

# Unmanned Aerial Vehicle (UAV) Pilots Labor Market Analysis: San Diego County

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June 2018

## Summary

The following list summarizes findings from the labor market analysis below for *Unmanned Aerial Vehicle (UAV) Pilots*:

- Depending on the company, *UAV pilots* may have other titles, such as Unmanned Aircraft Pilots, Unmanned Aircraft Systems Operators, Commercial Drone Pilots/Operators and Remote Pilots/Operators. For this report, *UAV Pilots* and all other related titles are considered one and the same and are referred to as *UAV Pilots*.
- All UAVs that weigh between .55 and 55 pounds are required to be registered with the Federal Aviation Administration (FAA). The registration costs \$5 per drone and the pilot must have a drone license to operate. As of December 2015, a Part 107 drone or remote pilot license, which is a license to fly a UAV, is now required by the FAA. A Part 107 license costs \$150 and requires passing an aeronautical knowledge test. If a prospective pilot does not pass the knowledge test, each re-take of the test will cost \$150. The license expires after three years from the date of issuance.
- Between 2010 and 2017, there was an average of 27 online job posting per year for jobs with the keywords “UAV Pilot” or “UAV Operator” in San Diego County.
- Nationwide, Unmanned Aerial Vehicle Pilots earn median hourly earnings of \$25.00; this is higher than the Self-Sufficiency Standard for a single adult in San Diego County, which is \$13.09 per hour.
- As of May 2018, there were 91 registered UAVs in San Diego County, with 51 registered to corporations, 22 registered to individuals and 18 registered to the government. That is 183 less registrants or 67 percent less registered UAVs than April 2017.
- Between January 1, 2015, and December 31, 2017, the top employers that posted online job postings in San Diego County for “UAV Pilot” and “UAV Operator” were General Atomics, BAE Systems, Northrop Grumman, CAE U.S.A. and Soft Incorporated.
- The average cost of a UAV registered in San Diego County is \$3,014.48 and the median cost is \$1,190.00.

## Introduction

This report provides labor market information in San Diego County for *Unmanned Aerial Vehicle (UAV) Pilots*. Depending on the company, *UAV pilots* may have other titles, such as Unmanned Aircraft Pilots, Unmanned Aircraft Systems Operators, Commercial Drone Pilots/Operators and Remote Pilots/Operators. For this report, *UAV Pilots* and all other related titles are considered one and the same and are referred to as *UAV Pilots*.

Until recently, UAVs were predominantly used by the defense industry. Now, UAVs have significant commercial and personal use. UAVs consist of remote-controlled airships, fixed wing aircrafts such as an airplane or aeroplane, helicopters and multicopters.<sup>1</sup> "Multicopter is the generic name for a drone that has multiple propellers—the term covers quadcopters, octocopters, etc."<sup>2</sup> For the purpose of this report, a multicopter will be referred to as drone.

Most drones fall under the following categories:

- Toy drone
- Hobby drone
- Professional/commercial drone
- Racing drone
- Military drone
- Photography drone

Unmanned aircraft systems and industries include:<sup>3</sup>

- Event photography
- Movie filming
- Aerial mapping
- Search and rescue
- Deliveries
- Building inspection
- Defense industry or military
- Agriculture

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<sup>1</sup> Type of Unmanned Aircraft Vehicles. [sciencedirect.com/science/article/pii/S0926580514000193](https://www.sciencedirect.com/science/article/pii/S0926580514000193).

<sup>2</sup> Drone Terminology. [airdronecraze.com/quick-reference-guide-of-drone-terminology/](https://airdronecraze.com/quick-reference-guide-of-drone-terminology/).

