PACIFIC STATES AERIAL

Pacific States Aerial is a full service commercial Unmanned Aerial System (UAS) operator authorized by the FAA to provide aerial services throughout the United States. Pacific States Aerial provides a complete package of data collection services to multiple industries using still photography, videography, and 3D mapping to establish elevations, linear and volume measurements and much more.

While our primary focus is in the construction industry, we provide aerial services to a variety of industries for marketing, monitoring, documentation, assessment and collaboration. In the construction industry, aerial services are available from project to completion and beyond. See the services described below for further information.

AERIAL PHOTOGRAPHY & VIDEO

MARKETING PHOTO & VIDEO

DOCUMENTATION

AERIAL 3D MODELING & MAPPING

3D MODELS

AERIAL MAPPING ORTHOMOSAICS

SITE & BUILDING MEASUREMENTS

PLANT HEALTH

VOLUME MEASUREMENTS

POINT CLOUD EXPORTS

AERIAL INSPECTION SERVICES

NEW CONSTRUCTION

PRE-SALE

INVENTORY ASSESSMENT

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AERIAL PHOTOGRAPHY & VIDEO MARKETING PHOTOS & VIDEO

Once only obtainable by manned aircraft, aerial photography and videography have advanced significantly.

Using our state-of-the-art UAV equipment, software, and advanced experience in construction, Pacific States Aerial delivers professional quality aerial photography and video. Whatever your photographic subject may be, our UAV team will provide innovative photographic services. Aerial photography provides critical information for precision planning and mapping for real estate development, environmental and surrounding area review and analysis for land planning architecture design or for a unique viewpoint of your project.

Marketing Photos and Videos - Utilizing high-resolution still photography and 4K video capabilities, our drone pilots can capture images and video of your subject from any angle. 4K video provides stunning resolution to show off your home, building, project, or event on a website or other presentation. Photo and video editing is also available. Marketing photos and video can make your presentation or website stand out and are popular in the real estate, construction, agricultural and the insurance industry.

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AERIAL PHOTOGRAPHY & VIDEO DOCUMENTATION

In the home building and construction industry today it is critical that documentation of your project begin at the design stage, continues throughout the construction process and post closing. UAV's in construction give the client a perspective on the project that was never available before. Some of the services available include:

- **Building Measurements –** Aerial imagery provides the information needed to accurately measure your building. Output includes linear measurements, area measurements, roof pitch and can even provide a take-off list of critical components of the structure.
- **Site Measurements –** Aerial imagery provides the information needed to accurately measure your site. Output includes linear measurements and area measurements. This imagery can be used to archive the measurements and condition of your site for future analysis and comparison.
- **Volume Measurements –** Aerial imagery provides accurate volume measurements during grading operations, for stockpile surveys, and even to estimate the amount of construction material delivered and available on-site.
- **Aerial Mapping and Orthomosaics –** Accurately measuring elements of your site including elevations, terrain, or finished lot conditions allow the user to scale or measure directly on the photograph for documentation or planning future projects.
- **Point-Cloud Export –** All of the services described above can be exported for use in common software like Pix4D® and Revit® by Autodesk™. Mapping your site and the surrounding areas allows your Architect to place your proposed project in a real setting. Mapping your building under construction allows for real comparisons to the design or construction drawings. Mapping your finished product gives real as-built renderings that can be integrated with your construction and homeowner's association documents and archived.

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AERIAL 3D MODELING & MAPPING

3D MODELS

Technology has given us the ability to create detailed 3D images to provide accurate and efficient site or building measurements.

There is no need to wait for a survey crew or use expensive LiDAR measuring devices to accurately measure progress on your site. Using a UAV, we can provide this information to a client in a fraction of the time of a ground-based survey crew.

3D models can be most useful for inventory management, elevation measurements, high resolution 2D maps (AKA orthomosaics), marketing media, stockpile management as well as weekly or monthly progress monitoring. This allows teams to work efficiently and stay on schedule without stepping foot on the project site, collaborate together visually and make annotations and measurements that suit your needs with our delivered 3D models while keeping track of the progress.

