

## Wal-Mart's Industrial Vehicle Management

Wal-Mart Stores, Inc. is the world's largest retailer, with nearly 6,500 stores and wholesale clubs across 13 countries, more than 1.9 million associates worldwide, and revenue of more than \$312 billion in fiscal 2006.

Wal-Mart also enjoys a reputation as a leader in supply chain technology and efficiency. It invented the practice of sharing sales data via computer with major suppliers and has been a global innovator in the use of wireless technology — warehouse management systems (WMS) and radio frequency (RF) data communication systems, for example — to track and manage the flow of goods through its distribution centers.

Never satisfied with the status quo when it comes to improving operations, Wal-Mart began looking at wireless technology for another application: controlling and monitoring forklifts and industrial vehicles that move merchandise inside its distribution centers. More than 100 such vehicles are utilized in a typical Wal-Mart distribution facility.

**Why Industrial Vehicle Management?** First, forklifts and other industrial vehicles are the workhorses of material handling within distribution centers. They are critical factors in facility productivity and throughput. With its strong tradition of pushing the envelope of supply chain efficiency, Wal-Mart wanted to analyze how industrial vehicle management systems could influence productivity beyond what it was already accomplishing with its WMS and RF systems.

Of equal importance, Wal-Mart wanted to find out how an industrial vehicle management system could make its distribution facilities safer for its associates. One of Wal-Mart's primary missions is to provide a safe work environment for associates.

Finally, because industrial vehicles are expensive to acquire and maintain — significantly more expensive than the average passenger car — Wal-Mart wanted to understand how an industrial vehicle management system might reduce the capital and operating costs associated with its fleet.

**System Requirements** Wal-Mart developed a list of required and desired functions for the "ideal" industrial vehicle management system.

For productivity management, Wal-Mart wanted to implement new activity metrics to better analyze and optimize the utilization of vehicles and operators.

Management also wished to achieve better asset visibility, including a more detailed understanding of time-motion history. In addition, Wal-Mart wanted to enhance

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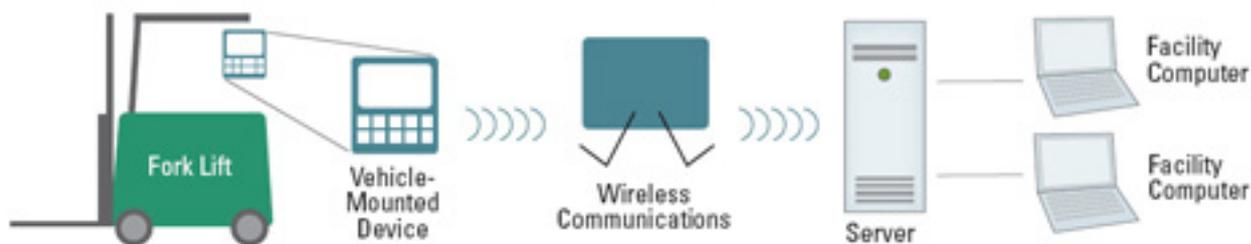
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work assignment communication, especially in response to unexpected changes in task priorities.

For safety management, Wal-Mart wanted to establish reliable vehicle access control, to ensure only properly trained operators could use equipment. A more easily managed method of completing, recording and archiving vehicle inspection checklists was also required. Impact sensing was also on the wish list, to increase visibility of unsafe driving and reduce accidental damage costs.

Finally, Wal-Mart wanted to consider how a fleet management system might influence maintenance efficiencies (for planning and executing preventative maintenance schedules, identifying emerging vehicle problems earlier, and establishing a better way to lock-out/tag-out equipment in need of maintenance).

Vehicle Management System: Basic Concept of Operations



Picking the right wireless technology Because industrial vehicles are mobile, they are inherently difficult to track, especially in a large distribution center (where they can easily “disappear” among rows of tall, merchandise-filled storage racks). It was obvious to Wal-Mart that an automated wireless technology was needed to manage its many mobile industrial vehicles.

Wal-Mart conducted an extensive review of available wireless vehicle tracking solutions, including ones that could use Wal-Mart’s existing wireless local area network (2.4 GHz), ones that used a cellular-based subscription service (like GPRS), and ones that used a standard RFID spectrum (900 MHz).

