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Guide to **Fleet**
Telematics Systems





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What is Fleet Telematics?

The term telematics combines the words telecommunications and informatics. Telematics is an integration of wireless communications, vehicle monitoring systems and location tracking devices. At a simple level, telematics may involve using GPS to track vehicles in a fleet. But today, the most sophisticated telematics systems can be used to intervene when a truck driver is going too fast, following too closely, or falling asleep behind the wheel.

The wireless cellular networks that fleet managers use to phone drivers can do much more than let them stay in touch -- they can monitor and even manage driver behavior. Indeed, the widespread availability of broadband cellular data networks is a major factor in the growth and widespread adoption of fleet telematics. Deploying wireless telematics systems can lead to increased productivity, improved customer service, higher levels of safety, and more efficient use of company assets.

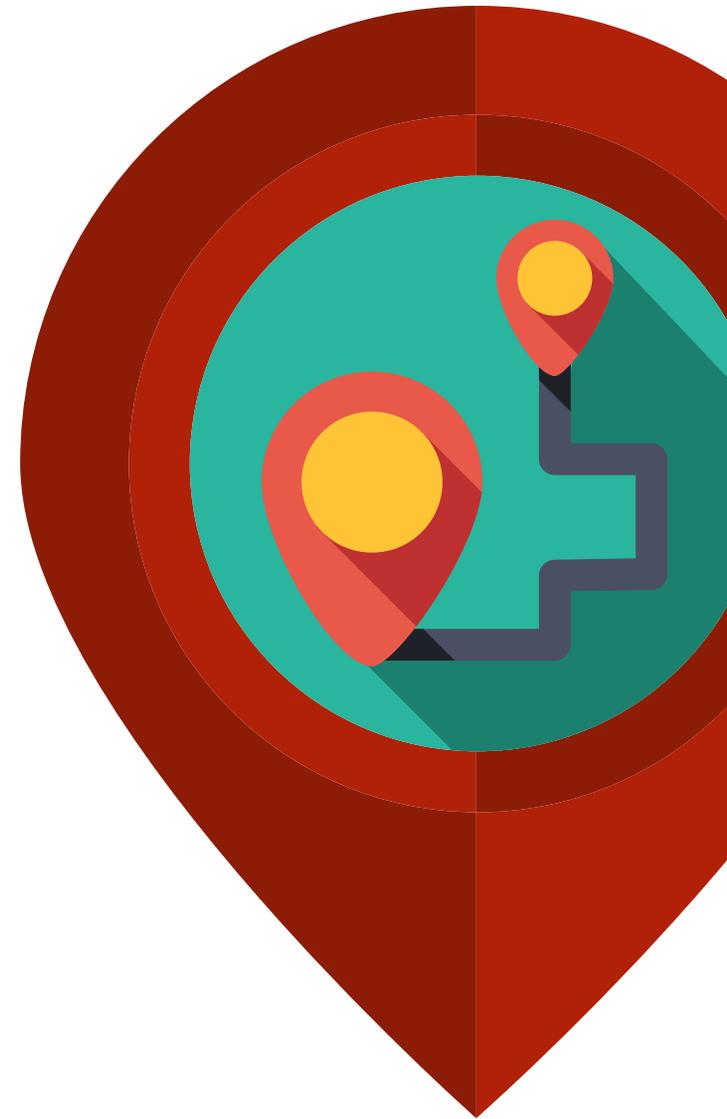
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Major wireless providers AT&T, Verizon, and Sprint all offer fleet management packages that employ GPS tracking and communication capabilities through their cellular networks. In addition, a variety of vendors use cellular and satellite wireless communications to provide customized telematics services.

Increasingly, vehicle manufacturers have been offering telematics as a pre-installed option. In 2013, GM sold 2 million cars with installed telematics, a trend that is expected to accelerate. “Global shipments of automotive telematics systems are set to rise to 84.4 million units in 2016, up by a factor of more than four from 19.3 million in 2008,” according to [iSuppli Corp.](#)

