

Build a smarter reality capture strategy by leveraging BIM + GIS

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About the speaker

Jeremiah Johnson

- Imagery Solutions Architect on Esri's Imagery Team
- Manned airplane pilot
- Developing drone workflows since 2012
- xyHt Magazine "Top 40 Under 40 Geospatialists" 2015
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The Current State of Reality Capture

NOT A RESEARCH PROJECT

In the beginning, it seemed reality capture tools were a solution looking for a problem. We knew that it would someday transform how we work, but it wasn't clear exactly how.

SHARING IS DIFFICULT

Everyone wants to update stakeholders with the most accurate information, however how does one do that with all the data that is collected daily on a site?

MORE DATA THAN WE KNOW WHAT TO DO WITH

The data coming off our reality capture devices is massive. Gigabytes of data per collection means terabytes of data over the course of a project. Where does this data go? How is it the most useful?

HIGH EXPECTATIONS

Having all this new data seems like magic to others. We're expected to be able to pull up "the latest" at the drop of a hat. How do we efficiently collect this data and distribute it so that it's always accessible?

Leveraging BIM

FLIGHT PLANNING

Use 3D BIM to import into Esri's Site Scan Flight app for more accurate flight plans over the project

PROJECT STATUS

Share BIM models in ArcGIS dashboards and custom applications for stakeholders to gain visibility on current project status.

TIE REAL-WORLD TICKETS TO DIGITAL FEATURES

Tagging items or issues in the real world or by using drone imagery can be tagged directly onto the relevant piece of the BIM model.

Collecting Reality Data



The Site Scan for ArcGIS Workflow

1 Plan & Capture



Use up-to-date overlays from ArcGIS to accurately plan flights, then autonomously execute the flight in the Flight Planning App to capture project data using drone of choice

2 Process, Manage, & Analyze



Site Scan for ArcGIS

Process flight data in Site Scan for ArcGIS then manage and analyze project data using Site Scan Manager

