3DR eBook

How to Build an Enterprise Drone Program

> Our field team didn’t fully understand the value of the drone data until we gave access to the entire team and explained how they could use it for their day-to-day work. This data helps provide simple solutions to the daily challenges on the jobsite.”

Andre Tousignant
Virtual Construction Manager, PCL Construction

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Drones are taking off in the enterprise.

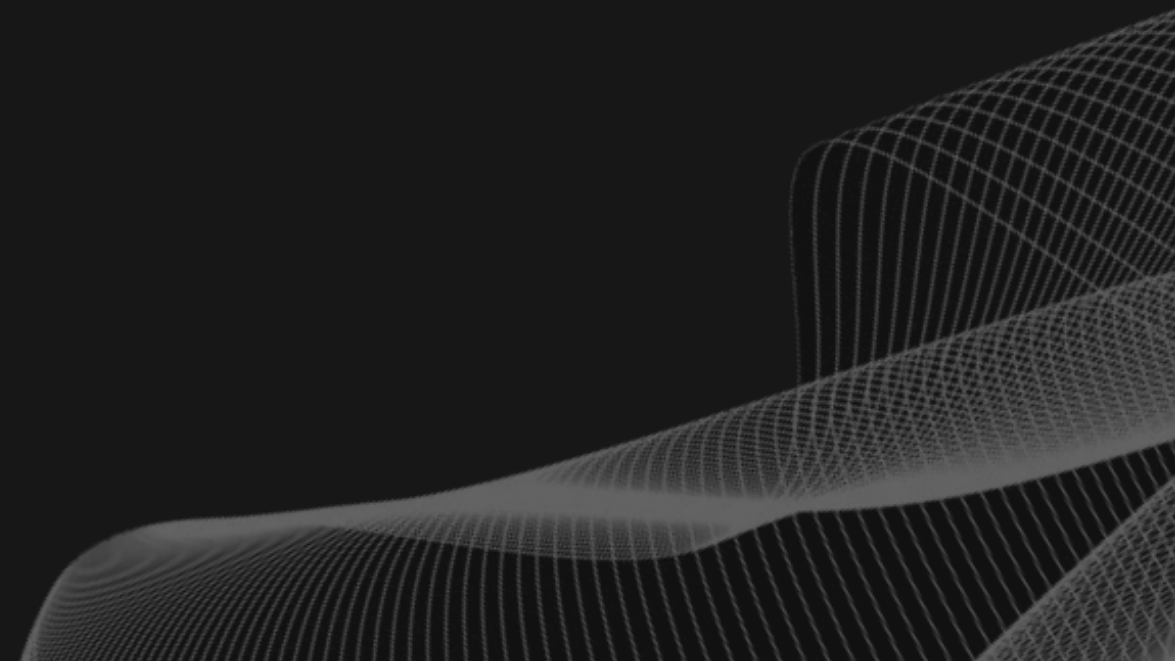
Large organizations—from ENR 400 firms to government agencies like state DOT's—are looking to use drones on more of their projects. Organizations of this size have some unique concerns. For example: how can they standardize drone operations across jobsites, share data with hundreds of people, and do so in a way that's secure and easy to manage?

We've worked directly with industry leaders like PCL Construction and PARIC to help answer these questions and successfully build their enterprise drone programs. Now, we're sharing our key learnings with you, to help you think about what's important as you bring drones into the enterprise.

As always, thanks for reading. Let's get started.

— 3DR

I. Pick your champion



Every drone program needs a leader.

Before you can get to the point where you're flying drones on multiple jobsites and sharing data across your organization, you need to start simple: identify an internal champion for your drone program, and let them take the lead.

As Nico Bonnafoux, Senior Customer Success Architect at 3DR, said: "The first, most important thing is to have a dedicated drone program lead, someone who has a good top down view of the company's projects and needs. In construction, we've found that's usually someone on the VDC team: start with one good VDC lead and one good project manager or project engineer. Together, they can get the program off the ground."

Be enterprise-ready

There's two ways you can start an enterprise-ready drone program from day 1: Implement and standardize from the top down throughout the organization, or start with a single project and spread to other jobsites from there.

What's best for your business? Both of these are good options—the right answer depends on your size, structure, and unique needs and goals. Either way, you need to establish a simple, repeatable process, which your owners can come to rely on.

For example, as Andre Tousignant, Virtual Construction Engineer at PCL Construction, said: “When we show Site Scan to an owner—including its legal and security departments—we explain that when we fly the drone, we define the area and set pre-programmed, repeatable routes. That gives us consistency on the operational side, and they appreciate the predictability of the system on their side.”