Using the existing wireless network seemed logical and convenient on the surface, but it would have required every vehicle-mounted device to have its own network IP address, which has significant cost and labor implications for technical support and network upgrades. Furthermore, it was deemed desirable to keep vehicle management data signals segregated from the data transmissions of missioncritical applications, like the WMS.

For wireless systems using cellular-based services, the main problem was ongoing cost—a per-asset, per-month payment that never ends (and that rises if data transmissions exceed a minimum level). Such systems also rely on GPS receivers for asset location, which do not work indoors, where GPS signals are blocked by the roof of the building. Although cellular-based systems are common for over-the-road vehicle tracking, they are unsuitable for tracking vehicles in and around a distribution facility, where localized, no-cost RF communications are possible.

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Ultimately, Wal-Mart's choice was an application specific wireless system from I.D. Systems that uses the same unlicensed, cost-free 900 MHz radio frequency spectrum utilized by the RFID systems widely deployed in Wal-Mart's supply chain.

**Picking The Right Vendor** I.D. Systems is a leader in wireless asset monitoring solutions, with a robust, technically advanced system specifically designed to manage fleets of industrial vehicles. Technical innovation, however, is not enough when it comes to deploying a wireless vehicle information technology at the world's leading retailer. Just as important: experience installing hardware on a wide range of vehicle types; system configurability and flexibility; software quality and user-friendliness; implementation and post-implementation support capabilities; and, perhaps most of all, demonstrated success partnering with customers to produce a solid bottom-line return on investment.

I.D. Systems, a NASDAQ-listed public company, has the experience, financial strength, and human resources — including extensive engineering, training, and field support teams — to configure, deploy, support, and sustain its systems very effectively across large-scale enterprises as well as individual facilities. In addition, I.D. Systems helps customers generate a significant return on investment through a process of close, proactive engagement known as Advantage™ support services.

**The Solution** Wal-Mart deployed its first wireless Vehicle Management System (VMS) from I.D. Systems in a single facility as a pilot program to measure system benefits. After an extensive evaluation, the VMS was expanded across multiple distribution facilities.

"The VMS delivered not only the promised safety and control benefits, but also significant incremental productivity improvements, above and beyond what our WMS was providing," explained one Wal-Mart supply chain executive.

As a productivity system, the VMS provided:

- Unique data on peak vehicle utilization that enables optimal fleet "right-sizing."
- Unique metrics on operator activities that identify opportunities for productivity improvement and help optimize labor allocation across periods of varying activity levels.
- Software that displays a graphical facility map, which enables not only near realtime visibility of vehicle/operator location and status, but also the ability to play back a "breadcrumb trail" of vehicle movement over any slice of time.
- A two-way text messaging system that enables management to divert material handling resources effectively to the point of activity where they are needed the most.

For safety management, the VMS provided:

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- Electronic vehicle access control with an independent, on-board database of driver training authorizations, which establishes and maintains operator accountability whether or not the vehicle has a live communication link to the rest of the system.
- An electronic safety checklist system with a patented, hierarchical, question-and-answer architecture, which can be configured independently for any number of different vehicle types, and which lets management choose a variety of both on-vehicle and systemwide responses to vehicle problems.
- Impact sensing that provides a broad choice of automated management responses, from alerting a supervisor with visual or audible alarms, to generating a warning icon on a graphical software display of the facility, to sending an email or text page to management.
- Automatic reporting and prioritization of emerging repair issues identified on electronic safety checklists, where operator responses are flagged by severity of vehicle condition.
- Wireless, remote lock-out/tag-out of equipment that is unsafe or in need of repair.

**The Return On Investment** Together, these many tools have given Wal-Mart (1) new ways to drive continuous improvement in material handling operations for increased productivity and throughput and (2) new process controls for safety management. Just as important, the VMS has proved easy to use for the many Wal-Mart stakeholders who interface with the system—vehicle operators, facility line management, information technology staff, and corporate management alike. In addition, from a technical operating perspective, the system's wireless communication system has worked effectively alongside other wireless systems and processes, including Wal-Mart's extensive WMS and RFID systems.

"While we will not divulge the exact return on our investment in the VMS," said the Wal-Mart supply chain executive, "suffice to say we have found it well worthwhile to invest further in this technology."

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