

# Real-time driver safety monitoring and incident management for the mining industry

GRAND PRIX

IOT PROJECT OF THE YEAR 2024

This project won the Grand Prix at the IoT project of the year 2024 contest. Explore the article and [learn more about all the winners.](#)

## Challenge

Ruvuma Coal, a leading mining company in Tanzania, was already using basic telematics, but as their fleet grew beyond 200 trucks, they needed a powerful driver safety monitoring system to reduce accidents often caused by driver negligence.

To meet this request, our partner Afritrack developed TrackRRM. This is a fleet management solution for the mining industry that brings together driver behavior data from different sources. Wialon, [an ultimate fleet management platform](#), sits at the core of the system.

The system detects unsafe driving and sends alerts to both the dispatcher and the driver allowing them to correct their behavior right away. This reduces accidents in the short term and builds a safer driving culture in the long term.

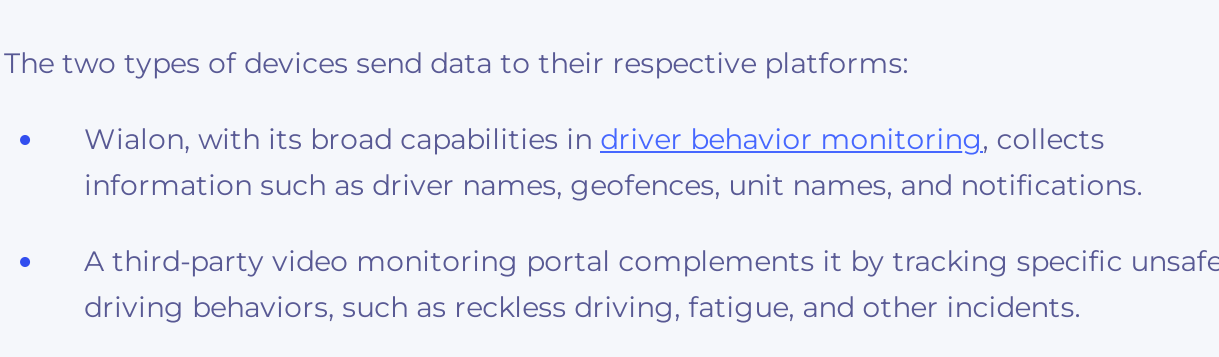
## Solution

### Hardware

TrackRRM uses two main device types for driver safety monitoring:

- Teltonika FMB920 trackers. This is a best-selling model used for tracking driving behavior, fuel consumption, and other use cases.
- Streamax ADPlus 2.0 AI dashcams. These cameras come with built-in speakers that warn drivers of risky behavior in real-time. They also send instant alerts to drivers, upload data for training, and provide live video playback.

This combination gives a complete view of driver behavior inside the cabin and on the road ahead.

