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BUSINESS CASE STUDY FOR THE CYCLER – A CIRCUMLUNAR VEHICLE FOR
DEVELOPMENT OF SPACE TOURISM AND LUNAR INFRASTRUCTURE BY 2030.**Abstract**

The cis-lunar space tourism is yet a futuristic concept. However, the thrill and innovation that it offers has potential to attract attention of High Net Worth Individuals. Developing regular touristic cis-lunar transportation could be an opportunity for space entrepreneurs. Moreover, once established the cyclic lunar transportation can be one of the factors that may improve lunar business and infrastructure described by concepts such as Moon Village.

Today, the commercial development of the cis-lunar vehicles is limited by costs and long duration research and development programmes. While, the commercial benefits of a reliable transportation system of crew, tools, materials, and supplies are not fully understood. Therefore, the authors research the commercial viability related to cis-lunar space tourism vehicle utilising the Cyclor concept.

This paper presents a business case for the cis-Lunar transportation vehicle and portfolio of services that can be realised by the year 2030. The business case expands previous studies on the Cyclor concept proposed by Bombardier, Dr. Farr and Dr. Peraldi in 2016. The commercial viability of this cis-lunar vehicle proposes the opportunity for international collaboration as well as potential for providing access to space flights for the space emerging nations.

The cis-lunar space tourism cyclor is envisaged as a modular vehicle that will orbit the Earth and the Moon on a free return trajectory in a seven-day crewed journey (based on a study by Genova and Aldrin). The modular structure provides premium/comfortable travel conditions for eight paying customers and three crew members as well as transporting goods using a cargo unit and a dedicated module to conduct scientific experiments.

The paper proposes a vehicle architecture using available components with the current TRLs of 6 or higher. This approach identifies technology gaps that need to be addressed in order to develop cis-lunar tourism and transportation and exposes the limited number of nations that are currently involved in developing these components. Furthermore, the paper introduces a risk assessment of the envisaged civil cis-lunar transportation system, a dedicated financial modelling tool together with potential approach for financing the system via International public-private partnerships.