The connected truck - fleet efficiencies through telematics
Real-time information gives fleet managers an edge

Telematics is here to stay
Managing multiple trucks and drivers has never been easier or more efficient thanks to modern fleet management tools that offer systems for saving money and maximizing delivery and operation efficiencies. Companies that have not considered networking their fleets and monitoring such crucial variables as driver behavior and fuel usage, may be putting their companies at distinct disadvantages.

According to Krish Inbarajan, senior director telematics at Ryder, a leader in onboard telematics, “Onboard technology provides fleet managers and drivers with real-time information that helps entire fleets operate more efficiently and safely. This new level of fleet efficiency translates into competitive advantage.”

Today’s technologies offer ways to maximize fleet efficiencies, safety, customer services, profitability and fuel performance. Truck maintenance, navigation and driver behavior monitoring are just a few of the ways telematics can help solve supply chain issues, better coordinate deliveries and create an overall more profitable and smoother operating fleet.

The connected truck
The common perception is that once a truck leaves the loading dock or terminal, it’s essentially on its own, isolated and out of touch until it reaches its destination. And since the first day trucks began plying the roads that was true. But not any longer.

Today, trucks out on the road, be it a local street or an interstate highway, are enmeshed in a complicated web that ties them into a company’s activities as integrally as any assembly line or warehouse operation. More accurately, trucks have become mobile nodes in a network that’s crucial to any fleet operation’s success, not to mention efficiency of the entire supply chain.

Any time you try to separate a web into individual elements, the divisions are going to be somewhat arbitrary, but to illustrate just how radical that shift has been, we’ve identified six different areas where the “connected truck” is fundamentally altering fleet businesses.

“Despite appearances, a truck on the road these days is never on its own”
- Fleet Owner Magazine

Fleet Owner magazine details today’s realities in fleet management in their article, “The Connected Truck.” The article, reprinted here with permission from the magazine’s publisher, provides a detailed overview of the wide array of data available to fleet owners.*

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Truck to fleet operations

The most profound impact of the connected truck can be found in fleet operations where immediate direct access to a wide array of data from vehicles is fostering new standards of efficiency, safety, customer service and profitability.

Instead of relying on periodic check-in calls to a dispatcher, all relevant back-office operations can share real-time information on a truck’s location and performance at any point in its workday. Equipment issues uncovered during the driver’s vehicle inspection or identified by sensors can be immediately routed to maintenance, driver managers and customer service for appropriate action. Driver performance problems can be brought to the attention of the safety department, which, depending on the situation, can choose to address them right away or use them to schedule future training. Aggregated data from the entire fleet can be used to balance load distribution, boost driver productivity, automate documentation and recordkeeping, even fine-tune trade cycles.

Essentially the connected truck is allowing fleets to manage by exception rather than general rules, according to Jim Sassen, senior product marketing manager at Qualcomm Enterprise Solutions (QES). Data from trucks can be integrated into overall fleet management systems, freeing up human capital previously involved in data entry and analysis to focus on addressing problems.

Targeted message

For example, a fleet doesn’t have to process paper drivers’ logs or vehicle inspection reports when those activities are automated on board the truck. “They can quickly see any problems,” says Sassen. “The same goes for critical events. A safety manager can get alerts in near real-time. Why spend all that time telling every driver the same thing when you can focus the message where it’s most needed?”

Taking it a step further, that data can be used for predictive performance analysis, identifying patterns that correlate to high safety risks and poor CSA scores. “Things that would have taken an analyst hours to do, if it was possible at all, can now be done in minutes,” says Sassen.

Onboard navigation is another operational tool that becomes more valuable with the connected truck. Not only can a dispatch sent to a driver be routed immediately with turn-by-turn directions, but with other connected trucks supplying real-time traffic information, routes can be modified on the fly for the shortest travel time.

Third-party research has shown a 15% reduction in route times in urban areas using that type of connected navigation, according to Michael Geffroy, vice president of sales - North America for TomTom, Inc. It also allows for automated real-time calculations of estimated time of arrival, providing both fleet operations and customers with the most accurate information about delays and delivery completions. Geofencing for service, security and productivity gains also become practical with connected navigation.