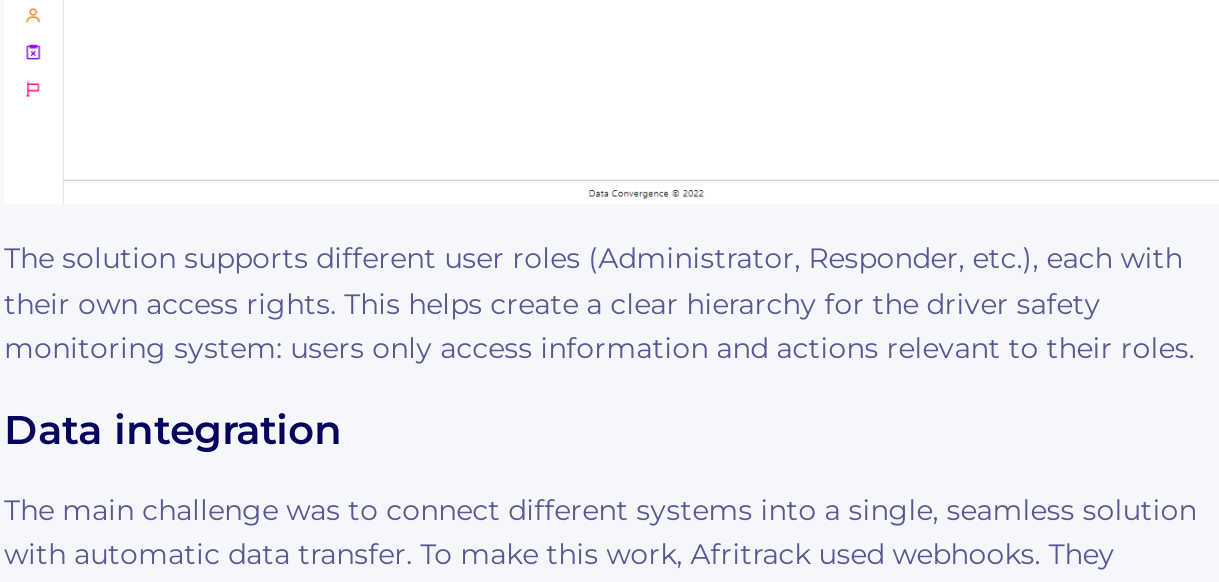


### Software

The two types of devices send data to their respective platforms:

- Wialon, with its broad capabilities in [driver behavior monitoring](#), collects information such as driver names, geofences, unit names, and notifications.
- A third-party video monitoring portal complements it by tracking specific unsafe driving behaviors, such as reckless driving, fatigue, and other incidents.

As part of fleet accident management services, TrackRRM integrates both platforms into a single unified interface. It combines data from Wialon and the video portal into one easy-to-use interface. This way, users can see each driver's performance along with relevant driving alerts.



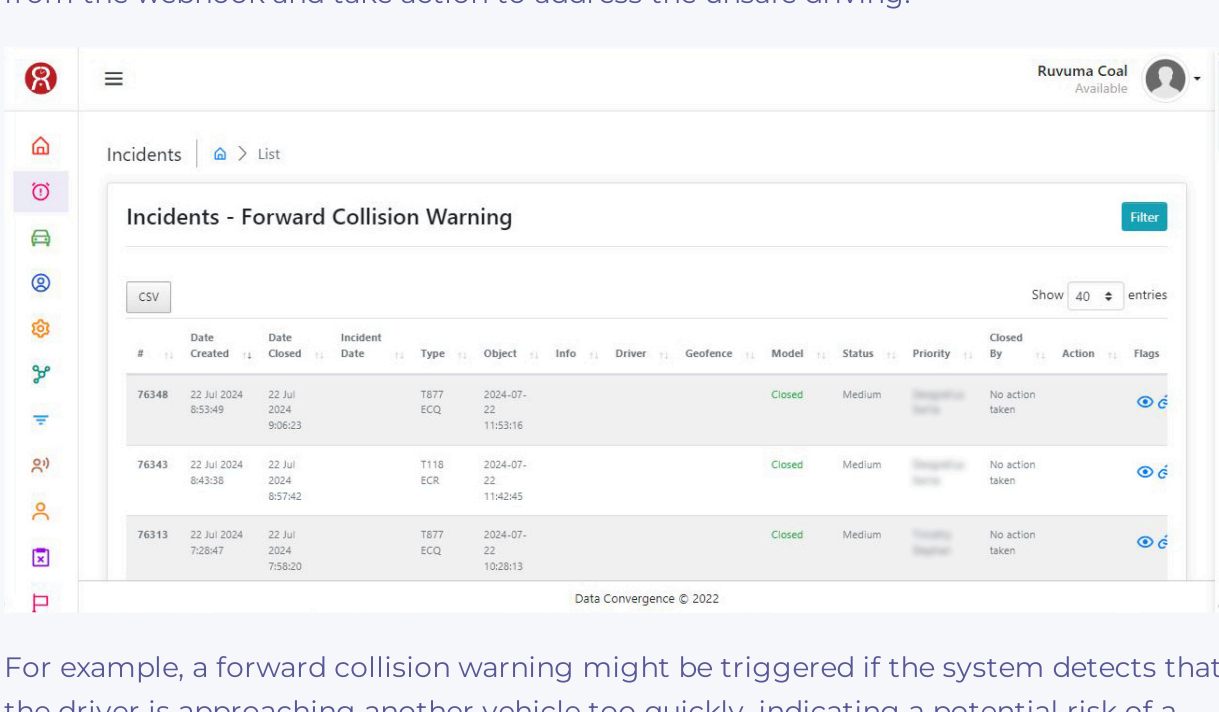
The solution supports different user roles (Administrator, Responder, etc.), each with their own access rights. This helps create a clear hierarchy for the driver safety monitoring system: users only access information and actions relevant to their roles.

