

MINING & RESOURCE EFFICIENCY

Predict haul-truck breakdowns before they stop production

Mining operator • Midlands



Flag failing haul-truck components early enough to schedule repairs before they cause unplanned downtime.

POSTED BY	Mining operator • Midlands	PILOT BUDGET	US\$20,000
LOCATION	Midlands Province (site visits available)	APPLICATIONS CLOSE	15 Dec 2026
SUB-THEME	Mining & Resource Efficiency	TEAM SIZE	2-6 people

1 The problem

Background

The operator runs a fleet of 18 rigid haul trucks at an open-pit mine in the Midlands, most of them more than 12 years old. Maintenance is mostly reactive: trucks are repaired after they fail, often far from the workshop.

What's going wrong

A breakdown takes a truck out of the haul cycle for two to five days and leaves loading equipment idle. The maintenance team already logs engine hours, oil analysis results and fault codes, but the data sits in spreadsheets and nobody has time to look for patterns.

2 What we need

A strong solution will:

- ✓ Predict likely component failures (engine, transmission, final drives, tyres) at least 7 days ahead.
- ✓ Use the data the mine already collects, adding low-cost sensors only where they clearly pay off.
- ✓ Give the maintenance planner a simple weekly view of which trucks are at risk.
- ✓ Run on site with patchy connectivity.

Constraints

- Must work offline and sync when the connection returns.
- No changes to manufacturer control systems without their approval.
- Any hardware must be rated for dust and heavy vibration.

3 Deliverables

By forum week, matched teams are expected to bring:

- 01** A working prototype tested on the historical fleet data.
- 02** A short report on prediction accuracy and false alarms.
- 03** A costed plan for a three-month pilot on four trucks.
- 04** A seven-minute pitch for forum week.

4 How teams are evaluated

Applications and final pitches are scored by the challenge owner and the ZBIF secretariat.

CRITERION	WHAT WE LOOK AT	WEIGHT
Fit to the problem	Does it solve the problem as the challenge owner describes it?	30%
Technical feasibility	Can the team build and run it with the resources available?	25%
Cost and scalability	Is it affordable to pilot, and to roll out if the pilot works?	20%
Team capability	Does the team have the skills and time to deliver?	15%
Local impact	Jobs, skills or value it keeps in Zimbabwe.	10%

Who can apply

- ✓ A registered ZBIF innovator account: innovators, consultancies, technologists, university teams or freelancers.
- ✓ At least one team member based in Zimbabwe.
- ✓ Able to attend forum week in Bulawayo on 27–28 April 2027 if shortlisted.
- ✓ IP ownership and pilot terms are agreed between your team and the challenge owner in the Deal Room.

5 Timeline

28 Sep 2026	Challenge posted
15 Dec 2026	Applications close
Within 3 weeks	Matching results sent to teams and the challenge owner
Until mid-April 2027	Build phase, with mentor and challenge-owner check-ins
27–28 Apr 2027	Live pitch and Deal Rooms at forum week, Bulawayo

6 Data and resources

Shared with matched teams after signing a simple data-use agreement.

Maintenance logs and fault codes, 2023–2026	Spreadsheet, anonymised
Oil analysis reports for the current fleet	PDF reports
Site visit for matched teams	By arrangement
Maintenance engineer as point of contact	Weekly check-in

7 How to apply

- 01** Create a free innovator account at **zbif.bulconsultancy.com**, or sign in.
- 02** Open this challenge (ref ZB-101) and press **Apply**.
- 03** Tell us your team name, size and how you would solve the problem. Applications close on **15 Dec 2026**.

Questions about the brief can be asked from the challenge page. Answers are shared with every applicant.