

## 27th IAA SYMPOSIUM ON SPACE AND SOCIETY (E5)

Architecture for humans in space: design, engineering, concepts and mission planning (1)

Author: Mr. Brent Sherwood

Caltech/JPL, United States, brent.sherwood@jpl.nasa.gov

## SPACE ARCHITECTURE FOR MOONVILLAGE

**Abstract**

The concept of a multinational MoonVillage, as proposed by Jan Wörner of ESA, is analyzed with respect to diverse factors affecting its implementation feasibility: potential activities and scale as a function of location, technology, and purpose; potential participants and their roles; business models for growth and sustainability as compared to the ISS; and implications for the field of space architecture. Environmental and operations constraints that govern all types of MoonVillage are detailed. Findings include: 1) while technically feasible, a MoonVillage would be more distributed and complex a project than the ISS; 2) significant and distinctive opportunities exist for willing participants, at all evolutionary scales and degrees of commercialization; 3) the mixed-use space business park model is essential for growth and permanence; 4) growth depends on exporting lunar material products, and the rate and extent of growth depends on export customers including terrestrial industries; 5) industrial-scale operations are a precondition for lunar urbanism, which goal in turn dramatically drives technology requirements; but 6) industrial viability cannot be discerned until significant in situ operations occur; and therefore 7) government investment in lunar surface operations is a strictly enabling step. Because of the resources it could apply, the US government holds the greatest leverage on growth, no matter who founds a MoonVillage. The interplanetary business to be built makes its own case for engagement.