



Unlocking Max Speed and Scalability



How AI is Revolutionizing the Walkout
Process for 7x Faster Basemap
Creation in Telecom Engineering



Introduction

The telecom industry is facing an onslaught of challenges; greater competition, market demand for more connectivity, and government funding complications, all leading to a surge in projects with tight timelines and limited workforces.

Speed to deployment has never been more important.

The key to securing funding lies in demonstrating your ability to complete broadband installations efficiently and on (or ahead of) schedule.

Telecom engineering teams have gone from delivering 3 miles per day to delivering 17+ miles per day with AirWorks' digital automated walkout process, and you can too.

Over the course of this eBook, you'll get an in-depth understanding of exactly how this process works, the implementation steps involved, and the overall impact on your ROI.

AirWorks Elevates your Operations, No Matter the Project:

- + High-level Design
- + Low-level Design
- + Make Ready
- + ROW Permitting
- + Construction Documents - BOM
- + As-Builts

This eBook will help you elevate and accelerate the operations of your engineering team by leveraging next-gen field intelligence technology and AI-enabled automated walkouts.



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Current Challenges in Telecommunications Network Building





Network Engineering Challenges

In order to remain competitive, leaders at telecom firms must ensure that their engineering and fielding teams operate with maximized efficiency. Yet many are struggling just to keep up with demand for more network connectivity in harder to reach areas.

Government funding and private equity is available to expand networks into when there is a good take rate and time to revenue, but speed to plan, design and construct is crucial.

The Problem?

The entire workflow relies largely on manual processes. Various project stages are limited to what a single individual can do per man hour, making it difficult to predict timelines (and even harder to find ways to speed them up).

Adding fuel to the fire? A tight labor market and frequent staffing shortages means that traditional project timelines aren't just slow, but also challenging to manage.

Now, leading telecom firms are relying on a new digital walkout process provided by AirWorks - which optimizes the workflows of engineering teams and enables faster surveying and design than ever before.

AirWorks is Trusted By Industry Leaders:





How Does AirWorks Solve These Problems?

AirWorks utilizes human-in-the-loop AI solutions to automate the processing and extraction of project site features. AirWorks' AI algorithms are built on more than 50,000 hours of data analysis and trained on thousands of acres of geospatial data at various GSD levels.

With AirWorks, you can automate away the time-consuming processes in key telco engineering project phases, empowering your team to deliver more projects, faster.

The Results?

Speed



- + AI data processing maximizes efficiency
- + Slash overall time to revenue
- + Confidently meet deadlines & secure funding
- + Free up your team for higher-level work

Scalability



- + AI scales instantly
- + Enables you to work on many projects simultaneously
- + Increase capacity without overloading staff

Accuracy & Quality



- + AI purpose-built for telecom projects
- + Human-in-the-loop process: QC'd by experts
- + Reliable
- + High-Quality
- + Eliminate need for significant QC

Business Impact



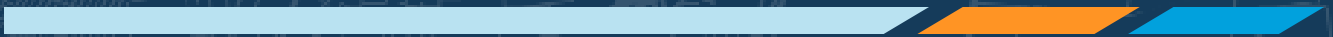
- + Extremely competitive rates
- + Give resources back to firm
- + Price reduction with scale
- + Drive revenue

Read on and we'll show you exactly how it works and how it's being used in telecom projects today.





AirWorks Field Intelligence Solutions: How it Works



AI Basics

Artificial Intelligence (AI) lies at the core of AirWorks' field intelligence solutions, enabling network engineering teams to shorten delivery timelines and increase capacity without additional hires.

In a broad sense, AI describes any computer function that mimics human behavior and logic.

We think it's important for you to see what happens in that blackbox so that you can better understand the mechanics of AI-powered feature extraction.

Our AI is purpose-built for telecom and trained on billions of geospatial data points

We train our algorithms to break down images into numbers and recognize patterns. When it comes to outputs, we are committed to delivering the highest level of quality and completeness per your project guidelines. We understand the varied nuances of accuracy requirements and work with you to get your project where it needs to be.

Computer vision and machine learning is critical to our mission and operations. But at the end of the day, how does it matter to the industry that we serve?

From the start, we wanted to make sure that we were building solutions and services that enable our customers to achieve more. Our mission continues to be to provide the data intelligence that powers the built world.