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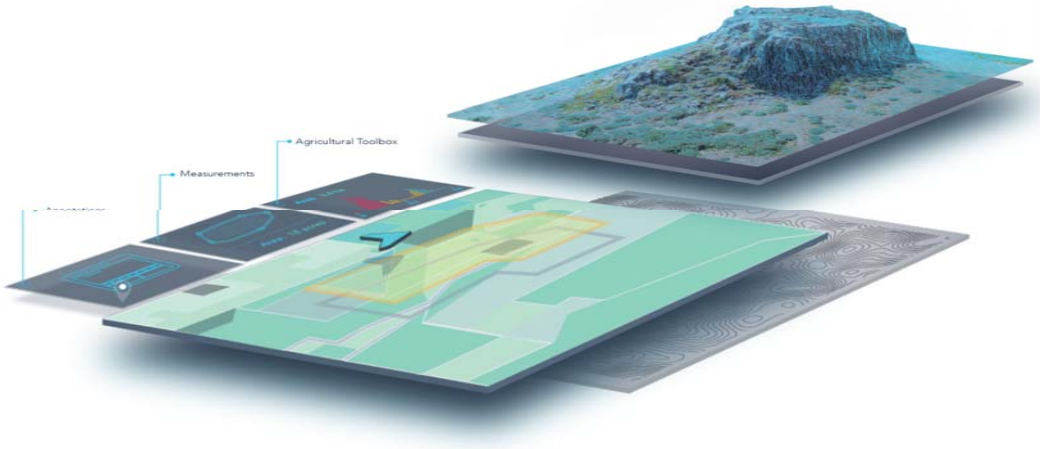
Aerial 3D Modeling & Mapping

Orthomosaics

Orthomosaic maps are a grouping of overlapping images of a defined area which are processed to create a new, larger “orthomosaic”: a highly detailed, up-to-date map that is in true scale. The meta-information within an orthomosaic map allows for point clouds, volumetrics, NDVI, 3D tours, and more. This opens up endless possibilities for your business by allowing clients to virtually tour your construction site via 2D or 3D maps for visual progress reporting, deliver up-to-date maps of your real estate to potential buyers, calculate raw materials on a construction site or easily conduct inspections over difficult terrain. Our team can deliver highly detailed, up-to-date maps of your property saving you time, money and manpower.



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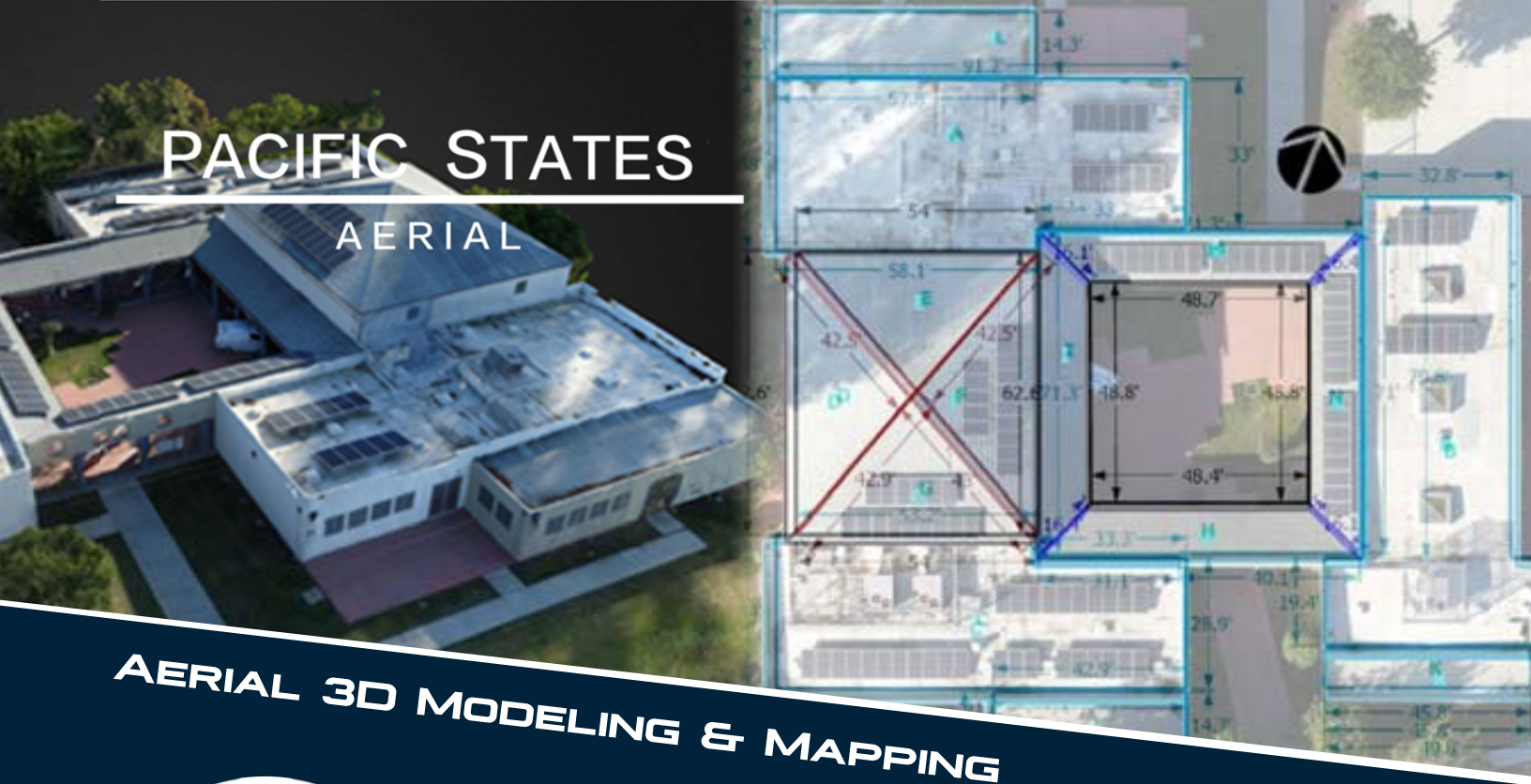

