

DRONE INSPECTION SERVICES



ACCIONLAND
PVT LTD



Transmission line
Inspection



POWER INFRASTRUCTURE CONDITION ASSESSMENTS

We are asset inspectors that provide transmission network managers with insights into their power line and transmission tower assets to avoid risk, improve safety and save money.

Asset integrity and condition inspection and condition assessments using drones is now an essential tool for monitoring power line and transmission and distribution networks.



What we do !

- Inspect all essential components of transmission and distribution network assets.
- We can identify deteriorating and defective cross members, bolts, phase conductors, gussets, insulators, ground wires and other poor performing components – all from unique angles and a safe distance.
- Defect analysis is conducted to asset managers through detailed reports and 3D digital platforms.





Infrared Thermal Inspection

Get advanced warning of components that are at risk of failing with the use of infrared thermal cameras. Our thermal inspections can detect differential heating of components to quickly highlight components of concern.

DELIVERABLES INCLUDE : **DOCUMENTATION OF STATUS OF FOLLOWING ASSETS:**

1) Guard wire

- a) Guard wire connection with tower
- b) Wire Surface damage (Deterioration)
- c) Holding Bracket of Guard wire to tower
- d) Guard wire dampers (Healthiness to be check - Vertical alignment, Damage/missing)

2) Insulator

- a) Insulator Clamp (Conductor side/Tower side)
- b) tongue (Joints with Conductor)
- c) Grading ring (Missing/damage)
- d) Corona ring
- e) Arc Horn (Alignment/Missing/broken)
- f) L.A (Damage/Loose connection) alling

3) Jumper

- a) Jumper Joints (with conductor)
- b) Distance from tower

4) Conductor

- a) Abrasion, broken strands, conductor fretting, uneven conductor surface, Bird Caging, conductor fretting.
- b) Spacers (Damage, Connection with conductor).

5) Tower

- a) Missing Nut/bolts and member
- b) Alignment
- c) Discoloration and name plate
- d) Earthing strip
- e) Right of way (Vegetation, Unauthorized access)
- f) Arial mark/Warning sign
- g) Foundation Healthiness (concrete spro

122.2 °F



-13.5



Corridor Survey

Be confident with the state of your transmission network corridors by populating your Electric Line Clearance Management Plans with the best data possible.

Assess the growth progression of trees, identify land use changes, vandalism, and other condition metrics within the corridor with drone 3D mapping and surveying solutions. We can safely cover large lengths of corridor with high precision, categorizing high risk areas for immediate action.

Deliverables:

1. Documentation of Vegetation Encroachment and creepers Around Poles.
2. Digitization of Roads, Highways, line crossings trees and other assets located in ROW in CAD format
3. Creating map with pole attributes, Lat-Long of each pole in a .shp file format which can be imported in GIS software.
4. Mapping and Overlaying of Prepared Network Map CAD for further use
5. Orthomosaic (2D Map) of the entire network in TIFF/ECW format.
6. Point Cloud of the entire network in LAS/XYZ



HOW WE DO IT ?



OUR DATA VALUE CHAIN

DISCOVER & PLAN



Our inspection experts help you determine your measurement objectives, flight plan, and technology portfolio.

COLLECT



Credentialed drone operators—use Precision Flight to execute flights tailored to a given structure's specifications. They're assisted by project managers who guide planning and regulatory compliance.

PROCESS



Drone operators upload data into Precision Analytics Transmission to apply machine vision and identify areas of concern. Data analysts validate the findings.

ANALYZE



Stakeholders, such as Operations Directors, Maintainers, or Asset Managers, use a browser-based interface to view statistics and high-resolution imagery annotated by issue type, severity, and other key parameters.

REPORT & INTEGRATE



Field Operators reference analysis outcomes in reports or other software, such as your asset management or enterprise resource planning system. (Our developers can assist your IT team in accessing a set of standard APIs.)