## Data integration

The main challenge was to connect different systems into a single, seamless solution with automatic data transfer. To make this work, Afritrack used webhooks. They automatically alert TrackRRM when a driver behaves unsafely.

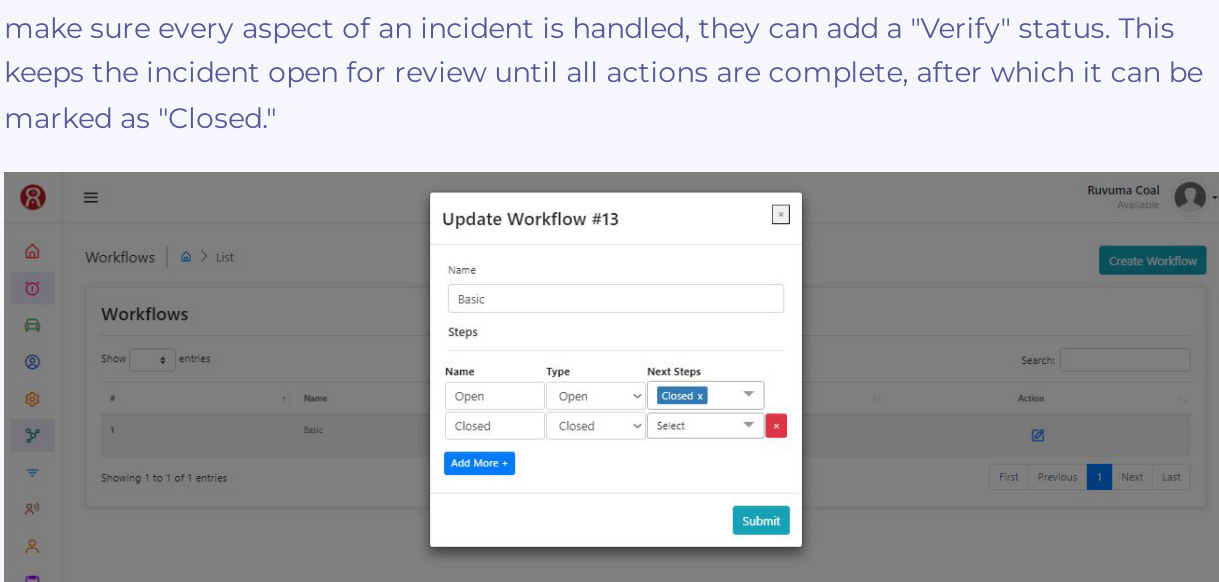
Here's how incident creation and management with webhooks works:

- Admins set up webhooks, and the system generates a unique URL for each one. This helps TrackRRM identify where the data is coming from and adds an extra layer of security.
- Each webhook configuration is stored in the TrackRRM database and is ready for use.
- When an external system, like Wialon or the video portal, detects an incident, it pushes a request with relevant data to the specified webhook URL.
- Every time data is received through a webhook, TrackRRM automatically registers it as an incident and logs details, such as Date Opened, Date Closed, Incident Type, Priority, Status, and Updates.



## Incident management

When TrackRRM registers an incident, users can review and update the information from the webhook and take action to address the unsafe driving.