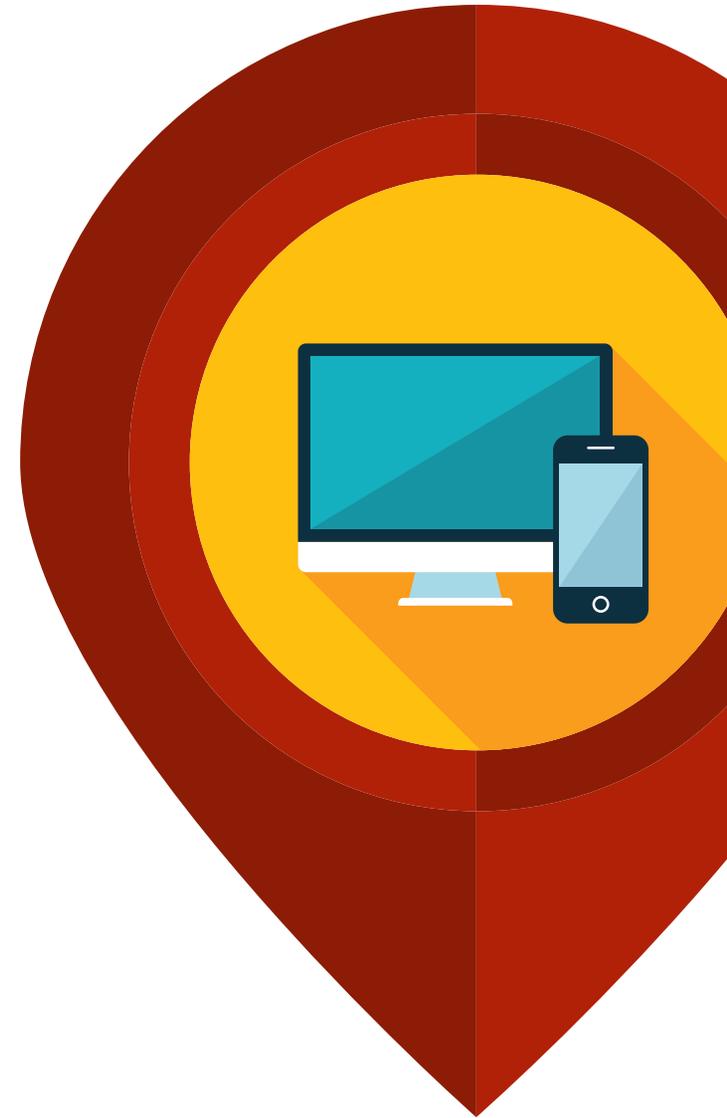
Not so long ago, telematics was limited to basic tracking and was affordable only for mega-sized fleets. Today, the widespread availability of the technology and the high adoption rate by vehicle manufacturers have lowered the cost of the equipment to a relatively small investment that quickly pays for itself. Thanks to integrating telematics into their fleets, companies are seeing a 15 percent increase in productivity per truck. Managers of even small fleets can now optimize the maintenance and performance of their vehicles while also improving driver performance and overall safety.



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What You Can Track with Fleet Telematics Systems

- Fuel consumption
- Remote engine diagnostics
- Automatic distress signals
- Driver line of vision
- Road conditions, i.e., visibility, precipitation, and temperature
- Vehicle speed versus posted speed limit
- Vehicle proximity to other vehicles
- Driver position in vehicle
- Driver location when outside of vehicle
- Amount of driver time spent in each location
- Location of trailers
- Location of container cars



How Telematics Systems **Optimize** Fleet Performance and Safety

- **Improve fuel consumption and lower fuel costs.** Fleet telematics can tell exactly how much fuel a vehicle is consuming in real-time, and identify excessive idle time and other driver behaviors that can be corrected to achieve higher mileage and reduce engine idle time. Promotion of good driving habits is estimated to reduce fuel consumption by as much as 10 percent. In addition, navigation systems not only plot the most fuel-efficient routes, but also receive notification of traffic blockages in time to modify the route, avoid congestion and still achieve the shortest travel time.
- **Reduce vehicle emissions.** Improving fuel consumption not only results in higher mileage and lower costs, but also reduces engine emissions, thus making it easier to cost-effectively comply with state and federal pollution control requirements.

Fleet telematics can tell exactly how much fuel a vehicle is consuming in real-time, and identify excessive idle time.