Combining the remote diagnostic capability of connected trucks with navigation also delivers efficiency gains. After diagnosing a vehicle trouble code remotely, a technical troubleshooter can search for the appropriate service providers in the area of the truck, as well as check inventories for needed repair parts, according to Robert Correll, general manager of central service for Daimler Trucks North America (DTNA). The fleet can then pick the service provider it favors, and the driver can be routed there immediately. Once they arrive, the provider is ready to affect the already diagnosed repair and get them on the way again quickly. “It is extremely efficient and effectively takes a lot of time and waste out of that process,” says Correll.
Biggest ROI

With fuel being largest single operating cost for most fleets, one of the most important elements in a return on investment for the connected truck comes from monitoring fuel economy by individual vehicle and driver. The most common use of the data coming from the truck is to provide drivers with feedback on fuel economy-related issues like idling, speed management and shifting habits, but the connected truck offers other opportunities to save fuel dollars if a fleet knows how to use all the data being collected.

For example, creating scorecards with vehicle fuel-use data can highlight opportunities to reduce fuel costs, such as indicating which speed ranges deliver the best balance of fuel economy and truck productivity, according to Brian McLaughlin, PeopleNet president.

Other analytical tools can take raw data from the truck’s ECM to fine-tune both vehicle and driver performance for maximum fuel economy, according to John Flynn, CEO of truck lessor Fleet Advantage. “Applying business intelligence tools to that data can get you a true total cost of ownership,” he says.

And that goes beyond fuel consumption, taking into consideration a wide range of lifecycle costs that change over time.

“Total cost of ownership isn’t a simple math exercise done when you originally bought a truck,” says Flynn. “Fuel costs change, the fuel economy [potential] of equipment changes. The most accurate lifecycle analysis needs real-time data because it’s never a final decision.”

Truck to shippers

Increasingly, shippers are looking to their carrier partners to leverage onboard technology to help solve supply chain problems and improve performance and profitability. It is a tall order, but fleets are finding ways to fill it just the same.

“The biggest thing we can do for our customers’ customers is to increase the velocity of information,” says McLaughlin. “With capabilities like tracking and geofencing, for instance, we can enable carriers to give shippers real-time answers to their most-important questions: Where is my load? When will it be there? Has it actually arrived? When did the truck depart?”

According to McLaughlin, having access to this type of information allows carriers and their customers to do a better job coordinating delivery, including reducing detention time, streamlining receiving, reducing cost and minimizing risk. “Having better data really helps to ‘crisp up’ all that,” he says.
Accurate ETA

TomTom’s Geffroy agrees. When a dispatch is accepted and the driver requests routing, tracking ETA (estimated time of arrival) every second and comparing it to the expected arrival time begins, he notes. The ETA takes into consideration historical and real-time traffic information. This enables the carrier to notify the customer of potential failures as well as provide advance notification of the driver’s arrival. Carriers and shippers can use this capability to improve efficiency and productivity.

Shippers of some cargo, like pharmaceuticals and perishable food, are asking fleets for even more than constant tracking. They are requiring carriers to deploy technology to help assure the integrity and safety of their goods and, in the case of temperature-controlled food for instance, also help to reduce spoilage and loss. The shippers’ customers in this case are the ones holding the whip handle, according to Dr. John Ryan, president of Ryan Systems. Ryan has spent over 25 years implementing high-technology quality control systems and is credited with piloting the first farm-to-fork, Internet-enabled food traceability system, using sensors and RFID technology to help get the job done.

“Mostly, the suppliers’ customers are the ones who want to know the data about the perishables they are paying for, he says. “They are driving this because they are the ones on the front line facing the customer, the end user. Their message is plain: You are responsible for what you are shipping to me.” The recent passage of the Food Safety Modernization Act will make this kind of accountability law for all food chain handlers, including truckers.

