GETTING AIRPORT OPERATIONS OFF THE GROUND WITH AERIAL IMAGERY

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San Francisco International Airport relies on the frequency and functionality of Nearmap imagery to maintain accurate records and manage its built environment.

For nearly 100 years, the San Francisco International Airport (SFO) has sought to provide exceptional service to travelers, airlines and the community. With nearly 58 million guests traveling through the airport each year, SFO places safety, security, and high-quality service at the top of its priorities.

But accomplishing these goals while complying with Federal Aviation Administration (FAA) standards requires something the airport didn't have in place until recently, up-to-date aerial imagery.

Though SFO was pleased with the aerial images from previous providers and inter-local government partners, a more timely turnaround time and frequency of collection became a higher priority as airport infrastructure continued to evolve.

That's when SFO discovered Nearmap.

"Nearmap provides recent content which helps us keep pace with the frequent changes to our Airport infrastructure," says Hanson Michael, Senior GIS Analyst at SFO. "We can really use the imagery to augment our data collection."

Integrating the current, high-resolution imagery of Nearmap with applications like Esri's ArcGIS products, Autodesk's AutoCAD, Autodesk's Revit and their 911 system software helps the airport perform day-to-day functions to the best of their ability — while meeting stringent federal airport regulations.

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CURRENCY IN A RAPIDLY CHANGING ENVIRONMENT

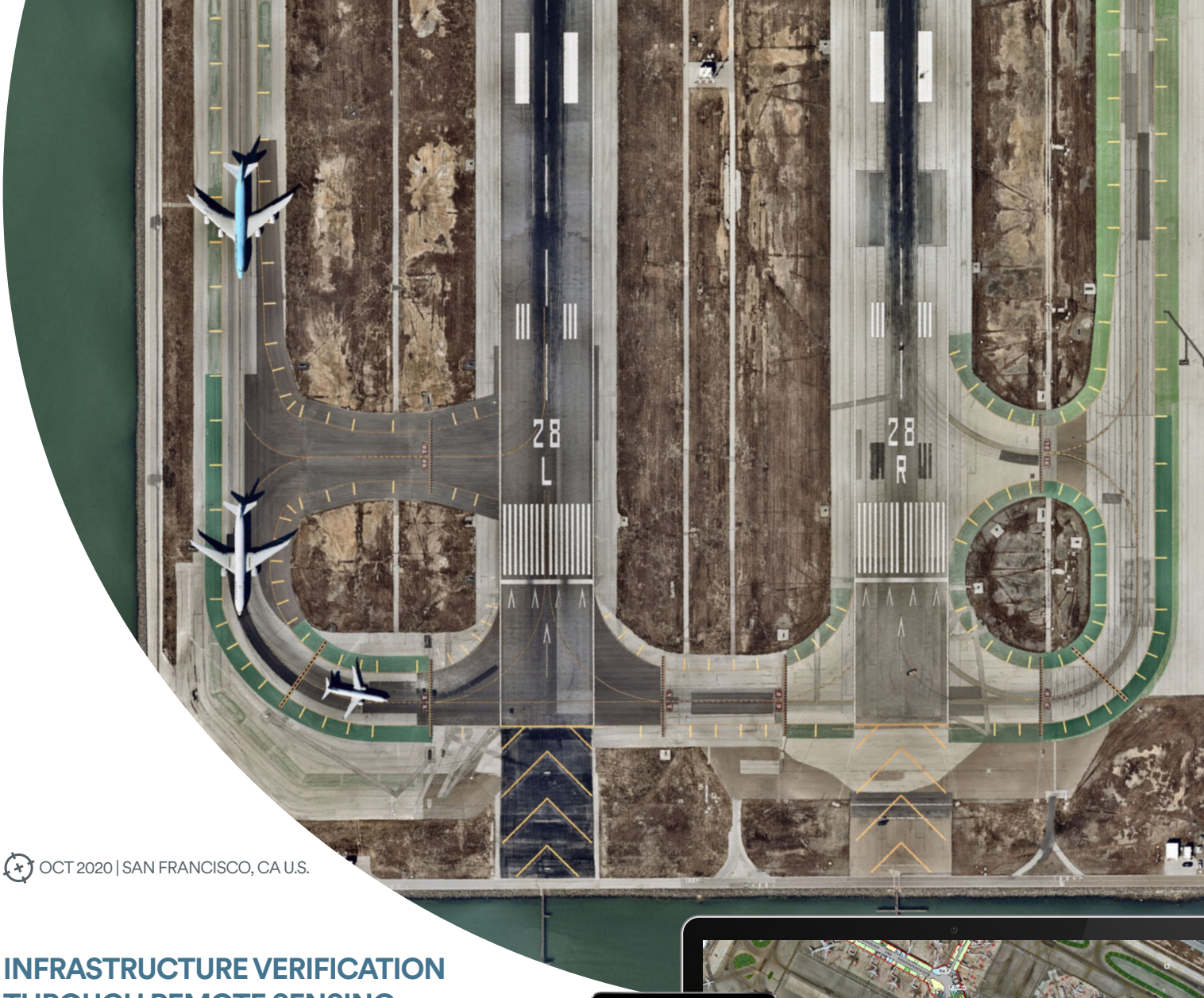
With imagery dating back to the 1930s, SFO has documented the progression of the airport over many decades. But with Nearmap, the airport could track changes over the span of a few months, instead of years. This has been especially critical given the rapid pace at which buildings are being constructed and taken down.