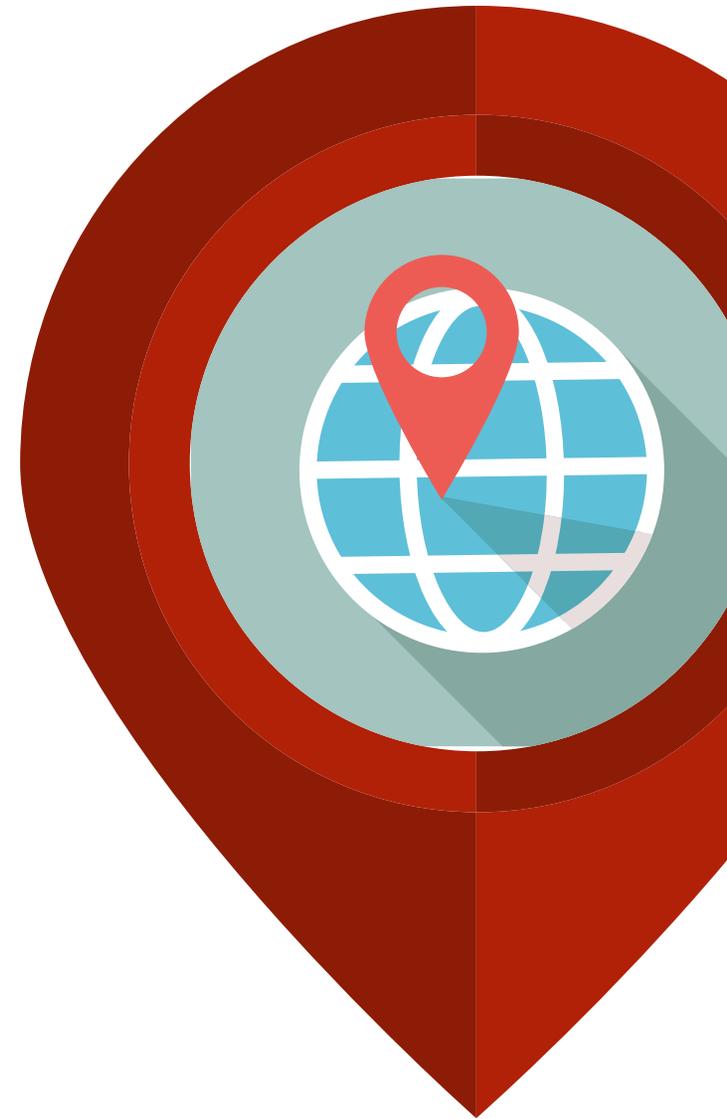


- **Improve preventive maintenance and optimize maintenance scheduling intervals.** Sensors continually monitor engine performance to detect problems before they become major issues, as well as issue trouble code alerts when regular maintenance (oil and other fluid changes, filter replacements, brake inspections, etc.) is due. Performing regular maintenance and catching problems sooner rather than later not only reduces overall maintenance cost and damage to the engine and the vehicle itself; it also results in better engine performance, which improves vehicle life span and fuel consumption. The bottom line is reduced operating cost.
- **Check inventories and order parts automatically.** When maintenance notifications are triggered, fleet telematics automatically check inventory to ensure parts are on hand (and issue orders if they are not), resulting in minimal vehicle out-of-service time.
- **Increase driver productivity.** GPS data and other remote diagnostics provide real-time updates to avoid traffic delays and ensure inventory is loaded, moved and delivered in the most efficient way possible. Moreover, improved vehicle efficiency means fewer delayed deliveries and less time waiting for repairs due to engine problems.

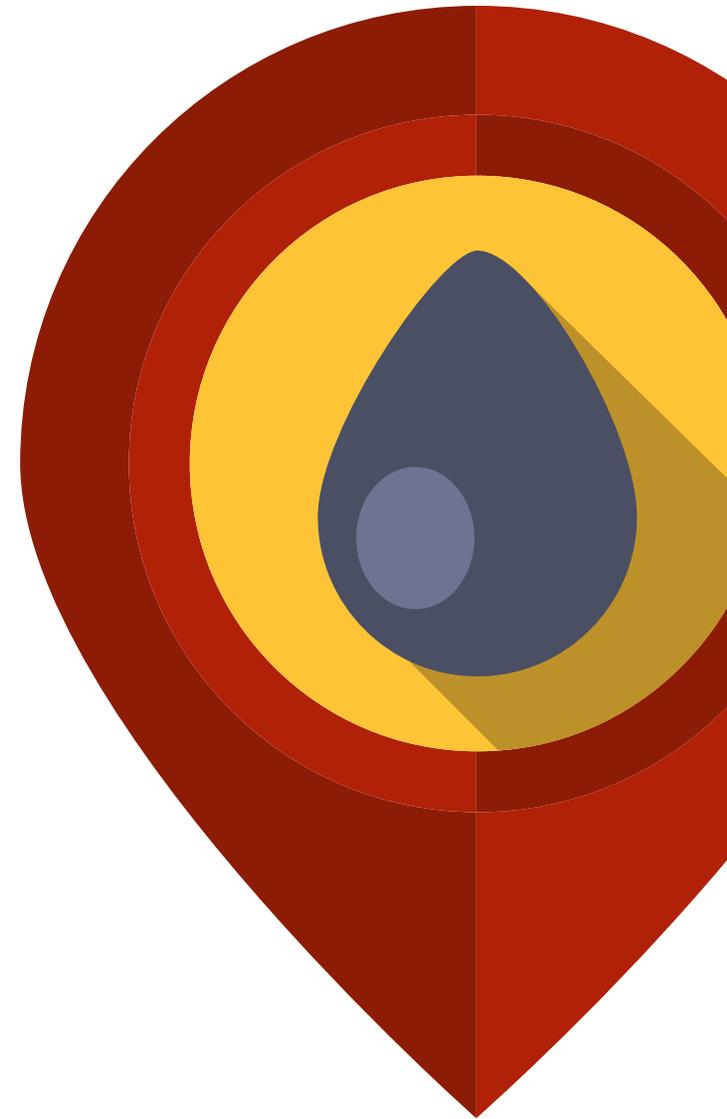


GPS data and other remote diagnostics provide real-time updates to avoid traffic delays.

- **Automate mandated pre- and post-trip vehicle inspections.** Again, real-time data can provide legally required reports almost instantaneously, optimizing driver work time.
- **Improve safety.** Real-time and historical data on driver behavior identifies potentially risky activities such as speeding and hard braking. Some telematics applications allow for breath analyzers that disable ignition if alcohol is detected. Drivers are less likely to engage in these behaviors if they know they are being monitored. Those with habitual patterns of unsafe driving can be moved into training programs or, if problems persist, dismissed with substantial documentation for cause. Improved safety means fewer accidents and fewer tickets, resulting in fewer operational disruptions, reduced driver costs and lower insurance premiums, not to mention promotion of better employee health and welfare with fewer injuries to drivers.
- **Reduce unauthorized vehicle use and improve recovery of stolen vehicles or trailers.** GPS location information not only tells you what your vehicles are doing on the job, it provides information on what your vehicles shouldn't be doing. "Geo-fencing" provides notifications when a vehicle travels beyond predetermined boundaries. Get immediate notifications of unauthorized use and identify the location of hijacked assets.



