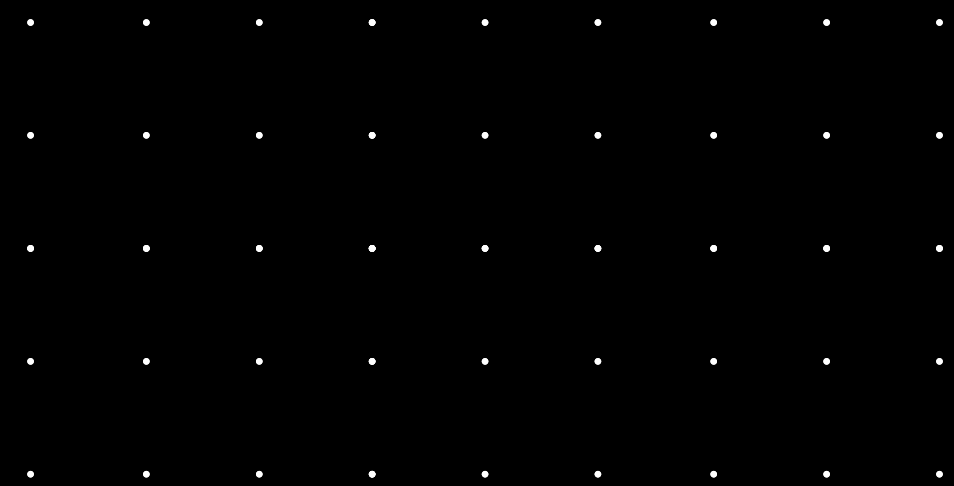


GemOne®

What Is Telematics?

A Complete Guide To Off-Road
Telematics For Owners & Managers
of Industrial Fleets



Learn About the **New Technology**
Enhancing the **Safety and Efficiency**
of Businesses in the Construction,
Equipment Rental, and Material
Handling Industries



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One --- WHAT IS TELEMATICS?

What is telematics? It's a much-asked question about a new and fast-developing technology, one which is central to the digital transformation of businesses using industrial equipment.

For those in construction, rental and mixed fleet, material handling, and equipment dealerships, telematics solutions offer huge potential benefits.

1.1 Telematics definition: *What is telematics?*

Telematics is the process of using technology to collect insights about your machinery, vehicles, and tools.

Installing a telematics device on your machinery adds capabilities to your vehicles and future-proofs your business.

Example: If your business uses **machines in a warehouse**, you can cut back on costly unreported impacts which hurt your business in terms of damage repair and machine downtime. Impact reporting means that you receive instant notifications of impacts so you can identify which operators and areas are most prone to incidents. Information and insights from machine data are displayed on an online cloud platform.

Another example: If you're a **rental company**, telematics systems let you know where your machines are in real time, so you can ensure they are being used correctly and in accordance with rental contracts.

These insights empower you to track your fleet, boost efficiency, operate more safely, and avoid unexpected downtime.

- Telematics is an interdisciplinary field that encompasses:
- > telecommunications (transmission of information);
 - > vehicular technologies (transport and road safety);
 - > electrical engineering (sensors, instrumentation, and wireless communications);
 - > computer science (multimedia and internet).

Telematics helps unleash the potential of your industrial fleet.

“These insights empower you to track your fleet, boost efficiency, operate more safely, and avoid unexpected downtime.”



1.2 Why is it called “telematics”?

The word “**telematics**” is a compound term combining the words “telecommunications” and “informatics”.

“**Telecommunications**” is about the remote transfer of information. “Tele” is derived from the Greek for “far off” or “at a distance”. “Communications” denotes the sending, receiving, and storing of data.

“Informatics” is a discipline incorporating the practice of information processing. It’s about the collecting, processing, and storage of data.

The core purpose of telematics is to transmit valuable information over long distances.

Telematics

/ˌtɛlɪˈmætɪks/

Tele + Matics

Telecommunications

Transmission at a distance

+

Informatics

The processing of information

Telematics is the technology of sending, receiving, and storing information using telecommunication devices on remote objects such as industrial vehicles.

1.3 The evolution of telematics

Telematics have developed at a fast pace in line with the advancement of computer technologies and the internet.

The term was first coined by Simon Nora and Alain Minc in a 1978 report to update the French government on the computerisation of society. It was Nora and Minc who came up with the portmanteau “telematics” (in French, “télématique”).

In 2008, the **Association of Equipment Management Professionals** (AEMP) decided to take telematics seriously. The AEMP was set up to serve those who manage and maintain heavy, off-road fleets. They provide the industry with contacts, knowledge, career development, and personal growth opportunities.

The AEMP brought together the major construction equipment manufacturers and telematics providers in the heavy equipment industry.

Together, they discussed the development of the industry’s first telematics standard.

They released the AEMP Telematics Data Standard V1.1 in 2010.

Since then, there have been major developments in application programming interfaces.

It’s resulted in significant growth in the integration of data from telematics systems into the databases of companies around the world.



1.4 Telematics vs Telemetry

The term “telemetry” is sometimes used in the telematics industry.

So what’s the difference between “telematics” and “telemetry”?

Telemetry is about measuring.

Devices take measurements at remote points and send them to a monitor.

Telematics is about processing.

Reporting tools turn data into information, often with a visual display on computer software.



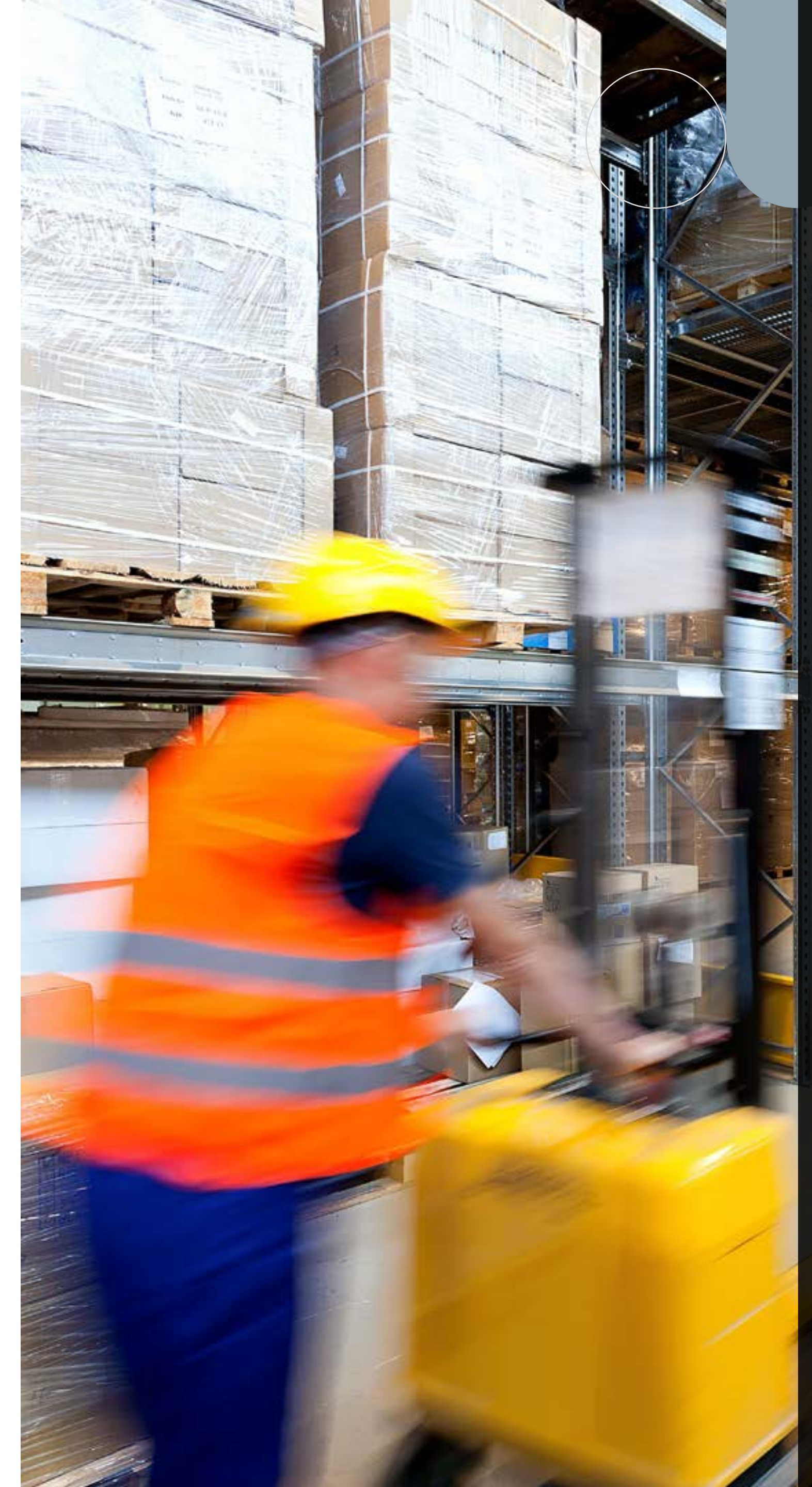
1.5 Is there a difference between telematics and GPS tracking?

