

IAF SYMPOSIUM ON SPACE SECURITY (E9)  
Policy, Legal, Institutional and Economic Aspects of Space Debris Detection, Mitigation and Removal  
(1-A6.8)

Author: Mr. Kevin Barry  
George Mason University, United States, kbarry362@gmail.com

FINDING A VIABLE ECONOMIC SOLUTION TO SPACE DEBRIS REMOVAL

**Abstract**

Space debris is an increasing problem. Unlike terrestrial debris, there are no natural systems, other than exponentially diminishing atmospheric drag, to self-correct. This creates a self-perpetuating problem that worsens over time as debris collisions create more debris. This danger is exacerbated by the exponential rise in space assets from small satellites and mega-constellations, projected to increase more than 30-fold this decade. Detection and mitigation strategies to monitor and reduce the level of space debris carried out by NASA, UNCOPUOUS, and others are admirable. They are likely a key component of any long-term strategy for space debris management. However, due to the physical nature of space debris propagation they cannot address current problems alone. Space debris removal and remediation must be implemented in parallel to these systems.

Currently, space debris removal is economically, legally, and technically infeasible. Fundamentally, this is a textbook example of a tragedy of the commons created by the self-serving actions of individuals in a shared space creating detrimental conditions for others sharing the same common resources. The purpose of this paper is to find viable economic strategies that create a greater marginal benefit than marginal cost for space debris remediation. Drawing from that economic pathway to explore what legal changes, modifications, or provisions would be needed in national and international sectors. Only after the necessary economic and legal steps have been taken can space actors move to technically address this problem – something beyond the scope of this paper.

To find possible paths forward, this paper will use case studies to analyze the economic and legal strategies employed to address different terrestrial tragedy of the commons scenarios, particularly those in maritime settings, comparing the applications of these outcomes to current conditions in space. Case studies will focus on examples in which government and private actors have worked to successfully address large, public negative externalities profitably without major disruption to business practices.

Finally, this paper will review some of the unique challenges of space law, weakly defined property rights, and intellectual property concerns, and their parallels and differences to the foundational Law of the Sea precedent. Nations and private actors are moving forward despite the above concerns, pushing and testing the boundaries of what is acceptable whether the laws support them or not. A viable economic solution must be found in order to support the legal, institutional and economic aspects of space debris detection, mitigation, and removal.