



overstory

The Playbook for Operationalizing Advanced Vegetation Intelligence

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Introduction

Facing a changing landscape of weather, infrastructure, and market challenges, the pressure is on for utilities to reimagine critical operations functions.

Extreme weather events like hurricanes, ice storms, and floods—as well as catastrophic wildfires—are putting lives at risk and threatening critical grid infrastructure. Simultaneously, the demand for energy is skyrocketing to accommodate electric vehicles, heat pumps, and data centers.

Tightening regulatory requirements, on top of everything else, mean operations teams are forced to make important decisions to manage their vegetation programs in a way that effectively balances safety, reliability, affordability, and environmental stewardship.

Confronted with such soaring demand and unprecedented risk, the need to reevaluate grid operations for resilience has never been greater.

The biggest challenge, however, isn't just recognizing the need for change: it's knowing where to start and how to implement impactful, scalable solutions.

Vegetation intelligence technology allows operations teams to lean on remote sensing data and AI to optimize their programs for the long term. For many utility vegetation managers and operations executives, though, the journey from recognizing the potential of the tech to effectively integrating it into their programs remains daunting.

This playbook bridges that gap. It's a guide to building executive buy-in, vetting partners, planning for impact, and operationalizing the tech within your organization—all from industry experts with firsthand experience. In the playbook, you'll find practical advice from vegetation management professionals, Ben Gura (ATC), Nick Day (ComEd), and Steven Frazier (OG&E) on using vegetation intelligence to drive critical change for more resilient utility operations.

Building the Business Case for Advanced Vegetation Management Technology

Because it's often the biggest operations and maintenance line item, vegetation management budgets often face intense scrutiny from executives. "Borrowing" some of the annual VM budget can seem like an appealing proposition for executives hoping to invest elsewhere. But that often comes at the cost of long-term system resilience and reliability.

Let the Data Speak for Itself

It falls on the shoulders of vegetation managers to use data to demonstrate proactive risk and budget management within their programs to those executives who need the information most.

At ATC, they tell a simple but powerful story around their vegetation management using three key reports:

1. Total costs to operate system
2. What's being done with the existing budget
3. What risks are associated with that budget

With that information, the team can highlight successes and flag outstanding risks so leadership understands both short- and long-term impacts of budget changes.

Get Executive Buy-In

But numbers are just the start. Ben Gura recommends getting your elevator pitch ready to help educate executives within your organization whenever the opportunity arises. Leadership will always focus on top-line goals like system reliability, resiliency, and affordability—by sharing how your work connects to those greater organizational goals, you make it easier to get executive buy-in on tools to help you reach those goals most efficiently.

At ATC, Gura measures various technologies by their ability to reduce outage rates, save on costs, and minimize tree maintenance requirements.

