Commercial Drone Insights from 8 Industry Experts

Developments, challenging the status quo and looking past 2019
Recent developments related to the autonomous operation of UAVs along with new solutions that challenge the status quo of the drone industry as a whole prove that the future of UAV technology is being defined in the present. Many people talk about how much opportunity will be opened up with changes to regulation and technological advances that allow drones to do things like stay in the air for longer amounts of time, but all of these long term developments are very much dependent on what happens in the space in the short term.

In order to better understand how these topics and plenty more can and are being defined in 2019 and beyond, we connected with numerous experts in the space to explore these details. Experts from across the industry laid out their insight when it comes to the impact upcoming acquisitions and partnerships might open up, whether more companies will look to “build or outsource” their drone implementations, what kind of impact we’ll see with the rise of autonomous fleets of drones, what items we’ll soon be seeing delivered via drone in the near future and much, much more.

About the Interviewer
Jeremiah Karpowicz is the Executive Editor for the Technology Group at Diversified Communications. He has created articles, videos, newsletters, ebooks and plenty more for various communities as a contributor and editor. You can read plenty more from him [here](#) or get in touch with him on Twitter: @jeremiahkarp
Featured Insight

Christopher Korody, Founder, DroneBusiness.center

Anil Nanduri, VP & GM for the Intel Drone Group

Josh Olds, President and Co-Founder, Unmanned Safety Institute

Svilen Rangelov, CEO and Co-Founder, Dronamics

Mariah Scott, President, Skyward, A Verizon Company

Michael Singer, CEO of DroneView Technologies

Ian Smith, Host, Commercial Drones FM podcast

Randall Warnas, Global sUAS Segment Leader, FLIR
Christopher Korody  
Founder, DroneBusiness.center

There is no topic that’s of bigger concern to commercial drone operators in the United States than FAA regulation. Part 107 opened a lot of doors and created countless opportunities, but questions about when the FAA will permit operations over people, at night and beyond visual line of sight (BVLOS) remain pervasive as ever. Will 2019 be the year we see these types of operations removed from the waiver process? Will a path toward doing so finally take shape?

There are few people better to explore that topic with than Christopher Korody, founder of DroneBusiness.center. His analysis of the commercial UAS business is delivered every Saturday morning via his Dronin’ On newsletter. It’s required reading for anyone who wants to understand not only how things are taking shape with FAA regulation, but what sort of an impact that will have on commercial users. As he says, he tries to connect the dots.

JEREMIAH KARPOWICZ: What sort of rules and updates should we expect to see from the FAA in 2019?

CHRISTOPHER KORODY: There are a lot of very specific things that “should” happen, but it’s really tough to say what we’ll see in 2019 because there’s also some uncertainty.

I wrote about much of that in my Great Expectations, 2019 Forecast Issue, which was a double issue because there was so much to get to. The Reauthorization is a really fat bill, and the FAA has an overwhelming number of things to do on multiple fronts – not just UAS. How resources get prioritized is a concern. Budget is a concern. As is what they prioritize to do first, second and never. As well as announced changes in management.

The transition from Administrator Huerta to Acting Administrator Elwell was pretty seamless from the outside. They maintained momentum and were “open for business” in two months, but the Acting Administrator is in a tough spot. We don’t really know what’s going to happen, except that he has withdrawn his bid for the permanent job. That’s got to impact decisions being made across the department. Who knows for how long.

We also have the transition at the sUAS level which may turn out to be a bigger deal, because Earl Lawrence spent a few years getting to know everyone, and everyone got to know him, so that’s a big loss. The good news is that the new Executive Director of UASIO, Jay Merkle, worked on LAANC so he’s definitely gotten his feet wet.

Moving from people to regulation, everything starts with getting a Remote ID rule in place. The ARC made a lot of recommendations but that’s over a year ago now. What are they going to come up with? That’s the real question because once that happens, we’ll see a domino effect across the space. Everything hangs on that. If it gets through the NPRM in 2019, we’ll have made some good progress.

It sounds like there’s a lot of uncertainty about what we will or won’t see from the FAA in 2019, which might be a bit unsettling to some commercial operators. Should that uncertainty impact business concerns around adoption in 2019?

I don’t think so. People should move forward with the understanding that 2019 is going to be another year of what I have taken to calling the “Waiver Nation.” It could easily extend into 2020, maybe 2021. The Transparency section in the Reauthorization should help a lot of people get more basic waivers approved. What’s exciting is the waivers that are being granted for extended operations. People are getting smarter about writing them to get
approval, and we'd all like to think that the FAA is getting smarter about reviewing them.

If you look at BNSF, which is a showcase of what BVLOS might look like, you can see how much equipment, manpower and money needs to go into it. I don't think most people are ready to gear up to that level, and even if the commitment and ROI is there, it takes awhile to put all of the pieces together.

Right now, you can develop SOPs and CONOPS. You can secure Part 107 waivers. All of that is essential work that people can do in the current regulatory environment.

