# MachineMax Telematics

**In the UK, traditional hire fleets are made up of mixed manufacturer plant and equipment. This is vital to give clients flexibility but poses significant limitations due to the variety of telematic software solutions available direct from OEMs. With no consolidated data, an accurate picture of how a fleet of machines is being utilised is (at best) difficult.**

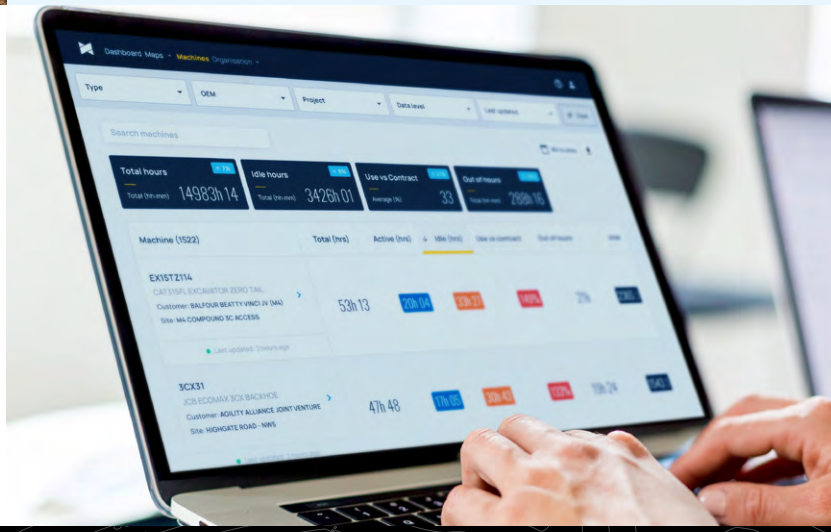
This means that machine usage is suboptimal, resulting in unnecessary operating costs and fuel burn as well as high losses in production. There are many different types of data to review and drive key performance indicators. Of this, idle time represents one of the biggest opportunities to develop better behaviours with our customers.



Data from the Flannery telematics dashboard shows us that across the Flannery fleet, during the month of September 2020, over 100,000 litres of diesel were burned whilst machines were idling. It is important to note that not all idling is negative. However a reduction in unnecessary idling represents a huge opportunity for the industry to save money and lower environmental impact. Reducing idle time requires a holistic, data driven approach that ensure fleet mix, site layout and working method represents the best value. Managing these elements, naturally leads to a reduction in idle time.

Together with MachineMax, Flannery have been working to provide a unified and consolidated view of data to all Flannery customers, enabling more effective production management and cost savings. Understanding exactly how a fleet is being used is the first step to the greener construction and as the industry becomes more target focused delivering a more sustainable project solution (with data to prove it) is increasingly important.

This paper highlights how Flannery are using telematics to drive behavioural change and a reduction in idle time.



## Overview

Identifying opportunities to drive better value for clients using telematics has often been a challenge due to fragmented data sources, and lack of utilisation data availability. With the right analysis, the biggest areas for improvement come by making small operational changes ensuring the impact of idling & emissions can be minimised.

Having insights to the real-world utilisation empowers plant managers with accurate data to evaluate if the correct machine has been selected for the task and if it is working at the optimum capacity. In addition to this, the data can provide excellent information on operator performance, identifying training opportunities and driving positive behavioural change.

Further to this, combining this data with Production Management information provides an accurate 'live' view of site efficiencies, extending the view beyond operator and machine, to site layout and process management.

Going forwards, Flannery and MachineMax will be working with key customers to provide these insights by doing the following:

**1. Enable telematics**

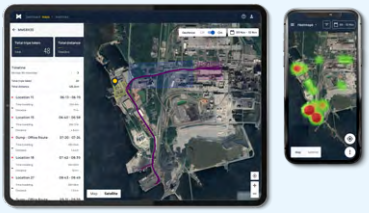
Integrate existing OEM telematics and enhance telematics availability with the MachineMax non-invasive sensors.

**2. Consolidate & normalise data**

Bring data together into 1 platform to enable fleet level view of data, and easy comparison between different machine types, OEMs and more.

**3. Provide the tools to take action.**

Visualise the data to allow instant action and easy reduction in idling and costs.

## Background

As construction and infrastructure clients look to adopt a more digital approach, the need for data in our industry is constantly increasing. Providing the opportunity to utilise management information to such an extent that we can drive better utilisation of plant and equipment onsite and make operations flow more smoothly, eliminating wasted time, money and resource.