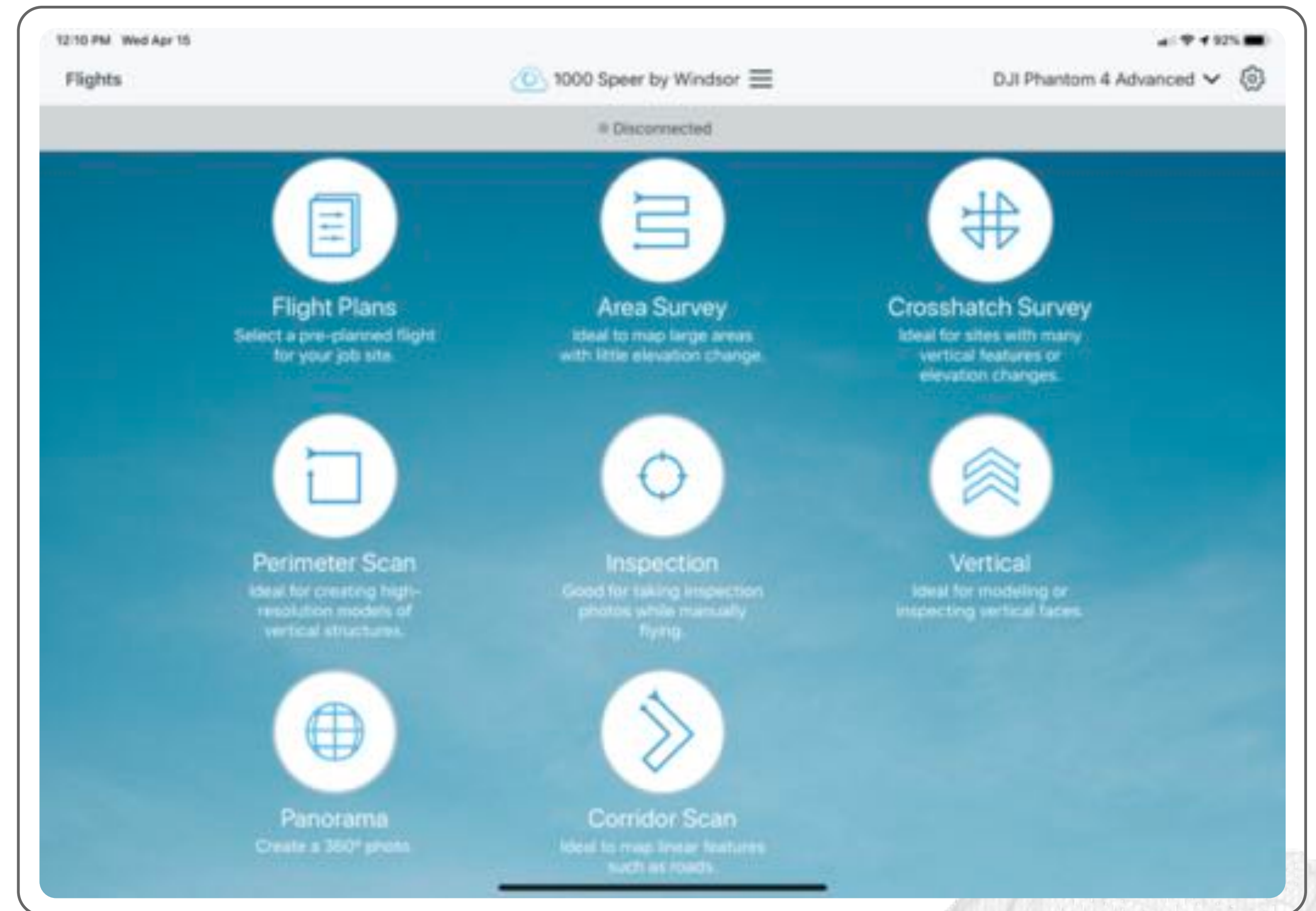
3 Disseminate & Collaborate



Improve data visualization and communication across key project stakeholders using integration share capabilities that push data to Esri ArcGIS Products and Autodesk BIM 360

