

OAZIS - project Business Plan



Executive summary

What we do. OAZIS-1 is a modular LEO station that **captures** large debris, **recycles** it into **rods/plates/wire**, and **sells** those materials **already in orbit** (Materials-as-a-Service, “MaaS”). Near-term revenue comes from **inspection services**; step-up revenue arrives with **ADR (Active Debris Removal) missions** and **MaaS** as recycling comes online.

Why now. Tightening deorbit/“zero-debris” norms are creating paid demand for inspection and removal. Builders exploring in-space manufacturing benefit from buying stock in orbit instead of launching every kilogram from Earth.

Economics at a glance (5,000 kg “Small” configuration).

- Two public SpaceX price bands:
 - **A) Rideshare list: \$6,500/kg → Year-1 CAPEX ≈ \$113.53M (\$22,706/kg built)**
 - **B) Falcon 9 dedicated list (~\$67M): → Year-1 CAPEX ≈ \$158.81M (\$31,763/kg built)**
- 3-Year P&L: Y1 negative during build; Y2 modest (inspections + early MaaS); Y3 strong (first ADR delivery + MaaS ramp).

Problem & Why Now (brief)

- LEO congestion and end-of-life spacecraft raise collision risk and insurance/operating costs.
- Regulators and programs increasingly **require** remediation (deorbit or removal).
- Operators need practical, price-clear options; public ADR awards demonstrate **willingness to pay**.

Solution (plain language)

- **Capture:** approach, stabilize, and secure non-cooperative targets using **standoff sensing** and **cage/coil/arm** capture options.
- **Process:** **passivate → cut/sort → smelt/cast** (induction + solar assist) into rods/plates/wire.
- **Power:** high-specific-power solar arrays plus **H₂/O₂ fuel-cell loop** for night/peaks.
- **Sell:** standardized in-orbit stock at **\$2,000/kg** baseline (typ. range \$500–\$3,500/kg).
- **Operate:** start with **inspections**, then **ADR**, then **recycling at scale** (MaaS).

Block	Mission (short)
B0 Core & Hall (Spine)	Structural spine and connecting hall: power/data/fluids trunks, shielding, mounts, internal rails, docking interfaces
B1 Capture	Standoff sensing; stabilize & capture via cage/coil/arm; retreat envelopes
B2 Processing	Passivation, cut/sort, induction/solar smelt → cast rods/plates/wire; slag/particulate management
B3 Power & Storage	Solar arrays; tanks; electrolyzer; H₂/O₂ fuel-cell stacks
B4 Inspect & Robotics	Proximity ops; LiDAR+camera navigation; manipulators; buffer handoff
B5 Comms & Docking	RPOD sensors; GN&C avionics; high-gain comms; docking ports
B6 Logistics & Inventory	Materials bay; racks; containment; truss/adapters

Operations App (two-panel dashboard)

