TerraOS

The Operating System for Land-Based Assets

Underwriting, operations, metering, and capital for every productive acre — outdoor hospitality, storage, residential communities, agriculture, energy leases, and specialty real estate on a single programmable substrate. Every dollar reconcilable to a joule of real-world flow.

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Domain
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01

Executive Summary

Land is the oldest asset class and the last one still run on spreadsheets, whiteboards, and disconnected point tools. TerraOS is infrastructure that brings a piece of productive ground — whether it is an RV site, a storage unit, a pasture, a solar array footprint, or a mobile-home pad — into a single programmable system.

What it is

A substrate of five primitives — **parcel, asset, meter, ledger, identity** — extended by six functional modules (sense, underwrite, operate, market, capital, govern) and pluggable domain packs for every use of land.

Who it is for

Sponsors, operators, REITs, family offices, fund managers, and stewards of working land. The customer can be running one park, ten storage facilities, a thousand grazing leases, or a mixed portfolio across all of the above.

How it works

Every dollar, every kilowatt-hour, every booking, every lease, every distribution — all live in one signed, reproducible ledger. The LP waterfall reconciles to last night's flow meters.

Why now

Land-based assets are consolidating fast. Institutional capital, edge hardware, accessible compute, and AI-grade pipelines make it possible — for the first time — to manage a whole asset class on one substrate.

02

The Land-Based Asset Opportunity

Most productive land in the United States sits outside the commercial-office and retail stack that dominates real estate software. Those asset classes are fragmented, under-digitized, and moving rapidly under institutional rollup.

~10K
RV parks & campgrounds
90%+ owned by operators with fewer than five properties
~60K
Self-storage facilities
Heavy small-owner base with growing institutional rollup
~44K
Manufactured-housing communities
Durable cash yields, sticky tenants, chronic tech gap
~2M
U.S. farms & ranches
Crop, grazing, timber, aquaculture — all leasable land
~5K+
Marinas & boat clubs
Slip-as-site economics, identical to RV in shape
Growing
Energy ground leases
Solar, wind, battery, and microgrid land contracts
The Shape of the Market

Across every one of these categories, the same pattern repeats: a very large number of small owners; a long-running pressure toward professionalization; institutional capital arriving; and operators asking for a system that

understands their business end-to-end. The underlying data model — parcels, the assets on them, the meters measuring them, and the dollars flowing through — is identical.

03

The Platform

TerraOS is organized as four stacked layers. The bottom is a common substrate shared by every customer. The top is asset-class plug-ins. In between sit the modules that do the work and the federation points to the rest of the Transaction Science family.

Figure 1 · Four-Layer Architecture

The Five Primitives

Every productive acre reduces to the same shape. The substrate makes that shape programmable so every module can read from and write to it safely.

⌖
Parcel

APN, lot, easement, zoning, title chain. One canonical record per piece of ground.

▦
Asset

Sites, pads, slips, units, bays, buildings, rows, towers. Composable hierarchy.

⚡
Meter

Telemetry in joules. Electricity, water, propane, sewer, labor, thermal.

$

Ledger

Every dollar tied to parcel + asset + meter. Signed, immutable, reconcilable.

⊙
Identity

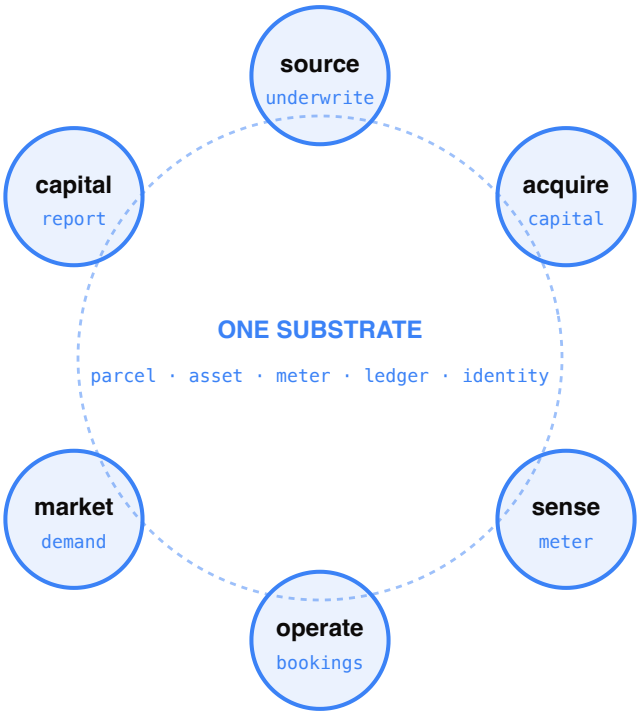
Owner, GP, LP, tenant, guest, vendor, inspector. Every actor credentialed.