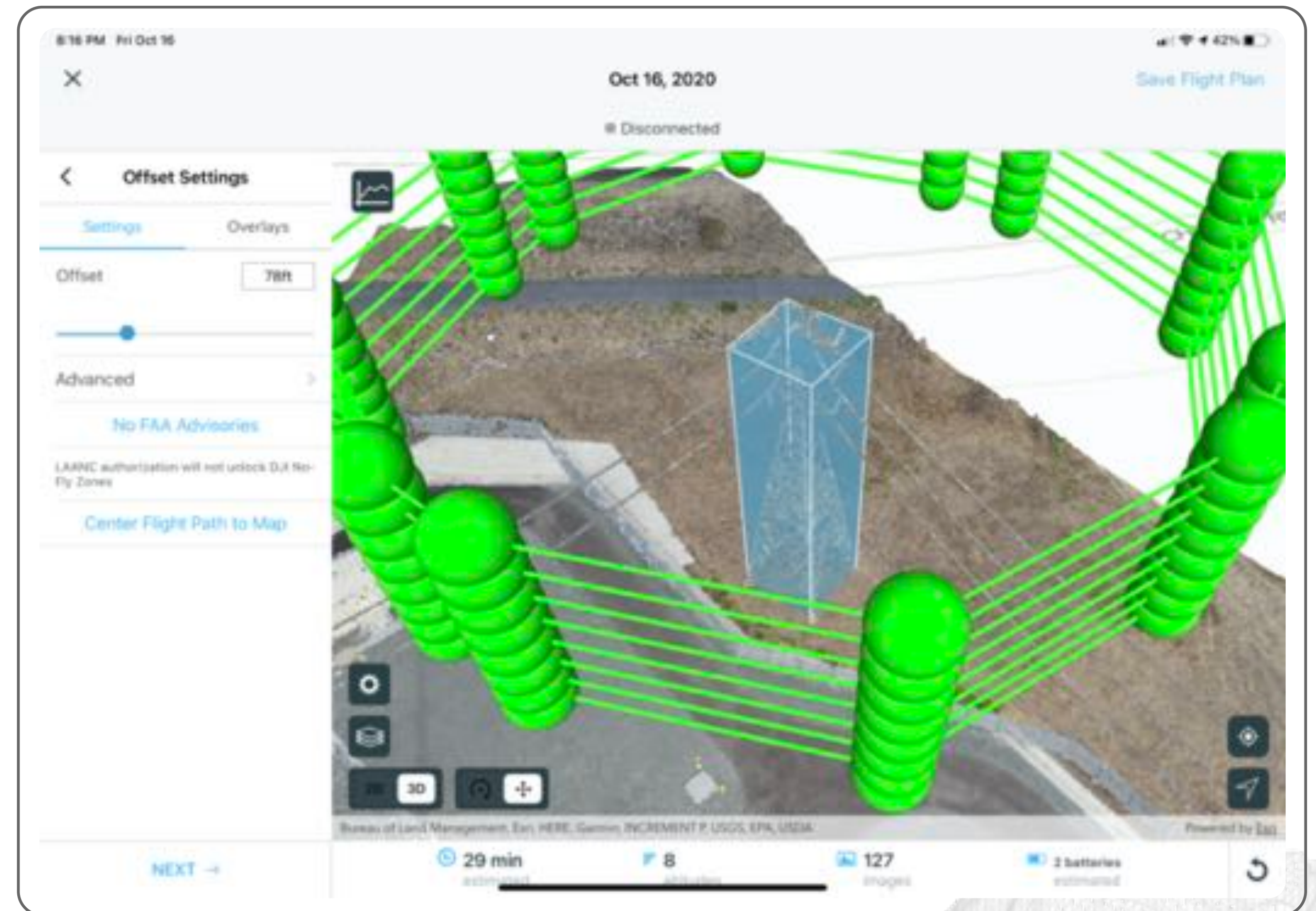
Site Scan Flight Planning App

- ✦ iPadOS application
- ✦ Built on the ArcGIS Runtime SDK
- ✦ Custom middleware to allow drone-agnostic workflows
- ✦ Field data management platform
- ✦ Fleet management
- ✦ Organization-mandated custom preflight checklist forms



