

Aerial image provided by Nearmap of La Jolla, CA taken on 9/25/2021.

# A Different Point-of-View

## Using Aerial Imagery to Build Stronger Cities

By Shelly Carroll, Vice President and General Manager, Public Sector, Nearmap

When it comes to aerial imagery, city governments often make do with sporadically updated captures that fail to provide the most up-to-date information about the changing landscape of their urban areas. While they understand and appreciate the value of collecting this data, the update cadence is often too infrequent to reveal vital changes. As a result, information that is essential to successful planning and ongoing operations can go unrecorded and unanticipated.

This era of cities having to “make do” with self-collected aerial data may be coming to an end, thanks to new and enhanced photogrammetric products and possibilities. Increasingly, municipalities are realizing that frequently refreshed and consistent aerial imagery is a requirement if they are to keep pace with fast-growing and quickly evolving communities.

### Sioux Falls Streamlines Assessments with Aerial Imagery

One recent example of this technology in action is happening in Sioux Falls, South Dakota, an Upper Midwestern city with a population of more than 200,000. The most populous city in South Dakota, Sioux Falls accounts for more than 30% of the state’s population.

Working with Nearmap, a leading aerial imagery and location intelligence company, Sioux Falls was able to streamline current assessment processes, leading to more accurate and easier-to-obtain data for their entire team of property assessors.

The company’s premium geospatial content, combined with world-class mapping software and integrations, provided city

assessors a consistent “source of truth” throughout the year. Armed with frequently refreshed images, the assessors were no longer constrained by the usual clutch of springtime image captures. Now they were able to review and assess based on late-season captures, as well, a time when many construction projects near completion.

All data was openly accessible to anyone in the assessor’s department with cloud-based access, allowing staffers to instantly stream imagery across devices. Easy integrations with CAD and GIS applications like Esri ArcGIS Pro were also essential for decision-makers from every municipal area, from public works employees to elected officials. The Sioux Falls team especially appreciated the ability to view current and historical imagery side-by-side, which is a feature of the Nearmap system that augments long-range planning activities.

City staff found that Nearmap’s 3D Textured Mesh, a fully textured and colorized model, provided an enhanced understanding of actual conditions, which contributed to better informed decisions. Lauri Sohl, Civic Analytics Manager for the City of Sioux Falls, says, “While 3D urban models of proposed buildings are useful, combining them with Nearmap Textured Mesh gives people a true understanding of a project.”

Photogrammetric Engineering & Remote Sensing  
Vol. 89, No. 1, January 2023, pp. 5-8.  
0099-1112/22/5-8

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and Remote Sensing  
doi: 10.14358/PERS.89.1.5

