

19th 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  
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LUNAR LANDING NECESSARY BUILDING BLOCKS AND GOOD PRACTICES FOR A  
SUSTAINABLE DEVELOPMENT OF HUMAN LUNAR ACTIVITIES**Abstract**

After almost 50 years from the last step on the Moon in 1972, Space Agencies and companies from all over the World are evaluating once again the need, potential and benefits of manned settlements on the Moon and beyond. Several spacecraft, landers and rovers have already made their way on Earth's only natural satellite, and more will come in the coming years, followed by or in parallel with human missions, with all the related challenges and issues to overcome. At first, Human activities will target specific locations on the lunar surface, mainly driven by scientific objectives. For these missions, the landing site will necessarily be close to the target areas, before a surface transport infrastructure is put in place, such a system of transport rovers or a rail network, in the far future. As the interest and involvement of public and private actors grow, and depending on their mission objectives, we will see either massive landings with multiple spacecraft involved or specific pinpointed landings with relatively small assets, to perform local analyses without the need to bring a full settlement to the location. Therefore, it is fundamental to see which resources/terrain characteristics will act as an attractor for intensive human activities and hence for multiple landing and traffic that will need some sort of regulation. One of the objectives of our research is to analyse those potential attractors and identify key factors that would make specific locations of the Moon more suitable for landing (e.g. surface characteristics, distance from points of interest). Once defined, the following objective is to evaluate what features and services a landing site should have in order to support exploration or exploitation missions and become an efficient spaceport. In parallel, as mentioned above, all these activities on and around the Moon surface need to be regulated and coordinated to avoid a "far west" scenario, with the related potential hazards that could affect the Moon environment, but also human settlements and facilities. The last objective of our project is to evaluate and propose ideas on how future missions could be regulated, taking into account that the Moon is a different celestial body that, at the current moment, is not under any national or international significant traffic management regulation.

Please note that the present abstract is submitted under the auspices of SGAC's Space Exploration Project Group, as part of the researches conducted within the T.U.R.T.L.E Research Group