



# CAN DRONES HELP YOUR SURVEYING BUSINESS?

Choose the right tools for your operation

As drone technology is becoming increasingly streamlined and accessible, a variety of industries are adopting drones into their workflows to dramatically increase efficiency. Simply put, drones are changing how businesses operate by reducing costs, saving time, improving safety, and providing a direct ROI.

In particular, surveying and mapping has been revolutionized by drone solutions. While traditional surveying methods can produce results on the scale of days or weeks, drones can do the job on a timescale of hours.

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**There is a saying in the construction industry, 'Schedule, Cost, and Safety, pick two.'**  
**What makes drones truly transformative for us is we get to choose and improve all three.**  
**- Grant Hagen, VDC Manager, The Beck Group**

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It's no wonder many businesses interested in optimizing their surveying and mapping capabilities have come to us asking which drone is right for them. Investing in new technology can be intimidating, and with so many options it can be overwhelming when it comes time to make a choice.

This buying guide will give a breakdown of the surveying and mapping solutions DJI offers, and familiarize you with everything you need to know to make an informed decision. First, we'll review some key considerations when it comes to surveying with drones, and then we'll highlight which DJI drone best suits your needs.

## FOR SURVEYORS, WHAT DO DRONES BRING TO THE TABLE?

First let's clarify the differences between a survey and a map. A map is a visual representation of an area used to illustrate geography and features. A survey, while also a map, is also used to measure the positions of and distances between two- and three-dimensional points. Maps and surveys, while highly related, have different use cases and value.

***When choosing a drone solution for your surveying and mapping needs, one important tradeoff to recognize is accuracy and speed.***

For example, mapping does not require the same degree of precision as surveying and can be achieved quicker. Within surveying and mapping, some techniques can yield data with a higher





degree of accuracy, while others can provide results rapidly under time pressure.

What exactly does accuracy mean when talking about surveying and mapping? One way to put it is how accurately your end product reflects the reality of your surveying site. The main way this is described in photogrammetry is Ground Sample Distance, or GSD. GSD is defined as the length (in inches, centimeters, or millimeters) between the centers of two consecutive pixels on your map. Alternatively, GSD can be thought of as the length of one pixel in your map. For example, if a drone achieves a GSD of 5cm/px, then we can understand

that one pixel on this digital map corresponds to 5cm in reality. A map with a “smaller” GSD has higher resolution and more accuracy.

When conducting photogrammetric missions with drones, the main factors that can affect your GSD are your camera quality (focal length, camera resolution), and flight altitude. For example, flying your drone at a higher altitude would allow you to cover more area in a shorter time, but capture your data at a lower resolution.

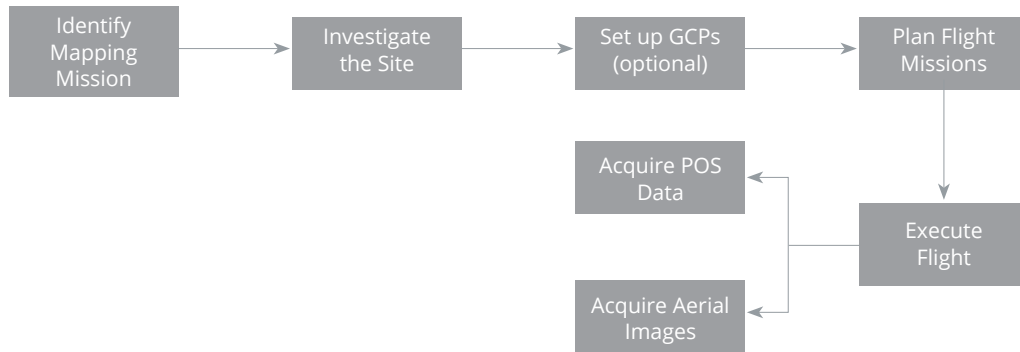
Here is a breakdown of your choices when it comes to surveying and mapping with a drone.

