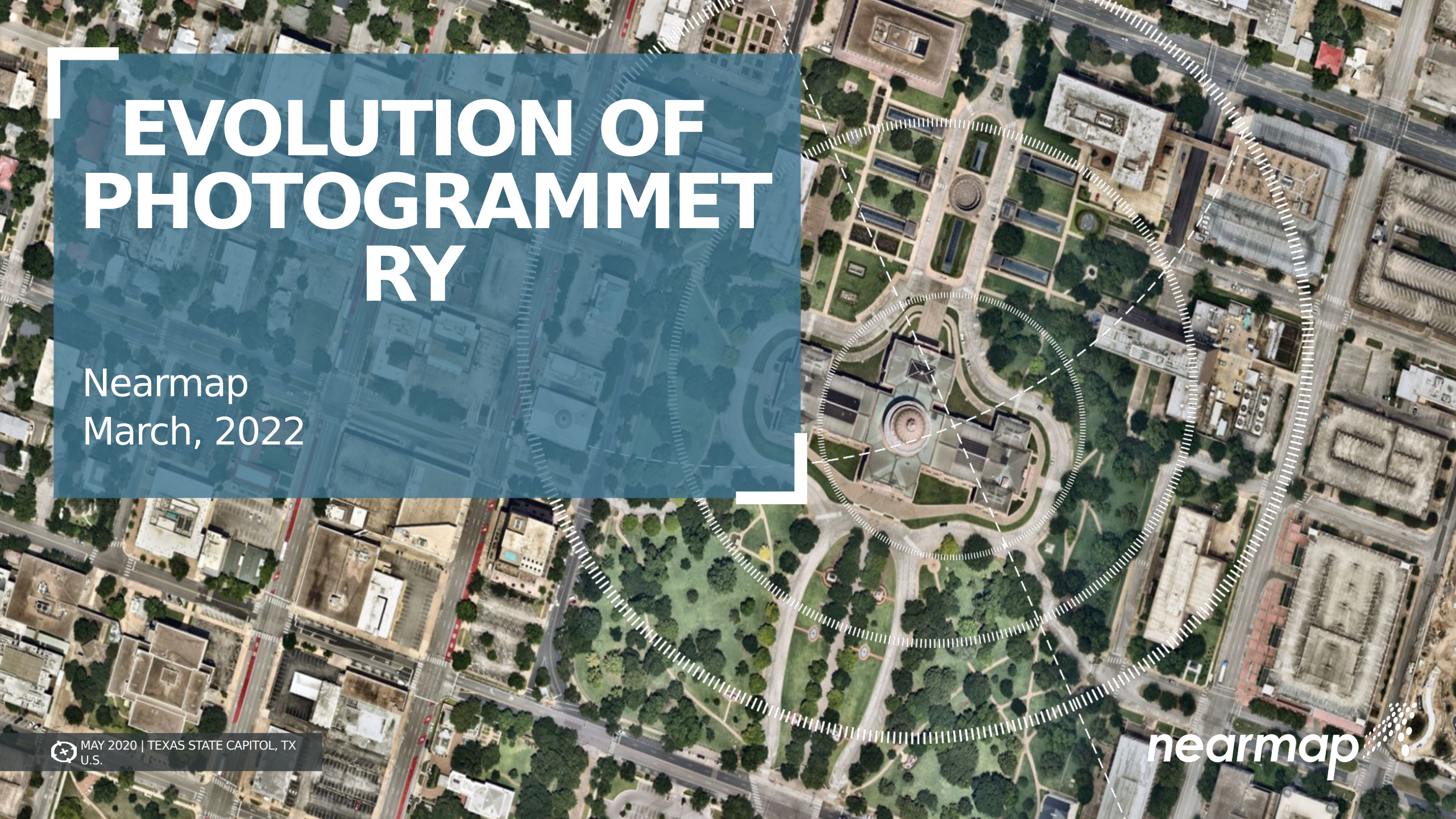
EVOLUTION OF PHOTOGRAMMETRY

Nearmap
March, 2022



YOUR PRESENTERS ARE:

