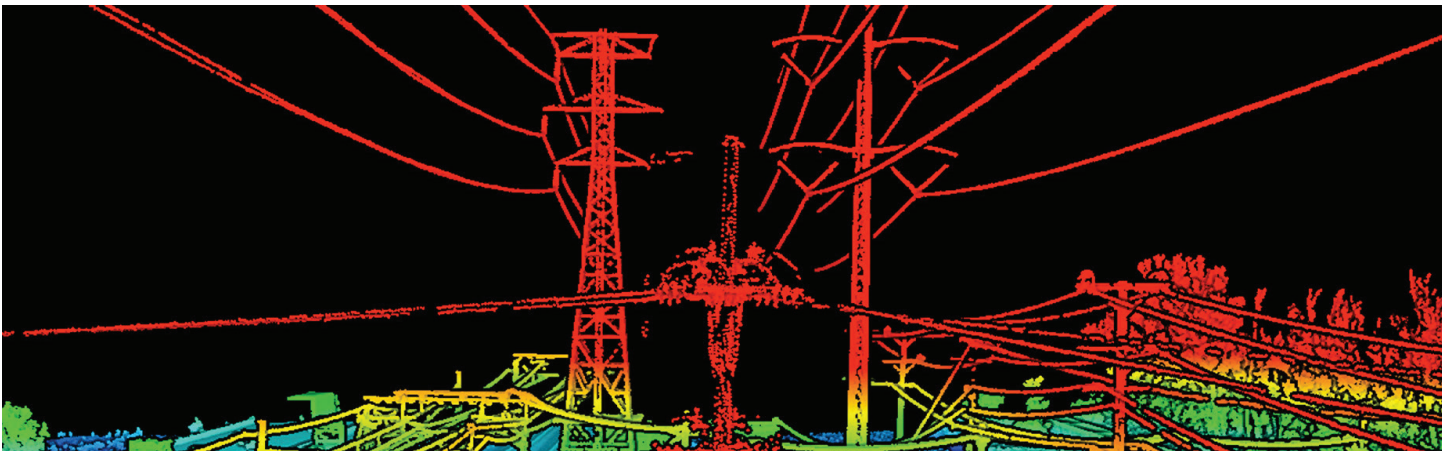


ARTICLE

Aerial Remote Sensing: A Picture Worth More Than a Thousand Words

By David DeLind

Simply defined, aerial remote sensing (ARS) is the process of detecting and monitoring the physical nature of an area. Through the combined use of unmanned aerial vehicles (UAVs) and LiDAR — light detection and ranging — systems paired with survey practices, ARS is able to provide fast and dense information regarding site measurements and point clouds capturing existing site conditions. Terrestrial scanning, photogrammetry and aerial LiDAR services can provide unique solutions for projects. And as with all things, such solutions are uniquely suited for particular applications and sites. Likewise, the utilization of aerial LiDAR can provide a number of benefits.



Laser-Focused on Aerial LiDAR

Aerial LiDAR, a method that sends pulses of laser light to determine the presence of objects in great detail, gathers millions of laser returns to construct a point cloud of the area or corridor being scanned. Even through heavily vegetated areas, it is able to provide ground data for design and estimation.

From a production standpoint, pilots and operators can fly over 5,000 acres a week and cover more than 500 miles a week in rural settings. This method provides diverse data for those looking to gather site information, such as contours, earth movement volumetrics, site change overlays, solar siting studies and more. The image capture penetrates through objects in which light passes through — which is called returns. Most commercial systems, which lack high laser

intensity, can only penetrate through transparent objects four or five times before they stop. For Burns & McDonnell, a higher-powered system that performs 12-15 returns before stopping is used, which provides a much higher quality and depth of data acquired.

Though ARS in various technical capacities and sensors has been around for quite some time, it is becoming more commonly used in different kinds of projects. For its many uses — including natural resources monitoring; disaster assessment and mitigation and data collection, research and management — ARS has numerous benefits. Among them:

- Highly accurate, low cost and efficient site contouring and volumetrics of a large site area.
- Durability through time as the data collected is

repeatable and can be used for different projects or applications from one capture — this will ultimately save costs on future projects.

- Proven compliance to plans, project earned value, volumetric validation and as-built site conditions through the use of low-cost repeated ARS captures.
- Improved safety in project execution, enabling inspection and data gathering of otherwise inaccessible terrain.

Fundamentally Changing How Engineering Is Done

Aerial LiDAR provides much faster and denser information than a traditional ground survey. The value of using LiDAR will only increase, it will be an essential point of entry for engineering projects and part of the design and construction verification process. With the ability to examine existing conditions of an area before groundbreaking and immediately highlight critical information, LiDAR can be used in various industries. For example, it can provide data regarding the moisture level, growth rate, invasive species identification and crop production for the agriculture industry. It can also provide hundreds of miles of information for construction

projects, information that will ultimately help with proactive quality control and quality assurance, cost, validation of assumption, and much more.

Finally, something to keep in mind is that as Da-Jiang Innovations (DJI) drones are becoming more restricted for usage on critical infrastructure projects, you want to see that the firm you are working with uses federally approved equipment. As an integrated EPC firm with a federal experienced team, Burns & McDonnell is able to deliver Department of Energy and Department of Defense-compliant projects.

About Burns & McDonnell



Burns & McDonnell is a family of companies bringing together an unmatched team of engineers, construction and craft professionals, architects, and more to design and build our critical infrastructure. With an integrated construction and design mindset, we offer full-service capabilities. Founded in 1898 and working from dozens of offices globally, Burns & McDonnell is 100% employee-owned. For more information, visit burnsmcd.com.