AIRWORKS

Leveraging Automated Mapping Products in the Public Sector

Gain Insights From Your Data Faster Than Ever Before with AirWorks Automation.

Introduction

We understand that the public sector has specific needs when it comes to remote sensing and data analytics. Our technology can provide government agencies with fast, accurate and comprehensive data for various applications, including impervious surface assessments, building verification, asset management, and more.

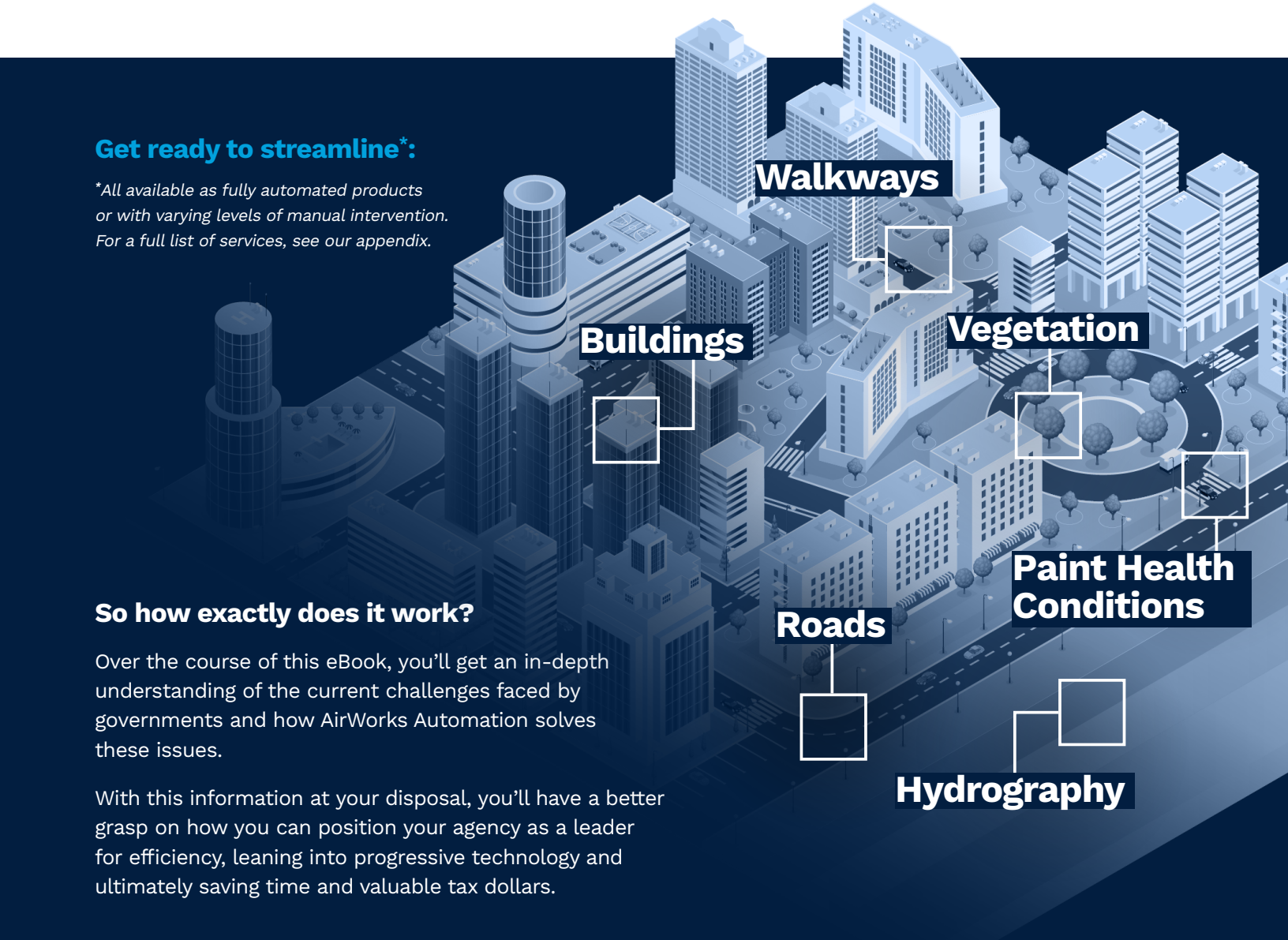
Autonomous feature identification from remote sensing data allows our clients in the public sector to **make informed decisions faster, saving money, minimizing risk, and providing a better overall understanding of the assets** they maintain.

