LiveEO

The Future of Vegetation Monitoring and Analysis Is Satellite-Based

Lineside vegetation can become a substantial safety hazard if not proactively managed, and for a number of reasons.

Firstly, overgrown vegetation can reduce visibility at rail crossings and obstruct signals, increasing the potential risk of a collision. This was sadly the cause of several train crashes at the Rosedale railroad crossing in the US, including one that triggered a chemical explosion, as well as a collision **between a train and rubbish collection truck in Kawerau, New Zealand, in 2017**, which led to the death of the truck's driver.

Then there's the issue of dry vegetation near tracks, which has a higher risk of igniting from wheel sparks or maintenance works. This is more of an issue than ever before due to the rise in heatwave temperatures and regularity, which has led to an exponential growth in wildfires.

We also can't overlook the problems caused by leaves accumulating on tracks, which affects train traction. Considered a joke by many passengers, the reality is that **leaves on the track can lead to incidents such as the Salisbury Tunnel Junction collision, which injured 14 people and caused substantial damage to the train and railway infrastructure.**

The list of risks from overgrown vegetation goes on; overhanging branches can weaken or damage rail infrastructure, unhealthy trees could fall on tracks during storms, roots can damage ballast and trackbeds, and vegetation can interfere with proper drainage of track beds, leading to premature decaying of materials.

These issues are all real, as shown by Network Rail, which **reported** that 400 trains – 34% of rolling stock – were damaged in vegetation-related incidents in 2018, and that these types of occurrence cost the railway upwards of 100 million GBP a year.

Limitations of Ground-Based Vegetation Monitoring

All infrastructure managers and owners undertake monitoring and assessment; however, this is most often ground-based, which has its limitations. Time-consuming and labour-intensive, it also causes safety risks of its own, as you're sending employees trackside.

With ground-based monitoring, field inspections usually take place at predetermined intervals. The problem with this cycle-based approach is that it doesn't take into consideration the changing environment and vegetation conditions.

Risks that come up between clearing cycles may not be addressed for a long time – especially in the case of large of large-scale networks like Deutsche Bahn's (34,000 kilometres) or Network Rail's (16,000 kilometres), leaving a greater probability of vegetation related incidents.

What's the Solution?

At LiveEO, we believe the solution lies with satellite imagery analysis. Satellite data provides a large-scale view of the state of lineside vegetation, enabling comprehensive monitoring and assessment of vegetation risks over large areas, including the most remote or inaccessible parts of a network.

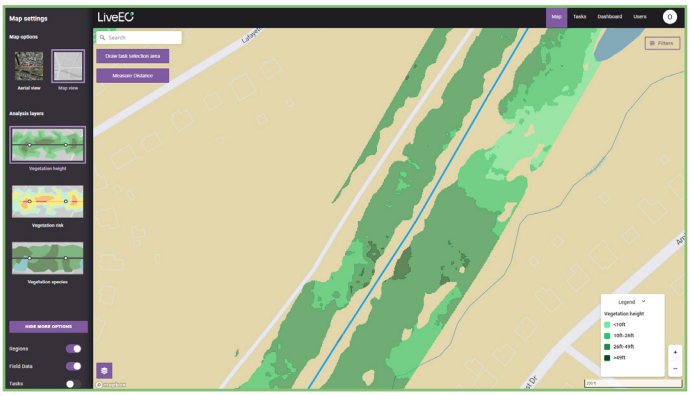
Satellite data is also regularly updated, meaning you can get up-to-date information on vegetation conditions, enabling you to **respond to issues as they arise** – very important **when extreme weather events occur and speed can be of the essence**.

It can also enable targeted interventions, which not only optimise resource allocation and improve cost efficiency but also promote environmental protection and conservation: a key focus for many rail companies today.

LiveEO's Vegetation Management Insight (VMi) Suite

LiveEO's Vegetation Management Insight (VMi) Suite uses cutting edge AI to identify potential threats using data gathered from advanced Earth observation satellites.

A variety of parameters can be set to improve risk clarification including, but not limited to, distance from track, tree height and health and even species. From here the system generates risk assessment reports and actionable insights. These are directly accessible via web and mobile app, which also doubles as an advanced work assignment and management



Vegetation next to railway tracks in the LiveEO web application

platform where managers, contractors and inspectors can work collaboratively.

The solution has been proven to help lower vegetation-related service disruptions by 15%, but that's not all. It also supports efficiency and cost savings, as it's been shown to lower contractor spend by 20% and inspection cost by 66% per kilometre.

Already Supporting the Rail Sector

LiveEO is already working with several key companies in the rail sector including **Deutsche Bahn** (DB), SNCF and ADIF. Proof of concept trials are either underway or have been completed, and in the case of DB, LiveEO has now rolled its solution out across the entire network.

If you'd like to learn more about LiveEO's VMi Suite, or book a demo, please visit **live-eo.com/vmi**.

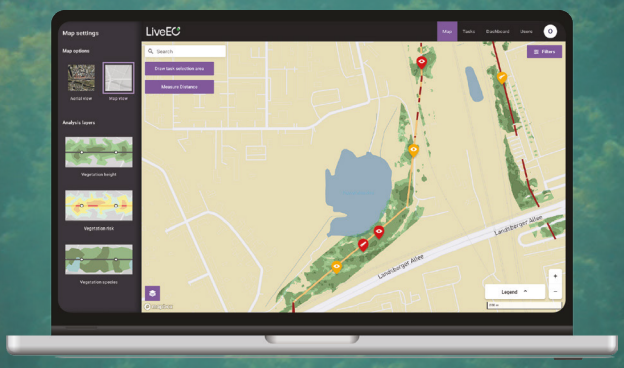
LiveEO's Vegetation Management Insight (VMi) Suite offers:

- Unlimited scalability
- High-frequency updates
- Comprehensive data and analytics
- Accessibility in the form of an intuitive web and mobile app

LiveEO

Keep the Trees in Check. Prevent Disruptions.

AI Vegetation Intelligence, based on Satellite Data.



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