Understand the Solutions Landscape

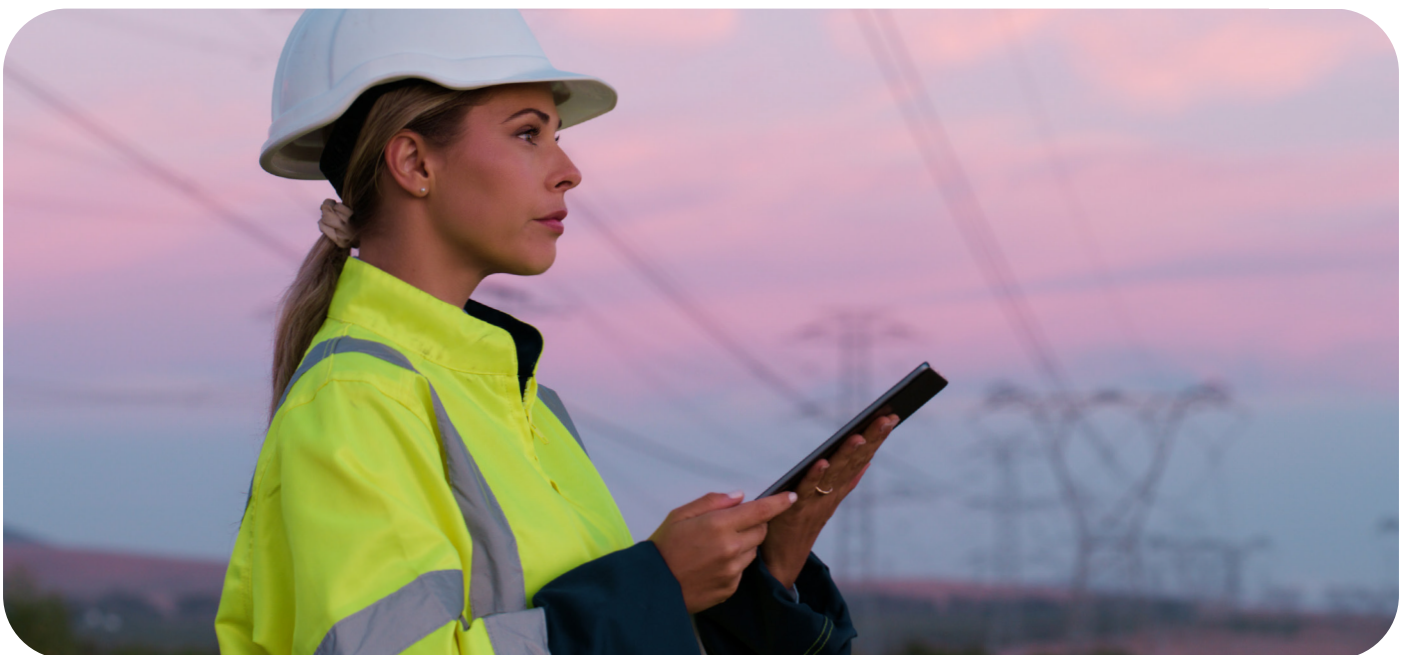
Tech solutions change and evolve so fast that it's important to look outside your own program, too. Benchmarking your own data is a start. Connecting and comparing data with other utilities is even better.

Industry events and groups like UAA, CEATI, NATF, and NWPPA, among others, offer the opportunity to learn from other utilities tackling similar challenges with myriad approaches. Nick Day recommends tuning in early and often to webinars and events to better understand the tech solution landscape:

" Get organized beforehand—to understand what's needed and how you will track success—so when you test new technology, you're able to be both successful in the project and evaluating the technology. "

- Nick Day, ComEd

No one tool will solve every problem, but finding the right combination of tools for your organization's specific needs can help you address your key challenges efficiently and affordably.



Choosing the Right Technology & Partners

Assessing the strengths and weaknesses of different technologies—and how they fit within your most relevant use cases—is critical in determining which tool is right for which project.

Starting in 2017, the ComEd team were early adopters of remote sensing technology—they've tested a few different remote sensing projects, including a LiDAR proof of concept, hyperspectral and satellite imagery, and unmanned aerial systems. Day explained that those projects, combined with his early conversations with other utilities comparing different tech solutions, helped him “educate up” and more easily demonstrate to executives where different tech fits best in their existing systems.

Evaluate Technology Effectively

When utilities evaluate different solutions on precision alone, they often miss actionability and correlation with meaningful operational metrics. Ultimately, system reliability and ROI mean more to ratepayers than owning an expensive digital twin of every tree branch across their network.

As an example, CenterPoint Energy recently requested \$9.9M in capital spending for a LiDAR-based model of its network as part of its pre-Beryl System Resiliency Plan. But Texas's PUC staff recommended denying that request for failing to consider more cost-effective alternatives. And Texas isn't alone—utility commissions in Michigan and Illinois have also publically pushed back on the high cost of LiDAR for vegetation programs in the last year.

