Aegis-Class Rover

Pressurized Mobility for a Permanent Lunar Workforce

Mission Purpose

The Aegis-Class Rover is a **pressurized, shirtsleeves lunar vehicle** built for the era *after* flags-and-footprints.
It enables **long-duration missions, industrial prospecting, water operations, and surface logistics** across the Moon — safely, comfortably, and at a scale no EVA-only rover can match.

Aegis isn't a "car."
It's a **mobile surface habitat**, engineered for 30–60 days of autonomous operations and integrated directly into the Aegis orbital–surface logistics chain.

Why a Pressurized Rover

Open rovers (ATV-style vehicles) solve early sortie missions.
Aegis solves *permanent lunar presence*:

- No time limits from EVA suits

- Full thermal control, air, water, and CO_2 scrubbing

- Medical bench + workspace

- Safe shelter during solar particle events

- Crew can work, rest, plan, repair, and sleep **without depressurizing**

This eliminates the single greatest bottleneck in lunar exploration: **EVA fatigue**.
A pressurized rover multiplies crew productivity by 4–6× over EVA-only concepts.

Core Capabilities

Crew Operations

- Supports **2–4 crew** (standard)

- Expandable with modular passenger modules

- Shirtsleeves environment with full life support

- Sealed, dust-mitigated interior

Mission Duration

- **30–60 days** independent operation

- Redundant thermal + atmospheric systems

- Solar + fuel-cell hybrid power

Autonomy

- Manual, semi-autonomous, or fully autonomous

- Return-to-base and autonomous scouting modes

Safety Systems

- Integrated solar storm shelter

- Active thermal management

- **Self-righting system** for tip/roll recovery

Vehicle Architecture

The rover uses a **modular train-style configuration**, allowing mission-specific arrangements:

Module Types

Module	Length	Description
Command Module	~10m	Crew controls, nav, pilot berth
Passenger Module	~24m	Seats/berths for up to 24 crew
Cargo Module	12–24m	Tools, ISRU equipment, storage
Systems Module	~6m	Fuel, power, cooling, comms

All modules share standardized mechanical, electrical, and data interfaces.

Mobility & Terrain Performance

- Wide-grip all-metal treads or hybrid inflatable options

- Active terrain-following suspension

- **Cruise speed:** 10–15 km/h

- **Sprint:** up to 25 km/h

- **Range:** 100–500 km (mission dependent)

- Designed for:

  - Regolith dunes

  - Crater rims

  - Rock fields

  - Long-distance exploration

Power Systems

- **Primary:** solar array + battery storage

- **Night ops:** fuel cell or radioisotope unit

- **Docking recharge option** at outposts or lander buses

Redundant system keeps mobility + life support online for **the full mission duration**.

Mission Roles

The Aegis Rover supports the full surface lifecycle:

• **Water & Resource Prospecting**

Carry tools, sensors, drills, ISRU payloads.

• **Construction & Logistics Support**

Haul equipment, deploy robotics, serve as a mobile command post.

• Long-Range Crew Transport

Move teams safely between outposts, sites, domes, and landers.

• Emergency Shelter & Medical Response

Pressurized refuge during solar events or EVA incidents.

• Tourism, Science, & Exploration

Pressurized visibility modules optionally included.

Integration With the Aegis Ecosystem

The rover isn't standalone — it's a surface node in a larger architecture:

- **Aegis Station** (lunar orbit habitat) for planning, comms, and repair

- **Short-Hopper landers** for crew/cargo handoff

- **Long-Hauler transports** for orbital logistics

- **Tanker fleet** for water/ISRU operations

- **WOK prospecting rovers** feeding data to Aegis surface missions

This creates a **closed-loop mobility and water-logistics system** from lunar orbit to surface.

Long-Term Vision

Aegis Rovers can operate singly or as **multi-module caravans**, forming a surface network that enables:

- Industry

- Science

- Tourism

- Settlement

This is the mobility backbone of a **living lunar economy** — not just exploration.