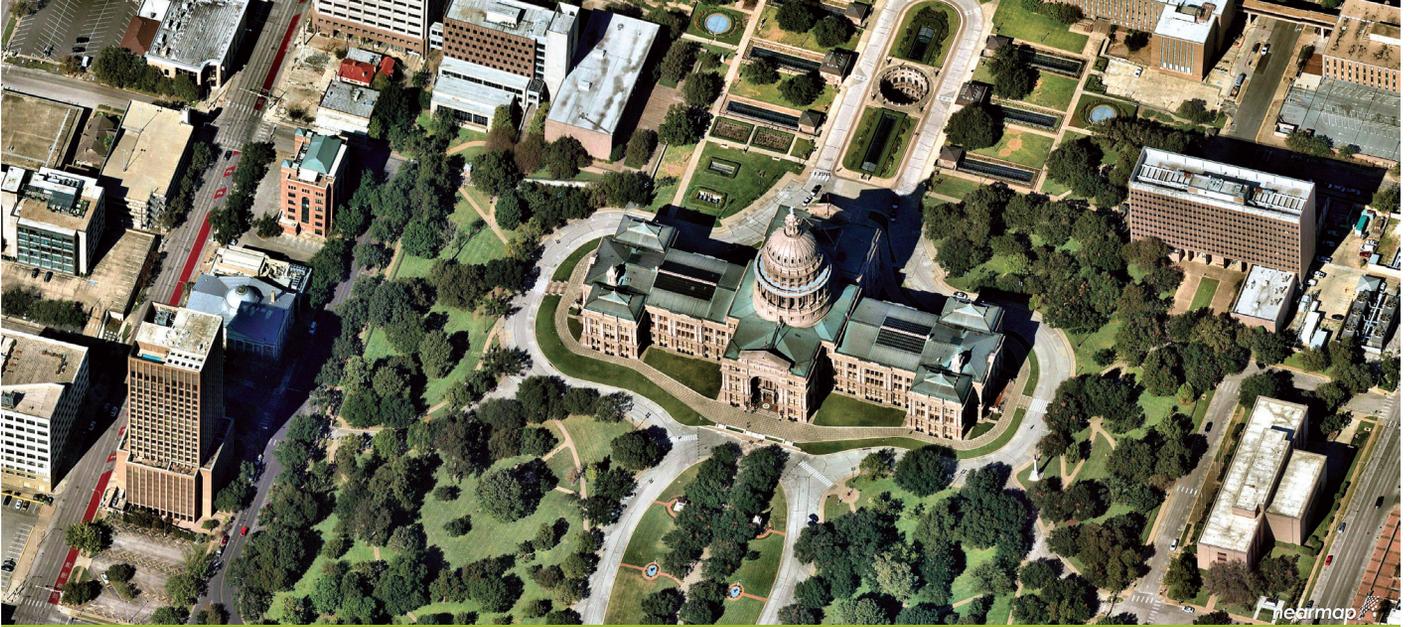


Aerial image provided by Nearmap of Sun Lakes, AZ taken on 5/23/22

## Breaking Down Silos for Smarter Cities

Many cities are finding that frequently updated imagery can break through existing departmental silos and support more efficient planning and operations throughout City Hall and beyond. Instead of relying on often-costly and inefficient bespoke aerial acquisitions, local governments are making the move to aerial capture programs, like the one in place in Sioux Falls. This way, users receive frequently refreshed high-resolution imagery and derived datasets that help them understand change at scale. Here's how municipal departments use these images:

- **Assessors** are able to conveniently and accurately inspect land, building structures, ground surfaces, and other taxable items for correct property valuations. They are able to remotely inspect parcels to identify new taxable activity and successfully defend against appeals.
- **Inspectors** rely on date-stamped aerial imagery to identify properties on which to focus attention. This reduces wasted trips to sites where, for example, construction has not yet begun or has slowed down mid-project.
- **Emergencies** require products like Nearmap's rapid ImpactResponse flights for the latest high-resolution basemaps to safely route police, fire, and response teams. Current aerial imagery is critical for coordinating actions on the ground, providing emergency staff a Common Operating Picture critical to developing strategy and coordinating tactics. And once the immediate danger of an emergency is over, teams can use the data to assess roof repairs, street blockages and other damage, accelerating the insurance claim process.
- **Transportation and road crews** can view even the smallest pavement irregularities – including potholes – with high-resolution, up-to-date aerial imagery. They can keep track of vegetation removal and planting projects, repairs, and they benefit from a bird's eye view of conditions as the seasons change. Officials can also use the imagery and 3D data to expand visibility into the material condition of assets like roads, vehicle depots, stations, rail tracks, bridges, pavement markings, and signage.
- **Public works, parks and recreation and environmental services** teams are able to work together seamlessly with a clear, current and consistent source of truth. For example, aerial imagery and derived datasets enable measurement and assessment of trees and greenspaces over time. For areas under water restrictions, officials can identify and monitor areas of concern that may indicate unauthorized use of scarce water resources.
- **Water, electricity, waste, and environmental utilities** use high-resolution aerial basemaps to track infrastructure, deploy crews efficiently, and respond quickly to interruptions. Large utility inventories can be quickly tracked through feature extraction and measurement of assets like electric distribution lines and poles, manholes, and water features. Potential risks to power lines or other vulnerable infrastructure from vegetation can be highlighted through historical image reviews.
- **City council, mayor, and other elected officials** value the presentation of planning materials that use GIS-integrated, high resolution recent aerial imagery to showcase environmental, social, and governance (ESG) trends. Policy development may be malinformed without the insights of location-based intelligence. And the common vision provided by recent aerial imagery is critical to a successful public input process.
- **Residents** are likely to be more engaged when better equipped with information that is easy to access and understand. Updates about the progress of road construction, new sidewalks, or park improvements can make planning their days easier. Cities are finding that communicating more accurate projections about projects helps gain public acceptance and green-light planned future efforts.



