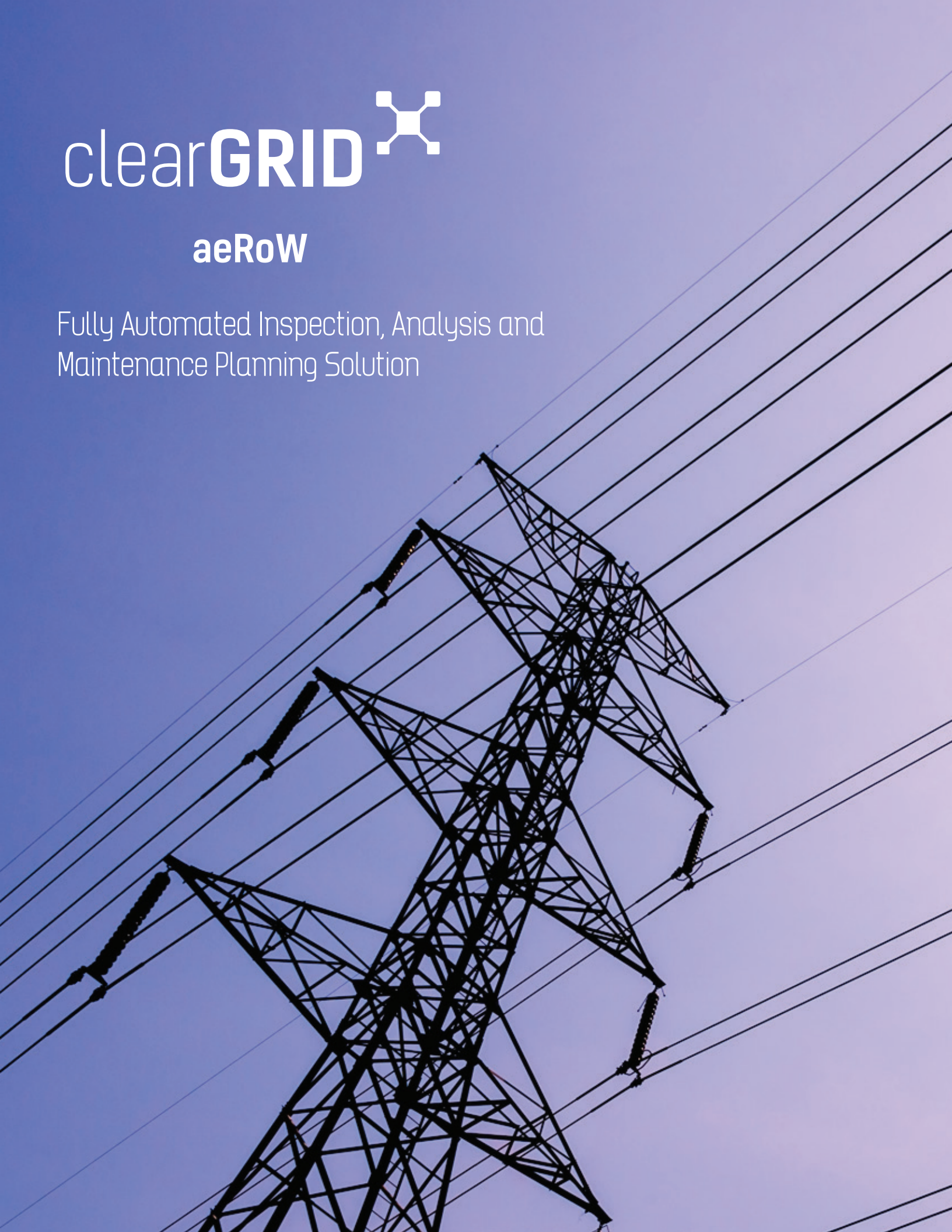# clearGRID

aeRoW

Fully Automated Inspection, Analysis and
Maintenance Planning Solution

Introduction

Diligent and efficient maintenance of right-of-way infrastructure is critical to the utility industries. Operators spend billions of dollars per year on maintenance, yet the industry still suffers from leaks, unplanned outages, safety issues, and fires. clearGRID is meeting that challenge head on, by bringing the best technology for right-of-way management to the market.