	GCPs alone	Drone without RTK	Drone with RTK	Drone with RTK + GCP
ACCURACY	High	Low	High	Highest
SPEED	Low	High	High	High-ish
COST	High	Low	Low	Low

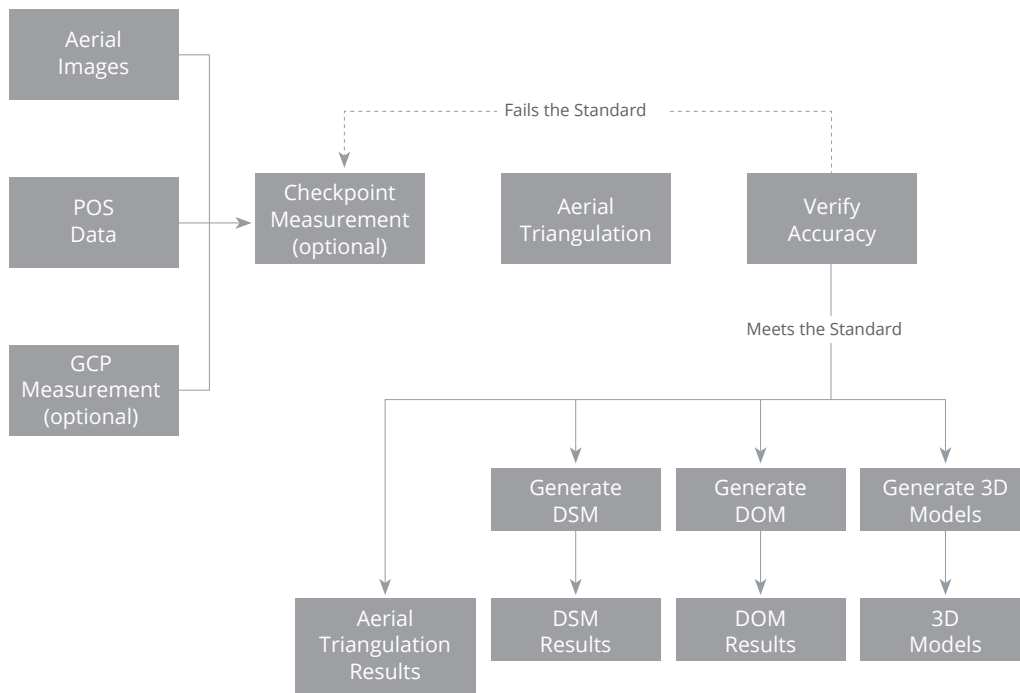
Different drone solutions and drone-assisted workflows can offer different degrees of accuracy. When selecting your surveying drone, it is important to recognize your demands, the demands of your clients, and the tradeoff between speed and accuracy.

Here is a graphic of how drones are typically integrated into your surveying workflows:

Onsite Data Collection



Data Processing



## CHOOSE YOUR DATA SENSORS

When choosing your surveying and mapping solution, you should also keep in mind which type of data you or your clients require. Different projects may call for different types of data, so we offer different solutions for these demands.

### PHOTOGRAMMETRY

Most typical aerial surveying calls for photogrammetry, or the creation of high resolution 2D or 3D models of your surveying site through a combination of many digital photos. Each of our surveying and mapping drones are equipped with a powerful digital camera capable of capturing high-resolution digital photos. Some solutions can be equipped with an oblique camera that can collect the images necessary for 3D modeling with fewer flyovers. Next, your photos can be stitched together using photogrammetry software, like DJI Terra, and the resulting models can be used to identify and measure features like distance, area, volume, and more.

Click [HERE](#) to learn more about the capabilities of DJI Terra.

### SPECIALIZED SENSORS

#### LiDAR or light imaging detection and ranging

This technology is flown above a surveying site where it uses a laser to illuminate a target, and measures the reflected light with a sensor. This process is repeated thousands of times to produce a point cloud that can represent your site with a finer degree of accuracy than photogrammetry.

Click [HERE](#) for more information how lidar is revolutionizing mapping and geospatial data.

#### Multispectral

These special cameras can capture visible and invisible wavelengths of light. For agriculture customers or surveys conducted to measure crop growth or environmental compliance, multispectral data is especially helpful for providing provide critical, actionable information

With drone solutions, you have a wide selection of surveying and mapping techniques and it's up to you to choose which methods best fulfil your requirements.



## CHOOSE YOUR SURVEYING SOLUTION

Once you've determined the type and quality of data you will be needing, we can come to choosing which DJI drone solution is the best fit.



### **MAVIC 2 PRO**

Affordable, compact, entry-level mapping solution, with meter-level accuracy, all in the size of a water bottle.



### **MATRICE 600 PRO**

Multifunctional, heavy lifter, equipped for meter-level accurate surveying and much more.

#### **Payloads:**

- LiDAR
- Multispectral
- Oblique Camera



### **PHANTOM 4 RTK**

Built specifically for surveyors with an integrated RTK module for centimeter-level accuracy that you can carry in a backpack.

We hope this information has helped direct you towards making the right purchase for you and your surveying and mapping needs. Whether you or your clients demand speed or accuracy, we have the right drone solution for you.



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