That's what we started out with, and that's what's leading us through. Quality-assured, lightning-fast data processing that helps free up valuable time for our clients to focus on the vital, higher-level work that they do best.

AI Uses Cases in Telecom

The current applications of AI in telecom engineering projects cover a wide range of project types and use cases.

Hand over the tedious-but-necessary field work to our automated walkout team to boost efficiency throughout your project, **whether you're jumping into high level design or low level design work or are ready for permitting.**

See what you can get done faster with AirWorks:

- + Broadband engineering
- + ROW Permitting
- + Fiber to the home (FTTH) expansion
- + 3D Pole Mapping



The Impact of AI on Telecom Timelines

Without the use of AI, each step in the network design and planning can be slow, and labor-intensive.

AirWorks uses machine learning to reduce the amount of time needed to complete each step, acting as a force multiplier for your existing field team.

This Digital Walkout Process has had a significant impact for our clients:

- + 10x+ Faster Basemap Creation
- + 20-30x more Engineering Miles per Month
- + Elimination of a ~5 month project backlog

Beyond unparalleled speed, telecom leaders are enjoying fewer unnecessary field visits, a safer work environment for field crews, and up-to-date digital assets that can be leveraged at other project stages.

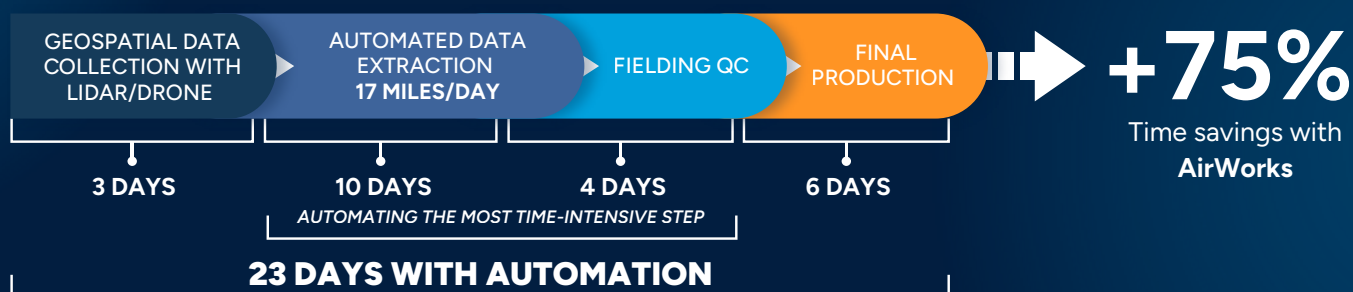
Current Problem: Generating Telecom Basemaps