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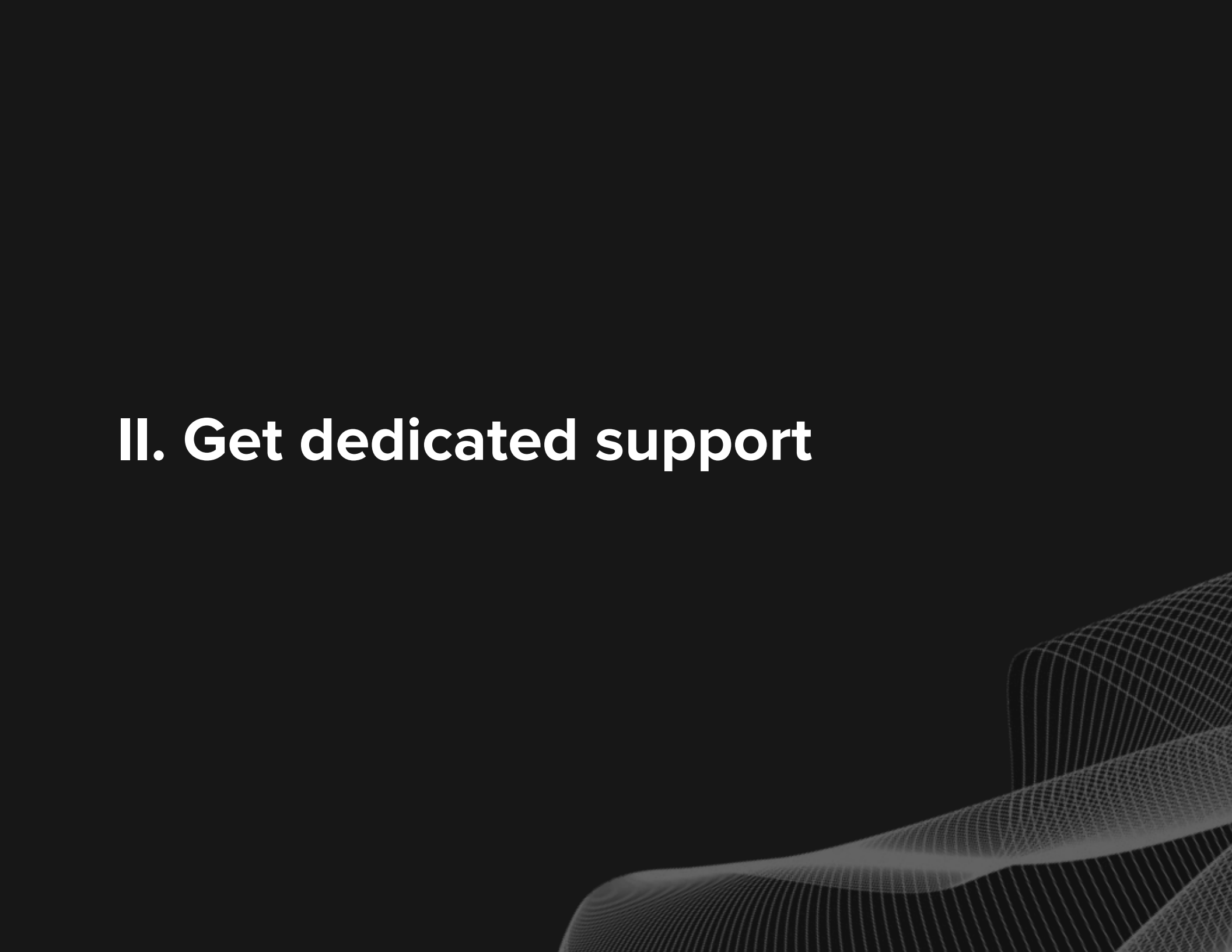
Nico Bonnafoux
Senior Customer Success Architect, 3DR

II. Get dedicated support



Flying a drone is easier than ever.

But for the enterprise, there's still a lot to consider: aviation laws, hardware maintenance and fleet management, flight planning, and much more. Behind every great enterprise drone program, there's a team of dedicated customer success experts at drone companies like 3DR, doing everything they can to ensure you're getting the most out of your investment. When it comes to support, there are a few things enterprise customers need to consider:

Onboarding

Enterprise deployments should start with a comprehensive onboarding program designed by your drone vendor, who should be on-site with you to kick things off.

For example, the 3DR enterprise onboarding includes: setting clear, measurable goals for data collection, obtaining FAA certification, configuring your org structure and permissions, setting up integrations and planning initial flights, and a comprehensive training of the complete Site Scan platform.