**You’ve written a lot about standards, and have even detailed why standards will be critical to UAV adoption. What do you think we’ll see for standards in 2019?**

Thanks for the mention – that’s the first piece of mine you published! I think we’re going to see a lot of standards in 2019 from a wide variety of US and international groups. American Petroleum Institute, NATE, ANSI, ASTM, SAE, CTA and many others including government agencies like ICAO and EASA. As I have been writing for some years, I believe that many of these standards must be developed by verticals in order to capture the needs of specific types of operations.

I think that the publication and adoption of standards will create a lot of discussion. Some will provide a basis for benchmarking which is something that corporate managers are usually interested in doing.

**Beyond regulation, anything you think will dominate the headlines in an especially big way in 2019? A new industry trend or perhaps something from the IPP?**

Well, there’s CUAS and as you and I are talking, we are in the middle of the shutdown at Gatwick. What’s happening there is unprecedented – it’s being called a deliberate act, and at this point it’s like a siege. Hundreds of thousands of passengers are being disrupted and right now the entire government appears helpless to do anything about it. Just imagine if that happened here. I don’t see how this can’t amp up the pressure on the FAA and DHS – the Reauthorization has given them a lot of authority.

I’d like to think that we will start to get some insights into the IPP programs by the end of 2019. It’s a three-year program, and we should get some idea of what is working and what isn’t. I am particularly interested in how the delivery programs go, since there is a huge issue of public acceptance that will be put to the test.

What I’m really looking forward to is a continuation of something I saw at the shows this year, which is what I call professionalization. People are realizing that running an ongoing air operation that supports an enterprise, and provides valuable data on a consistent basis, is a serious undertaking. It requires a high level of attention and professionalism. The operations will up-level, and with that will come the demand for more reliable gear, better software and better security. And as much as I admire DJI, I think a lot of people would like to have more choices for any number of reasons.

The FAA Reauthorization has provided the roadmap that everyone was asking for. Now it’s about execution. It’s all good, and it’s all part of the industry maturing. Of course, the surprises will come from places that you and I don’t even have on our radars right now. Which is what makes it fun.
Regardless of the role drones did or did not play in the temporary shut down of Gatwick airport, it’s clear that security and counter-drone solutions are going to be a major theme and topic of discussion for the drone industry in 2019. However, such things need to be considered in the context of how drones can help companies do everything from increase the visibility of their assets to modernize bridge inspections. Intel has taken the lead in terms of defining what these efficiencies can look like, and these benefits are set to evolve in a big way in 2019.

To get a better understanding of what those changes could look like, we talked with Anil Nanduri, VP & GM for the Intel Drone Group. Anil has previously talked about how drones can enable automation that accelerates deployment, but that’s just one of the topics that commercial drone operators need to consider in 2019.

**JEREMIAH KARPOWICZ:** What kind of changes do you think 2019 will bring us when it comes to changes with commercial drone regulation from the FAA?

**ANIL NANDURI:** We are seeing increased collaboration within the industry and the FAA on complex flight missions that are not initially covered within Part 107. Ongoing testing and proving out of night missions, BVLOS, remote ID, UTM, command and control technologies, and obstacle avoidance technologies that are critical for carrying out automated missions in a safe way.

In 2019, we plan to see the FAA granting more waivers as part of the UAS IPP program that will enable commercial drone operators to operate UAVs more autonomously, and eventually, remotely.

**Where do you think the greatest opportunities reside for individual operators as well as large organizations that want to trigger business transformations with drones in 2019?**

The integration of hardware and software solutions (E2E) is critical for further scale and adoption as a driver for commercial drone usage across individual operators and large organizations alike. There is also a large opportunity for artificial intelligence capabilities to aid with maximizing the data that drones capture by helping to ingest and extract the intelligence from this data through analytics.

Additionally, streaming solutions and cloud-based visual and asset data management platforms will amplify the efficiencies and benefits that commercial drone technology already provides.

**What are you personally looking forward to seeing happen/develop in the commercial drone space in 2019?**

At Intel, we are excited about the prospect of seeing drones deployed in a larger way across a myriad of industries such as utilities, construction, oil & gas, and insurance to increase productivity and operational efficiencies, as well as better asset and infrastructure maintenance. Along with wider adoption, implementation of these advanced technologies that further automation of mission planning, data collection, data management, processing and analytics, will all help trigger business transformation for operators both small and large.

In 2019, we expect to see, and participate in, a continued partnership between the commercial drone industry and regulatory/policy makers. This open and collaborative relationship will advance safety in the skies so that UAS and manned aircraft can co-exist.
Josh Olds
President and Co-Founder, Unmanned Safety Institute

As a professional flight safety organization for operators, enterprises, and organizations focused on integrating and operating UAS safely for civil or commercial purposes, the Unmanned Safety Institute works around the world to delivering award-winning UAS flight safety training and drone certification programs. As part of their efforts to educate the community, USI has previously detailed essential insights around adopting drones for business and also explained what it means to be safe when flying a drone.