"Prior to Nearmap, our imagery was typically on a 12-18-month cycle and the airport was changing at a much faster pace than this. So, for the high-resolution content, Nearmap has been working very well," said Hanson.

Access to historical imagery also provides a way to accurately compare those changes over time.

"Going back and doing some 'ortho-archaeology' on a building, to see what was where and when—that's been very helpful as well."

Hanson Michael, Senior GIS Analyst, SFO



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INFRASTRUCTURE VERIFICATION THROUGH REMOTE SENSING

One of the primary tasks for SFO is maintaining an accurate log of airport infrastructure, which must be reported back to the FAA. Pulling Nearmap imagery into Esri's ArcGIS Pro has simplified the process of verifying infrastructure locations.

"At the airport, we have some large infrastructure which we maintain in GIS, such as runways and taxiways, as well as maintaining a digital copy of all painted signs and marking lines out in the airfield," says Agie Gilmore, GIS Analyst at SFO. "All the paint on the airfield needs to be designed or approved by a SFO Civil Engineer, which also needs to be certified by the FAA."

Through remote sensing (enabled by Nearmap within mobile field applications), engineers at SFO can monitor pavement conditions, verify that drainage basins are in the right spot, and ensure that construction zones are correctly built. This leads to more accurate records and cuts down on potential risks posed by staff walking the perimeter of the asphalt on the airfield. Instead, workers can simply plot shapes directly on an iPad or desktop computer.

"We use this to help supplement our data QA/QC processes to make sure the information that project-teams have given us in the form of as-builts and engineering drawings are accurate," says Hanson. "And it's kind of hard to argue with an image that's recent."

Agie and Hanson work to ensure that this data gets dispersed throughout the organization in the format users require. This appeases the stakeholders who make these verification requests, as well as the engineers who oversee the airfield design. By integrating Nearmap imagery as a layer within AutoCAD, engineers have a clear picture of the airfield to work with.

"Civil engineers rely a lot on this kind of visual verification when they are designing new taxiways and taxi lanes. Any stripe you see in the airfield is designed very specifically by our civil engineering group," says Agie. "We have a dozen or so civil engineers along with mechanical and electrical engineers, so there's a large group that relies on imagery inside their own working environment."

READY FOR INSPECTION

As required by the Part 139 FAA inspections, SFO must develop an approved Airport Certification Manual once a year. Among other safety procedures and precautions, this includes ensuring that the airport has standardized runway safety areas and that it conforms to stringent lighting and marking standards.

To comply with these regulations, the Airfield Operations Department oversees the logging of pavement conditions and repairs around the airfield.

"First, they'll go out and mark an issue area, then a work order gets put in, next, a civil engineer designs a solution and then they demo the pavement and repave the area. During this process, they have to maintain a log of the pavement repair area and all of its associated information. This all gets logged back through to the FAA," says Agie.

Although the Air Operations team are not GIS professionals, Agie says that they do find it easy to use the mobile and desktop applications to maintain an accurate record of ground shapes and pavement repairs.

And when the location of everything – including every painted sign in the movement area of the airport – must be documented, accuracy is crucial. "Everything that happens in the airfield is a high priority. It's very important to keep a good record as well as maintaining high spatial accuracy," says Agie.

"We create applications and we also take in data from our civil engineers but we also have field workers going out there and verifying that everything we have is really a digital copy of what's on the airfield so we can report back to the FAA."

Nearmap's frequency, granularity and interoperability is critical to SFO meeting its goal to provide exceptional service to the millions of travelers and dozens of airlines using its facility every year. It's also able to support the airport's need to meet compliance obligations from the FAA while ensuring the safety of workers and engineers throughout the airport.

ABOUT NEARMAP

Global technology pioneer Nearmap provides easy, instant access to up-to-date and historic geospatial data that organizations depend on as their source of truth for the livable world.

Nearmap proactively captures wide-scale urban areas in the USA, Canada, Australia and New Zealand multiple times each year, with patented plane-mounted camera systems that provide superior detail, and automated processing pipeline that ensures rapid availability.

Regular surveys cover 71% of the US population—over 430 urban areas encompassing more than 330,000 square miles annually, with major metros frequently captured up to 4x per year.

Customers rely on Nearmap for consistent, high-quality content that enables remote capabilities and unlocks productivity for profound change: crystal-clear high-resolution vertical, oblique and panoramic aerial imagery; a vast library of historic captures; frequently updated city-scale 3D datasets on demand; and verified pre-processed property insights at unmatched scale with Nearmap AI.

Founded in 2007, Nearmap was named as one of the world's 10 Most Innovative Companies of 2020 by Fast Company magazine. With offices in the United States and Australia, Nearmap has a global customer base including government agencies and enterprises for whom current, reliable and truthful data is essential to critical decision making and operational workflows.

Nearmap's parent company, Nearmap Limited, is a publicly traded company listed on the Australian Stock Exchange and one of the 200 largest ASX-listed stocks in Australia.