Automation helps our clients make better decisions faster, freeing up their internal resources for more complex and valuable tasks.

In other words, you can complete months of tedious manual compilation work in just days by leveraging automation.

Get ready to streamline*:

**All available as fully automated products or with varying levels of manual intervention. For a full list of services, see our appendix.*



So how exactly does it work?

Over the course of this eBook, you'll get an in-depth understanding of the current challenges faced by governments and how AirWorks Automation solves these issues.

With this information at your disposal, you'll have a better grasp on how you can position your agency as a leader for efficiency, leaning into progressive technology and ultimately saving time and valuable tax dollars.

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The Current State of the Industry

Challenges Faced by Government Entities

State and local governments need access to comprehensive, accurate, and up-to-date data on their communities in order to build smarter, safer cities.

Aging infrastructure, changing climates, and rapid urbanization are all factors affecting leaders' ability to plan and forecast.

Until recently, most entities have relied on a manual mapping process to get the information needed to make important decisions on disaster planning, sustainability, climate response, and the like.

The problem?

Not only is the manual mapping process time-consuming, labor-intensive, and often out-of-budget—it also cannot be replicated quickly enough to track fast-moving changes.

Many communities spend up to a year or more attempting to collect this data—and by the time it's actually time to use it, it's already out of date.

Now, state and local governments are increasingly turning to automated mapping for more reliable and up-to-date data at a fraction of the cost.

With AirWorks Automate, you can utilize high-resolution aerial imagery to extract data that includes any real-world features needed for analysis, giving your agency a complete digital representation of critical infrastructure and natural features for communities to use for strategic planning and asset management.

How Does AirWorks Solve These Problems?

With Artificial Intelligence (AI), it's easier to be faster.

AirWorks' AI algorithms are built on more than 50 thousand hours of data perpetration by processing and training thousands of acres of geospatial data at varying densities.

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

The results?

Speed

- AI data processing is fast
- Cut project delivery timelines by 50% or more
- Confidently meet deadlines
- Reduce time to understand the value of your data

Scalability

- AI scales instantly
- Enables you to work on many projects simultaneously
- Increase capacity without hiring
- Triple your workload without overloading your staff

Accuracy & Quality

- AI + automation or semi-automation
- Consistent
- Reliable
- High-quality
- Eliminate need for significant QC post-AirWorks
- Trusted deliverables flexible across filetypes

Business Impact

- Extremely competitive rates
- Maximize fiscal responsibility
- Price reduction with scale
- Drive revenue

Read on and we'll show you exactly how it works, and how it's being used in the public sector today.

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AirWorks Automate: How It Works

The Impact of AI on Government Timelines

Manual compilation and updating existing GIS can be labor-intensive and time-consuming.

AirWorks Automate uses machine learning to reduce the amount of time needed for each step, slashing project timelines and increasing efficiency for governments who deploy it.

It's fast and easy:

A user can share their dataset with AirWorks through their preferred method: either by uploading it via the AirWorks cloud or, depending on file size and privacy preferences, sharing it directly with our team.

These datasets can be sourced internally through open source public data, or from one of our data partners (more on that later).

