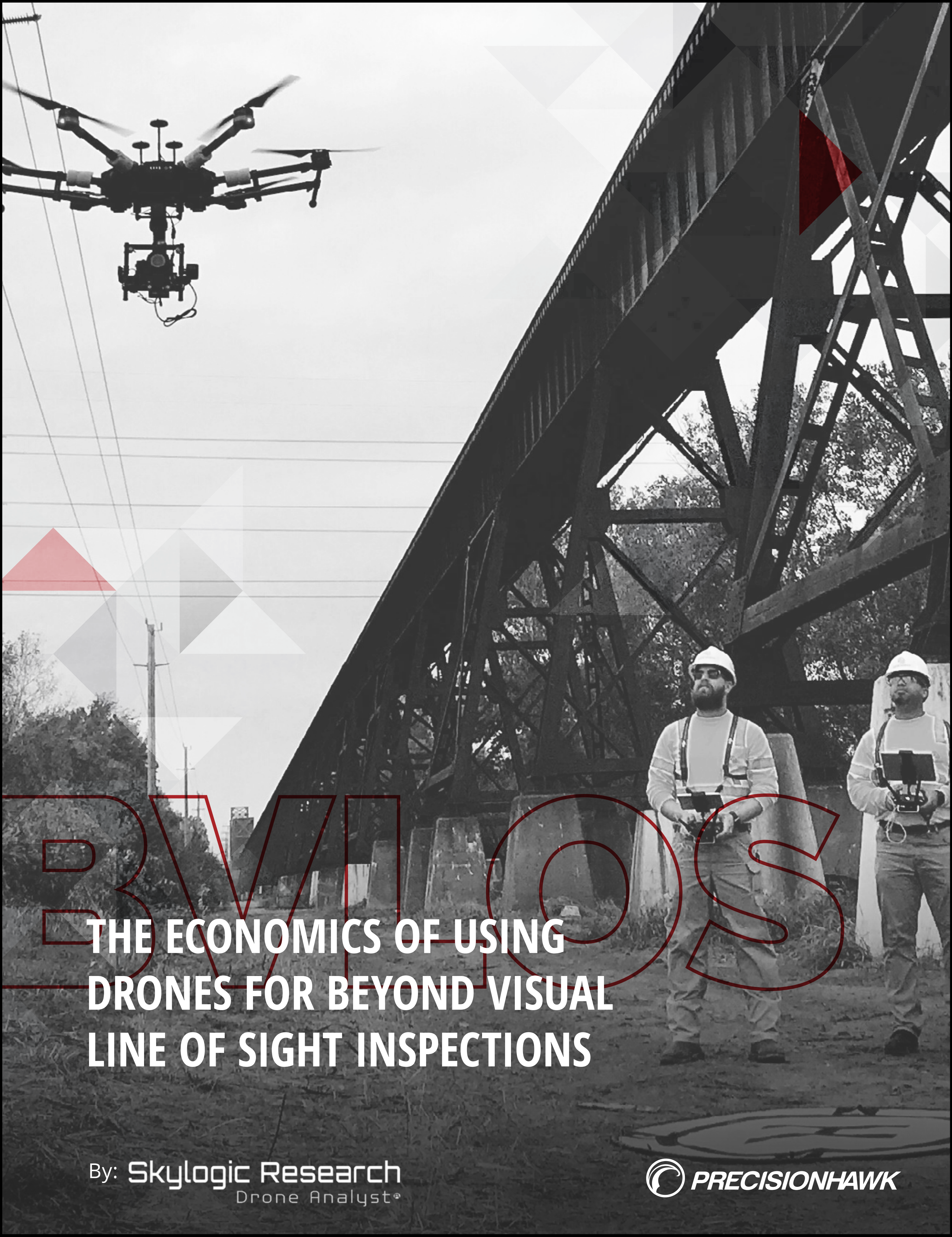

THE ECONOMICS OF USING DRONES FOR BEYOND VISUAL LINE OF SIGHT INSPECTIONS

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Drone Analyst®

PRECISIONHAWK

Contents

The foundation of an effective drone strategy is knowing when to use traditional, VLOS, and BVLOS inspection approaches

Economics-based inspection strategy

The promises of beyond visual line of sight (BVLOS) drone inspection have been tempting practitioners since the FAA first authorized BVLOS flight at BP's Prudhoe Bay Alaska operation in 2014. Since then, the technology to support it has been further developed, but in most countries BVLOS flight is either not permitted or highly restricted. In the U.S. alone, **thousands have applied for an FAA waiver to fly BVLOS operations**, but according to AUVSI's October 2018 summary, **only 23 have been approved.**

As the commercial drone industry continues to evolve, widespread BVLOS drone inspection has the potential to significantly change business models for oil and gas, utilities, insurance, and other industries. Representatives we spoke with in those industries point to four main drivers motivating them to explore BVLOS operations.