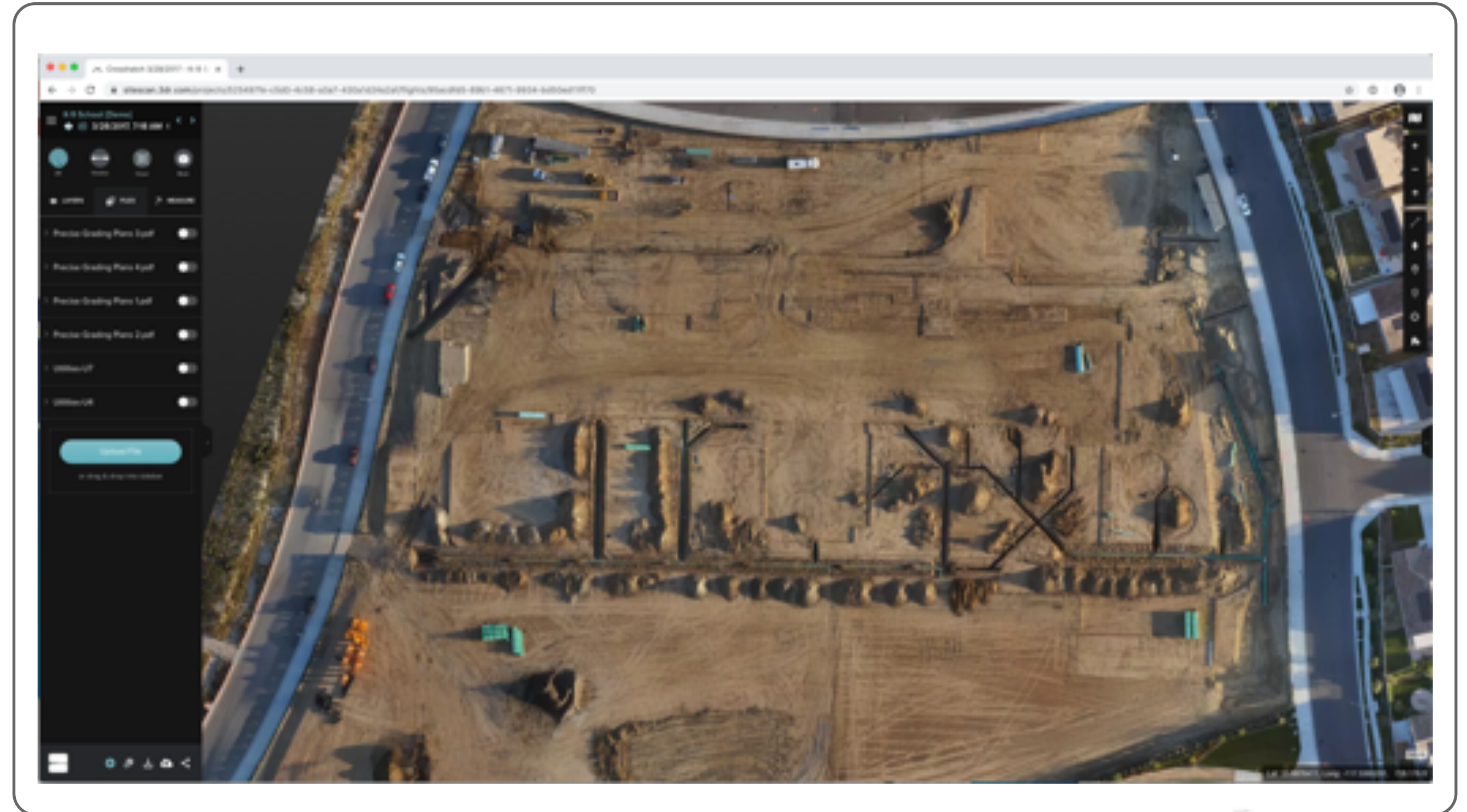
Site Scan Flight Planning App

- Plan automated 3D flights
- Import 3D infrastructure data to help plan around obstacles
- Choose any 3D scene in your ArcGIS Online account
- View 3D flight paths of the flight plan



Site Scan Manager

- Web application
- Complete analysis and collaboration tool
- Direct integration with ArcGIS Online, Portal, and Autodesk BIM360
- Generate inspection and volume reports as PDF documents
- Perform volumetric and cut/fill analysis with one click