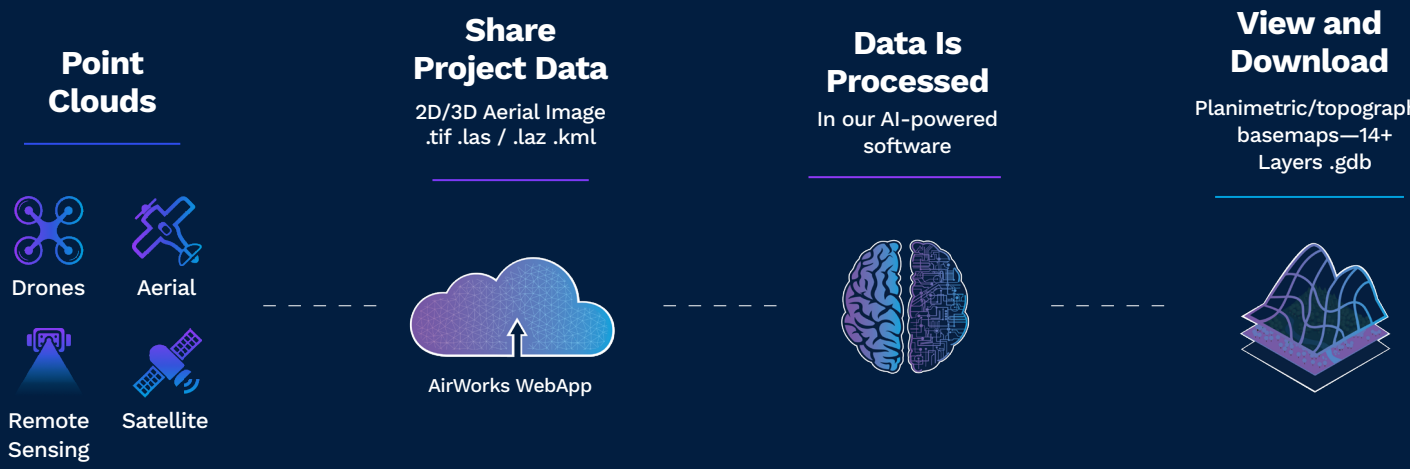
AirWorks performs various checks, looking at things like the density of points, the resolution of pixels, and proper spatial references.

Then, our machine learning algorithms* start to look at the data and segment, classify, and rasterize all of these types of features into the final deliverables needed for the project.

Finally, you can download the deliverable directly to fulfill your project requirements – whatever they may be!

*To better understand the mechanics of AI-powered feature extraction, please see the appendix.

The AirWorks Workflow



AirWorks' Data Marketplace

Need additional imagery or point cloud data to complete a project? The good news is there are a host of companies and governing bodies working to make widespread, high-quality geospatial data available to all.

At AirWorks, we can help you find the most applicable remote sensing data available for your use case, via publicly sourced resources, our data collection partners, and/or internal and historical resources.

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

The best part? These files can be uploaded directly to AirWorks for fast and accurate AI feature extraction and linework.

Our Data Partners

Whether you're in need of data to quickly assess existing conditions, estimate project risk, or determine an accurate project schedule, our off-the-shelf geospatial data marketplace is ready to help.

Our data partners give clients the option to use their imagery directly in-app, enabling them to seamlessly submit projects with the best, most up to date data.

Included in our growing list of data providers are:

Nearmap Vertical

If you're looking for high-resolution, frequently updated orthomosaic aerial imagery in major urban areas, look no further than Nearmap Vertical.

EagleView Reveal

Eagleview Reveal's coverage is impressive, touting 1 billion images in both urban and rural areas, covering 98% of the US population.

Publicly Available Imagery

Utilize openly accessible GIS data from reputable sources that provide their datasets for public use.

At our core, we remain data agnostic. We can process data from any commercially available or internally collected source.

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AI Use Cases in Government

For a full list of services you can complete with AirWorks, see our appendix.