CURRENT PROCESS - ALL MANUAL

*Assuming 100 miles, 120 ft row



AUTOMATED WORKFLOW WITH AIRWORKS



Data Input Types

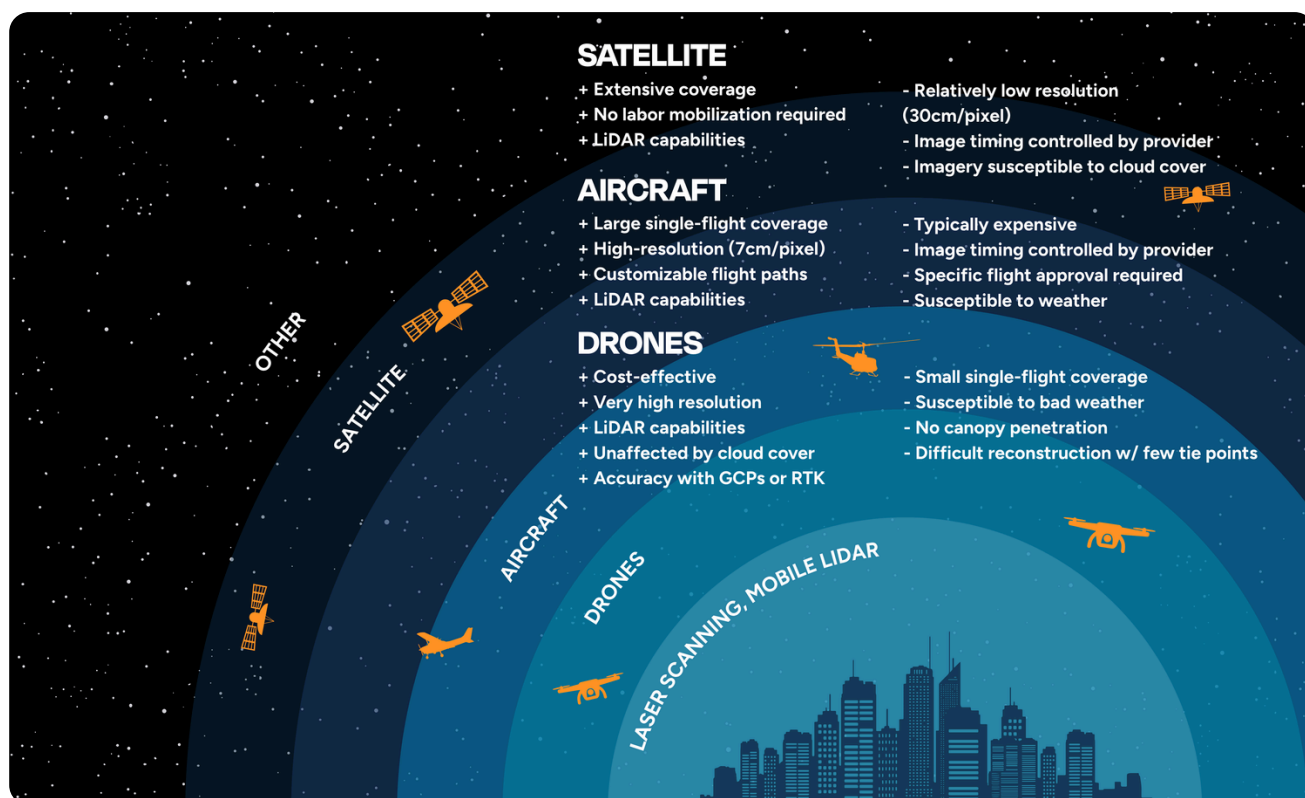
Different projects require different data input types, which require tailored algorithms and processing techniques. We partner with you to make sure you get the data you need from the field.

We can process a wide range of aerial imagery and point cloud data, collected via drone, manned aircraft, satellite, and mobile methods. **The options for remotely capturing field data are increasingly diverse but AirWorks is flexible and prepared to process them using our machine learning model with highly accurate outputs.**

So if you're uploading your own data, you can rest assured knowing that we're data agnostic and can manage a wide variety of remote sensing sources.

Is in-house data collection not possible or efficient in your case? Work with any of our partners to source your data, or hire them for a bespoke data collection project.

Input Data Sources



Data Sources for Different Use Cases

Telecom projects may require different data sources, depending on specific parameters and goals. Through our consultative process, we will guide you to the most efficient method that meets your needs.

For Example:

Manned Aircraft (2D)

This data source is best suited for quick projects that don't require extremely high accuracy. It can be very cost-effective if using commercially available data (for example, with Nearmap).

Used for:

- + Permitting
- + High-level design

Drone Imagery (2D) + Aerial LiDAR (3D)

This data source is best suited for detailed, precise work. Although more expensive compared to a variety of other data sources, Drone Imagery + Aerial LiDAR offers maximum precision.

Used for:

- + Make ready
- + Low-level design
- + Underground utilities mapping

Mobile Terrestrial LiDAR (3D)

This data source is the most expensive and advanced to use, but it's also the most versatile. If your project volume is large, using Mobile Terrestrial LiDAR can be remarkably impactful.

Used for:

- + Permitting
- + High-level design
- + Make ready
- + Low-level design
- + Underground utilities mapping

All of these capture methods can be utilized with AirWorks, enabling seamless integration into your workflows and ultimately maximizing efficiency.

AirWorks' Data Marketplace

When it comes to field data, there is no single right answer. Some projects may benefit from using higher-resolution data over low-resolution satellite imagery, such as Google Earth. Low-resolution satellite imagery often provides you with inaccurate, outdated, and limited data, resulting in heavy reliance on field verification. Using high-resolution Imagery and LiDAR ensures that you have recent, reliable, and geospatially accurate data, resulting in more robust basemaps and dramatically less time (and money) spent on field data collection; but can also be costlier than other methods.

