Plowman Craven

THE FUTURE OF RAIL SURVEYING

VOGEL R3D

KEY BENEFITS OF VOGEL R3D

- **Less Risk** - removes need to physically access tracks
- **Less Cost** - reduces expense of possessions & line blocks
- **Less Time** - shorter programmes with rapid data capture
- **More Speed** - rapid mobilisation, no waiting for possessions
- **More Value** - enhanced deliverables to supplement surveys
- **More Accuracy** - proven to deliver sub-5mm accuracy

ACCURACY, SAFETY & EFFICIENCY

A revolutionary new service from the surveying experts at Plowman Craven, **Vogel R3D** is a unique, UAV-based system that enables the **comprehensive surveying** of rail infrastructure to a sub-5mm accuracy in a fraction of the time of a traditional survey.

Able to cover even the busiest and most inaccessible areas of the rail network from a working height of 25m, Vogel R3D can capture data from a **position of safety** even during traffic hours, removing the need for possessions and line blocks, and drastically reducing the exposure of workers to risk. The result is a **shortening of programme times** and **significant cost savings**.

Developed from years of expertise in laser scanning and photogrammetry, and underpinned by robust survey principles, this ground-breaking system uses a state-of-the-art **UAV platform** and 100-megapixel camera to capture overlapping aerial images of an entire site.

Bespoke workflows and software algorithms are then used to convert the imagery into 3D data – to an accuracy that is **superior to any other method** of data capture, including even static laser scanning and train or trolley-based kinematic scanning systems.

> *"The application of the Vogel R3D system is a real **game-changer for Network Rail** and helps us to satisfy many of our survey requirements in a safe manner without the cost implications or potential programme delays associated with multiple possessions."*
>
> ***Chris Preston***
> ***Senior Engineer, Network Rail***

Full Footprint

Medium Zoom

High Zoom

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DATA BACKED

Trials have been undertaken to prove the accuracy of Vogel R3D and compare the data to traditional survey techniques. Plowman Craven's Vogel R3D meets Network Rail's Band 1 accuracy requirements and is suitable for track alignment and topographic survey at all GRIP stages.

Comparison to Amberg GRP1000 Track Alignment Survey				
	Left Rail		Right Rail	
	Lift (Δ height)	Slue (Δ plan)	Lift (Δ height)	Slue (Δ plan)
Mean	0.001	-0.002	-0.0001	-0.0013
Standard Deviation	0.0028	0.0013	0.0022	0.0021
RMSE	0.0029	0.0024	0.0021	0.0025

Comparison to Independent Check Points				
	Difference			
	Δ X	Δ Y	Δ Z	Δ 3D
Mean	0.0007	-0.0001	0.0002	0.003
Standard Deviation	0.0014	0.0014	0.003	0.0022
RMSE	0.0016	0.0014	0.003	0.0037

State-of-the-art UAV platform with a range of safety features

SAFETY, TRUST & EXPERIENCE

With enhanced flying permissions from the Civil Aviation Authority and five-star RISQS rating, Plowman Craven is already an industry-leader in the provision of Rail survey data. The Vogel R3D system has been trialled by Network Rail and survey accuracy results approved. Contact us today to find out how we can help on your next project.

About Plowman Craven

Plowman Craven provides integrated measurement and consultancy services to the property and infrastructure markets, pioneering the use of technical innovation to deliver proven expertise and trusted results throughout the project lifecycle.

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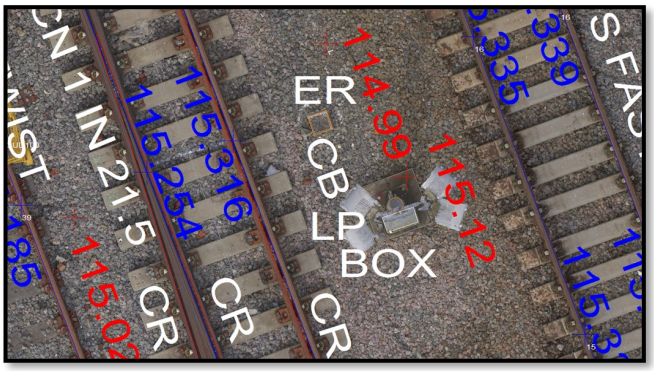
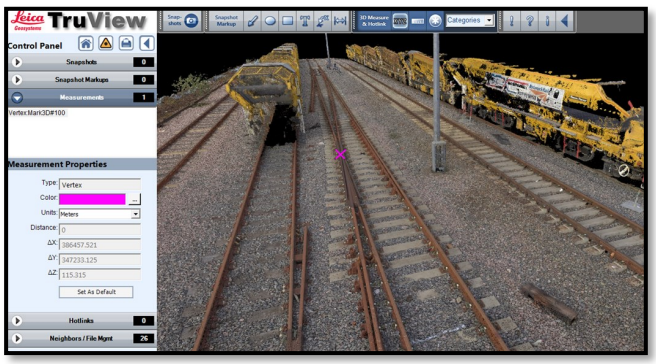
ENHANCED DELIVERABLES

- Track alignments for P-way design
- Topographical surveys
- 3D Point Clouds
- Building Information Models
- Orthophotos
- High-res imagery for asset inspections
- Site visualisations & TruView

High-res imagery captured even during traffic hours



Topographical survey data overlaid on point cloud



Interactive TruView software

Civil Aviation Authority

RISQS RAILWAY INDUSTRY SUPPLIER QUALIFICATION SCHEME VERIFIED

RICS