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THE RELEVANCY OF ORBITAL CARRYING CAPACITY TO SPACE POLICY AND REGULATION

Abstract

There has been a rapid increase in the number and types of activities taking place in the space environment, driven in part by novel private sector activities. Space governance frameworks - at both the national and international level - have generally not kept pace with this change. Of particular note is the planning, deployment, and operations of multiple very large satellite constellations (both commercial and governmental) consisting of thousands to tens of thousands of individual satellites in the same or similar orbits. These constellations challenge existing space operations practices and regulation and require updated approaches. They also raise concerns about space activities' impact on the space and Earth environment, including whether there is a limit to the carrying capacity of certain orbits. Work is underway in the technical fields to define concepts for assessing, measuring and tracking orbital carrying capacity. However, this technical work is largely disconnected from the policy and regulatory processes being used in multiple jurisdictions to grant licenses to multiple large constellations. It is unclear how, or even if, orbital carrying capacity concepts might be applied or used in licensing processes. Based on a series of workshops conducted with both the research and regulatory communities between March 2021 and March 2024, this paper will present an assessment of the relevancy of orbital carrying capacity to the license and oversight of large constellations. Participants in the workshops included regulators from more than 20 countries, including authorities responsible for space environment oversight as well as authorities responsible for spectrum access licensing. It will present the author's assessment of the current viewpoints and approaches to understanding orbital carrying capacity; and discuss the barriers that face efforts to use the concept in regulatory practice.