

UAS MAPPING

Is a Surveying license required?

Explosive growth

The speed at which UAS technology is being adopted is astounding. DJI sales went from \$131m in 2013 to an estimated \$1B in 2016. That trend is expected to continue.

Along with this explosion in drone-based aerial cameras has followed a rise of innovation in commercial drone-based services.

The real explosion of growth in these drone-based services is being held back by legislation. Until the FAA approves the use of drones in more industries than aerial mapping, mining, photography, real-estate and a few others, the overall drone services industry is going to remain rather flat.

In the meantime, the growing number of enthusiast UAS pilots is in contrast with the limited number of

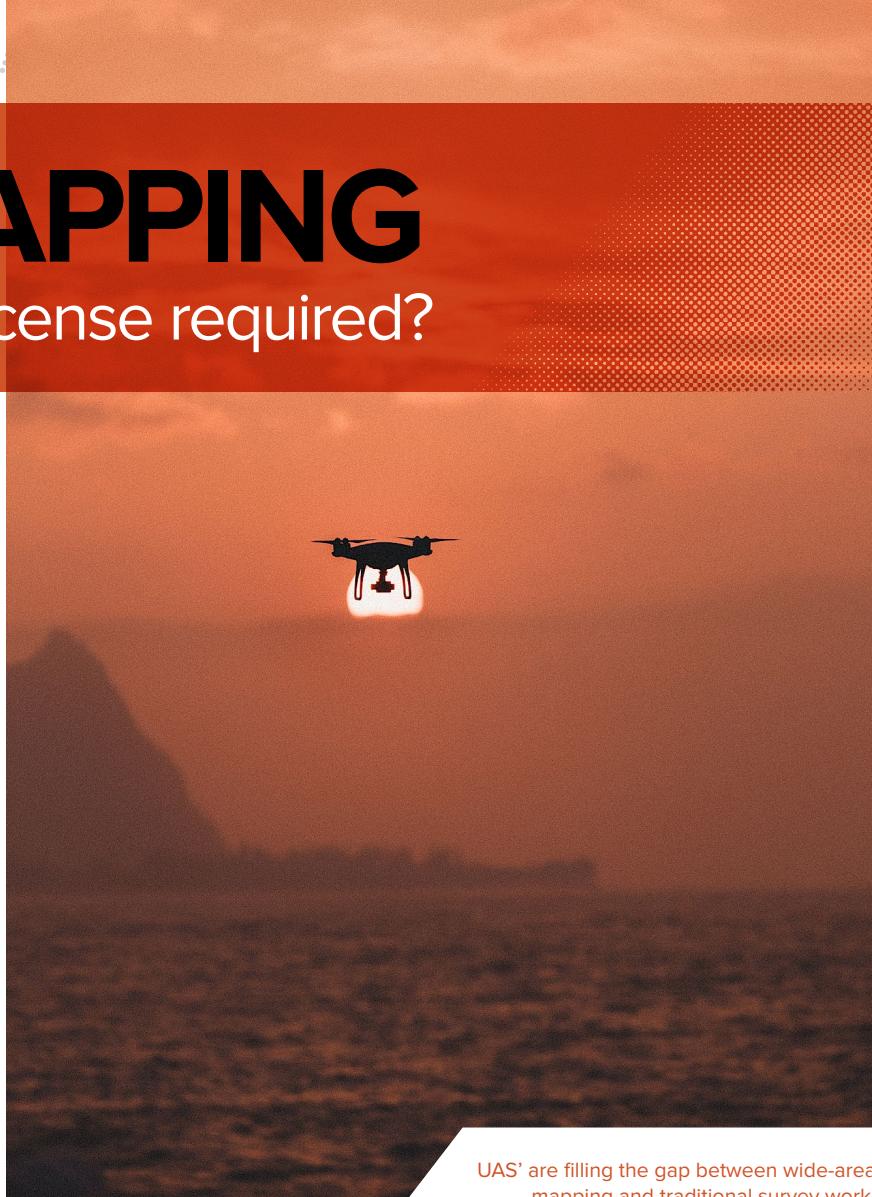
1

opportunities for deploying drones for commercial services. This imbalance is leading to some friction between the two. As enthusiasts expand their skills and capabilities, they naturally start exploring the capabilities of software like Pix4D, DroneDeploy, PhotoScan, Altizure and other easy-to-use

photogrammetry solutions (a more complete list can be found [here](#)).

Examples of enthusiasts making 3D maps:

- thehigh techhobbyist.com/drone-photogrammetry/
- diydrones.com/profiles/blogs/3d-mapping-with-your-drone
- reddit.com/r/DIY/comments/4a02dh/used_a_drone_and_photogrammetry_software_to/



Jakob Owens

UAS' are filling the gap between wide-area mapping and traditional survey work.



BY ANANDA FOWLER

There's a line there.

As 3D technologies take off in the consumer markets via Virtual Reality, 3D Printing and 3D phones (Lenovo Phab2 anyone?), the line between enthusiasm and professional responsibility are being tested.

In response to potential overreach by tech enthusiasts, a number of states have recently passed legislative clarifications to help ensure that professional services are capably provided by qualified service providers. More specifically, to make maps for money requires a license in most states.

Defining where the line between consumer and commercial maps is drawn, has been a work long in progress. Leading the way are professional organizations, such as the American Society for Photogrammetry and Remote Sensing (ASPRS) and the National Society of Professional Surveyors (NSPS).

ASPRS has come up with a broad list of services and skills which fall under the umbrella of the term 'professional' and has established certification requirements for professional members to recognize these individuals as fully qualified and capable of rendering professional services.

