HOW IN-CAB, CONNECTED TECHNOLOGIES ARE MAKING FLEETS SAFER AND MORE EFFICIENT

Tyler Harden, Executive Vice President, TTN Fleet Solutions

ttnfleetsolutions.com

The transportation industry has witnessed a significant transformation with the introduction of connected technology in cabs and trucks. Fleet operators and trucking companies are leveraging connected technologies to improve the safety, efficiency, and productivity of their operations. In this white paper, we'll take a closer look at various types of connected technologies available in truck cabs of modern fleet vehicles.

Telematics

"Telematics" is the buzzword that describes technology that enables communication between a vehicle and a central monitoring system. Telematics systems installed in cabs and trucks allow fleet managers to monitor various aspects of their operations, including:

- Vehicle location
- Driver behavior
- Engine performance
- Fuel consumption

With this data, fleet managers can optimize routes, reduce fuel costs, and improve safety by monitoring driver behavior.

There are several leading brands in the telematics industry that offer in-cab technologies for fleets. Here are some examples:

Geotab: Geotab is a leading provider of telematics solutions for fleets. Their in-cab technology includes GPS tracking, driver scorecards, and real-time engine diagnostics. Geotab also offers a range of third-party integrations, allowing fleet managers to customize their telematics solutions to meet their specific needs.

Omnitracs: Omnitracs is a well-known name in the fleet management industry. Their in-cab technology includes GPS tracking, electronic logging, and driver behavior monitoring. Omnitracs also offers a range of solutions for route optimization, fuel management, and safety compliance.

Verizon Connect: Verizon Connect is a subsidiary of Verizon Communications that provides telematics solutions for fleets. Their in-cab technology includes GPS tracking, driver scorecards, and fuel management tools. Verizon Connect also offers a range of solutions for dispatching, asset tracking, and compliance management.

Teletrac Navman: Teletrac Navman is a global provider of telematics solutions for fleets. Their in-cab technology includes GPS tracking, driver behavior monitoring, and electronic logging. Teletrac Navman also offers a range of solutions for route optimization, fuel management, and safety compliance.

Fleet Complete: Fleet Complete is a leading provider of telematics solutions for fleets. Their in-cab technology includes GPS tracking, driver behavior monitoring, and real-time vehicle diagnostics. Fleet Complete also offers a range of solutions for route optimization, maintenance management, and safety compliance.

GPS

Global Positioning System (GPS) technology has become ubiquitous in modern transportation, including in cabs and trucks. GPS systems enable fleet managers to track the location of their vehicles in real-time, which is useful for optimizing routes and responding quickly to unexpected situations. Additionally, GPS technology can provide drivers with turn-by-turn directions, which can help reduce driver distractions and increase safety.

The GPS systems market for the fleet industry is highly competitive, and there are many reputable providers in the market. However, based on market share, customer

reviews, and industry reputation, the top three providers of GPS systems for the fleet industry are:

Trimble: Trimble is a global leader in GPS technology, and their solutions for the fleet industry are among the most comprehensive in the market. Trimble offers a range of GPS systems and telematics solutions that can be customized to meet the specific needs of fleets, including route optimization, fuel management, and safety compliance. They have a large customer base and a reputation for quality and reliability.

Verizon Connect: Verizon Connect provides GPS and telematics solutions for the fleet industry. Their GPS systems are highly accurate and reliable, and they offer a range of features for fleet management, including real-time tracking, driver safety monitoring, and route optimization. They have a large customer base and are known for their excellent customer service and support.

Omnitracs: Omnitracs is a well-established provider of GPS and telematics solutions for the fleet industry. Their GPS systems are highly accurate and reliable, and they offer a range of features for fleet management, including real-time tracking, driver safety monitoring, and route optimization. They are known for their user-friendly software and excellent customer support.

Electronic Logging Devices (ELD)

Electronic Logging Devices are mandatory for all commercial drivers in the United States. These devices track drivers' hours of service and ensure that they comply with federal regulations. ELDs are also useful

for fleet managers, who can use the data to optimize scheduling, reduce downtime, and ensure that drivers are not overworked.

Omnitracs, mentioned above, offers industry-leading ELDs; however, these devices are also available from other companies including KeepTruckin and Samsara.

Each of these company's devices are Federal Motor Carrier Safety Administration compliant and provide real-time monitoring of hours of service.

Dash Cameras

Dash cameras have become increasingly popular in cabs and trucks due to their ability to improve safety and reduce liability. These cameras record video footage of the road ahead and the driver's actions, which can be used to investigate accidents or incidents. Additionally, dash cameras can help identify and correct unsafe driving behaviors.