1 SAFETY

2 COSTS

3 DATA QUALITY AND CONSISTENCY

4 TIME TO VALUE

> *In the U.S. alone, thousands have applied for an FAA waiver to fly BVLOS operations…only 23 have been approved.*

Safety, as in preventing fatal helicopter crashes or accidents from having to manually climb towers to take readings;

Costs, or reducing dependence on a $1,500-per-rotor-hour helicopter and personnel and even cutting the time and expense of the multiple flights needed in flying drones within visual line of sight (VLOS);

Data inconsistency and lack of quality, since manual data collection sometimes involves photos taken from a helicopter traveling at speed and at different heights for each flight—which leads to inconsistency—or hand-written notes taken while visually inspecting with binoculars—which leads to imprecise or poor quality data;

Time to value, meaning that BVLOS flight can cover a wide area and collect high-quality data much more quickly than traditional means, so, for example, insurance claims of total loss can be indemnified faster.

HOW DRONE INSPECTIONS OPERATE

Knowing the detail helps you understand the economics of using drones for inspections

Most drones used for inspections today are multirotor aircraft and are equipped with GPS-augmented flight controllers. The advantage of multirotors (like quadcopters) is that **they can vertically take off and land, hover, and maneuver with agility,** which makes them well suited to applications like facility inspections.

DEPLOYING DRONES OVER THE PERMIAN BASIN

Inspecting electric towers, well pads, wind turbines, and other infrastructures requires maneuvering in tight spaces and maintaining a visual on a single target for extended periods of time.

While drones are typically piloted from the ground by a human with a radio controller, many are also capable of autonomous flight along a precisely programmed (and consistently repeatable) flight plan. **This makes the data they collect more consistent** in terms of height and flight path than what's possible from a helicopter. And their ability to fly closer to infrastructure than a helicopter means the information they capture is more precise and higher resolution.

The best way to enable an effective drone strategy is to understand the economics of operating them. This is especially true as the technology advances. After all, when you know how much BVLOS operations cost and what you're able to gain from them, and how those costs and benefits compare with both VLOS as well as traditional operations, **you can plan an inspection strategy that delivers the most value for the money.**

> *The best way to enable an effective drone strategy is to understand the economics of operating them.*

IN THIS WHITE PAPER, WE'LL EXAMINE THREE DIFFERENT USE CASES FOR HOW BVLOS ECONOMICS COMPARE WITH VLOS AND TRADITIONAL METHODS.

What you'll learn might have implications for your own drone strategy. Every business is different, so your mileage may vary, but we hope to convey an approach to evaluating the economics of BVLOS operations that applies to a range of applications in various industries.

Multirotors can deploy a variety of sensor payloads, including RGB cameras, infrared cameras, and LiDAR units. These payloads can livestream images, videos, or data to operators on the ground or save them as high-resolution files onboard for later download. **These high-resolution files contain a wealth of information** about the state of visible and invisible phenomena.

Managers and asset owners can process downloaded files, create digital replications (aka digital twins), and manipulate the data to perform an ever-increasing number of analyses, including:

- Positions and surface measurements
- Linear measurement
- Uniform scale maps
- Infrared video and photo-thermal signatures and measurement
- Real-time worksite progress and safety reporting
- Environmental data collection using specialized measurement sensors for air quality, temperature, methane, etc.

Traditional means of inspecting infrastructures, using helicopters or climbing on structures, doesn't normally yield the automated, consistent, and precise data collection drones can deliver. Not only that, but the costs and risks of traditional inspection for some use cases is driving industries to explore drone-based inspection.

Inspecting oil and gas infrastructure

In the oil and gas industry, **the operational economic gain from BVLOS inspection is derived from increased efficiency.** Traditional methods of inspecting well pads involve a team of well tenders, engineers, and environmental experts driving from well pad to well pad, or walking pipelines, and photographing and taking notes on a clipboard or mobile device. **They check about 15 different issues on well pads,** ranging from gauges to valve settings to temperatures of different pieces of equipment, as well as methane detection and tank gauging (manually measuring each tank's volume of liquid). They also check for vegetation and encroachment right of way, ensuring that livestock hasn't broken through a fence and are loitering around a well pad.