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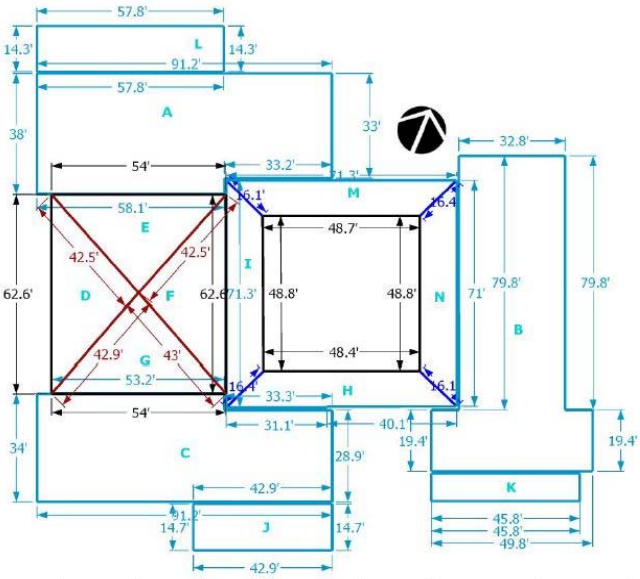
AERIAL 3D MODELING & MAPPING

SITE & BUILDING MEASUREMENTS

Whether you're inspecting a new building or investigating an insurance claim, it's important to capture accurate data quickly. Drone mapping is a powerful new tool allowing inspectors to safely and easily capture high-resolution aerial views of a site in minutes. This process simplifies inspections of non-accessible areas such as roofing, allowing the inspector to remain safely on the ground while reducing time spent in danger zones. Create detailed reports that include linear dimensions, area measurements and slope calculations, as well as create professional quality footage of your projects that you can use later in your marketing material. Back in the office or out in the field, it's easy to analyze high-fidelity reconstructions of sites, take measurements and share comments efficiently.



ID	Area ft²	Pitch	ID	Area ft²	Pitch
A	3302	0:12	H	691	3:12
B	3588	0:12	I	704	3:12
C	2944	0:12	J	632	0:12
D	908	5:12	K	400	0:12
E	885	4:12	L	830	0:12
F	911	5:12	M	700	3:12
G	901	4:12	N	710	3:12