All remote sensing technologies are evolving, but they're evolving at different rates, meaning technology cost-effectiveness depends on which use cases a utility aims to address. Understanding acceptable accuracy thresholds and cost trade-offs for those use cases helps teams make better decisions to effectively balance the tools in their toolbox with their budget.

At ComEd, Nick Day considered desired outputs like contract structures for pricing negotiations (requiring a highly accurate analysis) against risk assessments at a general level (which can be better achieved with a more scalable solution).

Partner for Long-Term Success

As the technology, climate, and utility landscape continue to evolve, a utility's needs will also change. Repurposing insights for additional use cases can help you identify long-term opportunities across departments to maximize your investment in technology.

Beyond just vegetation management, Steven Frazier's team at OG&E is exploring initiatives to repurpose Overstory's vegetation intelligence for projects like:

- Using the pole and line adjustments included in his vegetation risk analysis for projects beyond vegetation
- Predictive weather modeling projects
- Asset management analysis for more informed undergrounding

When it comes to these disparate projects, utilities all have different requirements for capitalization. But partnering with their asset management group to evaluate Overstory's vegetation intelligence gave the OG&E team a more complete picture of what's possible with the technology.

" For now it may only be vegetation inventory, but, in the future, you may need it for other applications. Getting other teams involved helps you understand what's possible with capitalization and long-term investments. "

- Steven Frazier, OG&E

And that partnership shouldn't stop at the edge of your organization. Selecting vendors with the same collaborative, transparent approach gives you the opportunity to share your program's priorities, learn from the people building the tech, and solve key challenges together. Day cautions against partnering with vendors who overcommit up front.



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“ A co-op with 500 miles of transmission does not have the same challenges or the same opportunities as an IOU with 36,000 miles of overhead line. Choose a vendor that is willing to learn and grow with you as opposed to sticking to the black and white scope of work. [Working together in that way] allows the technology, the vendor, and, for me, most importantly, the utility to benefit. ”

- Nick Day, ComEd

Developing Impactful Use Cases with Pilot Programs

The utility industry faces common challenges, but every operations program comes with its own nuances. It's important to test technology against what your organization specifically needs, not just against what it promises.

Develop a Meaningful Pilot Program

Starting with a pilot program can help. Pilot programs offer more affordable entry points to explore how you can use data to answer specific questions about prioritization and actionability.

Rather than measuring cost or accuracy of the technology alone, a pilot program should help you identify how much a new technology can support your greater business goals. Use the pilot to make a plan for how you'll take action on insights to reduce risk and better manage budget, for example, to better understand the value and the role of the tech in your program.

In a pilot, not every use case will shake out exactly as you expect. Understanding where a tool may not fit saves time and allows you to focus on the areas most likely to have impact. Using a pilot program to pressure test the technology, set benchmarks, evaluate different use cases, and get executive involvement can help you lay that critical groundwork for an impactful implementation.



Use Cases in Storm Preparedness and Risk Assessment

After a devastating ice storm in 2020, OG&E resolved to switch to a more proactive approach to vegetation management, hoping to avoid the most catastrophic outages in the future. Starting with a pilot program to test the intelligence, OG&E sought to learn how they could use remote sensing technology to assess the efficacy of their operations program.

When initially implementing Overstory, OG&E hoped to use vegetation intelligence to achieve three things:

- Prioritize their cycle
- Reduce their planning and response times by allowing them to analyze requests/risks remotely
- Stabilize the budget and defend where they're investing and choosing not to invest

Last year, another severe storm threatened their network. With only 36 hours to prepare, the team at OG&E turned to their new vegetation intelligence for insights on where they could prevent damage before the storm hit.

The OG&E team knew from assessing previous outage cause codes that many of their outages came from species like elms, cottonwoods, and Bradford pears with weak attachment points. Overhang from these species would pose critical risk in the storm. First, they pinpointed overhang on three-phase lines. Second, they highlighted declining trees with strike potential. With Overstory, the team identified more than 80 critical spans in just 30 minutes as opposed to the typical 2 days. And within 2 hours of their arrival, new crew members were trained on the platform and were empowered to take action to mitigate storm risk.