The good news, according to Ryan, is that technologies are available that are equal to the task. “Technology is actually pretty good,” he says. “You can use sensors to get temperature readings at the pallet level, and you can use GPS to track the load and cellular technology to transmit the temperature data in real time. We can also use sensors to detect tampering or find explosives. There is a lot of new sensor technology coming on line now, Ryan adds, which will provide real-time visibility to a number of other variables.

Priority delivery

It is not just food safety and liability issues that are driving the need for better cargo-specific information, he notes. Food spoilage in transit is also “a huge issue.” Approximately 5 to 7% of food is lost in transit. In this case, using technology to monitor temperature and to optimize cargo loading and routing can be a big help. “Produce with the shortest shelf life should be delivered first and through the shortest route in order to give that retailer the most shelf life possible,” Ryan notes. “Technology makes that doable.”

At TransCore, technology is also being deployed upstream to help facilitate communication between spot market shippers and carriers looking for loads. The company recently introduced a free mobile application that runs on iPhone® and Android® devices to give drivers information about loads available within about a 250-mi. radius of where they are. The loads are a subset of loads posting on DAT load boards located at truck stops in the vicinity.

Come February, according to Ken Harper, senior marketing manager for the company’s commercial technical group, an entire range of mobile load boards will be introduced that will also run on tablets. “Our shipper and broker customers are extremely happy that technology is providing additional ways to get visibility for their loads,” he says.
Technology-driven maintenance

Truck to maintenance

“We have always relied on the driver to monitor and maintain the health of the vehicle while on the road,” observes Eric Manegold, vice president business development for commercial vehicles at Zonar Systems. “Now technology has dramatically expanded that circle of care.”

Manegold identifies three major elements within today’s comprehensive, technology-driven approach to maintenance:

1. The ability to automate the pre- and post-trip vehicle inspections mandated for drivers and then to send that information back to the maintenance shop in real time.
2. Sensor-driven monitoring of the truck’s engine and other systems.
3. Improved preventive maintenance scheduling and execution, based upon accurate information about the vehicle.

Turning preventive maintenance into predictive maintenance, also called proactive maintenance or condition-based maintenance, has become a key focus for maintenance technology providers. Interestingly enough, more and better data gathered from the truck, not necessarily more onboard hardware, is what will make that a reality.

“Predictive maintenance will come from having a lot of good historical data,” says Dave Walters, solutions engineer for TMW Systems. “We can already start to predict maintenance needs based on history. For example, if a maintenance manager sees problems with a particular alternator occurring at about 75,000 miles and they have six more trucks in the fleet with that alternator approaching the 75,000-miles mark, then they can plan ahead and get the necessary parts so they are ready. Our system can do that today.”

For Walters, the next step toward true predictive maintenance will involve establishing a “life expectancy” for various components in particular duty cycles and then tracking the components against that expectation. “Maintenance managers will be able to ask, ‘Are these components meeting our expectations? Why or why not? Do we need to change our specs?’” he says. “The maintenance system will calculate automatically how well we are doing. That is the power of good data.”
Mining data
At Zonar, (which helped to develop Daimler Trucks North America’s Virtual Technician) Manegold is also seeing that reality unfold. “What is great about Virtual Technician, for instance, is that there is a constant stream of data coming in from thousands of vehicles which are connected 24/7,” he says. “That trending information can be used in so many ways, from fine-tuning fault code triggers to optimizing vehicle specs for various operations, creating condition-based PM schedules and establishing trade cycles.

“It will also enable us to see what it really costs to deliver a particular load, per mile, per pallet, per case, per driver, per vehicle,” he continues. “We could even use the data collected from a given truck to create a ‘bill of health’ for the second owner of the truck, which could take a lot of the mystery out of buying used equipment.”

“We are only beginning to understand the benefits of technology and the application of predictive programs,” notes Keith Harrington, manager-product strategy for Freightliner Trucks. “The ability to optimize vehicle performance and maintenance based on actual vehicle duty cycles has the potential to extend service intervals, increasing vehicle utilization. This adds to … a fleet’s bottom line.”