- **Resolve billing disputes.** Telematics data provides indisputable evidence of driver arrival and departure times to assert or dispute customer claims about lateness or any other failure to fulfill contractual obligations.
- **Simplify and improve regulatory compliance.** Telematics systems can automatically create digital trip logs and improve the accuracy of information required for regulatory reports such as Hours of Service and Interstate Fuel Tax (IFT).
- **Provide on-the-road training.** Higher Internet speeds, growing use of smartphones and tablets, and easy access to Wi-Fi make it possible to offer training to drivers while they wait for pickups. That transforms unproductive time into productive time and counts against total driving time for the day. Eliminating the need for drivers to take time off for training makes them and your company more productive.
- **Integrate telematics data into your fleet management system.** Balance loads, automate documentation and record keeping, and know when to trade in vehicles at the height of their resale value. The accuracy of telematics data integrated into your fleet management system eliminates time-consuming, manual data entry and more quickly pinpoints critical issues that require addressing. Driver information can also be incorporated into time-sheet and payroll systems.



Fleet Telematics Hardware

The hardware in fleet telematics systems collects information that is fed into the software for transmission and analysis. Hardware usually consists of some or all of the following four elements:

1. Embedded systems installed in vehicles or buildings
2. Mobile systems in smart phones or other GPS devices
3. Rearview mirror eye-level sensors
4. Key fobs or badges for tracking the movements of individuals

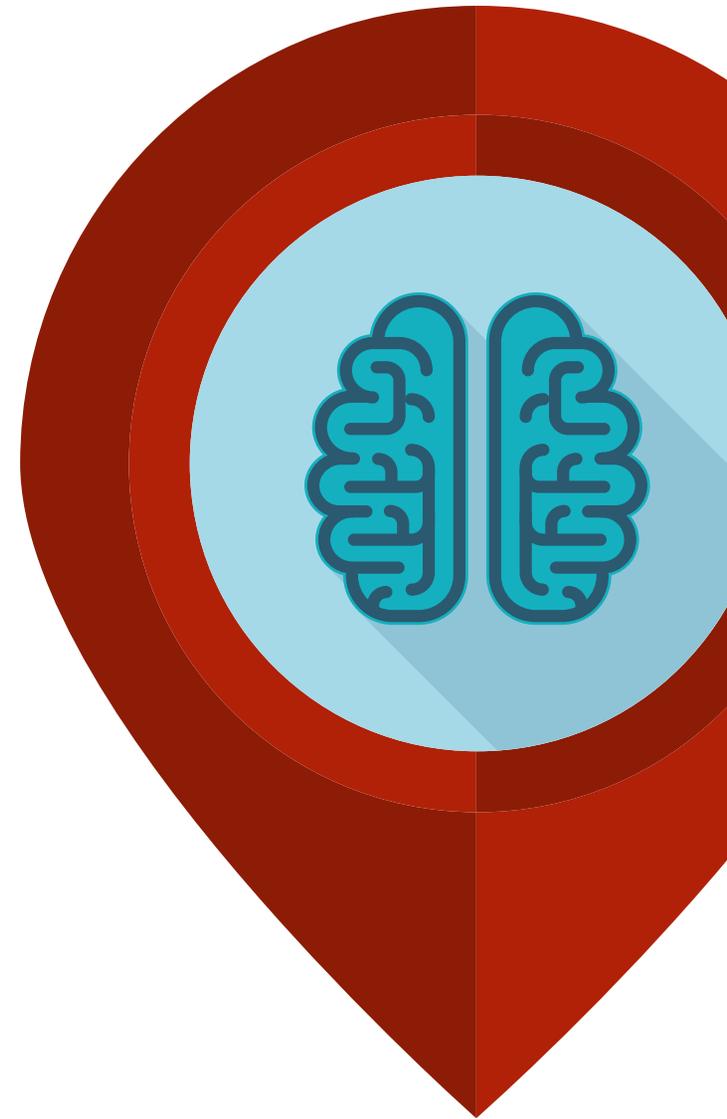
Original equipment manufacturer-installed telematics remain the choice of larger and long-haul fleets. Despite the increasing use of mobile devices and their expanding capabilities, embedded systems aren't in any danger of obsolescence. Larger operations depend on them for greater reliability and quality. For one thing, mobile devices are more susceptible to damage and loss and, unfortunately, tampering by employees. Moreover, OEM-installed systems integrate better with all the other technology in the vehicle, such as engine diagnostics systems.

As telematics grow in use, the price of hardware has been dropping. At the same time, smartphone and tablet-based telematics offer solutions that are, in many cases, less expensive alternatives to traditional hardware-installed



systems. Consequently, even small fleets are starting to embrace the technology, frequently in combination with the smartphones and tablets already in use by their drivers.

