

American Council of Engineering Companies (ACEC) California
Policy Platform
Unmanned Aerial Systems (UAS)

Approved by the Executive Committee on July 27, 2017

Approved by the Board of Directors on July 27, 2017

Issue:

1. General regulation of UAS

- The use of Unmanned Aerial Systems (UAS, a.k.a. “drones”) for recreational and commercial use expanded rapidly in 2015 and 2016. In August 2016, approximately 20,000 UAS were registered with the Federal Aviation Administration (FAA) for commercial use. Some sources estimate that there will be over 600,000 registered commercial UAS in the air by 2018. Including non-commercial UAS, it is estimated that there will be over 7 million UAS flying in the United States by 2020.
- In 2016, the FAA released its latest rules and regulations for commercial UAS use, trying to catch up with the rapidly expanding technology. These rules are largely administrative and generally are not enforceable by local and state law enforcement.
- Recreational and commercial use of UAS are causing concern amongst California residents, primarily over safety and privacy issues. Many local jurisdictions in California are adopting ordinances that give law enforcement the authority to cite reckless users, giving rise to a patchwork of potentially inconsistent laws. In addition, there have been a number of bills introduced in the state legislature (including Senate Bill 347 introduced in February 2017) intended to address safety and privacy issues.
- ACEC California member firms have various potential commercial applications for UAS (including mapping, photography, and remote inspection), and many have already been performing these services under the current FAA regulations. ACEC California member firms are concerned about local and state laws that may inadvertently prohibit or limit legitimate surveying and engineering UAS applications.

2. UAS as a tool for mapping

- Maps have been a part of human civilization for millennia. The methods of collecting data and creating maps have changed dramatically over the last forty years with the advent of the Global Positioning System (GPS), Geographic Information Systems (GIS), and computer modeling. Most recently, UAS have become important new tools in the mapping and modeling process.
- Photogrammetry, a labor-intensive map making process, was developed in the early 20th century and has traditionally been carried out by highly trained personnel in manned aircraft equipped with expensive aerial cameras. UAS are typically equipped with high-definition cameras (and increasingly other types of sensors), and are now commonly used to collect imagery and data from which maps can be generated.
- UAS and smart phones have come on the scene quickly and disrupted the traditional surveying and mapping establishment. With advances in camera lens resolution, data storage capacity, and image correlation and mapping software, both UAS and smart phones have made “photogrammetry for the masses” a reality. Any person with a cell phone can create virtual two-, three-, and four-dimensional models of nearly anything. Like smart phones, UAS are becoming affordable and widely available, thus expanding the potential for modeling and map creation.

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- Certain maps, such as those used for engineering analysis, design, and construction, and models used for maintenance of buildings, factories, roads, bridges, pipelines, walls, and the like, must be both accurate and precise. Highly accurate and precise mapping is of paramount importance as the basis for safe and reliable engineering design and reliable GIS applications. This is a public health and safety issue, as inaccurate and imprecise maps could contribute to faulty design and poorly located infrastructure.
- Highly trained and qualified California engineers and surveyors are licensed under current law to ensure that mapping meets established standards. Professional Land Surveyors and Civil Engineers are the only professionals allowed by California law to render a statement regarding the accuracy of maps and measured data.
- The widespread use of UAS has opened the door for the creation of a booming mapping/imagery/virtual model data acquisition and delivery industry that currently can operate, in large part, outside of the law. The temptation for owners, contractors, and others to acquire low cost data, produced by unlicensed vendors, hired outside of the Qualification-Based Selection process required by state law, will increasingly lead to sub-accurate and sub-precise mapping being used for engineering design and construction and GIS purposes, potentially putting the general public at risk.

Policy:

To ensure that qualified, licensed engineering and surveying professionals provide highly accurate and precise mapping for applications involving public health and safety, and to renew the focus on unlicensed engineering and surveying practice brought to light by the prolific use of UAS, ACEC California supports the following:

1. General regulation of UAS – ACEC California should be actively engaged in the legislative process concerning regulation of UAS. Our members must be ready to work with all interested parties to craft reasonable, effective, and fair laws that address public health, safety, and privacy issues, while allowing for creative and innovative use of these compelling new technologies.
 - ACEC California supports the concept of regulating UAS use to ensure privacy and public safety, while allowing for legitimate use by geospatial and technical professionals, including land surveyors, photogrammetrists, GIS professionals, engineers, construction managers, and others, as appropriate.
 - ACEC California supports new laws that include judicious provisions for reasonable notice, permits, licensure, liability insurance, and other checks and balances intended to preserve and protect privacy and safety.
 - ACEC California supports new legislation that harmonizes with existing federal laws and policies, including FAA governance of airspace at the federal level.
2. UAS as a tool for mapping
 - ACEC California supports the underlying premise of the Professional Engineers Act and the Professional Land Surveyors Act: the protection of the public is the highest priority.
 - ACEC California supports the continued use of highly accurate and precise mapping for engineering design and GIS applications, and supports reinforcement of existing engineering and surveying law when considering new UAS legislation.

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- ACEC California supports legislation that would require mandatory accuracy statements for all mapping, regardless of source, intended as the basis for public or private design work or GIS infrastructure applications, including buildings and pipelines.
- ACEC California supports the concept that highly accurate and precision mapping used for engineering design and GIS infrastructure applications should be certified as spatially correct and properly referenced to a known reference system.
- ACEC California supports the development of standards for UAS collected data and the maps and models created from that data.

Rationale:

Engineers and surveyors have been preparing maps for centuries, and while new tools are continually developed, the underlying mathematical principles do not change. Section 8726 of the Professional Land Surveyors Act, which defines the practice of surveying, describes it in terms of activity and result, correctly leaving out mention of tools. No matter what tools are used, the activity requires the same expertise. UAS-collected data intended for engineering design and GIS applications needs to be prepared and mapped under the direction of a licensed surveyor. Our concern derives from Section 8710.1 of the Professional Land Surveyors Act and Section 6710.1 of the Professional Engineers Act, both of which state that the protection of the public is the highest priority for the Board for Professional Engineers, Land Surveyors, and Geologists (BPELSG). Therefore, we support UAS related legislation that enhances the ability of BPELSG to protect the public and ensure that an appropriately-licensed engineering or surveying professional is involved in high-precision mapping activities.