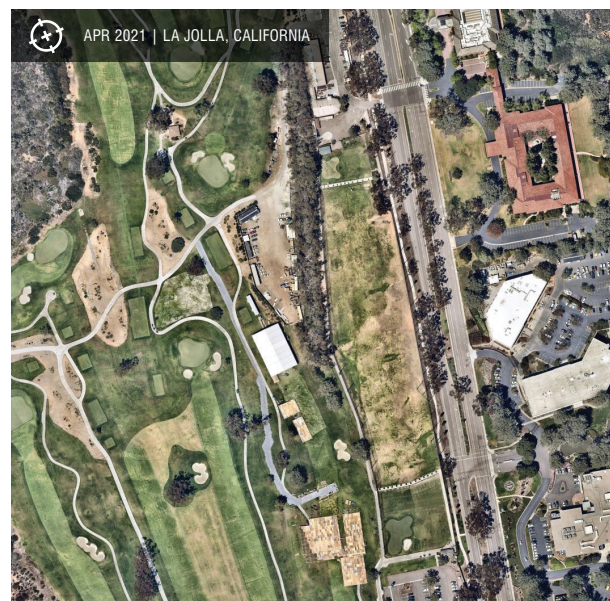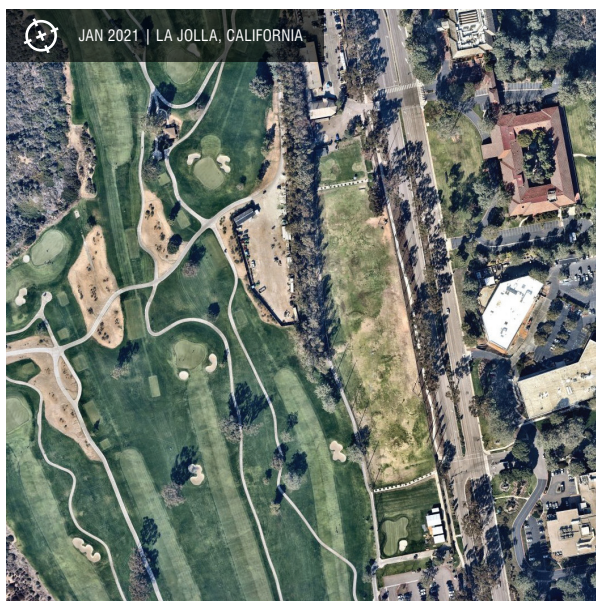# Improving on 'Par for the Course'
Aerial Imagery Helps Prepare Golf Courses for U.S. Open Tournament

Tim Lloyd
Director of Operations
U.S. Golf Association

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Nearmap imagery from January 2021 (left) and April 2021 (right) show the construction progress to the course in preparing for the U.S. Open.

The U.S Open Championship has been held since 1895 and is one of the most-prestigious and difficult golf tournaments in the world. Staged by the U.S. Golf Association (USGA), it's played on a different course each year and now welcomes tens of thousands of attendees every day.

Most golf courses aren't built for such crowds or the infrastructure required to host such an event, including temporary grandstands for spectators; buildings for food, drinks and other concessions; restroom facilities; television equipment and broadcast towers; temporary parking; security and public safety; and new roads to move all the additional vehicles around.

Currently tasked with planning and executing these tournaments is Tim Lloyd, director of operations for USGA. "My team specifically is involved in the build planning and execution of the onsite venue," he explains. "Taking a golf course and turning it to a stadium."

Expanding the Toolset

Such a monumental task requires a lot of people, equipment and planning, and Lloyd uses technology as much as he can to help. One of his primary resources is detailed, high-resolution aerial imagery from Nearmap, which provides content updates two to three times a year.

"We came upon Nearmap a few years ago and began to realize the benefit of having that constant update and the very crisp imagery as we look to our sites and how we overlay that two-dimensional plan on top of it," says Lloyd.

He also explains that a typical U.S. Open takes about four years to plan and build, and using Nearmap imagery taken during different seasons with varying vegetation growth is very useful.