Edge Type	Length
Parapets	1461
Hip	171
Eave	428
Valley	65

Total Area: 18106 ft² Total Facets: 14 Total Edge Count: 56

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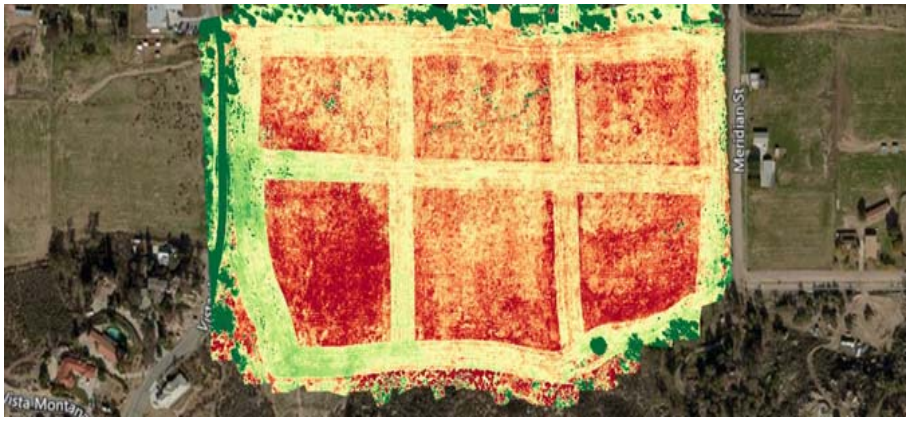
AERIAL 3D MODELING & MAPPING

PLANT HEALTH

Plan Health Scans—Agricultural drones allow relief for the modern day farmer. Drone technology can cut down labor requirements and reduce resource requirements (such as fresh water and pesticides). Farmers are also able to use drones to retrieve aerial-view images of their fields; there are currently three different types of view provided to the farmer through a drone. The first is seeing the crop from a birds' eye view; this particular view can reveal many issues such as irrigation problems, soil variation, and of course, pest and fungal infestations. The second view that is able to be received from the drone is something known as multispectral imaging; these images are used to show an infrared view as well as a visual spectrum view. When these views are combined, the farmer is able to see the differences between healthy and unhealthy plants. This difference is not always clearly visible to the naked eye, so having the ability to see the crops from these views can assist the farmer with assessing crop growth, as well as crop production.



Additionally, the drone can survey the crops for the farmer periodically to their liking. From a choice of weekly, daily, or to each hour, the farmer is able to use this information to show the changes in the crops over time, thus showing where there might be some "trouble spots". This proves to be a key benefit because by identifying these trouble spots, the farmer can then attempt to improve crop management and improve the overall production of their crop.

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Aerial 3D Modeling & Mapping

Volume Measurements

Stockpile measurement in less than a minute

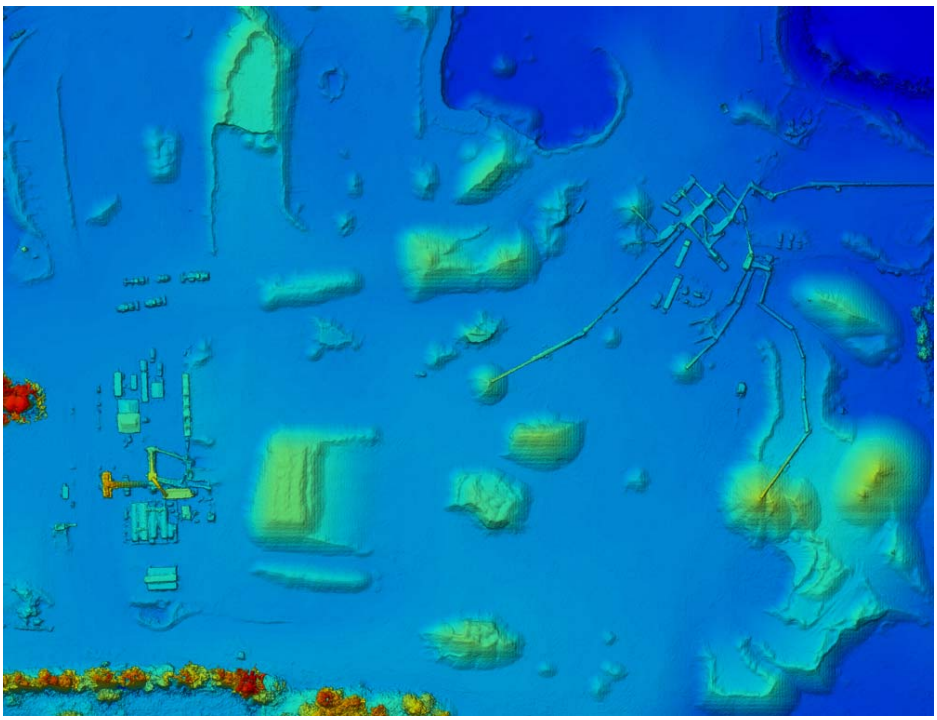
Automatically measure any type of stockpile:

-Aggregate materials like sand, stone, gravel and rock;

-Biomass products like pulp, paper, timber, logs, wood chips, mulch and manure;

-Minerals like gypsum, kaolin, lime, clay and ceramic;

-Road-building materials such as asphalt, petroleum, coke, cement and concrete.



