Drones in Construction, Earthmoving & Engineering

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Building Together, The Right Way

Trying to nail down exactly how many time-, money- and material-saving applications there are for drones in construction, engineering and earthmoving projects is like taking a peek into an architect's or engineer's brain.

There are so many awesome ideas and complex equation solutions that it's nearly impossible to choose the best examples.

We're talking about a seriously wide range of projects; here are some examples: taking exterior shots of a new building at various points over time; measuring aggregates being loaded and unloaded at a project site; determining how much material is being removed from a new flood-control channel every day; documenting subcontractor presence on the job; and protecting your company from liability if there's an accident.

Let's put it this way – when it comes to drone-enabled images, video and data crunching on construction-related projects, the potential is all-out, wide-open, 360-degrees.

Drones, Full-Throttle

Since the number of scenarios for using drones for capturing images and video, collecting data and creating maps and models in construction projects is seemingly infinite, broad-pass categorization can be helpful.

Based on Flight Pros' experience, construction-related applications fall into five general categories:

- Determining feasibility/desirability of a project
- Defining scope of work
- Construction management
- Documenting progress/creating historical records
- Regulatory compliance

Each of these uses for drones provides value to the project. Whether it's contracts enforced, deadlines met or efficiency gained, drones impact the project's bottom line.

Project Feasibility/Desirability

The first questions for any construction project, long before a spade is turned, is, "Should we do this?" Dozens of facts and factors go into answering that question; Drones can help with one in particular.

Using drone-shot images and video, developers, engineers and architects can create 3D models of project sites and the surrounding areas to test out various designs and solutions to potential problems.

A great example is a project we flew for SRF Consulting Group in downtown Fargo, N.D., in October 2017. SRF is a regional engineering, planning and design firm that has been consulting with the city on traffic enhancements. SRF used our aerial video in creating a 3D model/animation for a roundabout at Main Ave. and 2nd Street. *(Click the image to watch the video animation.)*

Fargo city commissioners recently approved the roundabout; drones played a role in helping them make their decision.

Scope of Work

Drones are used in many ways to define scope of work. For example:

- With drone-shot images, maps and 3D models, architects and engineers can gain a better sense of the land characteristics and anomalies for more accurate, real-world site planning.
- Drone-collected data can help determine questions like
  – How much product?
  – Where is the focus of the work?
  – How long do we anticipate our workers on-site?

With those answers, companies can put together more accurate estimates and bids.

- In earthmoving, drone data leads to highly accurate cut-and-fill volume projections.
- Drone use pays for itself quickly in other material volumization applications, as well. *(link to aggregates post)*
- Aerial images provide context and location awareness that isn't possible from the ground.

Construction Management

This subcategory alone covers an immense range. It can involve:

- Monitoring suppliers and subcontractors
- Ensuring deadlines are being met.
- Keeping precise track of materials used or needed.

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- Documenting worker safety.
- Illustrating quality of work.

The list goes on and on.

For project managers, the value of aerial photography and videography can be as basic as gaining a view they can't get from the ground. It provides a great sense of the project progress and provides a different perspective. This can be invaluable in making sure everybody is on the same page as a project moves forward.

Just the potential for monitoring material volumes is tremendous. Think of a project that requires that a specific amount of clay brought in every day. Drone-shot imagery can be converted into 3D models to show almost exactly how much was brought in on any given day compared to a previous day.

- If the amount is less than what was projected and planned for, where's the break in the chain?
- Were the trucks loaded to the agreed-upon levels or were they shortchanged?
- Was the subcontractor's crew a truck short?
- Was there a bottleneck somewhere?
- Was the scale for measuring material calibrated?

With answers to those types of questions, the project manager can make adjustments to save cost and effort and keep the project on track for meeting incremental and final deadlines.

Progress/History |

Before, during and after images and video keep stakeholders up-to-date on how things are going. They might be project investors who demand regular reports; building owners who have a lot riding on meeting deadlines; and, in the case of apartment complexes, future tenants who are anxious to move in.

A great example you might not think of is new golf course construction.

Several years ago, Flight Pros documented the new construction of the Oxbow Country Club course. We had a drone over the construction zone once every two weeks over a two-year period.

Regulatory Compliance

Drone-enabled photos, videos and data also ensure compliance with government regulations.

Take landfill management as an example. Let's say a municipality has a 20-year plan for its landfill. The city has it flown every three months to obtain images and data for creating 3D models.

In comparing the drone data to the plan, the city engineer can see things are looking good on the north side of the pile, but the south side is off the mark because the slope is too steep or the compaction rate isn't quite right in terms of rules enforced by the state health department and Environmental Protection Agency. With that information in hand, the city can adjust and get back into spec.

You Can Build It. We Can Help.

Drone imagery, videography, 2D maps and 3D models – this is powerful, highly valuable info for construction-related industries.

Let's get down to the heart of why we help customers by using drones –

The video and data are about saving time, money, manpower and other resources. It's about making sure projects are progressing as they should and you're protected as they move along. And, looking back, you'll have precise information for every project so you can improve estimating, bidding and executing the next time around.

For construction, engineering and earthmoving, you'll be in good shape from every angle with drones flown the right way.

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