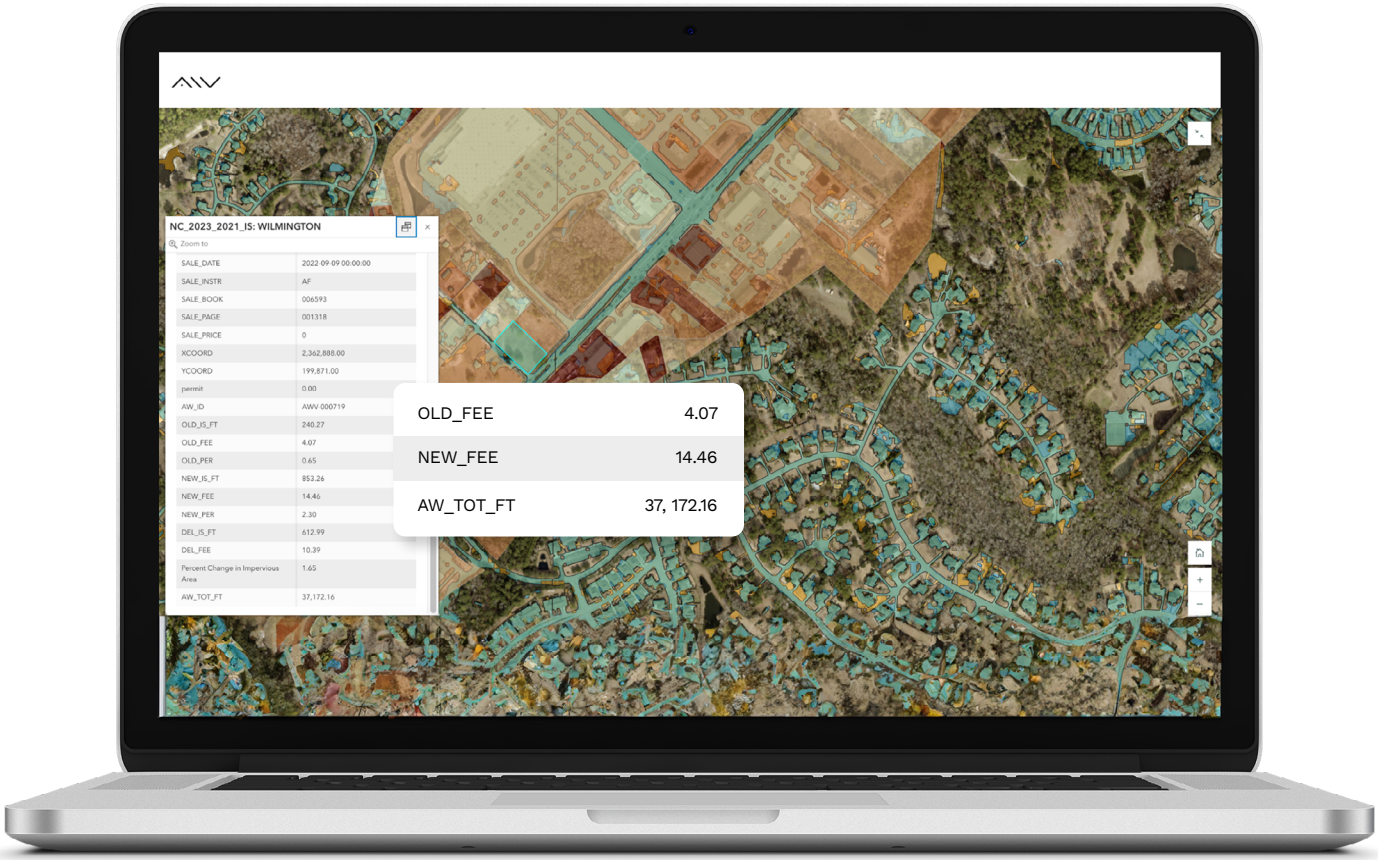
Automated Impervious Surface Mapping for Stormwater Quantification and Pollutant Mitigation

With new developments constantly under construction, communities are facing increasingly polluted waterways and overwhelmed infrastructure due to additional runoff. Stormwater fees based on impervious surface area are helping to supplement the assets needed to support drainage and improve aging sewer infrastructure.

AirWorks can autonomously delineate impervious surfaces, providing data to quickly and affordably calculate impervious surface areas for equitable stormwater fee allocation.

Encourage sustainable drainage solutions for residents and commercial property owners with fair fee quantification for impervious surfaces.

With AirWorks' analytics, you can leverage project insights for optimal management.



