

Transportation Technology Used in Trucks

Transportation Technology has evolved significantly in United States, not only to provide Operational Efficiencies and Cost savings but also to address Safety.

While in-vehicle technologies can produce a wealth of data and make fleets safer and more efficient, carriers are still learning how to best make use of them. Let us observe some of those technologies that enable “Business Transformation”.

1. Cargo Detector Sensor. The cargo detector sensor is mounted inside the trailer's top-front corner; it uses infrared or ultrasonic waves to detect the presence of cargo throughout the length of the trailer. It then communicates that status through the telematics system (cellular or satellite) to the yard or dispatch center.



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2. A Satellite Antenna. The data collected by a truck's various monitoring systems are sent to a central onboard computer, which sends updates back to headquarters via satellite antennas.



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3. Cellular Antenna. The data collected by a truck's various monitoring systems are sent to a central onboard computer, which sends updates back to headquarters via cellular links.

In the past, carriers relied exclusively on expensive satellite services for transmitting data collected by monitors onboard trucks, usually in periodic batch uploads that included only summary data. But carriers are increasingly using less costly cellular networks, which allow them to transmit more data back to the operations center, some of it in real time using Cellular Antennas.



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4. Lane Departure Warning System. Also called lateral drift warning systems, these systems use a forward-facing, windshield-mounted camera that tracks the position of the vehicle in the lane by watching the painted lane markers on each side of the road. When the vehicle starts to drift, speakers on either side of the cab alert the driver which way it's drifting.



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5. The Handheld Computer. Most trucks use dumb terminals connected to a fixed onboard computer and have limited text communication with the back office, but fleets are starting to adopt stand-alone handheld computers that support Wi-Fi, cellular, GPS and more.

The Handheld Computer includes a touch-screen interface and a range of applications, including one that allows the driver to immediately scan documents and signatures and transmit them over a cellular link, rather than using a fax machine at the next truck stop.

Additionally, carriers are adapting the technology that uses GPS data and mapping software to provide spoken, real-time directions to the driver. The device can be placed in a cradle mounted on the dashboard while the driver is driving. Its ability to give verbal directions is important because the driver doesn't have to look at the display. "That's critical from a production and safety standpoint."



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6. Tire Pressure Monitor Console. Sensors on each tire, feed their results via wireless to a console mounted on the dashboard so the driver can monitor all 18 tires at once.



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7. Onboard Computer. The average truck has more than a half-dozen computers in it that monitor everything from engine conditions to traction control and antilock braking systems. A central onboard computer mounted inside the cab gathers that data and sends updates back to headquarters by way of satellite or cellular links.



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8. Forward Collision Warning/Adaptive Cruise Control System. These systems use forward-mounted radar to detect vehicles or other objects in the road ahead. Adaptive cruise control uses radar to maintain a safe following distance behind vehicles. Some systems issue collision warnings, while others can take actions to slow down the vehicle to avoid a crash.



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9. Tire Pressure Monitor Sensors. Properly inflated tires improve gas mileage and extend tire life, so tire pressure monitoring systems provide a valuable service; some automatically inflate tires as well. Each sensor is mounted to a tire or valve stem, and its results are transmitted wirelessly to a dash-mounted console, shown on the next page.

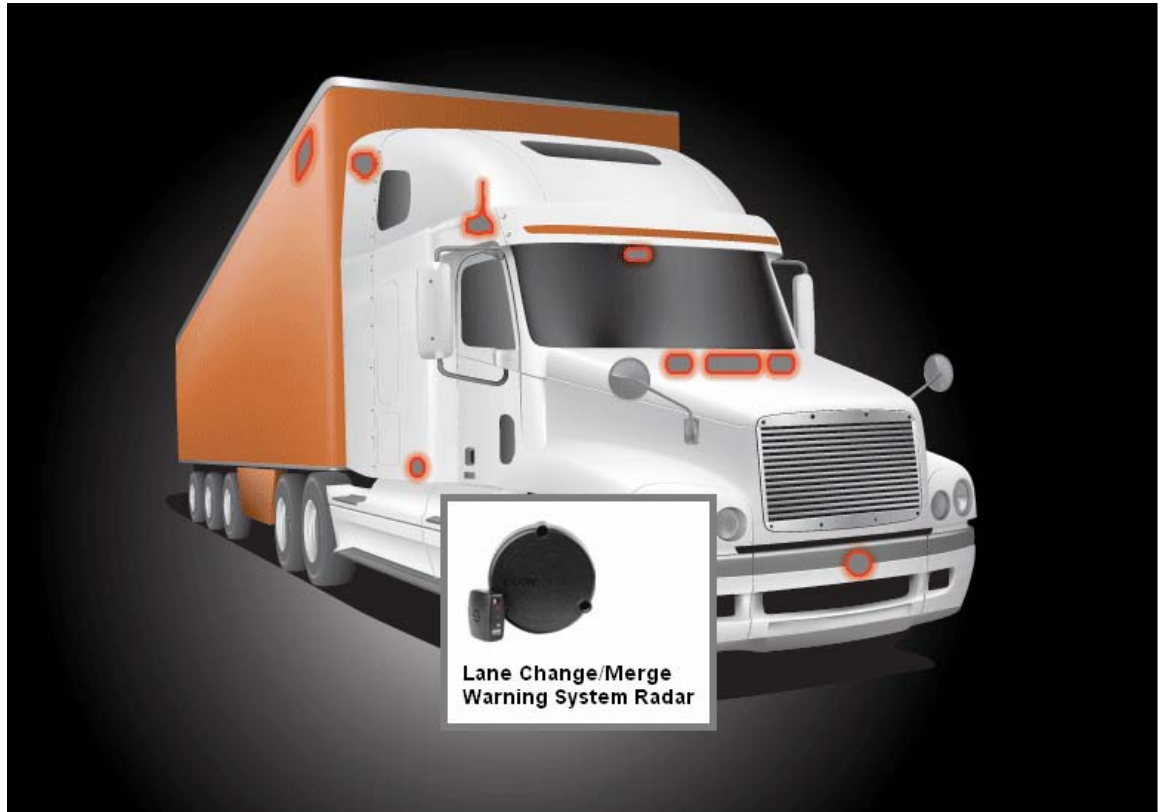
Tire pressure monitoring improves safety, but the bigger value lies in savings from improved fuel efficiency and extended tire life. The systems continuously monitor tire pressure; some automatically inflate tires as well. Properly inflated tires improve gas mileage, and at prices as high as \$400 per tire, keeping rubber on the road is one of the biggest maintenance costs for carriers.



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10. Lane change/merge warning system. These systems use side-mounted, short-range radar or ultrasonic waves to "see" vehicles in the driver's blind spot and produce an alert if the driver attempts to merge into an occupied lane.



References:

Mitchell, R. (2008). "IT hits the highway: Big rigs go high tech". ComputerWorld.

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