The good news is there are a host of companies working to make widespread, high-quality geospatial aerial imagery and LiDAR data available to all.

Commercially available geospatial data is saving telecom firms time and money, and broadening their reach by allowing them to reduce or even skip the hassle of fieldwork and conveniently access the geospatial data that they need.

Telecom firms are turning more frequently to these types of data sources because of the benefits gained when compared to technology like Google Earth.



Quality

Get higher resolution data for precision mapping



Variety

Select the most suitable data type for your specific project needs



Accuracy

Ensure you have the most recent, up-to-date data

AirWorks can help you identify and execute upon the best data capture strategy for your specific project needs and timelines.



How Telecom Clients Leverage AirWorks

We provide various levels of service, depending on each client's needs, current workflows and deployed technology.

If a team is already utilizing and deploying remote sensing tools, they can engage with AirWorks by only utilizing our automated data extraction solutions and services.

We can also help with the data collection itself. Together with our data partners, we've established a data marketplace with a variety of options to fit the specific scope and requirements of your projects.

Lastly, we also offer full service options for clients who need additional support, whether that's additional field work or more specific data collection. In these cases, we're able to bring in those types of data to stack on top of what we have helped collect and extract.

Data Processing

- + Firms already integrating geospatial data
- + Data Capture in-house or with partners
- + Use AirWorks to streamline base mapping
- + Solve labor issues
- + Scalability

Data Consultation + Processing

- + Data Collection via AirWorks Marketplace partners
- + Imagery & LiDAR
- + AI Extraction for aerial & underground use cases
- + Leverage AirWorks' expertise in remote sensing

Full Service

- + Data Collection, Software, and Field Support
- + Imagery & LiDAR
- + Poles, Parcels, Addresses, and other field work

Flexible Features and Layers

We help teams understand the field data needed for a project and then get it. To do this, we offer different options for features, layers, and attributes that our clients can select depending on the project's specific requirements. We will help you get the features you need to make your project successful with AirWorks.

We have the **flexibility to work within everyone's needs**, whether that's creating custom processing bundles or customized layers.

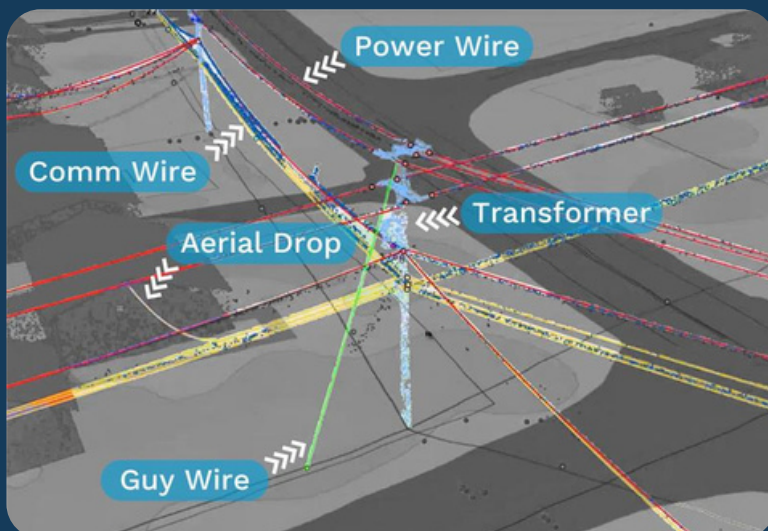
Plus, our a-la-carte option lets you handpick only the layers that you need so you can get your project back even faster and save on costs in the process.

All of the layers you need for your project are created by our AI and QC'd by our team of certified geospatial experts in Boston.

