An aerial photograph showing a two-lane asphalt road with a red car and a blue car driving. The road is bordered by a dense green forest on the right and a body of water on the left. The text is overlaid on the water and forest areas.

Driving resiliency with satellite intelligence:

How streamlined vegetation management
helps top utilities optimize cost centers
and mitigate risk



As utilities know all too well, vegetation is a key factor in risk management. From storm- and wind-related outages to catastrophic wildfires, vegetation plays a major role in the events affecting grid reliability and safety. In some areas of the U.S., trees cause over 90% of outages. And while only a small percentage of wildfires are directly caused by the intersection of vegetation and power lines, the costs can be astronomical, and the impacts devastating.

It's no surprise, then, that vegetation management is often the largest operations and maintenance line item in utilities' operating expenses. According to a recent CNUC survey, the average annual spend by utilities was \$27 million, with the largest amount reported by survey respondents reaching \$320 million in a year. Some investor-owned utilities have reported upwards of \$1 billion in annual spend. In total, U.S. utilities spend between \$6-8 billion each year on vegetation management budgets.

With so many competing pressures — regulatory constraints, changing customer expectations, rising costs and labor shortages, to name only a few — utilities must make their O&M dollars go further. At the same time, they need to limit their exposure to risks that drive costly liabilities such as outages and wildfires. Optimizing vegetation management is a key strategy to stretch budgets while also improving grid reliability.

The difference-maker? Satellite imagery combined with machine learning analysis to provide actionable recommendations. Rather than rely on time-based maintenance cycles and manual inspections, utilities can achieve immediate, mid- and long-term resource savings with cutting-edge technology and the optimizations it provides.

“Most utilities are on a time-based trimming cycle. But with satellite vegetation intelligence, we can, for the first time, scan an entire network in a matter of a few weeks,” says Brian Lafayette, Head of Business Strategy with Overstory, a leading satellite vegetation intelligence provider. “Now, utilities can make data-informed decisions about which areas are most likely to experience an outage and thus where resources should be allocated,” he says.

By adding satellite intelligence to existing tools and expertise, utilities can achieve more efficient operations and move toward greater grid resiliency.



Now, utilities can make data-informed decisions about which areas are most likely to experience an outage and thus where resources should be allocated.

Brian Lafayette

HEAD OF BUSINESS STRATEGY, OVERSTORY



Immediate savings through prioritization

By providing up-to-date information on vegetation conditions, satellite intelligence gives utilities greater flexibility in their vegetation management approaches. This technology can empower teams to identify hotspots requiring immediate trimming more quickly than they can with foot patrols, and satellite data is analyzed and made available faster than LiDAR data.

Identifying and addressing hotspots earlier may mean outages can be prevented before they happen, and infrastructure damage or degradation can be identified earlier, not when a failure happens. This allows for proactive maintenance activities rather than reactive ones.

“Satellite imagery gives utilities quick and comprehensive views of the risks they’re dealing with,” says Kevin Dasso, Executive Consultant for the electric utility industry and former Vice President with PG&E. “It’s the big picture, broader than LiDAR, but it’s very helpful in addressing immediate needs,” he explains. Crews can be quickly deployed to where they are most needed, then inspect or trim the vegetation most likely to cause an outage or incident.

This approach also saves on maintenance costs by streamlining pre-planning work and foot patrols, which still have an important role to play in validating satellite data. The satellite data can provide insights on where to send work planners to make better use of their time and more effectively identify risks. “It lets you use your budget more efficiently by not sending resources where work isn’t needed,” says Phil Chen, Strategic Solutions Lead with Overstory.

It lets you use
your budget
more efficiently
by not sending
resources where
work isn’t needed.

Phil Chen

STRATEGIC SOLUTIONS LEAD,
OVERSTORY

But satellite intelligence is more than just pictures. Overstory collaborates with utilities to develop a risk framework configured to their existing trim specifications. These frameworks aggregate data and rank spans in order of compliance with trim specs and allow Overstory to offer recommendations on risk prioritization based on factors like vegetation health and proximity to lines.

The company works with foresters and utility staff who are familiar with their territories and have the institutional knowledge needed to inform these collaboratively developed risk frameworks. The technology, therefore,

scales up the foresters' knowledge and disseminates those insights to the entire maintenance team.

Perhaps most importantly, foresters have validated these machine-learning-driven results. "In a double-blind study with one U.S. investor-owned utility, we compared our results to those of independent utility foresters who hadn't seen the data," Lafayette explains. "Spans we marked as low risk were marked that way by foresters 96% of the time. For high-risk spans, foresters found the same results as our data in over 90% of cases," he says.



In a double-blind study with one U.S. investor-owned utility, we found that spans we marked as low risk were marked that way by foresters 96% of the time. For high-risk spans, foresters found the same results as our data in over 90% of cases.

