

Overblown wireless costs?

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Savings start by choosing the right hardware today and knowing the changes taking place in cellular networks

Though it's still far from universal, trucks and other fleet vehicles in North America today are becoming more and more sophisticated, from telematics and fleet management systems to trailer and tire pressure monitoring and video- and radar-based safety systems. All these technologies and any accompanying devices need connectivity of some kind, but what can fleets do to help manage the associated wireless costs?

It's a question fleets may not be used to asking since they focus instead on what new technologies can do to increase efficiency and actually save costs. But there are things fleets can do to control wireless costs for the growing wireless connectivity model that's emerging for trucks. For example, this includes both short-range, which is in and around the truck, and long-range communications between a truck on the road and the Internet or back office.

"For vehicles—which are moving and sometimes far away from any kind of base station or [wireless] access point—I would say there's really only cellular technology that is available" to enable the necessary long-range connectivity, says Benoit Tournier, director of marketing for transportation with global wireless module and gateway provider Sierra Wireless. For short-range, "most of the time, there is some other communication involved," he adds. "It can be a mix of local area network and wide area network communication inside the same black box."

In other words, various systems on the truck itself can use WiFi or Bluetooth short-range communication to send and receive data, forming the basis of the much-discussed Internet of Things, or IoT, in a network surrounding the truck. A cellular modem of some kind then acts as a central, long-range connectivity portal or hub linking the truck and all its systems to the company's back office and the Internet.

"All these systems form a kind of local area network inside the vehicle, so it's a very good area network to collect information from different types of sensors and devices, aggregate all those communications, and route them to the wide area network through cellular connectivity," Tournier surmises.

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- Randy Swart, A. Duie Pyle, COO

The good news is that such a model can be quite advanced and scalable, even for heavier data users. Take, for instance, northeastern U.S. carrier, warehouse manager and freight brokerage firm A. Duie Pyle, which has just launched a docking system that can track shipments down to each individual pallet. By comparison, most tracking systems today provide only a single tracking number, notes Randy Swart, the company's chief operating officer.

"If a shipment has six pallets, let's say, they (typical systems) track it by one shipping number," he tells Fleet Owner. "They just assume that every time they move the shipment items that all six pallets moved, and that's not necessarily the case." A. Duie Pyle's system not only has unique identifiers for each pallet but provides specific data on each

pallet's weight and dimensions, and trailers also are bar-coded to monitor exactly where parts of a shipment are placed.

"We know if we put it 4 ft. back from the nose, 10 ft. back from the nose or on the tail," Swart explains. "A trailer has to be loaded evenly with weight throughout, or you end up overloading a single axle." And though A. Duie Pyle's system requires a large amount of wireless data transmission, it's all still connecting short-range wireless devices into a central cellular network, which might be based in a warehouse or other building or on the trucks when mobile.

"If you can have a [wireless] hotspot in the truck that hooks things together, including the data that's coming back from your engine telematics, then you can use one system to move a lot of data," Swart points out.

Aftermarket vs. factory

Under that model, however—a combination of local wireless systems linked into a single, robust cellular network—fleets must choose whether to have a "black box" cellular modem installed in their trucks right at the factory or as an aftermarket add-on.

If a fleet should choose the former method, that can lower hardware acquisition costs and also means "zero installation downtime," according to Telogis, a telematics systems provider whose solutions can be factory-installed in [Ford](#), [Hino](#), [Volvo](#) and other commercial trucks.

But going the aftermarket route could offer advantages as well, notes Dominique Bonte, vice president for business-to-business at technology and business consultancy ABI Research. "It's actually easier to replace aftermarket equipment in some ways than it is an embedded piece of hardware, which in some cases might not be replaceable at all," he says. "Some fleets make their [cellular connectivity systems] more modular and easy to be replaced. From a fleet perspective, that may be easier to upgrade."

For smaller fleets just getting their feet wet with things like telematics and fleet management systems, there may be another cost-saving aftermarket option, though it's limited: Use cell phones, tablets or similar devices as your connectivity hub in the truck. "Probably more for smaller vehicles and smaller fleets—maybe a delivery fleet or a service fleet—they might not have the budget to go with a full-blown telematics solution," Bonte says, "but they might be okay with using tablets or phones, putting some software on top of them and connecting their vehicles that way."

Going with such device-based connectivity can also provide access to low-cost apps such as navigation/routing to incrementally build on truck technology systems, and the wireless plans for the devices "might come in cheaper as well," he adds. "So especially for the smaller fleets, I would say that's an important way to save costs."

However, as noted above, using smartphones, tablets, etc., as your connectivity hub is a limited solution. "If you think about bigger trucks, you would want to go down the road of embedded connectivity," Bonte contends. "Having a heavy piece of equipment on the road, the problem with brought-in devices is you're never really sure if they are switched on, in use or even there on the truck. If it's embedded technology, you can monitor the vehicle 24 hours a day."