Some of the layers we can include in your order:

- + Utility Poles with Details
- + Overhead Wires
- + Manholes, Valves, and Handholes
- + Telecom Towers
- + Roads, Sidewalks, and Curbs
- + Pedestals and Cabinets

**And more.
Over 100
features
available, and
custom ones
upon request.**



AirWorks can extract and process over 100 layers and features, and can also fulfill custom requests. Some common layers include:

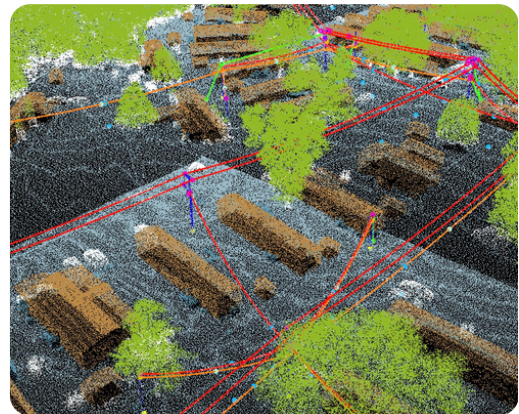
2D Layers for Underground Projects

| | |
|--------------------|--------------------|
| Roads | Sidewalks |
| Curbs | Driveways |
| Buildings | Handholes |
| Catch Basins | Manholes |
| Pavemark Lines | Pavemark Symbols |
| Power / Comm Wires | Power / Comm Drops |
| Utility Poles | Comm Cabinets |
| Pedestals | Traffic Signs |
| Light Posts | Marker Posts |
| Valves | Fire Hydrants |
| Railroads | Railroad Crossings |
| Fences | Legal Right of Way |



+ And More

| | |
|---|----------------------|
| Pole Details | Drip Loops |
| • Pole Height | Power / Comm Wires |
| • Pole Diameter - Top and Bottom | Power / Comm Drops |
| • Power / Comm / Guy Wires Attachment Heights | Clearance Violations |
| • Street Light Bottom | Guy Wire Overhead |
| • UGR | Guy Wire Ground |
| • Pole Tilt | Comm Cabinets |
| • Weather Head | Light Posts |
| • Transformer | Pedestals |
| • Comm Boxes | Fire Hydrants |
| • Antennas | Marker Posts |
| | Fences |
| | Railroads |
| | Legal Right of Way |



+ And More

Project Examples

A horizontal bar composed of three segments: a light blue segment on the left, an orange segment in the middle, and a darker blue segment on the right, all with a slight 3D effect.