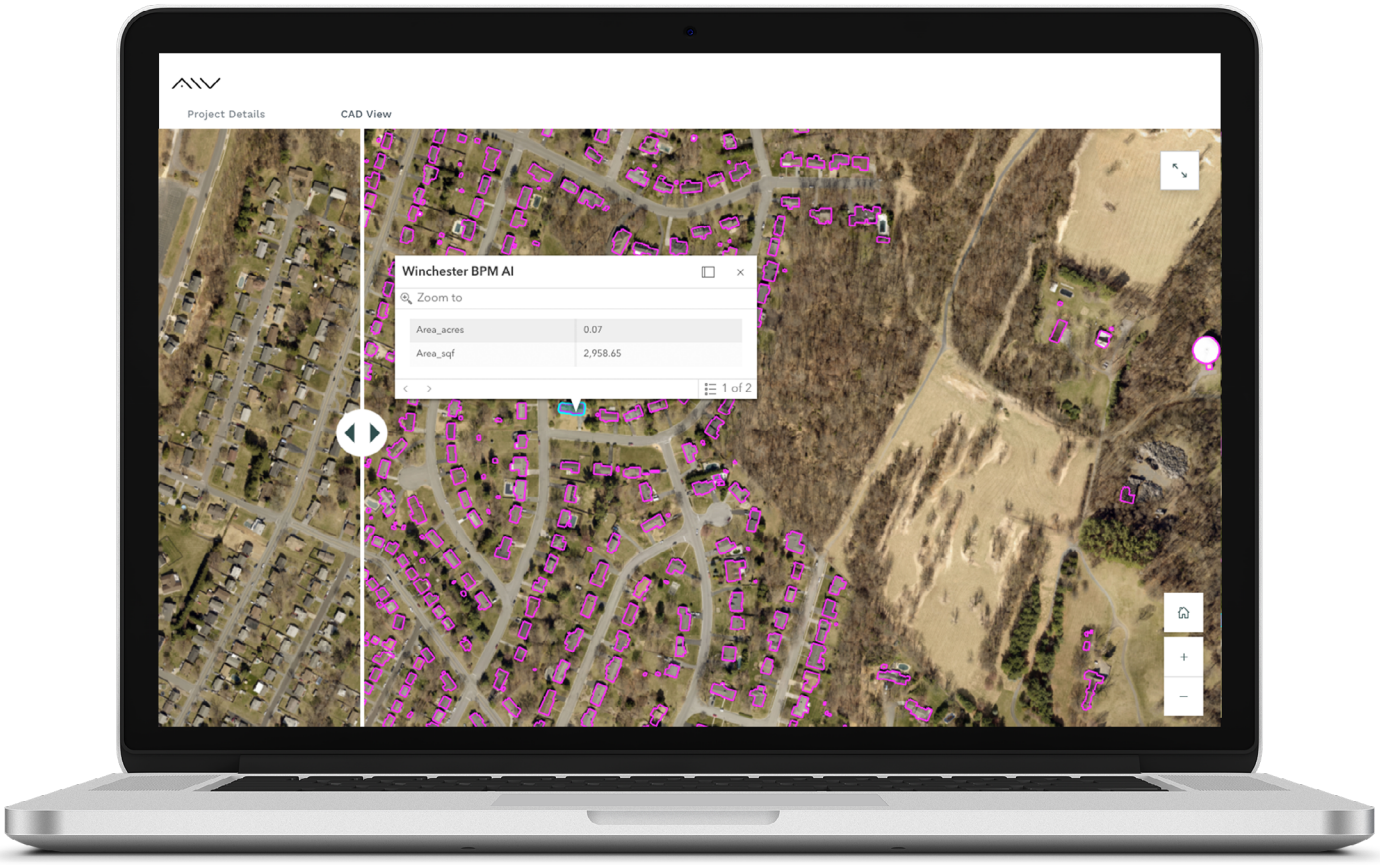
Automated Building Outlines

As residential and commercial property owners modify sites to include new or expanded structures, driveways, or parking lots, appraisers depend on current maps to monitor and revise ever-changing property values and status.

Update government GIS databases with AirWorks' on-demand AI feature extraction software.

AirWorks can quickly create updated linework identifying buildings and surrounding attributes from imagery or LiDAR data, giving appraisers and auditors real-time insights into individual properties, subdivisions, and entire counties.

Additionally, using Airworks alongside your parcel or computer assisted mass appraisal (CAMA) data can help your team identify permitting gaps and land use types.

