

EVOLUTION OF PHOTOGRAMMETRY

Nearmap
March, 2022



MAY 2020 | TEXAS STATE CAPITOL, TX U.S.

nearmap

YOUR PRESENTER IS:

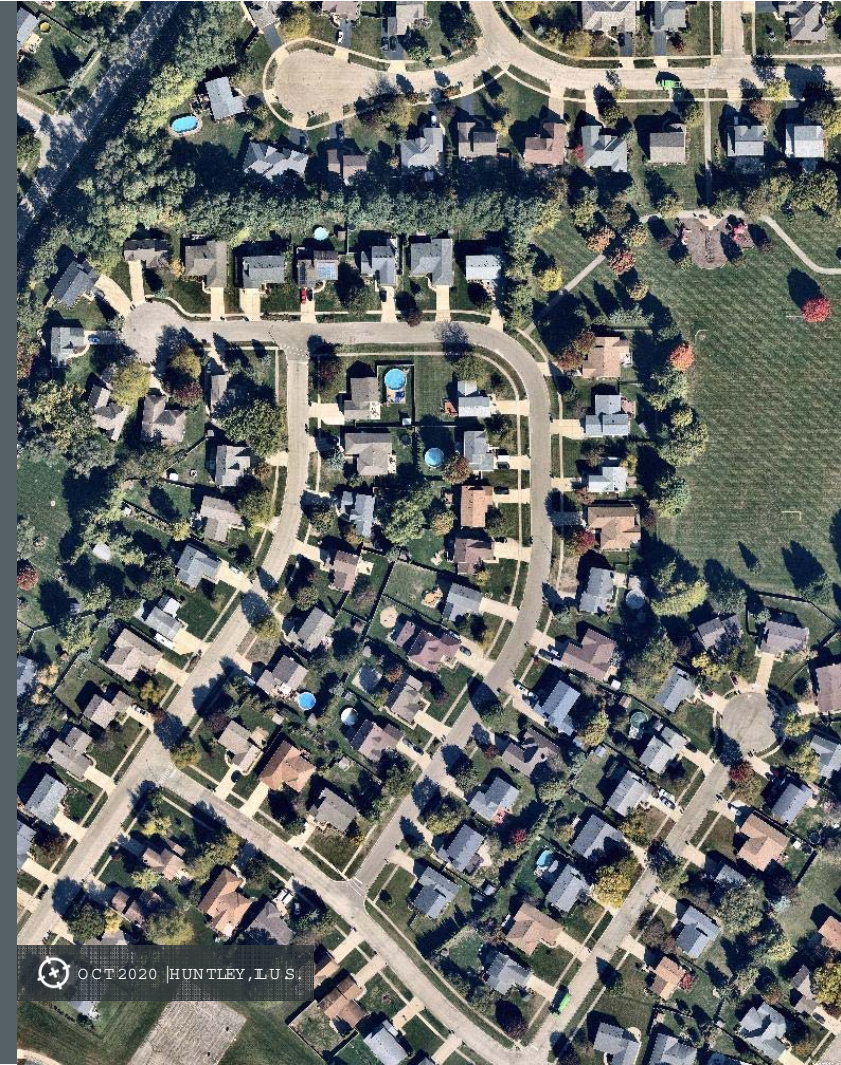


Jackson Adams
Senior Account Executive
Nearmap

Jackson has been with Nearmap for 3 years and has worked with both private companies and public entities. Currently, he is an Account Executive in the local government space and is passionate about the product Nearmap provides. Prior to working at Nearmap, Jackson was a construction project manager/estimator who used a variety of geospatial tools like Nearmap to make life easier.

AGENDA :

- HISTORY OF PHOTOGRAMMETRY/AERIAL IMAGERY
- WHERE WE ARE TODAY
- WHERE DOES NEARM AP FIT INTO THE HISTORY?
 - OVERVIEW OF NEARM AP
- Q & A



OCT 2020 | HUNTLEY, ILL.

PHOTOGRAMMETRY?!

"PHOTOGRAMMETRY HAS BEEN DEFINED BY THE AMERICAN SOCIETY FOR PHOTOGRAMMETRY AND REMOTE SENSING (ASPRS) AS THE ART, SCIENCE, AND TECHNOLOGY OF OBTAINING RELIABLE INFORMATION ABOUT PHYSICAL OBJECTS AND THE ENVIRONMENT THROUGH PROCESSES OF RECORDING, MEASURING, AND INTERPRETING PHOTOGRAPHIC IMAGES AND PATTERNS OF RECORDED RADIANT ELECTROMAGNETIC ENERGY AND OTHER PHENOMENA"



AERIAL PHOTOGRAPHY?!