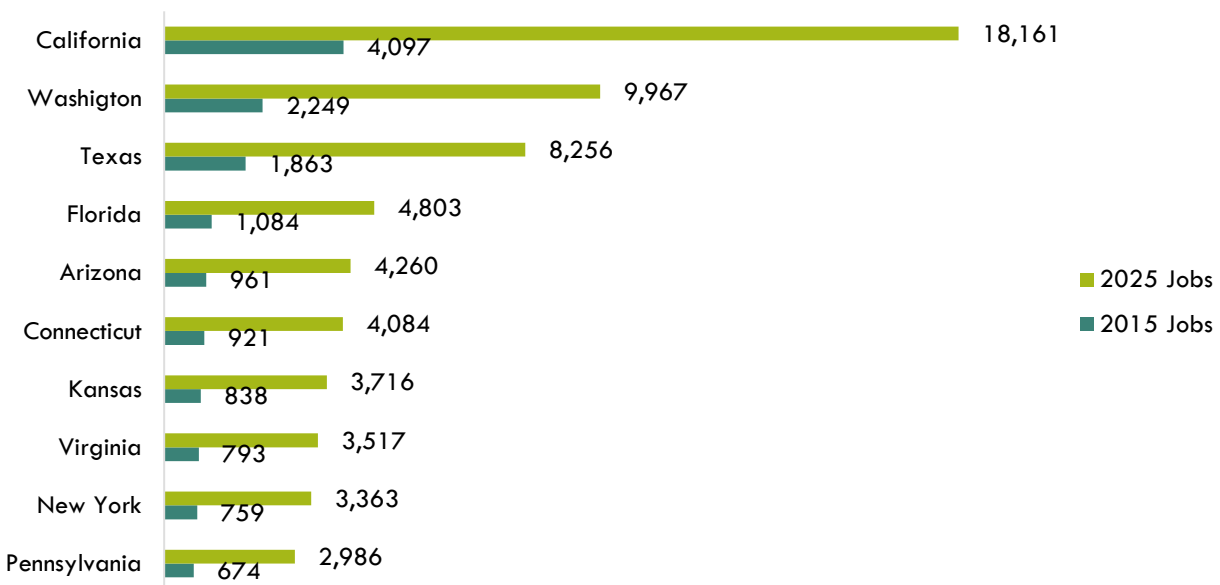
<sup>3</sup> Unmanned Aircraft Vehicle Pilot Occupations. [dartdrones.com/blog/drone-pilot-jobs-2017/](https://dartdrones.com/blog/drone-pilot-jobs-2017/)

All UAVs that weigh between .55 and 55 pounds are required to be registered with the Federal Aviation Administration (FAA). The registration costs \$5 per drone and the pilot must have a drone license to operate. As of December 2015, a Part 107 drone or remote pilot license, which is a license to fly a UAV, is now required by the FAA. A Part 107 license costs \$150 and requires passing an aeronautical knowledge test. If a prospective pilot does not pass the knowledge test, each re-take of the test will cost \$150. The license expires after three years from the date of issuance.

## Projected Occupational Demand

Typically, labor market demand for an occupation could be projected if the occupation has a code within the Standard Occupational Classification (SOC) system. The SOC system is a federal standard to classify workers in occupational categories. Because there is no SOC code associated with *UAV Pilots*, no projected occupational demand is provided in this report. However, according to The Association for Unmanned Vehicle Systems International (AUVSI), California is expected to create 14,064 jobs between 2015 and 2025 that are directly related to unmanned aircraft systems. Related jobs include flying, building, developing, selling, maintaining, and customizing drones as well as training people to use drones. Exhibit 1 shows the top 10 states projected to have the most direct employment increase in unmanned aircraft systems.

**Exhibit 1: Top 10 States with Jobs Directly Related to Unmanned Aircraft Systems by Number of Jobs<sup>4</sup>**

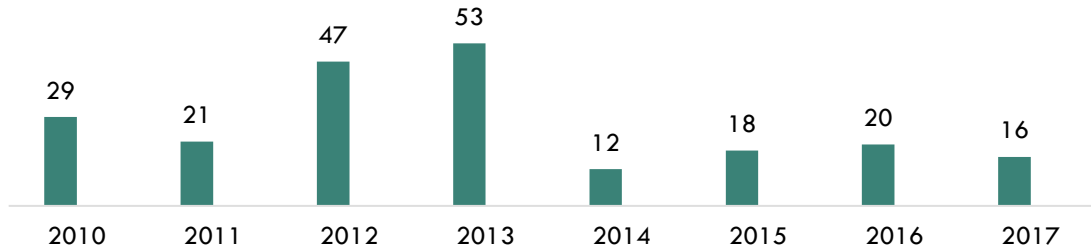


<sup>4</sup> AUVSI Economic Report, March 2013. [www.auvsi.org/our-impact/economic-report](http://www.auvsi.org/our-impact/economic-report).

## Online Job Postings

Between 2010 and 2017, there was an average of 27 online job posting per year for jobs with the keywords “UAV Pilot” or “UAV Operator” in San Diego County (Exhibit 2).

