Case Study - Spatial Computer Vision & Geospatial AI

Automated Rig Tracker

How Our Satellite Tracking Bot Eliminates $40,000-a-Day Idle Rig Fees

CLIENT BRIEF

High-density shale E&P operator — multi-basin asset logistics coordination

Thousands of sq miles surveyed | 24-hr turnaround | Supply Chain Optimization

01

THE CHALLENGE

Slow Contractor Reports Leave You Paying $40,000/Day For Idle Trucks

An E&P operator managing high-density shale assets was hemorrhaging capital through supply chain desynchronization — trying to coordinate high-cost service contracts with actual wellhead readiness, but three structural gaps destroyed scheduling efficiency.

1

THE STANDBY FEE BLEED

Relying on operator self-reporting and lagging truck manifests meant a 5-to-7 day delay in verifying when a pad was clear. When a drilling rig arrived before a frac crew rigged down, the operator paid up to $40,000/day in non-productive standby fees. Across a multi-basin portfolio, this invisible cost compounded with every misaligned move.

2

THE HIGH-CLUTTER PROBLEM

Off-the-shelf geospatial vision models failed in the visual chaos of active locations. They threw false positives — confusing fluid tanks, sand haulers, and service trucks with active derrick masts and frac spreads. The noise-to-signal ratio on a busy pad rendered generic detection pipelines commercially useless before deployment even began.

3

THE SCALE BARRIER

Manual field scouting across thousands of square miles was too slow and fragmented to support real-time decisions. Scheduling teams made multi-million dollar logistics decisions using data that was days or weeks stale. The economics of physical inspection simply did not scale to the density of a modern shale program.

Overhead imagery from a multi-well shale pad — Permian Basin, Texas. Structural classification applied across full pad footprint.

> *"A 5-to-7 day data lag on pad clearance translated into $40,000 per day of idle rig standby fees."*

PRIOR SYSTEM LIMITATIONS

Pad Status Accuracy	62%
Equipment Classification	54%
Real-Time Coverage	0%

02

THE SOLUTION

A GeoSpace-AI Engine That Tracks Site Progress Without Asking the Crews

Instead of a generic object detector, edgec.io engineered a CV pipeline that reads the spatial geometry and operational lifecycle of heavy wellhead infrastructure — turning satellite imagery into a real-time logistics feed.

CAPABILITY 01

Structural Component Mapping

The model bypasses single-object pixel matching. It isolates and maps the precise physical layout of active sites — recognizing the specific footprint of a frac spread (pumps, blenders, manifolds) or drilling derrick while filtering out peripheral industrial noise.

- Maps full site footprint geometry, not individual object classes
- Differentiates frac spreads, drilling derricks, and dormant pads
- Trained on multi-basin shale imagery across diverse weather and light conditions
- Filters tanks, sand haulers, and service trucks as non-operational noise

CAPABILITY 02

Activity-State Modeling

Moving past static classification, the system analyzes equipment density and orientation over consecutive days to classify live operational status — instantly differentiating between a crew actively drilling, a pad rigging down, or a completely dormant location.

- Lifecycle state tracked across ingestion, drilling, completion, and rigging-down phases
- 6-day advance prediction of asset availability vs. commercial data aggregators
- High-throughput spatial engine ingests vast regional aerial datasets
- Structured asset coordinates output directly into logistics scheduling databases

EXECUTION TIMELINE — 24 HOURS TOTAL

1

HOURS 0–6

Ingestion & Pre-Processing

Regional aerial datasets ingested and orthorectified. Site boundary delineation and clutter-class pre-filtering applied across the full basin. Atmospheric correction and resolution harmonization completed for all pad locations.

2

HOURS 6–18

Detection & State Classification

Structural Component Mapping deployed across all pads. Activity-State Model run across 3 consecutive imagery epochs. Equipment lifecycles scored and flagged. Operational state classifications validated against known reference sites.

3

HOURS 18–24

Validation & Database Delivery

Automated QA pass on all outputs. Asset coordinates and status classifications structured into client's logistics scheduling database. Anomaly flags raised for 11 high-priority pad transitions requiring immediate scheduler attention.

03

BUSINESS IMPACT

Protecting Your Budget and Your Timeline

91.8%
Field verification rate across real-world industrial environments

6 days
Advance prediction of asset availability vs. commercial aggregators

$160K
Reclaimed per critical rig deployment from eliminated standby time

0
Routine ground scouting missions required after deployment

By replacing lagging public filings with **absolute spatial truth**,the pipeline gave the client's scheduling team total operational leverage over field logistics. The system identified the exact day each drilling rig completed its final lateral and began rigging down — a signal that had previously taken 5–7 days to surface through conventional channels.

Armed with 6-day advance visibility into pad clearance, the supply chain team synchronized logistics to **eliminate 4 full days of idle standby time** on a single critical deployment. At $40,000 per day, the result was $160,000 reclaimed on a single move — a figure that compounded across every subsequent rig mobilization in the basin.

Routine physical scouting was **replaced entirely** with an automated anomaly-flagging system. Ground crews now deploy only when the system detects a high-value operational shift — transforming a cost centre into a surgical, on-demand resource with zero idle overhead.

OUTCOME

> *"We knew where every rig was, what it was doing, and when it would be clear — before our own field crews did."*

— Client, E&P Operations Lead

91.8% Detection accuracy

6 Days Early visibility

0 Routine scout runs required