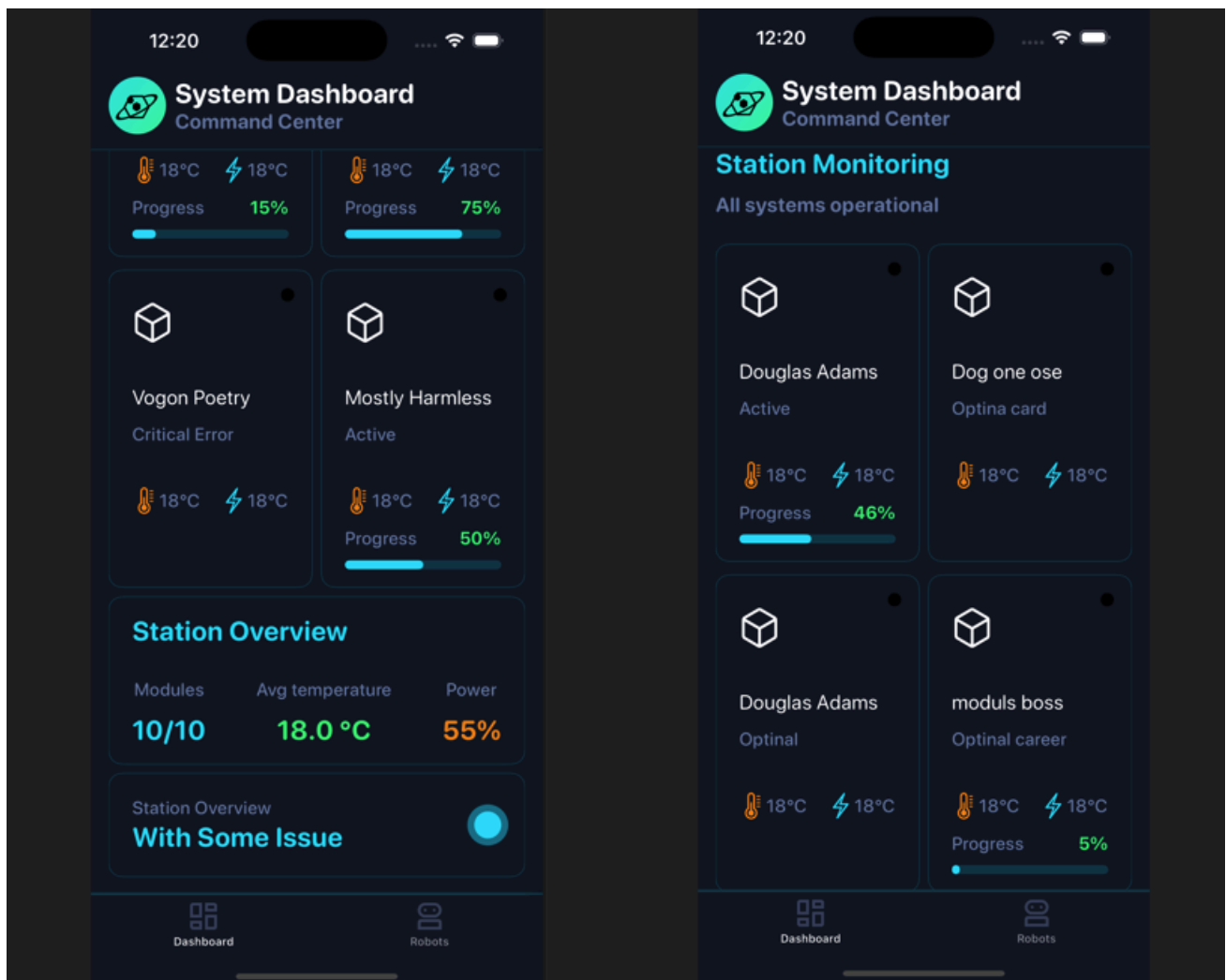
Login → Station account

Panel 1 — Station Overview

- Live status of all **7 blocks** and the station (power, thermal, comms, storage).
- Overall system calculations/metrics (Δv margins, energy budgets, throughput).
- **Instant alerts** if any value exceeds safe limits; color-coded warnings; exportable incident report.

Panel 2 — Robot Management

- Map of each robot's location (hall, module, external).
- Per-robot status & current task queue.
- **Direct commands**: “Return to station”, “Recharge”, “Process debris”, “Hold position”, “Begin passivation”, etc.
- Queue control (assign/sequence/pause/resume), safety interlocks (keep-out zones, automatic retreat).



Business Model & Pricing

- **Inspection Services: \$0.5–\$2.0M** per target (scope-dependent).
- **ADR Missions: \$10–\$80M** per object (mass/altitude/ Δv /tumbling/legal drive price).
- **MaaS (rods/plates/wire): \$2,000/kg** baseline (typ. \$500–\$3,500/kg) to undercut Earth-launch + logistics.

Market & Customers

- **LEO constellation operators** (inspection, risk reduction, compliance).
- **Space agencies & primes** (pilot ADR, debris mitigation).
- **In-orbit manufacturers** (buyers of rods/plates/wire).

Differentiation: ADR players get paid once; **OAZIS-1 monetizes each sortie twice**—ADR fee now and materials inventory later.

