

## Abstract

Traffic is surging in outer space. Low Earth orbit, where the vast majority of new satellites are placed, is rapidly transforming into a busy, congested and hazardous traffic domain. The massive expansion in scope and quantity of human space activities is elevating the risk of catastrophic collisions between spacecraft in Earth's orbital highways, threatening the space environment, astronauts and space-based infrastructure critical to modern societies.

The escalating traffic issue in low Earth orbit has catapulted Space Traffic Management to the forefront of academic discussions within the field of space law. However, prior studies have focused on the institutional framework required for a multilateral regime based in treaty law, while the substantial traffic rules have received negligible scholarly attention. Across the established human traffic domains of air, road and sea, basic traffic rules coordinate traffic and help prevent collisions. Yet little is known about the corresponding rules for space. This thesis contributes to filling this gap, by developing the concept of orbital rules-of-the-road and examining the potential regulatory frameworks for implementing such rules for the global commons of outer space.

This project accounts for the current state of tangible traffic rules in transnational space law today, analysing a broad range of legal instruments, including the primary treaties of space law, technical standards and softlaw such as industry guidelines. The study clearly demonstrates that no formal traffic rules presently exist for outer space.

Current geopolitical tensions inspire little hope that states can come together around a treaty-based Space Traffic Management regime. The thesis therefore explores alternative paths to frameworks through which transnational, binding rules-of-the-road can be implemented, examining customary international law, transnational private regulation and regional/national legislation as potential regulatory frameworks.

The consensus behind the urgent need for better traffic governance in orbit is substantial across academia, space industry and policymakers. There is significant momentum gathering behind the assertion that the establishment of fundamental rules-of-the-road is both an inevitable and essential step, if humanity intends to maintain ongoing access to and further expand our orbital infrastructure. We will therefore likely go from a period characterized by an absence of traffic norms to a period where different actors champion different competing norms.

**Keywords:** Space law, Space Traffic Management, collision avoidance, transnational law, rules of the road, international customary law, transnational private regulation, low Earth orbit.