GPS tracking shows the location of fleet vehicles. It's one important element of a telematics solution, but telematics offers a lot more.

Telematics systems deliver a much broader overview of various aspects of your industrial fleet. They equip you with the information required to make key decisions related not only to the location of vehicles, but across a range of other functionalities:

- > Telematics helps you **track your machines**, so you know where they are in real time and so you can set geofences to protect against theft.
- > Telematics helps ensure your fleet is **safer and more secure**, so you know who is using your machines and whether they're using them safely.
- > Telematics helps **boost the operational efficiency** of your fleet by giving you data and insights on how your machines are being used.
- > And telematics helps **streamline the service and maintenance** of your fleet so you can avoid unexpected costs and downtime.

Telematics is **much more** than GPS tracking.



1.6 How does telematics work?

The first step to implementing a telematics system is selecting the machine, vehicle, or tool you want to make smart.

How does that machine function?
What issues does it have?
What do you, as the user, want to know?

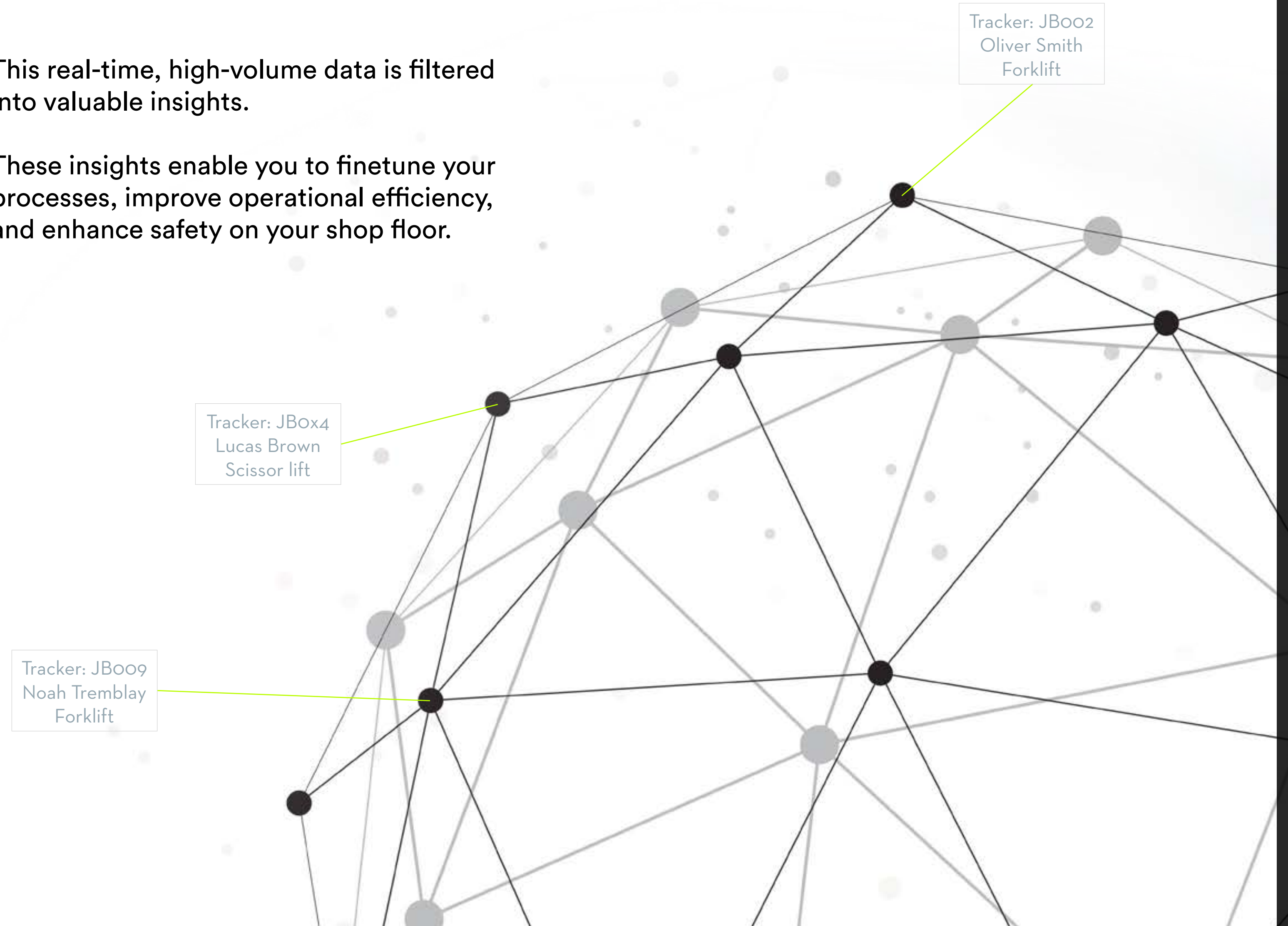
You install a telematics device (a “tracker”) into your machine.

This device collects the desired data from digital and analog signals, often event-based, and then sends that data to a cloud platform.

On that cloud platform, it is ingested, processed, and transformed into meaningful information.

This real-time, high-volume data is filtered into valuable insights.

These insights enable you to finetune your processes, improve operational efficiency, and enhance safety on your shop floor.



1.7 What are some examples of telematics features?

Features and functionalities of telematics solutions are wide-ranging.

Examples of telematics features which help boost operational efficiency include:

GPS location and geofencing;

With GPS tracking, you can find each machine quickly for pick-up at the end of a rental period or for maintenance, even when the machine is not in operation. Location history ensures you know that your machines are not being used anywhere else without your knowledge. Geofencing technology allows you to set virtual boundaries and receive immediate notifications if a machine exceeds your set limits.

Comprehensive reporting on fleet usage;

See exactly how long your machines are used. Some machines underused? Other machines used too much? Have all the data you need at your fingertips to make smarter business decisions about optimal fleet composition.

Service management systems;

Automatic service estimation notifications saves your technicians precious time on periodic maintenance and provides them with all the information they need for a quick and accurate intervention.

Battery monitoring

The batteries that power your industrial fleet drive your business forward. With battery monitoring solutions, you can avoid the unnecessary wear of batteries, maximise their charge cycles, and prolong their lifespans.

Examples of telematics features which make your work environment safer include:

On-screen safety checklists with customised questions in varying order;

On-screen safety checklists make re-start checks mandatory, with instant lockout if there's a critical issue. It ensures operators have inspected the machine and determined that it is safe to operate.

It documents the completed checklist and the amount of time it took to complete. It tracks user behaviour and safety issues with real time data on a cloud platform.

No clipboards. No illegible writing.
No paper. Just a safe fleet, every day.



Impact reporting and automatic collision lock-out.

Unreported impacts are costly to your business, both in terms of damage repair and machine downtime. Receive instant notifications of impacts so you can identify which operators and areas are most prone to incidents.

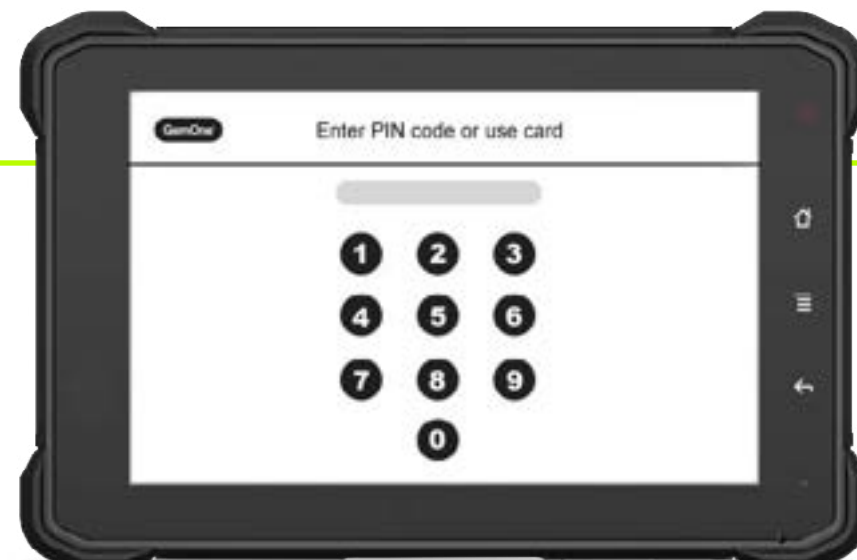
Add additional strobes and buzzer alarms to encourage safer driving behaviour and reduce incidents inside and outside your warehouse. Lock-out operators after impacts.



Access control via PIN code or RFID;

Give access to your machines to approved operators via a PIN code or RFID card.

Choose who you want to operate each machine, based on your own criteria of certifications and training.