Brian Lafayette

HEAD OF BUSINESS STRATEGY, OVERSTORY

More effective planning & budgeting

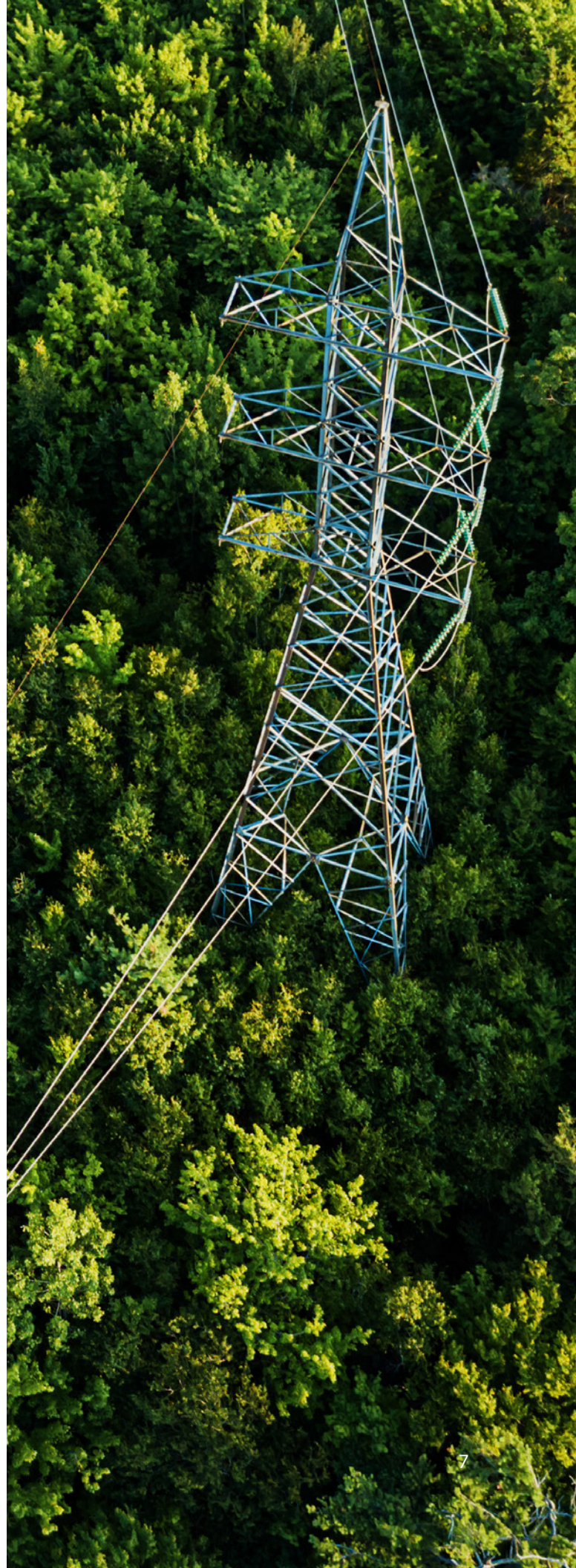
With a risk framework in place, utilities can go beyond identifying hotspots to more accurately predict the amount of mileage to be trimmed in a coming year. Rather than relying on static time-based cycles, utilities can use satellite data and the ranking of spans' vegetation status to prioritize which spans should be trimmed to avoid outages and incidents.


Tree-trimming crews can spend their time on areas that need work and avoid wasting time and effort on spans that require less maintenance. "If you know where outages are most likely to occur thanks to this data, then you can evolve your programs to spend less money in places that aren't high-risk," Lafayette says.

This approach guides contracting more efficiently than traditional time and equipment structures — essentially facilitating the move to unit-based or fixed-price contracts. "In my experience, unit-based contracting provides greater value and improved performance over time," Dasso says. "You get more predictable results, lower risk and managed costs."

Fixed- or unit-price bidding, when informed by accurate satellite-based intelligence data, can provide clarity for both utilities and contractors, because contractors don't have to account for contingencies and utilities aren't reliant on estimators' judgment for accurate assessments. The visibility provided by satellite data also assists utilities in defining the work units, for example, based on volume of vegetation, distance or other measures that utilities can codify. All of these capabilities bring objective parameters to budgets and work efforts for greater efficiency.

After annual trimming of spans identified as most in need, satellite data can also be used as a tool to better understand and measure the impact of risk mitigation efforts. "You can get a better understanding with satellite imagery than foot patrols and statistical sampling," Dasso says. "This becomes a feedback loop to improve performance and efficiency," he adds. The assessment capability afforded by satellite intelligence allows utilities to evaluate and compare their contractors' performance and make informed decisions for future contracting cycles.





