

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.

Planning for the inevitable: a guide to disasters in low Earth orbit

Lower altitudes are ideal for large constellations, CubeSats, and crewed spaceflight. Unfortunately, it's in these same altitudes where danger lurks from clusters and clouds of space debris. To help operators anticipate and prepare for this environment, we've outlined four types of potential disasters in LEO.

An operational satellite could collide with a trackable, operational or non-operational object. In 2009, an active Iridium satellite collided with an inactive Russian satellite. While this scenario is still possible, it's less likely thanks to changes in how operators behave and monitor activity in space, as well as modern tracking technologies and advanced operational capabilities.

Operational payload on catalogued object collision



The United States, India, Russia, and China have tested anti-satellite weapons (ASAT), resulting in thousands of pieces of debris in LEO. A cyber-attack is also possible, which could render a satellite non-operational.

Operational payload attacked by an adversary



Operational payload colliding with lethal, small debris



A collision with lethal, small debris (5 mm – 10 cm) could cause mission-degrading damage to an operational satellite or cause an object to break up completely. Unfortunately, this debris is not yet tracked, which means we're unable to effectively mitigate the risks from it.

Dead object on dead object collision



There's one noteworthy conjunction event between two objects in LEO every minute on average. 75% of the most consequential events are between two dead objects. If these objects collide, debris would be strewn across hundreds of kilometers in altitude, potentially impacting multiple constellations and creating a ripple effect.

Are you ready for an in-orbit disaster? **Start planning.**

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, contact 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 its vertically integrated technology system, LeoLabs delivers the information superiority needed to succeed in today's space race.