04

Six Functional Modules

Each module is a standalone product. Together they close the loop from sourcing a parcel all the way to returning capital to investors and reinvesting into the next acquisition.

Figure 2 · The Operating Loop



terraos / sense

Sense

The edge fleet. Cellular submeters, smart locks, flow meters, environmental sensors, occupancy counters, access gate ALPR, drone-survey ingest. Every reading normalized to joules and written to the substrate.

terraos / underwrite

Underwrite

Parses seller T-12, rent rolls, utility bills, and PMS exports into a normalized site-level operating model. Sources deals by crawling public listings, registers, and assessor data. Scores succession risk on owners.

terraos / operate

Operate

Booking and tenancy, dynamic pricing, guest and tenant comms, maintenance dispatch, utility billing, vendor routing, inventory. Open APIs so existing PMSs federate in rather than get ripped out.

terraos / market

Market

Listings, channel distribution, aggregator feeds, direct-booking sites, referral and franchise overlays. One engine for renting an RV site, a storage unit, a grazing parcel, or a solar lease.

terraos / capital

Capital

Syndication, LP onboarding, cap table, waterfall, preferred returns, distributions, K-1s, refinance modeling, exit scenarios. Routes through TX Science and SettlementScience for all money movement.

terraos / govern

Govern

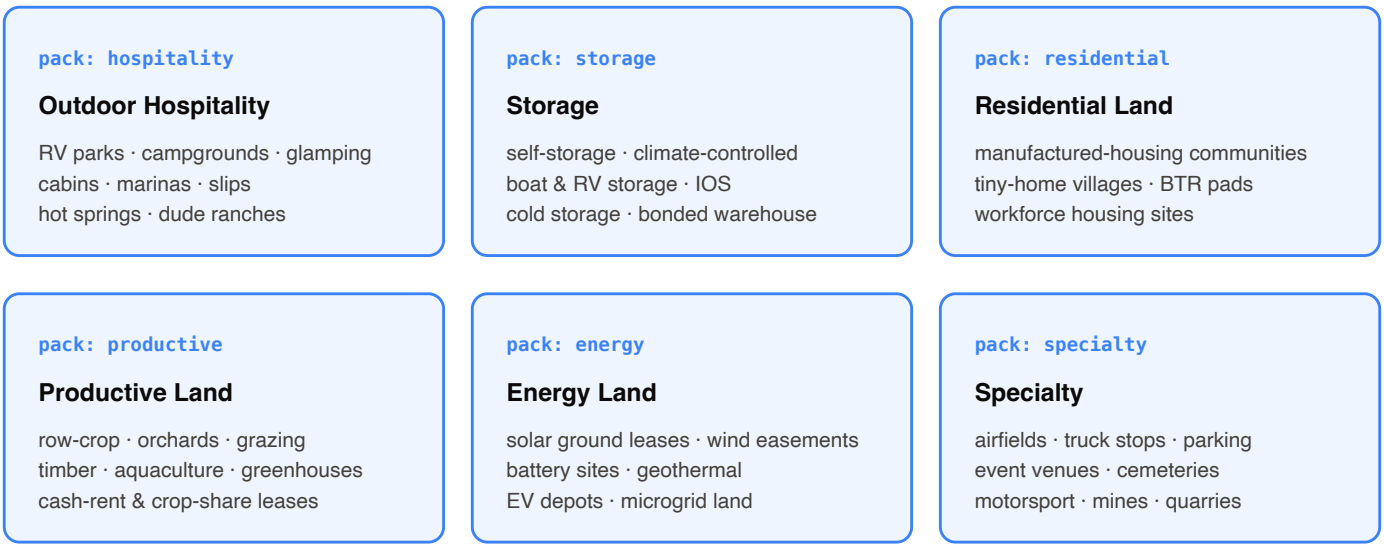
Zoning, ADA, environmental, franchise overlays, HOA, property tax, title insurance renewals. Reg D, Reg A+, blue-sky, AML. Continuous, per-parcel, per-offering compliance.

05

Asset Classes

Each domain pack is a thin plug-in: vocabulary, comp sets, pricing rules, hardware profiles, and regulatory overlays. The substrate and the six modules do not change. A mixed portfolio is one data model.

Figure 3 · Asset-Class Matrix



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How Customers Use TerraOS

TerraOS is deployed across many customer shapes. Five illustrative scenarios follow. Each sees the same substrate — the modules and domain packs are composed to the customer's situation.