4 Truck to driver
In the strictest sense, trucks have always been connected to drivers, connected through steering wheels, throttles, brakes and all those gauges feeding them crucial information. But the connected truck is making possible major improvements in driver productivity, safety and perhaps most importantly in this era of driver shortages, job satisfaction.

On the simplest level, it has made electronic onboard recorders (EOBRs) practical and affordable, replacing paper drivers’ logs with automated hours-of-service applications. Fleets expected great resistance to automated logs when first introduced, but in fleets using them, they have quickly become must-have conveniences for drivers, according to QES’s Sassen.

Diverting the driver
Not only does the truck feed engine and location information to the log system, but prompts drivers for their input when necessary, makes understanding complex HOS rules much easier, and generally relieves drivers of an onerous paperwork chore, he points out. More recently, the connected truck has also provided a way to remove another driver paperwork requirement while improving the efficiency of fleet maintenance and safety compliance. Automated vehicle inspection reports that guide a driver through that pre-trip process send off the reports to the appropriate parties for corrective action, an ever-more important function now that roadside deficiencies can have an immediate negative impact on a fleet’s public CSA score.

Connected navigation systems not only keep a driver on route, but can ease them through traffic congestion; increasing driver productivity and pay, not to mention soothe their nerves, according to Tom Geffroy. They can also contribute to paperwork reduction, triggering forms or special delivery instructions when a driver enters a geofenced area.

Similarly the combination of location information and remote diagnostic capabilities can mean drivers spend less time waiting for a truck to be repaired and more time on the road earning, according to DTNA’s Correll.

“But perhaps most importantly, the connected truck lets drivers concentrate on driving safely and efficiently by managing their workflow so they can focus on the immediate task in front of them instead of maintaining a long to-do list”, says Sassen. “For example, it can lead them through the pretrip inspection item by item, prompt them for log inputs only when it senses the truck is moving or stopped, or give them special delivery instructions just as they arrive at their destination”.

Finally, combined with the greater sense of direct connection to fleet operations, the connected truck’s ability to shoulder some of the non-driving responsibilities while also increasing productivity and pay make it a major element in delivering that overall driver satisfaction the best fleets want to foster.
“Researchers predict that connecting vehicles to other vehicles in this way would prevent “76% of the crashes on the roadway.”

- DOT Research and Innovative Technology Administration

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Connectivity for improved compliance and safety

5 Truck to truck and road

“Here I am” is the basic software application at the core of the Connected Vehicle Applications’ “Vehicle-to-Vehicle (V2V) Communications for Safety” research project being conducted by the Intelligent Transportation Systems Joint Program Office within the U.S. Dept. of Transportation’s Research and Innovative Technology Administration. It would be tough to come up with a better name for the program. It was created to explore the safety benefits that might be realized by “dynamic wireless exchange of data between nearby vehicles.”

The thesis is that by trading anonymous, vehicle-based data regarding position, speed and location (at a minimum), V2V communications would enable “a vehicle to sense threats and hazards with a 360-deg. awareness of the position of other vehicles and the threat or hazard they present; calculate risk; issue driver advisories or warnings; or take pre-emptive actions to avoid and mitigate crashes.” Researchers predict that connecting vehicles to other vehicles in this way would prevent “76% of the crashes on the roadway.”

Road talk

This result would not be bad at all by almost anyone’s measure, but researchers believe safety could be further improved if vehicle to infrastructure communications were added to the mix, and so another Connected Vehicle research program, this one dubbed the “Vehicle to Infrastructure (V2I) Communications for Safety” project, was also initiated to investigate the benefits that might be derived from the “wireless exchange of critical safety and operational data between vehicles and roadway infrastructure.”

Other projects in the connected vehicle research portfolio include dynamic mobility applications, the environment and the weather. Several trucking industry suppliers and even fleets have been involved as research partners. “These projects look at vehicles as individual nodes on a larger network,” says PeopleNet’s McLaughlin. “At PeopleNet, we have mostly been involved in research on wireless roadside inspections, wireless access to hours-of-service data and in measuring all trucks in an area to gauge highway speed and traffic congestion,” he says.

