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FEASIBILITY ANALYSIS OF A SPACEPORT IN MOROCCO AS A PATHWAY TO MEETING THE
GROWING INTERNATIONAL DEMAND FOR SPACE ACCESS

Abstract

The booming of the New Space economy in the past decade has brought to the market billions of dollars in investments and assets, with a continuously growing trend. The emergence of private companies in the space market has significantly contributed to that growth and to shifting the space market from a strongly political paradigm to a commercial and international one. Many private companies are currently selling ready-to-fly space assets such as constellations of commercial satellites, probes and components and are continuously developing new ones. As a consequence, the demand for a stronger launch capability has skyrocketed all over the world saturating the launch windows currently available at different spaceports around the world.

In this paper we investigate the possibility of building a spaceport in the southern region of Morocco as a strategic stepping stone for meeting the future demand of high frequency and cost convenient launch capability. Morocco presents unique geopolitical and strategic characteristic which makes it an attractive location for space launches. First, its proximity to the equator takes advantage of the Earth rotational energy, which leads to a lower propellant mass requirement for equatorial or near-equatorial Low Earth Orbits (LEO) and therefore reduce the overall launch costs. Moreover, the southern region of Morocco is not densely populated due to presence of the Sahara Desert, with obvious benefits in terms of launcher drop zones. Polar or highly inclined orbital launches can be performed aiming toward the Atlantic shore. Furthermore, while several lunar missions are forecast to be accomplished in the next decade, the launches must be performed in the proximity of the latitude that corresponds to the Earth-Moon orbital plane in order to minimize change-of-plane orbital maneuvers, which are expensive in terms of propellant utilization. Morocco can then play a major role in supporting lunar missions as it lies right on that ideal latitude. Lastly, the presence of the Atlantic shore can support the transport network and supply chain for a Spaceport through the installation of strategic maritime ports or refurbishing existing ones and connecting them to transportation hubs and the railway network.

The technical, logistic and economic requirements needed for a spaceport are analyzed as well as several scenarios such as refurbishment and conversion of an existent airport or the construction of a brand new one.