To explore how these topics and others will further evolve for commercial drone operators in 2019, we connected with Josh Olds, President and Co-Founder of the Unmanned Safety Institute. He’s a member of the FAA’s Unmanned Aircraft Safety Team (UAST) and is also a member of the advisory board for the Energy Drone Coalition. Josh is a FAA licensed commercial pilot and certified A&P Mechanic and has served in a variety of UAS operational roles operating and maintaining both fixed wing and rotorcraft Unmanned Aircraft Systems. This background has provided him with essential insight around what 2019 has in store for the drone industry as a whole.

JEREMIAH KARPOWICZ: How do you think the stance and approach around education and training for drones and drone operations will evolve in 2019?

JOSH OLDS: I see a significant trend in organizations moving toward standardized education and training across organizational business units, whereas the remote pilot certificate is a general requirement, but aviation-based safety based education and skill-based training are the primary requirements of remote pilots within the organization.

For many, Part 107 has opened the doors for training crews that had no prior experience in aviation or unmanned technology, so utilizing a balanced aviation-based safety education and training program has allowed employees to utilize drone technology as a tool but also as professional remote pilots in the national airspace. As waivers from Part 107 continue to increase, I see education and training that have primarily revolved around Part 107 requirements shifting to provide a better foundation for more scale and complex operations and for more complex aircraft that are driven by these programs of higher standards.

Two years ago the thought of education and training around this technology was bizarre to some as the technology and automation have taken many of the pilot operational requirements out of the loop. This being said, there has been a mindset shift that even with technology that is easy to fly, there are still judgment calls and planning decisions that need basic aviation safety practices and a currency and proficiency-based flight training program to maintain skillsets and informed aeronautical decision making. This is not very different than other industry skillset requirements.

Where do you think the greatest opportunities reside for individual operators as well as large organizations that want to trigger business transformations with drones in 2019?

The last two years of Part 107 has provided individuals and organizations an opportunity to find best use cases for VLOS technology to make current operations safer or even return efficiencies and value to the organization. As we turn the corner into 2019 there are significant opportunities that are present in the more complex operations and complex
The UAS aspect of the industry with BVLOS, aircraft greater than 55lbs, operations over people, more payload, redundant systems, etc.

To further enable these opportunities, I encourage an open dialog between the business units/departments of someone’s organization as management of the technology and opportunity requires collaboration. The most successful companies deploying unmanned technology, have teams that can coordinate and create efficiencies across departments (i.e. Information Technology, Flight Department, Compliance/Risk Management, Environmental Health and Safety, Operations, etc.).

**What are you personally looking forward to seeing happen/develop in the commercial drone space in 2019?**

The greatest opportunities for unmanned technology are stifled by lack of knowledge of the technology, time-honored aviation safety practices, and maintenance solutions ensuring airworthiness of aircraft systems. Opportunities turn into successful endeavors when the right foundational programs support the framework for success. As exciting as the technology is and the opportunities that are present, the seriousness of the endeavor of incorporating unmanned aircraft into a business and the national airspace requires organizational standards, structure, processes and procedures as VLOS operations are just the beginning.

To trigger business transformations for incredible opportunity and more so success in those opportunities, I am personally looking forward to seeing organizations establish and adopt foundations from which technology and aviation merge for a modern aviation solution.

**What’s going to be a bigger topic in 2019: the autonomous capabilities of drones, data security or counter-drone technology?**

Counter-Drone technology is going to play a large role in 2019. It is hard to ignore the situation at Gatwick as this has been a concern since the earlier portion of this decade for airports and large event venues.
Svilen Rangelov
CEO and co-founder of Dronamics

It’s been over five years since Amazon CEO Jeff Bezos showcased “octocopter” delivery drones, and said they’d be operational in five years’ time, delivering packages in various countries. While the company has made some progress with commercial drone delivery, regulators and operators across the world still have a great deal of work to do in order to truly unlock the potential of these applications.

Svilen Rangelov, CEO and co-founder of Dronamics, believes that 2019 will be a year when we see significant process in the expectations and regulations that currently exist for drones across the world. He believes customers of e-commerce platforms will expect faster, free-of-charge delivery of their goods worldwide and that while trade tensions internationally will slow the pace of growth of airfreight, overall 2019 will see more cargo flown than 2018. Most critically though, he believes more countries and governments from all over the planet will be open to trialing and potentially adopting UAV technology as a solution to numerous challenges related to everything from logistics to cost.

We talked with Svilen to further explore these predictions and discover more about what he sees taking place across the UAV market landscape for 2019.

JEREMIAH KARPOWICZ: How will upcoming regulation in Europe impact how countries and governments across the continent enable the technology? How will these potential changes impact the collaboration between UAV developers & manufacturers, regulators, airlines and logistic companies?

SVILEN RANGELOV: On a technical level, the upcoming regulation in Europe will formalize the shift from a weight-based approach to a risk- and performance-based one, with the regulatory framework that EASA has already shown. The regulatory framework serves as a good indication of what the actual regulation adopted by the European Commission will include. In other words, the regulations would acknowledge that a drone flying over, say, a large crowd in a city, should be treated differently than the same drone over a farm field, which is much more in line with what the industry believes to be appropriate than the previous, weight-based rules that some national regulators defaulted to, and still do.

