to initiate cost-shared, joint-development partnerships.
- The IPP Seed Fund is being used to provide "bridge" funding to enable larger partnerships and development efforts to occur and will encourage the leveraging of funding, resources and expertise from non-NASA partners, and NASA Programs.
- Three way funding from non-NASA partners, NASA Programs, and the IPP Program.

Summary of value of CAT Relationship to NASA

- Partnership supports the Exploration Systems Mission Directorate (ESMD) in the following two technology focus areas:
 - Lunar Construction - Civil engineering, regolith excavation, and material handling utilizing CAT experience.
 - Robotics and Operations – Advanced robotic systems for lunar outpost assembly and maintenance, surface mobility systems, and human-system interaction.
- NASA's Return on Investment (ROI) will be realized over both the short and long term.
 - This project will assist NASA in the development of lunar ISRU and surface handling equipment control and hardware requirements and the human-system interaction processes for time delayed remote operations.