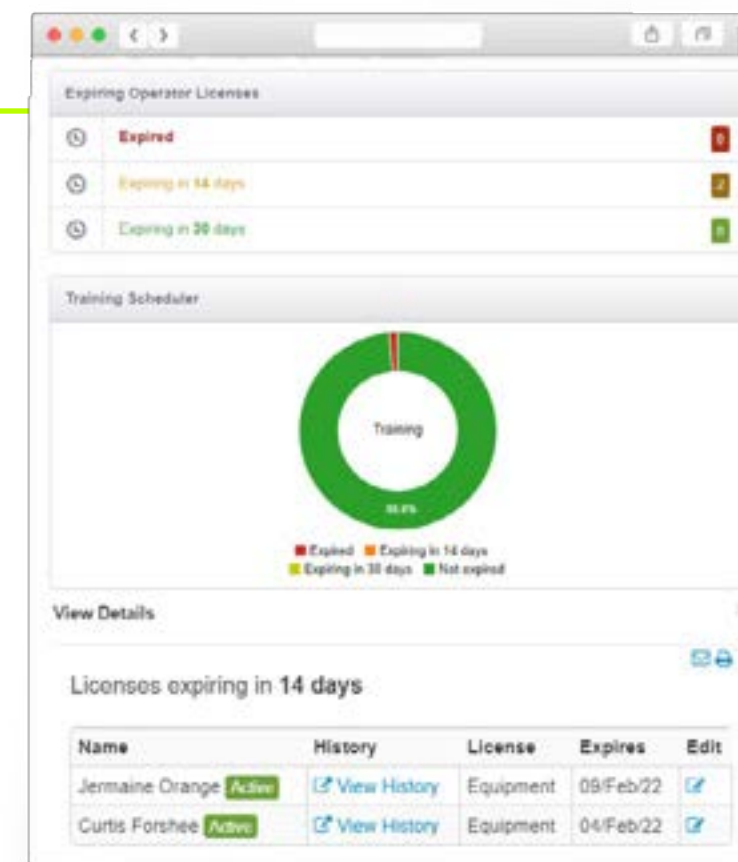


Licence management and verification of training requirements;

With operator license and training expiration tracking, you can ensure that operators using your machines always comply with the appropriate inspections, training, and licensing requirements.

If an operator's certification expires, they lose the ability to operate the equipment.

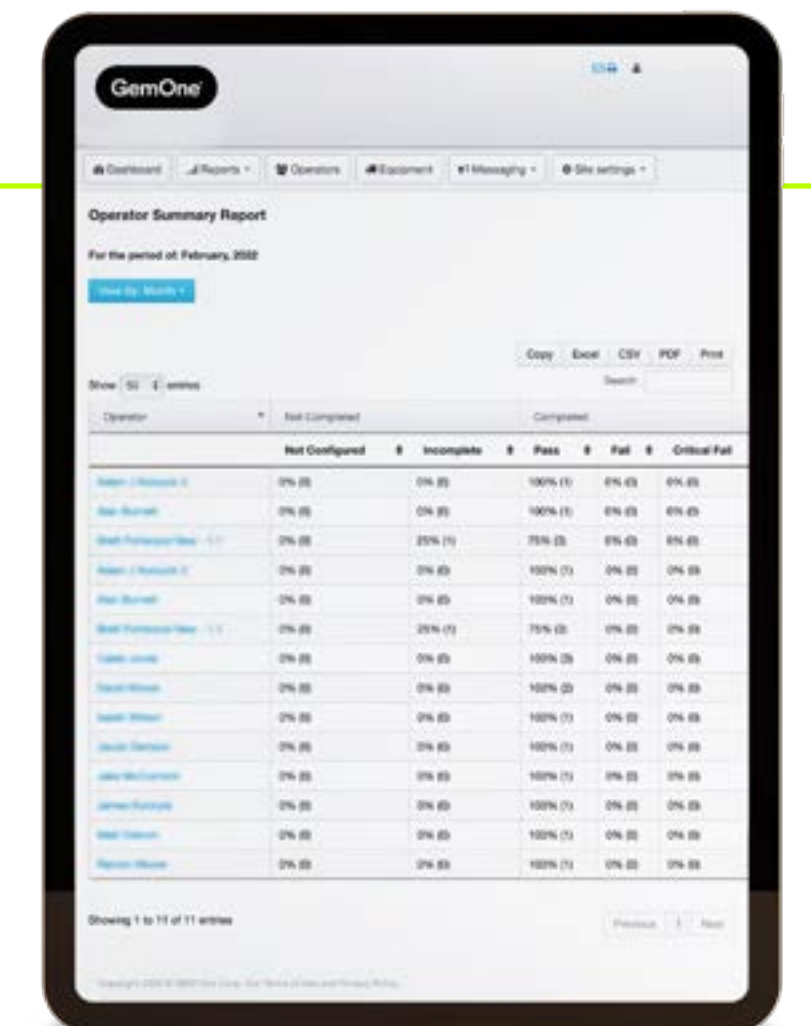
You'll never lose track of licence requirements and you'll ensure every operator has the up-to-date certifications to operate their equipment.



Session reporting;

Monitor the activity of operators on a daily basis to gain insights on efficiencies. Use reports in staff reviews and to set KPIs which reward safe, productive driving behaviour.

Gain insights on key time, seat time, and hours of movement. Identify and remove roadblocks to efficiency.



Telematics providers introduce new features all the time. Newer features include proximity warning systems, battery monitoring solutions, or weight sensor modules.

It's an exciting time in telematics and your business should not ignore it.



1.8 Which sectors and businesses can use telematics?

A wide range of sectors use telematics solutions on their industrial machinery.

Construction

Companies in the construction industry with their own fleet of machines use features relating to **operational efficiency**.

Example:

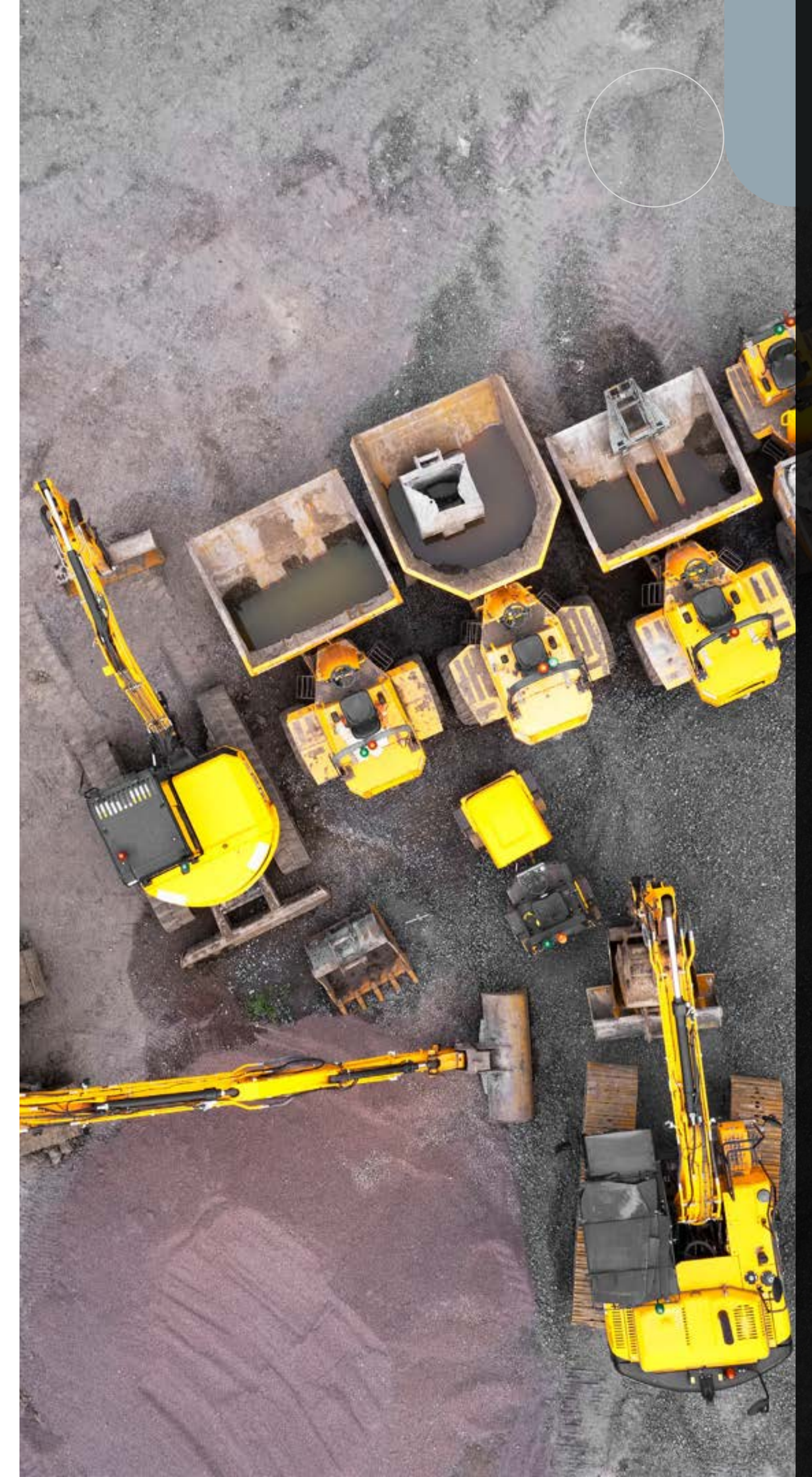
With hours metering, **construction companies** can see which machines are underused and which machines are used too much, giving them all the data they need to make smarter business decisions about optimal fleet composition.