Keep in mind that reliability adds weight to any system, and so weight could be a friend to safety if used properly. To focus only on kinetic energy means to automatically believe that all systems are equally hopeless, and even if one was to assume that this was true at some point in the beginning of the drone revolution, you have some manufacturers and developers going to great lengths to produce very reliable systems now, even in the consumer space. To their credit, EASA had this shift in their proposals years ago. However, the legislative process in the EU takes quite a long time, so I’m sure both EASA and the industry will be very happy to see this on the books at last.

After all, on a business level, uncertainty is worse than restrictiveness, and despite the proposals serving as good indications, it’s another thing when proposals become law. Once the law is clear, that’s when investment can happen on a meaningful scale. Also, collaboration between different stakeholders can truly begin. Until now, partnering across industry was difficult because uncertainty meant different players could have different perceptions of regulatory risk. Now that we’re going to have those regulations formalized, businesses can formulate much clearer paths and roadmaps to collaboration, and the B2B sector can really pick up.
You mentioned that trade tensions internationally will slow the pace of growth of airfreight, but that we’ll see more cargo flown in 2019 than 2018. Will this be more due to consumer demand, economic opportunities, changes to the technology, or something else?

This will be due to consumer demand that does and will continue to grow, albeit more cautiously. There are a lot of talks about an upcoming big shock or a hard reset. However, unlike the previous downturn, where the culprit was well anticipated—the housing market—when people picked a side on a single two-sided bet, now the potential culprits are quite a few, trade tensions being just one. This means the bets one must make to hedge their current positions are more distributed. Ironically, this brings more diversification, but it also means that correcting their position would take more time and instead of one big off-a-cliff shock there may be several, smaller ones. Consumers, accordingly, will keep looking for the other shoe to drop, and the next one, and the next one, so the slowdown will be ... slowed down. Lastly, because the trade war is a big part of the worry, multinationals’ natural response is reconfiguring supply chains, which means more business for the fastest mode of transport, as companies look to keep production and delivery commitments on schedule while this shift is happening.

Will regulation or economic realities be a bigger factor in the effort to utilize drones to democratize airfreight and lower the cost of shipping?

We’ve often said that shipping costs act like a tax that disproportionately punishes those that live or produce outside of the main centers of commerce. It simply requires energy to move atoms, and unlike digital goods, moving physical goods will always cost something, so our mission has always been to reduce this something to as little as possible. We’ve proven that the technology is here, so it is only up to the regulations to let technology respond to economic realities.

Consider this: for the billions of people around the world living in cities, all their needs can be met within the same day. For the other half, time moves a lot more slowly and trade is a lot more costly. An entrepreneur from a small town or a village can only sell to her fellow villagers, and if she is to sell her product to the big city, she must offer a lower price to accommodate the cost of shipping the goods in order to keep the retail price the same as her competitors from the city. Shipping, as a hidden tax on anything that comes in and out, contributes greatly to the increasing rural exodus resulting in a great strain on urban infrastructure. We have the opportunity to alleviate this by providing economic opportunity in remote and rural areas. It is only up to regulators to allow that to happen, to allow the other half of the world to get closer to enjoying the same benefits of urban life without actually living in an urban center.

What sort of items do you think we’ll newly see being delivered via drone in 2019?

If we’re talking about small delivery drones, I do hope that in 2019 we’ll finally see goods start being delivered via drone not just as a marketing stunt, and not as a money-losing fake-it-till-you-make-it demonstrator. However, I honestly doubt it, and the reason is simple: the reliability vs cost trade-off of small drones is still years away from making them both safe and economically viable. Tests by some of the largest manufacturers in the world show that to meet a 10-7 reliability level and transport 1.5 kg with a multirotor, you need a 20kg+ system AND throw away your batteries after 1.5 hours of operation. Numbers like these completely ruin the economics for drone delivery and the industry needs some serious breakthroughs to advance through that. This is why we continue to believe that larger systems will have an easier time getting commercialized because they can accommodate more redundancies and additional systems to ensure reliability. As for the goods, we believe e-commerce, pharma, perishables and humanitarian cargo have the most to benefit from unmanned deliveries.
What are you personally looking forward to seeing happen/develop in the commercial drone space in 2019?

We anticipate a lot of progress being made on the regulatory front in 2019, and this is the part we are looking forward to the most. When the Chicago Convention was signed in 1944, aviation had already existed for decades, so a lot of credit goes to regulators around the world who have been proactive in understanding how drones are a mix of old and new considerations in just a few short years. With the EU and others formalizing their rules and serving as guides to the rest, we anticipate 2019 will greatly accelerate the industry in clarifying both technical requirements and paths to adoption and integration into the airspace, and we couldn’t be more excited about that.
Mariah Scott  
President at Skyward, A Verizon company

2018 proved to be a big year for the commercial drone industry as a whole, as it saw the launch of the UAS Integration Pilot Program (IPP) from the FAA, new products like the Phantom 4 RTK from DJI and major developments for a new European regulatory framework for drones, but those are just a few of the highlights. They’re part of the reason that 2019 is set to be even bigger for the industry, as major developments with regulation, fleet management and numerous other topics have been predicted to come together in a big way 2019.

