

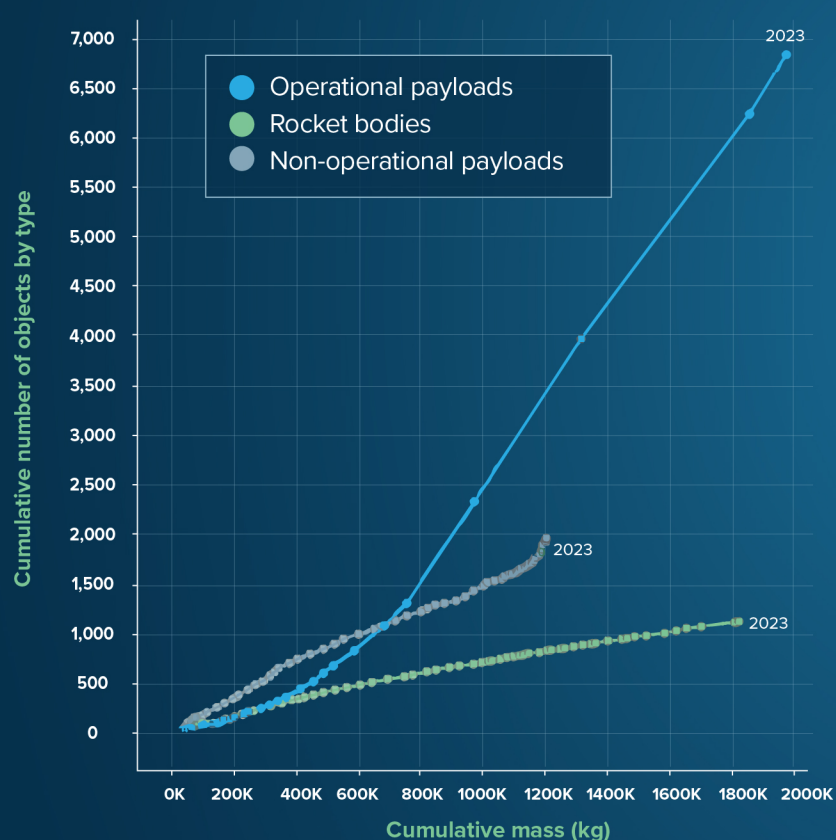
In 2019, 800 functional satellites were operating in low Earth orbit (LEO), now there are over 5,000. LeoPulse is your guide to this rapidly changing environment — providing crucial data and expert analysis to help uncover the challenges and solutions for today’s dynamic space era.

It’s a life cycle: the complex world of space safety explained

To keep spacecraft safe, we need to consider the object’s entire life cycle. Common practice has been to focus on one or two phases of a satellite’s time in space — that’s no longer sufficient. We must consider all phases, from architecture and design through retirement and remediation.



THE GROWTH OF OBJECTS AND RISK IN LEO



The number of objects and mass accumulation in LEO is growing rapidly.

- Net increase of **~2,500 objects** in 2022
- **4x higher** than the annual average for the last 15 years
- **~70%** of objects in LEO are still space debris

This illustration shows object and mass accumulation over time, from 1957 to early 2023. From this, we can draw three conclusions:

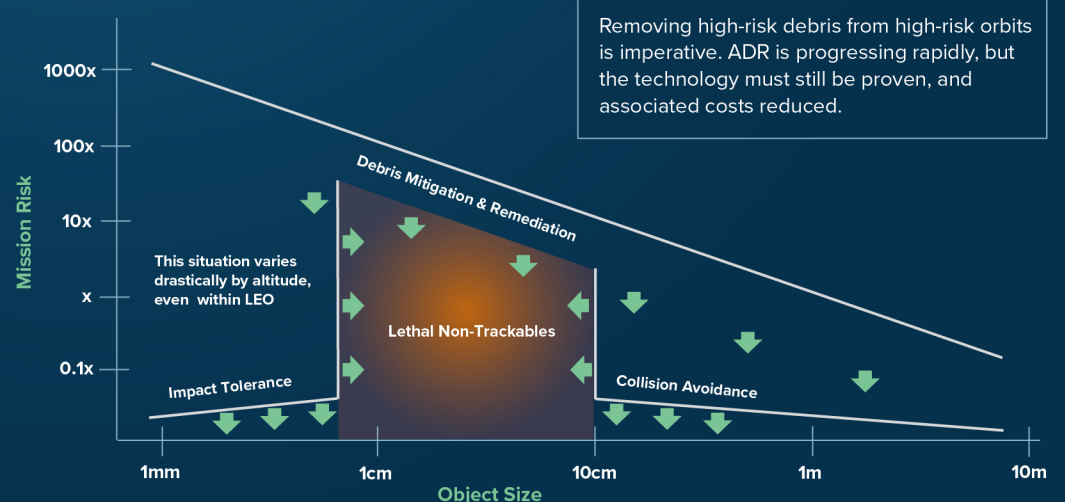
1. The drastic increase in operational payloads since 2020 is transformational and will likely continue
2. Total mass of operational payloads is still less than the accumulated mass of intact derelicts (i.e. rocket bodies and non-operational payloads); these are likely to be a catalyst for future debris-generating events
3. Intact derelicts abandoned early in the Space Age at certain orbits, or “clusters,” are persistent and account for most of the derelict mass

A HOLISTIC APPROACH TO SPACE SAFETY

Solutions must be designed to protect a spacecraft at every stage of its life, starting from design, invest, insure, launch and operations through regulation, retirement, and remediation.

This graph illustrates that mitigating and remediating debris is critical; including banning debris-generating events like ASAT tests, improving spacecraft design, and eventually removing high-risk debris from orbit.

Graphic source: Dr. Tim Maclay, ClearSpace



What about Active Debris Removal?
Removing high-risk debris from high-risk orbits is imperative. ADR is progressing rapidly, but the technology must still be proven, and associated costs reduced.

We're keeping space safe with superior information. **Here's how.**

Reference note: The findings shared in this infographic are derived from the hundreds of thousands of data products LeoLabs’ global network of phased array radars collect daily, as well as the analysis and insights pulled together by our team of experts. For specific reference information, please email us.

About LeoLabs: LeoLabs is transforming the way satellite operators, commercial enterprises, and federal agencies across the world launch and track missions in low Earth orbit. Through LeoLabs Vertex™, its exclusive space operations stack, LeoLabs delivers the information superiority needed to succeed in today’s space race.