Tyler Behle
Enterprise Account Executive
Nearmap

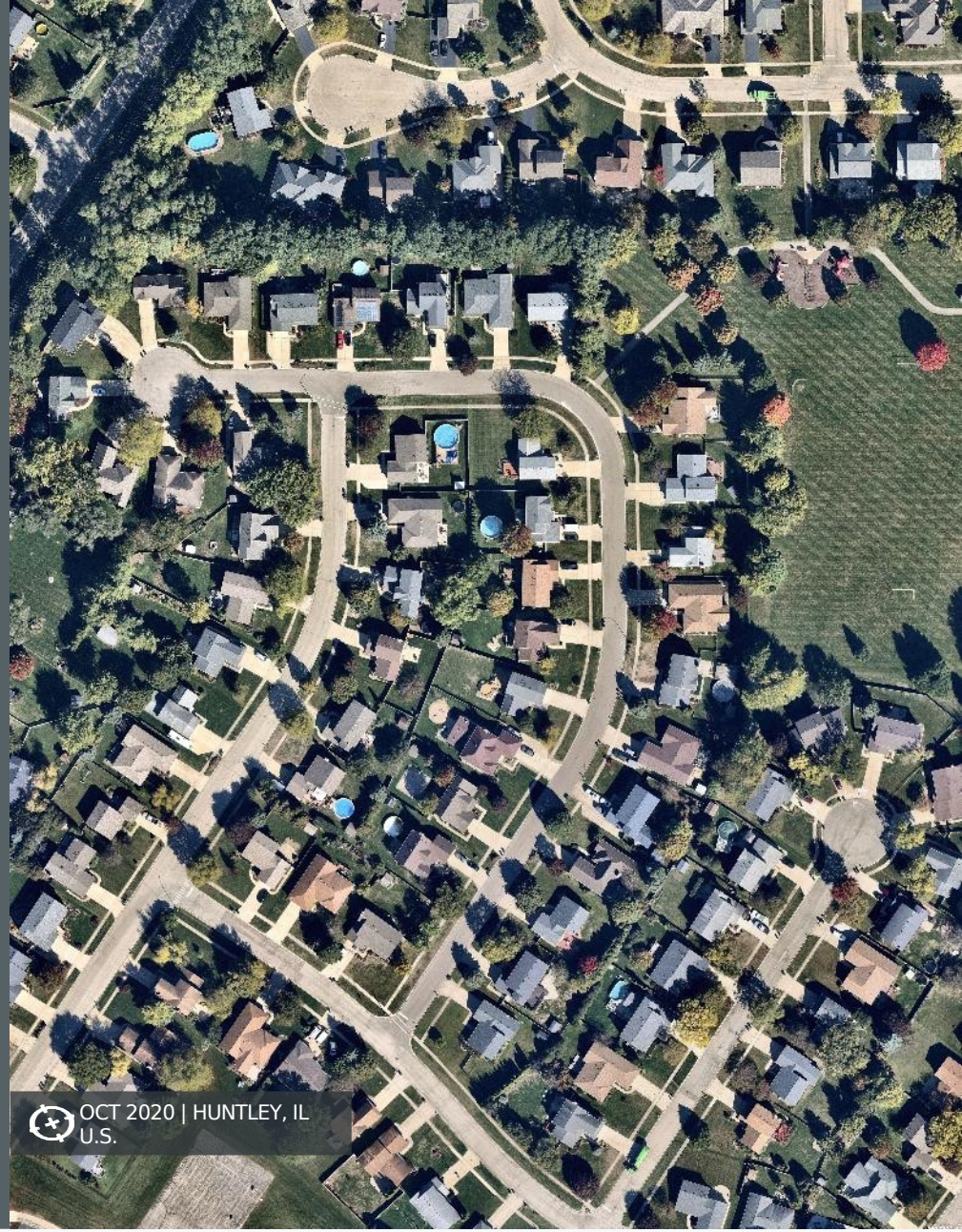
Tyler is a member of Nearmap’s Enterprise Government sales team helping cities and counties across the country realize and harness the power of Nearmap. His passion centers around empowering organizations with creative ways to add value through the use of aerial imagery.

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 NEARMAP FIT INTO THE HISTORY?
  - OVERVIEW OF NEARMAP
- Q&A



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"

+ ⇆ PHOTOGRAMMERTRY

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**

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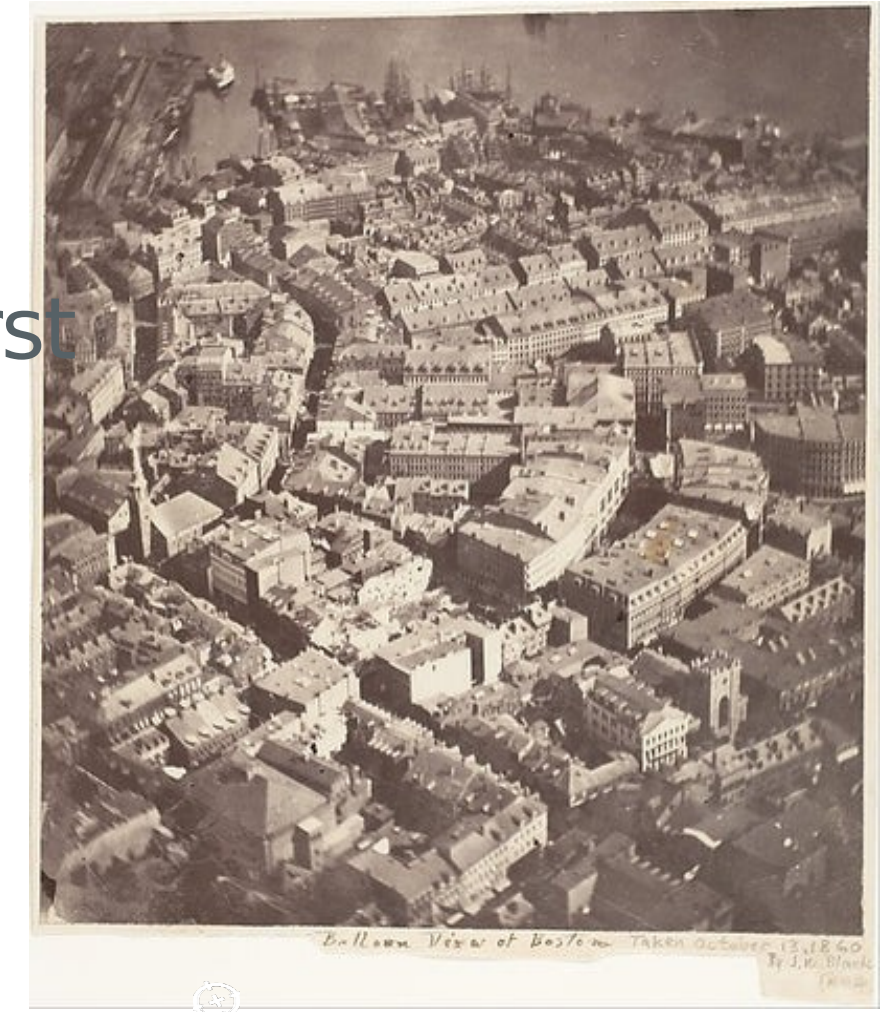
LIFTOFF OF AERIAL PHOTOGRAPHY

How was aerial photography first captured?