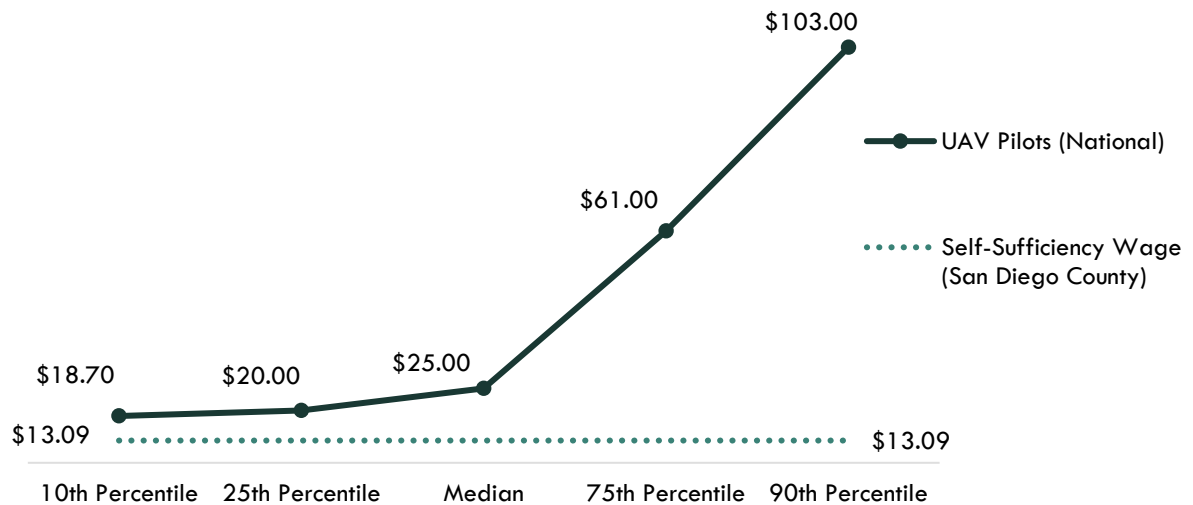
**Exhibit 2: Number of Online Job Postings with Keyword UAV Pilot or UAV Operator in San Diego County (2010-2017)<sup>5</sup>**



## Earnings

Nationwide, UAV Pilots earn median hourly earnings of \$25.00<sup>6</sup>; this is higher than the Self-Sufficiency Standard for a single adult in San Diego County, which is \$13.09 per hour (Exhibit 2).<sup>7</sup>

**Exhibit 2: Hourly Earnings for Unmanned Aerial Vehicle Pilots in the Nation<sup>8</sup>**



<sup>5</sup> Burning Glass Technologies. San Diego, CA. Full years 2010-2017.

<sup>6</sup> Payscale Unmanned Aircraft Vehicle Pilot salary in the Nation (payscale.com/research/US/Job=Drone\_Pilot/Hourly\_Rate).

<sup>7</sup> The self-sufficient wage in San Diego for one adult is \$13.09 (insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california).

<sup>8</sup> Payscale Unmanned Aircraft Vehicle Pilot salary in the Nation (payscale.com/research/US/Job=Drone\_Pilot/Hourly\_Rate).

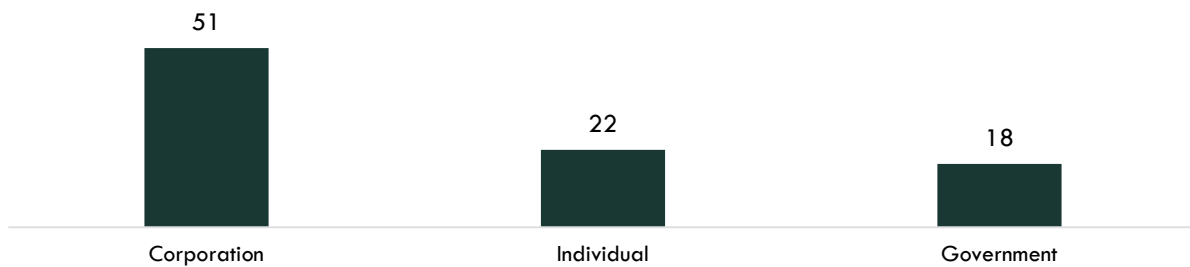
## Supply

Educational supply for an occupation can be estimated by analyzing the number of related program completers/graduates/awards in San Diego County. There are **four** community colleges that provide training for UAV-related jobs: Palomar College, Grossmont College, Miramar College and San Diego City College. However, due to the small size of these programs, the supply from these colleges cannot be calculated.

Because the FAA requires that drone pilots have licenses and registered drones, this report analyzes data from the Federal Aviation Administration registry to estimate the labor supply based on the number of registered unmanned aerial vehicles in San Diego County.