Helicopters are also used where an inspector is taking photos of any issues. But they're flying 30 mph down a line, so the quality of imagery and resulting data can be lacking. And the process of data collection is also inefficient—think about documenting tank gauges using a clipboard and piece of paper, and how many hands that information must pass through back in the office—risking error—before a ticket is issued to send a maintenance engineer out. Even when well tenders take connected devices into the field, measurement can be left to subjective, manual techniques.

INSPECTION CHECKLIST EXAMPLE

INSPECTION CHECKLIST 092018

A21 Wellsite Checklist | Location #2178 | Team C

Required verifications while on site:

Routine Wellsite Inspection Checklist | To Be Completed at Every Well Visit

1	Inspect the location and equipment for any potential safety or environmental concerns.	
2	Ensure all well signs are in place with appropriate contact placards.	
3	Verify all valves are in normal operating position.	
4	Activate level controllers. Manually dump separator. Drain all fuel scrubbers.	
5	Verify all valves under PSV's are locked.	
6	Inspect tanks and call in any fluid loads exceeding the minimum required load limit.	
7	Check all safety guarding, fluid levels, temperatures, and chemical injection rates.	
8	Verify no open ended valves and install plugs where necessary	
9	Verify all automation equipment are structurally sound	
10	Ensure location is secure. Shut gates and pick up trash.	
11	Walk down compression system and make entry in Compressor Read Up application	

Right now, regulations in the U.S. require well pads to be inspected for methane at least annually to meet Federal EPA guidelines and potentially more frequently to comply with state and local regulations. The time and personnel applied to those inspections deliver much more value if the well tender can perform maintenance—or fix any issues—while inspecting, since maintaining well pads keeps them operational. **An inoperable well pad loses revenue for the oil company.** The economic impact depends on the size of the oil field, but as an example, a 1% change in downtime can result in $600,000 revenue lost a day.

A 1% CHANGE IN DOWNTIME CAN RESULT IN $600,000 REVENUE LOST A DAY.

So if a well tender can be made 30% more efficient by performing high-value maintenance along with the inspection—and net more well pad uptime—the company gains a lot more than regulation compliance.

Due to the asset-intensive nature of the oil and gas industry, any slight improvement in asset utilization can result in a significant gain in revenue and cash flow. *Companies could lose up to 5% of production due to unplanned downtime.* The average impact of unscheduled downtime has caused process companies to lose more than $20 billion in production annually, according to World Oil.

WHEN TO DEPLOY BVLOS DRONE OPERATIONS

Oil and gas companies are using drones to address several issues:

Resource efficiency: When manpower is scarce or reduced (as was necessitated by the oil and gas crisis in 2014), **it's more efficient to use drones for well pad inspections,** sending a well tender and engineer out only to ensure uptime or make repairs. One company tested using VLOS drones to inspect a cluster of 10 well pads in a three-mile radius and determined that, if it costs them $80-$90 to inspect a well pad using traditional methods, **drones reduced inspection costs by approximately 66%,** to $45-$60 a well pad. With BVLOS, the three-mile radius could become a 40-mile radius, and the 10 well pads that a technician can inspect in a day could become 100 to 125 with BVLOS operations.

TRADITIONAL INSPECTION
$80-$90 / WELL PAD

DRONE INSPECTION
$45-$60 / WELL PAD

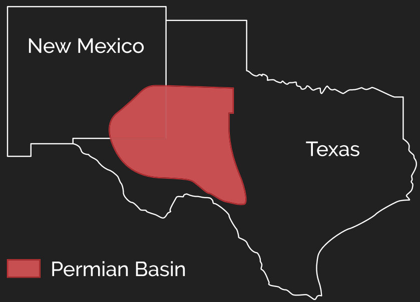
Of the 15 issues a well tender typically inspects, drones can handle tank gauging, methane detection, and change detection on the well pad. Drone inspection supports a "management by exception" policy in which the **drones are tracking changes over time that could indicate issues**—IR cameras can detect rising equipment temperatures, for instance, or photos can capture pooled water on-site, which could be a loss of primary containment, or vegetation and cattle encroachment.