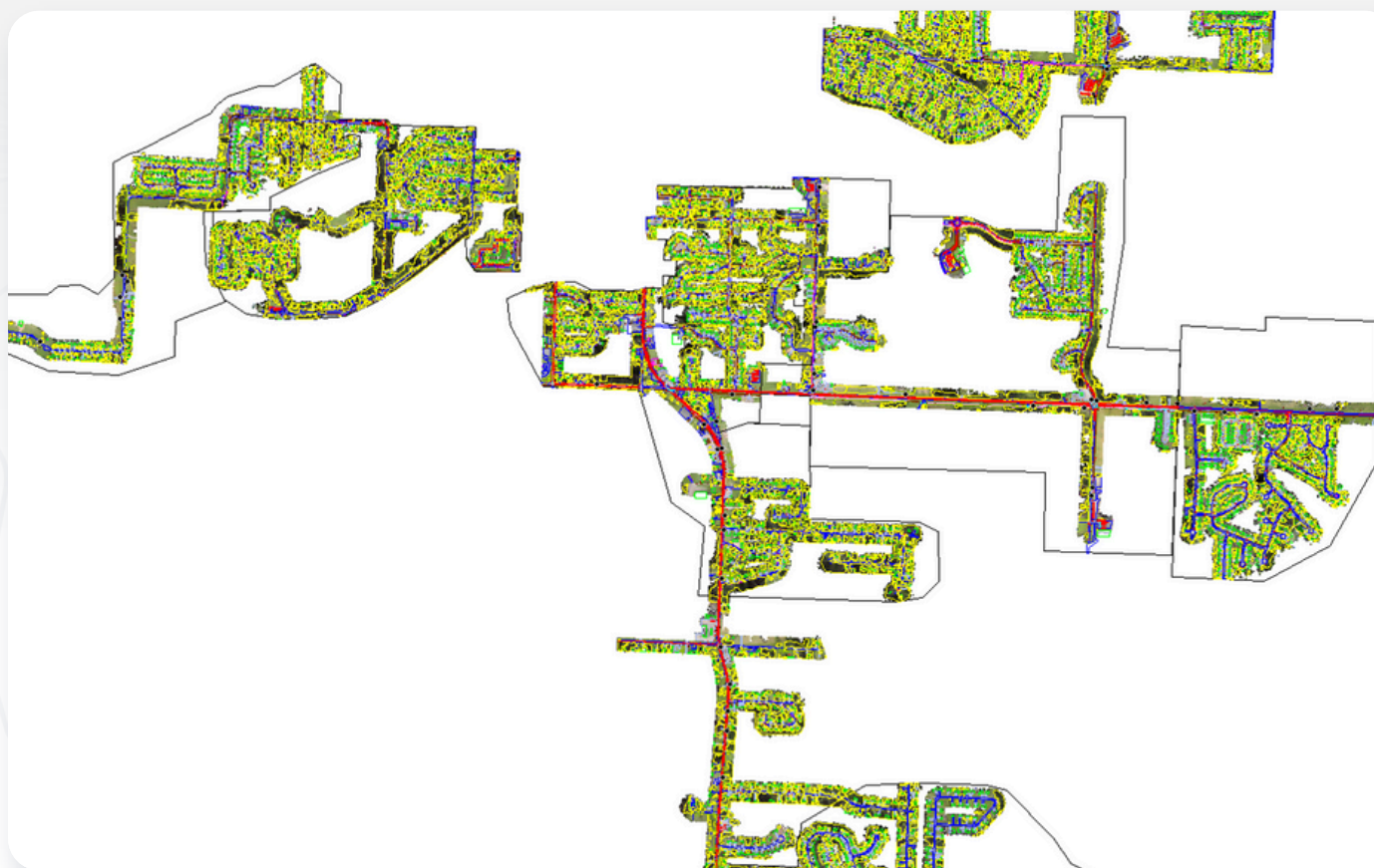
ROW Permit with Mobile LiDAR

When we first started working with LightSett, they were struggling to keep up with an increasing workload and a finite amount of field and engineering staff.

AirWorks helped close this gap by increasing the amount of engineering miles delivered on a daily basis.

With AirWorks, LightSett went from 3 engineered miles per day to 17+ engineered miles per day.

That's a 6.5x improvement each and every day without any need for additional hires.



2D basemap with identified road centerlines, curbs, manholes, valves, handholes, catch basins, utility poles, and more to enable ROW and underground utility engineering in both high and low level design phases.