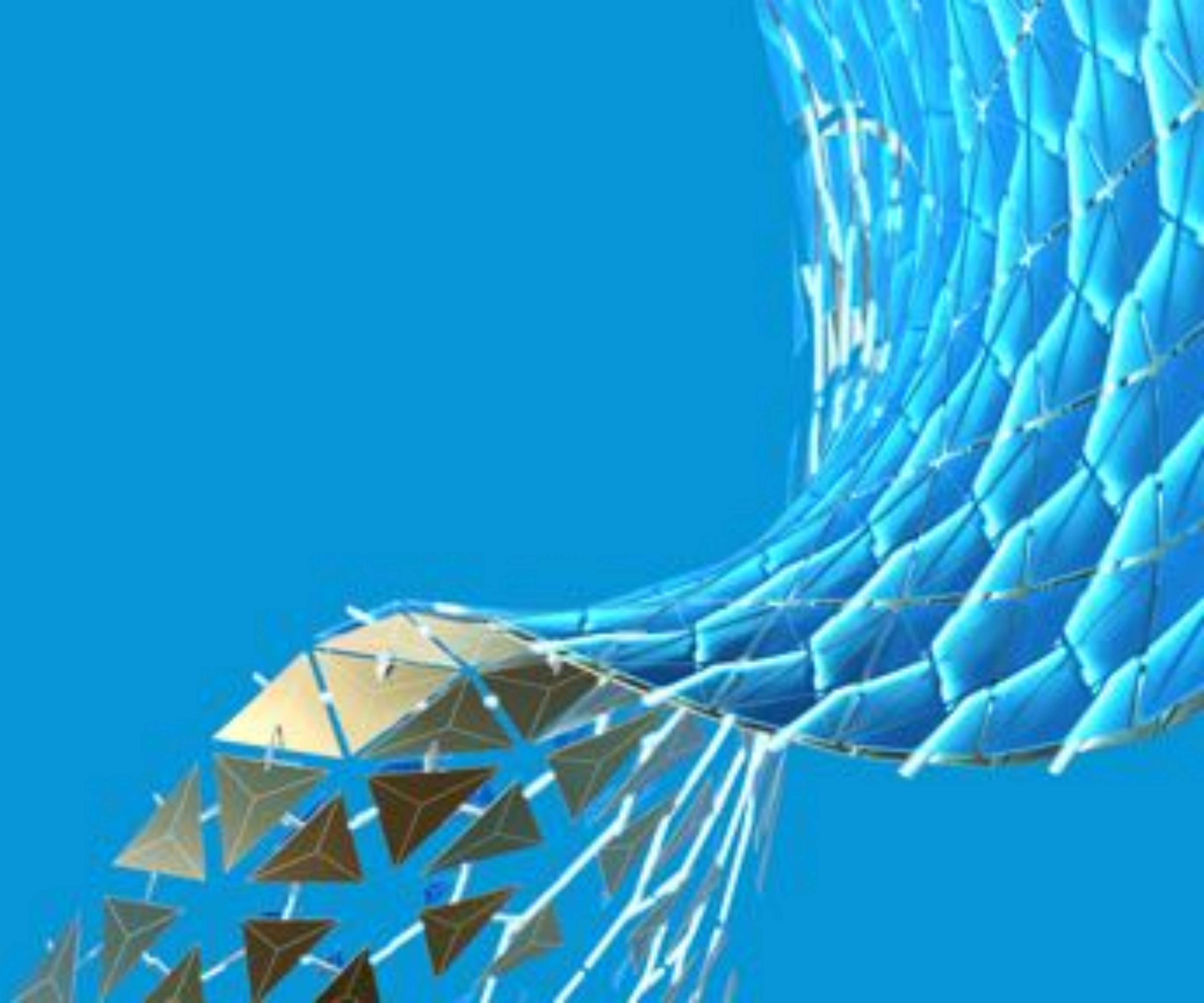


Site Scan Manager

- ◆ Perform remote inspections
- ◆ Navigate through all raw photos using the point cloud
- ◆ Create custom forms
- ◆ Create BIM360 Issues



Demo



✖ Disconnected



Flight Plans

Select a pre-planned flight for your job site.



Area Survey

Ideal to map large areas with little elevation change.



Crosshatch Survey

Ideal for sites with many vertical features or elevation changes.



Perimeter Scan

Ideal for creating high-resolution models of vertical structures.



Inspection

Good for taking inspection photos while manually flying.



Vertical

Ideal for modeling or inspecting vertical faces.