Rental

Rental companies hiring out a mixed fleet of heavy equipment use features relating to **track and trace**.

Example:

With GPS tracking and location history, **rental companies** know where their machines are in real time, so they can ensure they are being used in accordance with rental contracts. With geofencing, they can ensure machines never leave set boundaries, thus reducing the risk of sub-letting.





Material Handling

Material handling companies use features relating to safety and security. They want to enhance forklift driver **safety in their warehouses.**

Example:

With features such as proximity warning, **material handling companies** can curb the rise in staff absenteeism, machine downtime, and insurance premiums. A 360° proximity warning system equips material handlers with the alerts and actionable insights they need to reduce forklift incidents and make their workplace environment safer.

Dealerships

Equipment dealerships who lease to the logistics sector use features to help them with **machine service and maintenance.**

Example:

By enabling preventative maintenance through functionalities such as impact detection and asset utilisation, **equipment dealerships** can minimise breakdowns and downtime on equipment that they lease. Automatic service estimation notifications saves their technicians precious time on periodic maintenance and provides them with all the information they need for a quick and accurate intervention.

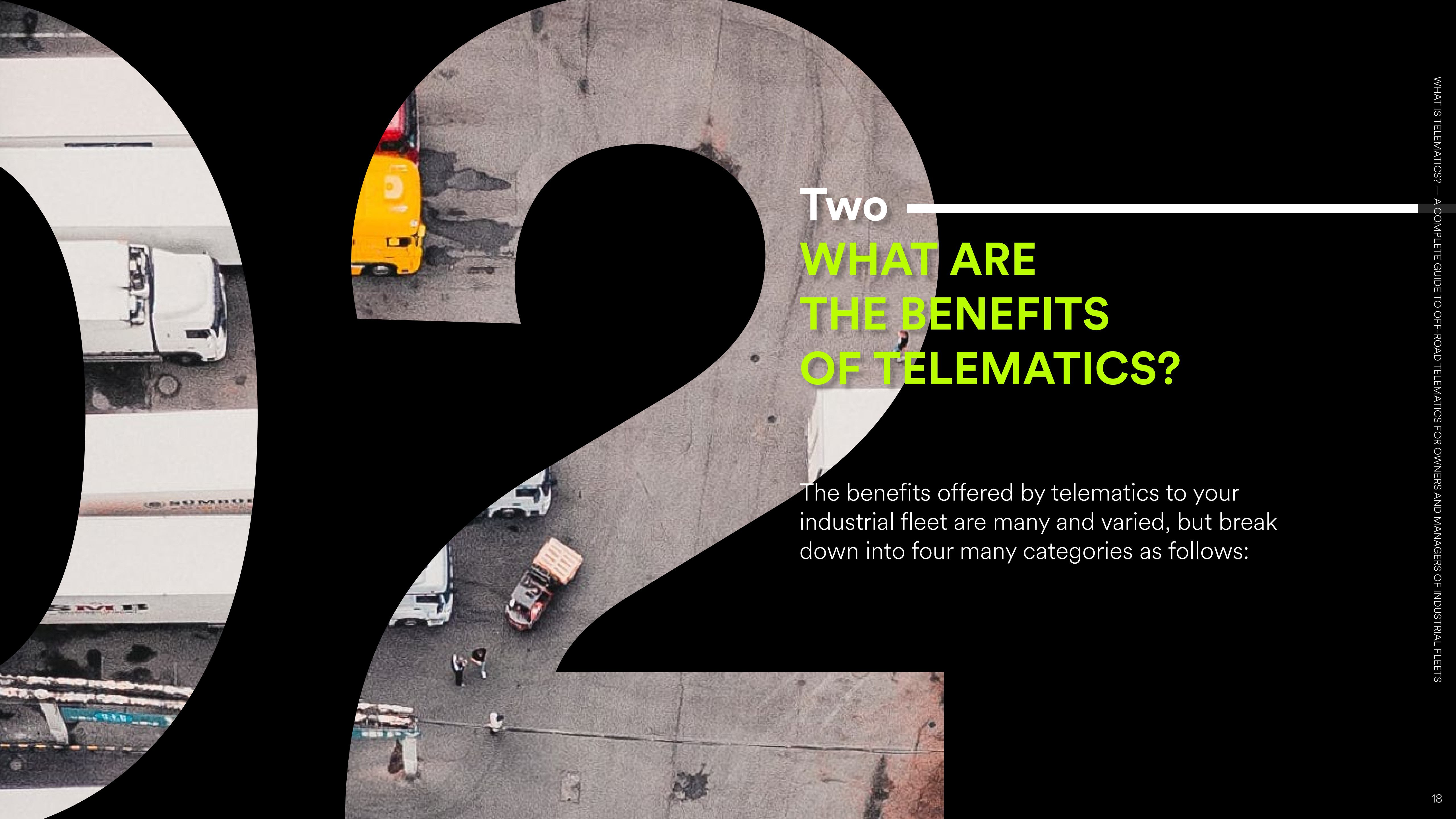
1.9 Which type of machines can I track through telematics?

Telematics devices are most commonly installed on machinery and vehicles such as forklifts, powered access equipment, and other heavy off-road machinery.

But smaller tools are increasingly being equipped with telematics devices in order to prevent theft, increase efficient usage, and localise warehouse goods.

The possibilities are expanding across different industries, from construction to agriculture, and from material handling to mixed fleet management.





Two — **WHAT ARE THE BENEFITS OF TELEMATICS?**

The benefits offered by telematics to your industrial fleet are many and varied, but break down into four many categories as follows:

2.1 Boosting operational efficiency

With a modern telematics system, you can take advantage of the operational data critical to your company's success. Measuring is knowing, and knowing allows optimisation. In both the short and long-term.

Telematics systems **monitor your machines and present the captured data in clear and personalised reports.** Know how your fleet is being used and detect where there is room for improvement.

This benefit includes the ability to review details of machine use and use that information for optimisations.

Which machine is used the most? Can the composition of your fleet be improved? When you are able to detect overuse and underuse, you can intervene in time.

A major benefit of telematics for rental companies, for example, is the ability to **monitor contractual terms and conditions.** Rental companies will want to know whether machines are used outside of contractual agreements. In this way, they can invoice additional use or adjust the contract to meet their customer's changing needs.

Battery monitoring systems enable you to keep an eye on the **health and status of your industrial batteries.** You avoid unnecessary wear of expensive batteries and have the opportunity to evaluate charging cycles.

Another major efficiency benefit is **fast reporting.** By using the extensive reporting options available in telematics systems, you can view valuable data in only a few clicks. It means you can give your stakeholders clear reporting with minimal effort.

“Know how your fleet is being used and detect where there is room for improvement.”

2.2 Enhancing safety and security

Safety is a crucial factor in a healthy company. In terms of infrastructure and in terms of people. A robust telematics solution will minimise risks, ensure the correct use of machines, and reduce the number of incidents. Whether you use your fleet yourself or rent it out.

Telematics systems integrate specific safety checklists, monitor the status of machines, and ensure that no unauthorised operators work with your machines. Meeting safety standards is simpler than ever. Prevention is always better than a cure.

Telematics systems also help your business comply with safety standards. Work according to OSHA guidelines or other regional safety standards. Incorporate these standards and guidelines into **machine-specific safety checklists**. You'll know that your employees or renters are working safely with your fleet.

Telematics means safer work for your staff in practice too. There are various telematics options for boosting machine-operator safety. **Cameras** provide better situational awareness. You can **lock out vehicles after impact detection** to your set parameters. It empowers you to make your work spaces safer.

Working safely starts with the correct use of the machine. With impact reporting, you can **detect careless or inattentive driving behaviour**. This enables you to intervene

quickly, whether an incident occurs on your own site, on the road, or at a renter's location. It also helps track inefficient machine usage or overuse of a machine.

A major safety benefit of telematics is getting an **overview of users**. See who is operating a machine at any time. Choose access control features to ensure the right people are working on your fleet. Track users in real time and prevent unauthorised work with your machine. Manage driver's licences to coordinate machine access.





2.3 Empowering track and trace

Telematics lets you know exactly where your machines are located at any moment. Whether they're inside your building, on your site, or on the move. The robust trackers fitted in your machines communicate constantly with an online cloud platform.

This enables you to save valuable time and money by knowing the location of your machines. In day-to-day operations, but also in the event of incidents. **You can track your fleet in real time and store the data so you can use it for reporting or business decisions.** For European businesses, it's important your telematics solution is GDPR guidelines compliant.

The benefits of track and trace manifest in a variety of ways. **Find a machine quickly** for pickup at the end of a rental period or for maintenance. Google Maps finds the route for you, accurate to a few metres.