First ”surviving” aerial photograph?



1860 from a hot air balloon by James Wallace Black

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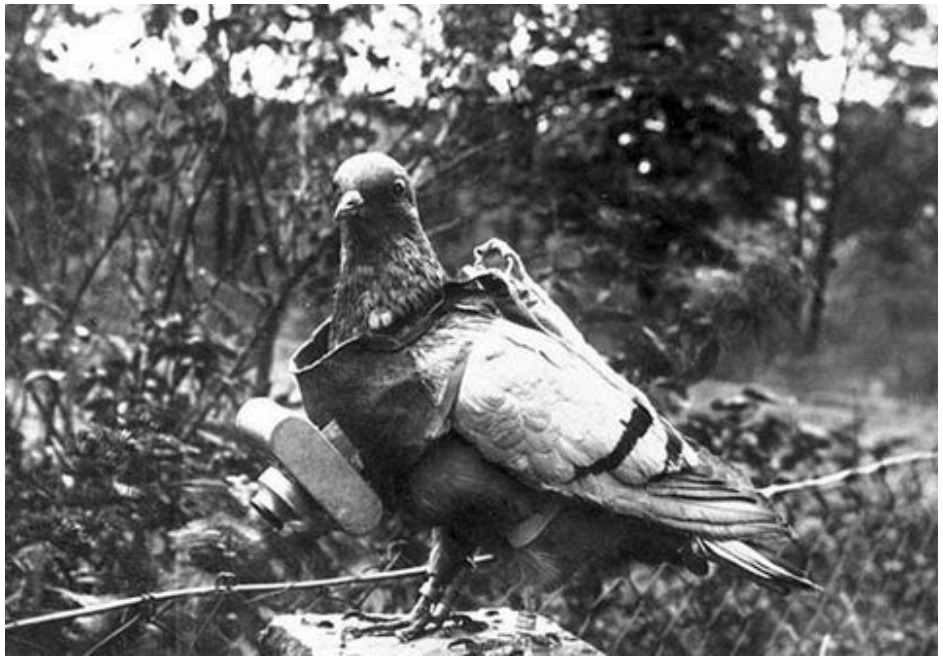
EVOLUTION OF AERIAL PHOTOGRAPHY

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

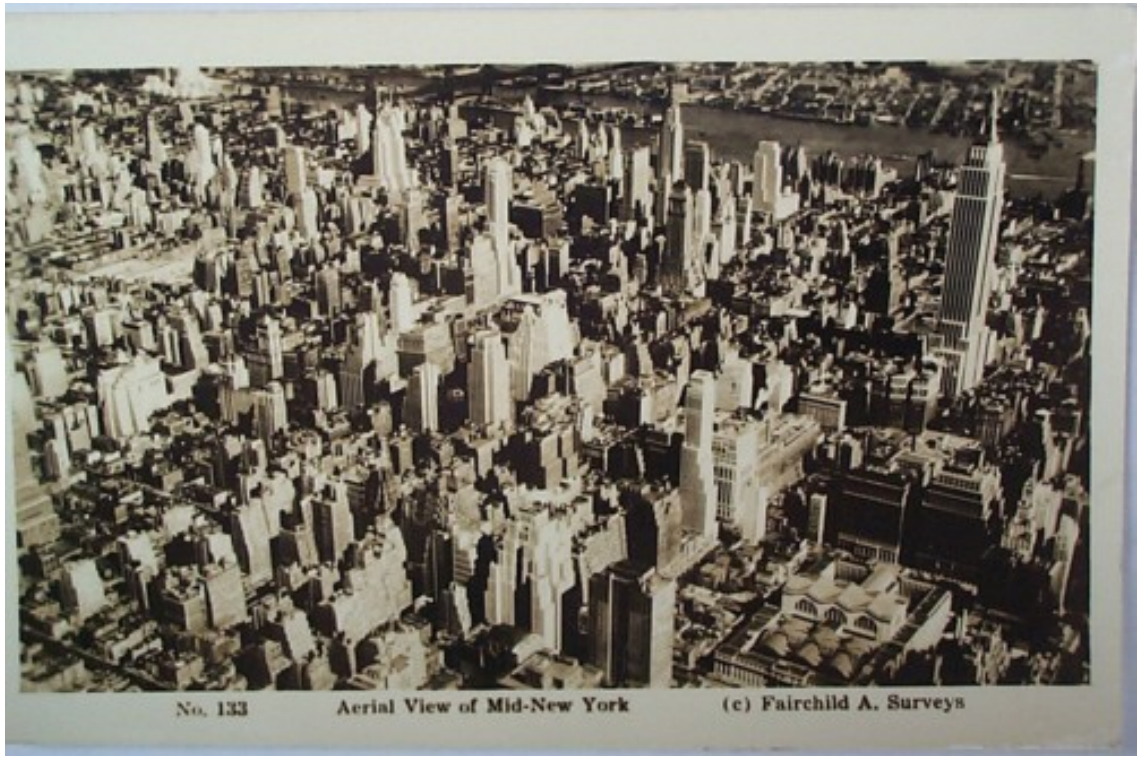
EVOLUTION OF AERIAL PHOTOGRAPHY

EVENT THAT LAUNCHED AERIAL PHOTOGRAPHY BY AIRCRAFT?

WWI

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

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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, current 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. 50cm vs Nearmap 5cm, scalable captures

Google Earth = for consumer use as apposed to commercial use

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

THE BEAUTY OF IT ALL!

