



## Perspective Blog - September 2022

### Orbital Debris: why don't we just clean it up?

*Trevor Owen*

Since the Commercial Space Act of 2003, we have seen a massive increase in the number of organizations which offer launch and on-orbit services. While this has led to a fantastic renaissance in our community (one which fills me with joy every time I see a SpaceX booster land), we should also remember that our local corner of space is finite despite the fact that space itself is very, very large. This uptake in space activity has led to a dramatic increase in the number of objects on orbit and an exponential increase in [space debris](#).

So, why don't we, the space community, just clean it up?

Dealing with debris can be broadly broken down into two categories: Space Traffic Management (STM) and Space Situational Awareness (SSA) / Space Domain Awareness (SDA). SSA/SDA is knowing what's going on in space; tracking, identification, and orbit determination. STM deals with the management of assets in space, it reacts to what we learn in SSA; licensing, debris avoidance, and general mission operations.

While some foundational regulations and capabilities exist, there are legal and technological hurdles which must first be overcome. Governments, such as the [French](#) and [US](#) governments, and NGOs, like the [UN's Office of Outer Space Affairs](#), are backing development of regulation and technologies necessary to address orbital debris. The private sector is also contributing to progress. Astroscale's [ELSA-d mission](#) presents a novel solution to satellite end-of-life, one that sees satellites repaired and re-used.

While recent debris mitigation regulations have become more specific than their predecessors (e.g. 25 year end-of-life and graveyard orbits), the capability of space actors is rapidly changing. This is no accident, as the space community is young and new technologies seem to enter the market every year. As the technology evolves, mission operations teams will develop their own methodologies. The successful methods will be adopted, become norms, which can then be used to define future debris mitigation regulations. This is how the space industry is learning to regulate itself, through the full participation of both private and public space actors.

When looking to evaluate which of these methods should become norms, we should take care to balance 3 factors:

- Space debris is a communal problem for the space industry. The international space community must work together towards a solution because the solution, and responsibility, is on all of us.
- Our technical capabilities are immature. We will continue to grow, not just in launch capabilities and satellite technologies, but also in how we track and service our on-orbit assets. We should be careful to not kill off our innovative spirit.
- Our laws rest on the back of norms of behavior, established best practice, and current legal precedent. This has proven to be a pathway to success in the past and can guide us into the future.



### **Author Bio:**

Trevor Owen is an Aerospace Engineer with over 7 years of experience in satellite mission operations and systems engineering. He joined SGAC as a policy researcher in Summer 2021 and has contributed to multiple project groups relating to orbital debris and space sustainability. Trevor is also pursuing a masters degree with the University of Texas where he is focused on orbital mechanics, space sustainability, and Space Situational Awareness.