"TECHNIQUE OF PHOTOGRAPHING THE EARTH'S SURFACE OR FEATURES OF ITS ATMOSPHERE OR HYDROSPHERE WITH CAMERAS MOUNTED ON AIRCRAFT, ROCKETS, AND OTHER SPACECRAFT"



+

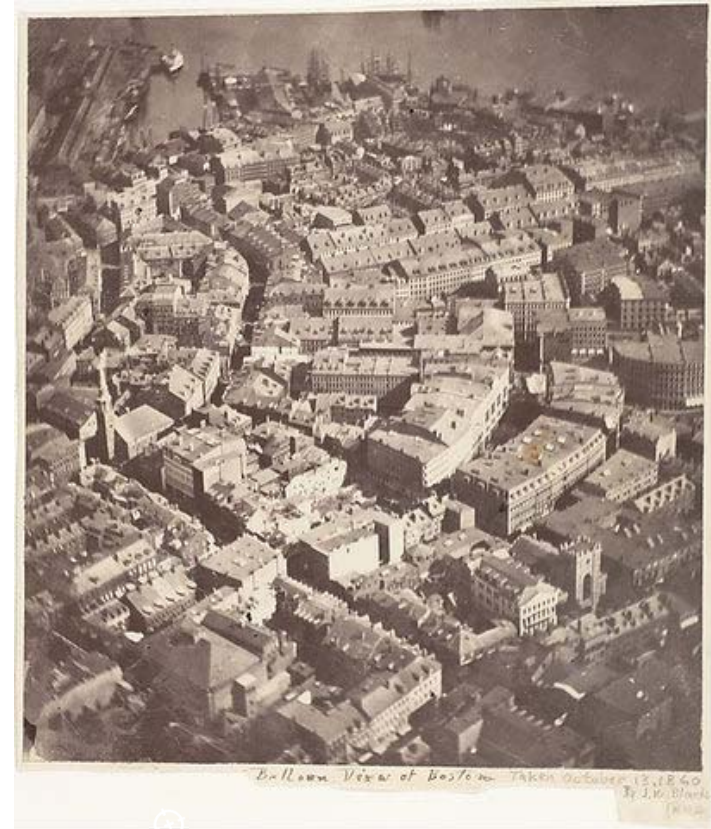


AERIAL PHOTOGRAPHY

L I F T O F F O F A E R I A L P H O T O G R A P H Y

How was aerial photography first captured?

First "surviving" aerial photograph?



1860 from a hot air balloon by James Wallace Black

EVOLUTION OF AERIAL PHOTOGRAPHY

FIRST UNMANNED FLIGHT OF AERIAL PHOTOGRAPHY?



1882 from a single kite by Arthur Batut

EVOLUTION OF AERIAL PHOTOGRAPHY

What came next?



1907 Pigeon Photography by Julius Neubronner

EVOLUTION OF AERIAL PHOTOGRAPHY

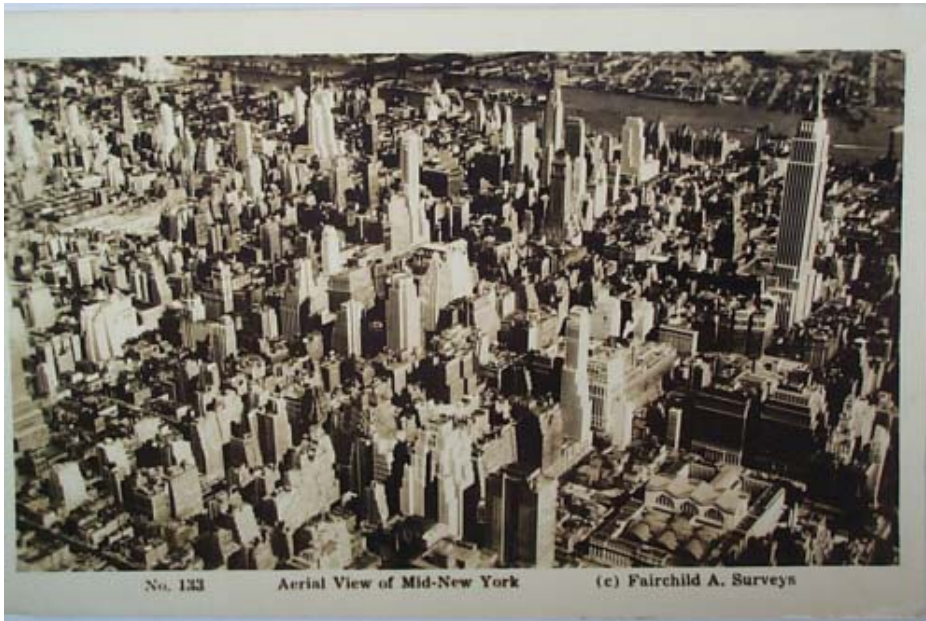
EVEN T THAT LAUNCHED AERIAL PHOTOGRAPHY BY AIRCRAFT?