Flying safely

As you scale drone flights across multiple projects, there are more safety concerns to consider. Dedicated support representatives are experts in airspace regulations and can help design safe,

legal flight plans for you to follow. Also, as LAANC continues to grow in coverage, it helps to have a drone platform with LAANC capabilities for automated airspace authorizations.

Hardware replacements

Have a problem with your hardware on-site? Make sure that your drone vendor can quickly send a replacement. We know that you don't want to have *any* downtime—a replacement program will help keep your drones in the skies, collecting consistent, reliable data.

Direct line to support

Sometimes, when you have a pressing question or a problem on-site, nothing beats being able to pick up the phone and get answers, fast. Make sure you choose an enterprise drone vendor that's available when you need them. 3DR, for example, provides technical phone support 12h per day, which is a common requirement for enterprise customers.

II. Be smart about sharing

Once you're flying drones consistently and collecting useful aerial data—like orthomosaics, point clouds, 3D meshes, and more—it's time to start thinking about the right ways to share this data beyond the VDC team and get it in front of the rest of your organization.

Drone software platforms have created a variety of ways for you to share your drone data, from public share links to PDF exports to direct downloads of the data products themselves. While these all have a place in your workflow, you'll need more at the enterprise level in order to ensure your data is secure and has value to each end user. This can be accomplished by having a central administrative dashboard with a robust accounts and permissions system. This will make it easy to customize how stakeholders see and engage with your drone data, from subcontractors to field personnel, management teams to clients, and much more.

How does this actually work? In the 3DR Site Scan enterprise platform, for example, we define permissions by the organization, project, and user levels. When you create a new user, you can put them within one of these categories, and then give them a specific level of access: administrator, full-access, read-only, or 'operator'.

Here's the full breakdown:

Organization administrators: For the leaders of your drone program across the company. They have full access and control over members and data permissions.

Organization, full access: These members can do everything except manage other member's permissions.

Project administrator: For those running drone operations for a single project, like project managers and team leads.

Project full-access: For those who want to be able to process flights, but not create projects or manage permissions. This often is used for field engineers, surveyors, technicians, and the like.

Read-only: Your client or other external stakeholder can log in to their read-only account and see just what they're interested in: up-to-date, high-resolution photos, orthomosaics, and point clouds of their project. They can make measurements, but they can't make edits, export data, or change permissions.

Operator: This is only for those who are flying the drone—not viewing or analyzing data.

This is an approach that's thoughtfully designed for the enterprise: it gives everyone the right amount of access and visibility into your projects—no more, no less.

Sharing drone data across the enterprise

Organization-level permissions

Executives, Directors, VDC Managers

Project-level permissions

PE's, PM's, Supervisors, Estimators

User-level permissions

Field Crew, Surveyors, Mining Technicians

Major construction firms are already working like this.

PCL Construction scaled their enterprise drone platform to get more value out of their data than ever before. As Andre Tousignant said: “With Site Scan’s enterprise platform, we determine how many people need access to the drone data for each individual project. This helps us make sure we’re thoughtful about sharing our data, not giving access to those who do not need it.”

This has helped PCL Construction improve visibility into their drone data, and it has made a big impact. As Andre said: “Utilizing the enterprise platform and sharing our drone maps and models… that’s where we’ve seen the most value. When people see the web interface and the tools available, they are immediately interested and start thinking about how they can use the data.”