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WE ARE NEARMAP:

- 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 Nearmap 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

FAST COMPANY 2020 MOST INNOVATIVE COMPANIES

esri Partner Network Gold

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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

DESKTOP-READY DATA SUPPORTING BUSINESS NEEDS

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

Captured: 1 Oct 2017
Louisville, KY

RAPID, INDUSTRY-LEADING DELIVERY

mosaic

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WE PROACTIVELY UPDATE SPATIAL DATA THAT BUSINESSES COUNT ON

1

ALWAYS CURRENT: WIDE-SALE REALITY 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.

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OUR TECHNOLOGY

MORE THAN AERIAL IMAGERY

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

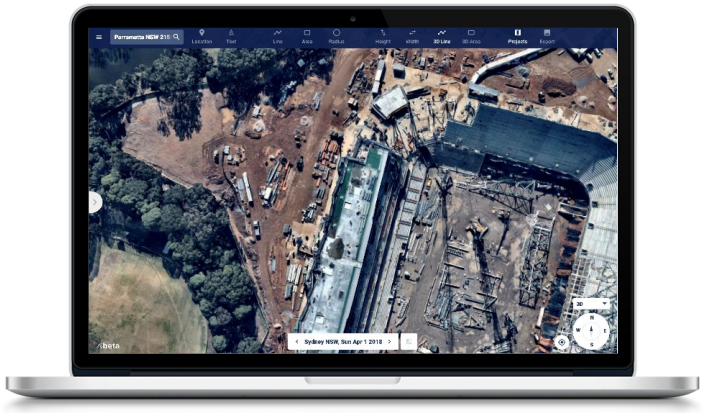
DESIGNED FOR THE CLOUD

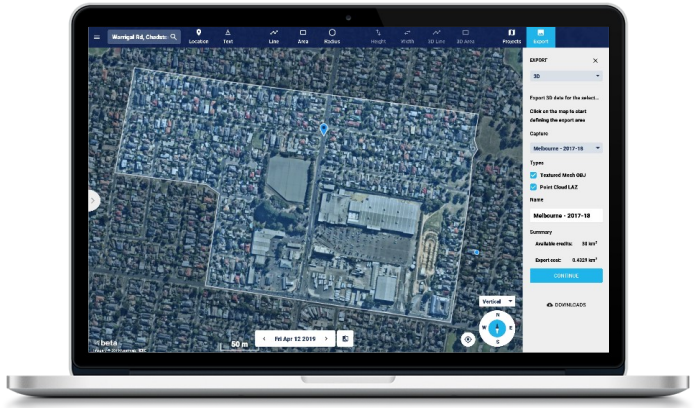
When combined with machine learning algorithms, our imagery delivers deep insights and automated location intelligence for a wide range of industries.

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 MapBrowser

Our light-weight 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 platforms built on top of ArcGIS software. Nearmap Oblique is also accessible via an oblique viewer widget made with ArcGIS Web AppBuilder.

3 WMS (Web Mapping Service)

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

AUTODESK. esri THE SCIENCE OF WHERE Bentley Advancing Infrastructure

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NEARMAP TIMELINE: EVOLUTION OF PRODUCTS

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

NOV 2020 | GRIFFIN, QLD AU

NOV 2007
First AU capture (Perth, WA)

EARLY 2011
Launch WMS

JAN 2014
Launch MapBrowser Classic

JUN 2014
Started flying with HyperCamera System (HC1) for commercial operations

EARLY 2016
Launch Tile API

MAY 2017
Started flying with HyperCamera System 2 (HC2) for commercial operations