W W I

EVOLUTION OF AERIAL PHOTOGRAPHY

Look at how far we've come!



Series of overlapping photos taken by
Sherman Fairchild in the early 1930's,
used to make a map of Manhattan Island

IMAGERY ECOSYSTEM TODAY

SATELLITE IMAGING

- 30cm to 3m+ resolution
- Global-scale, frequently updated
- Task based missions
- Macro-environmental analysis

AERIAL IMAGING

- 5 - 30cm resolution
- 2.2 - 3" resolution Nearmap imagery
- Regional-scale, frequently updated
- Multiple high-res formats (ortho, oblique, 3D)
- Fine feature and detail extraction and regional scale

UAV IMAGING

- Sub cm+ resolution
- Project based, restricted coverage
- Multiple high-res formats (ortho, oblique, 3D)
- Fine feature and detail extraction and regional scale

LOCATION INTELLIGENCE

DRONES / GOOGLE EARTH / OTHERS?

Drones = Very high resolution, bespoke flights, currently yet costly method to acquire imagery.

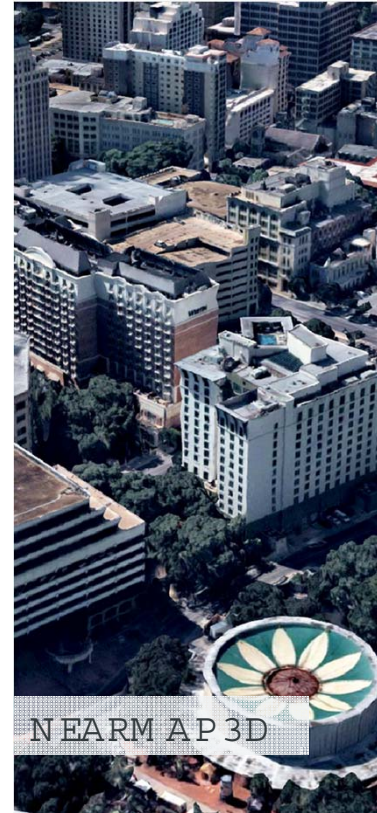
(e.g. 1 sq.km per day vs aerial XXXX sq.km per day)

Satellite imagery = lower resolution, e.g. 50 cm vs Nearmap 5cm, scalable captures

Google Earth = for consumer use as opposed to commercial use

Other aerial imagery providers = varies greatly by processing times, resolution, product offerings, and business models

THE BEAUTY OF IT ALL!





WE ARE NEAMAP:

- Headquartered in Sydney, Australia. Listed on ASX – S&P/ASX Global 200 Index Company
- Established in 2007, we have a growing footprint in Australia, USA, Canada, and New Zealand
- Proudly streaming frequently updated spatial content to 10,000+ active customers, globally
- Pioneered and patented the world's first end-to-end processing pipeline that delivers high resolution location intelligence within days of capture
- In March 2020, Fast Company named Neamap one of the World's 10 Most Innovative Enterprise Companies
- Esri Gold Partner since 2019, winning the title "Best New Content Provider" in 2017 with Esri



HOW NEARMAP CREATES AERIAL MAPS.



FAST AERIAL SURVEY OF LARGE AREAS

- Patented HyperCamera
- Collects large areas
- All imagery is 2.2 to 2.8-inch GSD
- 28cm RMSEr



SCALABLE CLOUD-BASED IMAGERY PROCESSING

- Patented processing
- Publishes within days
- Identifies triangulation points
- Creates DEM
- Ortho-rectifies images
- Uninterrupted mosaic



DESKTOP-READY DATA SUPPORTING BUSINESS NEEDS

- Instant access
- Industry-leading cloud service
- Accessible via MapBrowser
- Integrates with GIS, CAD
- 3rd party applications

RAPID, INDUSTRY-LEADING DELIVERY →



Captured: 1 Oct 2017
Louisville, KY

nearmap

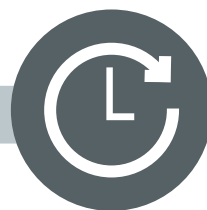


WE PROACTIVELY UPDATE SPATIAL DATA THAT BUSINESSES COUNT ON



1 ALWAYS CURRENT: WIDE-SALE REALTY CAPTURE PROGRAM

Frequently updated aerial survey of large urban and regional areas, up to 3 times a year leaf on and off; accessible 24/7.



