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Author: Mr. Justin Ahwah
International Space University (ISU), United States

Mr. Samy Nicolas BOUCHALAT
International Space University (ISU), France
Ms. Martina Dimoska
International Space University (ISU), France
Ms. Eszter Gulacsi
International Space University (ISU), France
Mr. Jermaine Gutierrez
International Space University (ISU), Germany
Mr. Mickael Holle
International Space University (ISU), France
Ms. Yeong-eun Hwang
International Space University (ISU), Korea, Republic of
Ms. Anastasia Konstantopoulou
International Space University (ISU), France
Ms. Julie LESPAGNOL
International Space University, France
Mr. James Murphy
International Space University (ISU), United States
Mr. Charles-aimé Nzeussi Mbouendeu
International Space University (ISU), France
Mr. Thomas O'Sullivan
International Space University (ISU), United Kingdom
Ms. Damini PANTALEON
International Space University (ISU), France
Mr. Swapnil Parekh
International Space University (ISU), France
Mr. Niravkumar Patel
International Space University (ISU), France
Ms. Laura Perez Tembleque
International Space University (ISU), Spain
Ms. Marion Pigassou
International Space University (ISU), France
Ms. Katia Talbi
International Space Univeristy, France
Ms. Stephania Turyk
International Space University (ISU), France
Dr. Taiwo Raphael Tejumola
International Space University, France
Mr. Nicolas Peter

International Space University (ISU), France
Prof. Gongling Sun
International Space University, France

STARSHIP IMPACT ON THE SATCOM INDUSTRY

Abstract

Starship, SpaceX's latest reusable launch vehicle and the world's most powerful rocket in development, is expected to cause a significant impact on the satellite telecommunications industry. Reductions in launch costs, higher payload masses to orbit, the largest payload fairing, and frequent launches are all factors that would each individually disrupt the SatCom industry. Starship is redefining all four factors simultaneously. Within this report, impact assessments on space-based systems and launch vehicle developments historically form a knowledge base for SatCom industry participants, space agencies, and regulators to assess future initiatives against. The rapid development of Starship has given rise to a further assessment. The Telecommunications and Integrated Applications (TIA) directorate of the European Space Agency (ESA) has requested an investigation into the projected impacts of Starship's development on fixed, broadcast, high-throughput, and mobile communication services. The investigation is conducted by a team from the Master of Space Studies 2022 class of the International Space University (ISU), within the frame of the annual Team Project. To develop recommendations on business opportunities for SatCom players and identify changing trends on satellite design drivers, this report conducts a real-time technological assessment - a qualitative and quantitative analysis on Starship's impact across socio-economic, scientific, regulatory, and engineering domains. Findings suggest Starship's operation, carrying high volumes of payload with a regular launch cadence, will heavily impact the economics of the SatCom industry. New market developments towards an integrated space computing network leverage advancements in cross-link communication between terrestrial and non-terrestrial networks – of which mega-constellations form the backbone for space architecture. Starship is also impacting satellite design drivers for manufacturers. Larger mass-to-orbit capabilities are paving the way for more capable satellites in NGSO. An increased launch cadence is changing the mantra of high-reliability GEO satellites to increased expendability. Our recommendations beyond the industry, to agencies and regulators, highlight the need for sustainable utilization of this new launch vehicle. Regulators must address the environmental and social impacts of frequent, powerful launches. National space agencies must consider implications of global data connectivity advancements and deep-space communication, alongside growth in national private sectors.