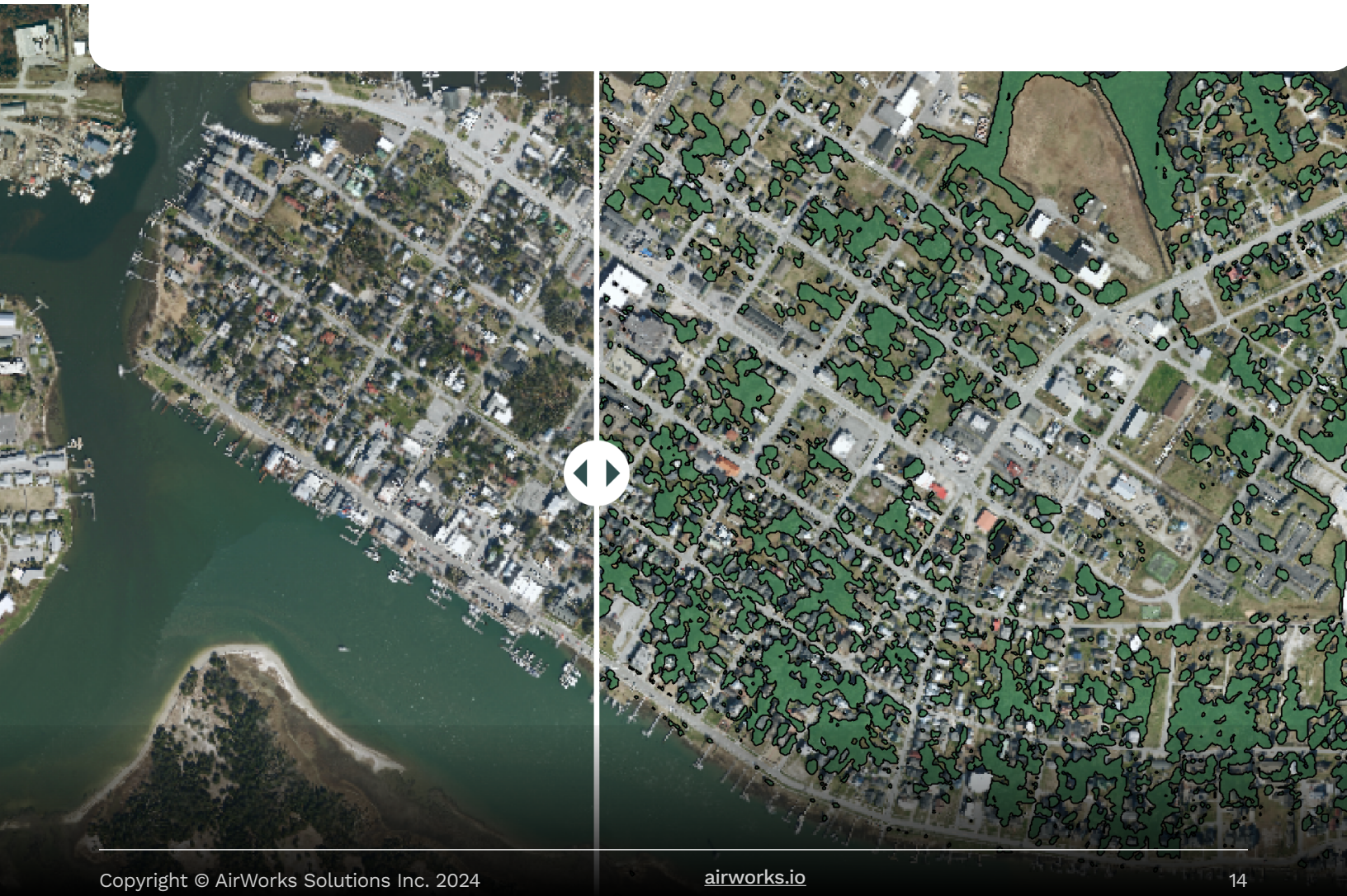


Asset Management

Understanding existing conditions is critical for the public sector to effectively resource-plan and budget.

By including Airworks in your workflow, you can minimize dangerous field work by utilizing remote sensing technology and automated processing. With our quick analysis, we enable our clients to quickly identify and prioritize areas that require attention. Additionally, we can assist with budget management and production requirements by providing a better understanding the square footage of repairs needed to help you quantify materials (like asphalt, tar, guard rail, etc.) that may be needed for right-of-way improvement and construction.

Vegetation mapping for urban forestry and development is another important use case for our asset management clients. Through Airworks, you can assure that your constituents are abiding by city ordinances and permits regarding vegetation, fencing, additions and more.



