5 THINGS TO KNOW About How Drones are Being Used for Construction in North America
In the construction industry, where jobs are fraught with cost overruns, missed deadlines, untended RFPs and more, drone consultants’ services are in high demand. Construction projects are bedeviled by many factors that can drive up costs, impact worker safety and spawn lawsuits between stakeholders. Drones have made definable differences in this space, since they decrease the need for lengthy visual inspections, reduce planning time, and identify problems by spotting anomalies.

One of the biggest misconceptions about drones in construction focuses on a drone replacing workers or equipment, but that is an illogical worry. Drones are merely an additional tool construction companies can use to gain actionable insights and make more informed decisions for their clients. Autonomous drones and the data they capture and provide for other autonomous operations still need to have humans involved in a critical manner. No matter how developed these algorithms become, humans still need to interact with the data and make decisions. That’s something we can see in terms of how the technology is being applied right now.

Developing a technology roadmap is essential

The challenges that come up when it comes to the first steps that need to be taken with drone adoption are often greeted with skeptical looks, and some professionals may even look the other way or make an investment in the technology, only to quickly discard it when unable to do much more than take aerial photos.
Some companies, like Sappington, are focused on helping other companies to think differently about how they can and should be using technology by creating a vision and roadmap. Sappington has helped companies like Microsoft and IBM work through challenging transitions that saw them move away from a proven business model.

“One of the reasons I got interested in drones and the discussion that’s happening with them in construction is because I saw they could provide a unique visibility that wasn’t available before,” said Sappington Founder and CEO Tim Goggin. “I also saw people considering them just in terms of being ‘shiny objects,’ but that’s what made it a great moment to try and help leaders within construction companies consider technology that enables things like automated inventory across your whole company without lifting a finger. It’s helped them step back and really think about the ways tech can add value to their business.”

The idea is to help a company to develop a vision for how they want to use technology first, and once that’s set, the next step is to create a digital roadmap that lists and prioritizes the technology investments required to achieve the vision.

For example, for a company like Stockpiles Reports, their value is in optimizing a materials yard, especially for companies that are selling those materials to customers. Anyone with these kinds of assets on hand can derive an incredible amount of value from knowing what’s going on with those piles at any given moment in order to recognize when time and resources are not being utilized. Providing better visibility across material yards is a specific example of what a digital vision can look like.
Companies are buying, building and outsourcing their drone needs and services

Making profit from flying drones doesn’t solely depend on buying a drone with a few sensors and flying it around, especially for a job in a construction site where acquiring the right data is key. When establishing a drone business, organizations should think about choosing between implementing their own drone programs, outsourcing, or doing both. Platforms such as PrecisionHawk’s pilot network make it easier for construction companies to scale across all their projects without being dependent on a few internal Part 107 certified pilots.

However, organizations, and anyone who wants to start a drone business should keep in mind that a good consultant should go beyond offering just images and videos. Effectively leveraging drone technology depends on not just capturing data, but on what sort of data is being captured, and how that information is turned into actionable insights.

In addition, drone consultants must carry hull and liability insurance, for the equipment and for bodily injury. They should know which types of flights are permitted and which aren’t. Most construction sites require authorization be given to on-site personnel. Waivers allowing operations beyond the visual line of sight (BVLOS) allows pilots to capture more area in a single deployment, compared to flying a drone within line of sight; this option may be a smart move for the consultant, depending upon the project.

There’s also the need to know which type of sensor benefits a certain job. While many drone operators provide video, photography or one type of sensing equipment on the drone they fly, there are a variety of other sensors available. Using them can enhance the services operators provide for construction clients.
LiDAR sensors augment pre-construction surveying and mapping with a 50 percent-time savings on data capture, compared to traditional techniques. Multispectral sensors can offer vegetation mapping on proposed sites, and volumetric calculations on aggregate material (which helps with materials planning and staging). Thermal sensors can detect hidden anomalies beneath surfaces and check for proper sealing of roofs and windows. And visual sensors can be used to measure the elevation and shape of the terrain, calculate cut-fill volume, create models, and monitor job progress.