There are lots of potential benefits from expanding connectivity to include other vehicles and even the infrastructure, according to McLaughlin. “Projects like these raise issues of privacy, of course,” he says, “but there is still a lot of merit … Wireless inspections, for instance, could give fleets the opportunity to fill up their CSA files with lots of positive results, and that would be a help to carriers.”

Still, McLaughlin expects it will likely be “five to ten years” before things like wireless roadside inspections become a reality.
Truck to regulators

The most contentious issue raised by the connected truck is its ability to deliver information directly to the regulatory agencies and enforcement entities that oversee the industry. With some justification, fleets worry that regulators gaining legal access to all or even a large portion of the data flowing off of the truck will create liability issues, if not problems with over-enforcement that could cripple their operations.

Working well

To some extent, though, that issue is a bit of a red herring. Well-established automated clearance systems like PrePass and weigh-in-motion systems are already delivering significant benefits for fleets that use them. Similar inspection-on-the-fly demonstration projects have also been conducted, showing great productivity gains by eliminating time-consuming roadside inspection stops. These are all positive examples of the value the connected truck can bring to regulatory and enforcement activities.

Things become murkier when it comes to hours-of-service and automated logs. Currently trucks equipped with EOBRs and automated log applications must be able to display or provide that information on demand to enforcement personnel. An FMCSA rule that would have required some industry use of EOBRs was thrown out by the courts last year, but the agency continues working on EOBR technical issues that include security and storage of collected log data. That work includes tightening language on just what types of location and status data should be recorded automatically from the vehicle, and how fleets should make available stored driver records to various federal, state and local regulatory agencies. Essentially this is a question in flux with regulators, courts and users all working to influence the final outcome.

Still to come

Also in the near future in the area of truck to regulators is phased deployment of onboard diagnostic (OBD) systems that will measure actual tailpipe emissions for heavy- and medium-duty diesel engines at very low levels, warning drivers if any element in those systems malfunctions. The phase-in will begin in 2013, with all new trucks requiring OBD by 2019. The systems are required to store any failure information and to make that information available for repair and maintenance service, but there is no other specific regulatory or enforcement actions attached to the OBD requirement at this time.

The Connected Truck, Fleet Owner Magazine, Jan 2012
We're here to help you
Drive What Matters™
Our own RydeSmart success story

Having applied telematics to our own fleet at Ryder has enabled us to develop technology that helps maximize efficiencies and safety. RydeSmart 3.0 offers users real-time data from the road to help optimize and direct commercial fleets. Information about driver locations, fuel usage, idle time, DOT log requirements and other analytics vital to the efficient operation of a fleet are easily accessible with this unique and state-of-the-art system.

The web-based systems offer an array of benefits including, geofencing, access to on-board event recording as well as on-demand vehicle route-history replay, the ability to track multiple vehicles real time, up-to-the-minute traffic conditions, easy storage and collection of driver and vehicle performance logs, “bird’s eye” view maps, and iPad® applications for access to fleet management data on the go.

Ryder customers can gain access to RydeSmart 3.0 with no upfront costs, and have the peace of mind that Ryder Shops can maintain and repair their systems, they can share their experiences with other Ryder customers, their fuel tax reporting is automatic, and they can continue to monitor their fleet with Rydesmart on rentals.

Ryder customer, Hungry Howie’s has found that RydeSmart saves both time and money and allows their transportation staff to focus on their core pizza business. “RydeSmart, communications and monitoring make a big difference in our business,” said George Speshock, transportation manager for the company.

Chuck Verba, safety manager for Performance Food Group Transco (PFG) Customized Distribution, finds RydeSmart most helpful in the compliance area. “With RydeSmart, we know everyone is playing by the rules,” he said.