By removing the necessity of manual inspections, oil and gas companies can use well technicians to focus on either higher value-added inspections or maintenance alone. The real economic benefit, then, isn't in a 22% cost reduction or an increase in the number of well pads you can inspect in a day—it's in **having those technicians available to focus on uptime and drive or maintain overall revenue.**

Safety: The nature of well pads makes them dangerous to inspect and maintain. Well pads (also called pumping stations) have multiple centrifugal pumps that increase pressure used to move crude oil and petroleum—flammable and combustible liquids—through pipelines. The pumps may be powered by a variety of internal combustion engines or electric motors, all of which are subject to breakdown. According to the Center for Disease Control, from 2003 to 2013, the number of work-related fatalities in the oil and gas extraction industry increased 27.6%, with a total of 1,189 deaths, and more than 50% of persons fatally injured were employed by companies that service wells. **Flying drones reduces the amount of time well tenders spend in the immediate proximity of well pads and other equipment.**

FROM 2003 TO 2013...WORK-RELATED FATALITIES IN THE OIL AND GAS EXTRACTION INDUSTRY INCREASED 27.6%

Another danger in inspecting well pads, especially when they're spread over a 100-square-mile area, are auto accidents. Oil and gas infrastructure inspection over land involves driving miles and miles in between well pads, along pipelines, and so on. The Permian Basin in Texas has seen fatal accidents rise as crude rallies and oil prices rise, so much so that Route 285—which runs through Pecos, Texas, and Carlsbad, New Mexico—has been nicknamed "Death Highway." In 2017, according to the Dallas News, 93 people died in accidents involving trucks on the Texas side of the basin, 43% more than in 2012.



Using BVLOS drones for inspection over a wide area would significantly reduce drive time and the risk of accidents.

Better data: Last, using VLOS and BVLOS drones for checking well pads results in **higher quality, more consistent, and faster data collection.** Helicopter pilots can attempt to fly the same altitude and route over a pipeline or well pad, but a drone can be preprogrammed to run the exact same navigation points and route at the exact same height. Route and height are key for collecting consistent imagery. Not only that, but **drones collect structured data** that can be aggregated with a larger structured data set and then transmitted directly via API to a work-management system. Data is not only collected more quickly but in a manner that skips manual touches and potential data integrity loss.

OIL AND GAS INFRASTRUCTURE INSPECTION: *To inspect about 15 different issues on well pads and pipelines, including gauges, methane detection, valve settings, equipment temperatures, tank gauging, vegetation and encroachment right of way*

	TRADITIONAL	VLOS	BVLOS
METHOD	Well pad inspection by well tenders driving from well to well, hand-collecting data. Pipeline inspection by driving and/or helicopter with photos captured	Well pad inspections by drones flying well pads clustered in a 3-mile area and pipeline inspections of up to 6 miles	Well pad inspections by drones flying well pads clustered in a 40- to 50-mile area and pipeline inspection of up to 40- to 50 miles
$ COSTS	$80-$90 per well pad, with 5-10 inspected per day	$45-$60 per well pad, with about 8-16 inspected per day	$30-$50 per well pad, with 100-125 well pads inspected per day
PROS/ BENEFITS		More efficient inspections, allowing technicians to focus on maintenance and uptime; higher quality and more consistent data is processed more quickly and with less error	Even more efficient inspections, especially of pipelines, allowing technicians to focus on maintenance and uptime; higher quality and more consistent data is processed more quickly and with less error
CONS/ RISKS	Helicopter and auto accidents; poorer data quality with risk of human error; inspection wastes technician time on things other than uptime	Reduced	More reduced

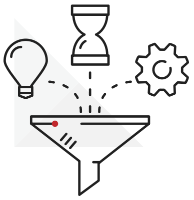
THE BOTTOM LINE:

The operational economics of oil and gas necessitate using trained well tenders only for high-value inspection and maintenance tasks that improve uptime and protect revenue. **Flying drones VLOS can drive efficiencies in well pad inspections, and BVLOS operations drive even greater efficiencies in well pad and pipeline inspections.** Both reduce the risk of fatal accidents from flying helicopters or driving cars, and both enable higher quality, more consistent, and faster data collection and analysis.

Inspecting utility infrastructure

The key operational benefit of using drones for inspecting utility lines and towers is safety. Electric utilities have traditionally used helicopters to inspect both towers and power lines, risking the helicopter's rotor blade striking a wire and causing catastrophic damage and often fatalities. One company we spoke with had lost three people in the last four years and knew another company that had lost two aircraft and two employees.