Here are some ways in which fleets are using dash cams to improve safety:

Capturing video evidence: Dash cams can capture video footage of accidents and other incidents on the road, providing valuable evidence for investigations and insurance claims. This can help fleets to identify the cause of accidents, determine fault, and prevent similar incidents in the future.

Monitoring driver behavior: Some dash cams are equipped with features that can monitor driver behavior,

such as speeding, harsh braking, and swerving. This can help fleet managers to identify unsafe driving habits and provide coaching and training to improve driver safety.

Improving driver visibility: Some dash cams are designed to provide improved visibility for drivers, particularly in poor weather conditions or low-light situations. This can help drivers to avoid obstacles and hazards on the road and reduce the risk of accidents.

Preventing theft and vandalism: Dash cams can also be used to deter theft and vandalism, as the presence of a camera can make would-be thieves or vandals think twice before targeting a vehicle.

Enhancing safety culture: By demonstrating a commitment to safety through the use of dash cams, fleets can help to build a strong safety culture among their drivers and staff. This can lead to improved safety performance and a reduction in accidents and incidents on the road.

There are several companies that offer innovative dash cam technology for the fleet industry, and it's difficult to single out one as the most innovative. However, one company that is often mentioned as a leader in the dash cam market is Lytx.

Lytx offers a range of dash cams and other telematics solutions that are designed to improve safety, efficiency, and productivity for fleets. Their flagship product is the DriveCam Event Recorder, which is a dual-facing dash cam that captures video footage of both the road ahead and the driver inside the cab.

The DriveCam uses advanced sensors and machine learning algorithms to analyze driver behavior and detect risky driving maneuvers, such as sudden braking, swerving, and hard acceleration. When an event is detected, the DriveCam automatically saves a clip of the video footage, which can be reviewed by fleet managers for coaching and training purposes.

Lytx also offers a range of other dash cam solutions,

including the SF300 and SF550, which are designed for different types of vehicles and use cases. These dash cams are equipped with advanced features such as night vision, advanced analytics, and customizable settings.

Advanced Driver Assistance Systems (ADAS)

ADAS technology includes various features designed to help drivers avoid accidents and improve safety. These features may include lane departure warning, forward collision warning, adaptive cruise control, and blind spot detection. ADAS technology can reduce accidents, save lives, and lower insurance costs for fleet operators.

Here's a summary of several, popular, ADAS features.

Lane departure warning: This system uses cameras or sensors to detect when a vehicle is drifting out of its lane and alerts the driver to take corrective action. This can help to prevent accidents caused by driver distraction or drowsiness.

Adaptive cruise control: This system uses radar or cameras to maintain a safe following distance between the vehicle and the one in front, automatically adjusting the speed of the vehicle as needed. This can help to reduce the risk of rear-end collisions and improve fuel efficiency.

Automatic emergency braking: This system uses sensors or cameras to detect when a collision is imminent and applies the brakes automatically to avoid or mitigate the impact. This can help to prevent accidents caused by driver error or distraction.

Blind spot detection: This system uses sensors or cameras to detect vehicles in the driver's blind spot and alerts them when it is unsafe to change lanes. This can help to prevent accidents caused by driver error or misjudgment.

Rearview camera: This system provides a view of the area behind the vehicle when reversing, making it easier for drivers to park and maneuver in tight spaces. This can help to prevent accidents caused by poor visibility.

The benefits of ADAS include:

Improved safety: ADAS can help to reduce the risk of accidents caused by driver error, distraction, or fatigue, making the roads safer for all users.

Reduced driver stress: ADAS can help to reduce the cognitive load on drivers by providing additional information and assistance, allowing them to focus on driving and reducing their stress levels.

Increased comfort: ADAS can provide a more comfortable driving experience by reducing the need for constant adjustments and corrections, improving ride quality, and reducing fatigue.

Improved fuel efficiency: ADAS can help to optimize vehicle speed and distance, reducing fuel consumption and emissions.

Several companies manufacture Advanced Driver Assistance Systems (ADAS) solutions for the commercial trucking industry. Here are some examples:

WABCO: WABCO is a global supplier of safety technology and services to the commercial vehicle industry. They produce a range of ADAS solutions for commercial trucks, including collision mitigation systems, lane departure warning systems, and adaptive cruise control.

Bendix: Bendix is a leading supplier of safety and braking systems for the commercial vehicle industry.

They produce a range of ADAS solutions for commercial trucks, including collision mitigation systems, lane departure warning systems, and blind spot detection systems.

Continental: Continental is a global technology company that produces a wide range of automotive components, including ADAS solutions for commercial trucks. Their technologies are designed to improve safety and efficiency for commercial truck drivers, including collision mitigation systems, lane departure warning systems, and blind spot detection systems.