" What we learned is that we no longer have to be reactionary. We can start being more proactive and prevent some of these problems before they ever happen. It helped sell the point that storms are expensive for us, and we can use those storm dollars and resources much more efficiently. "

- Steven Frazier, OG&E

Managing Risk with Data-Driven Decision-Making

A proactive approach to vegetation management starts with a clear picture of system-wide risk. Even the most effective programs have blind spots. Without an objective way to measure and prioritize risk across an entire system, utilities are increasingly vulnerable to extreme weather and labor market challenges.

Identify Hazard Trees off the ROW

Hazard trees off the right of way, for example, are a common cause of outages for utilities across North America, with tree health a primary concern for many utilities struggling with die off in previously healthy ecosystems. Vegetation intelligence can pinpoint not only unhealthy trees but those trees within striking distance of conductors, helping teams prioritize trimming work in areas that would otherwise be overlooked, even on a healthy cycle schedule.

Prioritize Risk at the System Level

It's critical to note, too, that identifying more risk shouldn't always lead to more trimming. In fact, an objective, system-wide picture of risk often helps utilities deprioritize premature trimming and reallocate valuable resources to areas that pose higher risk or impact more customers. Ultimately, that means stretching the same budget for a greater ROI.

When Frazier and team implemented vegetation intelligence in their program, they were relieved to find that many of their previously held expectations about their system's risk profile were correct, but Frazier noted, "now we have the data to back it up. This data changes the conversations we're having with one another and how we can plan and execute our workload."

System-wide data helps utilities move beyond an assessment of existing practices. It allows vegetation managers, often for the first time, to prioritize work across an entire network efficiently in a single platform.

ATC employs four different vegetation management specialists to oversee distinct geographical regions. They used a vegetation intelligence pilot to explore how remote sensing data could practically help them manage their entire system rather than splitting it into four geographies. "Make sure that you're addressing risk where it's appropriate for the whole system, not just a particular area," encouraged Gura.

Optimize Cycle Programs

OG&E has already proven the value of vegetation intelligence for pre-storm use cases, but they're also actively implementing the data to optimize their cycle and their customer management programs.

Armed with objective data across their system, they're able to assess their existing cycle and can use network-wide data to determine which trim cycles are most appropriate where. This means potentially stretching their substations from a four-year trim cycle to a five- or six-year cycle to allow themselves more flexibility in allocating resources on areas of their network that need it most.

Improve Customer Management Programs

The OG&E team is also putting vegetation intelligence to work in their customer management program. They typically get between 8,000 and 10,000 non-cycle customer requests annually—much more than their budget allows them to address. Historically, they prioritized customer requests based on subjective keywords, which meant the impact of risk mitigation efforts was unknown.

Now, Overstory's vegetation intelligence data gives them an objective, measurable risk score that aids in prioritizing valid and urgent customer requests. They're expecting to save 25-30% of their vegetation management expenses by deprioritizing sending unnecessary boots to the field—that savings alone pays for the intelligence.

Getting Team Alignment with Clear Benchmarks for Success

For utilities facing extreme weather, labor shortages, and regulatory pressure, there's a tension between innovation and pragmatism. While there are many ways to approach the challenge—each with their unique strengths—satellite and aerial imagery afford network-wide actionable insights at an accessible price, giving utilities the tools they need to make impactful decisions to adapt quickly.

Set Clear Objectives and Accuracy Standards

When ComEd started their initiative to explore remote sensing technologies, they aimed to identify minimum outputs for accuracy and align on success thresholds for accuracy.

In one early test on 3000 trees, ComEd compared the ability of hyperspectral and multispectral imagery to identify 3 primary species and 2 classifications (other deciduous and other conifer). Multispectral identified those with 84% accuracy while hyperspectral identified them at 91% accuracy.

