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The Multitech Approach

Today's trend to reduce our carbon footprint has led many governments to encourage commuters to use public transportation. But waiting for a bus, particularly in bad weather, is not an appealing prospect. To boost ridership, transit companies have invested heavily in GPS-based automatic vehicle location (AVL) systems, so we get real-time information about bus arrival times on our smart phones and on

digital bus stop displays. Great—now we know exactly how late the bus is going to be, and how many buses will arrive at once.

A key to keeping buses running on time is getting them out of the depot on schedule. Easier said than done. While computer-aided dispatch (CAD) software can dispatch vehicles, it can't ensure that the buses, typically lined up in rows inside a metallic building, can actually move. The right driver has to be sent to the correct bus at the proper time, and that bus must be free to pull out or the whole system veers off schedule.



You can't use a GPS-based AVL system to locate the right bus, because it won't work indoors, and even if it would, it couldn't pinpoint the vehicle location to the required accuracy. In most cases, no single technology can deliver the end-to-end location requirements for an entire distributed solution. GPS is the perfect technology to track buses out on their routes, but inside the depots, ultra-wideband (UWB) is the technology of choice. In other situations, Wi-Fi is the winner, and in others still, ultrasound rules.

The problem is that location systems have had a technology-centric birth, with companies growing up around particular implementations. Solution providers have a tendency to make promises well beyond the capability of the technology at hand, and a reluctance to admit or even see the limitations of their own products. This has led to end users being

underserved—they're forced to buy point solutions to address individual problems or hire systems integrators to string together multiple solutions.

The situation is beginning to improve. Instead of pushing single-technology location systems, vendors are asking: "How can we best serve this customer?" The answer invariably lies in combining technologies, as a first step. The solution also must be easy to deploy, which means all the technologies need to be housed in a single device. Ubisense's active Trimode RFID tag, for example, designed to meet the vehicle location needs of the bus industry end to end, incorporates GPS to track buses outdoors and UWB to precisely locate buses indoors. The tag can also operate indoors, in "presence mode" (2.4 GHz), when it's sufficient just to know that the bus is in the depot.

Multitechnology solutions are breaking down barriers to location system adoption. In the near future, end users will not have to ask, "Why can't I just go to one vendor to solve all my location problems?"

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