Mobileye: Mobileye, a subsidiary of Intel, is a leading supplier of ADAS solutions for the commercial vehicle industry. Their technologies include collision avoidance systems, lane departure warning systems, and forward collision warning systems.

ZF Friedrichshafen AG: ZF Friedrichshafen is a global technology company that produces a range of ADAS solutions for the commercial vehicle industry, including collision mitigation systems, lane departure warning systems, and blind spot detection systems.

In-Cab Communications Systems

In-cab communication systems are technologies that allow drivers to communicate with dispatchers, managers, and other members of their fleet while on the road. These systems typically include a combination of hardware and software, such as in-cab messaging devices and mobile applications.

There are several examples of in-cab communications devices or systems that are commonly used in the commercial trucking industry. Here are a few:

Mobile data terminals (MDTs): MDTs are ruggedized tablets or other devices that are mounted in the cab of the truck. They allow drivers to receive dispatch instructions, send messages, and access real-time information about their routes, such as traffic updates and weather alerts.

Two-way radios: Two-way radios are a simple and reliable form of in-cab communication that have been used in the trucking industry for decades. They allow drivers to communicate with dispatchers, managers, and other members of their fleet while on the road.

Electronic Logging Devices: Mentioned earlier, ELDs are devices that are used to track a driver's hours-of-service (HOS) and ensure compliance with FMCSA regulations. Many ELDs also include messaging capabilities that allow drivers to communicate with dispatchers and other members of their fleet.

Bluetooth headsets: Bluetooth headsets are a hands-free way for drivers to communicate with dispatchers and managers while on the road. They allow drivers to stay focused on driving while still receiving important information and updates.

Fleet management software: Fleet management software platforms provide a comprehensive solution for managing all aspects of a fleet's operations, including in-cab communication. These systems typically include messaging capabilities, real-time data tracking, and other features designed to improve efficiency and safety for drivers and fleets.

The benefits of in-cab communication systems in the commercial trucking industry include:

Improved safety: In-cab communication systems allow drivers to receive critical safety-related information in real-time, such as road closures, weather alerts, and traffic updates. This can help drivers avoid hazardous conditions and make informed decisions about their routes and driving behaviors.

Increased efficiency: In-cab communication systems can improve fleet efficiency by allowing drivers to communicate directly with dispatchers and managers. This can help reduce downtime, optimize routes, and streamline operational processes.

Enhanced driver satisfaction: In-cab communication systems can improve driver satisfaction by providing drivers with real-time support, access to information, and streamlined workflows. This can help reduce stress and improve job satisfaction for drivers.

Improved compliance: In-cab communication systems can help fleets comply with regulatory requirements, such as the Federal Motor Carrier Safety Administration's (FMCSA) Electronic Logging Device (ELD) mandate. These systems can also help fleets manage compliance-related tasks, such as driver hours-of-service tracking and vehicle inspection reports.

Overall, in-cab communications devices and systems are essential for keeping drivers connected and informed while on the road. By providing drivers with real-time information, streamlined workflows, and direct communication with dispatchers and managers, these systems can help fleets optimize their operations and improve safety and efficiency.

Driver Performance Monitoring Systems

Driver performance monitoring systems can fairly be called a sub-category of Telematics. These are technologies that track and analyze driver behavior in commercial vehicles. These systems use various sensors and data sources to monitor driver performance, such as GPS tracking, engine data, and video cameras.

The goal of driver performance monitoring systems is to improve safety, reduce costs, and increase efficiency for commercial fleets. By tracking and analyzing driver behavior, these systems can help fleets identify areas

where drivers may need additional training or coaching, as well as areas where processes or equipment may need to be improved.

Some common features of driver performance monitoring systems in the commercial vehicle industry include:

Speed monitoring: Speed monitoring systems track how fast drivers are traveling and can alert managers if drivers exceed speed limits or exhibit unsafe driving behaviors.

Braking monitoring: Braking monitoring systems track how often drivers brake hard or abruptly, which can indicate aggressive driving or unsafe following distances.

Idling monitoring: Idling monitoring systems track how long drivers idle their engines, which can help fleets identify areas where fuel consumption can be reduced.

Video monitoring: Video monitoring systems use cameras mounted in the cab and on the vehicle to record driver behavior, such as speeding, hard braking, or distracted driving. This data can be used for coaching and training purposes, as well as for investigations of accidents or other incidents.

GeoTab, Samsara, and Omnitracs are widely considered as leading providers of these technologies.