The size of landfills or pits can be accurately measured based on cut and fill volumes.

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AERIAL 3D MODELING & MAPPING

POINT CLOUD EXPORT

Virtual design and construction teams are quickly discovering the value that drone mapping brings to all stages of a construction project, including initial site survey and design, volume and elevation measurements and comparisons, and quality assurance. In a fraction of the time it takes to conduct a ground-based survey, a drone can automatically fly and capture imagery of a project site that can then be processed into highly-accurate point clouds compatible with Building Information Modeling (BIM) software.

Using traditional ground methods, a 60-acre site could easily take two or even three weeks to survey. Drone mapping reduces that process to four days or less from initial request to importing the point cloud to BIM software. Some of the biggest time savings come from the data collection step. For most construction sites, it takes less than an hour to fly and capture mapping imagery. We then process the flight photography to a cloud-based server platform to create a map and 3D model, allowing export as an Autodesk™ Revit™ file for BIM integration.

Accept Survey
1- 2 days

Data Collection & Post-processing
1- 2 weeks

Delivery of PDF, CAD File, Contour Map
1-2 weeks

Total Time
2-3 weeks

Mobilize to Site
1 day

Fly Drone & Collect Data
1-2 days

Delivery of PDF, CAD File, Ortho Map, Contour Map, Point Cloud
1-2 days

Total Time
1-4 days

Not only are drone-based surveys faster to perform than ground-based surveys, but they also deliver much more detailed data. A traditional survey may only yield a few hundred points of resolution, whereas drone-generated point clouds can contain millions of points. The result is a high-resolution 3D model that is revolutionizing the work flow of many around the world.

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AERIAL 3D MODELING & MAPPING

NEW CONSTRUCTION

Many projects are monitored and managed from a distance. Project managers, investors and executives normally visit the jobsite periodically. Aerial modeling and mapping offers time-lapsed imaging of your jobsite on a scheduled basis. Whether being used for draw requests, progress reporting, or as-built documentation, aerial mapping is the solution.

Each visit to a site exported as a 3D model gives distant stakeholders a real view of the progress on-site. Export any of these models to a Point-Cloud file and you can measure to ½ cm accuracy. Imagine a map of the post tension cables in the base of a large building that can be measured to ½ cm anytime in the future.

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Aerial 3D Modeling & Mapping

Pre-Sale

Most pre-sale inspections do a comprehensive analysis and documentation of the interior of a building and only a cursory analysis of the exterior and even less of the roof. Aerial photography and the modeling and mapping capabilities give a crystal-clear view of the roof, even the unreachable portions.

Another consideration for pre-sale is the condition of the surrounding landscaping and drainage. Whether for new construction or existing property, documentation of the existing conditions is important from a risk management perspective.

Documenting the conditions of the property and buildings prior to the transfer of responsibilities to the HOA is an important step to managing expectations and reducing litigation in the future. Aerial photography captures the condition of the landscape, sidewalks, driveways, streets, roofs, exterior walls and much more. These images are helpful in the future to counter claims made about the conditions at the time of turnover.

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Aerial 3D Modeling & Mapping

Inventory Assessment

Many apartment and commercial property clients manage their inventory by reacting to issues after they occur. Roof conditions are a challenge for most apartment owners to analyze and a plan for repairs or replacement before they occur.

Physically mounting and analyzing roofs for the purpose of determining a remaining serviceable life estimate is time consuming and dangerous. In addition, the damage that occurs then becomes part of the repairs or replacement needed.

Aerial imagery offers a time and cost effective option to evaluate your inventory without the risk involved in mounting hundreds of roofs. A typical community can be completed in one to two days with reporting available within a few additional days. This imagery and analysis can include:

- Detailed imagery of the issues found and results of the analysis.
- Detailed measurements that can be used for budgeting and comparison to sub-contractor bids.
- Imagery available to sub-contractors during the bid process which allows all questions to be answered before the final bid.
- Images which are often used to determine the sequence of the repair process.
- Similar imagery which is available to assess other components of your property such as streets, landscape, tree health, and pools and other common areas.

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