Our right-of-way management solution captures vegetation & component information, identifies critical asset conditions and addresses them in a maintenance plan optimized for your business objectives.

clearGRID offers a comprehensive, turn-key solution, that is easy to implement, cost effective, and quick to show results. Our technology stack combines long distance automated inspection using LiDAR, UV, IR, Multispectral & High Res Image & Video. Fully automated analysis, optimization, and maintenance planning software, deliver a new era of cost savings and operational efficiencies to utility operators.

clearGRID moves Operators from to reactive to proactive operations

Our goal is to help operators move beyond manual inspection methods, ad-hoc analysis, and spreadsheet planning, by integrating best in class technology foreach component of inspection,analysis and maintenance planning:

1

Field data capture
Best platform for use case & full stack sensors

2

Cloud Analytics
World class software ACCA (Automatic Corridor Clearance Analysis)

3

Cloud Optimization
Optimization engine automatically creates prioritized plan

4

Could Storage & Sharing
Create, store & share prioritized maintenance plan

5

Integration
Generate work orders and custom integration into existing practices

Field data capture is the **first** priority in order to truly optimize work, and the first step is to enable **frequent intelligence gathering** at a low enough cost that all ROW's can be inspected in the correct inspection cycle at very high resolution, thereby identifying and addressing grid and pipeline problems in an optimized plan. clearGRID uses a low cost, ultra high resolution solution, getting operators ahead of the curve. Vegetation and component information are collected automatically: we capture LiDAR (approx300pts/m2), high-resolution imagery, video, multispectral, UV, IR and thermal.
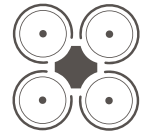
Secondly, most companies are already drowning in data, so unless management and analysis of that data is automated, it is potentially useless. The solution is not simply more data. clearGRID addresses this head on with ACCA (**Automatic Corridor Clearance Analysis**) and 3-D modeling of the right-of-way. We identify "critical" asset conditions and provide visualization of hot spots in easy to view digital form, accessible to all groups in the company, anytime, anywhere. Our cloud service solves the data management & access problems that prevent companies from getting value from their data collection efforts. We eliminate issues around where inspection images are stored, where LiDAR models are located, and who can access them.

Third, to truly drive a new paradigm of preventative maintenance, a solution must provide a robust methodology to **optimize** timing, importance, risk and other business constraints that are unique and customizable for each operator. We then create work plans, laying out where and when to deploy people and equipment, to get the highest return on capital, allowing the operator to covey that information quickly and easily to field staff.

clearGRID's technology stack

clearGRID's automated inspection, analysis and planning product is based on the use of automated analysis of the collected data and automated generation of optimized maintenance plans, in a modern easy to use interface.
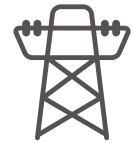
Aerial Platform
Fixed wing / UAV

Sensors
LiDAR / IMU / Cameras
· Proprietary Integration
· Lightweight
· Cost-effective
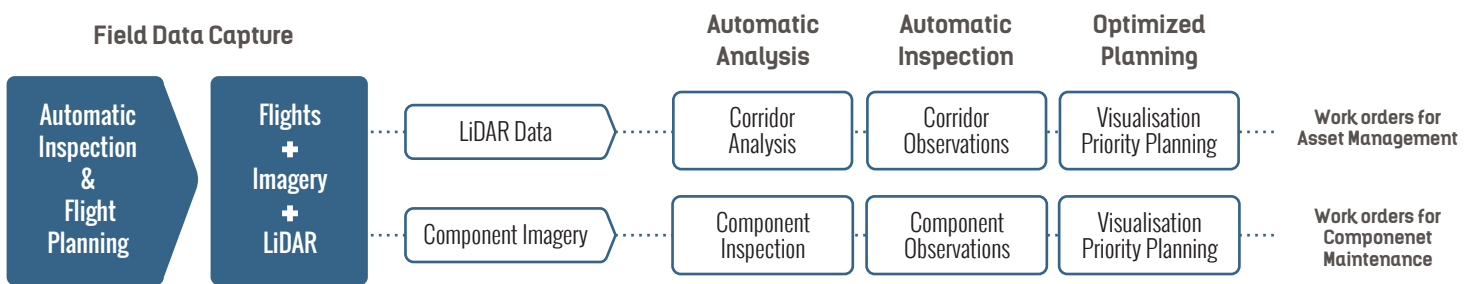
Multi Sensor Aquisition