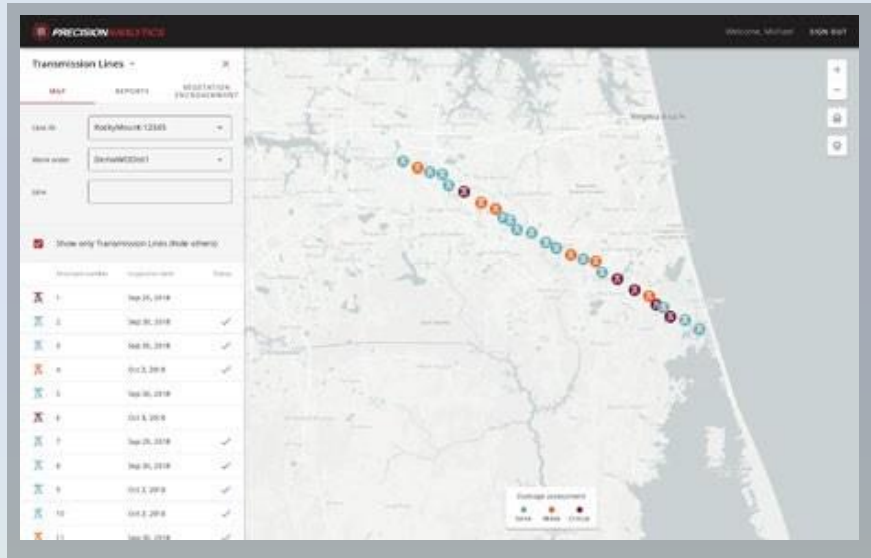


To effectively and efficiently manage the comprehensive visual inspection (CVO) process, operators need a system for navigating, annotating, and organizing transmission tower condition data—one that standardizes how their organization views its assets



That's where PrecisionAnalytics Transmission comes in.

After Digitization, the imagery that represents priority issues, is aggregated and the data could be viewed in web-based interface that's accessible from anywhere.

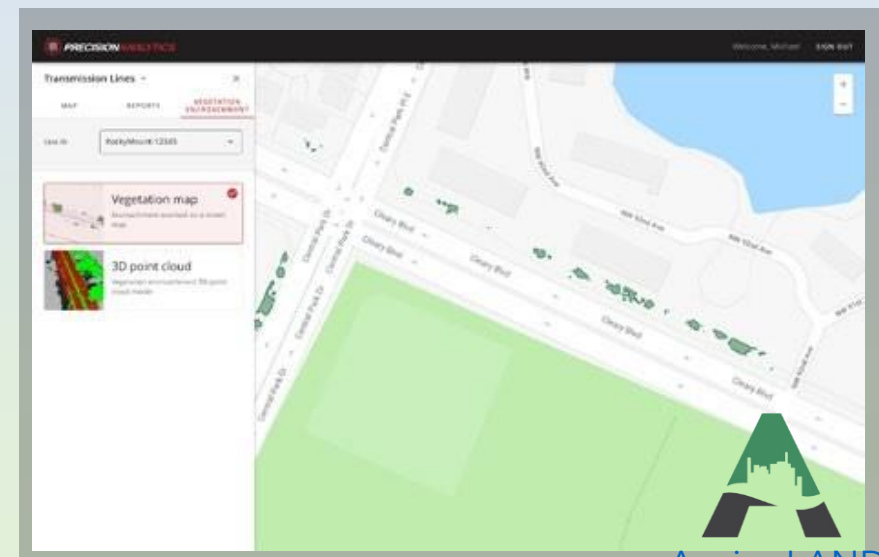


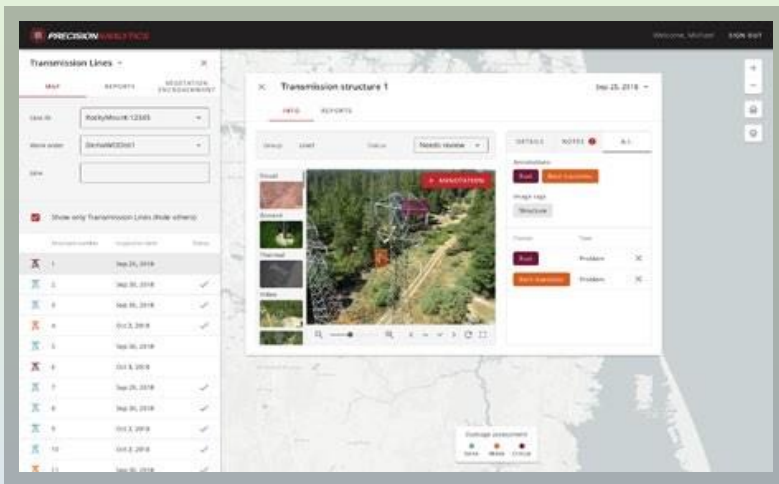
Vegetation Map—

View an encroachment map overlaid on a street map, or in a 3D point cloud model, to ensure the areas around assets are clear.

Infrastructure Statistics—

Get a comprehensive view of all your assets, including not only transmission lines but also distribution lines, wind turbines, and solar panels—either separately or all at once. Segment your health trends at the portfolio or site level: view rolled-up statistics on damage severity, issues, and other measures you identify.