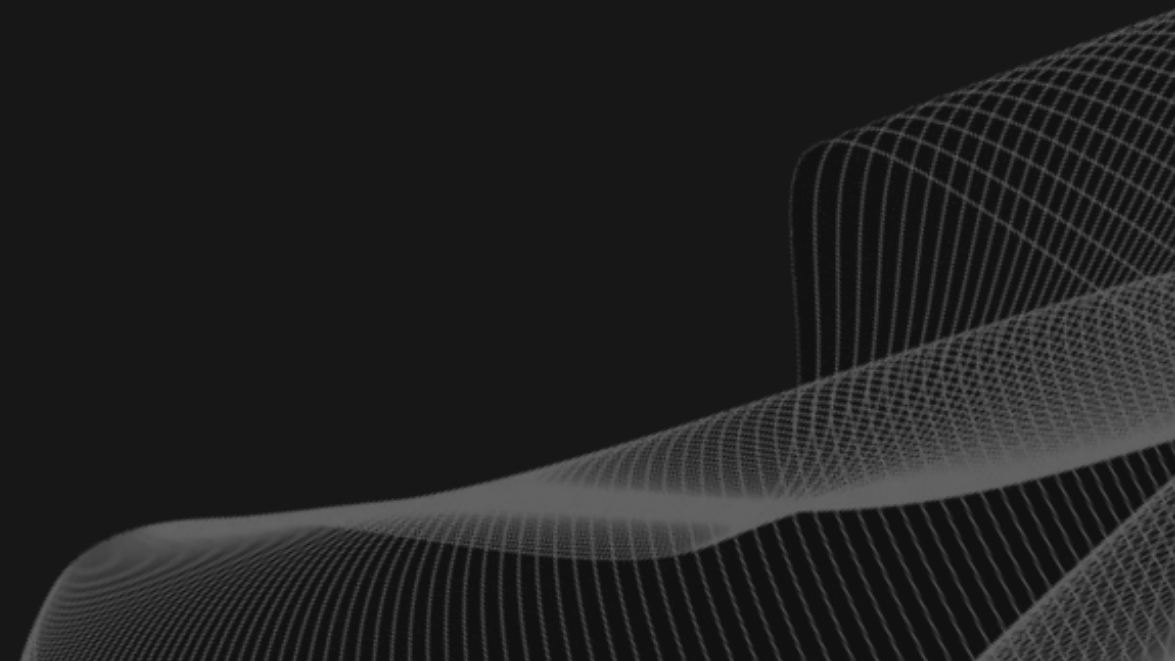
PARIC, an ENR 400 Contractor based in St. Louis, has improved project outcomes by making their data accessible to their whole team—especially field personnel—rather than just their VDC department. As Andy Leek, VDC Director at PARIC, said: “Now that we have this data, we actually want to relay it out to the field so they can understand what’s going on in their project on a weekly basis. We can also share access to this data with the project stakeholders and the project team. So you may have project engineers in the field that are using this data to calculate volumetrics, but then the project stakeholders just want to be able to view it.”

Video: How PARIC uses drones on-site

> As we've started adopting drones into our workflow, we've realized very quickly that it integrated into a bigger process. Five years from now I think that we're going to use drones on most all of our projects"

Andy Leek
VDC Director, PARIC Corp.
ENR 400 Contractor

IV. Stay flexible



Your drone platform needs to be flexible.

There are two areas that highlight the importance of flexibility: what drones you can fly, and what software your data works with.

One platform, multiple drones

Most effective enterprise deployments have more than one kind of drone in their fleet. Here are some of the main reasons why:

- You might simply want to fly with the latest, most advanced hardware

- Your client requires having a drone from a specific manufacturer or with a unique set of features

- Your team may have already learned how to use a certain kind of drone, and it'd be costly and time-consuming to train them how to use a different one

These all highlight the importance of having a software platform that supports multiple drones, giving you the freedom to choose the right tool for the job. For example, 3DR Site Scan supports both 3DR and DJI drones, including the Phantom 4 Pro and, most recently, the M200 series. All of these drones can be fully used with Site Scan's autonomous flight modes, which can easily be re-flown for consistent and safe data capture.

Data interoperability

It's not just about hardware: you'll also need to seamlessly export your drone data into common file formats, so you can work with your drone data in the geospatial and construction software tools you use every day.

This is especially true for large organizations that have standardized on a set of software tools, such as Bentley, Esri, QGIS, or Autodesk products like Civil 3D, InfraWorks, and Revit. Your drone data needs to work directly with these tools, otherwise you're holding yourself back from a truly successful enterprise deployment.

Drone data, meet BIM 360

Smart construction firms are looking for ways to bring together their drone maps and models with the BIM tools they use every day.

Autodesk is leading the push to BIM with their BIM 360 platform, which is making it easy for construction firms to manage their entire project lifecycle on a single platform. By bringing drone data—like up-to-date maps and 3D models—into tools like BIM 360, it helps create a single source of truth on your projects. For large enterprises and organizations, that's an invaluable resource to have.

3DR recently launched the first native, deep integration with Autodesk BIM 360. Here are a few key features of the integration:

Overlay up-to-date design files

Pull your CAD and PDF design files from BIM 360 into Site Scan and overlay them onto your orthomosaics, so you can compare design to reality and spot mistakes. If a design file changes in BIM 360, it will automatically update in Site Scan.

