

17th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)Strategies & Architectures as the Framework for Future Building Blocks in Space Exploration and
Development (1)

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SCENARIOS & ARCHITECTURES FOR THE MOON VILLAGE

Abstract

Humanity – as represented by diverse countries, many companies of various sizes, academics around the world and individuals of many countries – is now moving to extend activities to the Moon. It is impossible to truly know the future; however, planning methodologies that take uncertainty into account in a structured fashion can provide useful insights that allow thoughtful preparations in the face of that inevitable ignorance. The “Moon Village” represents an encompassing concept for a diverse assortment of planned and prospective activities on and near Earth’s Moon. It is not limited to a specific project, location or organization. During the past 12-18 months, the near-term potential steps that might be taken toward a permanent human expansion to Earth’s Moon have been changing rapidly – driven in a significant measure by the new NASA leadership and evolving plans related to US lunar plans. Without narrowing scope to a particular implementation (for example, a specific “Moon Base” at in a particular location), but to still provide a consistent framework for the conduct of studies, research and development and business investments, a set of “Moon Village Reference Scenarios” (analogous to what are sometimes called “Design Reference Missions”) have been defined. These scenarios deliberately look to the far-term: from the present out to 2100, in order to place near-term projections in a larger context. Each of these three scenarios – if they were to become the future – would involve similar and distinct missions, systems and commercial markets. Within each of these scenarios, example architectural concepts have been defined that allow the scenarios to be more thoroughly and analytically examined. This paper will provide an overview of present international lunar exploration and Moon Village activities, including a discussion of the alternate scenarios described above. On that basis specific lunar systems and architectures, missions and markets will be sketched and an integrated roadmap for each scenario framed. The paper will conclude with a discussion of the common threads that span the alternative futures, it will highlight the most distinct aspects of each and it will identify some potential “signposts” that can be watched for that would indicate which path humanity will be taking to its lunar future.