2 CONSISTENT: AUTOMATED PHOTOGRAMMETRY PIPELINE

Scalable processing pipeline means content can be delivered within days of capture, with consistent quality and resolution.



3 NO FUSS: ENABLE INSANELY SIMPLE ADOPTION

Instant access via MapBrowser, Esri ArcGIS Marketplace, or APIs. Our simple subscription model means no need to worry about annual procurement and storage.



OUR TECHNOLOGY



MORE THAN AERIAL IMAGERY

Scalable processing pipeline means content can be delivered within days of capture, with consistent quality and resolution.



DESIGNED FOR THE CLOUD

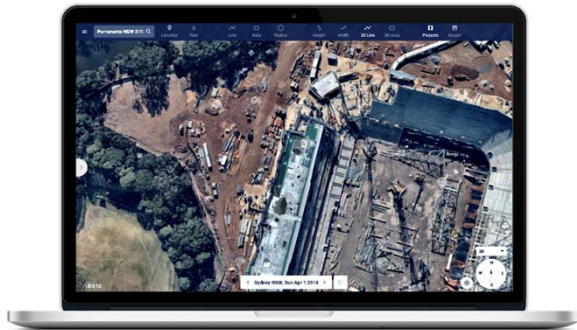
When combined with machine learning algorithms, our imagery delivers deep insights and automated location intelligence for a wide range of industries.



A WIDE VARIETY OF DELIVERY MECHANISMS

Let your users access the content in a way that works best for your organization. Simply access content by logging into MapBrowser, create APIs and integrate into your favorite GIS, CAD, or geospatial software platform.

PLUG AND PLAY



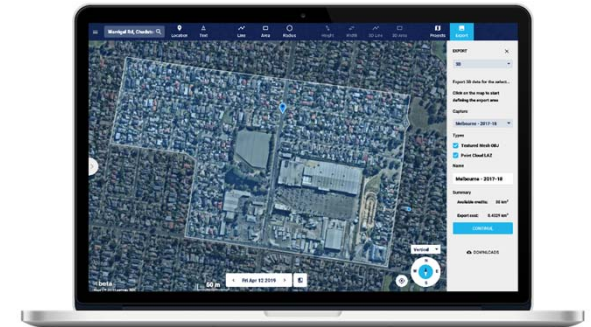
1 Map Browser

Our lightweight web application enables you to explore, measure and keep track of your projects from anywhere in the world. Switch between Nearmap's vertical, oblique, and 3D content in a few clicks. Export georeferenced 2D, 3D and AI content.



2 Esri ArcGIS Marketplace

Stream Nearmap vertical content into ArcGIS products as well as a platform built on top of ArcGIS software. Nearmap Oblique is also accessible via an oblique view widget made with ArcGIS Web AppBuilder.



3 WMS (Web Mapping Service)

Auto-generate a simple or custom WMS URL using the Nearmap custom export tool, then copy and paste that URL into third-party applications to stream Nearmap Vertical content. Perform geofencing and time navigation.