Transmission Tower at-a-Glance—

Home in on problem areas, such as rust or a bent transistor. Review the overall health of transmission assets and navigate image sets using intuitive markers, color-coded for damage severity.



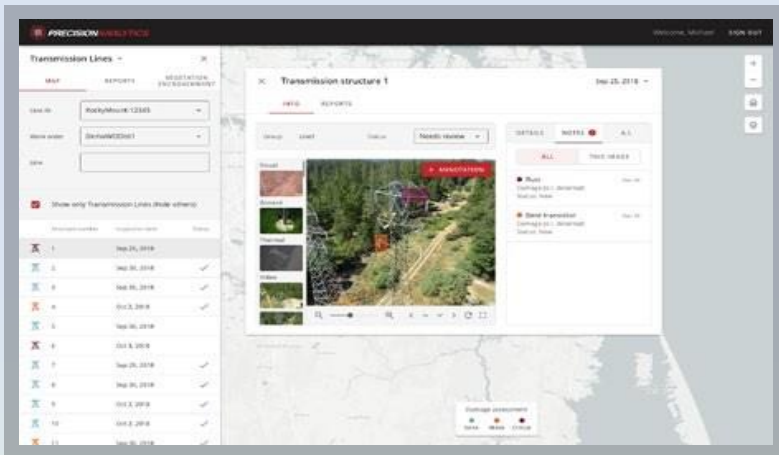
Detailed Views—

View full-resolution imagery and zoom in on key issues.



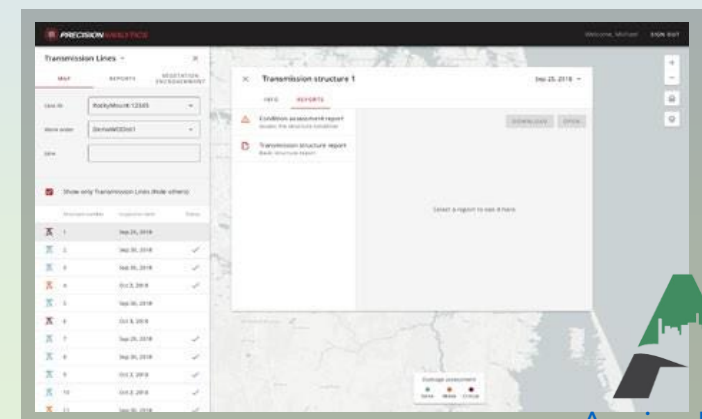
In-situ Communication—

Create and edit annotations and store metadata, such as the type of observation, your finding, the size of the issue, damage severity, and other parameters. Add comments to other stakeholders.



Historical Recordkeeping—

Investigate the genesis of an issue. View historical imagery for the same location on the tower from prior inspections to identify potential precursors to the issue at-hand.





Typical issues that analysts identify using drone-based imagery include:

- Cracked insulators
- Corrosion
- Vegetation
- Structural issues
- Missing and backed-out cotter pins

Our team of data analysts can produce these annotations or we can leave it up to you.

CRACKED INSULATOR



LEANING STRUCTURE



Overall, your newfound insight will power improved asset management.



Overall, your newfound insight will power improved asset management.

VEGETATION CONCERNS



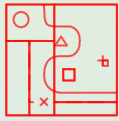
MISSING COTTER KEY



In short, **our team shall streamline your asset management cycle into a single, intuitive system.** Stakeholders across your organization will gain greater insight into the health of your assets, you can use our Analytic Utilities to identify hard-to-find maintenance issues—before they degrade performance or cause a critical failure—and trend data will surface problematic components or areas.



OUR COMMITMENTS ARE OUR VALUES



Mission Requirements

Understand the assets and area of interest to be inspected, and the specific requirements of the mission.



Mission Readiness

Complete a rigorous training program for the complete mission lifecycle, from analyzing airspace around transmission towers to managing unusual asset configurations and weather patterns.



Procedure

Follow flight standards, a comprehensive mission checklist, safety management systems, and incident protocols.



Regulatory Compliance

Comply with guidelines, designed by our policy analysts, to limit regulatory exposure.



Quality Assurance

Verify that the data meets quality requirements using ground truthing techniques; identify anomalies, omissions, and other issues prior to delivery.



Data Secure Chain of Custody

Protect mission data by following secure transportation, transmission, and destruction protocols.



Continuous Improvement

Engage in a continuous improvement plan, reporting lessons learned and applying them to future operations.