To get a better specific sense of what 2019 has in store for the commercial drone industry, we connected with Mariah Scott, President at Skyward, A Verizon company. Under her leadership, Skyward has helped enterprises realize the enormous potential of drones, which has given her incredible insight around what 2019 has in store for organizations looking to adopt the technology as well as the drone industry as a whole.

Jeremiah Karpowicz: There are lots of “big picture” market predictions out there in terms of the potential value of drone technology, but what do you think we’ll see in 2019 when it comes to connected fleets of autonomous vehicles?

Mariah Scott: 2019 will be the year of the autonomous drone. What will that look like? We’ll see private companies and public agencies dispatch autonomous drones together with existing networked fleets of ground and aerial vehicles for data-gathering and yes, delivery. Operators will be able to fly a drone from anywhere in the world with network-connected ground control stations (GCS), and data will be transmitted back via a network-connected GCS or even a connected drone.

We’ll see public agencies use connected fleets of ambulances, fire trucks, helicopters, and drones for natural disaster response, unfolding emergencies, and search-and-detect applications. We’ll see drones integrated into smart cities as an essential part of the infrastructure for inspections, asset management, data services, delivery, and more.

Private companies will integrate cargo planes, freight trucks, and drones for incredibly efficient delivery. We’ll come to expect that news organizations will provide live coverage of emerging events with both drones and ground cameras. And the fact that they do this will no longer be newsworthy.

These integrated networks will be managed and delivered by public agencies and companies rather than rolled out on a nationwide level, but they’ll serve as smaller scale proofs-of-concept for the grand vision—a global system of safe, connected, efficient, autonomous drones. We’ll also see regulatory and technological innovations that will bring us closer to that goal.

Part 107 has opened up tremendous opportunities for operations and organizations of all types, but regulation is still the number one issue that people ask about. Given Skyward’s ability to provide commercial drone pilots with instant access to controlled airspace using the new Low Altitude Authorization and Notification Capability (LAANC), what can you tell us developments we might see for remote IDs & waiver integration with LAANC in 2019?

The phrase “regulatory innovation” doesn’t tend to elicit excitement—but when it comes to drones, new regulations have catalyzed market growth and spurred innovation. Just look at Part 107 and LAANC, two regulatory advancements that drastically increased drone...
adoption and expanded use cases throughout the United States. This year, the FAA will enact regulations that will bring us closer to a unified, connected, global system of manned and unmanned vehicles.

For 2019, I predict that the FAA will implement a requirement for remote identification for all drones, recreational and commercial, flying in the U.S. This is a foundational element of the bigger, more audacious universal traffic management (UTM) project that will enable the most interesting and life-changing drone use cases, from package delivery to aerial taxi services. In order to manage air traffic, pilots, operators, and regulators have to know precisely which vehicles are in the air at any given time. Implementing remote ID will mark a moment when UTM moves out of R&D and becomes something that is actually happening. Globally, we’ll see the foundation of a global registry of pilot registration and identification that, like remote ID, will be another foundational element of a global UTM network.

Closer to home, we’ll see the FAA integrate Part 107 waivers with LAANC access. This development in particular would be great news for Skyward customers. Today, if a company has a daylight waiver that allows them to fly at night, it cannot be used in conjunction with LAANC access. A company can choose to fly either at night or in controlled airspace, not both—even if they have proven equivalent levels of safety. Now would be an ideal time for the FAA to enable LAANC-waiver integration for qualifying operators.

Lastly, the question of “build or outsource” is one of the bigger topics of discussion when it comes to how an enterprise wants to leverage drone technology. Any predictions around whether or not we’ll see larger companies bring drone programs in-house in 2019?

I predict that we’ll see a groundswell of companies bringing drone programs in-house. We’ve seen companies begin to move away from third-party aerial service providers over the past two years as companies have seen how easy it is to adopt drone technology, train pilots, and achieve ROI. At Skyward, we recently commissioned the first double-blind study of drone use among medium and large U.S. companies through an independent research firm. The study found that 88% of these companies see ROI from drones in a year or less. That’s significant, especially among earlier adopters, and we can expect many more large companies to follow suit. The study also found that only 20% of companies are outsourcing flight services.

In 2019, we’ll see more consolidation among both flight services providers and the startups that have primarily served those providers. These include data processing platforms, asset management software, and even aircraft manufacturers.

Recommendation: Pay attention to your software providers and other vendors. If they are startups that primarily serve small companies or other startups, it’s likely we’ll see them try to shift focus in the coming 12 months.
Michael Singer
CEO of DroneView Technologies

2018 saw more and more companies realize that there often isn’t an “either/or” answer when it comes to building a drone program or outsourcing UAV services, and that challenges related to adoption and integration often have little to do with the drone technology itself. These are issues that Michael Singer, CEO of DroneView Technologies, has seen evolve firsthand.

As the leader of a company that specializes in aerial mapping and geospatial services, Michael has witnessed a transformation around the understanding that companies have when it comes to the real benefits of drone technology. That understanding has influenced how more companies in a variety of industries will adopt the technology in 2019 and beyond.