Assests to inspect

CLOUD

Cloud-based Analysis and Planning

Environment 3D Modelling

Automatic Analysis

Reporting / Maintenance Plans

CLOUD

Maintenance Plans

Field Data Capture

Automatic Analysis

Automatic Inspection

Optimized Planning

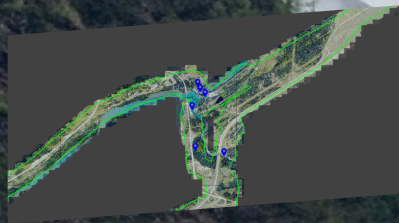| Automatic Inspection & Flight Planning | Flights + Imagery + LiDAR | | LiDAR Data | | Corridor Analysis | Corridor Observations | Visualisation Priority Planning | **Work orders for Asset Management** |
| | | | Component Imagery | | Component Inspection | Component Observations | Visualisation Priority Planning | **Work orders for Componenet Maintenance** |

Here's how it works

1. **Field Data Capture:** We capture infrastructure and ROW information from aerial inspections combining LiDAR, imagery and video, at a lower cost than has ever been possible.

2. **Next Generation Analytics:** We build a 3-D model of the infrastructure and ROW to identify "hot spots" or areas require maintenance.

3. **Prioritized Maintenance Plan:** Our software prioritizes "hotspots", ranking and grouping them into work plans based the clients business objectives, ensuring resources are focused on the highest return projects.
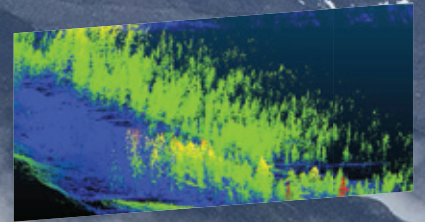
4. **Delivery** of plans and work orders

Automated Aerial Survey
Capturing the raw data from the field - LiDAR + Images + Video.

Digitizing of the physical ROW into an object model
Understanding exact location, condition and form of each infrastructure component - vegetation, pylons, line, components.

Vegetation analysis
Automatic analysis to identify the hotspots and priorities for vegetation management.

Component analysis

Automatic analysis to identify hotspots and priorities for component maintenance and replacement.

Prioritization and optimization of work plans

Provides the insight for maintenance to be directed to where it can yield highest return, and ensures legal and regulatory compliance.

Managing and storing the information on condition, observations, hotspots and plans

to ensure the data is accessible and usable for actual maintenance work execution, future analysis and reporting.

clearGRID's
solution is a full technology stack
combining automated inspection,
LiDAR & multiple sensors, fully
automated analysis and
optimization, and maintenance
planning software

clearGRID: Cutting through the noise in maintenance planning

Characteristics	Field Visual Inpection Companies	Helicopter Visual Inspection Companies	Helicopter LiDAR Inspection Companies	clearGRID	Competitive Advantages
Inspection Delivery Time	Years	Months	Months	**Weeks**	Automated VS. visual analysis
Production Cost	Very High	Medium	High	**Low**	Fixed wing VS. helicopter cost Automated VS. manual analysis
Actionable Plans	No	No	No	**Yes**	Only solution including maintenance plans generation
Accuracy of results	Varying	Varying	Varying	**Consistent**	Automatic analysis is not subject to visual interpretation
Reactiveness	Very High	Medium	Low	**High**	Availability of fleet (lower CAPEX than helicopters)
Throughput	Very Low	Medium	Low	**High**	Very scalable fleets (lower CAPEX requirements

About Us

Sustainable, Reliable, Repeatable

clearGRID is a North American technology company serving the utility industry. We specialize in aerial data collection and analysis for the gas, water and electric industries.

Our Values

Safety is the Highest Priority - clearGRID has years of experience working with aviation regulators to develop emerging industries with the highest standards. clearGRID is focused on using technology to change the way aerial data collection is done: no more multitasking and distractions for pilots!

We Value You - The value of solving problems from the ground up starts with strong utility partnerships in the very beginning. That's why this solution is built for utilities by utilities. We encourage feedback from clients to constantly improve services.

Best in Class Technology - The value of the right tools for the right job cannot be emphasized enough. In this case, the right tools (platform, software, control systems) greatly enhance the safety, efficiency and reliability of the solution. clearGRID's team has over 10,000 hours of in-the-air experience with aerial data collection and are setting the standard in using the technology to get things done right.

Contact clearGRID to schedule a face-to-face meeting or a Pilot Project.

Ellen Christopherson, CEO

ellen.christopherson@cleargrid.io
844-402-5327 x110