



Creating Foundations to Build On



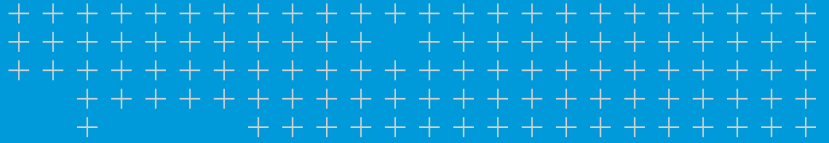
California's San Luis Obispo County is known for dramatic beaches and seascapes.

Photogrammetry software helps lay the groundwork for a future community.

A U.S. company uses Trimble technology to deliver critical maps in a fraction of the cost and time of traditional land surveying.

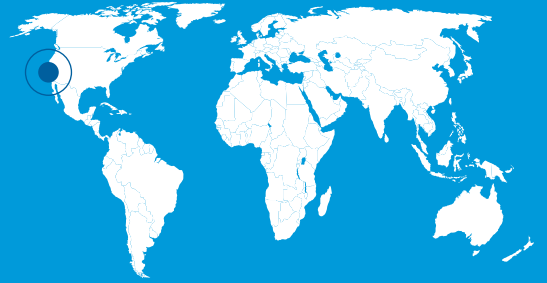
Solution

Trimble® Inpho® Suite



overview

California's San Luis Obispo County has attracted thousands of newcomers in recent years, and that influx has strained its housing market. One ambitious development project aims to help ease that pressure. In support of this vision, a local photogrammetry company has been using advanced photogrammetry software to deliver detailed, foundational 3D maps upon which to build the new community.



Location
CALIFORNIA



Given San Luis Obispo's (SLO) urban growth, the state of California expects the city of SLO to build 3,508 housing units by 2028 to meet estimated demands. In May 2019, construction began on San Luis Ranch (SLR), a mix of 580 multifamily and single-family homes intertwined with parks, open space and agricultural farmland.

Central Coast Aerial Mapping (CCAM), has been offering digital orthophotography and photogrammetric mapping services since 1977 and has earned a unique reputation for producing superior, 3D-stereo-based maps efficiently and cost effectively. Given its reputation and strong working relationships in the AEC and surveying markets, the prime development contractor chose CCAM to provide the critical 3D data for the SLR project.

CCAM needed to produce two 3D topographic maps vertically accurate to 0.1 foot, which included 1-foot contours and planimetric features such as roads, fences and vegetation. One topographic map would cover 441 acres and a second map would detail a 140-acre section

planned for grading. CCAM also needed to create two orthomosaics at 0.2 feet accuracy.

AN EFFICIENT PROCESS

Prior to the aerial work, a crew set nine ground control points (GCPs) and established five checkpoints. They then flew the area of interest (AOI) with a digital photogrammetric camera. They captured 23 photos at a ground sample distance of 3 cm. The processed images, the GCPs and the center coordinates of each photo were imported into Trimble Inpho's MATCH-AT georeferencing module to automatically triangulate the images.

"Before we used MATCH-AT, we'd have to find common image points and tie them together manually, which could take days," said Robert Lafica, certified photogrammetrist and CCAM's owner. "Inpho triangulated this project in 20 minutes."



The cleared area of the San Luis Ranch's future residential community as seen from the top of a nearby hill. When complete, the SLR will accommodate 580 multifamily and single-family homes.



A 3D rendering of the planned San Luis Ranch community.

Once the final triangulation was complete, the team used Inpho's MATCH-T software to automatically generate thousands of 3D points for a DTM. Using 3D stereo technology, they incorporated those 3D terrain points and mapped break lines, contours and planimetric features. Each of the 23 photos were orthorectified and Inpho's

OrthoVista module stitched together the orthorectified images to create a 2D orthomosaic of the AOI. CCAM operators then performed quality control checks to finalize the seamless orthomosaic. The 3D topographic grading map, DTM and orthomosaic were delivered two weeks from data acquisition.



“We couldn’t have met the high-precision and detail requirements of the datasets in the tight deadline we had without the automation and accuracy of the Inpho technology,” said Lafica.

As construction of the SLR continues, CCAM may need to provide more critical maps. Should they receive the call, they will no doubt lean on their Inpho software to put the precision in their photogrammetry products.



Above: The finished orthophoto mosaic from 2020. CCAM used Inpho OrthoVista to automatically stitch together the 23 orthorectified images.

Top: The SLR will include parks, open spaces and agricultural farmland.

Bottom: The 2020 3D topographic map of the graded area, which spans all the way from the north where the street is to about half way down the map.

“With Inpho software, we produced incredibly precise and feature-rich topographic maps and orthomosaics in a fraction of the time and cost of traditional land surveying. The efficiency and accuracy of its automatic triangulation capabilities are unrivaled.”

— Robert Lafica, certified photogrammetrist and owner of Central Coast Aerial Mapping

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