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## BLE Beacons for Business

Apple introduced the iBeacon protocol in 2013 as a way for Bluetooth Low-Energy (BLE) devices to transmit location information to a Bluetooth-enabled device, such as a smartphone or tablet. While Bluetooth usually requires pairing, iBeacons could communicate with any device and trigger an action, such as sending a message or launching a browser.

BLE beacons, which function as active RFID tags that transmit a unique ID at regular intervals at 2.4 GHz, were quickly picked up by retailers to send location-based messages to consumers. A beacon in the men's section of a department store, for example, could trigger a message about a sale on men's suits or sports coats (see Macy's Tests Shopkick's ShopBeacon at New York, San Francisco Stores). Museums use them to trigger contextual information in smartphone applications as people view exhibits (see Welsh Museums Deliver Extra Content Via Bluetooth Beacons). Sports franchises and arenas have adopted the technology to trigger video content, promotional offers and other information at sporting venues (see Cleveland Cavaliers Use Beacons to Provide Interactive Team Experience).



Illustration: iStockphoto

Now, BLE is making inroads into purely business applications. Palm Beach Aggregates, a Florida mining company, processes roughly 2 million tons of crushed limestone, sand and other materials for use in asphalt, cement and concrete products, and as base materials for building foundations and roads. On

any given day, 100 to 150 trucks arrive at its facility to pick up one of approximately 20 different products, loaded in quantities specific to each vehicle's weight limits, and destined for a variety of customers.

Until recently, the company used manual processes, which were error-prone. Trucks queued up at the loading area for the appropriate material and waited to receive it. Loaders used the weight limit printed on the side of each truck as a guide to indicate how much to load. The trucks were weighed as they exited the facility. Sometimes the wrong product, or too much or too little material, was loaded onto a truck. If the amount of material was excessive, the driver had to go to a dumping area to discharge the surplus. Since government regulations, in many cases, restrict the use of the excess material, a single error often cost the company hundreds of dollars.

Now, a Bluetooth beacon is mounted on each truck's windshield. Upon arrival at the quarry, a driver reports to the scale house, where the truck is weighed. At that location, a dispatcher with an Android-based tablet receives the ID transmitted by the vehicle's beacon and sends that ID to a cloud-based software application. The dispatcher enters the empty truck's weight into the software, which schedules the truck for loading. Loaders also have BLE-enabled tablets and get information on what materials—and how much—should be loaded onto a specific truck.

The Port of Aalborg, in North Jutland, Denmark, is using BLE technology to improve traffic management, enabling it to know where vehicles are located in real time and how fast they are moving. The port uses BLE to capture data in real time, and then disseminates that information to drivers, prompting them, when necessary, to select alternate routes to reduce congestion (see [Sensors Track Traffic Congestion at Port of Aalborg](#)).

TimeForge, a provider of online labor-management software, has

introduced a solution that leverages BLE beacons to help companies view where their personnel and key assets are and have been (see TimeForge Intros Beacon-based Solution for Managing Staff, Assets). And Emanate Wireless has built Bluetooth into its active RFID tags, so they can communicate with tablets and smartphones.

The big benefit for BLE in business applications is similar to the benefit in consumer applications—beacons can communicate with almost all tablets and smartphones. This reduces infrastructure cost. An active RFID system would have cost Palm Beach Aggregate far more, for example, because the company would have had to install active RFID readers around its facilities. And it would have had to purchase seat licenses for the software to locate tagged vehicles on its premises.

BLE is not a replacement for all active RFID solutions, but it is an option companies should consider for purely business—as well as consumer—applications.



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