More affordability means a greater focus on application. As Genevieve Conti, assistant editor of *Trucking Info* points out, “When Qualcomm first offered its Omnitrac system in 1987, the hardware cost \$4,500 per truck, with a \$50-a-month service fee for satellite connection. ... Today, the company’s newly released fleet management solution, the MCP50, has a suggested retail price of \$799 and monthly service charges as low as \$19.95. ... As costs come down ... there will be less focus on the hardware installed in the truck and more focus on the information we get from it.”



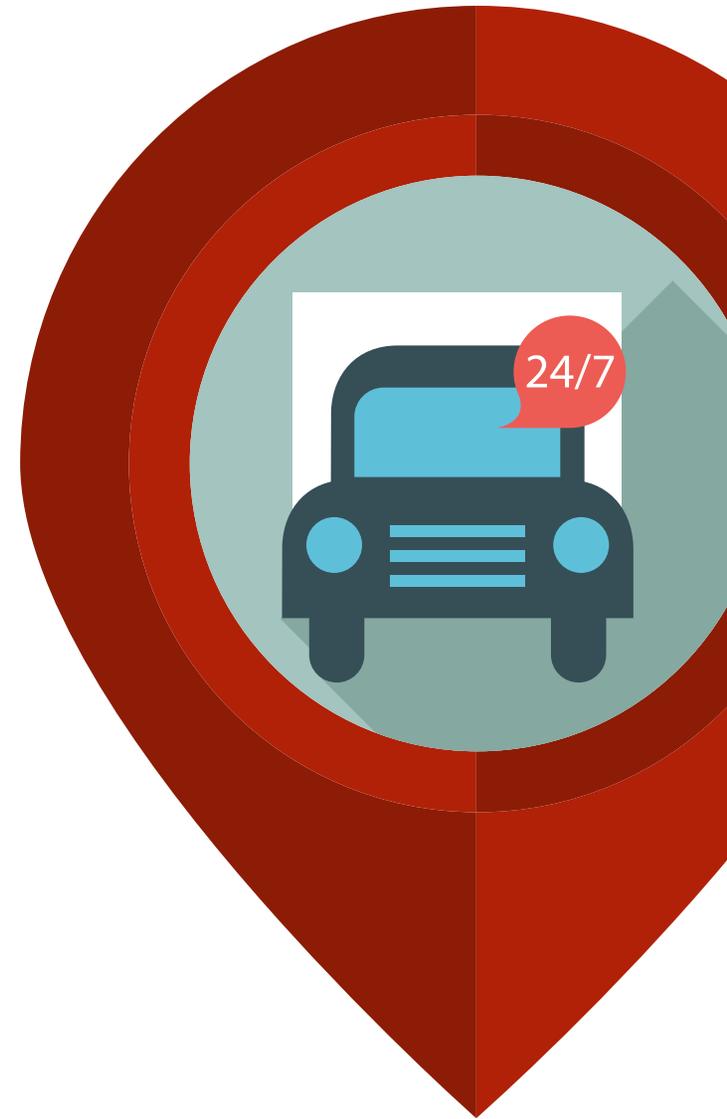
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Fleet Telematics Software

As with most software today, the trend in fleet telematics is towards SaaS (Software as a Service). In contrast to traditional on-premise servers storing data collected from programs installed on your PC network, a vendor stores your data for you and provides access to it through a web browser. ABI Research forecasts a 15-fold increase in commercial SaaS-based fleet telematics units, from 1.06 million in 2012 to a projected 16.8 million by 2018.

The advantages of SaaS-based fleet telematics include:

- Elimination of installation and IT infrastructure expense
- Easy administration
- Open systems easily integrate with other applications
- 24/7 access
- Compatibility with mobile devices
- Unlimited users; easy scalability
- Frequent and automatic updates and patch management
- Easy-to-use, familiar and intuitive user interface
- Server redundancy to ensure accurate backups and prevent data corruption or loss

