



# Use of Drones in Telecom Industry Operations

#### Highlights

- Autonomously survey assets within minutes
- 360-degree image coverage of telecom towers
- Easy accessibility to remote towers
- Helps in making the right decisions, at the right time
- Increased staff safety

New 5G rollouts, more diverse network technologies, the emergence of new business models and other market trends require telecom companies to be more agile, more data-driven, and more focused on increasing their operational bottom lines as well as pursuing new revenue streams. As companies across industries have discovered, the best catalyst to achieve these outcomes is digital transformation. This case study highlights the use cases where drones have been used by telecom companies to take steps towards digital transformation in their operations.

**Industry** Telecom



## Introduction

Several enterprise applications, such as industrial inspections, security & surveillance, surveying & mapping, and project progress monitoring are experiencing an incredible shift from manual operations to drone-based digital operations with the emergence of fastevolving drone hardware, easing government regulations for civilian drone operations, and computer vision as an extremely powerful tool in acquiring intelligence for enterprises in every field. From agriculture and telecom to construction and oil and gas, every single enterprise can benefit from the incredible visual intelligence that can be gathered by drones in minutes, replacing labor-intensive, and unsafe data collection imprecise, processes.

Enterprises understand and are excited to experience the deep impact drones can have on their bottom line. However, some serious challenges are stopping them from integrating and scaling the adoption of drones in their operations and thus realizing their full potential.

At Asteria Aerospace, we have made it our priority to eliminate these roadblocks for enterprises to adopt drones in their everyday business processes. Central to this mission is SkyDeck - Asteria's cloud-based drone operations and aerial intelligence platform.



Success Story | Telecom Industry

## **Need for Digital Transformation in Telecom Operations**

Multiple factors are reshaping the operating environment for telecom companies and driving urgency to digitize core operations, respond faster to change, and leverage data to boost visibility, insights, and value generation. Several major trends underlie this dynamic environment:

- **5G Rollouts:** With 5G rollouts, the network architectures have evolved and has become more complex than ever, the upgrades have become frequent, and the pace at which it takes place has increased as well, thus it is important for the telecom players to have reliable real-time visibility of the quality of their network assets.
- **Market Pressure:** Telecom leaders are actively seeking various revenue sources such as renting available space on existing tower assets. To leverage the distributed nature of tower sites to make these new business models work, tower companies need to possess a view of the available space, asset quality and a continuous view of the relevant assets.
- **Bottom Line Pressure:** Telcos are looking for ways to improve the efficiency of their operations and maintenance workflows and translate the same into cost and time savings. Digitization of maintenance records, compliance records, and having an accurate assessment of site conditions for maintenance planning are essential.

• Shortage of Skilled Personnel: The traditional way of collecting data about equipment and conditions at a tower site has its own disadvantages such as injury risks, manual workflows, and potential data integrity problems, and requires skilled personnel which are in acute shortage.

For telecom tower companies, the key is to obtain a comprehensive, real-time view of what is going on at each structure. Fast access to timely, accurate tower data (for example, measurements precise enough to feed CAD applications) has a massive upside. Having a better window into onsite conditions can boost efficiency, leading to optimized maintenance schedules, for example. It can improve revenue reassurance, since realtime tower audits will disclose exactly what equipment a carrier has installed and whether that equipment should trigger contract escalators. Further, it enables companies to leverage the data to seize new business opportunities<sup>1</sup>.

The best way to gain a comprehensive, real-time view of each tower is to create a service image or digital twin — a dependable set of data points providing end-to-end visibility across tower company or telco infrastructure unit assets.



1. https://www.bcg.com/en-in/publications/2020/digital-landscape-tower-companies

# **Drones for Digital Transformation**

Drones, equipped with cameras or LIDARs, can collect high resolution, accurate, digital data thereby creating a digital twin / as-built model of a tower site. Digital data collected by drones can be processed using photogrammetry software and machine learning algorithms than can interpret the data and provide detailed information about installed equipment, and condition of the tower and surrounding site area. Utilizing drones in tower inspections can reduce the amount of time required at a site by the inspection team and enhance the level of safety of operations. The downside is that drones require skilled pilots and expensive data processing software. However, advances in autonomous mission deployment and data processing may soon rebalance the current equation with the outcome that an automated drone inspection can be carried out by any engineer with minimal training.



Drones flying orbital flight paths to capture high resolution imagery, and 3D digitization

## Use of Drones by Global Telecom Companies

This section highlights a few case studies on how drones are being used by global telecom companies as part of their digitization strategy. These sample use cases are collected from public domain knowledge and should only be considered as indicative and not exhaustive.