OCT 2017
Launch Nearmap Oblique and new MapBrowser

MAY 2019
Launch Nearmap 3D

OCT 2019
Launch WMS 2.0

FEB 2020
Launch DSM & True Ortho API

MAY 2020
Launch Nearmap Oblique for ArcGIS

JUN 2020
Launch Nearmap AI

NOV 2021
Launch Nearmap ImpactResponse

FEB 2022
Launch improved MapBrowser UX

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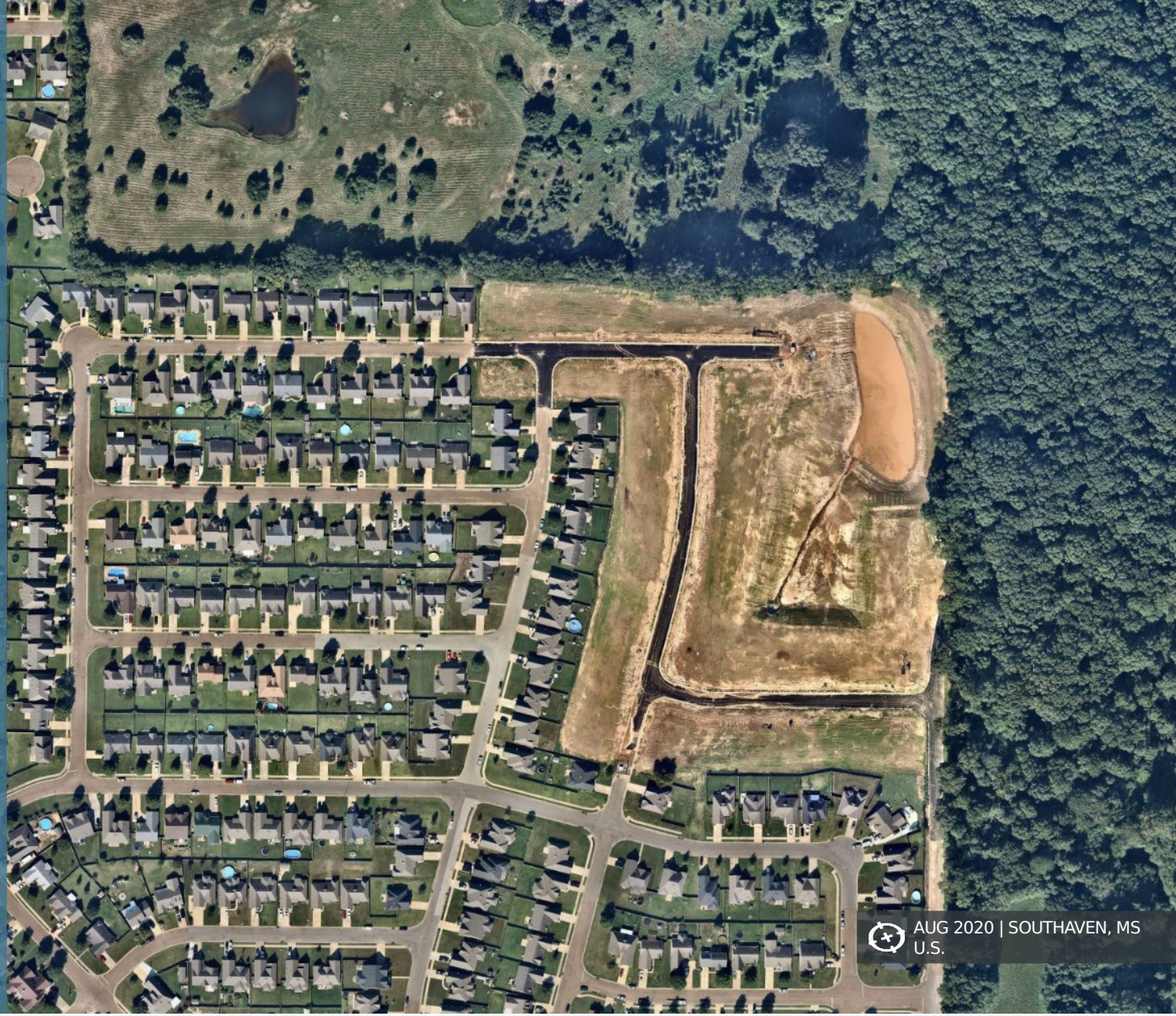
PRODUCTS



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 mgmt. software

SPECIFICATIONS:

- Resolution: 2.2-3” GSD
- Absolute Horizontal Accuracy: 7.8-19.8 RMSEr

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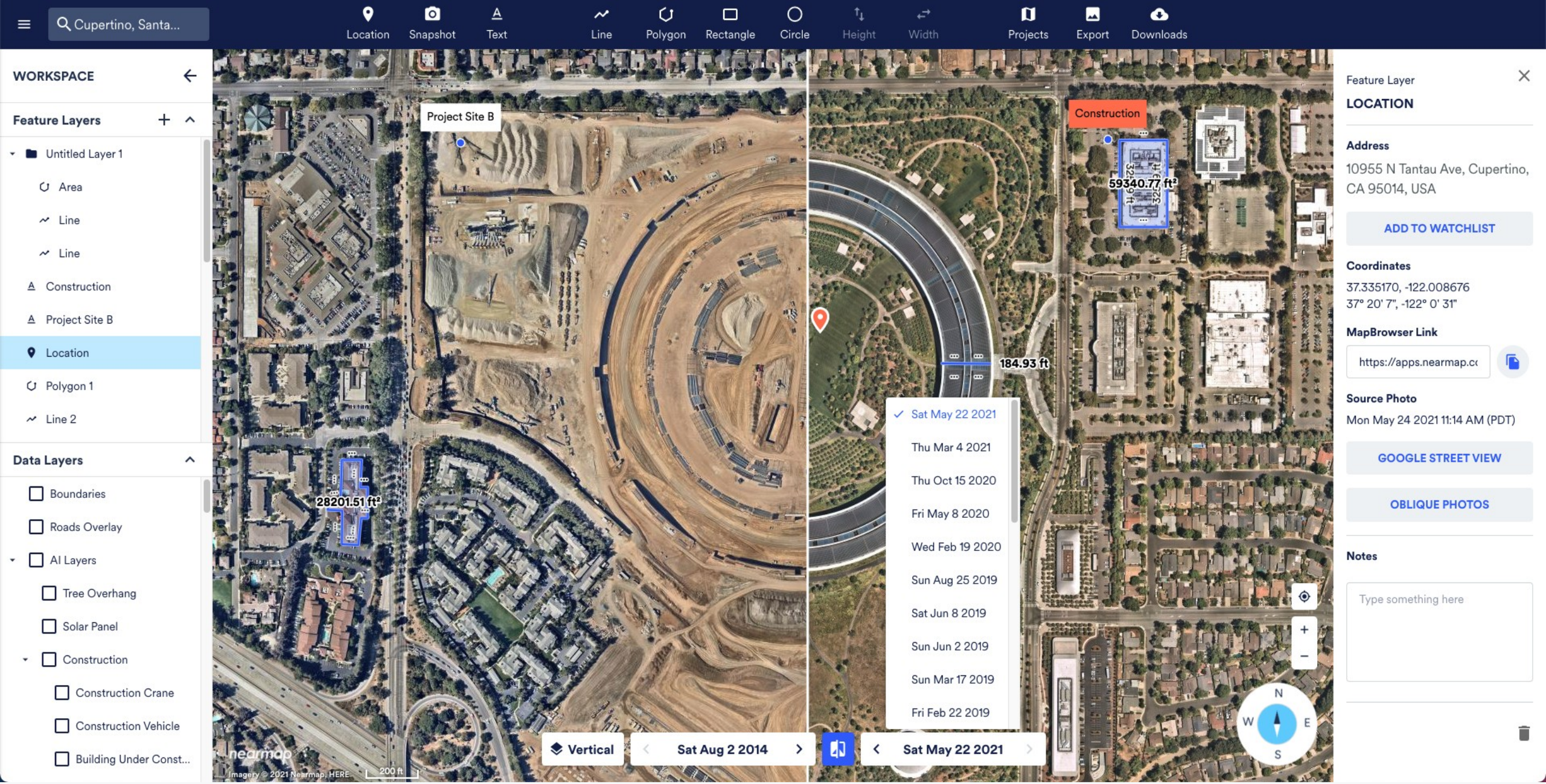
Cupertino, Santa...
Location
Snapshot
Text
Line
Polygon
Rectangle
Circle
Height
Width
Projects
Export
Downloads
WORKSPACE
Feature Layers
Untitled Layer 1
Area
Line
Line
Construction
Project Site B
Location
Polygon 1
Line 2
Data Layers
Boundaries
Roads Overlay
AI Layers
Tree Overhang
Solar Panel
Construction
Construction Crane
Construction Vehicle
Building Under Const...
Project Site B
28201.51 ft²
Construction
59340.77 ft²
184.93 ft
Sat May 22 2021
Thu Mar 4 2021
Thu Oct 15 2020
Fri May 8 2020
Wed Feb 19 2020
Sun Aug 25 2019
Sat Jun 8 2019
Sun Jun 2 2019
Sun Mar 17 2019
Fri Feb 22 2019
Vertical
Sat Aug 2 2014
Sat May 22 2021
N
W
E
S
nearmap
Imagery © 2021 Nearmap, HERE
200 ft
Feature Layer
LOCATION
Address
10955 N Tantau Ave, Cupertino, CA 95014, USA
ADD TO WATCHLIST
Coordinates
37.335170, -122.008676
37° 20' 7", -122° 0' 31"
MapBrowser Link
https://apps.nearmap.c
Source Photo
Mon May 24 2021 11:14 AM (PDT)
GOOGLE STREET VIEW
OBLIQUE PHOTOS
Notes
Type something here