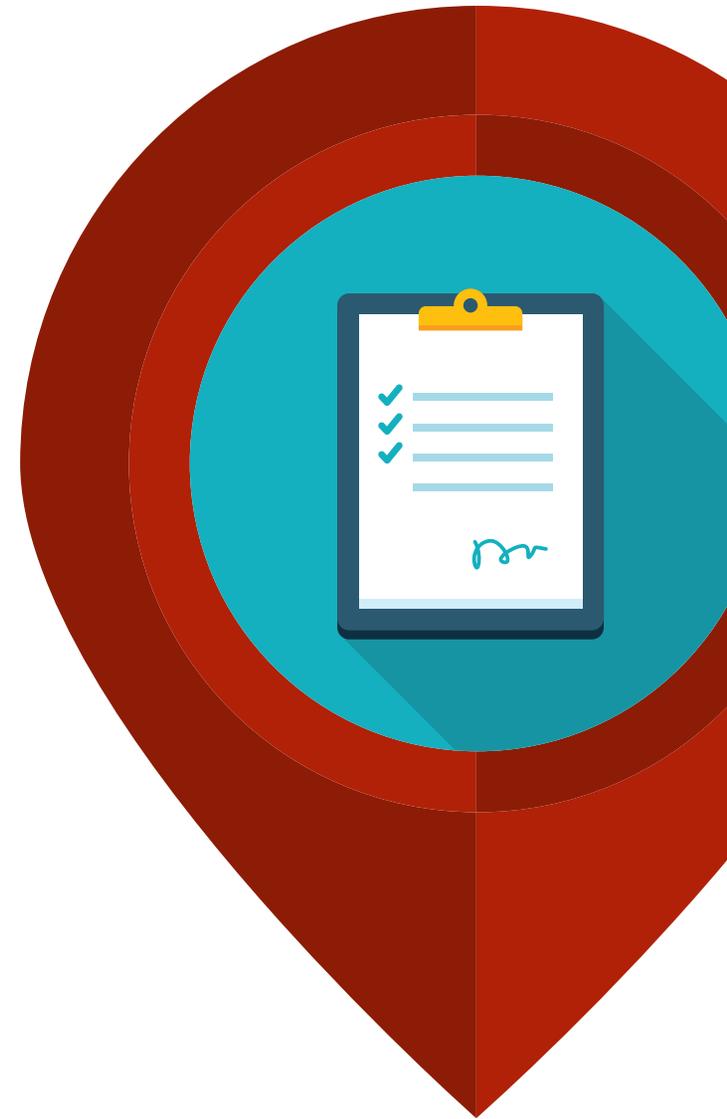


Data collected by telemetric devices are mined to distill actionable, real-time analytics typically regarding:

- Asset utilization (e.g., vehicle speed and location, times of arrival, fuel consumption)
- Regulatory compliance and safety
- Driver communications
- Maintenance and inspection records
- Alerts regarding any of the above that requires timely corrective action

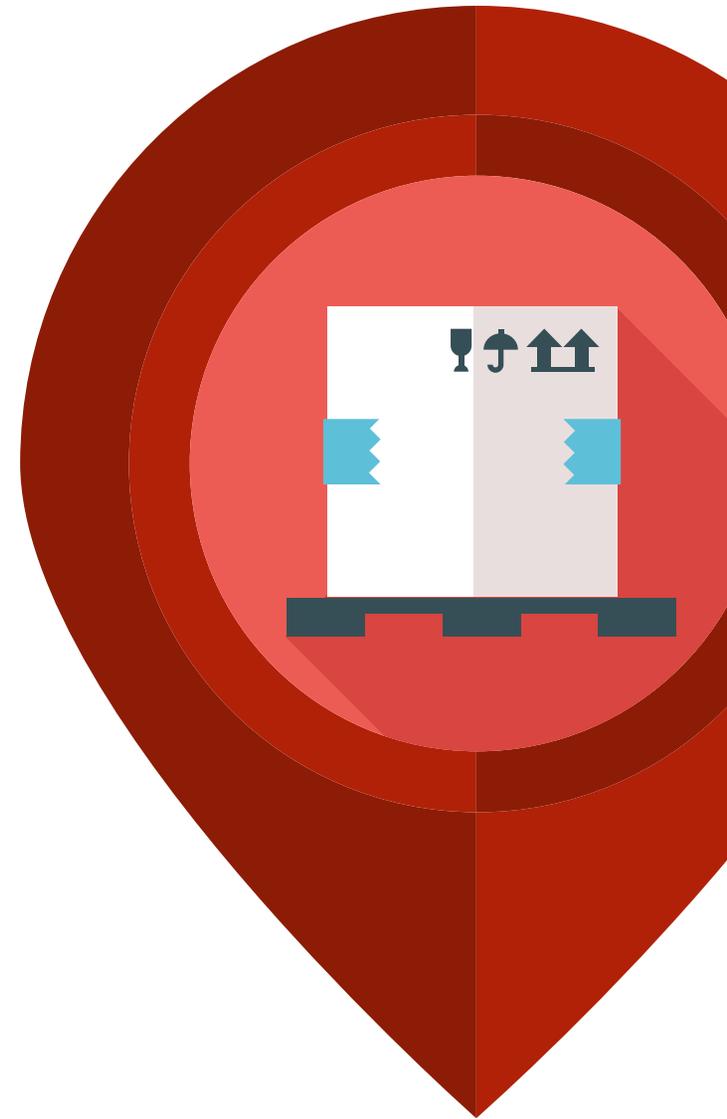
As SaaS-based telematics grow in popularity, reports and data analysis will increasingly be performed via a web interface, or dashboard. A web dashboard allows managers to quickly sort and interpret a variety of data on driver behavior, location, and routing information, as well as vehicle operating conditions.

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Trends in Fleet Telematics Systems

- Regulation is expected to clarify requirements for the use of Electronic-On-Board Recorders (EBORs) on commercial trucks. While the Federal Motor Carrier Safety Administration (FMCSA) previously issued rules to compel compliance with electronic monitoring, the new regulation seeks to clarify previous ambiguities, in particular regarding what might constitute driver harassment based on continuous surveillance.
- Telematics will become a communication platform for apps and services that go across all vehicle domains: the powertrain, the chassis, advanced driver assistance systems (ADAS) and infotainment. This diversity of information tracking further increases the value of telematics for fleet managers. Examples:
 - Sensors on reefers (cold-storage containers) trigger alarms when temperatures fall outside required norms to keep food preserved, and also provide an audit trail. Ensuring food is transported unspoiled has obvious advantages for customer service and efficiency.



