

SpaceAvengers Consulting

<u>Team Member Name</u>	<u>Year</u>	<u>Major</u>
Member 1: Rohini Alla	2024	Business Analytics
Member 2: Nisha Gargipati	2024	Business Analytics
Member 3: Vibha Hegde	2025	MBA Business Analytics
Member 4: Supriya Sharma	2025	MBA Business Analytics
Member 5: Pankaj Toppo	2025	MBA Business Analytics

Advisor(s): Jennifer Merton

Topic Title: Space Debris Pollution - Orbital Sustainability

Audience: SpaceX's Board of Directors

Sustainable Development Goals

SDG #13: Take urgent action to combat climate change and its impact.

SDG #17: Strengthen means of implementation & the Global Partnership for Sustainable Development.

Executive Summary

Space Exploration Technologies Corp, founded by Elon Musk in 2002, is a pioneer in private sector launch service provider and satellite communication currently operating heavy rockets (Falcon 9 and Falcon Heavy) and spacecraft (Dragon and Starship). Starlink satellites are an internet constellation with coverage extended to over 70 countries. In this aim, SpaceX has launched 5828 satellites which are currently in orbit raising the concern of space debris and the threat it poses to the current climate.

With the Federal Aviation Administration claiming 85% of the expected risk from these satellites, the issue is now a global concern. In addition to this, frequent launches have increased the on-ground debris that affects wildlife and people near the launch station, threatening the already escalated climate issues. Furthermore, the issue of space debris concerns everyone on the planet as the re-entry of this debris is not restricted to a specific country or location. The probability of debris hitting populated areas is offset due to Earth being 70% water body, however, the damage to Earth's atmosphere and water bodies due to these heavy-weighting satellite debris is real and drastic. Another issue with space debris even if the specific bands are licensed by SpaceX is that these could potentially collide with satellites of other countries and trigger international conflicts, violating SDG #17.

In this regard, SpaceAvengers Consulting aims to highlight some recommendations for a more accountable and sustainable business model, that not only reduces the risk of debris but also aims at increasing the overall growth of SpaceX. Some of these recommendations are aligned with the legalities surrounding orbital sustainability, space law regulated by the United Nations Office for Outer Space Affairs, and business guidelines in the space industry. This in turn aligns with SpaceX's mission "to revolutionize space technology with the ultimate goals of enabling people to live on other planets."