Further, smartphones and other devices that can serve as wireless hotspots aren't designed to handle a fleet's higher data needs. "If you consider a tablet or smartphone, usually they are in the passenger compartment or cabin, which is like a cage," Sierra Wireless' Tournier says. "All the radio frequency waves are inside this cage and do not provide the best sensitivity and coverage."

Cellular quickly evolving

To hold down wireless costs, a fleet should also understand what's happening in cellular network development, which will help the company make "future-proof" equipment purchases. "Cellular networks are evolving quite fast," Tournier explains. 2G wireless networks commonly used three years ago are now phased out or being phased out in North America; two years ago, Apple iPhones used only 3G, and they're now using 4G/LTE networks, he notes.

“It’s no big deal if you have to change these consumer designs; you just scrap the previous device or resell it and buy a new one,” he says. “But when you design a black box which will be installed in a heavy truck or light commercial vehicle—that box will usually be operated in that vehicle for the next five to seven years—you really need to consider scalability and to ensure that it will be future-proof.”

For fleet use, both Bonte and Tournier refer to the rapidly evolving cellular landscape, which at present in the U.S. is shifting to 4G/LTE coverage. The newer networks are able to handle greater amounts of data, have better range and can deliver lower latency—i.e., delay—times in transmission, which will be essential for things like truck platooning or any moves toward self-driving or autonomous vehicles. And while 4G and in some cases 3G networks are still being rolled out, “we’re already talking about 5G,” says Bonte.

“In a nutshell, 5G will open up a lot more possibilities and a lot more use cases,” he adds. “It will be a much more important technology compared to 3G or 4G, which have enabled telematics and infotainment; 5G will become a critical component, a critical feature, in both passenger and commercial vehicles. There will be low enough latency for communicating and transferring critical safety information between vehicles—their position, other vehicles in the vicinity, traffic incident information—and the infrastructure itself.”

So fleets should be aware that 5G is coming and “could be the unifying connectivity technology that will be used for everything that’s needed in vehicles,” Bonte predicts, but that next-gen network will be defined and deployed likely in limited areas perhaps in the early 2020s. Fleets should therefore look for cellular connectivity systems that will be able to use 4G/LTE networks, which he expects will be a safe bet for the next 10 years or longer, as well as older 3G networks.

That equipment choice is more a decision the cellular hardware manufacturers make, Bonte points out. And in that vein, Tournier contends that cellular connectivity “modules” such as those that his company Sierra Wireless provides will be ideal for trucks’ black boxes and “are much smaller than the legacy modems in the market a few years ago.”

These modules can provide connectivity and manage all core cellular technology, according to Tournier. “It will be very important for the hardware manufacturer or fleet management company to design black boxes based on these cellular modules, selecting the right supplier which can provide pin-to-pin compatible modules that can be easily switched from one to another” as cellular networks evolve. “That is a point to consider if you want to decrease the costs of development and hardware in the coming years,” Tournier says.

Another way to lower your wireless costs, as with other expenses, is to standardize equipment across the fleet as much as possible. “A fleet might purchase trucks from Daimler that come with embedded connectivity, and some of their other vehicles have aftermarket technology,” notes Bonte. “So you often have a very heterogeneous environment, and I think that’s a big problem for fleets.

“With a mixed environment like that, you have to manage the separate pieces to that puzzle,” he continues. “And I think in that case, it’s very hard to have one common policy or one common strategy going forward.”

The mobile device ownership debate

When it comes to mobile devices such as smartphones and tablet computers in the trucking industry, major cellular providers offer discounted plan rates specifically for fleets. But should motor carriers follow a BYOD (bring your own device) model or a corporate-owned device strategy? Ron Hassanwalia, chief operating officer of enterprise management firm SOTI Inc., recommends that fleets remain in charge of mobile device purchasing and responsibility.

Here’s his reasoning:

1. There could be legal/privacy tangles. There are concerns and even potential legal issues regarding devices owned by drivers used in transportation, he contends. Privacy and security are a few examples, since fleet owners have less leverage to control devices they do not own. A driver who comes to work with a smartphone may not want the boss tracking his or her GPS, but if GPS applications are removed from the device, the driver may not be able to perform the job effectively.

2. Distracted driving is a big potential liability. A company-owned device can be set up so that it functions in compliance with distracted driving laws, protecting the company from liability in case of a crash.

3. Reliability is critical. A fleet owner purchasing smartphones, tablets and similar devices is likely willing to spend more to ensure the devices are suitable for the applications they'll need to run and are ruggedized or have a protective case to handle everyday use on the road. Individual drivers looking to purchase such devices might balk at added costs or being restricted in the apps that are allowed to be installed.

Fleet owners want their mission-critical devices working reliably 100% of the time, because the net opportunity cost of business lost is much higher than the cost of the mobile system, and what might seem like extra or unnecessary costs to a driver regarding a wireless device and service would be a non-issue for a business owner.

4. It can be unclear as to who pays for breakage. In a BYOD scenario, there's always the question of who pays for a device if it breaks on the job—the employee who owns the device or the business/company. Thus mobile device purchasing and responsibility is best left in the hands of the fleet, not individual employees, Hassanwalia argues.

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