- Data collected on public transport system vehicles can be shared with the public via smartphone apps and web portals, improving customer service by communicating accurate arrival and departure times, as well as other pertinent information concerning vehicle status.
- Social media integration can keep drivers connected with customers and provide updates on location and estimated times of arrival. Social media data can also improve route mapping.
- Taxi drivers are using smartphones and tablets to receive fares, while customers use the same devices to book a taxi. This data can be integrated into the vehicle's overall telematics.
- Back-seat video systems provide a number of display features for passengers, including current location maps, selected video clips, information about transportation company, or destinations and cities, as well as a credit card reader to pay for the fare or service.



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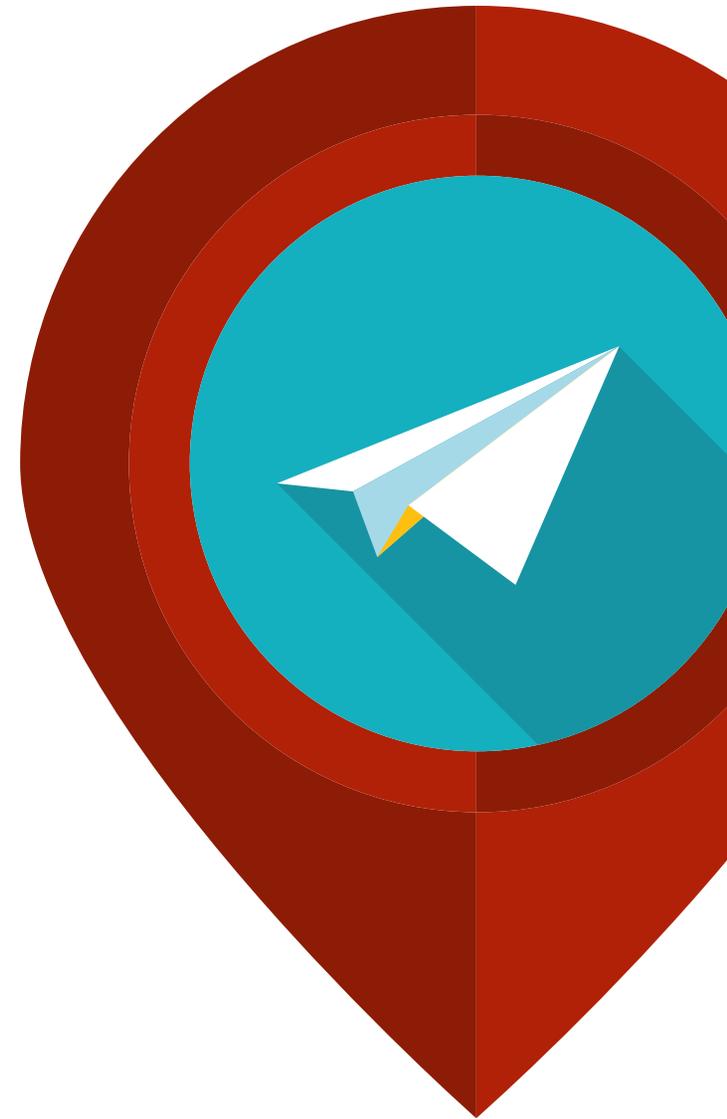
- Retrofitting telematics systems to older vehicles not only improves overall vehicle management, but also useful vehicle life expectancy. Aftermarket systems are particularly attractive as a one-stop telematics solution to manage mixed fleets of light-and heavy-duty use.
- Vehicle-to-Vehicle communications (V2V) and Vehicle-to-Infrastructure (V2I) communications. Also called Cooperative Intelligent Transportation Systems (C-ITS). Vehicles, roadways, police and safety departments will automatically share updates on traffic and safety conditions in real time. Vehicle-embedded computer systems interpret data collected from these sources, issue appropriate notifications, and suggest responses.
- Before long, self-driving vehicle won't be just something you see in the latest sci-fi movie. Vehicle makers are testing the technology and expect it to be operational throughout the United States within 10 years. Convoys of autonomous trucks travelling along smart roads are envisioned not only as a more efficient means of transportation, but a safer means of moving people and materials. Preliminary trials of a driverless convoy of 10 vehicles led by one driver in a lead truck showed a 15 percent



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improvement in fuel consumption. Already, automated emergency braking, lane switching and cruise control systems -- all part of Advanced Driver Assistance Systems (ADAS) -- are taking over from the human driver and will soon become standard equipment.

- Using mobile devices increases self-service option. Customers can bypass human customer service operators to directly rent, fuel and pay for vehicle use through their smartphone or tablet. Telematics will ensure drivers adhere to vehicle requirements for safety, drop-off and pick-up times, and geo-fencing restrictions.



