

# The Profession of Surveying

**Salary** | As a professional surveyor or P.S., you can expect to earn about 36 percent more than the average median salary. More-experienced surveyors earn higher salaries and those who own firms can easily earn six figures.

**Future Outlook** | Employment of professional surveyors is predicted to grow 11 percent faster than other occupations.

**Professionalism** | Surveying is a profession. Joining the profession and becoming a P.S. instantly says you are a professional with experience.

**Technology** | Surveyors use ever-advancing technology in the field and in the office.

## How to Become a Surveyor

In general, people who like surveying also like math—primarily geometry and trigonometry. The field attracts people with geology, forestry, history, and astronomy backgrounds, too. Accredited college programs throughout the country—sometimes called geomatics engineering—offer two-year and four-year degrees.

Getting a license is important to advancing in a surveying career. Every state requires a licensed surveyor to verify and sign each finished survey. States set their own laws, requirements, and procedures for surveyors to obtain their license. After completing their education, surveyors have to obtain work experience under the supervision of a licensed surveyor. Then surveyors can take an exam for the state in which they will work. Many surveyors pursue a license in multiple states, especially when they work for large firms.

**Discover more.**

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# PROFESSIONAL SURVEYING

**P.S.** | A career without boundaries



**National Society of Professional Surveyors**

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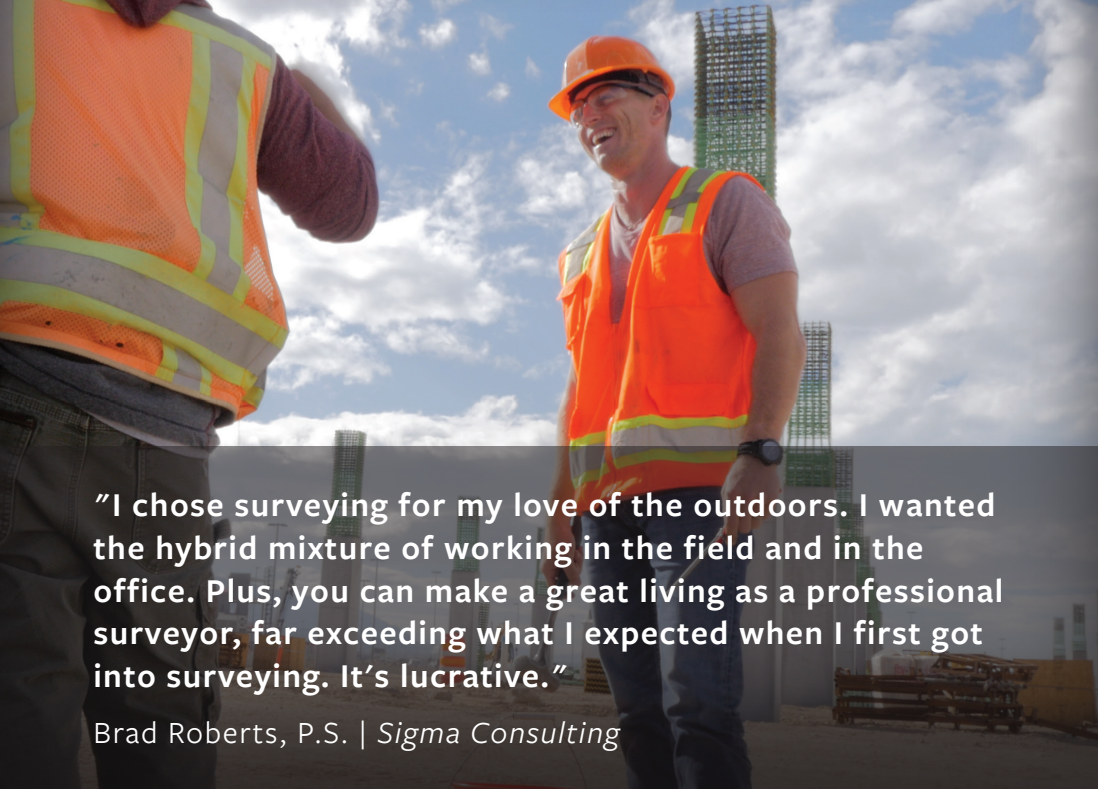
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"I chose surveying for my love of the outdoors. I wanted the hybrid mixture of working in the field and in the office. Plus, you can make a great living as a professional surveyor, far exceeding what I expected when I first got into surveying. It's lucrative."