**JEREMIAH KARPOWICZ:** DroneView Technologies works with enterprise customers throughout the United States to collect, process and extract real value out of aerial data. What can you say about how the way in which you’ve been able to work with those companies in 2018, and how you think that will evolve or change in 2019?

**MICHAEL SINGER:** I can certainly say that we’re seeing increased sophistication and a better understanding of the capabilities and benefits of drones in our clients. As an example of that, not too long ago, certain clients might wait for leaf-off conditions in the fall or early spring to gather aerial image data from manned aircraft. Today, they have come to understand that they can do the same project throughout the year with a drone using a LIDAR sensor that they weren’t able to do in the past with image-based photogrammetry. We’re using LIDAR sensors on drones with far greater frequency than ever before especially on sites with vegetated areas to do this kind of work for our clients.

The approaches for gathering data are changing as well, and I expect that to continue in 2019. We have seen increased drone adoption for precision mapping projects, in many cases supplementing or replacing traditional field survey methods. For some clients, especially those with frequent mapping or stockpile volume project needs, we have trained them to do some of the image and ground control acquisition work with their own equipment and resources. We continue to do all of their image processing, post-processing and final mapping for them.

We call that our “hybrid solution”, and it’s the best of both worlds approach for some clients. We often provide initial training on the right method for ground control placement and optimizing drone flight settings to achieve the desired result. More and more companies are realizing that even if they do want to set up their own program, they need this kind of training.

**What can you say about how this better understanding of the value drones can provide came about? Do you see that further evolving in 2019?**

You have to remember, success with this technology requires moving large image files, incorporating survey methods and ground control, processing those files on relatively robust workstations and then doing some manual post processing to ultimately drive accuracy and consistency in someone’s mapping solution. This better understanding ultimately came from many companies realizing that while they are capable of some of those components, they’re not as well suited for others. That creates the opportunity for a symbiotic relationship with us, and some clients are seeing the benefits of this kind of relationship.
As a specific example of that, many organizations in the civil engineering world have come to us to figure out how we can help them, because they’ve realized the countless nuances that need to be considered to achieve consistency and reliability of result. It takes a skill and expertise that usually requires someone to be doing a specific task on a regular basis. They’re not dealing with a handful of details, but instead with hundreds of them. More and more organizations are realizing that, and coming to us to ask about the kind of training we can provide which can include where to put targets, how to use them, how to check the accuracy, etc.

Do you think that mentality around hybrid solutions and realizing adoption doesn’t have to be about either setting up a program or totally outsourcing UAV services will extend across the drone industry?

It certainly goes beyond the industries we’re focused on, but you have to remember that the “drone industry” is really several industries all under the same umbrella which all have discreet skillsets and requirements. The skills required to do aerial mapping with survey grade precision are dramatically different than what’s required in public safety/first responders or for insurance inspections. Exactly what a hybrid solution looks like for us will be different from what it looks like for someone who’s focused on other vertical markets.

That said, yes, I certainly think you’ll see more of these hybrid solutions across disciplines. A better understanding that service providers should really have a discreet subject matter expertise is driving some of that. Don’t try to be all things to every industry. The concept of, “flying a drone is my new career and path to getting rich,” is becoming less and less prominent. With better specialization, we’ll see hybrid solutions that provide definitive value in totally new ways.

What are you most looking forward to in 2019?

We’re excited to take the next step with our clients and projects. With increased complexity, and with a greater trust of our professional guidance, we’re going to be able to use this technology in ways that are both innovative and powerful to bring even more value to our clients and the marketplace. There’s a discrete set of skills and expertise that’s required to bring value to any marketplace, and I think we’re going to be able to take that to a whole new level in 2019 because the foundation we’re building and expanding on is stronger than ever.
Ian Smith
Host, Commercial Drones FM podcast

Over the course of 2018, Commercial Drones FM podcast host Ian Smith connected with countless thought leaders from across the drone space to explore where and how the technology is making a difference. The insights he discussed with Adi Singh from Ford, Greg Agvent from CNN and George Mathew from Kespry were especially notable, but his “Too Hot For Snot” episode is probably the best example of what it can mean to use drone technology in a way that is innovative as it is influential.

How that innovation and influence will further play out in the drone space in 2019 is a topic that many are curious about, especially with so much uncertainty regarding everything from regulation to exactly how drone adoption can impact the bottom line for a company. The conversations Ian has had throughout the year made him the perfect source to explore what’s in store for individuals and organizations with drone technology in 2019.

JEREMIAH KARPOWICZ: You’re seen firsthand how drones are making an impact in the construction industry, and we’ve seen companies quantify the value the technology represents. Do you think that will lead to an exponential growth of drones in this sector?

IAN SMITH: Growth of the technology in any sector is ultimately about where things are and where they’re headed with FAA regulation. Unfortunately, I don’t think we’re going to see any major regulatory milestones from the FAA in 2019. That’s going to put a bit of a damper on the growth of the whole industry, but it won’t be as big of a deal in construction.

In construction, they don’t really need BVLOS regulations, they don’t really need to operate at night, and they don’t really need flight over people regulations because everyone on the construction site is actively aware and involved with what’s happening. They can already get waivers if they need to operate in restricted airspace, so the growth in this sector isn’t as dependent on what’s going on with the FAA as it is in other space.