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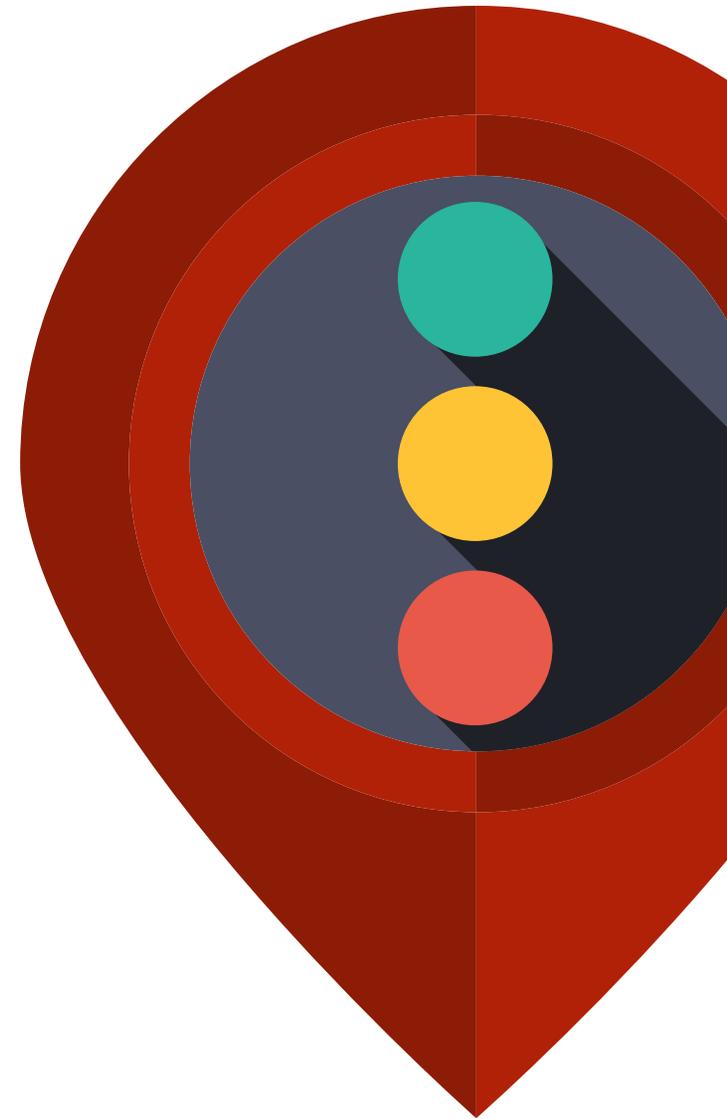
Tips for Evaluating Fleet Telematics Systems

- **OEM or Mobile Device.** The first fleet telematics systems were all-in-one hardware and software solution packages, and that continues to be the industry standard. However, a growing trend is to provide software that works on common smartphones, tablets, or retail GPS consumer devices, which is particularly attractive if you don't have complex logistical routes and/or a large number of vehicles.
- **Cell Service or Satellite?** Cellular-based systems are most effective in urban areas. Satellite systems are preferred when a vehicle travels out of cellular network ranges, usually rural areas. There are hybrid systems with both options.

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- **Anticipated Use.** Consider the environmental conditions your fleet operates under. If you operate in hard environments, you'll need extra rugged or water-resistant cases for the devices. What kind of reports do you need, and how frequently do they need to be generated? Generally speaking, the number and frequency of reports help you determine both hardware and software needs.
- **Getting What You Pay For.** Fleet telematics can pay for itself with improved cost-efficiency. That said, a fully integrated system, even with prices going down, could still represent a significant investment. Reputable dealers provide you with extended service agreements and warranties, as well as on-site and telephone technical support, to help ensure that your investment is a wise one.



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Business.com Checklist for Fleet Telematics Systems

	My Needs	Vendor 1	Vendor 2		My Needs	Vendor 1	Vendor 2
Usability <ul style="list-style-type: none"> • Web-based reporting and data display • Customizable reports • Real-time data mapping 				Interactivity <ul style="list-style-type: none"> • Social media integration • Internet connectivity • Mobile device capabilities/integration 			
Location-Based Data <ul style="list-style-type: none"> • Real-time vehicle location • Vehicle routing/tracking • Route or incident mapping • Turn-by-turn directions 				Integration <ul style="list-style-type: none"> • Fleet Management Systems • Other enterprise-wide systems such as HR, payroll, time sheets, etc. • Data export 			
Safety Monitoring <ul style="list-style-type: none"> • Acceleration • Harsh Braking • Lane tracking • Camera recording • Geo-fencing 				Service Region <ul style="list-style-type: none"> • U.S. • Canada 			
Diagnostics <ul style="list-style-type: none"> • Maintenance alerts • Fuel consumption • Emissions • Problem code alerts • Eco-driving alerts 				Pricing			
Communications <ul style="list-style-type: none"> • Two-way dispatching • Two-way messaging • Email alerts • Automatic tracking/reporting of stops • Wi-Fi connectivity • Training delivery capability 				Installation Fee			
				Monthly fees			
				Software upgrade/maintenance			
				Technical support <ul style="list-style-type: none"> • 800 number • email/chat 			
				Training			
				Extended Warranty			