Additionally, track and trace functionalities help **protect against theft or subletting.** Set geofences as virtual boundaries for the area in which your machines can operate. Get a notification immediately if a machine exceeds these limits. Even machines not in operation are protected with the tracker's internal battery.

Track and trace also helps you to optimise your work environment. **Find points of improvement** within your warehouse, yard, or site. With impact detection, your telematics system tells you where most accidents occur. Focus on these zones and reduce the number of incidents.

2.4 Streamlining service and maintenance

The right telematics solution can help you keep your fleet in top condition.

It prevents downtime of machines and increases efficiency within your company. It allows you to monitor each machine with a system that automatically maps that data. Prolong the life of your machines and save your business time and money.

Telematics systems ensure you schedule **timely machine maintenance** and follow up on issues fast. It enables you to prevent sudden failures and the problems they cause. Because of this, your machines will enjoy a long service life.

Service and maintenance features include notifications of errors on machines. With timely problem detection, you can quickly repair and **prevent long-term damage.**

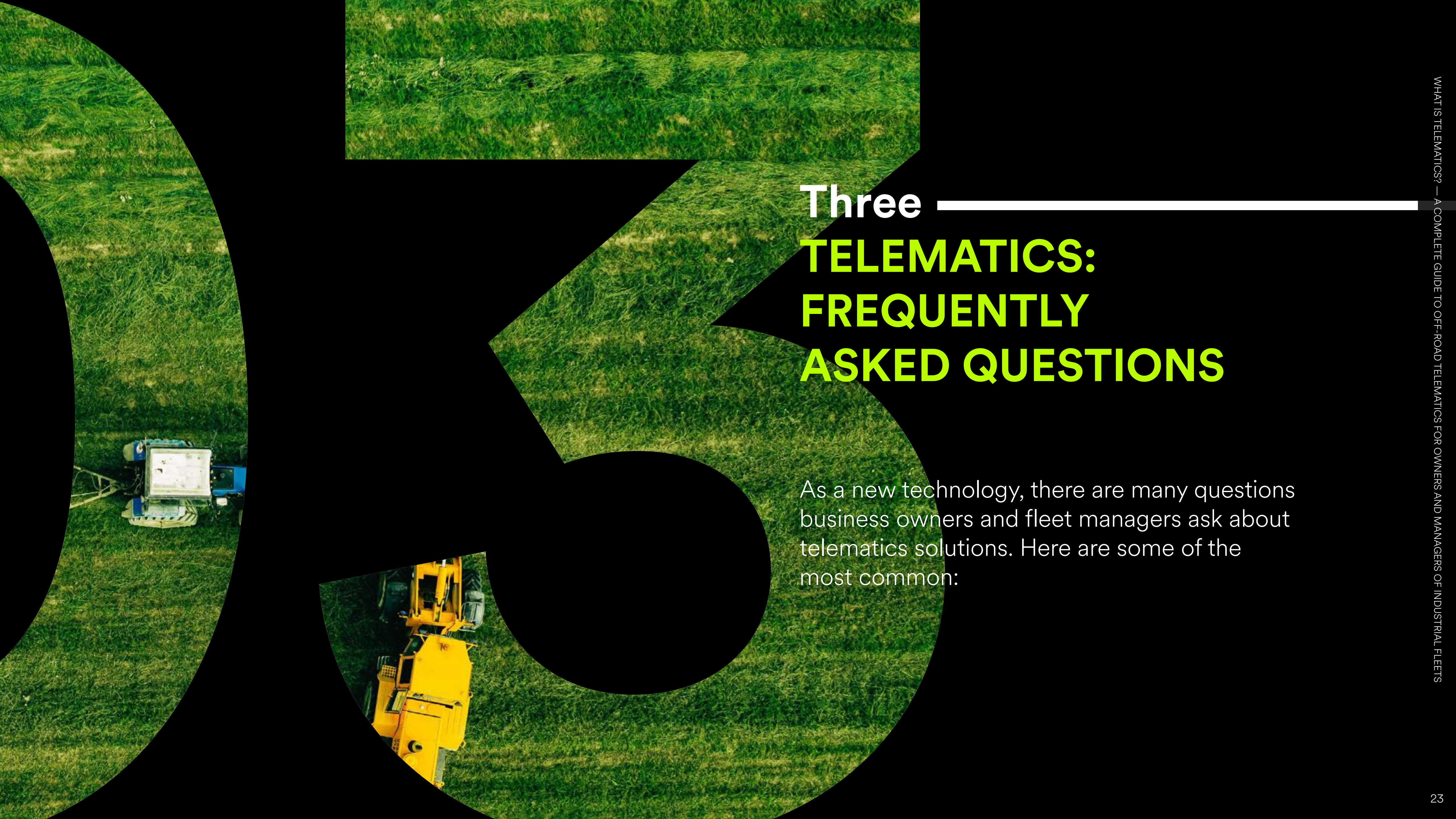
Telematics facilitates technical interventions. You can even give technicians remote access to machine error codes. You can get a **quick diagnosis** and see exactly what materials are needed for the repair. Cut unnecessary travel, saving time and money.

Telematics systems equip your technicians with the information and manuals they need to properly maintain your machines. Enable them to perform a repair quickly and accurately, whether your fleet is diverse or not.

This helps you maximise uptime across your fleet. Get a notification when a machine's maintenance is due. Schedule periodic maintenance work in time so your fleet remains in optimal condition.

“Telematics systems ensure you schedule timely machine maintenance and follow up on issues fast.”



An aerial photograph of a green field. In the lower-left quadrant, a blue tractor is visible. In the lower-right quadrant, a yellow tractor is visible. The field is divided into sections by black circular and polygonal shapes. A white horizontal line is positioned above the word 'Three' in the title.

Three **TELEMATICS: FREQUENTLY ASKED QUESTIONS**

As a new technology, there are many questions business owners and fleet managers ask about telematics solutions. Here are some of the most common:

3.1

If I have to invest in telematics, will my operational costs increase?

There is a cost in installing telematics devices on your machines. There are also costs in maintaining the system and the online cloud platform.

But telematics systems pay for themselves many times over in the long run. You'll save time and money through the benefits to business efficiency and safety.

With decreasing costs of computing and cloud storage in recent years, telematics solutions are only becoming more cost-efficient. The threshold for businesses to adopt telematics is lower than it ever has been.

Digital transformation of business is coming. Whether you're in construction, rental, material handling, or equipment dealership.

Those who decide to invest in telematics now will be better placed to face the various industry challenges down the line than those who do not.

3.2

My machine operators have mobile or cell phones. Why do I need telematics?

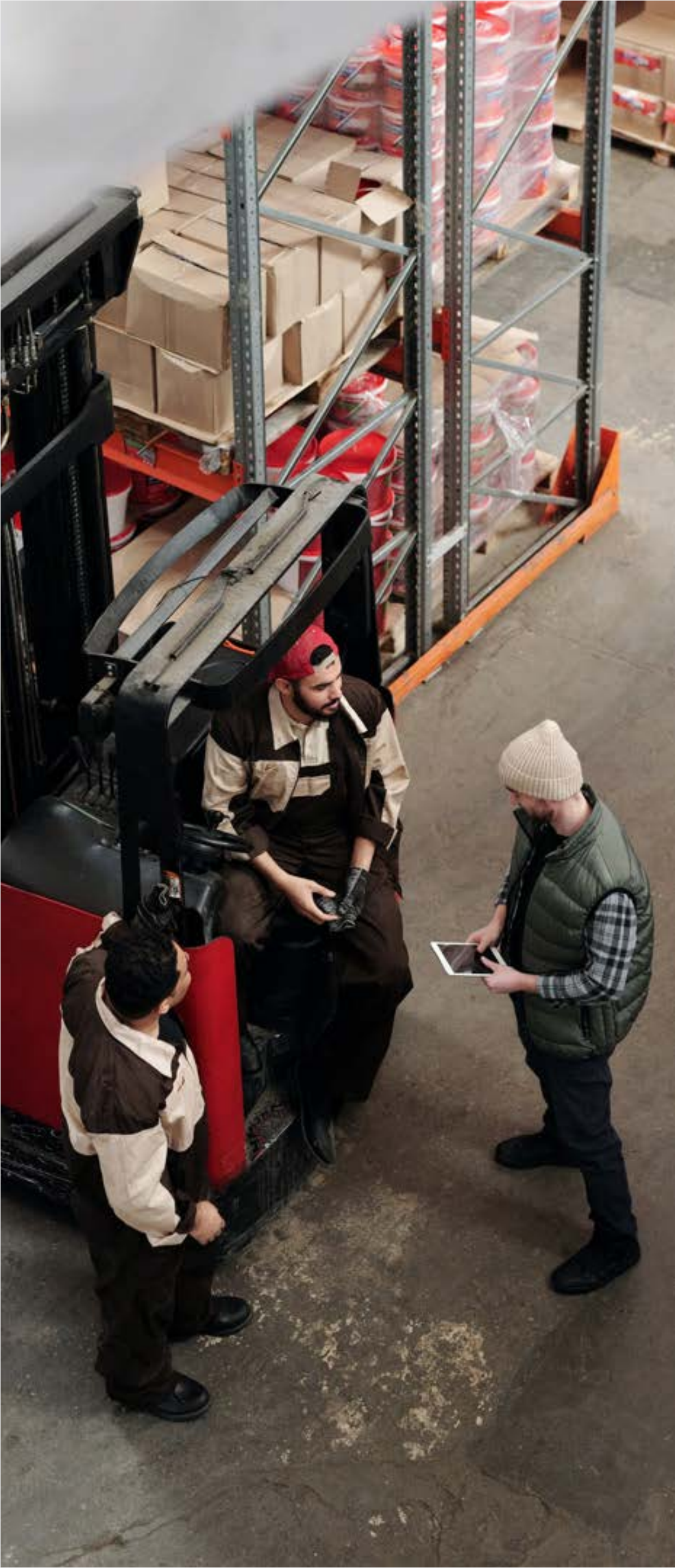
Mobile or cell phones offer a fraction of the functionalities of a telematics system.

