



6 Questions to Consider Before Launching a Wireless Telecom Enterprise Drone Program

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Thinking of starting your own enterprise drone program for wireless tower or telecom rooftop work? You're not alone. According to the [FAA](#), there are nearly a million UAVs registered in the U.S. and nearly 350,000 have been deployed for commercial use. The North American commercial drone market is estimated to be \$129 billion by 2025, according to [Grand View Research](#). Many Telecom enterprises are deciding to do this for four main reasons:

1

Collecting and utilizing maintenance and inspection data for asset management

2

Sales and leasing of tower and ground space

3

Pre- and post-construction inspections

4

Required TIA inspections

[PwC estimates](#) that nearly \$20 billion of the commercial drone market expansion will be tied to communication service providers. Between 2020 and 2025, [GSMA](#) reports, 80% of the \$1.1 trillion global capex investment will be on 5G networks. This investment in 5G networks will require much more data collection on both the front and back-end of construction and tower modifications to take place over the next several years.

Deploying a drone program is one way to become more efficient with the massive amount of work happening with 5G build-outs. For example, a drone program can support 5G build-outs by quickly collecting tower data regardless of resources or data constraints. You can reduce repetitive tower climbs and safety risks by integrating drone technology for mount mappings, equipment inventory, inspections as well as pre- and post-construction audits.

5G build-outs are top of mind, however, there are many more use cases for replacing a site visit or tower climb with a drone flight. Here are some examples of where our clients see safety and efficiency gains while reducing costs:

- Planning and design for tower modifications
- Available space on the tower and in the compound
- Changes on the tower and compound over time
- Pre-tower climb hazard identification
- Verification that build-out or modification was done to spec (close-out)
- Documentation for county and state government

This drone data collection benefits the entire ecosystem from tower owners to network operators to leasing companies to engineering firms, construction companies, and tower climbers who do the work.

That said, where do you start on creating your own enterprise drone program for telecom? There are some key questions you need to ask yourself. Let's dig in...

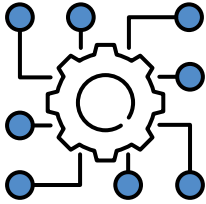
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1

Should you Build a Drone Program In-house or Outsource?

Some factors to consider when building your own drone program include the following:



RESOURCES

Just like any other business decision on “build vs. buy”, or “build vs. outsource” in this case, it’s important to consider the impact on and makeup of your resources. You essentially have two options.

Build: If you decide to build in-house, your employees must [study](#) and pass for their Remote Pilot Certificate and learn the [Part 107 guidelines](#) which apply to operators flying for commercial use. You’ll then need to ensure your team is up to date on all regulations and guidelines as time passes. If your employees are already traveling to certain sites to do work, adding a drone to their toolset can be a worthwhile investment. If flights must be completed at a certain time of the day or scheduled at an exact time, this can be done more easily with an internal team and may cost more to outsource and guarantee a flight at a certain time and date. However, if your staff rarely visits your towers or if they lack the bandwidth to take on new tasks, the business case may be made to outsource.

Outsource: If your assets to be flown are spread out, or your resources are fixed, then you may choose to outsource the flying to a DSP (Drone Service Provider). With so many licensed drone pilots and the low barrier to entry, DSPs range from one person shops to global providers. Something to look out for, though, is if the DSP you plan to utilize is the right one for the job. Ask for references, proof of insurance, proof of licensing, and a sample flight to get started. Many tower analytics software providers



CAPITAL EXPENSE

The cost of purchasing the hardware, software, accessories, and training, and additional insurance can add up.

Build: Outfitting an internal team with full drone hardware, batteries, carrying cases, and safety equipment can be expensive depending on the type of drone you choose. Typically, you should budget between \$4,000 and \$7,000 per pilot. Drone liability insurance is no longer an exotic addendum and most major providers offer drone insurance as an add-on to corporate liability policies at reasonable costs. The larger risk is putting an employee on the road to go to a location if this is not currently part of their workflow. Further, you must consider that if every one of your technicians has a drone and it’s only a small portion of their job description, your investment has little ROI as the drone equipment is sitting idle most of the time.

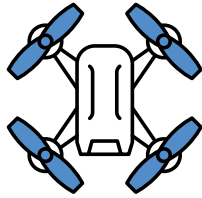
Outsource: It can be more cost-effective to outsource the work to a DSP, who will utilize their own drone hardware, be insured and has backup hardware in the case of a malfunction.

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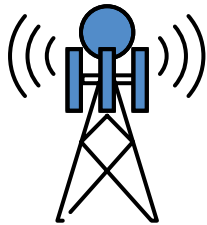
How Will You Choose the Right Drone Platform for the Job?

So let's say you intend to build your own in-house program – how do you select the right drone platform?