As of May 2018, there were **91** registered UAVs (up to 55 pounds) in San Diego County, with **51** registered to corporations, **22** are registered to individuals and **18** registered to the government (Exhibit 3). That is **183** fewer registrants (**67** percent) registered unmanned aerial vehicles than April 2017.<sup>9</sup>

**Exhibit 3: Registered Unmanned Aircraft Vehicles in San Diego County as of May 2018<sup>10</sup>**



The average cost of a UAV registered in San Diego County is **\$3,014.48** and the median cost is **\$1,190.00**. Refer to Appendix A for more information on registered drone models in San Diego County and their respective costs.

## Demand vs. Supply

A complete labor market demand and supply analysis could not be completed for this report due to lack of data. However, based on online job postings, San Diego County saw an average of 27 online job postings per year since 2010; therefore, it could be estimated that employers have a labor market demand of **27 UAV pilots** per year. Additionally, because the FAA requires that drone or *UAV pilots* register with the Federal Aviation Administration, it could be estimated that only 22 registered individuals

<sup>9</sup> San Diego Union Tribune Drone Registrations for the County, 4/2017. [sandiegouniontribune.com/news/data-watch/sd-me-faa-drone-20170406-story.html](http://sandiegouniontribune.com/news/data-watch/sd-me-faa-drone-20170406-story.html).

<sup>10</sup> FAA Registered Drones in San Diego County as of 5/29/18. [registry.faa.gov/aircraftinquiry/statecounty\\_inquiry.aspx](http://registry.faa.gov/aircraftinquiry/statecounty_inquiry.aspx).

constitute the supply for *UAV pilots*. With only 22 registered drone pilots and over 20 job postings per year for *UAV pilots*, it could be argued that there is a supply gap for the occupation.

## Top Employers and Work Locations

Between January 1, 2015, and December 31, 2017, the top employers that posted online job postings in San Diego County for “UAV Pilot” and “UAV Operator” were [General Atomics](#), [BAE Systems](#), [Northrop Grumman](#), [CAE U.S.A.](#) and [Soft Incorporated](#) (Exhibit 4).<sup>11</sup>

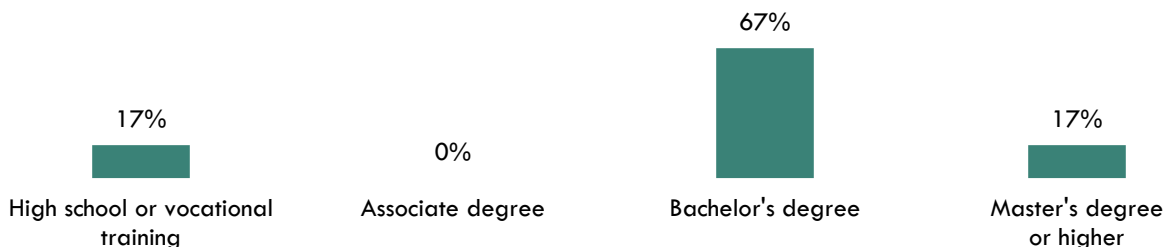
### Exhibit 4: Top Employers in San Diego County for UAV Pilots and UAV Operators

Top Employers
<ul style="list-style-type: none"> <li>• General Atomics</li> <li>• BAE Systems</li> <li>• Northrop Grumman</li> <li>• CAE U.S.A.</li> <li>• Soft Incorporated</li> </ul>

## Skills, Education and Certifications

Because there is no SOC code associated with *UAV Pilots*, no national educational attainment data was provided in this report.<sup>12</sup> National educational attainment data illustrates the typical education obtained by individuals employed in a specific occupation. However, based on online job postings between January 1, 2016 and December 31, 2017, the top listed educational requirement for “UAV pilots” and “UAV operators” is a bachelor’s degree (Exhibit 5).<sup>13</sup>

### Exhibit 5: Educational Requirements for UAV Pilots and UAV Operators in San Diego County<sup>14</sup>



<sup>11</sup> Burning Glass Technologies. San Diego, CA. Full years 2015-2017.

<sup>12</sup> EMSI. San Diego (6073). 2018.02 Class of Worker. QCEW + Non-QCEW + Self-Employed. 2017-2022.

<sup>13</sup> Burning Glass Technologies. San Diego, CA. Full years 2015-2017.

<sup>14</sup> Burning Glass Technologies. Occupational Deep Dive. San Diego, CA. Full year 2017.

Exhibit 6 lists the top specialized and soft skills that appeared in online job postings for the full year 2017.