They may be useful for messaging between machine operators and fleet managers. But they do not show the bigger picture.

They don't give business owners and fleet managers the **actionable insights** they need to improve safety and efficiency.

Telematics does.





3.3

Isn't telematics a bit like Big Brother watching my machine operators? Won't my operators dislike it?

A telematics system is a business tool which **works to the benefit of business owners, but also to the benefit of machine operators.**

Telematics helps drivers and operators by making their workplace safer and more productive.

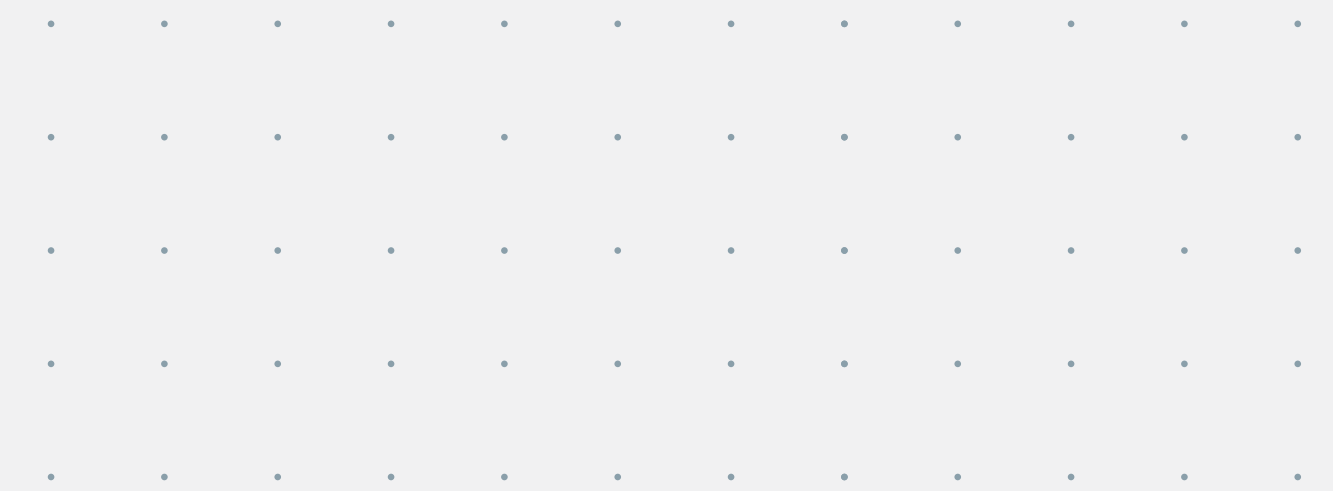
It helps them communicate more effectively with management, with operators more easily and instantly being able to send notifications of issues with the fleet to fleet managers.

Features such as proximity warning, safety checklists, and access control reduce incidents so operators are safer in their work.

It also introduces equity into the workplace, with all machines and all operators monitored fairly. This can be beneficial to operators on annual reviews.

It's important for business owners and fleet managers to explain the benefits of telematics to their operators. If it's communicated clearly, operators will understand the reasons behind implementation and support its utilisation.

Fleet managers often use telematics to establish award programmes for their best operators. This might take the form of a simple gift card awarded each quarter. Operators can see through statistics how they are performing alongside their colleagues, not only fostering friendly competition amongst peers, but helping to make operators part of the plan for improvement.



3.4

I only have a few machines in my fleet. Is telematics suitable for my small business?

Telematics systems offer you valuable business insights whether you own one vehicle or a fleet of thousands.

No matter the size of your fleet, modern smart telematics will help you meet your company's needs today and respond to the challenges your business will face tomorrow.



3.5

Does telematics impact the warranty of the machine?

It does. In a positive way.

If you overuse your machines, or don't use them correctly, or fail to follow up on maintenance, you might lose your warranty.

The telematics system alerts you when one of the above situations occurs.

This enables you **to intervene and make sure that there are no issues** with warranty of the machine.

3.6

Will the telematics hardware drain the machine's battery?

The telematics device is connected to the battery of the machine so it can measure its voltage.

The telematics device does use the battery to charge itself, but it uses very little energy. There is never a draining or discharging of your machinery's battery.

The technology uses various techniques, such as Sleep Mode, to **optimise usage of the battery and to protect it.**

3.7

Who owns the generated telematics data?

There is a generally accepted rule that the owner of the machinery owns the data. The telematics provider does not have the right to share the data.

But in the absence of a legal framework related to data ownership, it is recommended that you make specific arrangements.

A well-defined contract between the telematics provider and you as machine owner will offer **clarity on data issues.**

Telematics generates personal machine data as well as non-personal machine data.

So include agreements about the right to reclaim data and how you will comply with GDPR guidelines.

3.8

What is the CAN bus of a machine?

CAN stands for Controller Area Network.

It's a specialised internal communication network that interconnects components inside of machines.

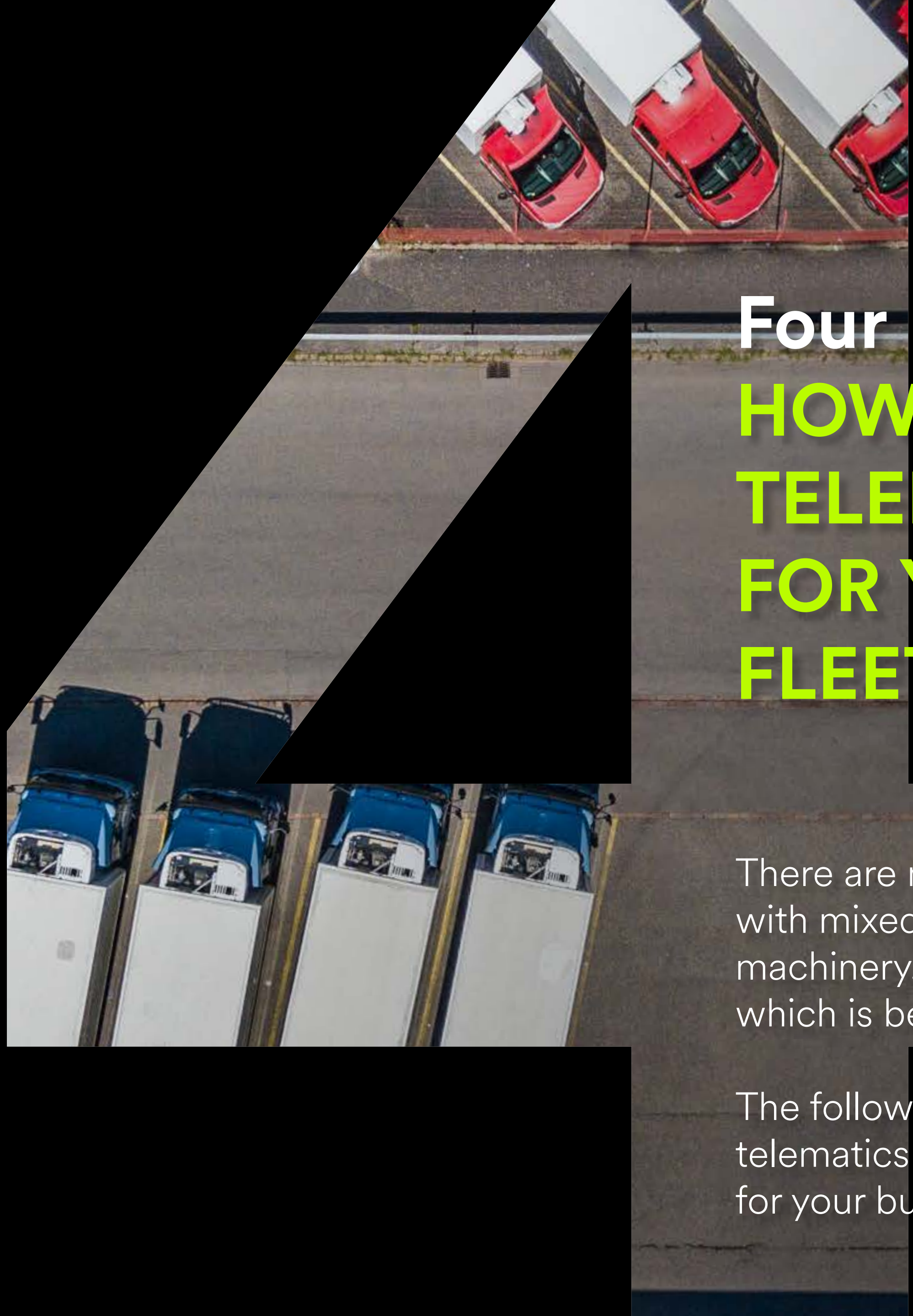
The CAN allows the **exchange of messages without conflicts in a short time-frame.**

You can access this network of information through CAN ports.