Over the last four years Flannery Plant Hire has been working collaboratively with customers and technology partners to develop a consolidated, data-focused dashboard that helps customers make informed decisions about their hire fleet. The latest digital service helps construction companies to maximise the profitability of their hirer fleet by providing a complete view by project or product type, using smart sensors and next-generation analytics.

As a hirer our understanding of the practical use of this data and experience from previous iterations of the Flannery telematics dashboard has fed the development of this brand-new software. This project represented significant investment for Flannery as well as a considerable step forwards from the first version launched to customers three years ago.

During this time Flannery has also been working hard to utilise the increasing level of production management technology that has become available from OEMs. Early on it became apparent that combining this data with telematics would increase customer engagement and drive better results across a range of KPIs. The MachineMax solution has made this ambition a reality.

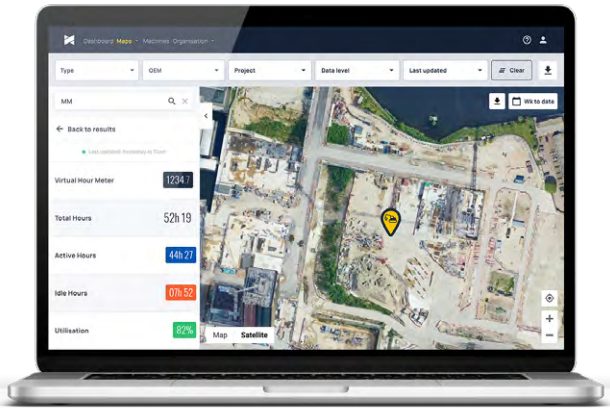
Helping clients to identify "waste" whether that is time or fuel is key to reducing cost and improving the overall environmental impact that our plant has on site. It is clear to Flannery that an area of focus for the construction and infrastructure industry is idling time. Data from MachineMax (based on every machine monitored on their platform globally) shows that idling fuel consumption exceeded 2.5 million litres of diesel in September 2020. Flannery are committed to working collaboratively with our clients to significantly reduce this figure. Let us now explain how.

## Technology

MachineMax provide a revolutionary telematics solution via an intuitive platform, from which fuel, emissions and idle time can be managed as well as using geo-location technology to track machine movement.

Traditionally using an AEMP 2.0 data feed will deliver information once a day, this is available from Flannery as standard for all clients. By retrofitting MachineMax sensors and trackers we are now able to provide a “live” solution for clients. Tracing machines in real time, the software consolidates all of the information from the machines on site and delivers an accurate whole fleet view of machinery.

The latest AEMP2.0 standard - which serves as the “language” that the technology uses to communicate with the machines - has gone a long way to standardise the data throughout the industry. However, the incoming data still needs to be aggregated and normalised across the different providers so that it delivers comparable data and the metrics relevant to the company. Providing real-time actionable insights, the artificial intelligence analyses idle time with burning emissions and allows clients to make informed decisions. This is a great first step for many clients and something that Flannery has been proactive in promoting over the last four years.




## Production management

Easy to install, the MachineMax digital box provides a live GPS signal in terms of where the machine is. The sensors require the minimal set up time with no disruption to productivity. As soon as the MachineMax sensors are installed on the machines on site, it takes a further minute to establish an interface with a computer. Once the installed sensors are up and running, they transmit real-time data that indicates when the equipment is on, off, idling and its location. Previously, the operator would have had to manually record this information (as accurately as possible) and somehow enter it into a centralised database. Using this technology, all data can be recorded and reported immediately.

The consistent, objective data provides visibility of work and allows clients to make decisions on the best product mix and volume to deliver their project. This ultimately results in improved revenue and capital discipline, decreased operating costs and a drastically reduced carbon footprint.

By providing real-time information and on-demand reports, the MachineMax solution provides a clear, genuine oversight.