Scenario 01

Outdoor Hospitality Syndicator

A sponsor acquires RV parks and campgrounds through accredited-investor syndications. Before TerraOS, the team stitched together a PMS, spreadsheets for T-12 analysis, a separate portal for investors, and QuickBooks for accounting. With TerraOS:

- **Underwrite** ingests the seller's T-12 and utility bills and builds a site-level operating model with hookup-type mix, seasonality, and energy-denominated cap-rate comps.
- **Sense** installs cellular submeters on every pedestal at close. The day after closing, every kWh sold shows up in the ledger.
- **Operate** runs the booking engine, dynamic pricing, and maintenance dispatch. The PMS is federated in; existing guest data is migrated in place.
- **Capital** runs the cap table, waterfall, and quarterly distributions. LPs log in and see distributions reconciled to real revenue, not manual summaries.

Scenario 02

Multi-Facility Storage Operator

A regional self-storage operator has 18 facilities and wants to professionalize operations before a recapitalization. TerraOS connects to the existing gate controllers and smart locks via the sense module, pulls unit occupancy and delinquency into the substrate, and runs rate optimization through market. The investor data room for the recap is a read view on the same ledger the operations team uses daily.

Scenario 03

Mixed-Asset Family Office

A family office holds RV parks, a self-storage portfolio, three MH communities, and several solar ground leases. Instead of four stitched stacks, TerraOS presents one portfolio dashboard: NOI per asset, cap rate by class, utility pass-through margin, LP distributions, and insurance renewal calendar. The audit and tax function draws directly from the ledger.

Scenario 04

Working Land Manager

A farmland manager handles 120,000 acres of row crop, grazing, and timber on behalf of institutional owners. TerraOS tracks parcel, lease, tenant, soil and weather telemetry, irrigation metering, and rent flows. Cash-rent vs. crop-share lease structures are native to the productive-land domain pack. Quarterly reports to the institutional owners generate from the ledger.

Scenario 05

Energy Land Developer

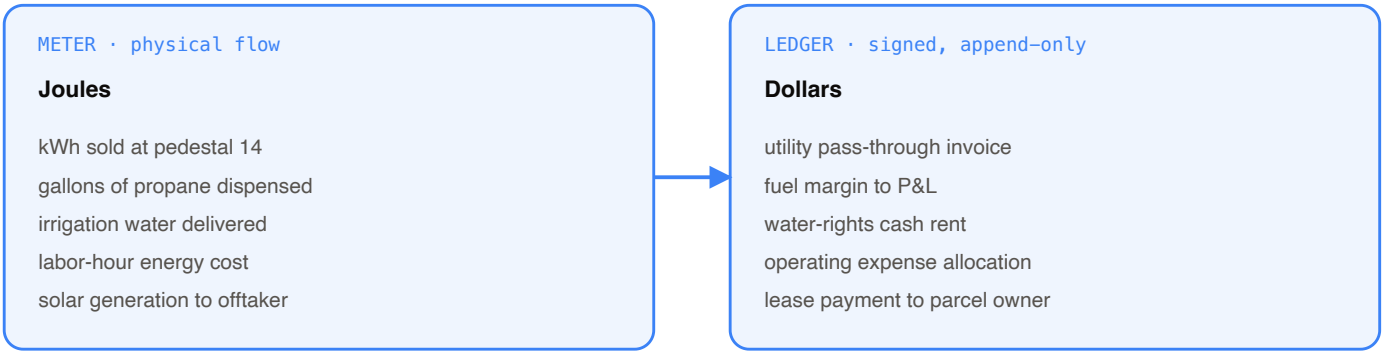
A solar developer holds 9,000 acres of ground leases across three states. The energy-land domain pack models lease escalators, generation telemetry from offtake counterparties, decommissioning reserves, and easement stacking. The substrate is the single source of truth for the owner, the developer, and the offtake counterparty — each seeing the slice relevant to their role.

07

The Economics: The Joule as Unit of Account

Every land-based asset already meters physical flow. TerraOS makes that the native ledger currency. The dollar P&L is a projection of the underlying joule flow. That single choice changes the economics of trust, diligence, and exit.

Figure 4 · Dollar Ledger Reconciled to Joule Flow



What This Unlocks

Diligence

A prospective buyer does not take the seller's T-12 on faith. The ledger is reconstructed from signed meter and booking events — the buyer re-derives the financials independently.

LP Trust

Limited partners see quarterly distributions trace back to specific meters, specific nights, specific units. The waterfall is not a summary; it is a query against a signed log.

