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COMMERCIAL SATELLITE COMMUNICATIONS CAPACITY TRENDS

Abstract

This paper discusses global commercial transponder capacity enabling satellite communications (SATCOM) capability across satellite service segments, the historical trends in its deployment, supply and availability, and cost. The paper considers two types of commercial communications satellites, conventional and high-throughput. The paper considers satellites operational in orbit each year and new satellites deployed annually; their estimated global in-orbit capacity available each year and the new capacity deployed annually; the estimated value of satellites in orbit and of the new satellites deployed annually; and the estimated in-orbit capacity cost and the cost of new capacity by year, differentiated by satellite type. The estimated capacity cost is defined as cost of unit of throughput, or US dollars per Mbps. The two satellite types are differentiated by the type of payload technology: widebeam conventional satellites with the footprint on the ground covered by a single beam and high-throughput satellite covering their service area with multiple narrowly focused spotbeams and employing frequency reuse technology. The paper findings discuss the trends in the global commercial satellite fleet, considering the increasing share of high-throughput satellites by the number of satellites in orbit (reaching 12 percent in 2017), by the estimated value of each satellite type (reaching 13 percent in 2017), and the estimated transponder capacity provided by each of the two types of satellites (exceeding 34 percent in 2017). The estimated average global in-orbit SATCOM capacity cost is decreasing: in 2012 – 2017 the conventional widebeam capacity saw cost decreases while the high-throughput capacity cost decreased even more over the same period. On average, global SATCOM capacity of all types decreased 21 percent in 2012 – 2017. The paper also discusses the satellite service market implications of these trends, including an increased satellite broadband connectivity and improved affordability, enabling greater data volumes and data speed over satellite, and enabling and expanding new markets, such as end-user consumer broadband internet service. While the historical trends discussed in this paper cover predominantly the geostationary commercial communications satellites that have dominated the commercial satellite communications market since its inception nearly 50 years ago, the future satellite communications capacity discussion addresses both geostationary and non-geostationary capacity that can possibly be made available by the proposed new geostationary systems and multi-satellite non-geostationary constellations that may potentially increase the available commercial satellite communications capacity by an order of magnitude and respective implications of such capacity expansion for the global satellite telecommunications market.