**Exhibit 6: Top Skills for UAV Pilots and UAV Operators in San Diego County<sup>15</sup>**

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> <li>• Training Materials</li> <li>• Customer Service</li> <li>• Autonomous Systems</li> <li>• Courseware Development</li> <li>• Curriculum Development</li> <li>• Surveillance</li> </ul>	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Communication Skills</li> <li>• Writing</li> <li>• Research</li> <li>• Troubleshooting</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft Office</li> </ul>

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**Important Disclaimers**

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor’s Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

<sup>15</sup> Burning Glass Technologies. Occupational Deep Dive. San Diego, CA. Full year 2017.

## Appendix A: Drone Models, Cost, and Website

Of the drone models registered in San Diego County, the following table lists the model name, cost, and website used to determine the cost. Models with “Experimental” in the “Cost” column have no cost associated because they are not sold commercially. An “X” in the “Cost” column means that no cost was found for the associated model name.

Model Name	Cost	Website
ALTA 8	\$17,495.00	<a href="https://bit.ly/2J0T05x">https://bit.ly/2J0T05x</a>
EBEE	\$12,500.00	<a href="https://ebay.to/2stABDZ">https://ebay.to/2stABDZ</a>
X8-M	\$7,000.00	<a href="https://bit.ly/2IYLVSU">https://bit.ly/2IYLVSU</a>
LANCASTER	\$6,900.00	<a href="https://ebay.to/2H9oS1T">https://ebay.to/2H9oS1T</a>
E386	\$6,890.00	<a href="https://bit.ly/2xxEsVy">https://bit.ly/2xxEsVy</a>
INSPIRE 1 PRO	\$2,900.00	<a href="https://bhpho.to/2JjyDzC">https://bhpho.to/2JjyDzC</a>
TORNADO H920	\$2,500.00	<a href="https://bit.ly/2LaxZ4R">https://bit.ly/2LaxZ4R</a>
DJI S1000	\$1,500.00	<a href="https://bit.ly/2su85S1">https://bit.ly/2su85S1</a>
S1000+	\$1,500.00	<a href="https://bit.ly/2J791ml">https://bit.ly/2J791ml</a>
INSPIRE 1	\$1,400.00	<a href="https://bit.ly/2JkZYkZ">https://bit.ly/2JkZYkZ</a>
MAVIC PRO	\$1,200.00	<a href="https://amzn.to/2kCuk15">https://amzn.to/2kCuk15</a>
SPREADING WINGS S900	\$1,190.00	<a href="https://bhpho.to/2JkQW7q">https://bhpho.to/2JkQW7q</a>
DISCOVERY PRO	\$1,140.00	<a href="https://bit.ly/2LO4E1p">https://bit.ly/2LO4E1p</a>
PHANTOM 4	\$1,035.00	<a href="https://amzn.to/2smK2oy">https://amzn.to/2smK2oy</a>
PHANTOM 3 PROFESSION	\$800.00	<a href="https://amzn.to/2slba6s">https://amzn.to/2slba6s</a>
PHANTOM 3 ADVANCED	\$695.00	<a href="https://amzn.to/2kGmhUm">https://amzn.to/2kGmhUm</a>
TAROT T15	\$650.00	<a href="https://bit.ly/2J2vi4z">https://bit.ly/2J2vi4z</a>
PHANTOM 2 VISION +	\$600.00	<a href="https://amzn.to/2JnrJJW">https://amzn.to/2JnrJJW</a>
TYPHOON Q500 4K	\$600.00	<a href="https://bhpho.to/2HbNibe">https://bhpho.to/2HbNibe</a>
PHANTOM 2	\$460.00	<a href="https://amzn.to/2LdhS6L">https://amzn.to/2LdhS6L</a>
SOLO	\$315.00	<a href="https://amzn.to/2xrpPmy">https://amzn.to/2xrpPmy</a>
SKY RANGER	\$40.00	<a href="https://amzn.to/2svgrbZ">https://amzn.to/2svgrbZ</a>
F450	\$23.00	<a href="https://amzn.to/2kD9IOV">https://amzn.to/2kD9IOV</a>
RV-8	Experimental	
UBC97000-1	Experimental	
UER97000-5	Experimental	
URBANE FLYER 30 MKII	Experimental	
210QC	X	
APH-22	X	
APQ-18	X	
ARMDS	X	
HEAVY LIFTER	X	
INSTANTEYE MK-2 GEN3	X	
LIGHT LIFTER	X	
P2 MULTIROTOR	X	