THE LUNAR EXPLORATION ROADMAP. EXPLORING THE MOON IN THE 21ST CENTURY: THEMES, GOALS, INVESTIGATIONS AND PRIORITES, 2008. C. R. Neal[1], and the LEAG Executive Committee (http://www.lpi.usra.edu) [1]Department of Civil Engineering & Geological Sciences, University of Notre Dame, Notre Dame, IN 46556, neal.1@nd.edu.

Introduction: With the renewed focus on solar system exploration as defined by the US Space Policy, the Moon plays a pivotal role. In order that this role can be played to its fullest, the Lunar Exploration Analysis Group (LEAG) has been tasked by the NASA Advisory Council (NAC) to develop a Lunar Exploration Roadmap. The roadmap should "map science goals to objectives and to observations and measurements. This roadmap should include an assessment of needed technology developments, areas of potential coordinated activities for commercial and international participation, and potential feed-forward activities for the exploration of Mars and beyond."

The LEAG Executive Committee (see http://www,lpi.usra.edu/leag for details) met at the Lunar and Planetary Institute in January of 2008 and formulated the Themes and Goals for the roadmap. The Themes and Goals map directly to the Global Exploration Strategy [1] and the NAC Tempe Workshop [2], as well other reports on returning to the Moon [e.g., 3-6]. These have subsequently been placed on the LPI web site and opened for public comment. These comments will feed into the development of Objectives, Investigations, and ultimately Measurements (where applicable). To facilitate this process, a number of Specific Action Teams have been organized to examine each theme and, where necessary, individual goals.

Roadmap Theme 1: "Pursue scientific activities to address fundamental questions about the solar system, the universe, and our place in them". There are 4 goals under this theme:

Goal 1a: Understand the formation, evolution and current state of the Moon.

Goal 1b: Use the Moon as a "witness plate" for solar system evolution.

Goal 1c: Use the Moon as a platform for astrophysical, heliophysical, and earth-observing studies.

Goal 1d: Use the unique lunar environment as a research tool.

Prof. G. Jeffrey Taylor (University of Hawaii) is leading the Theme 1 SAT with Dr. James Spann (Marshall Space Flight Center) leading a mini-SAT for Goal 1c and Dr. Michael Wargo (NASA HQ) is putting together a mini-SAT for Goal 1d (lead TBD).

Roadmap Theme 2: "Use the Moon to prepare for future missions to Mars and other destinations." There are 2 goals under this theme:

Goal 2a: Identify and test technologies on the Moon to enable robotic and human solar system science and exploration.

Goal 2b: Use the Moon as a test-bed for systems, flight operations, and exploration techniques to reduce the risks and increase the productivity of future missions to Mars and beyond.

Dr. John Gruener (Johnson Space Center) is leading the Theme 2 SAT.

Roadmap Theme 3: "Extend sustained human presence to the Moon to enable eventual settlement." There are 4 goals under this theme:

Goal 3a: Identify, develop, and mature technologies and deploy initial infrastructure capabilities.

Goal 3b: Reduce the cost of re-supply and dependency on Earth.

Goal 3c: Keep humans healthy and safe off-planet.

Goal 3d: Facilitate development of self-sustaining economic activity.

Prof. Lawrence A. Taylor (University of Tennessee) is leading the Theme 3 SAT.

Crosscutting Themes: There are 4 crosscutting themes that resonate through each of the main themes:

- Learn to live and work successfully on another world.
- Expand Earth's economic sphere to encompass the Moon, and pursue lunar activities with direct benefits to life on Earth.
- Strengthen existing and create new global partnerships.
- Engage, inspire, and educate the public.

The development of the roadmap is dependent upon community input. While the main title of the product is given in this abstract title, the full title includes the following: "A Community Effort Coordinated by the Lunar Exploration Analysis Group". We have opened up the Themes and Goals to public comment and once the SAT reports are all completed, a draft Roadmap will then be reviewed before being put on the web for further comment. The Lunar Science Conference will facilitate direct community input into the SAT process before the final reports are compiled into a draft roadmap.

References: [1] The Global Exploration Strategy: The Framework for Coordination (2006). www.nasa.gov/pdf/ 178109main_ges_framework.pdf. [2] NASA Advisory Council Workshop on "Science Associated with the Lunar Exploration Architecture"

(2007) http://www.hq.nasa.gov/office/oer/nac/. [3] The Lunar Geoscience Working Group (1986) NASA document SP-84. [4] LExSWG (1995) Lunar Surface Exploration Strategy, http://www.lunarwire.com/ Link-Click.aspx?fileticket=FkLMOUAmSLA%3D&tabid=56&mid=524. [5] LExSWG (1992) A Planetary Science Strategy for the Moon. JSC-25920, www.lpi.usra.edu/lunar/strategies/. [6] LAPST (1985) Horizons and Opportunities in Lunar Sample Science. *LPI Tech. Rpt* **85-04**.