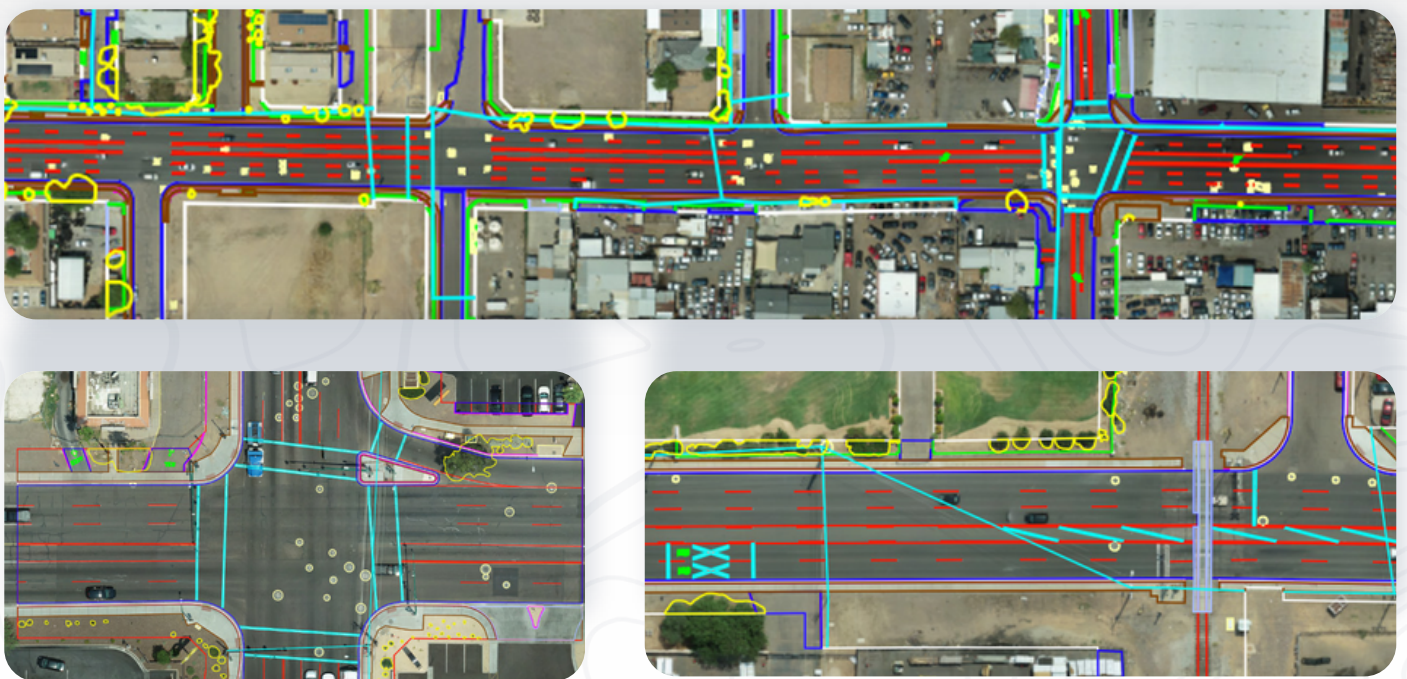
Strand Mapping with UAV

One of our U.S. based clients was working on a strand mapping project covering roughly 4.5 miles using aerial data collected via drone.

While they had already a functional internal drone mapping team, they were limited in their ability to visualize the data their team was collecting from the field. Ultimately, the in office mapping staff needed to be able to process field data, and do basic design faster.

With AirWorks, this client was able to cut their drafting time by 70%.

The ability to rapidly create these vectors drove the biggest return on investment.



2D basemaps with identified pavement markings, utility lines, utility poles, vegetation, manholes, curbs, sidewalk, and more to enable strand mapping from UAV data of a project site

Tackling the Project Backlog



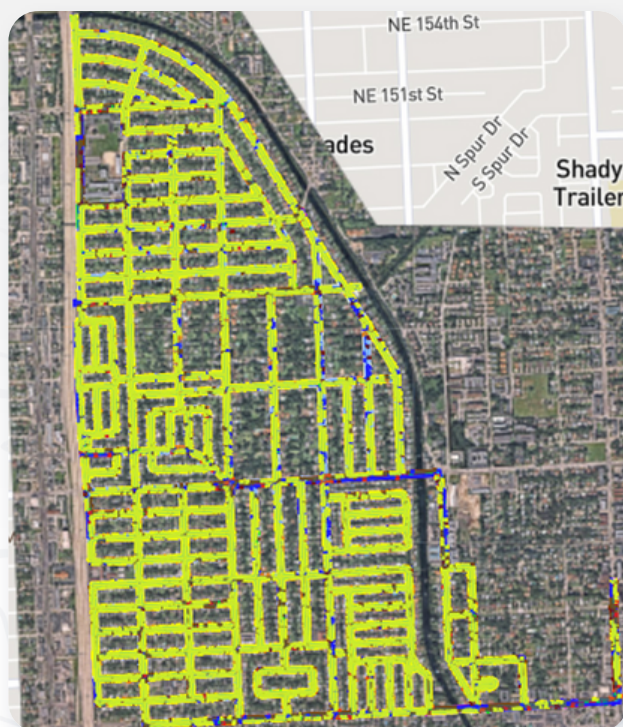
MasTec, was using AirWorks to support them in ROW permitting for underground and utility projects.

Their biggest struggle was tackling a massive backlog going back 5 months.

They sourced our data from data marketplace and decided to use Nearmap. We were able to use Nearmap imagery to run extraction for inside the right of way to create basemaps to enable permitting with greater speed and accuracy.

With AirWorks, this client was able to completely clear their 5 month backlog.

Afterwards, we were able to develop a tool together in which we could cut down on extraction in areas that weren't being used, enabling our client to deliver faster in a more budget-friendly manner.



2D basemap with identified vegetation, roads, curbs, utility poles, pedestals, manholes, and more to enable ROW and underground utility engineering in both high and low level design phases.