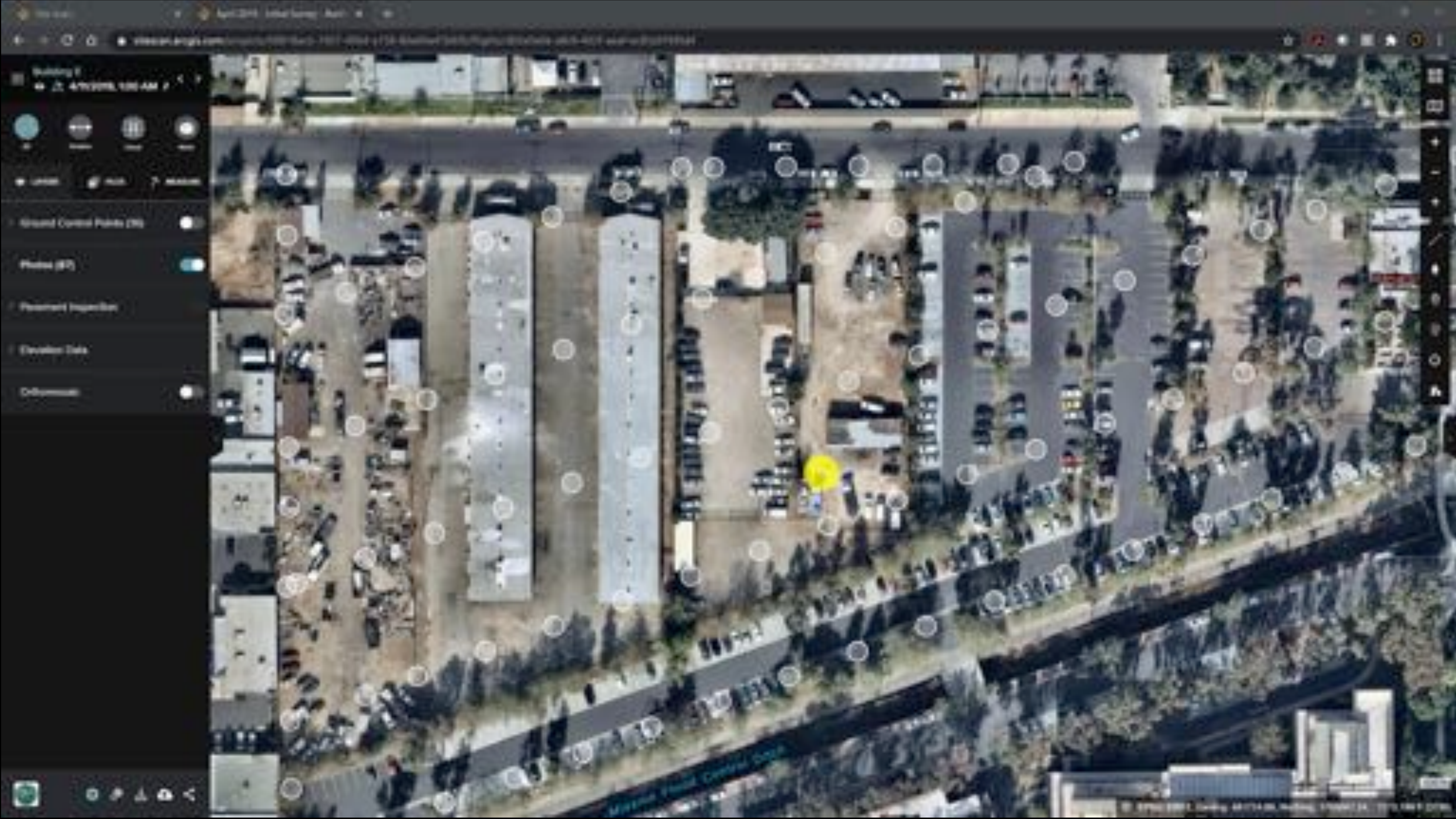
Panorama

Create a 360° photo.