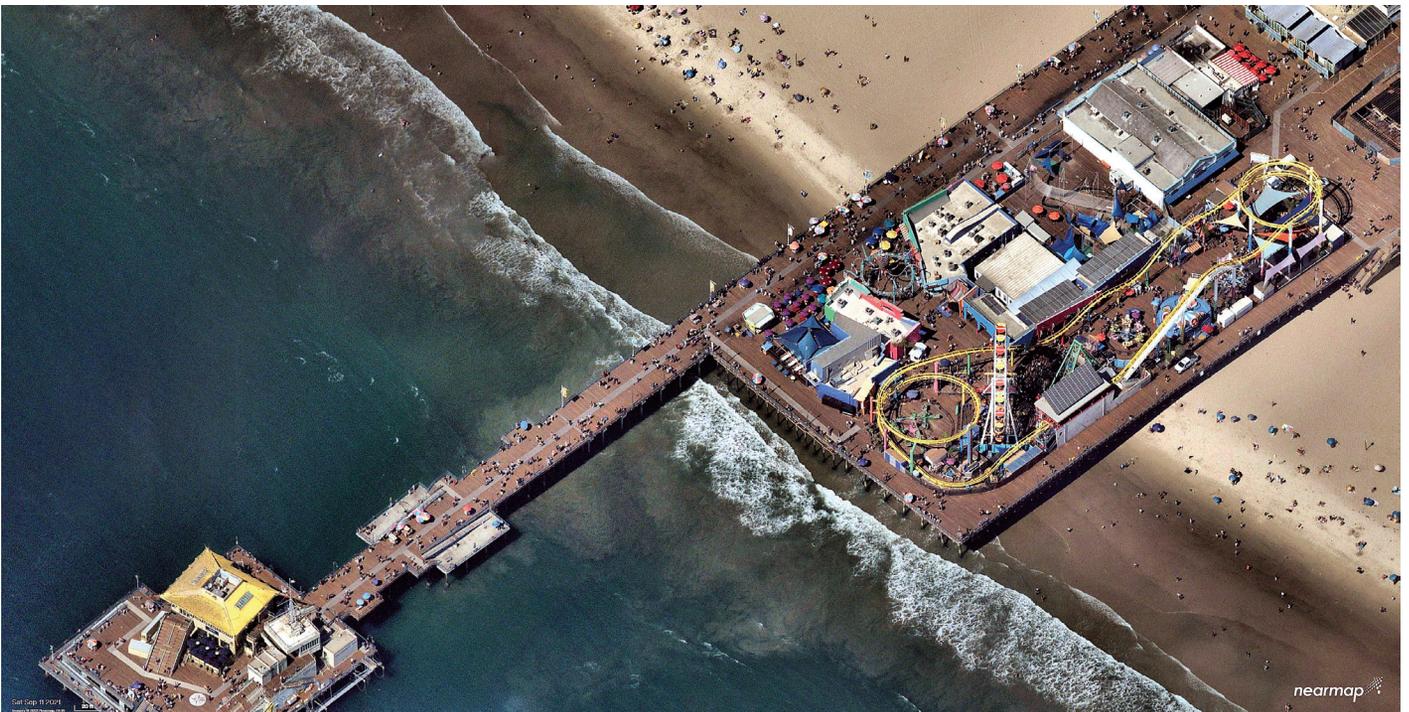
Aerial image provided by Nearmap of the Texas State Capitol taken on 10/30/2021.

## How it Works

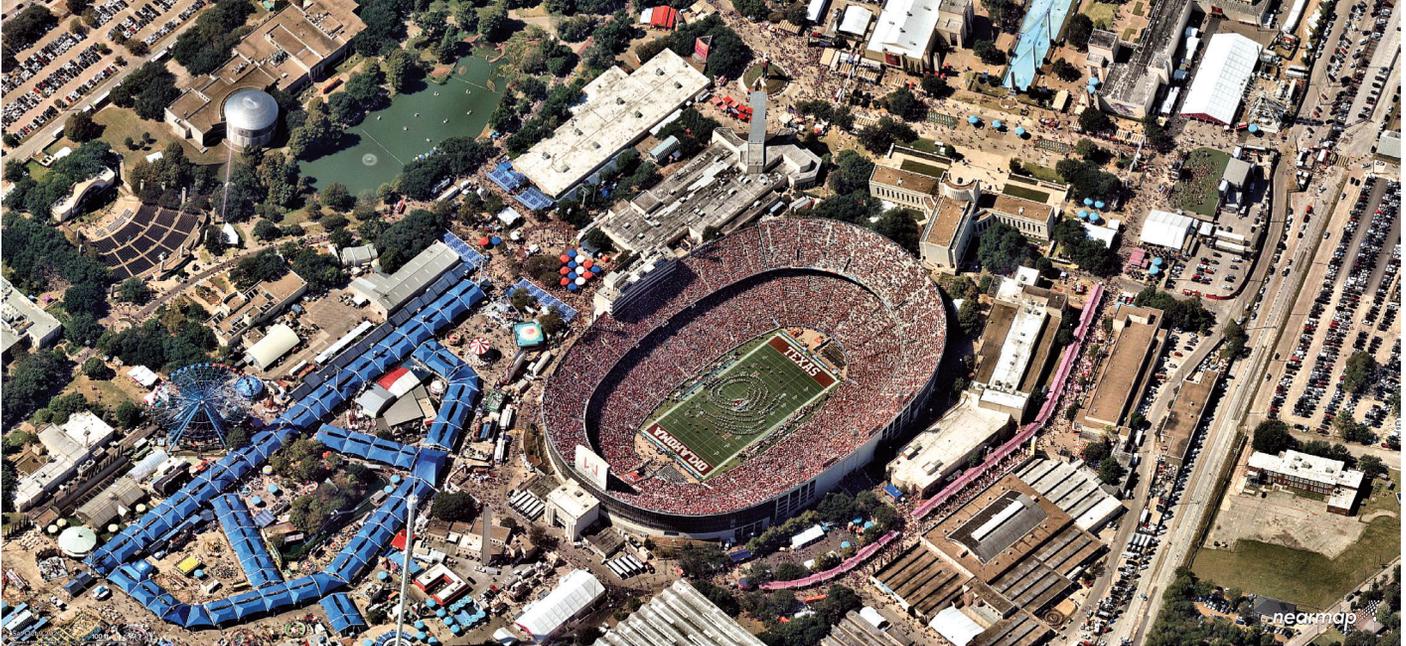
Nearmap proactively acquires and processes aerial imagery and positional data, providing subscription-based access to an ever-growing library of geospatial content. Over 80% of the U.S. parcel base is captured annually at a frequency of up to three times per year. The Nearmap ImpactResponse Program focuses on areas of natural disaster, repositioning resources and acquiring imagery immediately following flood, wind, fire, and other events. Rounding out the acquisition offerings is the NearmapNow Program, which allows customers to obtain custom flights. In 2022, these three programs captured data for over 1.7 million square kilometers across North America.