Aside from the tragic loss of life, **the costs of a fatal helicopter crash can run in the millions.** The cost of insurance—which can be as high as 3% to 5% of the helicopter hull value—and crash payouts are carried by the pilot's policy. Pilots and inspection crews are frequently contracted out by the utility company.



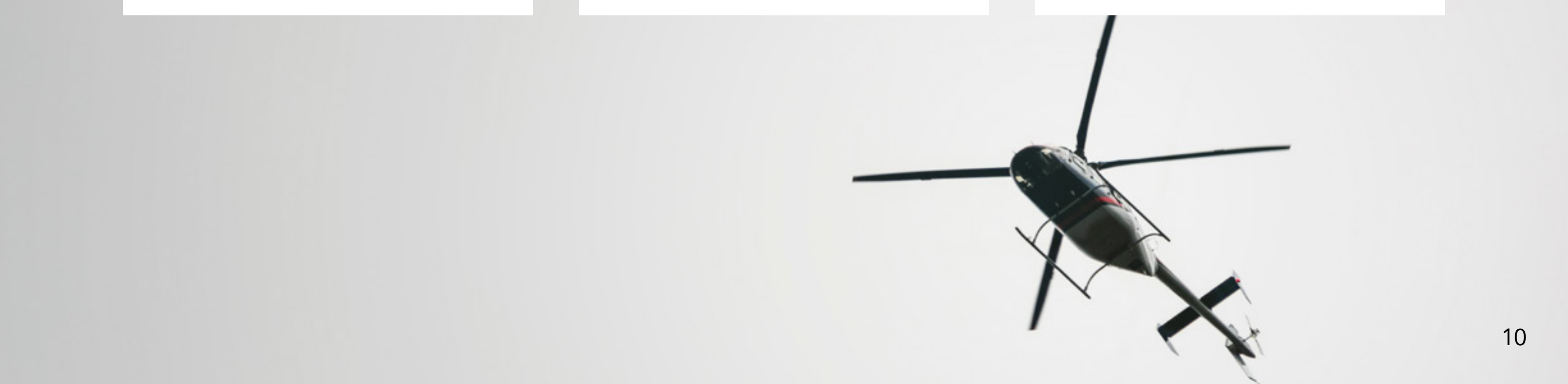
ASIDE FROM THE TRAGIC LOSS OF LIFE, THE COSTS OF A FATAL HELICOPTER CRASH CAN RUN IN THE MILLIONS.

The economic impact often includes:

A worker's comp settlement of between **$250,000 and $1 million** for the pilot and any other pilot employee aboard

A settlement above **$10 million** for any third-party passenger

A reputation hit and **PR crisis** for the utility company contracting with pilots



TYPES OF UTILITY INSPECTION

Electric utilities conduct several types of inspections. A **comprehensive visual inspection**, or CVI, requires a helicopter to hover 360 degrees around a utility tower and look at every nut, bolt, and cotter key. These are usually done over a period of time—for instance, one-sixth of a utility's towers receive a CVI every year, so all of them benefit from a CVI every six years.

A **routine inspection** begins at one tower or utility substation and travels 20 or 30 or so miles to the next substation, looking for more major and high-level defects like leaning posts, trees that are an issue, broken cross arms, and wire issues, etc. Routine inspections, done once yearly over the entire system (which can be thousands of miles) usually require a helicopter pilot and a sensor operator running cameras that capture visuals, infrared data, and corona or ultraviolet data.

Fault inspections occur when an issue is reported, like a leaning post, and can occur four to five times a month.

TRANSMISSION LINE TOWERS

> **The key operational benefit of using drones for inspecting utility lines and towers is safety.**

WHEN TO DEPLOY BVLOS DRONE OPERATIONS

CVIs of towers are where utilities are benefiting most from VLOS drone flight. The fourth largest gas and electric utility company in the U.S. by market value told us the cost of VLOS inspection is "extremely competitive with helicopters" while significantly reducing the risk of fatal accidents. Another utility company—one that brings electricity and gas to nine million customers each day—operates a self-service model in which linemen are given small multirotor drones in their toolkits, and they fly VLOS to inspect structures without having to climb them, saving time and increasing safety margins.

According to a CBS Denver report, Xcel Energy in Colorado estimates flying drones BVLOS will cost between $200 and $300 per mile compared to helicopter flights that cost an average of $1,200 to $1,600 per mile.