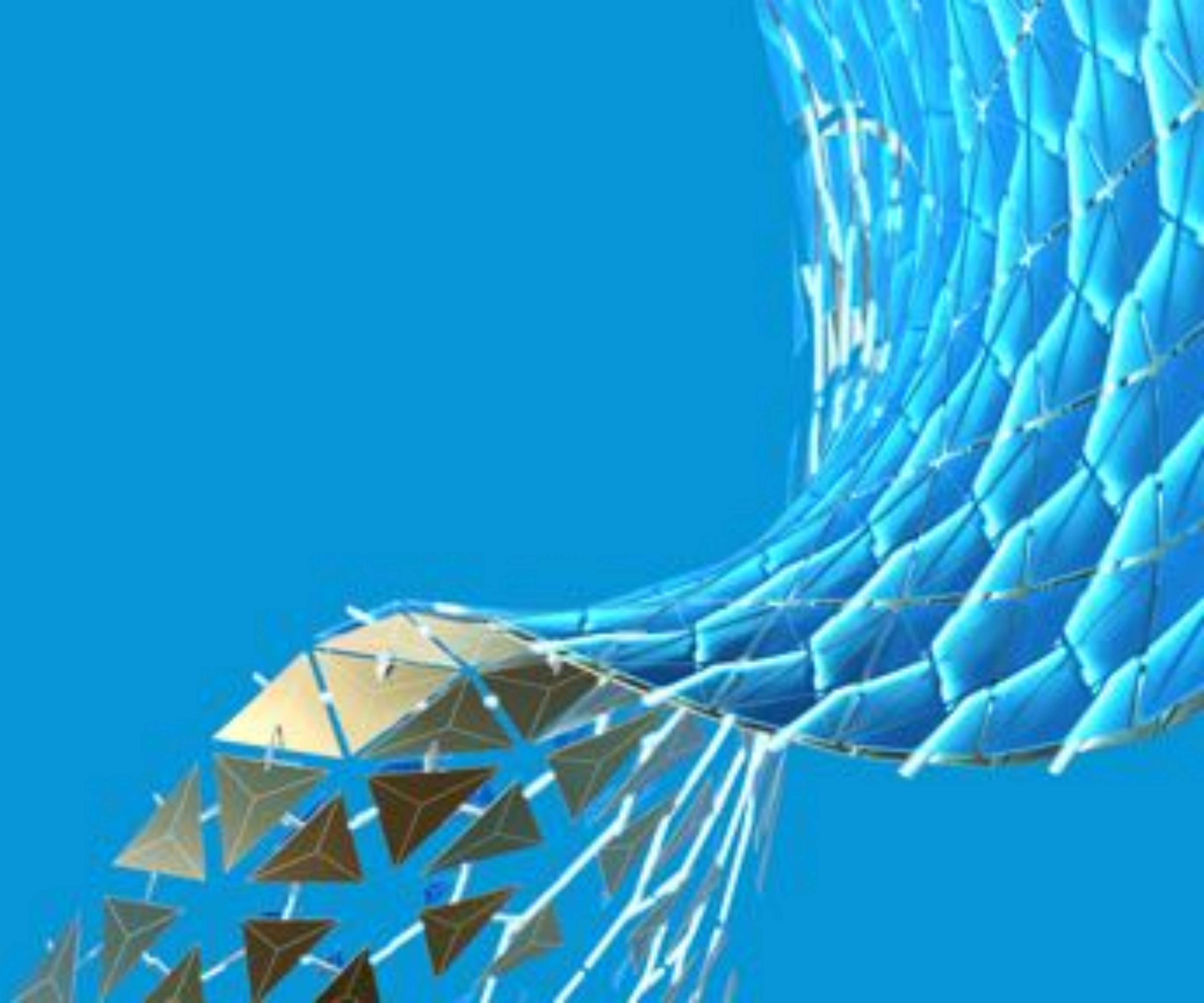
Corridor Scan

Ideal to map linear features such as roads.





The Future



New

Coming in 2021

ArcGIS GeoBIMSM Interconnects ArcGIS with Autodesk BIM360

Cloud-to-Cloud Connectivity

Dynamically Integrating GIS & BIM Data
... Helping to Achieve Digital Twin Integration