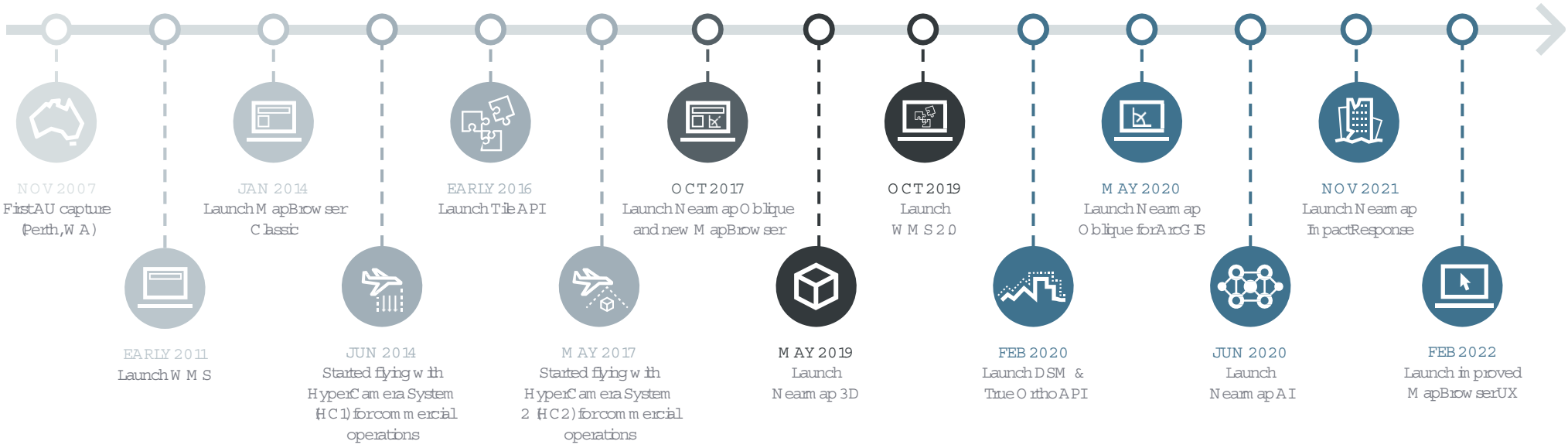




NEARMAPTMELINE:EVOLUTION OF PRODUCTS

We listen when our customers tell us the requirements and we continually evolve our products to better meet the needs.

NOV 2020 | GRFFN, QLD AU



PRODUCTS



AUG 2020 | SOUTHAVEN, MS U.S.



VERTICAL/ORTHO

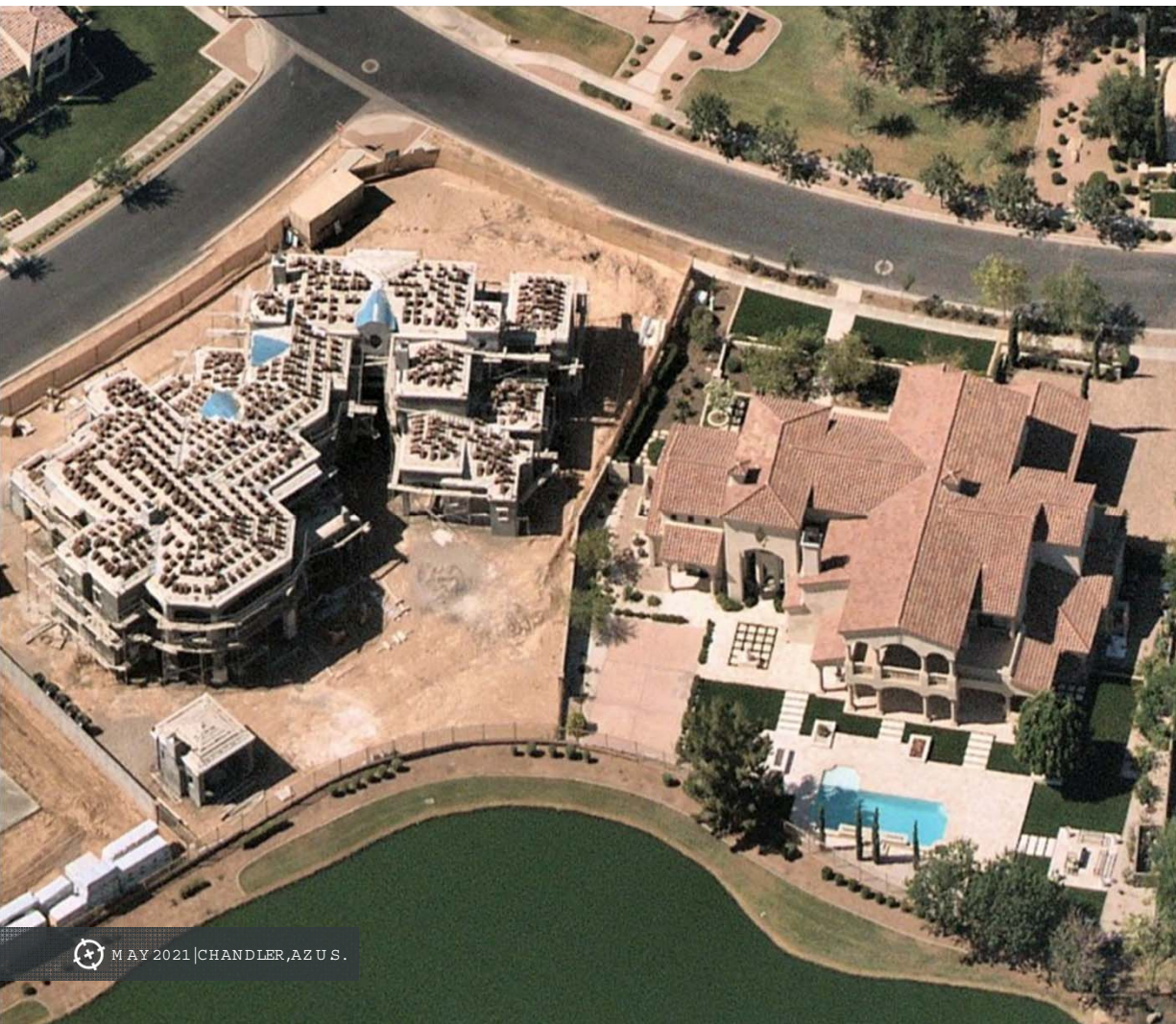
WHAT IS IT?