BVLOS FLIGHT	HELICOPTER
$200-300 PER MILE	**$1200-1600** PER MILE

It's the routine inspections traveling 20-30 miles from tower to tower where VLOS inspection is less cost effective, mainly because of the time and multiple deployments required. One drone inspection services company we spoke with said that VLOS inspection speed is dependent on the environment and right of way, but all things being equal may cover 10-12 miles a day. **With BVLOS, this same company estimates they'll be able to cover between 20 and 30 miles a day.** Routine inspections are where utility companies are experimenting with or exploring extended visual line of site (EVLOS) and BVLOS inspection operations as an economically viable investment.

ELECTRIC UTILITY INFRASTRUCTURE INSPECTION: *To perform both detailed, comprehensive inspections of utility towers or substations as well as high-level routine inspection of utility wires.*

	TRADITIONAL	VLOS	BVLOS
METHOD	Comprehensive visual, routine, and fault inspections of towers and lines with helicopter, lineman, and sensor collector	Many comprehensive inspections of towers and lines are done by linemen with drones	Routine inspections of towers and lines, flying from tower to tower
$ COSTS	Helicopter pilot and a sensor operator are contracted out at around $1,500 per rotor hour, which includes the inspection report. Cost of insurance and crash payout carried by pilot's policy; payout for a third-party passenger could be $10M conservatively, and that doesn't include cost of negative PR and reputation hit for utility co.	Costs associated with helicopter crashes are eliminated. Drone pilots charge $75 to $100 an hour and utility inspectors charge $30 to $50 an hour, depending on location. One inspection services company charges $2,600 to $3,600 per day (or $325 to $450 per hour), on average, for drone pilot, inspector, equipment, and report.	Lower, in one instance, cost starts at $3,600 per day (or $450+ per hour).
PROS/ BENEFITS	Helicopters capture visual, infrared, and ultraviolet data from videos; photos capture potential line/tower issues	Similar to traditional, but VLOS drone inspections can deliver a higher level of inspection data detail, (e.g., missing pins, rust, damaged insulators), more consistent data, and a more efficient tower inspection process compared with typical ground or helicopter patrols.	Not only is the data higher quality, more consistent, and more accurate, but using BVLOS drones with AI allows you to build an extremely precise digital twin model of much higher quality than what you would get from LiDAR or helicopter photogrammetry. A digital record lets you mobilize without traveling again, use AI to assess issues, develop cost estimates, and ultimately develop the report.
CONS/ RISKS	Helicopter crashes and fatalities	Pilot error and software or automation failure can cause a drone to crash, but damage is significantly reduced from helicopter crashes	Pilot error and software or automation failure can cause a drone to crash, but damage is significantly reduced from helicopter crashes

THE BOTTOM LINE:

For CVIs, **operating VLOS drones can significantly reduce the risk of helicopter accidents and deliver improved data** as well as a more efficient inspection processes. The opportunity for economic ROI of BVLOS operations is in routine line inspections, which are still largely conducted with helicopters.

Insurance claim inspections

In the insurance industry, assessing losses over a wide area—such as from recent floods, lava flows, fires, and other widespread disasters where flight or walking inspection is either dangerous or impossible—is **driving the exploration into BVLOS inspection.**

IN PAST COUPLE DECADES, THE AVERAGE ACREAGE SIZE OF WILDFIRES HAS INCREASED 400%[3]

Consider the case of a Fortune 250 insurance company. With 12.5 million policyholders, this company offers auto, home, and other types of insurance plus banking and financial services, and more. **Their goal is to indemnify their customers as quickly as possible** after damage is done—whether because of a catastrophic event or minor accident. They began investigating the use of drones about 10 years ago to assist in identifying and triaging damage to homes after catastrophic events. Their aerial imaging systems acquire orthomosaic and georeference imagery to make determinations on claims.