Day explained that the ComEd team was immediately impressed with the accuracy of hyperspectral imagery. But then they asked themselves: was 91% accuracy worth 5x the price of an alternative that delivered 84% accuracy? For them, the answer was no.

Another municipal utility tested the accuracy of Overstory's vegetation intelligence with a field study of a portion of the spans analyzed. In that study, they achieved a 93% agreement on span designations as a proxy for the necessity of work.

It's a lesson in restraint—in finding balance between precision and practicality. For utility companies operating on tight budgets, the numbers matter. Success, Day argues, comes not from having the shiniest technology, but from understanding what technology can help you achieve organizational goals at the right price.



Build Team Consensus and Involvement

Of course, even the sharpest metrics mean little if the right team members aren't on board. Involving other stakeholders in the process helps get buy-in across the organization. Beyond leadership, it's important to get field teams involved from the start.

Day recommends spending time in the field together and leading regular progress updates to bridge the gap between those at board meetings and teams in the field. Set recurring meetings to check in on progress to facilitate a smoother transition to data-driven decision making. And invite all stakeholders into the conversation from the start to build shared ownership and a common understanding of how the tech supports broad business objectives.

For the team at ATC, they they found vegetation intelligence supported four key business goals:

- **Mitigating risk** with actionable insights on risk, priority, and impact
- **Reducing cost** with more efficient work prioritization
- **Supporting cross-departmental projects** with more accurate asset and vegetation data
- **Developing and training new people** by giving them territory insights without driving across the entire network

Meeting Compliance & Security Standards

For transmission operators especially, the stakes are high to meet regulatory requirements. FAC-003 is the standard to meet, and with about 20% of ATC's system over 200KV, much of their vegetation management resources are spent ensuring that no compliance issues ever occur.

How ATC Approaches Compliance

Today, ATC clears the lines then performs 100% QA/QC after the work is done. Three years post-trimming they do mid-cycle ground control. And every year, they patrol the lines with helicopters. They use LiDAR in conjunction with their mid-cycle patrol instead of paying for expensive annual LiDAR flights—this method gives them a healthy balance of accuracy and cost control.

As satellite and aerial technology progresses, the team at ATC expects to use PLS-CADD models to combine sag and sway with environmental layers. Adding things like waterways, vegetation encroachment, and herbicide rights on top of Overstory's insights will give them a complete picture of network compliance and help them spot possible pitfalls early.

Cybersecurity in the Adoption of New Tech

As utilities integrate more advanced technology into their systems, they must also guard against a growing threat: cybersecurity. In an era where cyberattacks can cripple entire infrastructures, utilities can't afford to take risks. Any new solution must be vetted for its ability to protect sensitive data, which can delay kickoff.

" If you're gonna start a proposal RFP process, anticipate that you may want to reach out to your IT folks ahead of time. "

- Ben Gura, ATC

Ensure that cybersecurity protocols are integrated from the RFP/RFI process to make it easier for teams to properly evaluate possible partners. For ATC, all selected vendors wait in a security stage gate—that process involves assessing data storage, data sharing, and analyzing third-party programs that might be used in data collection or analysis, and also the data lifecycle. It can take about a month.

Challenges and Lessons Learned in Technology Implementation

When asked about the biggest surprise or lesson learned in implementing Overstory technology, Gura responded:

" The biggest surprise for me was just how quickly we were able to justify the cost of continuing the program. "

- Ben Gura, ATC

Justify the Cost of the Tech

To analyze the cost of remote sensing technology, ATC compares the lines they'd already planned to trim against the lines the technology helps them defer. With this data, they were able to show that in just a year, the technology paid for itself by helping divert funds into doing work on riskier areas.

By freeing those dollars over the lifespan of the line, they can better optimize their entire cycle.