You'll find the list here: asprs.org/certification-program/classification-chart-for-photogrammetry-and-mapping-sciences.html

Definitions

Freedom gives us the right to do anything we like. The law gives us boundaries to ensure the safety of the general public.

When the unenviable circumstance of litigation between a customer and mapping provider come into play, the definition(s) of "Land Surveying" come into the spotlight.

These definitions are established by the judicial and legislative branches of government.

50 Shades of Land Surveying

The ASPRS has been helping to draw these lines by clearly and opening discussing these definitions and actively maintaining a list of legal definitions as established by each state.

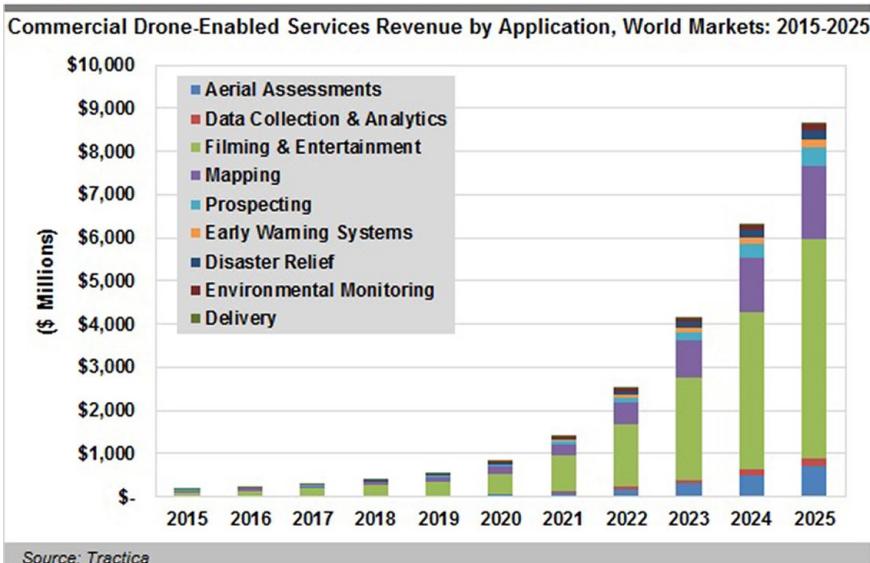
This list is compiled by the ASPRS every few years. The latest was published in 2015. For brevity, here are relevant excerpts from 4 of the 50 states, which are all contained in this ASPRS document; asprs.org/a/divisions/PPD/StateSurveyingRegulations_2015-07-08.pdf.

California

Determines the configuration or contour of the earth's surface, or the position of fixed objects above, on, or below the surface of the earth by applying the principles of mathematics or photogrammetry

Florida

4(a) "Practice of surveying and mapping" means, among other things, any professional service or work, the adequate performance of which involves the application of special knowledge of the principles of mathematics, the related physical and applied sciences, and the relevant requirements of law for adequate evidence of the act of measuring, locating, establishing, or reestablishing lines, angles, elevations, natural and manmade features in the air, on the surface and immediate subsurface of the earth, within underground workings, and on the beds or surface of bodies of water, for the purpose of determining, establishing, describing, displaying, or interpreting the facts of size, shape, topography, tidal datum planes, legal or geodetic location





Andy Schneider

Drones capture all the details, but there's a boundary there only a professional can deliver.

or relocation, and orientation of improved or unimproved real property and appurtenances thereto, including acreage and condominiums.

(b) The practice of surveying and mapping also includes, but is not limited to, photogrammetric control; the monumentation and remonumentation of property boundaries and subdivisions; the measurement of and preparation of plans showing existing improvements after construction; the layout of proposed improvements

Illinois

(b) Establishing the area or volume of any portion of the earth's surface, subsurface, or airspace with respect to boundary lines, determining the configuration or contours of any portion of the earth's surface, subsurface, or airspace or the location of fixed objects thereon, except as performed by photogrammetric methods or except when the level of accuracy required is less than the level of accuracy required by the National Society of Professional Surveyors Model Standards and Practice

Link to the National Society of Professional Surveyors (NSPS) Model Standards and Practice found here: nspus.com/?page=ModelStandards

New York

The practice of the profession of land surveying is defined as practicing that branch of the engineering profession and applied mathematics which includes the measuring and plotting of the dimensions and areas of any portion of the earth, including all naturally placed and man-or machine-made structures and objects thereon, the lengths and directions of boundary lines, the contour of the surface and the application of rules and regulations in accordance with local requirements incidental to subdivisions for the correct determination, description, conveying and recording thereof or for the establishment or reestablishment there

Conclusions

In principle, three of these four states agree on a general definition of Land Surveying: any professional service

responsible for providing quantitative, measured or mathematically modeled representations of the earth's surface.

One of these four states, Illinois, has a definition based on [accuracy standards](#) instead. Which, in principle, means that if a photogrammetric model is generated and does not meet the accuracy standards defined by the National Society of Professional Surveyors, it is legal for a non-licensed entity to deliver it as a professional service.

There are different laws in different states, so it is important to investigate [your state's legislation](#) to be sure of the requirements in your state. An FAA Part 107 sUAS Remote Pilot Certificate is required in all cases where commercial UAS services are provided.

Know the laws and enjoy the privilege of flying a UAS for pleasure, profit or both! ☺

Ananda Fowler is the CEO of KENANDA Lidar Solutions Ltd (Nigeria) and Owner of GEOHAWK GmbH, a global consulting company in Austria. He has 15 years of geospatial experience and holds an FAA sUAS Remote Pilot Certificate. He grew up in California and presently resides in Austria.