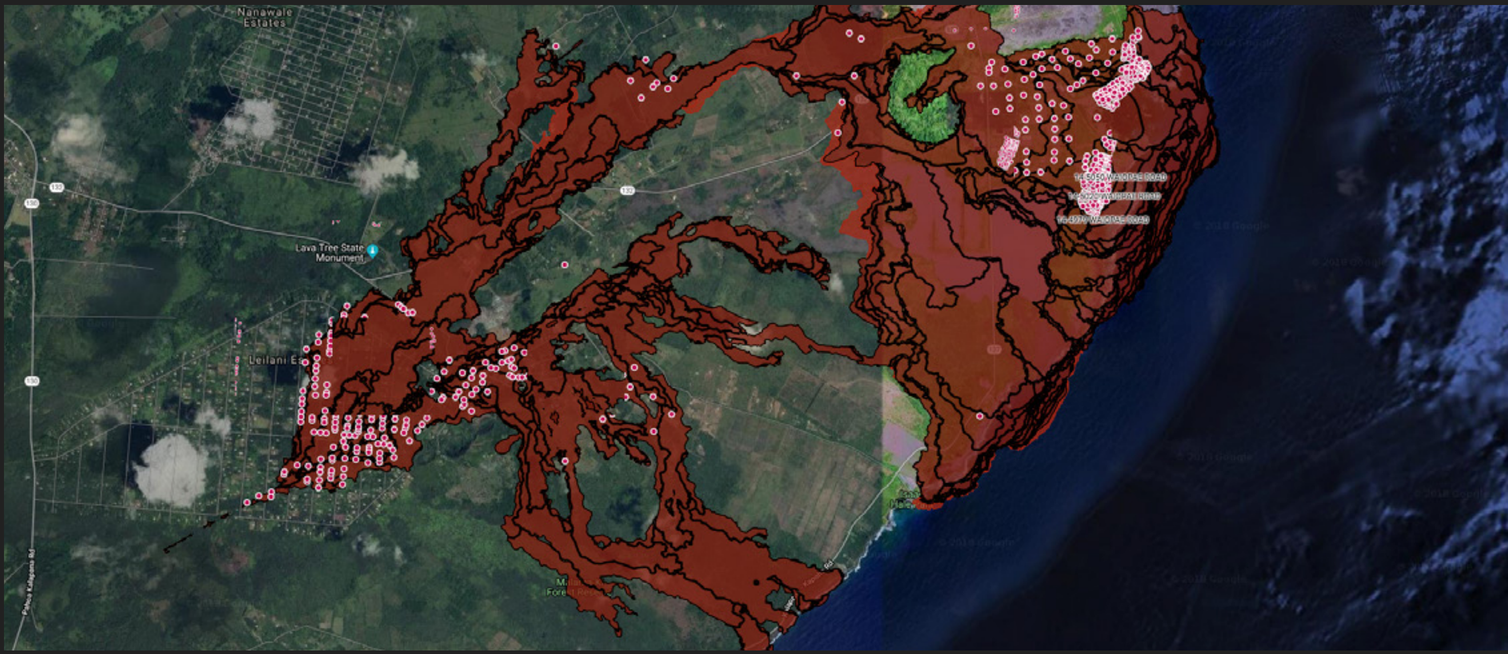
This insurer concluded it doesn't always make economic sense to operate VLOS drones to assess damage to houses one house at a time. After all, the time it takes them to fly one house at a time is about 30 minutes, which is relatively the same time it takes a skilled adjuster to climb up on a roof and conduct an inspection.

But other insurers—especially property and casualty insurance carriers—have concluded that **operating VLOS drones does provide significant economic benefit.** The difference lies in the type of assessment needed. Performing surface assessments to, for instance, identify shingle damage from hail storms is an operation economically suitable for VLOS drones; performing claim inspections where adjusters need to lift up asphalt or architectural shingles to assess the quality of the underlay is not economically suitable for VLOS drone inspection.

[3] WILDFIRES IN THE U.S. ARE GETTING BIGGER, 7/17/2018, FIVETHIRTYEIGHT

WHEN TO DEPLOY BVLOS DRONE OPERATIONS

Where the insurer we interviewed does see a viable ROI with drones is in inspecting neighborhoods or large areas that have been damaged by floods, storms, fires, and so on. That type of **wide-area mapping usually necessitates flying either EVLOS** (or operating within a defined area of operation with the pilot having visual situational awareness of the airspace within which the drone is flying) **or BVLOS.**



ADDRESSES OF HOMES LOST IN 2018 PUNA ERUPTION

For instance, they partnered with a research organization to fly the 2018 lava flows in the Leilani Estates neighborhood in Hawaii. In one day, they were able to conduct a series of ortho flights with several DJI multicopters. They were not flying BVLOS and were mapping an area about the size of a square mile with five flights.

In this case, they were able to see how many homes, and which ones, were affected by the lava—and these were homes that weren't accessible any other way. Some had lava moving through their front yards, and people couldn't manually access the area. **But VLOS drone flight delivered a safe approach to inspecting the wide area at arm's length.**

By mapping a typical area of interest using BVLOS drone-based data collection, the insurer we interviewed estimates they could **save 20% on costs associated with claims adjustment.**

For this insurance use case, then, **BVLOS becomes economically viable when it allows insurers to safely and quickly make broad swath assessments to whole neighborhoods** and determine total vs. partial home loss. Its other benefit in that scenario, compared with the photos an adjuster takes, is that the comprehensive data set allows zooming in and re-inspecting without having to send an adjuster back out.