### Rakuten Mobile, Japan

Rakuten Mobile has fully adopted drones for site completion inspections nationwide. By using drones in completion inspections, Rakuten Mobile aims to improve the efficiency of base station construction and accelerate the expansion of its network area.

In typical completion inspections, an engineer climbs the antenna tower on which the base station is installed and visually inspects the equipment. However, these inspections raise several concerns regarding safety, the time required to carry out the inspections and personnel costs. By carrying out the work with drones, completion inspections can be conducted in a shorter amount of time, more efficiently and with a higher degree of safety. Completion inspections will be carried out to transform their tower inspections using automated drone workflows. Drones will take multi-angle photographs of the newly constructed base stations. Rakuten Mobile are also exploring into the use of drone-based inspections during natural disasters and other emergency situations as well.

### Vodafone, UK

Vodafone will be using drones to help inspect their infrastructure in hard-to-reach areas, both in rural areas and in urban centres. Initially, the inspections will be focused on tower sites which are due for upgrades. The data captured by using high-definition cameras and LIDAR mounted on drones will allow for the creation of digital twins of the tower that can be assessed by stakeholders remotely.

Such an approach has many advantages for the operator. For one thing, it is much faster and cheaper than sending out an inspection team, the lack of which will also make the process more environmentally friendly through reducing the number of visits needed. Perhaps most importantly, however, is the improved safety of the process, with engineers no longer forced to climb up towers to perform their surveys.

2. Rakuten Mobile and Rakuten AirMap to Carry Out Mobile Base Station Inspections Utilizing Drones

#### AT&T, USA

AT&T has spent more than two years exploring different ways drones can benefit their customers and help them run their network efficiently. This drone research has enabled them to begin using drones for cell tower inspections. AT&T estimates that the use of drones can eliminate up to 30% of tower climb and increase workplace safety.

Drones are used to collect imagery data to identify network updates or repairs that need to be completed on a tower before a crew is put onto the site. Drones help tower maintenance technicians plan to have the right tools before they leave the ground, whereas previously they would have to guess the tools to carry with them up the tower.

#### T-Mobile, Netherlands

T-Mobile Netherlands is one the very first European providers to use drones as a tool to inspect tower antennas. Instead of driving out with mobile elevated work platforms and cranes, T-Mobile uses small drones to fly up to the antenna masts and take pictures, videos, readings and measurements that are required for quality checks.

For T-Mobile, using drones instead of heavy machinery saves time, money and results in a low carbon footprint. During the pilot phase, T-Mobile tested drones in a soccer stadium. In the past, checking all flat panel antennas on the roof and the stadium spotlight masts would have taken nearly a week - however, with drones, the same task could be completed in just 15 minutes. And, even more importantly than the savings, they determined that using drones is a lot safer than climbing up the masts or sending a worker up on an elevated work platform. Drones help inspectors to speed up their work, remain safely on the ground and even get more measurements than they could have before.

T-Mobile are is exploring the use of drones in several ways - antenna inspection is only the beginning. Drones can be used to test the network quality over the ocean near the shore. They can also be used to verify the line of sight between masts at large-scale events to help ensure network quality.

#### Verizon, USA

Verizon has completed successful cell site inspection trials using drones, for sites that are located in remote areas and disaster-affected areas where there is limited access. The drones are capable of recording/ live streaming HD video and capturing high-resolution photographs of a cell tower. This capability provides valuable 3-D imagery which is used to determine the safe access to the site and estimate post-disaster damage to the tower site and equipment. It has several advantages over manual inspections - operators can access sites quickly to assess damage and it makes operations safe. Consultant/subject matter experts can also review the data remotely for more accurate decision making.

## The Summary

Telecom companies around the world are utilizing drones as part of their digitization strategy - to increase accuracy, transparency and collaboration in their operations. Drones can collect data to create a single view digital twin model of telecom tower assets that can be used for network optimization, revenue generation, and site inspections and maintenance.

As drone technology, sensor technology and data processing/analysis techniques increase their efficacy, the scope of utilization of drones in the telecom tower industry will keep increasing and ultimately be a key component of the digital transformation of the industry.

- Vodafone testing drones for mobile site surveillance
  Verizon Uses Different Types Of Drones for Network Performance
- 5. AT&T: How We're Using Drones to Make Cell Tower Inspections Safer 6. T-Mobile: "The Game of Drones" has just begin

<sup>2.</sup> Rakuten Mobile and Rakuten AirMap to Carry Out Mobile Base Station Inspections Utilizing Drones





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