Connecting the telematics device to the CAN ports of your machine enables you to read specific data.

Think about your car. When your car mechanic connects his laptop with the car engine CAN port, he can read what's happening inside your engine in real-time.





Four

HOW TO CHOOSE A TELEMATICS SOLUTION FOR YOUR INDUSTRIAL FLEET

There are many technologies available to companies with mixed industrial fleets or material handling machinery. Sometimes, it can be confusing to know which is best for your company.

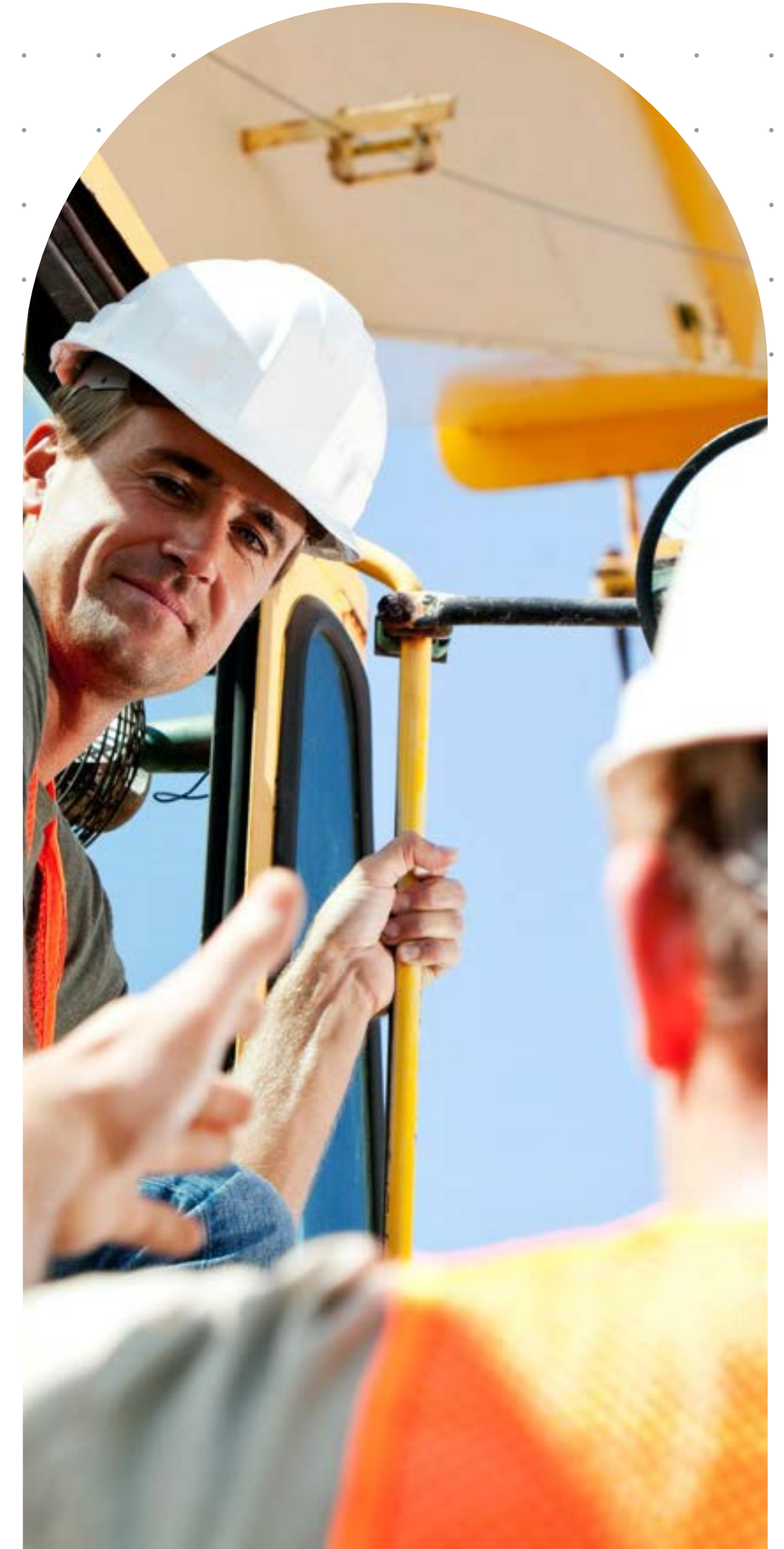
The following are questions you should ask potential telematics providers so you can make the right choice for your business, your fleet, and your staff.

4.1 Does the provider offer onboarding, customer service, and ongoing support?

Will the telematics provider assist with installing telematics devices, setting up your online cloud platform, onboarding machines into the system, and training fleet managers in how to use it?

Will there be ongoing support from the telematics provider, both if there is a technical issue with the hardware on your machines, and in using the cloud platform on an ongoing basis?

You need to find a telematics provider whose teams will work closely with yours to establish the best combination of machine-specific accessories for your fleet and the most suitable software modules for your business. Especially as you scale your business. A collaborative and long-term approach lets you choose the exact solution that's best for you.



4.2 Is the solution compatible with a diverse range of assets?

Your fleet may consist of a range of different types of machines, from forklifts to scissor lifts. Even amongst the same class of machine, you may have various brands or manufacturers.

It's important that you choose a telematics provider that can offer technology to support all the machines in your fleet today and all those that might be added in the future.

Your telematics system should be able to receive data from all these different machines and process them on one single interface.



4.3 Can the solution be integrated with other business technology?

Your business already involves a lot of different types of software.

You have tools to assist with payroll, accounting, timekeeping, regulatory requirements, maintenance, and enterprise resource planning.

In order to streamline your business workflow and reduce costs and overheads, it's important to make sure that your telematics system dovetails with all your existing business tools.

4.4 Is the solution user-friendly and easy to use?

As the volume of information continues to grow, and the complexity of data increases, the user interface of the telematics platform you choose becomes increasingly important.

Your choice should be one that is intuitive, forgiving of errors, and operated in a simple manner.

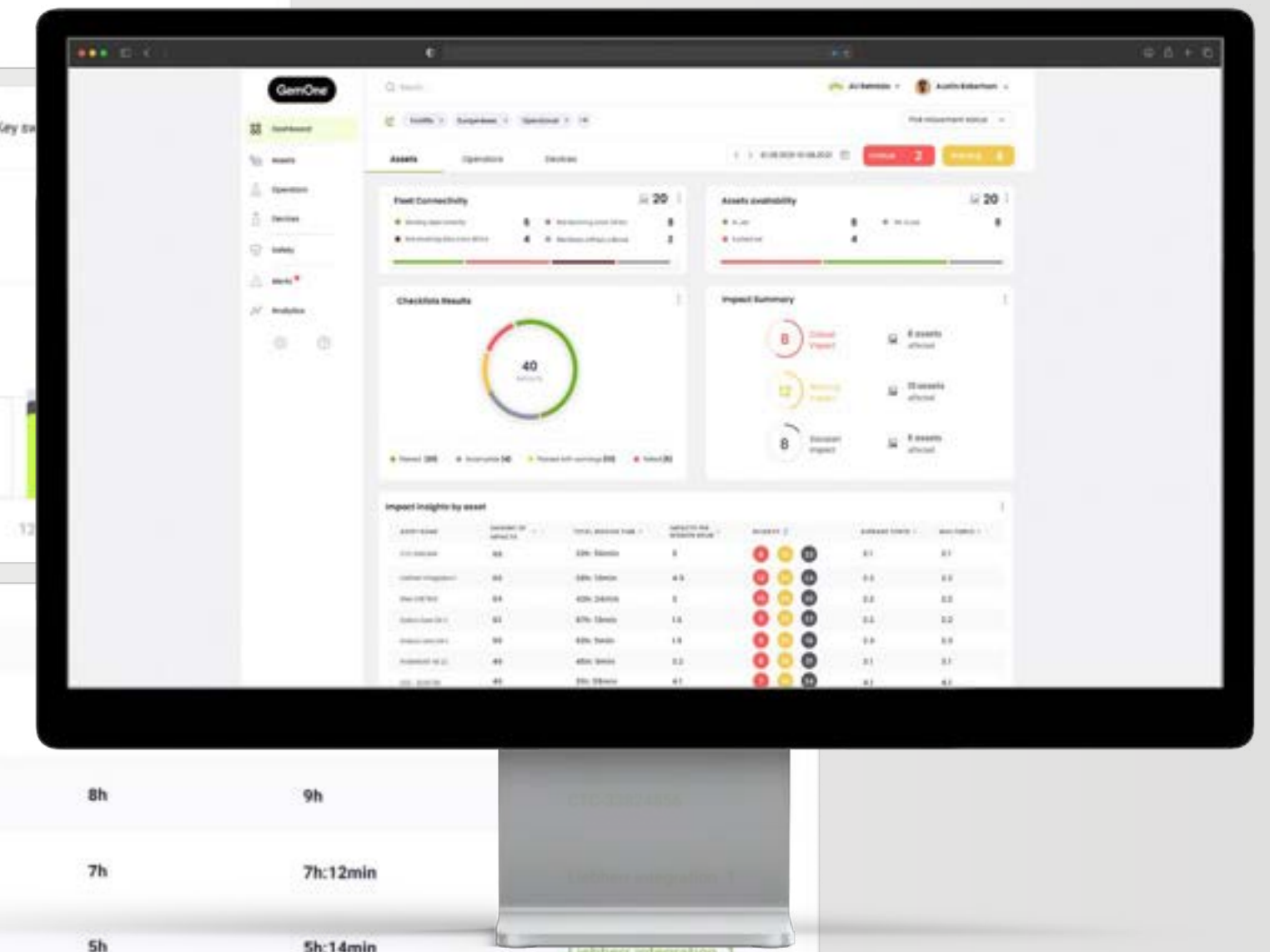
A shorter learning curve will make it easier for your business to onboard new users. And it helps to ensure new modules or features can be easily learned.