INSURANCE CLAIM INSPECTION: *To triage, assess overall damage, prepare inspectors, and acquire orthomosaic and georeference imagery for determining approximate number of adjustment claims needed on individual buildings and multiple structures in a wide area.*

	TRADITIONAL	VLOS	BVLOS
METHOD	Helicopter or manned aircraft used to collect images or video to determine specific areas where damage occurred; Post-process data analysis	An adjuster uses a drone to fly over a structure or a wide area	Wide area mapping plus creating images for each home or structure that will have a claim in that area; Real-time data collection and analysis
$ COSTS	Helicopter or Cessna pilot charges $15-$100 per structure; orthomosaic maps of an area can run $8,000 to $10,000 for a typical mission. In the event of a crash, the cost of insurance and crash payout carried by pilot's policy; payout for a third-party passenger could be $10M conservatively, and that doesn't include cost of negative PR and reputation hit for the insurance company.	Drone pilot, $75 to $100 per hour, at 30 mins/structure Significantly reduced chance of fatal accident	Estimated 20% reduction in costs. Fatal accidents are significantly reduced and/or eliminated
PROS/ BENEFITS	$15 to $100 per home	Higher level of detail in inspection data; photogrammetry/digital twin and damage identification. Fewer fatalities from adjusters climbing on and falling from roofs; more efficient inspection process	Would replace traditional wide-area mapping and triaging with location accuracy. Not only is the data higher quality, more consistent, and more accurate, but using BVLOS drones with AI allows you to quickly build an extremely precise digital twin model of much higher quality than what you would get from LiDAR or helicopter photogrammetry. Benefits of having a digital record are you can mobilize without traveling again, use AI to assess issues, develop cost estimates, and ultimately develop the report.
CONS/ RISKS	Risk of fatal crash; lack of data accuracy, quality, and consistency	Does not include roof material underlay assessments, ROI may not be high enough to scale	Few

THE BOTTOM LINE:

For some individual home inspections, traditional methods may still make economic sense depending on the assessment type—for surface assessments, VLOS drone operations are economically suitable, especially for difficult-to-reach areas. But for wide-area assessment, **BVLOS operations are estimated to return significant ROI.**

The insurance company we interviewed estimates they would save $15 million over the next three years—or cut 20 percent of the cost of assessing wide areas of damage. And, most important, it would speed their ability to facilitate the financial security of their policyholders.

Conclusion

As these use cases illustrate, businesses must have an understanding of the operational economics of drones to develop an effective drone strategy. **When you know how much it costs to deploy drones**—whether VLOS, EVLOS, or BVLOS—**you can compare the costs and benefits against traditional operations.** Helicopters may still be viable when they can efficiently and accurately collect data in specific situations, but VLOS inspection is fast replacing helicopters in two of our three use cases and delivering better data more economically. Expectations are high for BVLOS inspections—especially for 50-plus-mile flights—and smart companies are already experimenting with EVLOS and exploring options for BVLOS.

> **Expectations are high for BVLOS inspections...**

Next steps

Find out more about [BVLOS drone operations] and how PrecisionHawk's Pathfinder Program has yielded data to support the expansion of FAA-approved drone operations. Our BVLOS Consulting Services can help you navigate the regulatory waters of BVLOS, develop safety practices for BVLOS operations, conduct operational risk assessments, provide training, and ultimately integrate BVLOS operations into your organization.

ABOUT PRECISIONHAWK

PrecisionHawk is a leading provider of drone technology for the enterprise. PrecisionHawk's client list includes Fortune 500 companies and market leaders in 150 countries, spanning a range of industries, including agriculture, energy, insurance, government, and construction. To date, **PrecisionHawk has raised more than $100 million** from leading venture capital firms including Third Point Ventures and Millennium Technology Value Partners, with strategic investments from enterprise customers and partners including Comcast Ventures, DuPont, Intel Capital, NTT Docomo, and Yamaha Motor. The company, founded in 2010, is privately held and headquartered in Raleigh, NC.

More information about PrecisionHawk can be found at www.precisionhawk.com or on Twitter @PrecisionHawk.

The leading provider of drone technology for the enterprise

ABOUT SKYLOGIC RESEARCH

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