The challenge that construction professionals are going to be working through with drones in 2019 relates to scale. Right now, each drone flight needs a pilot, and there’s only a finite amount of people that will be able to operate these drones, because you can’t train everyone in your organization to get Part 107 certified. Being able to scale the technology out to where organizations can cost-effectively use drones before they become this huge logistical issue will be a bigger issue than regulation, but regulation is ultimately what enables the exponential growth you’re talking about.

Without regulations that will help enable that, it’s going to be tough in 2019 to see a ton of growth. 2018 and 2019 I think will ultimately be about incremental growth, rather than exponential growth.

And will that incremental growth be enabled or in some cases strengthened by acquisitions and partnerships that will happen in 2019?

2019 will absolutely bring more of the incumbent software companies into the construction ecosystem, and that’s something we’ve already seen.

For example, PlanGrid is a cloud-based software construction company that wants to totally digitize the construction site. They use drones to capture and collect a lot of their data and augment their products, and Autodesk recently purchased them. That’s a big deal because it means drones are going to be that much more of an integrated product in the Autodesk ecosystem, which is huge. Tellingly, it’s not something that came out of nowhere, because Autodesk has been pushing the limits of drones for the past five years.
We’ll see more of that type of consolidation in 2019 so that drones can permeate throughout some core products to get to even larger organizations. Bigger companies like Autodesk will get sucked deeper into the space thanks to these integrations.

**What kind of innovations and developments are you looking forward to seeing in 2019?**

There are a few things I’m keeping my eye on.

As excited as I am about passenger drones and flying taxis, it’s too early to really focus on that, in the U.S. at least. Maybe we’ll see something for that in a place like Dubai in 2019, but it’s not going to happen here. I think that’s the future though, but it all depends on Remote ID, regulation, and being able to scale. It’s not going to do anyone any good if it’s just one random route in one city.

What excites me for 2019 is what’s going to happen with a few companies that can really challenge the status quo of the drone industry. There are two companies that I think have the greatest potential to do something really cool, and one of them is Skydio. They’ve opened up an SDK for their commercial operations of their platform, and while regulation is going to limit what you can really do there, companies can use that full autonomy could be used for something like flights in tight spaces. There are a lot of other potential uses that could be developed.

The other company that has that potential is Impossible Aerospace. They’ve essentially created a flying battery, and that means their drone is able to stay up in the air much longer than operators are used to. Technology like that, if they can get some traction with actual use cases, is going to be a really great thing for the industry that will help solve some unique challenges and create some innovative use cases.

I’m also excited about Delair. Full disclosure, I’m a former Delair employee, but they continue to keep their head down and make really nice strides forward on the fixed-wing side. They keep getting investment, making acquisitions, pushing their products and expanding their reach in a way that makes a lot of sense.

And of course, I’ll be looking at what’s next for DJI, but that’s a little bit different because when I said I wanted to see those companies challenge the status quo of the drone industry, what I really meant is challenge DJI. They’re still making moves and expanding into other product lines, but we really need to see some more successful drone companies to spice of the drone industry. Colin Snows reported a 74% global market share in sales across all price points for DJI in 2018, and I think that’s stagnating an important part of the ecosystem.

So I’m looking forward to what we’ll see from them, and what we’ll see in response to them.

**Beyond regulation, what topic do you think is going to dominate the headlines in 2019?**

There’s a lot of uncertainty around UTM and privacy, and the biggest thing is Remote ID. No one can agree on a specific standard for how that should be handled, and I think that’s such a fundamental thing. I’m hoping to see some real progress toward UTM and Remote ID toward the end of 2019. I really believe that once that’s taken care of, then a lot of things will start to fall into place.

What might not dominate the headlines but will nonetheless be incredibly important is the further maturation of the industry that we’ll see in 2019 which takes us further from the hype. The hype got people interested in drones, but now we’ve got case studies out there in terms of how drones are enabling an ROI and being thought of as a tool. A lot more people have come to realize that this stuff doesn’t have to be exciting, it just has to be useful.

I can’t tell you the last time I got excited about using a hammer, but it’s still an incredibly useful tool. We’re getting people to think in the same way about drones, and that’s probably more important than any headline you’re going to see in 2019.
Randall Warnas
Global sUAS Segment Leader, FLIR

The advantages and opportunities that thermal imagery provides are incredible to consider, especially since that information can be gathered so quickly and easily via a drone. We’ve explored what kind of value can be created with the combination of thermal and multispectral imagery in one drone flight, and that thermal piece is being enabled by FLIR Systems technology. Their innovative sensing solutions have essentially created a sixth sense for users that continue to change expectations for a variety of commercial applications.

Randall Warnas is the Global sUAS Segment Leader at FLIR, whose insights and knowledge are on regular display at FLIR DELTA, a drone education lab for thermal applications. His experiences with drone and thermal technologies have provided him with an incredible perspective around how entire industries will be further changed by thermal capabilities in 2019, and what kind of impact that will enable for the drone industry as a whole.