LEADING PLATFORMS

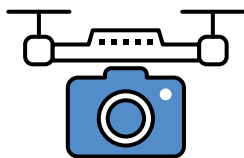


Just like Apple iOS vs. Android, there are a few different options for enterprise drone platforms. The majority of UAVs sold in the US market are made by the Chinese manufacturer [DJI](#) and leading US manufacturer [Skydio](#). Where drone platforms are manufactured can become an issue with [recent tariffs](#) and other regulations directed towards goods imported from China. Further, the [U.S. Government](#), and even some industries as a whole (e.g., electric utilities), are actively working to ban Chinese-made drones related to security concerns. But otherwise, choosing the type of manufacturer you need for the job brings other considerations into account such as autonomous flights through visual navigation or GPS capabilities.



TOWER FLIGHTS AND RF INTERFERENCE

Telecommunications towers with wireless antennas and/or microwave dishes can cause potential RF interference. This can make it imperative to pick the most recent hardware with the latest set of features no matter which drone platform you choose. Newer drones have better RF interference shielding.



CAMERA AND SHUTTER TYPE

Before you choose the drone you plan to operate, you should be aware of the type of camera the drone has and what type of shutter the camera has. Most drone cameras come with a rolling shutter, a shutter that captures parts of the full image at different points in time, but some drone cameras come with a global shutter -- a sensor that can capture all of the pixels of one image at the same time. In our experience, a global shutter is better for capturing high quality photos for towers and can produce more accurate digital twins. A rolling shutter is acceptable for mapping big areas and video filming but motion blur or blurry imagery can occur when taking photos of vertical structures like towers. Additionally, these blurry photos can fundamentally disrupt the ability to produce an accurate 3D model.

Pointivo advises clients on the best types of drone equipment to purchase and how to set up an internal platform to avoid mis-purchasing. Drone hardware is non-refundable even at big box retailers so you would have to absorb the cost of a wrong purchase.

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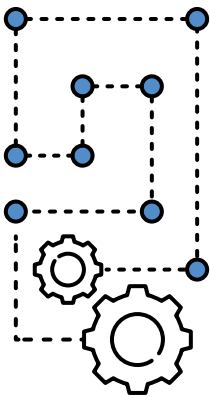
What Drone Flight Software Will You Use?

It's not only about the drone hardware platform, the flight software is an integral part of any solution.



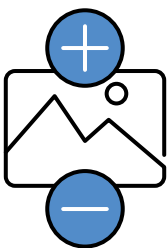
AUTOMATED FLIGHT SOFTWARE

You, of course, must have visual line of sight when flying a drone, but you should also use automated flight software which customizes the flight of a specific tower using parameters set by the pilot onsite. Automated flight software is an investment in scalability and consistency in your drone data capture while still offering customizability. On guyed towers, you'll also need to ensure you are taking into account the locations of guy wires that help hold up stand-alone structures that can exceed 2,000 feet in height. Guy wires are nearly impossible to see while you're flying a drone. This is why it's imperative to use flight software to plan your flight ahead of time so you're less likely to crash the drone into the guy wires while your eyes are more focused on the drone itself and the screen you're using to navigate the drone. While some drones feature controllers with built-in screens, most automated flight solutions will require the pilot to use a controller that allows a separate phone or tablet capable of running the specialized software to be attached.



QUANTITY OF IMAGES

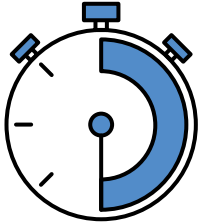
Automated flight software will save the pilot a lot of time on site by optimizing for image count. Take too many images and it's a longer flight and requires more data processing, but take too few images and you won't get the data you need. We at Pointivo have spent hundreds of hours with all the leading drone platforms to create the most efficient flight plans in order to capture the ideal number of images. On average, we capture half as many photos and save half as much time collecting the proper data than our competitors. For example, we see an average of more than 1,000 images captured in more than an hour with other providers, while we can cut both of those metrics in half without cutting the quality of output.



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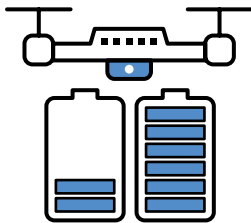
How Much Time Will You Need in the Field ?

There are several factors to consider that will have a direct impact on your capture time in the field.



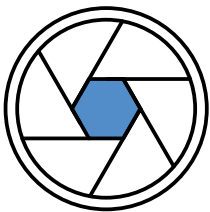
CAPTURE TIME

Some parameters that have an effect on the time spent in the field include the number of RAD centers and the height of the tower. Additional parameters include the wind, altitude, and number of flight direction changes during flight. Mapping out your flight path ahead of the job and understanding how many breaks you may need to charge batteries, is going to have a great impact on the amount of time it takes to capture all of your data.