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Get Started Today

Summary: AirWorks Automate

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

90+

Customers

3,500+

Projects Delivered

40%

Projects Delivered Ahead of Schedule

4 Days

Average Turnaround Time

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 automate do the tedious work for you.

Deliver

View and download completed files and quickly move on to other project stages.

Flexible Pricing Options

Build the plan you need to get started.

Pay-Per-Project Pricing

Leverage the power of AI & machine learning without the commitment of a high fixed cost annual subscription.

Pre-Paid Packages

Ideal for teams looking to maximize cost-savings and benefit from a dedicated support team.

Multi-Year Discounts:

We understand that governments need to build budgets ahead of time—that's why we offer multi-year discounts to encourage program growth for your goals.

Schedule a 15-Minute Demo Today!

You've got questions, we've got answers. Talk to someone from our team to get more information on how AirWorks can help your team unlock max efficiency with AI.

SIGN UP

Questions? **Contact Us:**

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Appendix

AI Basics

Artificial Intelligence (AI) lies at the core of Airworks' feature extraction software, enabling firms 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.

It's not magic. It's not a robot. At the end of the day, it's mathematics and data.

We train our algorithms to break down images into numbers and recognize patterns. When it comes to output, we can measure what's good and what isn't good and tie that back to accuracy statements, which is what our clients in the telecom world live by.

Computer vision, machine learning—all of that is super important to what we do. 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 products that mattered to our clients. 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. We hope this eBook helps shed some light on the generalized theories of AI and how we leverage it in this space.

Here's to building a more livable world.

Feature Extraction Basics

Feature extraction is the process of recognizing and categorizing individual components within an image to convert complicated raw data into an understandable and manageable representation.

This method takes a busy image, filters out distractions, connects the dots, and reduces the data down to the critical elements of the original image.

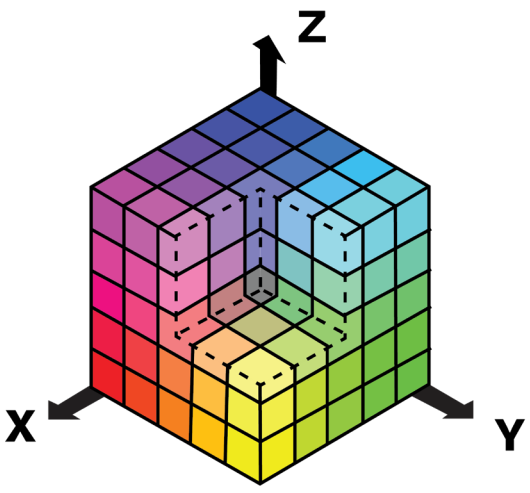
Feature extraction can be done manually or through artificial intelligence (AI).

AI feature extraction relies on pixel representation in RGB color space. Images are broken down into pixels, and each pixel is one color (some mixture of red, green, and blue). The color is translated to numbers in the RGB color space so it can be interpreted by the algorithm.

Algorithms are trained to recognize groups of pixels as specific features. As the program sees more and more data, it begins to recognize a wider range of features within the category and make connections on features that are often seen together.

Eventually, the goal is for the deep learning algorithm to correctly make predictions about features it may have never specifically seen.

THE HUMAN EYE SEES the world through combinations of red, green, and blue.



Digitally, this can be broken down into a 3D coordinate space, with red, green, and blue on separate axes and on a range of 0 to 255 (one byte).

Setting the value of all color channels to 0 creates black (no light emitted), while setting the value of all color channels to 255 creates white (maximum light emitted).

Combinations in between create the variety of colors we see and make these colors recognizable to algorithms through numbers.