GeoBIM Projects



Apps

AUTODESK[®] BIM 360[™]
AUTODESK[®]
FORGE

Infraworks, Civil3D & Revit

ArcGIS
Online &
Enterprise



ArcGIS Pro

GeoBIM Apps

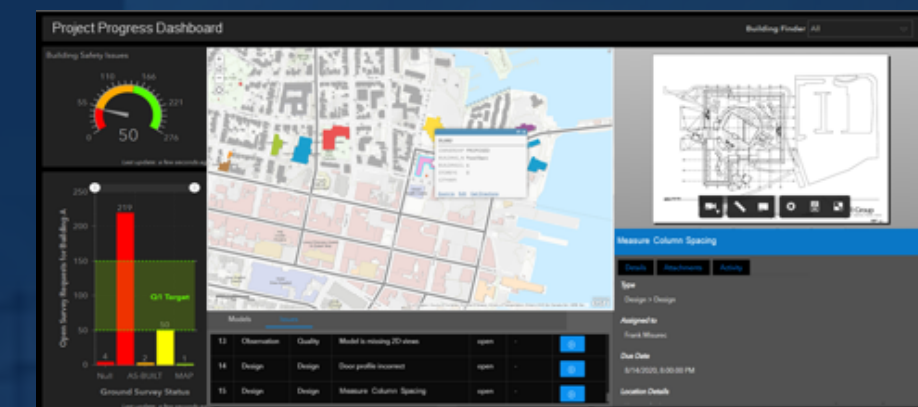
Issue Clustering



Documentation Review



Performance Dashboards



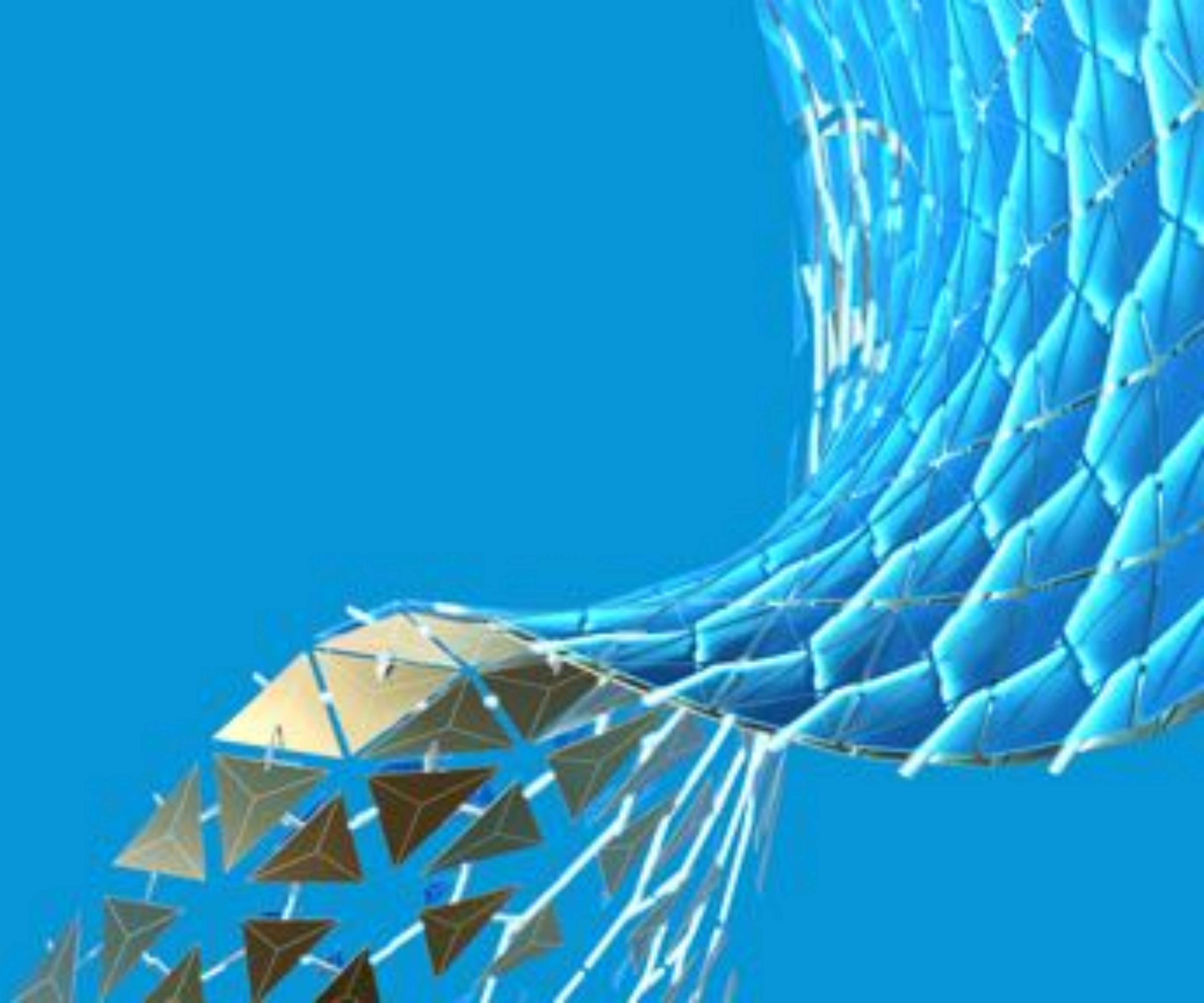
Design Coordination



Sell | Plan | Design | Build | Operate

Supporting Design, Construction and Operations ...
... Transforming Projects with Geographic Context

Conclusion





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