- Top-down imagery
- Measure line, area, or radius
- Overlay GIS data
- Integration via WMS/ArcGIS Marketplace into GIS, CAD, Asset management software

SPECIFICATIONS:

- Resolution: 2.2-3" GSD
- Absolute Horizontal Accuracy: 7.8-19.8 RM SER

22



MAY 2021 | CHANDLER, AZ U.S.

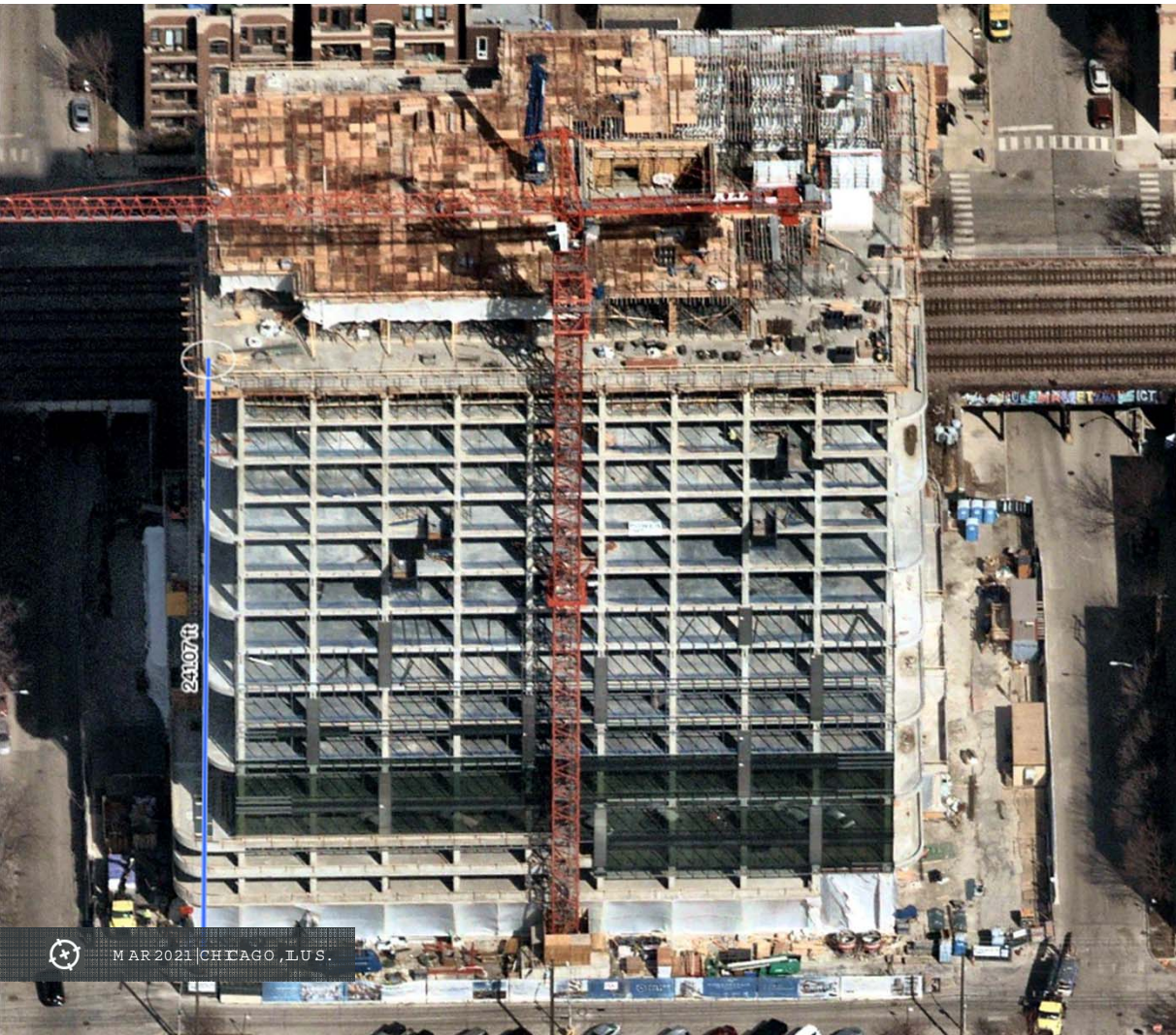
PANORAMA

WHAT IS IT?

