Case Study

Bushfire Aerial Patrol using LiDAR

techwave

Techwave established in 2004, is a global end-to-end IT services & solutions company, which develops long-term relationship with clients by leveraging unique delivery models and expert frameworks.

Summary

A leading Australian electricity distributor supplying power to over 1.7 million homes and businesses across a 22,275 sq km network faced critical challenges in bushfire risk mitigation across its vast overhead network infrastructure. Managing hundreds of thousands of power poles and nearly 50,000 km of electricity cables required accurate aerial intelligence, vegetation encroachment detection, and hardware defect identification across bushfire-prone areas.

By implementing advanced LiDAR data processing, GIS updates, and large-scale network analysis, the organization enhanced visibility across its infrastructure, improved risk identification, and achieved cost-effective operations while maintaining high data accuracy and operational efficiency.

Techwave's expert team applied advanced LiDAR analysis to detect and report critical hazards across the utility's overhead network, helping reduce risk exposure and improve overall grid safety and reliability.

Industry:
Utilities

Region:
Australia

Key Challenges:

- Vegetation hazard management gaps,
- Bushfire risk assessment complexity,
- Vegetation encroachment (grow-in, fall-in) Clearance compliance requirements,
- Bushfire preparedness limitations,
- Hazard prioritization challenges,
- Complex terrain constraints,
- Regulatory exceptions management

Business Challenges

- Establishing structured vegetation hazard management cycles for consistent inspection, identification, and remediation across a vast network.
- Conduct accurate bushfire risk assessments to evaluate asset-related fire risks and define priority zones in bushfire-prone areas.
- Managing vegetation encroachment risks, grow-in, and fall-in.
- Ensuring compliance with minimum clearance requirements.
- Strengthening preparedness during bushfire danger periods.
- Addressing fall-in vegetation hazards that pose sudden risks to network infrastructure.
- Prioritizing hazard remediation activities based on risk severity, location, and potential impact on operations.
- Handling exceptions in complex terrains, regulatory constraints, and high-risk zones while maintaining consistency in operations.

Strategy & Solutions

Techwave enabled the delivery of fit for purpose solutions and methodologies tailored to the Australian utility's distinct requirements:

- Used advanced **remote sensing techniques,** including aerial, mobile, and terrestrial surveys, to inspect nearly one-third of the network annually, capturing high-resolution data from LiDAR, imagery, and multiple geospatial sources.
- Simplified **pole-top image validation** by reviewing, selecting, and accurately mapping the most relevant images to corresponding assets within the GIS environment.
- Enabled data-driven decision-making through **vegetation clearance analytics,** while continuously updating spatial geometry and attributing data for both existing and newly identified assets.
- Applied **LiDAR-based classification and analysis** to assess vegetation proximity, along with detailed conductor and crossarm evaluation across spans and pole segments for precise hazard identification.
- Conducted comprehensive **tile, pole, and span-level analysis** to ensure granular visibility and consistency across the network.
- Deployed geospatial solutions to establish standardized workflows, enhance data integrity, and enable efficient service execution.

Business Outcomes

Enabled faster and more reliable network-wide risk analysis, improving decision-making for bushfire mitigation.

Delivered scalable operations to support high-volume inspection programs without compromising data accuracy or turnaround timelines.

Achieved high-precision processing of 125,000+ spans, strengthening vegetation risk detection and asset visibility across the network.

As part of the ongoing annual cycle program, four complete cycles were delivered, each providing full coverage of the distributor's overhead network.

Enhanced grid safety, operational consistency, and preparedness for bushfire risk through standardized, data-driven workflows.

Why Techwave?

With over two decades of experience supporting 500+ clients across five continents, Techwave enables enterprises to turn complex business challenges into measurable outcomes. Our deep expertise across Cloud, Data, Engineering, Automation & AI, SAP, and Application Development drives scalable digital transformation initiatives.

In the utilities domain, Techwave helps modernize networks with a focus on speed, cost efficiency, risk mitigation, and regulatory compliance. Advanced capabilities in data management, LiDAR processing, and geospatial SAP integration ensure high accuracy at scale while minimizing rework. AI-driven automation and field-enabled solutions keep physical network data aligned with operational systems, reduce data inconsistencies, strengthen safety, and simplify audits, building resilient and future-ready infrastructure.

Techwave is your gateway to transformative IT and engineering expertise since 2004. With roots in Houston, Texas, we lead global businesses on digital journeys. Our services include Enterprise Solutions, Product Engineering, RPA, Advanced Analytics, AI/ML, and IoT. With 3,000+ experts across 11 countries, we're committed to innovation.

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