Exit Value

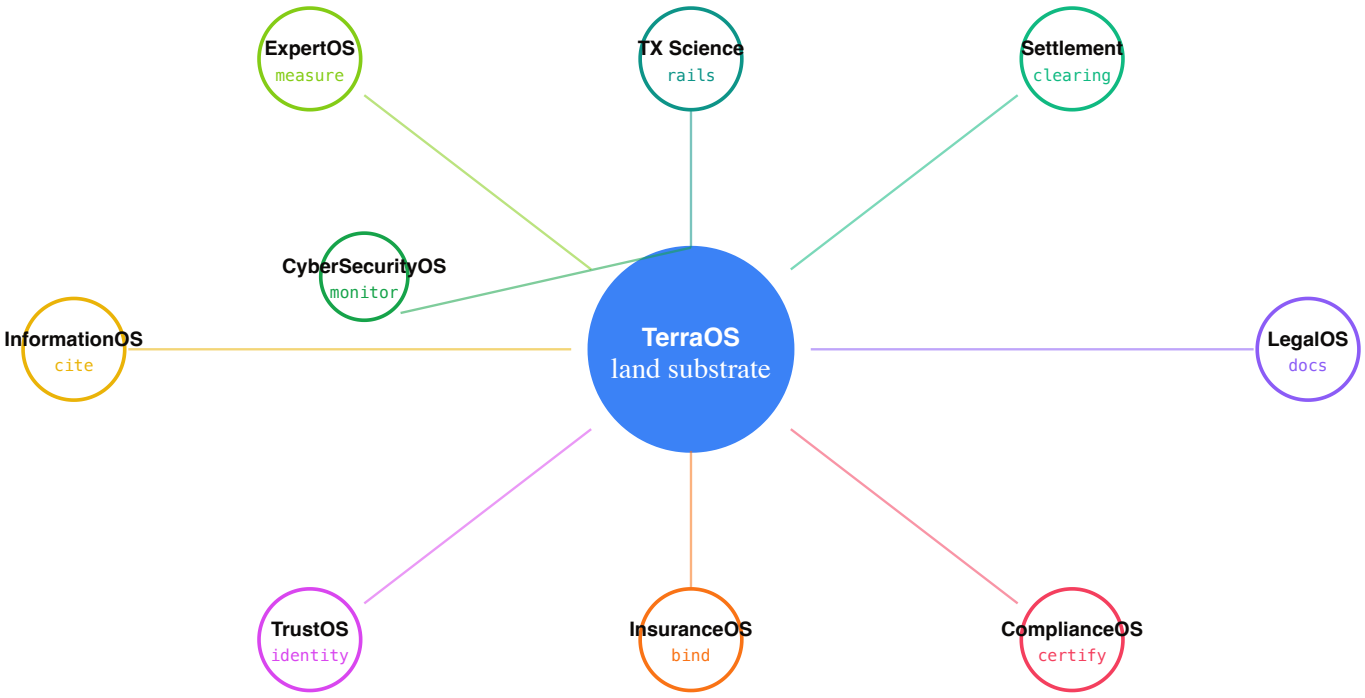
At refinance or sale, the asset carries a multi-year, sensor-attested operating history — a richer and more auditable credential than any Excel package.

08

Transaction Science Federation

TerraOS is a composer. It does not rebuild identity, transaction rails, legal drafting, compliance, or insurance. Instead, every capability that the family already provides federates into TerraOS for every productive acre.

Figure 5 · Federation Network



09

Security, Privacy, and Tenant Isolation

Tenant-held keys

Every customer operates in its own tenant with tenant-scoped keys, storage, and indices. Cross-tenant access requires explicit, signed authorization and is logged immutably.

Edge attestation

Sensor readings are attested at the device and written to an append-only, hash-chained log. A tampered meter cannot silently corrupt the ledger.

Regulated-data handling

PII, investor identity data, and payment credentials are partitioned. Accredited-investor verification runs through TrustOS; payment instructions route through TX Science and SettlementScience.

Continuous monitoring

Every sensor, PMS, and gate-access event streams into CyberSecurityOS as a shared detection substrate — anomalies in edge hardware, booking fraud, and payment tampering surface as measurements.

10

Engagement Models

TerraOS meets customers where they are. Three standard shapes; every engagement can mix and match modules.

Module License

Buy one or more modules as SaaS per portfolio. Common starting points: sense + operate for a working operator, underwrite for a sourcing-heavy sponsor, capital for a syndicator bringing LPs onto the substrate.

Full Stack

Adopt the full six-module platform. The entire deal lifecycle — sourcing, acquisition, operations, capital, compliance — lives in one place. Ships with the federation to the Transaction Science family by default.

Infrastructure Partnership

For institutional operators and REITs, TerraOS is available as a dedicated deployment: private tenant, dedicated metering fleet, direct integration with existing portfolio-management and treasury systems.

Start with a Parcel

The fastest way to see TerraOS is to bring one deal — a park you are closing, a facility you are underwriting, a lease you are structuring — and watch the substrate populate itself.

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Every acre. One ledger.

Underwriting, operations, metering, and capital for every productive piece of land — one substrate, one audit surface, every dollar reconcilable to a joule.

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