PANORAMA

WHAT IS IT?

- Multi-perspective 30-45° angle views
- View all four cardinal directions
- Seamless pan & zoom
- Mosaic continuous view without “geo-fencing”

SPECIFICATIONS:

- Resolution: 3” GSD

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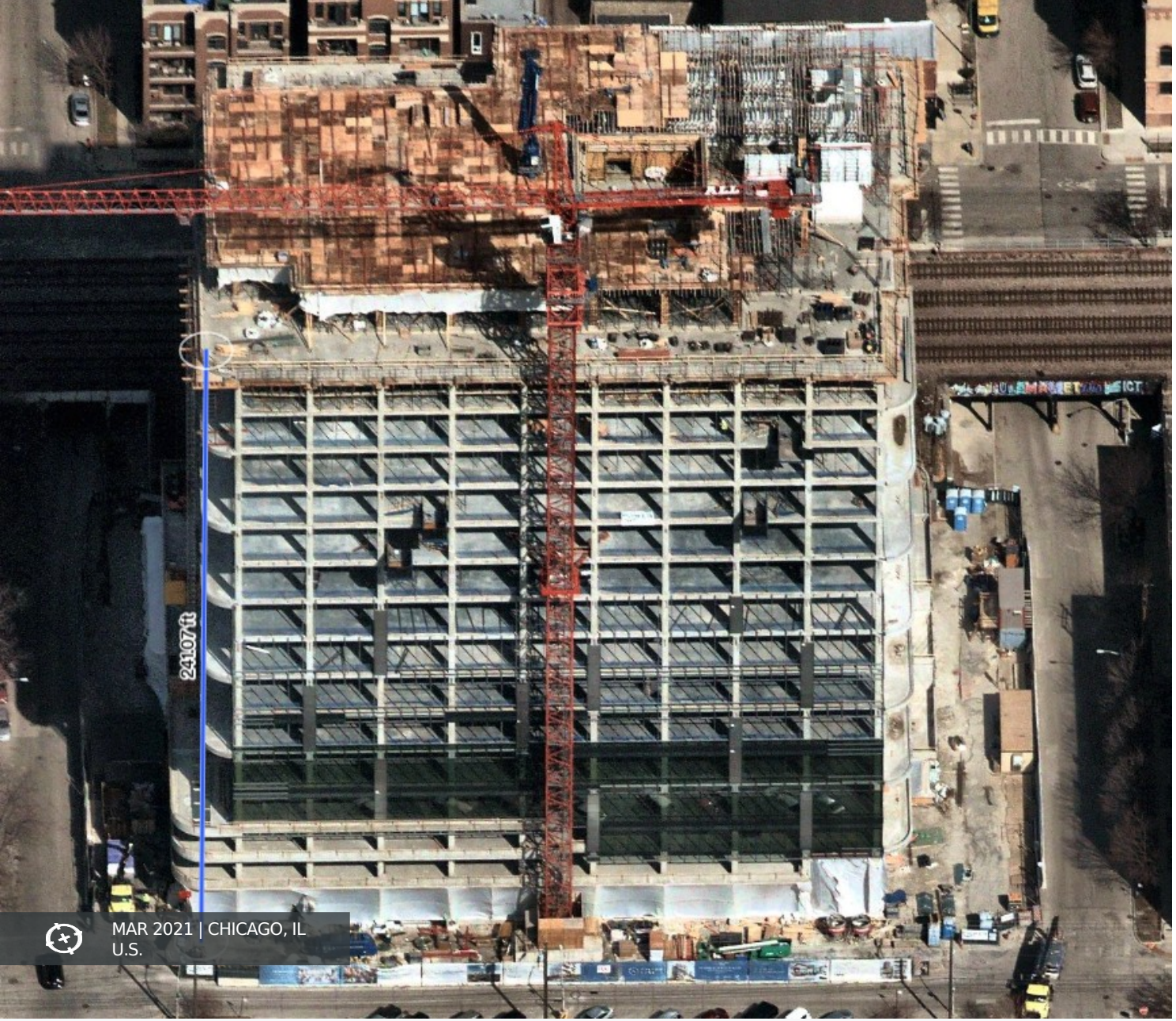

