



CASE STUDY:
POWER
ENGINEERS



A Verizon company



How An Engineering Consulting Firm Saved Money, Increased Efficiency, and Preserved Sensitive Wildlife Using Drones



[POWER Engineers](#) is an employee-owned consulting services and engineering firm specializing in the delivery of integrated solutions in a wide range of industries. Based in Idaho, with 40 locations across the United States, as well as an office in South Africa, POWER provides services on projects involving infrastructure, facilities, energy, and the environment.

Several years ago, POWER realized the value that drones could add to their projects. And as a sophisticated consulting firm, they also understood the regulatory, insurance, internal, and client requirements they would need to meet in order to operate successfully. So they did the market research and built a consensus among company leadership. They also considered the data deliverables they needed and worked backward to build a drone program that was versatile and that could start small and scale organically.

POWER Engineers uses drones for a wide range of projects, including:

- Substation construction monitoring
- Transmission line construction access planning
- Substation hardening line of sight analysis
- Transmission line interactive visual simulations application for stakeholder engagement
- Transmission tower construction animation video for public education
- Interactive masterplan
- Landslide documentation
- Remediation site monitoring
- Stockpile volume calculation

“The bulk of our work is in high voltage transmission lines,” said Aaron Ames, POWER’s department manager of [Mapping and Analysis](#). Along with Jason Pfaff, department manager of [Applied Technology](#), Aaron leads POWER’s team in using drones to capture terrain information, high-resolution photography, and collect other sensor data. Aaron and Jason were architects of the drone program at POWER, and they advocate for the technology both within the company and to clients.

Recently, Aaron worked on a transmission line project in Arizona. POWER’s goal on the project was to provide information for planning a transmission line to be constructed in an area that is home to sensitive wildlife, including the protected saguaro cactus.

“Our goal is to supply the access plan, mitigation plan, and that sort of thing,” said Ames in a recent [webinar](#). POWER had to plan the roads that would cut through this delicate landscape, which means taking every single cactus into account.

CHALLENGE:

Gathering environmental data without disturbing the environment

“For environmental permitting, there are sensitive plants and animals in the area, and we need to help the client figure out where these resources are and how to design their access roads to each structure to minimize the impact and calculate how much impact there is,” Aaron said. “We needed information to determine which cactuses needed to be avoided, moved, or replaced.”

POWER was faced with a difficult challenge. They needed to accurately and completely catalog the sensitive wildlife in this area and minimize any damage that might occur as a result of collecting that data. And they needed to do so in the most timely, efficient, and affordable way possible, without compromising data quality.

“Manned flight would have been a good option to collect high-resolution photography and terrain,” Aaron said, discussing his decision. “Another option could have been ground survey with a large field crew with GPS units to get out there and stand by each cactus and do those measurements. That would have put a lot of people on the ground, and it would have required quite a bit of subcontracted work. Both of those options would have taken more time. Both of them would have been more expensive.”

OPPORTUNITY:

Limit environmental impact by using drones and a small field crew

Because POWER Engineers has established a robust unmanned aerial imaging program, they had the tools available to perform the job, and the operational experience to do so smoothly. With a much smaller field crew than they would have used in a ground survey, they placed several ground control points (GCPs) in the desert and collected aerial data with a senseFly eBee fixed-wing drone, which is better suited than rotary aircraft to mapping large areas. The GCPs acted as fixed coordinates for the software to reference, increasing the overall accuracy of the resulting maps by an order of magnitude and yielding high-quality, actionable data for POWER and their clients.

Though placing the GCPs took longer than Ames would have liked—over half the time spent on site was spent establishing them—thanks to careful planning, they had no incidents in over four days of flying, demonstrating their professionalism and high safety standards. Importantly, the operation resulted in reduced damage to protected wildlife and a sensitive habitat was preserved. It just so happened that, in this case, the cheapest and fastest option for aerial imaging also was the most environmentally responsible.

How POWER Engineers Uses Skyward: Tailoring the flight plan to avoid airspace restrictions.

Aaron Ames cited Skyward as an important tool in planning and executing this infrastructure project.

“The biggest thing that we used Skyward for was flight planning and to make sure that we weren’t in airspace that required further authorization,” he said. “We didn’t really have time in our schedule to obtain waivers from the FAA or work with the military. So we were able to tailor this flight into a small area.”

By using Skyward, POWER Engineers increased the efficiency of their workflow and avoided costly delays from wrangling with a months-long waiver process.

POWER also uses Skyward to track their drone operations. “I look to Skyward as a tracking tool that will help us differentiate ourselves and have all that information, especially our safety record, to show clients that we have a robust system that’s tracking everything that we do, from planning to delivery. So if they ask about flight hours and experience, we’ll have that ready, with all our insurance documentation and certifications.”

Lessons from POWER Engineers:

1

Gain buy in from company leadership and risk management divisions by addressing safety concerns and showing how drones will be able to make money, save money, or both.

2

First understand what you want to accomplish with a drone. Then purchase the combination of software, aircraft, and sensors that can support your deliverables.

3

Drones can be cheaper, more efficient, and less disruptive than comparable mapping or surveying methods.

4

Avoid costly delays and legal troubles by using Skyward to plan your flight path to avoid any restricted airspace, if possible.