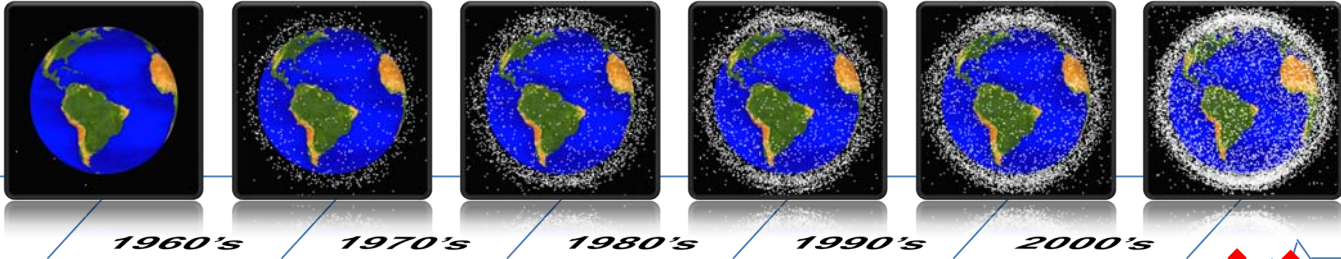


An Investigation of U.S. Orbital Debris Policy Changes to Support LEO Conservation

Thomas Percy, Mechanical & Aerospace Engineering



Overview: Low Earth Orbit, A Global Natural Resource At Risk

The world relies on the services provide by satellites in Low Earth Orbit. However, our lack of forethought has allowed orbital debris to accumulate increasing the risk for catastrophic collisions like the Iridium-Cosmos collision of 2007. Left unchecked, this problem will grow until entire regions of LEO are rendered unusable. A shift in space policy is required to help conserve LEO.

LEO By The Numbers	
25	Suggested max. number of post-mission years for a LEO sat ("The 25-year Rule")
80%	Current 25-year Rule compliance rate
48%	U.S. share of active satellites in LEO
400	Total number of in active satellites LEO
11,400	Total number of tracked objects in LEO
500,000	Estimated number of objects big enough to do damage but too small to track

TODAY'S PROBLEM

LEO is becoming increasingly crowded. There are currently over 11,000 unclassified, trackable objects in LEO; Only 400 are active satellites.

The current regulatory system of the U.S. is fragmented with 6 licensing authorities providing guidance (not regulation) in accordance with the National Space Policy and the U.S. Government Orbital Debris Mitigation Guidelines.

WILL GET WORSE TOMORROW

Business-as-Usual operations will result in a cascading increase in population as objects collide creating zones of LEO where over-crowding makes spacecraft operations too risky

Key Findings: What Makes Effective LEO Conservation Policy

- Centralized governance
- Management rather than guidance
- Immediate 25-year rule compliance

Shifts in policy will be the cornerstone of LEO conservation by promoting responsible use of this vital natural resource

UNLESS SOMETHING CHANGES

Higher (>90%) compliance rates with post-mission disposal guidelines can bring population growth rates to near 0, maintaining low risk regions of LEO for operations