OBLIQUE

WHAT IS IT?

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

SPECIFICATIONS:

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

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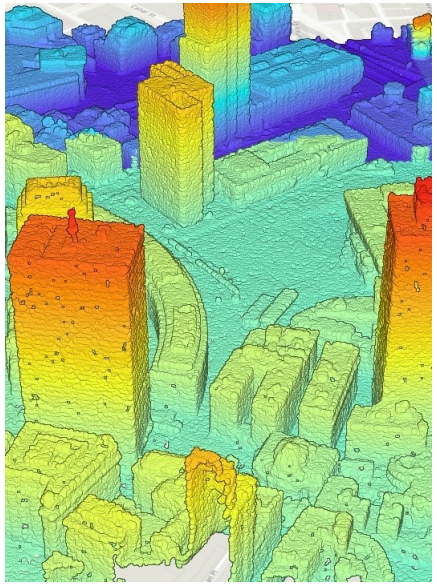
NEARMAP 3D FAMILY

TEXTURED MESH

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

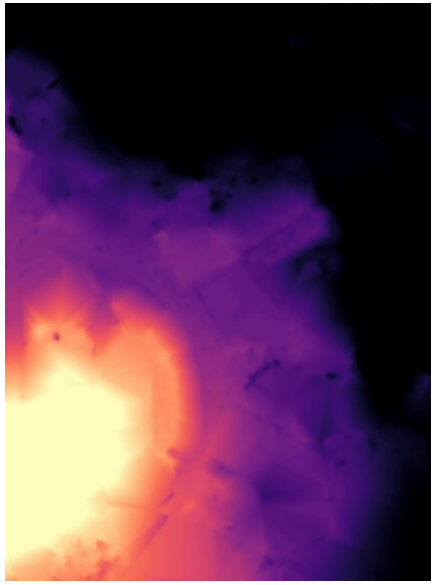


POINT CLOUD

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.

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NEARMAP AI

SOURCE OF TRUTH

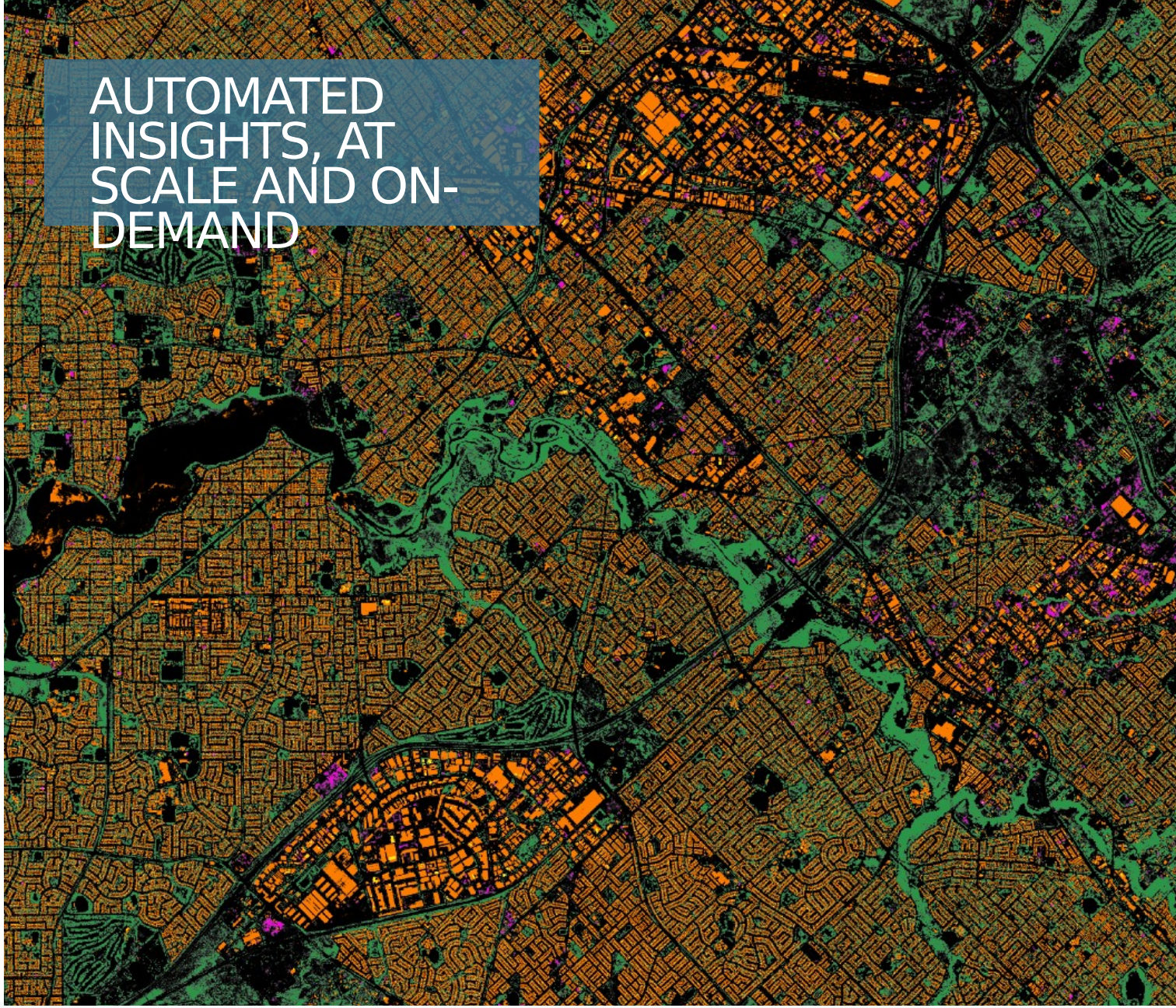
Datasets are processed at scale, derived at 2.2-3” GSD raster resolution. Available for every image capture June 2020 onwards.