Data Input Types

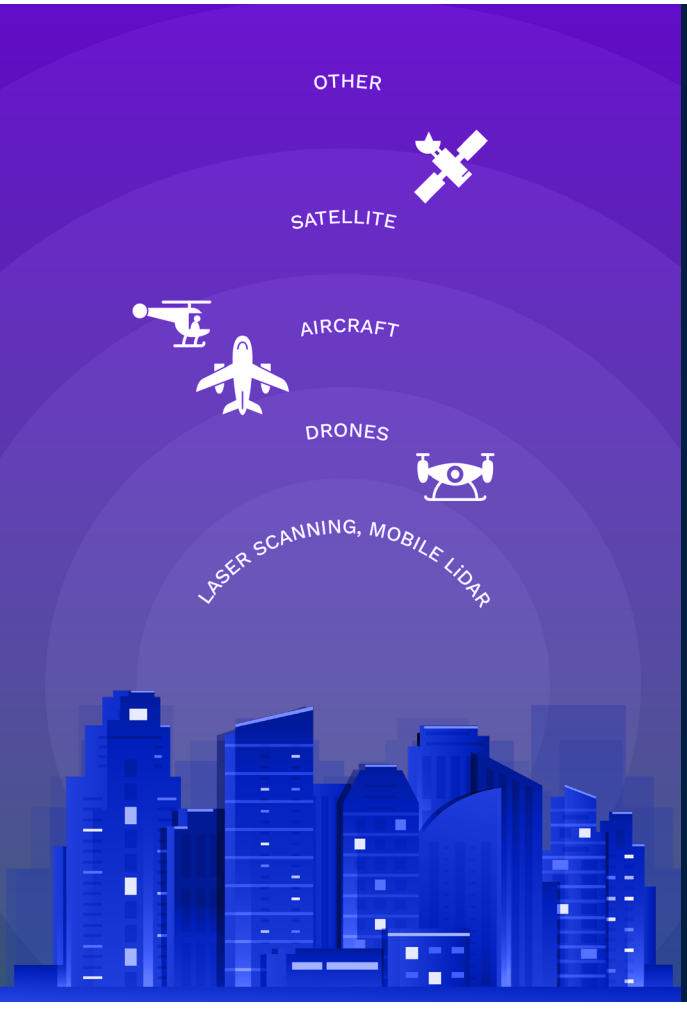
Different projects require different data input types, which require tailored algorithms and processing techniques.

AirWorks Automate processes a wide range of imagery and point cloud data—whether collected via drone, manned aircraft, satellite, or mobile methods.

This increasingly diverse data builds an increasingly stronger machine learning model with increasingly more accurate output.

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

And if in-house data collection isn't possible or efficient, we've got plenty of options of off-the-shelf geospatial data for you to choose from—read on to learn more about our data marketplace.



Input Data Sources

Satellite

+ Extensive coverage
+ Wide spectral capabilities (LiDAR)
– Relatively low resolution (30cm/px)
– Limited coverage in some regions
– Image timing controlled by provider
– Imagery susceptible to cloud cover

Aircraft

+ Large single-flight coverage
+ High resolution (7cm/px)
+ Wide spectral capabilities (LiDAR)
– Typically expensive
– Specific flight approval required
– Image timing controlled by provider
– Susceptible to weather
– Limited availability

Drones

+ Cost-effective
+ Imagery acquired on-demand
+ Very high resolution
+ Unaffected by cloud cover
+ Accuracy with GCPs or RTK
– Small single-flight coverage
– Susceptible to bad weather
– No canopy penetration
– Regulations or bans restrict usage
– Difficult reconstruction with few tie points

Flexible Features and Layers

We offer different options for features, layers, and attributes that our clients can select depending on the project's specific needs—get the features you need to make your project successful with AirWorks Automate!

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

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

If you can see it, we can extract it.

Utilities:

- Manholes
- Catch Basins
- Utility Structure
- Utility Box
- Utility Roof
- Solar Panels
- Fire Hydrants
- Utility Poles
- Overhead Wires
- Transmission Pylons & Poles

Road & Sidewalk:

- Roads
- Sidewalks
- Curbs
- Pavement Markings

Walls & Fences:

- Walls
  - Stone Walls, Wood Walls, Concrete Walls
- Fences
  - Fence Lines, Guard Rails, Railing

Planimetrics:

- Building Outlines
- Water
- Building Footprints
- Concrete Pad
- Railroad
- Docks (Piers & Gangway)
- Decks

Vegetation & Landscape:

- Vegetation
  - Single Trees, Tree Lines, Bushes, Landscape Areas
  - Tee, Green, Fairway, Bunker
- Gravel

The best part? AirWorks offers special pricing packages to ensure that you maximize cost savings.