



OPPORTUNITY #18

What if we adopted Space Development Goals (SpDGs)?

UNIVERSAL UNIVERSE GOALS

A set of universal goals acts as a call to action to protect space and ensure that all who want to access it can do so without unduly increasing debris or space pollution and safeguarding space for generations to come.

MEGATREND

Saving Ecosystems

TRENDS

International Collaboration
Future of Space

SECTORS AFFECTED

Materials & Biotechnology
Automotive, Aerospace & Aviation
Chemicals & Petrochemicals
Communication Technologies & Systems
Cyber & Information Security
Data Science, AI & Machine Learning
Energy, Oil & Gas, & Renewables
Financial Services & Investment
Infrastructure & Construction
Insurance & Reinsurance
Logistics, Shipping & Freight
Manufacturing
Metals & Mining
Government Services
Professional Services



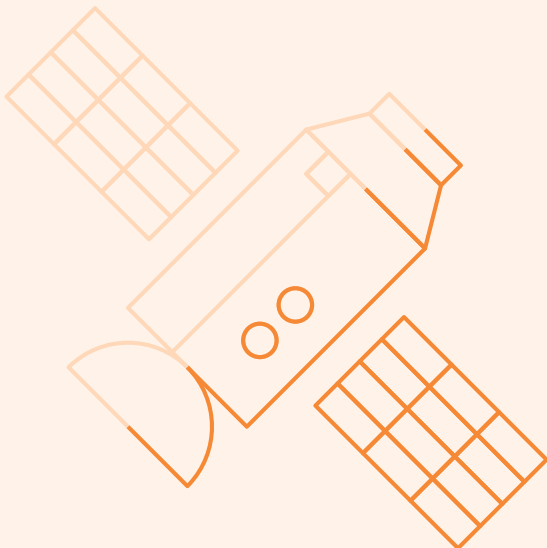
WHY IT MATTERS TODAY

The United Nations Committee on the Peaceful Uses of Outer Space was established to prevent or reduce the creation of space debris.³⁸⁰ A set of space debris mitigation guidelines were endorsed by the General Assembly in 2007 but these are not legally binding and have not been adopted by UN member countries.³⁸¹

Meanwhile, there has been a striking rise in the number of satellites being launched into space. Satellites are providing increasingly accurate and important data for a host of tasks and activities, including communications, earth observation, navigation and GPS, military support and weather prediction. Estimates project that, by 2030, close to 990 satellites will be launched every year³⁸² compared to an average of 230³⁸³ per year in the previous decade.³⁸⁴

Out of potentially 11,000 satellites³⁸⁵ circling the earth, only around half — 5,465 — as of May 2022, are operational.³⁸⁶ The countries and bodies that are at the forefront of the satellite industry include the United States, China, Russia, the United Kingdom, Japan, India, the European Space Agency, Canada and Germany. In 2021, among the 30 countries with the highest numbers of satellites launched into space, the United Arab Emirates stood in 20th position tied with Saudi Arabia, Switzerland and Taiwan, each with 14 satellites in orbit.³⁸⁷

The market size for global space debris monitoring and removal reached \$866 million in 2021 and at a compound annual growth rate (CAGR) of 7% it is expected to almost double, to \$1.5 billion, by 2029.³⁸⁸



Out of potentially 11,000 satellites circling the earth, **only around half** —

5,465
SATELLITES

— as of May 2022, are **operational**



THE OPPORTUNITY

As space becomes busier, humanity risks repeating mistakes made concerning the earth's environment by introducing objects into space that ultimately threaten the safety of craft, crews and possibly even the earth itself. Legally binding goals to keep space pollution to a minimum and to find ways to safely collect and dispose of large debris would enable safer space operations for generations to come.

The exploration and exploitation of space could offer humanity a novel source of solutions and resources. Examples include new ways of medical diagnosis, testing new materials for improving solar cell performance, radiation protection and concrete manufacturing, biomineral for new minerals and testing biomedical devices to aid re-design, under new conditions that are impossible to achieve on earth.³⁸⁹

However, in the long term, these possibilities will result in a build-up of abandoned and disused equipment and other forms of space pollution. Some chemicals used in space technologies burn up, potentially depleting the ozone layer and harming the environment, when they re-enter the atmosphere.³⁹⁰ Defunct satellites and other debris can present hazards to space exploration, with the liability for orbital debris particularly challenging in the case of smaller pieces of debris whose origins may not be known.³⁹¹

Besides risks of injury or damage because of space debris re-entering the earth's atmosphere,³⁹² space debris also poses a critical threat to the launch of new satellites and has the ability to harm satellites already in orbit. It also presents a risk to infrastructure, such as spacecraft and space stations. If enough debris ends up in orbit, it could ultimately lead to the 'Kessler syndrome' scenario, in which there is a self-generating cascade of ever-increasing collisions, rendering some orbits unusable.³⁹³

BENEFITS

A safer space environment with greater collaboration among actors, contributing to growth. Mitigation of risks associated with falling space debris onto earth.

RISKS

Adoption and/or enforcement of goals too late to prevent a significant build-up of space debris. Deployment of space pollution rules to prevent certain actors using certain orbits or to block them from launching satellites.



By 2030, close to

990 SATELLITES

will be launched every year compared to
an average of **230 per year** in the previous decade