

ORBITAL DEBRIS RECOVERY

Don't burn it. **Reclaim it.**

Proposed autonomous drone-swarm architecture for orbital debris
Pre-flight · simulation and design validation · no flight results claimed.

8,000+

Metric tons of debris in orbit

~1M

Pieces lethal to satellites

Orbitalreclaim LLC · Sacramento, CA
orbitalreclaim.polsia.app

THE PROBLEM

Orbit is filling up. Nobody is cleaning it.

Mega-constellations are deploying thousands of satellites. Collisions generate thousands more fragments. Current debris removal costs \$100M+ per object. At that rate, Kessler Syndrome triggers before we clean a fraction of what is up there.

The gap: too small for existing solutions, too large to ignore.

Astroscale and ClearSpace target 100kg+ objects at \$82–110M per removal. The 1–10kg debris class — highest collision frequency per object — has no economical solution. OLE v2.0 fills this gap.

8,000+

tons of debris

~1M

lethal fragments

\$100M+

per object (current)

OUR SOLUTION

Autonomous drone swarms.

Coordinated fleets of mass-produced drones that sweep debris fields in parallel.
One mothership deploys dozens of capture agents per orbital pass.

Preserve, Not Destroy

Capture and process materials in orbit instead of burning them up. Aluminum, titanium, and rare metals become feedstock for in-space manufacturing.

Fleet Economics

Orders of magnitude lower cost per object at scale. Mass-producible drone units — linearly scalable coverage of orbital lanes.

Orbit-by-Orbit Coverage

Systematic sweeps across congested altitude bands — LEO first, then MEO and GEO as the fleet scales. No target left behind.

KEY DIFFERENTIATOR

We organize, preserve, and protect orbital infrastructure.

OLE v2.0 doesn't just remove debris — it manages the orbital estate for the long term.

Fleet economics, not mission economics

Autonomous Drone Swarms

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Reclaim, Don't Destroy

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Revenue From Waste

Debris removal contracts fund operations. Recycled materials sell to in-space manufacturers. Two revenue streams, one platform.

COMPETITIVE ADVANTAGE

OLE v2.0 vs. current approaches.

Factor	Industry Standard	OrbitReclaim
Architecture	Single spacecraft per target	Drone swarm per orbit band
Cost per removal	\$86M+ (ClearSpace-1)	Orders of magnitude lower at scale
What happens to debris	Burned in atmosphere	Recycled into raw materials
Throughput	1 object per mission	Multiple objects per deployment
Revenue model	Cleanup contracts only	Contracts + material sales
Target class	100kg+ large debris	1–10kg fragments (underserved)

MARKET POSITION

OLE v2.0 does not compete with Astroscale or ClearSpace — it fills the gap they have left. The 1–10kg debris class has no current economical solution.

TARGET CUSTOMERS

Five customer segments — three near-term, two future-stage

Mega-Constellation Operators

SpaceX, Amazon, OneWeb. Proactive lane enforcement to protect operational assets. High-frequency, recurring revenue contracts.

Space Insurance

Insurers pricing collision risk for LEO constellations. OLE data + enforcement services reduce loss-adjusted claims.

In-Space Recycling Mfrs.

Future stage: material recovery partnerships. Corralled debris clusters become feedstock inventory for orbital manufacturing.

Traditional Satellite Ops

Commercial and government satellite operators requiring debris risk reduction for high-value orbital slots (GEO, MEO).

Government research calls

Targeting Space Force, NRL and NASA NIAC research calls. Future funding, validation, and operational contracts are conditional.

Three revenue streams — near, medium and future term

Mission Contracts

\$1–3M

Near-term (2027–2028)

Per-orbital-plane lane enforcement contracts with mega-constellation operators. Fixed-scope missions: debris characterization + relocation.

Subscription Monitoring

\$50–200K/yr

Medium-term (2028+)

Ongoing orbit monitoring + enforcement services. SaaS-style pricing per monitored orbital slot. Recurring revenue, long-term contracts.

Material Recovery Partnership

Revenue share

Future-stage (2030+)

Revenue share from recovered materials (Al, Ti, rare metals) sold to in-space manufacturing operators. Future upside once corralling infrastructure is established.

PHASE I OBJECTIVES

\$150–225K · 6 months · three

deliverables.
If future Phase I funding is awarded, it would support simulation + design validation. No hardware launch is required for that proposed scope; Phase II hardware and operational proposals remain conditional.

PHASE I — 6 MONTHS

Technical Baseline & Simulation Validation

Orbital Mechanics Simulation

Planned high-fidelity N-body simulation of 5-drone swarm operations across LEO orbital bands. It would model relocation and corral metrics: 9Gb budgets, inter-drone spacing tolerances, debris tagging accuracy, and formation stability under J2 perturbation.

Hardware Prototype Design

Proposed engineering design package for the drone bus: cold-gas propulsion module, electroadhesive grapple system, LiDAR/vision sensor suite, and onboard compute. It would include mass, power, and thermal analyses.

Autonomy Stack Validation

Planned hardware-in-the-loop (HIL) validation of the decentralized swarm consensus protocol. The test plan would exercise GPS-denied relative navigation, communication latency, and fail-safe dispersal; no completed HIL or flight result is claimed.

Conditional Phase II pathway: If future funding and validation are secured, OLE v2.0 could seek \$750K+ through an eligible NASA SBIR or SpaceWERX opportunity. The SDA's \$52.5M award is market context only.

LET'S TALK

Space shouldn't be a landfill. It should be a supply chain.

Building the infrastructure to make that real. Sacramento, CA to low Earth orbit.

OrbitReclaim

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Ready to discuss partnership, investment, or operational debris contracts?

Request a demo at orbitreclaim.polsia.app/demo

POLICY TAILWIND

The FCC's 2022 rules now require LEO satellites to dispose within 5 years (down from 25-year guideline).
Thousands of existing satellites don't comply — driving demand for active debris removal services.