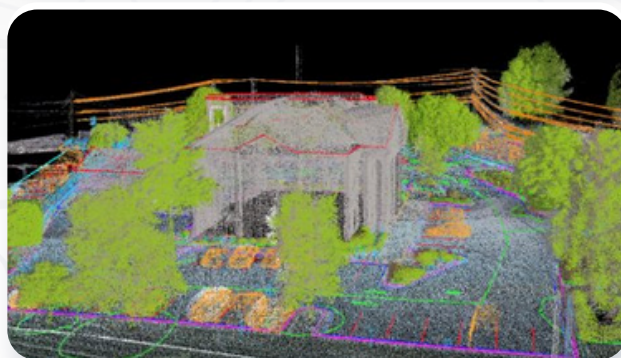
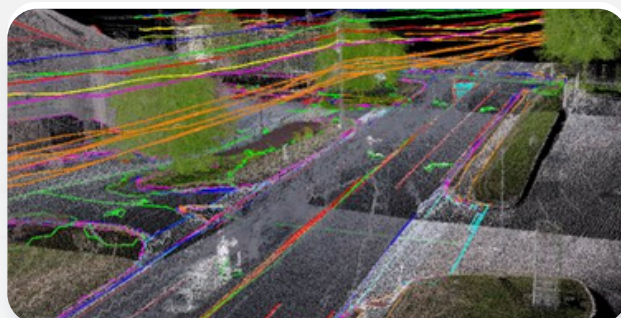
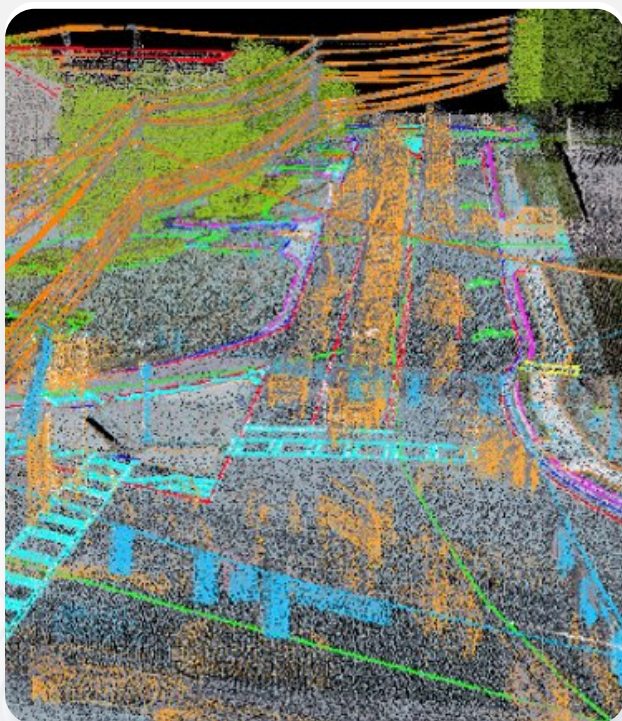
Aerial Make Ready: 3D Linework Delivery

In our final project example, we showcase a client, KCI, that was moving away from high-level needs for permitting and moving into low-level design.

Their project was focused on pole extraction or make-readies, which required a slightly different resolution in imagery and a different point cloud density.

With AirWorks, this client was able to extract all the vectors needed from an incredibly dense point cloud in a flash.

The ability to get more accurate data quickly revolutionized our client's data processing timeline. This project also showcases how we can partner with engineering teams at any stage of a project.



3D LiDAR point clouds used to create a digital twin of a project site, enabling measurement of distances, robust project site visualization, and accurate permit applications.



Summary: AirWorks Field Intelligence Solutions

By putting reliable and actionable data in your hands, we give you the tools to deliver more projects, faster.

18+

Miles Mapped Per Day

7x

Faster Than Manual Methods

Data-Agnostic

75%

Average Time Saved Per Project

We can work with almost all types of field data:

- + Drone
- + Manned Aircraft
- + Open Source
- + LiDAR (Aerial & Mobile)
- + Satellite

Working with AirWorks is fast and easy:



Upload

Bring your own data or easily source it from one of our Data Marketplace partners.



Process

Reduce project costs with better resource allocation by letting AirWorks the tedious manual work for you.



Deliver

View and download completed, QC'd files and quickly move on to other project stages



Connect with AirWorks

To learn more about how AirWorks can elevate and accelerate the operations of your engineering team:

Schedule a demo at airworks.io/sign-up

Email: contact@airworks.io

Call: 857-990-1060

Visit our website: airworks.io



Bring the Field to You