

UAVs in CONSTRUCTION

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I was in the Construction industry for 38 years before a disabling accident ended that career in 2008. That is why I am back in school now. I do not see any other industry that has benefited from the use of UAVs “drones” more than construction. In the 12 years I have been away from Construction, UAVs have revolutionized the Construction industry in so many ways.



[Shane McLendon](#)

The sheer size and scope of the construction industry worldwide, as well as the diversity of projects undertaken, all provide opportunities to add value with the use of Drones. Drone technology, known as unmanned aerial vehicles (UAVs), in construction is becoming ever more important. There are many different reasons for UAVs in the construction industry. By capturing real-time images from the field, UAVs help improve safety, communication, marketing, and have many other advantages. This paper will explore the many different facets of UAVs in construction.

At the beginning of any construction project, there are all the basics. Where to place the project geographically, the location can be placed strategically by factors of logistics, utilities, transportation ..., and by costs of construction. Topography, cuts and

fills, and type of soil. All these require extensive labor to collect data. The use of UAVs for surveying proposed construction sites can save tons of time and money. UAVs are equipped with GPS, and “now with options to read geothermal levels, longer battery life, and incredibly high-resolution cameras” (Anderson 2020), They can also carry LIDAR which allows you to see through existing vegetation. This makes UAVs exceptional pre-project tools.

Once a site is selected you already have detailed survey data that cuts down on the labor for on the ground surveying. This again is saving time and money to get the site prepared for construction. Actual cuts and fills can be monitored with the use of UAVs allowing the project manager to pinpoint adherence to the schedule and react promptly to any problems that may arise. UAVs “Surveys provide critical information that enables informed decision-making ranging from construction site planning, to design and upkeep of infrastructure, to delineating cadastral property boundaries, and more” (Knisely 2019). These all create real-time conditions in the field and take what could be days to weeks of manual surveying.

Most projects have a limited footprint in which to store and or stage materials. UAVs can be an exceptional tool here also. “Drones have become the go-to tool for construction firms to track, map, survey, inspect, and manage worksites more efficiently and safely,” (Goodman 2020) said Dan Burton, founder of DroneBase. During construction, the benefits of UAV’s are numerous. The aerial real time data can be used to solve logistical access problems such as truck delivery and staging areas. Manage stockpile volumes more accurately. Progress tracking and reporting keeping all parties

abreast of project progress. “Spot safety issues, preserve subcontractor relationships, negotiate solutions, maintain accountability, and minimize downtime” (Dennis- et al.).

For marketing, client updates, and proving or un-proving claims using UAVs in construction is invaluable. You have a detailed record of progress (picture worth a thousand words) to show your clients. A 20-minute UAV flight gives Superintendents and Project managers real-time information. This could normally take hours and frees up the time available for more productive use of resources and planning. “It’s also a much safer solution than taking pictures from a crane and more affordable than a helicopter flight,” (Goodman 2020). Making critical decisions because you have real-time information provided by UAVs increases safety. You can see and monitor employees that may be taking unnecessary risks. UAVs “in construction can do a great job of hovering over a location that is too dangerous for a worker to get to and can save lives by monitoring workplace conditions in areas that are very hard to reach” (Anderson 2020).

A big question for construction companies wanting to use UAVs is cost. Whether to have the UAV program in-house or sub-contract it out. “The choice between DIY or using a contractor comes down to how to spread out the need is, Burton said” (Goodman 2020). If you have projects spread out over a large geographic area it would be better to use a contractor in each specific area. The FAA in the USA requires all pilots of UAVs to be licensed as well as registering the UAV itself. Insurance is another consideration that needs to be considered as if anything goes wrong the UAV owner would be responsible. Another developing issue over the use of UAVs is in construction

law. “Construction lawyers should stay abreast of how drones are being used and regulated so that they can effectively advise clients on appropriate contract provisions on projects using drones and be prepared to use data from drones when disputes arise” (DeCamara and McMillan 2019).

Conclusion

The use of UAVs in construction will continue to develop at breakneck speed in the coming years. The short time I have been out of construction and the major advances in UAVs and GIS has led to a remarkable advancement in construction practices. Construction has had the largest percentage of UAVs growth. Between 2017 and 2018 UAV usage in construction raised by 239%. Several UAV software programs are geared toward construction, they allow integration of UAV data into already used construction project management software. UAVs in construction have been shown to increase by 20% the bottom line. The use of UAVs in construction in the future will become a necessity for companies to stay competitive.

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