- Multiperspective 30-45° angle views
- View all four cardinal directions
- Seamless pan & zoom
- Mosaic continuous view without "geofencing"

SPECIFICATIONS:

- Resolution: 3" GSD



OBLIQUE

WHAT IS IT?

- Multiperspective 30-45° angle views
- Gallery of individual source images for each cardinal direction
- Measure height

SPECIFICATIONS:

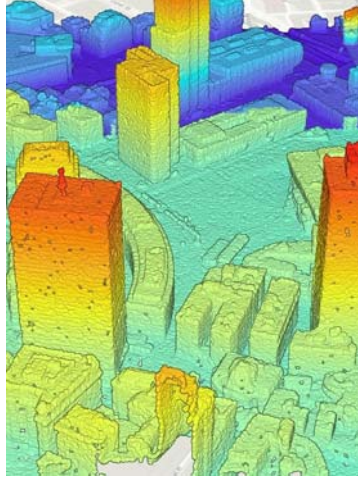
- Resolution: 3" GSD
- Vertical Measurement Accuracy: 6"

NEARMAP 3D FAMILY



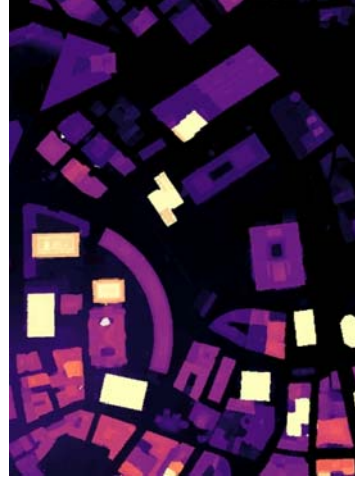
TEXTURED MESH

Textured Mesh is a 3D triangulated wireframe model with high-resolution photo-realistic textures applied, available in multiple formats.



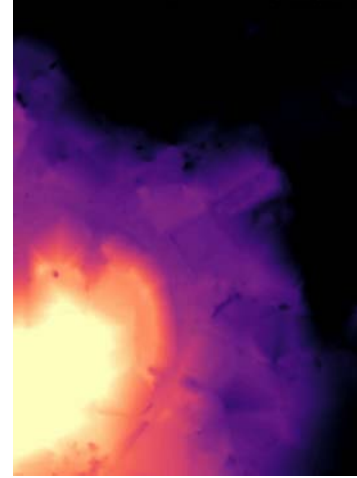
POINT CLOUD

The Nearmap Point Cloud is a vector file made up of points containing X, Y and Z and color values in the LAS format.



DIGITAL SURFACE MODEL

DSM is based on a raster file made up of pixels containing surface elevation values in the GeoTIFF format, including heights of both natural and built objects above sea level.



DIGITAL ELEVATION MODEL

DEM is based on a raster file made up of pixels containing bare earth elevation values in GeoTIFF format.



TRUE ORTHO

True Ortho is based on a raster file made up of pixels containing RGB color values in the GeoTIFF format.

NEARM A P A I

SOURCE OF TRUTH

Datasets are processed at scale, derived at 2.2-3" GSD raster resolution. Available for every in age capture June 2020 onwards.

AUTOMATED LOCATION ATTRIBUTES

Toggle on/off AI layers to digitally identify objects and parcel attributes - ensuring assessed values are accurate and all taxable parcel features are detected.

STREAMLINE ASSESSMENT WORKFLOWS

- Reduce site visits
- Wide-scale change detection
- Detect hard to discern parcel features
- Verify permit compliance



AUTOMATED
INSIGHTS, AT SCALE
AND ON-DEMAND

NEARMAP AI FAMILY



AI PACKS

AI-derived attributes are sold as AI Packs:

1. Building Footprints
2. Swimming Pool
3. Solar Panels
4. Ground Surfaces
5. Vegetation
6. Construction Sites
7. Building Characteristics
8. Trampolines
9. Roof Characteristics
10. Roof Condition
11. Poles

ASSESSMENT BUNDLE

- Building Footprints
- Construction Site
- Building Under Construction
- Swimming Pool
- Solar Panels
- Driveways

All AI Packs are available in Raster and Vector formats



GEO DATA LINK

WHAT IS IT?