Block	% of CAPEX	A) \$113.53M	B) \$158.81M
B0 Core & Hall (Spine)	15%	\$17.03M	\$23.82M
B1 Capture	16%	\$18.16M	\$25.41M
B2 Processing	22%	\$24.98M	\$34.94M
B3 Power & Storage	20%	\$22.71M	\$31.76M
B4 Inspect & Robotics	10%	\$11.35M	\$15.88M
B5 Comms & Docking	9%	\$10.22M	\$14.29M
B6 Logistics & Inventory	8%	\$9.08M	\$12.70M
Total	100%	\$113.53M	\$158.81M

3-Year Financials (USD)

Revenue

Item / Year	Year 1	Year 2	Year 3	Notes
Inspection Services	\$600,000	\$2,000,000	\$4,300,000	Paid imaging / assessment
ADR Missions	\$0	\$0	\$35,000,000	First large ADR delivered in Y3
MaaS (rods/plates/wire)	\$0	\$1,200,000	\$6,000,000	~600 kg/yr (Y2) → ~3,000 kg/yr (Y3) at \$2k/kg
TOTAL INCOME	\$600,000	\$3,200,000	\$45,300,000	

Operating Expenses (OPEX — excludes CAPEX) (USD)

Item / Year	Year 1	Year 2	Year 3	What this covers
Ground Ops & Development	\$1,200,000	\$2,000,000	\$4,000,000	Mission control, engineering, tooling
Data / SSA & Cloud	\$300,000	\$800,000	\$1,000,000	Tracking data, cloud compute, storage
Insurance & Compliance	\$200,000	\$500,000	\$1,500,000	Licensing, liability, regulatory
Marketing / Business Dev	\$300,000	\$700,000	\$1,500,000	Sales, partnerships, outreach
TOTAL OPERATING EXPENSES	\$2,000,000	\$4,000,000	\$8,000,000	

Operating Result (Income – OPEX) (USD)

Year	Result
1	–\$1,400,000
2	–\$800,000
3	+\$37,300,000

Qualification & Survivability (proof we survive launch/LEO)

- **Launch environments (SpaceX):** random vibration, acoustics, shock/pyroshock, quasi-static/sine-burst—designed and tested to launcher user-guide envelopes.
- **Space environments (LEO):** thermal-vacuum & cycling (GEVS/ECSS practice), **outgassing** (ASTM E595), **atomic oxygen** coatings/selection, EMI/EMC, radiation (TID/SEE on critical parts), **MMOD** shielding analysis.
- **Process:** design to environment → **qualification** (protoflight/qual levels) → **acceptance** on flight units → materials control and bake-outs → AO/radiation mitigations.

Risks & Mitigations (top 6)

1. **Non-cooperative capture** → staged demos; start cooperative; strict retreat envelopes.
2. **Regulatory/ownership** → owner-consented targets via agency pilots; clear passivation & return plans.
3. **Insurance/liability** → premiums budgeted; standardized ops & containment; indemnities inside pilot frameworks.
4. **Δv /propellant margins** → conservative budgets; tug partnerships; tiered target list by altitude.
5. **Throughput shortfall** → start with aluminum; validate alloys; scale furnaces; maintain buffer inventory.
6. **Schedule slip** → dual-track revenue (software/inspections) cushions cash.

Roadmap & Milestones

- **0–6 months:** finalize design & suppliers; OF-Console MVP (two-panel app); SSA partnerships; inspection-demo definition.
- **6–18 months: inspection demo flight;** publish imagery/targeting; sign pilot ADR; order long-lead for B2/B3.
- **18–30 months: cooperative capture demo;** finalize launch manifest; integration/test.
- **30–60 months:** deploy **OAZIS-1 core + two modules**; first **MaaS** sale; deliver **first ADR**; expand to full 7-block capacity.

Funding Plan & Use of Funds

- **Non-dilutive:** agency grants/pilots (e.g., debris-mitigation programs), national innovation funds.
- **Strategic:** primes (tooling/cert), rideshare providers, SSA data partners.
- **Equity:** Seed/Series-A staged to milestones (inspection → capture demo → first ADR).

Use (Year-1): B2/B3 hardware, capture kit builds, qual testing (vibe/acoustic/TVAC), launch integration, ops & insurance, initial robots and spares.