It’s not all about the ROI

While there are countless instances where it’s simple enough to measure the difference in time or costs of using a drone, there’s also one aspect that Richard Lopez, Virtual Design and Construction Manager at Hensel Phelps, takes very seriously: safety. If this wasn't the case, Lopez says it’s likely their drone program would look much different.

“To tell you the truth, it’s actually more expensive for us to fly a drone on a site versus us hiring someone out due to our employee rates,” Lopez admitted. “The thing is, we’re not looking at it for the monetary value. We’re looking at it more for the safety aspect. Us having control of the jobsite and knowing that our people aren’t being put in harm’s way and can react to developments much quicker is where the ROI is for us. If we can provide information to the superintendent, and they can then plan their workload and get all their crews in the right locations when they need to be there by looking at the aerial data, right there you have value.”

Jeffrey Freund, Vice President at Firmatek, a data analytics firm using drones to service the construction and mining industries, also thinks the “value of increasing safety, just from a time delay perspective, can be incredible”, adding that “if someone can get a drone in the air and see what they needed to see or even more than they can by walking around a site, I think that’s a huge safety benefit.”

Another important aspect that Lopez puts emphasis on is the type of safety sensors equipped with the drone. By having a strict and stringent protocol in place, Lopez has been able to ensure drones are an asset, rather than a liability. All of it comes back to his focus on reconsidering the true value of drones from the perspective of safety before anything and everything else.
Drones are helping to digitize the construction world

Creating 2D sitemaps and 3D models is one of the advantages of using drones and one that Skycatch is dedicated to. In 2018, a manufacturing agreement between Skycatch and DJI saw the rise of Skycatch’s High Precision package, an all-in-one solution to completely automate operations for the enterprise. By identifying where and how the data captured by drones could create efficiencies, Skycatch and DJI were able to create a solution that represents savings of up to tens of thousands of dollars per week for many construction and mining customers. While one day on a big site or project could cost as much as $4-6 million depending on the site, eliminating a couple of weeks means tens of millions of dollars can be saved. That’s a difference Skycatch technology has made by being able to provide models that are as much as 80% more accurate than ones generated from data gathered by a standard drone.

Komatsu, a Japanese multinational corporation that manufactures construction, mining, forestry, and military equipment, is using Skycatch’s solution to automate operations for their bulldozers, excavators, and other types of heavy equipment. This is “helping them meet their business objectives, but it’s also serving to define what it means to digitize the entire world and digitize as many of the job sites out there as possible”, according to Christian Sanz, CEO at Skycatch.

The technology is being used to streamline communication between departments

Unearth Technologies is one of the companies dedicated to studying how to turn data into actionable information. In an industry where delays and cost overruns have contributed to 20% waste across the market, Unearth is working to utilize data gathered by drones and other devices to drive better decisions and simplify communication, ensuring these issues are resolved before they become a problem.
The company’s software has been used by various construction companies to ensure that crews working on opposite shifts can efficiently share information, and do things like track construction progress on mobile devices. Project managers can easily get a complete summary of jobsite progress and issues to help avoid critical delays. It’s the kind of communication that’s made a real difference to professionals like Derek LoPresti, a project manager at Tiger Construction - a general contractor that handles both civil and heavy highway projects as well as commercial, industrial and institutional building projects.

“The biggest thing the Unearth software allows us to do is effectively communicate with people on the job site every day,” LoPresti continued. “It allows us to extend the physical properties of the job site to someone who might not have it so they can be on the same page as to what they might be experiencing. For example, a superintendent could notify a delivery driver exactly where he wants something to go by sending them a map. They can overlay plans and figure out where conflicts are in the drawings, so there’s a lot of opportunities to help better communicate as a team and to catch things you wouldn’t have noticed otherwise.”