Overall, driver performance monitoring systems are becoming increasingly important in the commercial vehicle industry as fleets look for ways to improve safety and efficiency. By providing real-time data on driver behavior, these systems can help fleets identify and address potential safety risks, reduce costs, and optimize their operations.

Maintenance Tracking Systems

Maintenance tracking technology in the commercial fleet trucking industry is a system that helps fleet managers keep track of the maintenance needs of their vehicles. This technology uses data from sensors, telematics

devices, and other sources to monitor the health and performance of each vehicle in a fleet.

The goal of maintenance tracking technology is to help fleets identify potential maintenance issues before they become more serious and lead to breakdowns or other problems. By monitoring key performance indicators (KPIs) such as engine health, tire pressure, and brake wear, maintenance tracking technology can help fleets schedule preventive maintenance and repair tasks at the optimal time, reducing the risk of unexpected downtime and costly repairs.

Some common features of maintenance tracking technology in the commercial fleet trucking industry include:

Real-time monitoring: Maintenance tracking technology continuously monitors each vehicle in a fleet in real-time, providing up-to-date information on KPIs and other relevant data.

Alerts and notifications: When a maintenance issue is identified, the technology can send alerts and notifications to fleet managers or maintenance personnel, providing them with the information they need to take action.

Predictive maintenance: Maintenance tracking technology can use historical data and predictive analytics to identify when maintenance tasks will be needed in the future, helping fleets plan and schedule preventive maintenance proactively.

Integration with other systems: Maintenance tracking technology can be integrated with other systems, such as telematics or fuel management systems, to provide a comprehensive view of fleet operations.

There are several top providers of maintenance tracking technology for the commercial trucking industry. These three are often recognized as leaders in this space:

Verizon Connect: Verizon Connect's solutions include real-time monitoring of vehicle health and performance, automated maintenance scheduling, and predictive maintenance analytics.

Trimble Transportation: Trimble Transportation is another leading provider of fleet management technology, including maintenance tracking solutions for the commercial trucking industry. Its solutions include real-time diagnostics and alerts, automated maintenance scheduling, and customizable reporting and analytics.

Fleetio: Fleetio is a cloud-based fleet management software platform that includes maintenance tracking functionality. Its solutions include automated maintenance reminders and scheduling, real-time alerts for vehicle issues, and detailed reporting and analytics.

Additional providers of maintenance tracking technology for the commercial trucking industry include Omnitracs, Zonar Systems, and Geotab, among others.

In summary, maintenance tracking technology is becoming increasingly important in the commercial fleet trucking industry as fleets look for ways to improve efficiency, reduce costs, and ensure safety. By providing real-time information on vehicle health and performance, this technology can help fleets make better decisions about maintenance and repair tasks, minimizing the risk of downtime and costly repairs.

With regard to any of the companies or brands used in this paper as examples of connected technologies, it's important to remember these markets are competitive and that other brands and options are available. Nothing here should be taken as an endorsement of any

particular brand. Furthermore, fleet managers should carefully evaluate the features and capabilities of any in-cab systems and choose solutions that best meets their needs.

How TTN Is Enhancing Service With Connected Technologies

TTN Fleet Solutions has several initiatives in development with regard to connected technologies. Both are designed to make access to roadside assistance easier and faster for fleets, large and small.

The first of these initiatives involves TTN's relationship with CrownSource, the maker of the fleet maintenance industry's newest mobile app for owner operators and small-to-medium sized trucking and specialty fleet transportation companies.

The app, known as BigRig Savings, puts discounts at the fingertips of operators and drivers for items like fuel and tires.

TTN has become the premier provider of emergency roadside assistance, repair, towing, and scheduled preventive maintenance with the mobile app.

This will extend our services to non-contracted clients who need help and want to pay as they go, rather than committing to an ongoing account relationship with TTN.

The app is available now by applying at crownsourceinc.com and is slated to be released within the Apple Store and Google Play within approximately the next month.

A second example of how TTN is using connected technologies to increase access to and enhance roadside assistance services is marked by our relationship with Platform Science.

Platform Science offers a configurable, open platform delivering modern telematics and enterprise-grade applications to the fleet industry. The company has worked along side with drivers, back-office employees, IT managers, and compliance teams to create a platform that works "out-of-the-box."

With this platform, TTN is offering access to FleetAssist, the industry's smartest, easiest Software-as-a-Service for managing unexpected maintenance events.

This combination of Platform Science's closer-to-the-customer distribution model and TTN's proven software and service will add discipline and control to maintenance and recovery process for medium to large transportation companies.

For more information, contact your TTN Fleet Solutions Representative, or contact Tyler Harden at tharden@ttnfs.com.