Scale from Pilot to Full System Implementation

For OG&E, scaling from pilot projects to full-system implementation brought its own set of challenges. As Steven Frazier recalled, OG&E piloted vegetation intelligence across a few substations, including one from the previous, current, and next cycle year.

The transition from piloting Overstory's vegetation intelligence to rolling it out system-wide will test the team's ability to prioritize what they work on next. They plan to use the data to prioritize resources and funding and accomplish their goal of better system integrity.

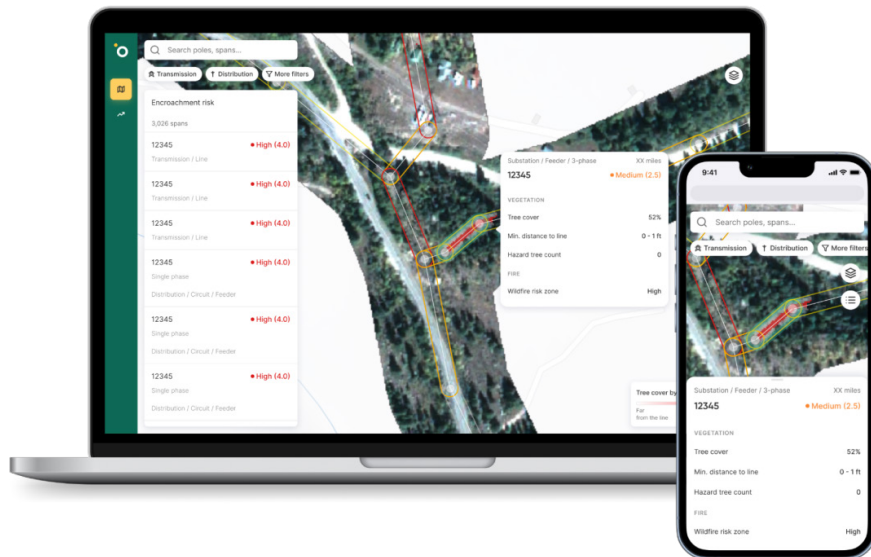


Driving Meaningful, Long-Term Change

As utilities navigate an increasingly complex landscape of extreme weather, rising demand, and regulatory pressures, their ability to innovate while maintaining operational pragmatism is critical. While identifying the advanced technologies that can help is important, the real challenge is implementing that tech in ways that drive meaningful, long-term change.

By starting with clear objectives, aligning on success metrics, and choosing partners who are adaptable and transparent, utilities can lay the groundwork for technology that not only addresses today's challenges but also evolves alongside tomorrow's needs.

This is a pivotal moment for utilities to seize the opportunity to innovate, building grid resiliency that not only strengthens infrastructure but also protects the communities they serve. In the end, the most resilient utilities will be those that successfully integrate data-driven decision-making into their operations while maintaining flexibility in the face of an ever-changing energy landscape.



About Overstory

Overstory offers actionable vegetation intelligence for safer, more reliable power. By combining remote sensing data with AI, we help utilities make smarter, data-driven decisions about the vegetation around their transmission and distribution corridors.

Optimize resources

1

Maximize time and money by prioritizing impactful vegetation management work, reducing spend in clearer areas to focus time and budget where they're needed most.

Mitigate risk

2

Address risk from encroachment, hazard trees, and wildfire before it materializes by shifting to proactive, data-driven vegetation management.

Future-proof operations

3

Build resilience and predictability into your program to adapt to changing weather and market trends. Codify your decision-making so you're prepared for any circumstance.

Leading investor-owned utilities, municipalities, and cooperatives alike are partnering with Overstory to provide safer, more reliable power.

Find out how actionable vegetation intelligence can support your team's goals.

Book a demo or learn more overstory.com/solutions.

The background is a solid teal color with several large, overlapping circles in varying shades of teal, creating a layered, organic effect.

The logo for 'overstory' features a small orange dot above the letter 'o', followed by the word 'overstory' in a white, lowercase, sans-serif font.