Building a more resilient program

“For many utilities, there is no bigger risk than a wildfire,” Chen says. “Identifying hazard trees that could fall on a line or ensuring there is space around assets is vital to addressing those types of risks,” he explains.

By offering actionable recommendations informed by risk frameworks — developed by Overstory in partnership with utilities — satellite intelligence provides documented decision-making criteria. Using objective measures within frameworks that help inform maintenance decisions, utilities can develop defensible strategies backed by evidence. “No one can eliminate all risks,” Dasso says, “but having a structural prioritization based on documented conditions can go a long way in limiting risk.”

No one can eliminate all risks, but having a structural prioritization based on documented conditions can go a long way in limiting risk.

Kevin Dasso
EXECUTIVE CONSULTANT

This speaks to the importance of using all the tools in utilities' toolboxes — satellite data alone can't reduce all risk, but combined with LiDAR and foot patrol inspections, it becomes another layer of protection by enabling evidence-based decision-making.

It also demonstrates to stakeholders that a utility is using the latest technology available to gain new insights and be as proactive as possible with vegetation management. "Supplementing satellite data with techniques such as LiDAR, high-resolution imagery and foot patrols is an important best practice," Dasso says. "Including satellite data means you're continuously improving, and you're prioritizing corrective actions based on documented conditions versus a judgment call."

Relatedly, by including staff knowledge into data-driven frameworks, utilities save institutional knowledge from being lost through attrition or turnover. As employees with decades of experience [retire](#) in greater numbers, and with staffing shortages continuing across the industry, machine learning is becoming increasingly valuable for retaining historical knowledge of a given system and its terrain.

Combined, these factors support overall resiliency for utilities because there are multiple checks on the conditions of grid infrastructure and the vegetation surrounding it. Risk frameworks informed by both satellite intelligence and human expertise combine all available tools utilities have to leverage. And by more effectively reducing risks of outages and incidents via these innovations, utilities provide more reliable service and more resilient power supplies.





Transparency for better operations today – and tomorrow

By optimizing the effectiveness of their budgets and workforce with satellite vegetation intelligence, utilities can improve related operations efforts with more time and money for things like asset management and better customer service, resulting in overall improvement in their grids. This translates to better SAIFI and SAIDI scores, overall risk management improvements and more reliable, affordable service for customers.

Armed with satellite data and machine learning analysis, utilities are also better prepared for uncertain conditions, and they can better understand how those conditions change over time. “You can take snapshots and overlay them to see how things change, for better or worse,” Dasso says. “You can also take that imagery to your stakeholders to demonstrate the effectiveness of your planning and maintenance programs.”

Satellite vegetation intelligence plays a key role in all of these aspects of risk management by providing the means to improve operations. But it can't be done in a vacuum. The right partner will make the data available and configurable — no black boxes.

“Utilities shouldn’t throw away the information they have or what they know. Instead, providers should share underlying vegetation insights derived from satellite data — like the location of sick trees and species of concern — with utility teams who can get additional information from it,” Lafayette says. By working together with vegetation intelligence partners who prioritize transparency and collaboration, utilities can use both tree-level insights and larger-scale recommendations to inform smarter and smarter decisions over time.

Lafayette continues: “Identify what you need first, measure the ROI, and then with more data over time, keep making iterative steps and improvements.” The scalability of this technology means utilities can modify it as needed based on their conditions, even when those conditions change.

Identify what you need first, measure the ROI, and then with more data over time, keep making iterative steps and improvements.

Brian Lafayette

HEAD OF BUSINESS STRATEGY,
OVERSTORY

With actionable insights and high-quality data, utilities can improve the reliability and resilience of their grids and be ready for whatever the future may bring.

[Get in touch with Overstory to see how satellite vegetation intelligence can improve your operations.](#)

An aerial photograph showing a winding asphalt road that curves through a dense forest of green trees. To the left of the road is a wide, turquoise river. The road has white lane markings and a yellow center line. The forest is lush and green, with some trees showing signs of autumn. The overall scene is bright and scenic.

overstory

Overstory helps utilities optimize their vegetation management work to reduce cost and improve reliability across their network. Using machine learning and satellite imagery around transmission and distribution corridors, Overstory analysis shows utilities where they can direct pruning efforts to make the biggest impact on key business metrics like outages, SAIDI, SAIFI, and O&M budgets.

[Learn more](#)

studio / **ID**

BY INDUSTRY DIVE

studioID is Industry Dive's global content studio offering brands an ROI rich tool kit: Deep industry expertise, first-party audience insights, an editorial approach to brand storytelling, and targeted distribution capabilities. Our trusted in-house content marketers help brands power insights-fueled content programs that nurture prospects and customers from discovery through to purchase, connecting brand to demand.

LEARN MORE