- Integrate your parcel and street data directly into MapBrowser
- Overlay and view data on Nearmap Vertical, Panorama, and Oblique imagery
- Search by parcelID
- Retrieve/display parcel attribute data

EMBED INTO CAM A

- Integrate MapBrowserURL into CAM A
- Example: Tyler's World
- Search parcel in CAM A -> click MapBrowser link -> taken to that parcel in MapBrowser

*Currently in Beta Phase

GEO DATA LINK (BETA) – PANORAMA VIEW

470003893119

Location Snapshot Text Line Polygon Rectangle Circle Height Width Export Downloads

WOR 470003893119
Montgomery County Data/Parcels

Feature Layers + ^

Location

Data Layers ^

Parcels

Boundaries

Montgomery County ... Preview

Parcels

Boundaries

Parcel ID

Alt ID

Streets

Street Name

Jessica Drive

470003893101

470003893119

470003893128

PARCEL DETAILS

Preview

OBJECTID 89411

TAXPIN 470003893119

Alternate ID 47050C035

Parcel Type BASE PARCEL

Calculated Acreage 0.21929861

True Calculated Acres 0.2192987

created_user

created_date

last_edited_user

last_edited_date

Shape.STArea() 9552.651489257812

Shape.STLength() 405.52623229629

Parcel Link

<https://apps.nearmapde>

DTM-Based Height Correction

Enabled

Disabled

Preview

Imagery © 2021 Nearmap, HERE

10 ft

Panorama

< Sat Mar 20 2021 >

W N E S

GEO DATA LINK (BETA) – OBLIQUE VIEW

The screenshot displays the Nearmap Geo Data Link (Beta) interface in an oblique view. The main map shows a residential area with several houses and a street labeled "Jessica Drive". Yellow lines outline the parcel boundaries. The interface includes a top navigation bar with various tools like Location, Snapshot, Text, Line, Polygon, Rectangle, Circle, Height, Width, Export, and Downloads. A search bar at the top left contains the parcel ID "470003893119". A sidebar on the left contains "Feature Layers" and "Data Layers" sections. The "Data Layers" section is expanded, showing "Parcels" with sub-options: "Boundaries", "Parcel ID", "Alt ID", and "Street Name". The "Parcel ID" and "Street Name" options are checked. A "Photos" section at the bottom left shows a thumbnail of the current view. On the right, a "Parcel Info Display" panel shows details for the selected parcel (470003893119), including OBJECTID, TAXPIN, Alternate ID, Parcel Type, Calculated Acreage, True Calculated Acres, created_user, created_date, last_edited_user, last_edited_date, Shape.STArea(), and Shape.STLength(). Below this, a "Parcel Link" section shows the URL "https://apps.nearmapde". At the bottom right, a "DTM-Based Height Correction" section has a radio button set to "Enabled". The bottom of the map shows a "Preview" label, "Imagery © 2021 Nearmap, HERE", a scale bar (20 ft), and a compass rose. The date "Sat Mar 20 2021" is displayed in the center bottom.

Search by Parcel ID

Toggle On/Off Parcel & Street Data

Parcel Info Display

Feature Layers

Data Layers

Parcels

Boundaries

Montgomery County Data/Parcels

Preview

Photos

North

Oblique

Sat Mar 20 2021

Parcel Details

PARCEL DETAILS	
OBJECTID	89411
TAXPIN	470003893119
Alternate ID	47050C035
Parcel Type	BASE PARCEL
Calculated Acreage	0.21929861
True Calculated Acres	0.2192987
created_user	
created_date	
last_edited_user	
last_edited_date	
Shape.STArea()	9552.651489257812
Shape.STLength()	405.52623229629

Parcel Link

<https://apps.nearmapde>

DTM-Based Height Correction

☒ Enabled

☐ Disabled

USER TEST MONIALS



“

“My colleagues at the city have come to rely on our department for a wide array of maps for planning projects and events. Nearmap plays a significant role in enhancing these maps. In fact, 95% of our map requests have Nearmap in them — specifically with the GIS data they provide — which is something I can't get with Google. Nearmap has become our backbone and the starting point for everything our shop does. It's way more powerful than Google and once people get a taste of it, they crave it and want more and more of it.”

- Betsy Chatham, GIS Manager, City of Grapevine, TX

GROWING PARTNER ECOSYSTEM