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



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

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GEODATA 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 parcel ID
- Retrieve/display parcel attribute data

EMBED INTO CAMA

- Integrate MapBrowser URL into CAMA
  - Example: Tyler iasWorld
- Search parcel in CAMA -> click MapBrowser link -> taken to that parcel in MapBrowser

***Currently in Beta Phase**

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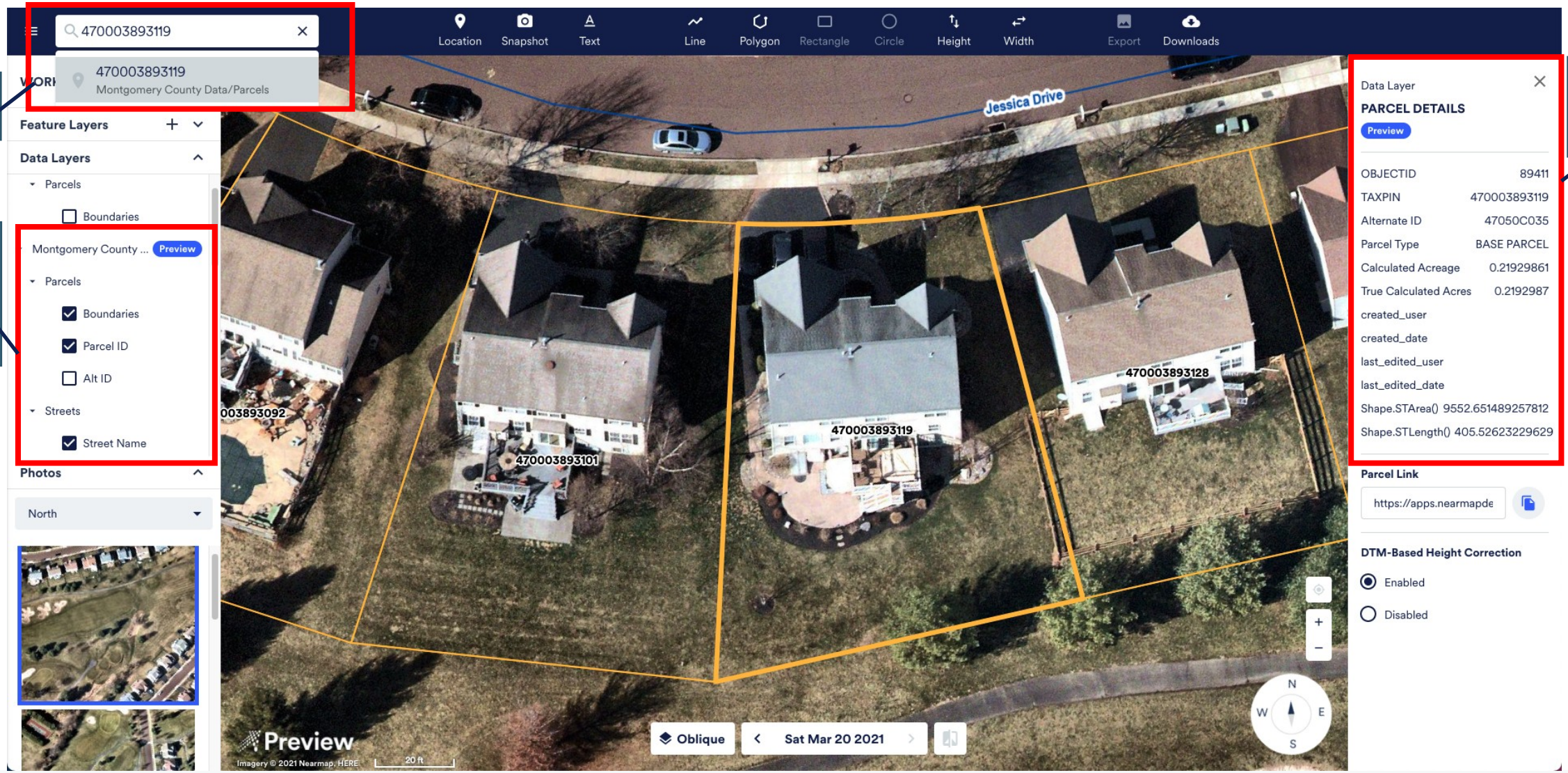
GEODATA LINK (BETA) – PANORAMA VIEW

GEODATA LINK (BETA) – OBLIQUE VIEW



USER TESTIMONIALS

“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 crate it and want more and more of it.”

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

GROWING PARTNER ECOSYSTEM

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