

# MAXIMISING THE POSSESSION WINDOW

Robotic Solutions for Restricted Access Rail Infrastructure in Control Period 7 (CP7)

RAIL & INFRASTRUCTURE REPORT

JANUARY 2026

EXECUTIVE SUMMARY

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## The "Boots on Ballast" Challenge

Control Period 7 (CP7) presents Network Rail and its supply chain with a dual challenge: deliver increased asset resilience against a backdrop of extreme weather events, while aggressively reducing workforce exposure to live risks. The mandate from the **Safety Task Force** is clear: remove boots from ballast wherever technology permits.

Traditional inspection methods for Culverts and Under-Track Crossings (UTXs) are becoming operationally unsustainable. Manual confined space entry requires lengthy possessions, extensive safety crews (standby rescue), and exposes operatives to high-risk environments.

This whitepaper demonstrates how Civil Connect's fleet of **Robotic Crawlers and Inspection Drones** solves this paradox. By deploying remote technology, we can inspect critical drainage assets with 100% data capture and zero human entry, maximizing the efficiency of every possession window.

### CP7 EFFICIENCY TARGET:

Network Rail aims to reduce track access time by 15% whilst increasing inspection output. Only robotics can bridge this productivity gap.

Zero

CONFINED SPACE ENTRIES

4x

INSPECTION SPEED VS MANUAL

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THE REGULATORY LANDSCAPE

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## 01. The CP7 Safety Imperative

Following the tragedy at Margam and the subsequent Office of Rail and Road (ORR) notices, Network Rail's "Safety Task Force" has fundamentally altered the rules of track access. The hierarchy of risk control now heavily favours elimination over mitigation.

### The ALARP Principle in Practice

If a culvert can be inspected by a robot, putting a human inside it is no longer "As Low As Reasonably Practicable" (ALARP). It is an unnecessary risk.

### The Operational Cost of Manual Entry:

- **Possession Overruns:** Setting up tripods, winches, and gas monitoring takes valuable time. A slight delay in setup can lead to possession overruns, incurring massive Schedule 8 penalties.
- **Human Limitations:** A surveyor in a 600mm culvert is focused on survival, not data. They cannot carry LIDAR scanners or high-powered lighting arrays, leading to sub-optimal data capture.

### The Robotic Alternative:

Civil Connect removes the human from the hazard. Our operatives set up in a safe zone (cess or green zone) and deploy the crawler. Setup time is reduced from 2 hours to 20 minutes.

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ROBOTIC CAPABILITIES

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## 02. The Technology Suite

Civil Connect deploys a tiered robotic capability designed specifically for the restricted access environment of the railway.

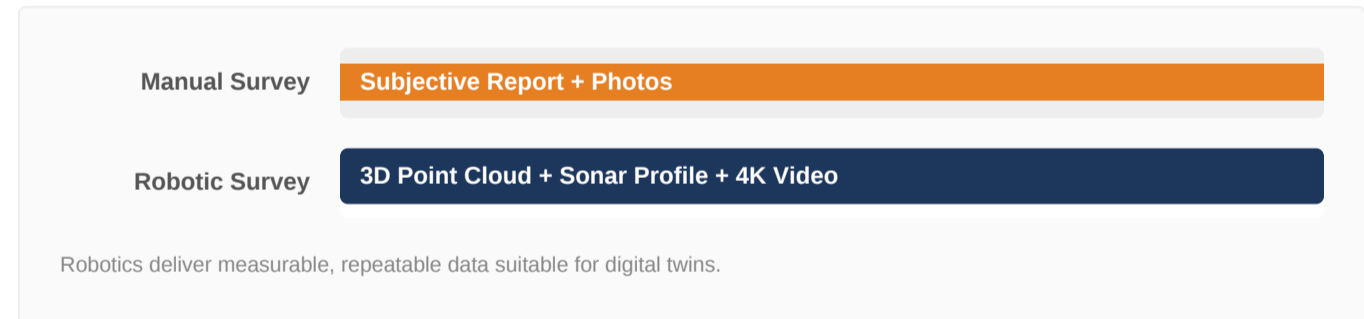
### ATEX-Rated Crawlers

For UTXs and long culverts. Equipped with multi-beam Sonar (for silt levels) and HD Pan/Tilt/Zoom cameras. Capable of traversing debris and heavy silt loads up to 500m tether length.

### Confined Space Drones

For vertical shafts and large-diameter brick culverts with difficult access. Cage-protected drones utilize LIDAR to build 3D point clouds of the structural condition without anyone stepping on the track.

### Data Density Comparison



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OPERATIONAL VALUE

05

## 03. Strategic Benefits for Route Directors

Adopting robotic inspection is not just a safety decision; it is a commercial multiplier for CP7 delivery.

4:1

INSPECTIONS PER SHIFT

-60%

COST PER ASSET SURVEYED

### 1. Maximising the Window:

In a standard 4-hour maintenance possession, a manual team might inspect 1 complex culvert. A robotic team, requiring minimal setup and no "breathing apparatus" protocols, can inspect 3 to 4 assets in the same window. This effectively quadruples the productivity of the possession.

### 2. Digital Twin Readiness:

Network Rail's "Intelligent Infrastructure" program requires data. A handwritten report from a surveyor is "dead data." A LIDAR scan from a drone is "live data" that can be integrated into the Ellipse asset database, allowing for predictive failure modelling of embankments and track drainage.

## 04. Conclusion

The days of sending humans into dark, dangerous pipes under live railways are numbered. Civil Connect provides the technology to close that chapter.

By partnering with an Agile Tier 1 equipped with robotic fleets, Route Directors can meet their CP7 efficiency targets while satisfying the Safety Task Force's most critical demand: getting boots off the ballast.

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## CIVIL CONNECT

### Secure Your Network.

Reduce risk, maximize possessions, and deliver CP7 efficiency with robotic inspection.

#### Audit Your High-Risk Assets

Contact our Rail Division to discuss a pilot robotic survey for your route.

Contact Rail Team

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References:

- [1] Network Rail (2024). Safety Task Force: 10 Point Plan.
- [2] ORR (2023). Annual Report of Health and Safety on Britain's Railways.
- [3] Network Rail (2024). CP7 Strategic Business Plan.