Communicating with drivers and being able to track each vehicle are among the favorite RydeSmart features for Barbara Pray, who manages a 60-truck fleet for NRF Distribution in New England. “The RydeSmart tracking and message functions allow us to save on cell phone costs and provide our customers with more accurate ETAs,” she said.

Hungry Howie’s finds communications and monitoring capabilities of RydeSmart invaluable

Hungry Howie’s Transportation Manager George Speshock is a faithful user of the onboard telematics system, RydeSmart. The easy-to-use features and convenient applications help his company save money and time and help him focus on job tasks that matter to his core business.

Speshock’s east-based US fleet covers more than 1.5 million miles a year, making such issues as fuel efficiency and government compliance critical to the company’s bottom line. “Helping us stay DOT compliant is huge,” he said. “Our drivers love not having to complete paper logs and our CSA scores are extremely low.

He also appreciates the usefulness of RydeSmart in locating vehicles and communicating to his drivers. “I can select a vehicle, and then put in the destination address to find the estimated time of arrival and mileage, all without bugging the driver,” he explained. “It’s a tremendous help to be able to get messages to the drivers without disturbing them.”
Like so many other fleet owners, idle time remains an important issue for Hungry Howie’s. Speshock is working closely with the Ryder team to use RydeSmart to help reduce fuel costs. “The cost of fuel is killing a lot of smaller companies,” he said. “With RydeSmart, communications and monitoring make a big difference in our business. The Ryder team is always there to answer our questions. We look forward to learning even more ways to use RydeSmart to improve our transportation efficiencies.”

**Performance Food Group Transco (PFG) customized distribution uses Telematics for safety and compliance**

Poised like an air traffic controller in front of his computer screen, Chuck Verba, safety manager for Performance Food Group Transco (PFG) Customized Distribution, keeps a keen eye on his 100 drivers across a 10-state district, thanks to RydeSmart software. A Ryder customer for more than two decades, Verba relies on the telematics tool to deliver fresh foods to such popular restaurant chains as Cracker Barrel®, Outback Steakhouse®, Ruby Tuesday®, and T.G.I. Friday’s®.

He says that RydeSmart is invaluable in helping his drivers adhere to DOT regulations and allowing the company to respond quickly to customer requests. “We want to do what’s morally right, and with RydeSmart we know everyone is playing by the rules,” he said. “I can also tell who is abusing the equipment or not getting the best gas mileage.”

“Sometimes a warehouse is in need of an unexpected pick-up,” he added. “With RydeSmart, we can easily find the closest vehicle — within 10 feet — and respond immediately to a customer’s request.”

Verba also finds RydeSmart an effective tool for getting messages to his drivers, either one at a time or all at once. He sends out weekly safety tips fleet wide, and says the RydeSmart function that only allows drivers to view messages when the vehicle is turned off, is a valuable plus. “We’re trying to get away from cell phone use, and RydeSmart reinforces our focus on safety,” he said.

“I can quickly set up whatever reports I want,” he added, explaining that the features are useful and easy-to-use.

**NRF distribution saves time and money with fleet management technology**

NRF Distribution is New England’s largest flooring distributor with strong family roots that date back to the 1800s. At the company’s headquarters in August, Maine, dispatch administrator, Barbara Pray, manages a fleet of nearly 60 trucks. For the past two years, she has used RydeSmart to save time and money.

“The RydeSmart tracking and message functions allow us to save on cell phone costs and provide our customers with more accurate ETAs,” she said, adding that her favorite function is the ability to identify the exact location of the nearest truck. “It comes in very handy when a truck needs assistance as well as other circumstances,” she said.

Pray says the report functions are popular with her boss, who is currently working hard to cut back on idle time. “He utilizes multiple reports to maintain and cut costs. He also reviews the logs on a regular basis to identify if changes are needed,” she explained.

“I like the software,” adds Pray, who also finds the message function a more efficient way to reach the drivers. “Best of all, the drivers enjoy and appreciate the technology that helps the entire company operate smoother.”

To find out how Ryder can help you realize bottom-line savings with onboard technology, visit www.rydesmart.com.