Outsourcing vs. Insourcing (or Both)



Who should collect data about your assets' health? That depends on your requirements, timeline, budget, and appetite for risk. While the discussion of these variables—and how they might change your staffing plan—are beyond the scope of this brief, here are three common strategies to consider:

DESCRIPTION

OUTSOURCE

In this approach team—collects data, managing the drone deployment end-to-end.

HYBRID

A hybrid strategy involves establishing a staff of drone operators and augmenting that staff with third-party providers when needed. Typically, on-staff operators are allocated to high-value or complex inspection tasks, while outsourced flight operators are relegated to routine or one-off missions, such as emergency response or pre-operation/ commissioning inspections.

INSOURCE

When you insource your drone operations, you do it all. You'll likely need to engage a third party to assist you in developing and maintaining a program strategy and training staff.

BENEFITS

The benefits of this approach are that you will:

Save on costs and resources required for drone operations, including staffing, training, equipment investment and management, and regulatory compliance
Shield your business from the nominal risk of aircraft incidents
Procure services as needed

Using this strategy, you get many of the benefits of outsourcing and you can focus your staff on critical missions.

The main benefit of this approach is that you can cross-train existing staff. The staff that deploy ground teams or aerial lifts can opt for a drone when applicable. Also, you can capitalize some costs associated with program startup and maintenance (such as equipment costs).

DRAWBACKS

Benefit from state-of-the-art innovations in drone technology
Respond to calls for flights in as little as 24 hours
Scale to meet gradual increases or spikes in demand

A drawback of this approach is that your inspection operations are segmented from your maintenance operations. (For example, when maintainers fly, they can conduct immediate spot maintenance.) Also, your costs are entirely operational.

However, the drawback of this plan is that your program will incur many of the same startup costs and labor—such as equipment procurement, regulatory filings, and program development—associated with fully insourcing drone operations. And though manageable, you'll need to coordinate missions between internal and external resources.

However, this method requires a greater up-front investment of your time, capital, and labor, and exposes your program to aerospace regulatory and safety risks. Not to mention, you'll need to stay apprised of changes in technology and regulations- if you want to deploy a drone solution at scale.



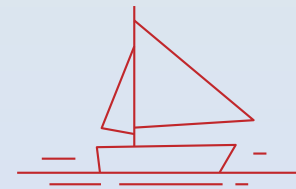
TRANSMISSION TOWERS UNDER STRESS

Electrical transmission towers are expected to operate in terrains that often face harsh weather. While the galvanized steel of towers in rural or desert locations can last up to 50 years, salty coastal air or heavy industrial environments can cause a transmission tower to accelerate through the corrosion phases that lead to failure in as little as 15 years ¹.



Steel transmission towers
in rural or desert environments last:

50 yrs



Steel transmission towers
in coastal or industrial environments last:

15 yrs

Depending on how many towers a utility has, neglecting to repair structures before they reach the second and third stages of corrosion **can cost utilities anywhere from ₹98cr to ₹171 cr overall** ¹.

In addition, design and manufacturing defects and installation problems need to be identified early to avoid catastrophic failure, asset damage, and injury.

¹ <https://www.utilityproducts.com/articles/print/volume-8/issue-1/product-focus/td/transmission-tower-maintenance.html>

Beyond the problems with the inspection itself, lackluster data and recordkeeping can impair maintenance efforts. If inspection data isn't standardized and stored properly, asset managers can experience difficulties predicting failures, identifying problematic components system-wide, and conducting other critical analyses.

STRENGTHENING ASSET MANAGEMENT WITH DRONE-BASED AERIAL INTELLIGENCE



To overcome the challenges associated with traditional comprehensive visual inspection (CVI) methods, We provide a drone-based transmission tower management solution that includes data collection, processing, and reporting in a streamlined solution.

The resulting reports can be referenced directly to resolve issues, or it can be incorporated into asset management or enterprise resource systems to automatically prescribe action.

The result:

- ☐ Less downtime due to unforeseen damage
- ☐ Higher accuracy and higher margin of safety
- ☐ A 28% reduction in inspection costs
- ☐ Faster fixes to issues and greater production per tower

In sum, utilities get more efficiency out of their resources—not to mention safer conditions for their staff.

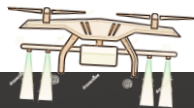
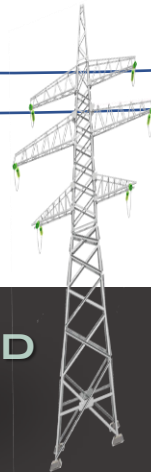


**HIGHER
ACCURACY**

Drone-based CVIs uncover 42% more areas of concern (AOC) than ground-based and helicopter-based inspections can uncover.



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