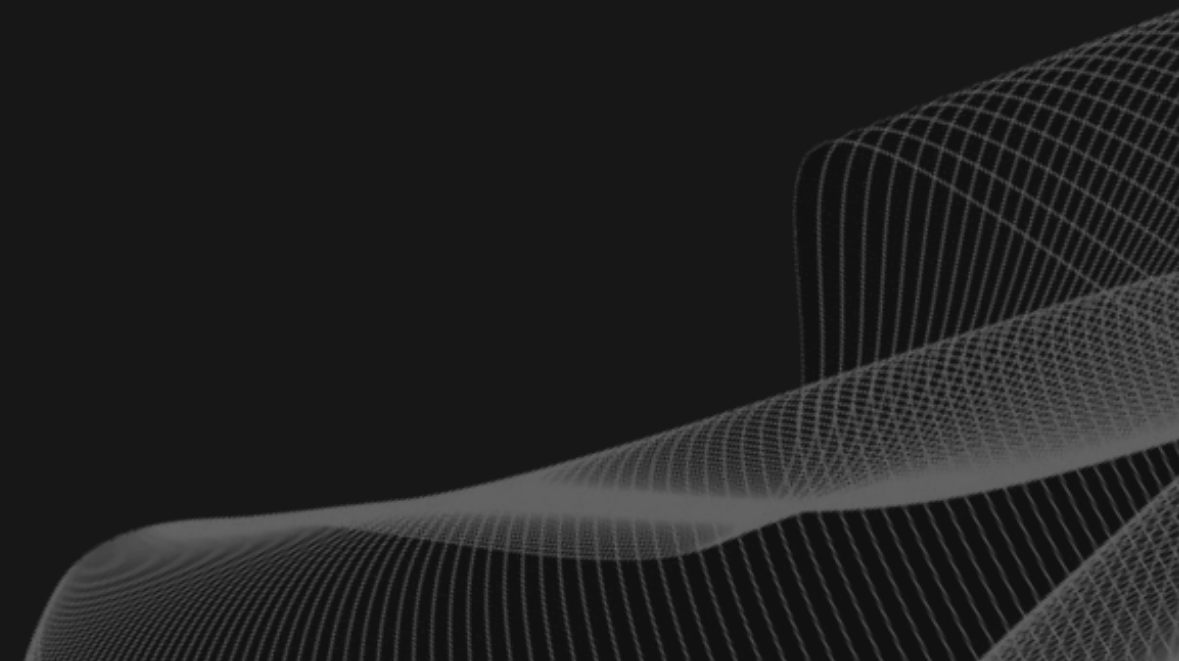
Share drone data with your team

Push your Site Scan drone data—orthomosaics, point clouds, digital elevation models, and more—into your BIM 360 account so it's easily accessible in tools like Revit, BIM 360 Glue and Field, and more.

Solve problems in the field

Spot a problem on your jobsite that needs to be fixed? Create issues directly on your orthomosaic in Site Scan and push them to BIM 360 Field, making it easy to collaborate with your field personnel and resolve issues quickly and effectively.

IV. Keep your data secure



For large, multi-stakeholder organizations like yours, the last thing you want to worry about is your drone data being in the wrong hands.

This is especially true on projects where confidentiality is key, like in government work or for high-profile clients.

That's why data security has become such an important topic in the drone industry: you want to get the benefits of collecting and sharing aerial data without worrying what might happen to it. When evaluating security in any drone solution, there are a few things to look out for:

Ownership

Who owns your data—you, or your drone company? If it's the latter, here's the truth: you have little control over what they do with it. When you're looking for a drone solution, make sure to carefully read privacy policies and master agreements so you know exactly what your drone data might be used for, and who it could be shared with.

Access

How easily can external parties see your drone data? Are there public links that anyone can share? While you initially might think more access is always better, having a 'wild west' of access will only end up causing problems for you and your business.

Cloud security

For US-based firms, it's best practice to ensure that your cloud-based drone platform is encrypted—look for an EV SSL certificate as an indication of this—and that all data and metadata is stored on US-based servers.

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Andre Tousignant
Virtual Construction Manager, PCL Construction

In this book, we've covered a few key principles you can stick to when building your own enterprise drone program. It's by no means exhaustive—there's a whole lot more to consider, and your needs will vary depending on your projects, goals, and more—but we hope this will help as you get started.

If you have questions or would like to dive deeper to discuss your own enterprise needs, we'd love to chat. Feel free to set up a call with us, which will include a web demo of Site Scan, our complete drone data platform.

If you'd like to learn more about Site Scan and see how it works, visit www.3dr.com.

Have feedback? We'd love to hear from you. Feel free to email us at hello@3dr.com.

Thanks for reading—happy flying!

3DR builds drone technology for construction and engineering professionals.

Our flagship product, Site Scan, is a complete drone to data platform for the AEC industry. It's the complete package for businesses of all sizes and includes a drone, software for the field and the office, enterprise support, and the educational resources you need to succeed.

For more information, visit 3dr.com

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