

# Mastering Fleet Operational Performance With Predictive Maintenance

A Case Study By Pitstop



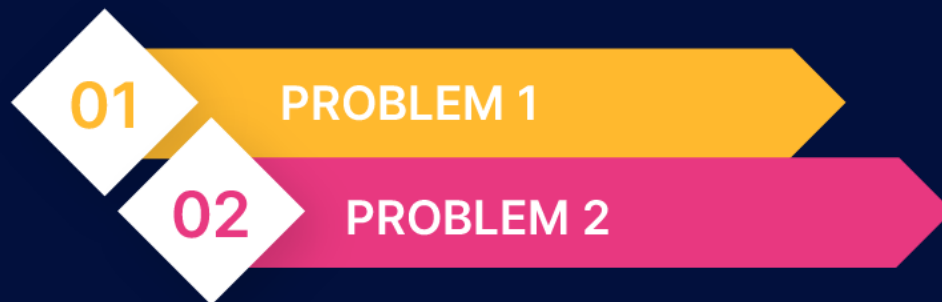
## Overview

A mixed mining fleet (Company Y) was experiencing heavy usage and wanted to understand how artificial intelligence and predictive insights could impact their fleet of over 1000 heavy-duty pickup trucks. To do so, Company Y integrated Pitstop's advanced AI algorithms onto their fleet which successfully identified vehicle issues in real-time; reducing overall downtime and cost.

## Challenge 1: Improving Operations

Company Y is a large mining company that specializes in producing energy, such as oil and wind. Due to the nature of their industry, Company Y's vehicles had to endure bad driving conditions on a daily basis, which resulted in many of their vehicles presenting heavy brake wear. To cope with this, Company Y increased the number of vehicles that are put in inventory for the purpose of replacing those that are undergoing repairs in an attempt to keep downtime at a constant low level.

Located in mostly secluded areas, Company Y is a self-contained fleet for the purpose of reducing the time, cost of repairs, and inefficient operations. This means that they do most of their own vehicle maintenance and repairs within the vicinity of their site; requiring them to employ skilled mechanics and advanced tools.



**Both factors combined have resulted in unnecessary expense of capital equipment and operational cost for Company Y. These resources could have been utilized more productively such as investing in other aspects of the organization.**

# Solution 1

To increase efficiency in its fleet, Company Y used Pitstop's algorithm that combined artificial intelligence and machine learning. During its first implementation onto Company Y's fleet, Pitstop's algorithm identified **four battery failures** that required immediate attention, as well as other less critical diagnostic codes.

By predicting these failures ahead of time, it can be estimated that for every battery failure identified, Pitstop helped Company Y save up to **\$500 per vehicle**. This return on investment is further multiplied when taking into account the difference in downtime and resources needed when battery failures were left unidentified and untreated.

The screenshot shows a dashboard titled "Pitstop insights" with a date range of "10 Mar - 21 Mar". Below the title is a filter bar with tabs for "Battery", "Fuel Trim", "Brakes", "DEF fluid", and "Cranking Voltage", along with an "Add +" button. The main content is a table with the following columns: "Name", "Status", "Possible Reasons", and "Fault codes Present".

Name ↓	Status	Possible Reasons	Fault codes Present
Battery	Check battery	Insufficient charge	No Relevant DTC
Fuel Trim	Fueltrim decrease	Fueltrim anomaly	No Relevant DTC
Brakes	Worn	Frequent Heavy Braking Overtime	No Relevant DTC
DEF fluid	Check DEF	Fluids low	No Relevant DTC
Cranking Voltage	Check starter	Insufficient charge	No Relevant DTC

**Pitstop gives their customers peace of mind through constant monitoring to reduce the number of excess vehicles needed. Company Y could then adjust their capital expenditures which could be reinvested into the company's operation. On the other hand, they would need fewer mechanics in their internal repair shops since vehicles won't need to come in multiple times and would have less severe malfunctions as a result of Pitstop's predictive analytics. All this would improve Company Y's bottom line.**

## Challenge 2: Getting the right information

A common challenge faced by larger organizations like Company Y is data overload; obtaining and communicating the right information to the right people at the right time. Failure to do so can lead to consequences both small and large scale.