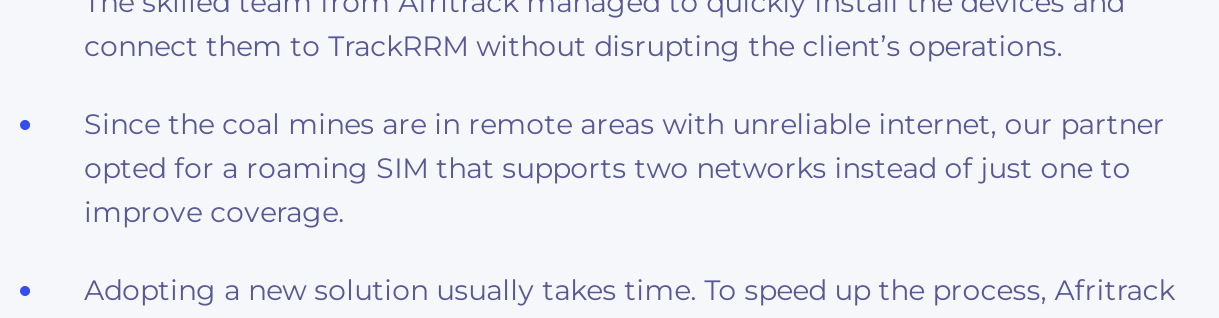
For example, a forward collision warning might be triggered if the system detects that the driver is approaching another vehicle too quickly, indicating a potential risk of a crash. In this case, the dispatcher receives an alert and can immediately contact the driver to ensure they are aware of the danger and take corrective action, such as reducing speed or increasing following distance. Similarly, if a driver is caught not wearing a seatbelt, the dispatcher is notified. This way, they can quickly reach out and remind the driver to buckle up or address other safety concerns.

Users can customize these workflows too. If a dispatcher or fleet manager wants to make sure every aspect of an incident is handled, they can add a "Verify" status. This keeps the incident open for review until all actions are complete, after which it can be marked as "Closed."



## Dashboard and reporting

The Dashboard tab shows key metrics for fleet incident management. Supervisors can quickly check incidents by type, priority, asset, and status, and see how many are open or closed. They can use this data to spot trends in driver behavior and decide how to prevent unsafe behaviors in the future.



Users can also generate reports and export incidents by status, priority, open date range, and close date range.

## Implementation challenges

Here are the challenges Afritrack faced during the implementation of the fleet management system in the mining industry:

- The coal mines operated around the clock, with all trucks running at full capacity. The skilled team from Afritrack managed to quickly install the devices and connect them to TrackRRM without disrupting the client's operations.
- Since the coal mines are in remote areas with unreliable internet, our partner opted for a roaming SIM that supports two networks instead of just one to improve coverage.
- Adopting a new solution usually takes time. To speed up the process, Afritrack assigned a full-time account manager to help fleet operators transition smoothly.

## Results

TrackRRM, as a fleet management system in mining, has significantly improved driver safety at Ruvuma Coal and helped the company stand out as a responsible and reliable player in the field.

First, TrackRRM documents unsafe behaviors as incidents, tracking any corrective actions taken with drivers. This way, Ruvuma Coal can see how effective their training really is.

Second, the company now offers bonuses for drivers who practice safe driving. Even those who initially used TrackRRM intrusively have now adopted safer driving standards. This helps build a stronger safety culture within the company.

Finally, TrackRRM also acts as a source of forensic evidence in case of incidents or accidents, adding an extra layer of protection.

Looking ahead, Afritrack plans to expand TrackRRM's features, making it even more versatile and potentially offering it to other clients as one of the more effective fleet management solutions for the mining industry.

90%

Fewer accidents in the first year

50%

Faster turnaround time

## Company profile

**IoT project of the year nomination:** Substantial fleets

**Country:** Tanzania

**Industry:** Mining and processing

## Solutions

Wialon

Teltonika FMB920

Streamax AD PLUS 2.0

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