JEREMIAH KARPOWICZ: With the announcement of the DJI Mavic 2 Enterprise Dual, it seems like we’re already seeing the type of solutions that will make the adoption of thermal technology even easier in 2019. Do you think these sorts of integrations are going to be an even bigger story in 2019 than thermal technology itself?

RANDALL WARNAS: They’ll certainly be critically important, and that’s mostly because you have to remember that thermal is a 40-year-old technology that to most people, it’s science fiction. The biggest changes we’re making are around ease of access to get this technology into more people’s hands than ever before. Integrations like you’re seeing with the Mavic 2 Enterprise Dual as well as ones we’ve created in the past like the DJI Zenmuse XT2 are all about making things simpler and easier on user interface side. We want to encourage more people to give it a go.

Part of that is also about these products being that much more affordable and capable than ever before. A few years ago, you had to have a much larger budget to get involved in the technology. Prices have come down in a major way since then, especially with the Lepton, which is what is in our FLIR ONE mobile accessory.

We’re also now starting to use our VGA Boson camera core, which is smaller than the predecessor Tau 2 for various reasons including that the thermal sensor pixel is smaller. So as we create new products based around the Boson, we’re going to reduce power input, size and weight which all have a dramatic effect on flight capacity. That’s going to enable these products to be more easily integrated into a variety of different aerial platforms. Versatility is really where we’re seeing our biggest opportunities in 2019.

What sort of impact do you expect that versatility will enable in for operators when it comes to especially creative approaches with the technology in 2019?

Thermal imaging technology is not something people are interacting with on a regular basis, but once someone sees what it can add to drone applications in the workplace, there’s a lot of enlightenment that happens. When you’re able to see heat you can think about a given task or requirement in a whole new way. We see creative applications all the time, many of which have been enabled thanks to someone getting their hands on our product.

I know there’s a group in the Czech Republic that’s using our products to look for problems with their underground heating mechanisms which run under the roads to keep ice from forming on streets. They’re charged with inspecting the entire infrastructure of these systems, and they couldn’t have easily done that without our thermal sensors. That’s just
one example, but when you see how compelling this imagery is, it really gets people thinking. From there, all it takes is a “maybe I should try this” idea to literally change the way they’re going to do things going forward.

You work with a number of public safety officials, including fire departments and police officers. I’ve heard that their biggest challenge with the adoption of drone technology is around the public perception of their use of the technology, so I’m wondering if you’ve seen that change or think it will further evolve in 2019.

I have seen that change, and much of it is due to one of the greatest shifts we’ve seen within the drone industry as a whole. It’s taken some time, but we now, finally, have large enterprises and public safety entities being vocal about how they’re using the technology.

Drone technology has had the reputation of being a bit taboo, and there was often a serious caution around how an enterprise or department would promote what they were doing. I think we’re rounding that corner, and people really want to take credit for the incredible things they’re doing with this technology. I think we’ll see more of the people that have been using thermal imaging drones out there in 2019 talking about the efficiencies they’re creating and the safety savings they’re seeing. The fear of competition or public pushback is becoming less and less.

That’s really important, because we’re all waiting for the industry to get some validation to the point that it’s a no-brainer and we aren’t fighting the same battles with the FAA or public opinion. That willingness to showcase what adoption looks like is in part driven by the versatility and power of the integrations we talked about earlier, and that’s why I think 2019 is going to be a year of finding out who is really here to stay in this industry.

2018 obviously provided us with a few examples of companies who aren’t in this industry to stay, with Airware being the biggest one. That has and still does cause some people to be nervous about where this industry is headed, but do you think the further consolidations we’ll undoubtedly see in 2019 should be a cause for concern?

When the news about Airware came out there were a lot of people that put on their panic hat and figured there must be others as well, but that’s really not what we should be focused on. Yes, there will be winners and losers in this space, but those that are willing to collaborate and open their doors to possibilities are going to stick around.

For those that truly have something to offer to the industry, sticking it out is going to be worth it, and we haven’t hit even the tip of the iceberg on this. It’s still early days, and I’m hoping that the changes in public perception and examples of where this technology is already making a difference will help move things along in a big way in 2019. Shakes up and shakeout are going to happen, but our focus should be on encouraging positive changes to FAA regulation as well as getting everyone on the same page so we can work together to collaborate and use drones responsibly.

Lastly, any hints you can offer about upcoming guests on or developments in 2019 on FLIR DELTA?

We’re hoping to attract different leaders within the drone industry to talk about their personal journeys and their interests. The goal there is really to just build a community around drone stakeholders, regardless of whether they’re working with thermal industry or not, or whether they’re on the consumer side or the industrial side. We want to bring everyone into a single place where we can talk about this technology and how these spaces are changing, because there are so many lessons to be learned about taking risks, managing risks, effectively collaborating and how you interact with an industry.

Specifically, we’re set to have multiple conversations with our partners from MicaSense and SlantRange on the multi-spectral side, but also with DJI, Yuneec and Intel on the airframe side. We’re also going to be talking with high-end users from LAFD, NYPD and a few other entities that are using the technology at a high level.
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