BATTERIES

The capture time per tower and the number of tower missions per day will help you understand the number of batteries you'll need. The flight software will estimate with great accuracy the number of batteries needed per flight. In our experience, it takes, on average, no more than two batteries to fly a cell tower. However, when you take wind and the amount of photos you plan to capture into account this could increase the amount of batteries you need. A drone battery can take over an hour to charge and most drones used in this space can fly up to a maximum of 30 minutes. At Pointivo, our philosophy is to try to keep all jobs down to 1 to 2 batteries for field efficiency purposes.



IMAGES CAPTURED

The goal here is to take only as many images as you need to capture an accurate digital 3D model. The more images you take equates to longer flight time, more batteries and more time spent at the tower site.

Once you reduce the time and batteries, you can fly more towers per day. For example, Pointivo's customers have flown 8 or more towers in one day, while some of our competitors may only be able to fly a few towers in a day.

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Are You Informed on Restricted Airspace, No Drone Zones and the Rules of the Sky?



You should always research where you [can and cannot fly](#). With the new FAA Automated flight waivers, some major drone hardware will not let you fly in a restricted airspace. Examples include the White House, prisons, and other sensitive areas. There are several free and paid applications to help navigate where and when you can fly. For commercial flight, notable applications are Airmap, Aloft, and Skyward. These applications allow you to request authorization through the Low Altitude Authorization and Notification Capability ([LAANC](#)), a collaboration between the FAA and the commercial drone industry.

Note that even though Part 107 rules require flights to remain below 400 feet, [you can actually fly 400 feet above the top of most towers when inspecting them](#), but you want to make sure you're not entering controlled airspace. Do some research to see if you're required to get permission to fly in Class B, C, D or E [airspace](#), first.

All drones used in commercial flight must be registered at the FAA DroneZone. There is a \$5 Registration fee and the registration number must be visible on the drone exterior. It is also good practice to include a phone number. Drone flyaways are now quite rare, but they do happen.

6

Now That You've Collected Images, How Do You Use the Imagery and Data to Create Business Value and Justify a Drone Program?



How do you look at hundreds or thousands of drone images of an asset and cull the relevant data? Drone Imagery is far superior to a handheld camera on a tower climb because it can capture the entire asset and the data can be “tagged” with GPS Location or other relevant data. The next step is to “stitch” the images together to create a “digital twin” of the asset and provide the capability for a virtual climb or walk of the asset and compound. The digital twin and virtual walk speeds up various previously manual workflows. Data can be made available via the Cloud to all parties vs. silos of PDF documents, images, etc. Once the imagery has been processed and made available, with the right software platform, your business can realize the scale and speed combined with better imagery and data to provide better analysis and more informed business decisions. This saves time and cost which at the end of the day increases revenues for all parties. Choosing the right analytics platform is crucial.

Pointivo's [patented](#) Tower Analytics platform leverages a scalable, predictable, and repeatable solution to offer the fastest and most accurate solution in the industry. Pointivo is accurate to within 0.5 cm when measuring equipment, antennas, mount dimensions, and height above ground level (AGL) and delivers comparable accuracy for azimuth and downtilt. The Pointivo Tower Analytics platform processes thousands of towers and of assets per month and provides clients a [patented](#) Software as a Service (SaaS) platform that reduces the need for tower climbing, lowers cost, provides actionable data faster, and helps solve real business problems for clients, every day.



Conclusion

The time is now to start an in-house or outsourced drone program. Choosing the right partner is imperative to maximize the return on investment and reap the benefits of deploying drones over traditional methods. These returns include the ability to scale your business, reduce costs, and provide better and more accurate data. Working with an expert such as Pointivo can save you months of man-hours and potential costly mistakes, regardless of whether you decide to outsource or build your own in-house drone program.

Pointivo can help you determine whether you should outsource the drone data capture or develop the capability in-house. Pointivo has experience flying drones in-house and out-sourcing flights as well. Furthermore, we have worked with leading drone manufacturers and flight software companies to develop the most efficient autonomous flight tool while at the same time perfecting a way to use scale markers as targets in order to achieve a fast, reliable, and accurate method for asset data capture. In fact, it is the fastest on the market. Pointivo Tower Analytics uses rich 3D visualization, integrations with legacy databases and equipment catalogs, and engineering software features that drive more efficient wireless infrastructure initiatives, more quickly than any of our competitors.

Pointivo combines extensive drone knowledge, autonomous flight software, [broad patent protection](#), and the Pointivo Tower Analytics platform to create the best partner and solution for the tower industry.

[Contact Pointivo today](#) about launching your own enterprise drone program for telecom asset inspection.



Who We Are

Pointivo's analytics platform is built by a world-class team of AI and computer vision software experts pioneering AI-driven 3D image analytics technologies for physical asset inspection. We give companies a deeper understanding of their assets to drive revenue, operational efficiencies and cost reductions. Combining machine learning, computer vision, and advanced analytics, our customers are innovators relying on our platform and applications to deliver insights to enhance business processes for damage detection, equipment inventory, budgeting and risk mitigation.