

Pros & Cons of Aerial Surveying with Unmanned Aircraft Systems (UAS)

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Unmanned Aircraft Systems (UAS) platforms are used to conduct aerial surveys using photogrammetric principles. Depending on the project area and location, data collection via a UAS platform may offer several advantages because of its unique capabilities to capture low altitude imagery and process data using automated Structure from Motion image measurements. Although there are several advantages to using UAS platforms to perform aerial surveying on some sites, there are disadvantages as well to using this evolving technology. Due to weather, regulatory restrictions, and environmental factors UAS can be limited in its application. Below is a list of some of the “Pros” and “Cons” when it comes to utilizing an UAS platform on a project.

Pros	Cons
Cheaper and easier to deploy than manned aircraft	Can cause damage to property and injury to people
Able to quickly gather data on small sites that have non-vegetated bare earth	Photogrammetry from UAS imagery is only reliable on bare earth with minimal vegetation
Generates dense point cloud data that accurately represents the ground’s surface which can be reformatted to evenly spaced 1 foot or 2.5-foot spaced Digital Elevation Models (DEM) for improved data management while maintaining elevation data accuracy	FAA restrictions <ul style="list-style-type: none"> • UAS cannot be flown over non-participants • UAS cannot be flown over roadways in highly populated areas with posted speed limits above 45 mph UAS is not viable for most Preconstruction mapping projects due to FAA restrictions
Data can be processed and delivered within a few days of data collection	Limited capabilities for imagery acquisition in winds higher than 15mph
Can be quickly deployed in emergency situations such as, hurricanes or landslides to obtain data necessary to calculate quantities	More imagery must be captured due to the smaller camera footprint of the UAS which affects data management
Since flights are much lower than fixed wing aircraft, weather conditions such as partly cloudy or overcast have minimal effect on capturing imagery if the cloud ceiling is 500ft above flight altitude	Risk of equipment malfunction during flight <ul style="list-style-type: none"> • Battery failure • Fly away
UAS can be outfitted with LiDAR sensors to gain accurate elevation data in vegetated areas	Can be affected by magnetic deviations, manmade or natural