These metrics include:

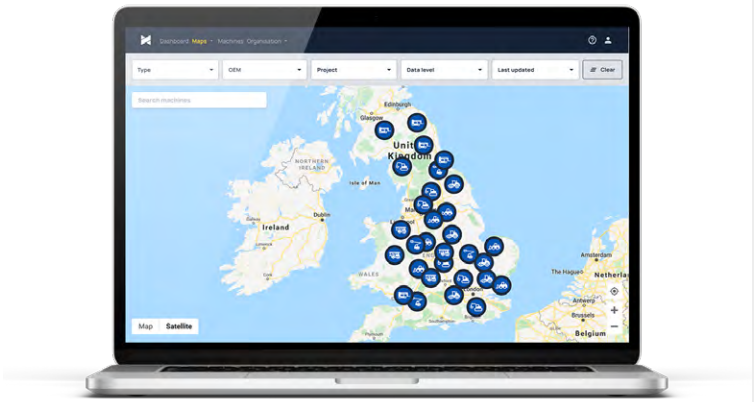
- Machine utilisation
- Payload cycle
- Total distance (odometer reading)
- Idle hours > Idle hotspot locations
- Fuel waste (hour Meter reading)
- Operator behaviour, including speed of travel, idle time
- Location

## Benefits

| | |
|---|---|
| **Visibility** | Track all machines online in a single platform |
| **Operator performance** | Identify training needs and help reduce emissions by cutting idling time |
| **Sustainability** | Reduce carbon emissions |
| **Cost** | Manage idling, cut maintenance and operational costs |
| **Productivity** | Increase output by identifying bottlenecks, reduce cycle time, optimise shifts |
| **Safety** | Avoid no go zones, monitor speed and out of hours operation, prevent theft |

## Visibility

Reviewing and tracking all machines in the hire fleet delivers benefits to purchasing managers, site managers and asset owners. The benefits for purchasing managers are that they can manage their hire fleet, moving underutilised assets or taking the decision to off-hire where necessary. The system provides the same benefits to site and project managers as well as enables effective production management.




## Operator performance

The equipment management platform allows site managers to better manage operators, identify training needs and helps reduce emissions by cutting idling time, correct machine mode selection, optimising skip payload and ensuring even spacing between haulage trucks. The ongoing analysis allows the reporting and benchmarking the progress to maintain operator performance levels. Across sites operator behaviour can be identified across any equipment they are working on, providing a more accurate picture of behaviour.

Where excess idling is identified Flannery have developed a specific ECO Operator Training module which helps to educate operators on best practise.

## Cost

Reducing idle time can significantly reduce fuel usage, one of the most significant project costs. By better managing asset use many projects can also reduce rental costs and CAPEX spend. As mentioned above, the wider benefit of using less means service intervals are not met as quickly, reducing the requirement for service downtime and general wear and tear on assets. The lowered fuel use allows the machines to be refuelled less often which leads to a tangible cost reduction.

## Sustainability

With MachineMax's data insights, fleet operators can dramatically increase the active utilisation and productivity of their machinery. The main advantages of using this technology are that all metrics are permanently updating in real-time, problems (such as physical bottlenecks on site, road crossings or any other reason for the machine to stop) can be Identified and resolved quickly and efficiently helping to reduce engine run time, fuel burn and emissions.

Driving utilisation, the technology could ultimately reduce the total amount of plant required by ensuring the right machine is on site at the right time and working on a suitable task. A leaner product mix onsite has wider reaching benefits; fewer on and off-hires mean reduced transport on and offsite. The inevitable reduction in the total amount of fuel required consequently means that there will be an overall reduction in the need for fuel tankers having both a positive environmental impact but also a reduction in one of the most significant PPI (People Plant Interface) risks that we face on construction sites today.


As routine maintenance is better scheduled with fleet wide visibility of hour meter readings, unnecessary downtime can also be limited ensuring a consistent focus on production on site. Proactively reviewing machine data (which is being produced live) enables our service teams to receive and asses service alerts as they happen, often allowing a preventative plan of action to be put into effect long before site, and sometimes even the operator, are aware of a developing problem. From a hirers perspective it makes servicing less reactive, often reducing the impact of replacement parts in terms of cost and time to fit but importantly in terms of overall carbon footprint when considering unnecessary trips to site and delivery of parts that may not have been required had the repair been actioned earlier.

## Productivity


For hirers, the system allows for the proactive management of asset utilisation and operator performance. Flannery can create additional value by providing support to clients in interpreting the data delivered by the system. The data allows us to identify and effectively reduce idle time and time stationery on site. Analysis of this helps increase output by identifying bottlenecks onsite and optimising workflow.

When ingesting 3rd party payload sensor data, the system also enables the accurate monitoring of payload targets; ensuring operators are performing in the most efficient way. For haulage operations lost/spilt loads across site can also be monitored, ensuring muck-away tasks are optimised and haulage roads are as clear and safe as possible. Analysis of this data also helps with the identification of further training requirements where machine modes or driving styles are not being properly utilised.