Brad Roberts, P.S. | *Sigma Consulting*



## Technology in the Field

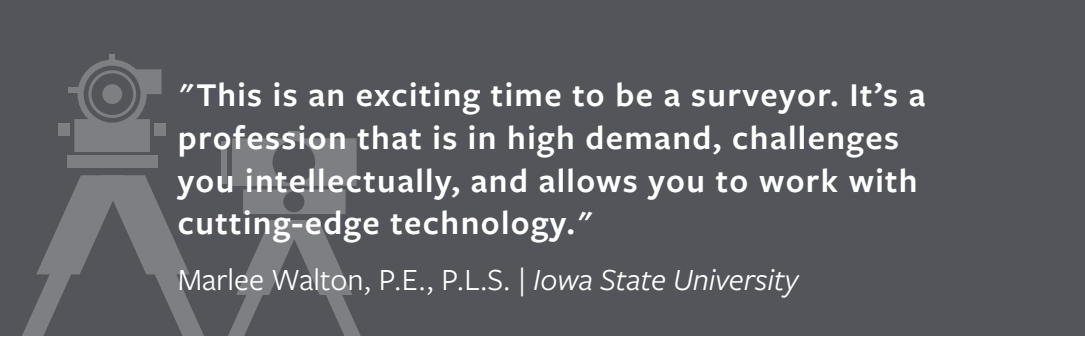
**UAS (drones)** | UAS or unmanned aircraft systems are emerging tools for professional surveyors. UAS produce aerial maps that are used for progress monitoring and as-built surveys.

**LiDAR (airborne and ground-based)** | Light detection and ranging (LiDAR) is a remote sensing method used to examine the surface and features of the Earth. It uses lasers to measure variable distances and helps surveyors create maps more accurately, precisely, and flexibly.

**GNSS** | Global navigation satellite system (GNSS) receivers use signals from satellites to collect position, velocity, and time information to accurately map and model the physical world. GPS is an example of a GNSS.

**Photogrammetry** | Photogrammetry involves making measurements from photographs and then developing a map, drawing, or model of the object. This is primarily used with aerial and terrestrial photographs to determine distances and elevations.

**Total stations** | Total stations are instruments that use electronic transits to measure angles and distances to determine the location and elevations of features.



"This is an exciting time to be a surveyor. It's a profession that is in high demand, challenges you intellectually, and allows you to work with cutting-edge technology."

Marlee Walton, P.E., P.L.S. | *Iowa State University*

## Types of Surveyors

### Construction Surveyor

Think about what we build: bridges, houses, skyscrapers, underground tunnels, pipelines, utility networks, refineries, shopping centers, and offshore oil rigs. The list is endless. Construction surveyors make measurements and recommendations to engineers, architects, and other professionals at all stages of construction projects.

### Boundary Surveyor

Boundary, or cadastral, surveyors measure, mark, and map the boundary lines of land ownership. These surveyors trace deeds and other public records to verify the measurements of a piece of property for which the original survey could date back hundreds of years.

### Geodesist

These surveyors determine the size and shape of the Earth and the precise location of points on its surface. Geodesy is closely connected to astronomy and has been used to guide the old great sailing ships and today's water traffic. With the creation of GPS, or global positioning systems, geodesists can tell the exact position of an object on the Earth's surface—usually within a centimeter. Geodesists often work for the government in all areas of the country.

### Geographic Information Systems Analyst

GIS analysts use high-tech computer software and hardware that stores, displays, analyzes, and maps information. The land survey is the first layer and provides the framework for additional data layers that give more detail. Additional layers could include a city's traffic lights and fire hydrants, for example. Large companies, cities and towns, and commercial developers use GIS studies to plan projects.

### Photogrammetrist and Remote Sensing Analyst

These specialists gather information about a site without actually coming in contact with it. Aerial photography and satellite imagery are examples of data collected. These surveys are good for land inaccessible by foot or large areas that need to be surveyed quickly. For example, a photogrammetrist may be hired to track the movement of a pollutant in a large body of water after an environmental accident.

### Forensic Surveyor and Expert Witness Specialist

Federal, state, and local laws play a large part in surveyors' careers. A licensed surveyor can clarify and add credibility to a court case about a property dispute or aspects of an industrial accident. Surveyors who build reputations as expert witnesses are in high demand. Being an expert witness requires extensive knowledge about a particular area of surveying and many years of experience.

### Topographic/ Hydrographic Surveyor

Topographic surveyors measure and map the shape, contour, and location of land features such as valleys, mountains, and man-made objects on the surface of the land and below bodies of water. Underwater topographic surveying is known as hydrography. This type of surveying is important when measuring erosion, guiding dredging projects, exploring for oil and rare mineral deposits, and marking underwater hazards. Hydrographic surveyors use specialized equipment to gather data and draw maps for many clients, including the shipping industry, government researchers, oil companies, and utility networks.

## Professional Surveying: Mapping the Future

Surveying is a branch of applied mathematics that is concerned with analyzing and recording the characteristics of a land span to help design, plan, map, or construct.

Professional surveyors measure just about anything on the land, in the sky, or in the water. We depend on surveying to ensure order in the physical world around us, and it plays an integral role in land development—roads, cities, bridges, utilities—you name it.