"The ability for us to see that infrastructure as we lay it in is critical to our ability to plan accurately," he adds. Nearmap location content can be used to plan and execute the control of procurement, transport, and stationing of workers and materials in the different phases of the construction to reduce disruption to the local community and surrounding businesses.
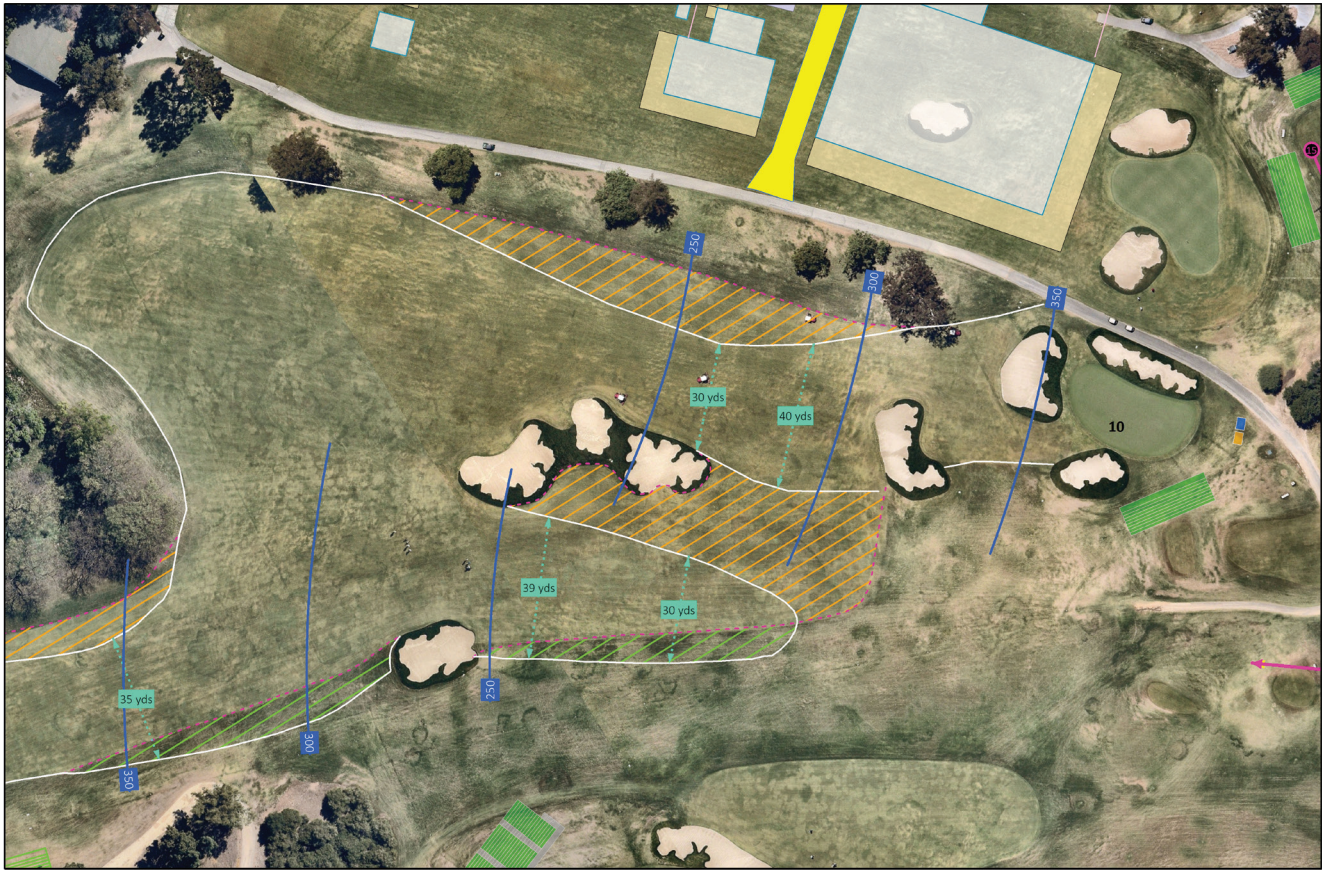
The USGA uses Nearmap imagery as a basemap within ArcGIS to assess a course's normal layout for its members and if it needs to be modified to make it more challenging for the U.S. Open and the world's best golfers.

High resolution imagery is vital to the planning process. Nearmap's current-generation camera system captures data with a ground sample distance (GSD) of 5.5 centimeters in vertical imagery with a horizontal accuracy of 19.8 centimeters, which allows for extreme precision.

Changing Course

In addition to laying out the new infrastructure needed for every event, Nearmap imagery is used to determine if a course needs to be modified to suit the world's best golfers.

As an example, Lloyd cites the Los Angeles Country Club, which will host the 2023 U.S. Open. During planning, they realized professional golfers, who hit the ball farther than most of the regular members and can be more creative in their approaches, may try to navigate a hole more-directly by playing a shot to a different hole, and then back to the green of the original hole. They didn't want the intent of the course to be challenged, so they're redesigning those holes so the

best players in the world have to stay on the hole as intended.

"This is a unique application, but without Nearmap, we wouldn't be able to show it," notes Lloyd. "Once those changes are made, we'll then get the updated aerial [imagery], and we'll be able to show it as it is in real time."

Making a Difficult Job Easier

Lloyd notes that although planning for a U.S. Open and all the changes needed on each course have been happening for more than 100 years, modern technology improves the ease and accuracy of the transitions.

"In the past, prior to our ability to use Nearmap, we'd be guessing, we'd be estimating and drawing in freehand how those buildings situated, perhaps with some blueprints and otherwise," he explains. "But now we have the ability to see it, as soon as that building was under construction and then when it was completed. We could see exactly what it looked like, and we were able to plan accordingly."

To host a U.S. Open, the USGA often needs to add temporary infrastructure to an existing course. This can include buildings for players, stands for patrons and even new roads that allow for all the additional vehicles needed for such an event.

About Nearmap

Nearmap's cloud-based geospatial information services and aerial surveys offer instant access to high-resolution vertical, oblique and panoramic aerial imagery, city-scale 3D datasets and Nearmap AI along with integrated geospatial tools. For more information, visit *www.nearmap.com*. **II**