## Safety

The new MachineMax system allows for the creation of no-go zones and ability to monitor out of hours operations which contribute to the prevention of accidents on site and the management of regulated site hours alleviating the potential for conflicts with local communities/ stakeholders (noise/movement prevention orders). In addition to this, MachineMax data insights help manage the number of machines in confined areas of projects or for example reducing the queues forming at loading points for mass haulage operations. Monitoring out of hours operation also allows for alerts in the event of a site break-in. Other safety benefits include (where the system has access to payload sensors) the monitoring of speed around site and machine loads (under and overloaded), as well as the tracking of lost loads as mentioned earlier

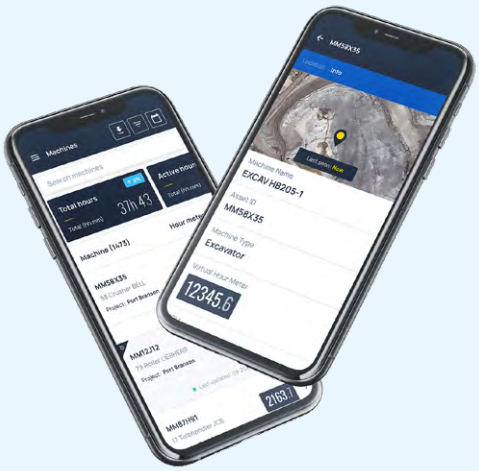
By tracking “uptime” and the driver’s activity across the project using the multiple assets, the software allows clients to focus on driver fatigue and better manage this risk. Particularly as an operator’s work on multiple machines can be aggregated (making actual working hours more accurate). Pro-actively monitoring when machines are “taking a break” means that site managers can check designated rest breaks and lunch breaks are being taken. Again, helping to safeguard people and equipment.


As per previous points, a reduction in service intervals and refuelling reduce the need for engineers and fuel tankers on site, ultimately lowering the risks associated with people plant interface.

Flannery are constantly looking to develop how our technology can interface with our other safety partners so as to consolidate more information and providing a “one-safe-source” of data reflecting what is happening onsite. The system is already compatible with existing safety systems, which would consolidate alerts from people detection systems, inclinometers and internal/external connected camera solutions.

## Conclusion

The MachineMax telematics platform provides a multi-stage approach, analysing a range of complex data, providing a broad view of machine performance and highlighting the most efficient way to improve productivity and effect cost savings on site. The innovative software helps to review driver behaviour and identify the necessary training to improve metrics and efficiencies. The data will also help Plant Managers onsite to ascertain the optimum number of machines and the required fleet mix. It is widely accepted that construction sites are dynamic and ever changing. Responding to this requires constant and consistent data to review and this process must have “buy-in” across sites and working groups. Taking a collaborative approach increases understanding, engagment and makes actioning changes easier, ensuring that benefits can be realised.

It is also relevant to note that there are many external factors that machine data is only now beginning to incorporate. Weather, operator ability and availability, construction design changes and access to site all evolve over the lifetime of the project and often directly influence our ways of working resulting in decisions having to be made that might not result in the most efficient solution had a perfect set of environmental factors been available.

It is important that this paper identifies the fact that machine utilisation and ‘redundancy’ are two contradictory concepts of the future construction site. Whilst this is the case from a data perspective, they remain, in some instances, a necessity. Our modern construction site will, in certain circumstances, require machinery on standby as any downtime from a primary machine(s) may have such a significant impact on either timescale or cost (often both) that a spare or ‘redundant’ machine may be required regardless of its comparative lack of utilisation.

How all of these factors impact efficiency over time mean that the “perfect” solution is unlikely to exist. Data has to therefore be used considerately and in collaboration with the real-world factors to reassure clients and partners that the best value solution is being sought and put into effect.

Going forwards, over the next six months, Flannery will look to consolidate data collaboratively with clients to estimate the benefits of implementing the telematics platform. Flannery are certain that this advanced technology can generate value. Allowing our clients to remotely manage their entire fleet from one place, and to make instant decisions in real time will encourage improved revenue and capital discipline, decreased operating costs and ultimately a reduced carbon footprint.


## Case Study

If you would like to discover how our Telematics platform could be utilised at - and bring savings to - your site, please email us today at innovatewithus@flanneryplant.co.uk

**If you have an innovation you would like to share with us, use the email above to get in touch.**

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