Nearmap has built and owns its entire technology stack, from sensing systems to processing pipelines through delivery solutions. This patented digital “ecosystem” optimizes the quality, consistency, and speed of deliverables while minimizing the operational risk associated with capturing petabytes of data globally.

HyperCamera 2, the current generation of camera system, captures vertical imagery at a Ground Sample Distance (GSD) of 5.5cm (2.2”) and horizontal accuracy of 19.8cm (7.8”). Oblique imagery and positional data are acquired concurrently. A full compliment of 3D content and Artificial-Intelligence (AI)-derived data layers result from each capture: textured mesh, Digital Surface Models (DSMs), point clouds,



Aerial image provided by Nearmap of Santa Monica Pier, CA taken on 9/11/2021.



Aerial image provided by Nearmap of Red River Showdown in TX, taken on 10/9/2021.

and over 75 thematic vector datasets. HyperCamera 3 will debut in spring of 2023, with technological advances that significantly enhance spatial and spectral resolution, as well as the processed deliverables.

Nearmap's cloud-based photogrammetry pipeline generates these products for streamed access to customers within days of capture. Integration with GIS, CAD, Asset Management, and other decision support systems is seamless, enriching their content and context. The imagery, 3D, and AI content serves as source of truth to power a government's common operating picture (COP), allowing cities to maximize the value of all their location intelligence assets.

## City Officials Weigh In

For cities that have made the move to frequently captured high-quality aerial imagery, the improvement is notable. They have been able to embrace change and build a more sustainable future by relying on the more current geospatial information.

For Trisha Favulli, Director of Assessing for Falmouth, Massachusetts, the move to more frequent aerial data has allowed her town to get ahead of a serious assessment backlog. "Before Nearmap, we were already two years behind on our imagery capture through our county commission. With Nearmap, my view has never been clearer or more up-to-date."

Timothy Zimmer, the GIS Administrator for Shelby County 911 in the Memphis metropolitan area, is impressed with the overall improvement of the accuracy of the information he can now access any time, from any connected device. "I really like how Nearmap is integrated into the GIS stack," he says. "We are able to stay on top of new developments, roads, and addresses. And being able to have Nearmap imagery integrated into our GIS systems helps us to be much more accurate."

The frequency of information updates has made a difference for Matthew W. Bradbury, GIS Administrator for the City of Redlands, California. "Nearmap affords us the ability of a bird's-eye view of our city not just once a year, but several times per year, at a resolution that is rarely obtainable within our budget," he says.

## The Future is Now

Cities of the past often operated within clearly defined departmental silos that limited knowledge-sharing and mutually beneficial planning opportunities. Street crews might dig up and resurface a major road, unaware that the water utility teams had a pipe-replacement project planned for the area six months later. The street closures required for a city festival might not be effectively communicated to traffic, public works, or sanitation crews. And citizens might feel confused about the purpose and status of city improvement projects, or blindsided by changes proposed for their neighborhood.

Today, cities supported by frequently updated imagery are able to operate with a more data-driven mindset. High resolution imagery and derived data encourage a Common Operating Picture, from which everyone can share knowledge, and in which cities can grow and thrive, fueled by an understanding of the history and the changes within their boundaries.

## About the Author

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