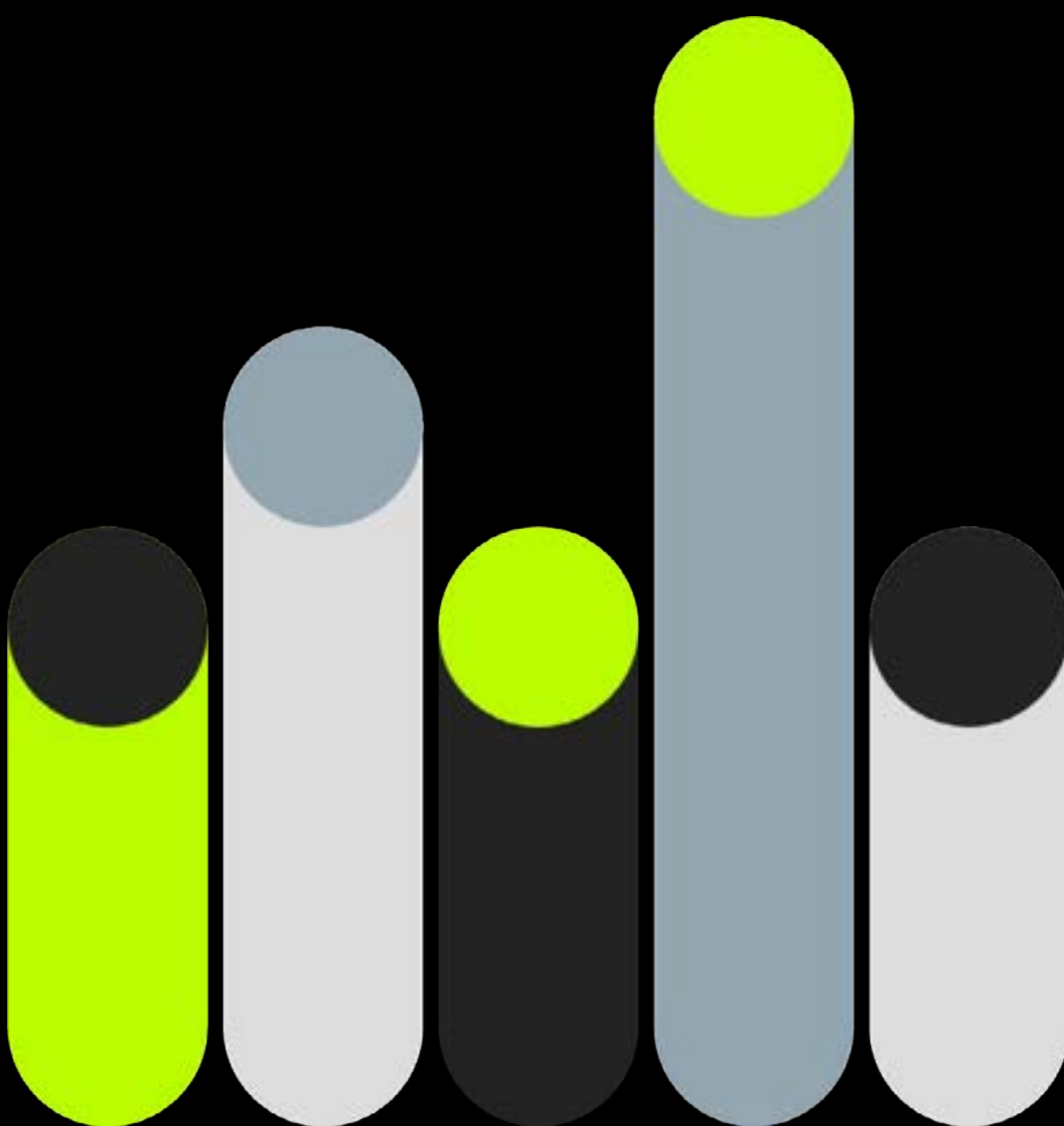
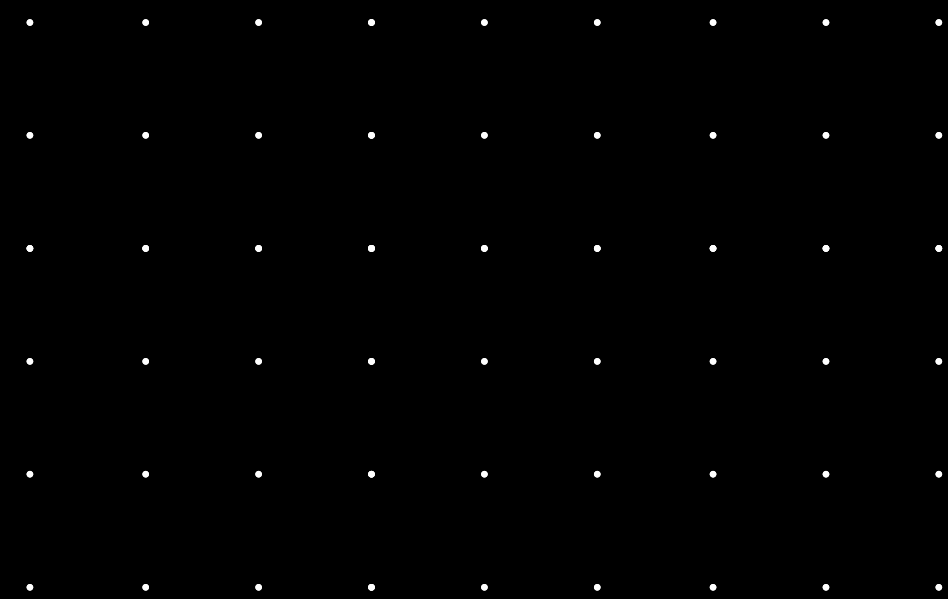
This screenshot shows a configuration form for a Liebherr forklift. The form includes fields for 'Year of manufacture' (2020), 'Serial prefix' (Z-338), and 'Serial number' (S/N 1106B40438). It also features dropdown menus for 'Organisational unit' (Warehouse Hatvan), 'Asset type' (Warehouse equipment), and 'Asset subtype' (Forklifts). There are checkboxes for 'Type' (Off-road, On-road) and a 'Current operating hours' field (150). At the bottom, there are 'Custom labels' such as 'Leasing type: operational' and 'Electrical forklifts: ZT'.

This dashboard provides a summary of the asset's status and performance. It includes sections for 'General info' (Organisational unit: Warehouse Hatvan, Type: Warehouse equipment, Subtype: Forklifts, Labels: ZT (Electrical Forklifts), Operational lease (Leasing)), 'Connected device' (Device: GEM-OX-C, Status: Inactive, GSM signal strength: 0, Asset power: 14,62 V, Inputs connected: 2), 'Active alerts (2)' (Device inactivity, Asset undervoltage), 'Now operating' (Operator: Alan Gefferson, Session start: 25 Oct 2021, 23:15), 'Operating hours: 563.3 h', and 'Battery Voltage: 12.96 V'.



DATE	SESSION TIME	KEY SWITCH ON		
Apr 30, 2021	8h: 1min	7h		
Apr 27, 2021	8h: 12min	9h	8h	9h
Apr 23, 2021	7h: 56min	7h: 12min	7h	7h: 12min
Apr 20, 2021	7h: 14min	5h: 14min	5h	5h: 14min
Apr 17, 2021	6h: 47min	4h: 22min	4h	4h: 22min





White paper by GemOne
More insights on gemone.com