In particular, Company Y experienced issues revolving around Diesel Exhaust Fluids (DEFs). If DEF errors in the fleet are not addressed within the set period of time, the vehicle with the error could experience an engine lockout and ultimately require a tow.



**DATA OVERLOAD**

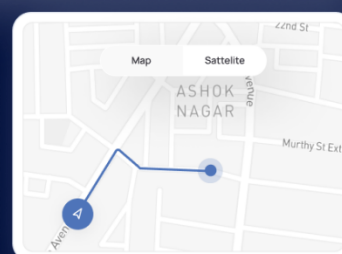
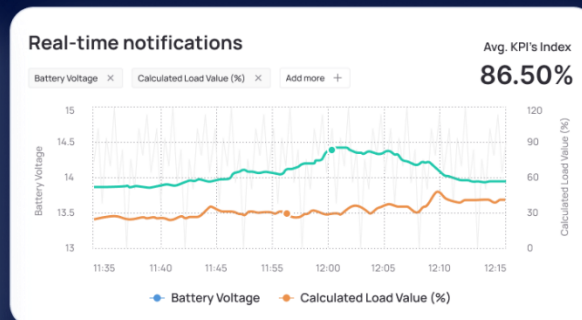
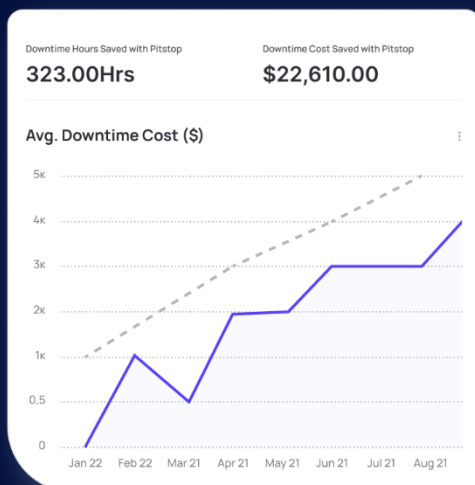
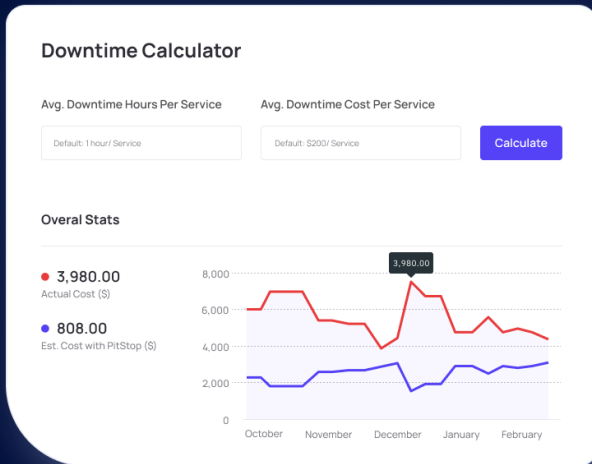
**This process is critical and time-sensitive. If not addressed immediately, it will take up more of Company Y's time, money, and resources while also maintaining unnecessary backup vehicles.**

## Solution 2

Pitstop successfully tackled this recurring problem using a predictive analytics algorithm that provided Company Y with real-time and easily-accessible DEF predictions and suggestions. These results were uploaded onto the Pitstop dashboard that can be accessed by Company Y's fleet managers, where they also have the option to receive email or SMS notifications when an alert comes up.

The Pitstop dashboard categorizes vehicle issues into critical, major, and minor to provide fleet managers accurate and easily-interpreted information that will help in more precise decision-making. Doing so will help fleet managers identify potential DEF issues beforehand and take actions swiftly; avoiding potential engine lockdowns and towing.

**Ultimately, Pitstop's algorithm and dashboard successfully helped Company Y optimize their fleet performance and efficiency.**



## Outcome

Pitstop successfully delivered the project by showcasing how AI can positively impact Company Y's large fleet by providing accurate predictive analytics and a high ROI. Pitstop also proved the advanced algorithm is flexible and can easily be implemented in different challenging environments, such as mining fleets.



Have a project in mind for Pitstop?

Reach out to us today!

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