

# The sky's



Cary Cameron,  
senior vice  
president,  
strategic  
solutions



# the limit

## A unique optical RTLS system has led to dramatic productivity improvements at Genco ATC's returns center in McDonough, Ga.

By Bob Trebilcock, Executive Editor

**Y**ou usually don't find third-party logistics providers, or 3PLs, on the bleeding edge when it comes to the adoption of new materials handling technologies. Profit margins are thin and customers rarely commit to the kind of long-term contracts that justify an investment in technology.

Instead, they stick to proven solutions like lift trucks, pallet racks and floor storage with a dash of bar code scanning, labor management and warehouse management thrown in for good measure.

Genco ATC, the second largest 3PL in North America, has added a new variable to the conventional formula at a 223,000-square-foot return center it operates for a major retailer in McDonough, Ga. There, Genco ATC has installed a unique, patented optically based real-time locating system (RTLS; Sky-Trax, [www.sky-trax.com](http://www.sky-trax.com)) to track the movement of lift trucks, drivers and pallets in the facility as well as the final putaway location of each pallet in storage. The system has also eliminated hand scanning of pallet bar code labels and pallet location IDs.

While most RTLS systems rely on RFID technology, Genco ATC's uses 2D bar code location markers suspended from the ceiling, 2D bar codes applied to the pallets, and a camera-based imaging system mounted on the top and front of each lift truck. The top-mounted camera takes multiple images per second of the overhead location markers to calculate the real-time location of each lift truck as well as its direction and speed. The front-

mounted camera reads the pallet bar code label that is on the lift truck forks and tracks its movement throughout the warehouse to its exact putaway location (see page 21). The system is accurate to within an inch, says Cary Cameron, Genco ATC's senior vice president of strategic solutions.

The result has been a 47% productivity gain in pallets moved per hour since the system was installed a few years ago, Cameron says, adding, "We're confident there's still room for improvement."

In fact, the system is so accurate that Genco ATC is now using an optical RTLS as the navigation system with automatic guided vehicles in another facility.

### Improving productivity

Genco ATC is the industry's leading provider of reverse logistics and returns processing for major retailers. It had operated a returns facility in downtown Atlanta for one leading retailer for years. That facility was relocated to McDonough, Ga., in 1996, when the Olympics came to Atlanta.

Back then, Genco ATC tracked pallets in its warehouse management system (WMS) with RF-based bar code scanning. The process required scanning a bar code on a pallet followed by a scan of the location bar code on the pallet rack. Too often, the operators didn't complete the transaction: They either didn't scan the putaway location, or if a system-directed location was already full, they



didn't scan their alternative choice.

As a result, Genco ATC added a paper-based system as a backup to the RF-driven system. That improved accuracy, but did little to improve productivity since it required additional steps. Lift truck drivers had to take time to fill out the paper logs. Those logs had to be audited, which also took time. If the information on the logs didn't match the information in the WMS, the auditors had to search for the pallet to correct the system.

"If the pallets we needed to pick weren't where they were supposed to be, someone had to go find them," says Cameron. "We were losing a lot of productivity."

In 2004, Genco ATC launched an initiative to improve productivity. "Our

goal was a 100% improvement over a five-year period," says Cameron.

Over the next several years, Genco ATC piloted a real-time locating system that used a combination of active and passive RFID tags. The active RFID tag was used to track the lift truck while the passive RFID tag was used to track the pallet. With those two pieces of information, Genco ATC would be able to track where the lift truck was or had been and where the pallet had been dropped.

If successful, the system would automate the process of capturing putaway locations and eliminate the need for a paper-based quality check while improving accuracy. In practice, the RFID solution fell short. The system did an adequate job of scanning the tag on the pallet, but the combination of metal on the lift truck and steel in the pallet racks interfered with read rates on the active tags. Moreover, Cameron says, the system could only track the lift truck to within 8 feet in the aisle and couldn't tell in what direction it was facing. "I didn't know if it was on the right or left side of the aisle," she says.

By the end of 2006, it was

clear an RFID solution wouldn't work in this application.

### Exit RFID, enter camera-based imaging

In January 2007, Cameron and a team from Genco ATC came across a new booth at the ProMat show in Chicago. The technology provider was demonstrating a solution to precisely track lift trucks in buildings.

Specialized cameras were mounted on the top of lift trucks looking up to read large, 2D bar code position markers installed in the ceiling. Processing the images on the ceiling in real time enables the solution to track the location of lift trucks and the direction of travel to within inches anywhere in the building. One application showed that two trucks headed toward a collision could set off an alert, like a flashing warning light at the end of an aisle, that would signal the operators to slow down and be cautious. That information could be displayed on a screen for supervisors.

"They weren't marketing it as an inventory management system," says Cameron. "But while we were watching the demonstration, a light bulb went off. We realized that with a little tweaking, their solution could do exactly what we were trying to do."



The optical recognition system at Genco ATC's McDonough returns processing facility has led to a 47% gain in pallets moved per hour since the system went live.

Soon after ProMat, Genco ATC launched a pilot of the technology with a few lift trucks. Late that fall, the system was rolled out to a total of 10 lift trucks. The results were almost immediate. “We got the accuracy we needed and within two days of implementation we saw an 18% gain in our pallets moved per hour,” says Cameron.

Operators adapted easily to the system. “All a teammate has to do is pick up a pallet and drive it to the location indicated on the screen,” says Cameron. “If a teammate already knows how to drive a lift truck, they can be productive in about 10 minutes.”

In addition to eliminating the need to scan pallets and putaway locations and maintain a paper log, Genco ATC used the visual tracking capabilities of the system in the early stages to rethink its processes.

“One of the reporting capabilities of the system allows you to review the path of the lift truck during a specific time frame,” says Cameron. “We used that to see where a specific lift truck traveled during a 10-hour shift.” Genco ATC used that information to redesign operational practices to reduce operator travel time and further improve productivity. “We no longer need to use that tool every day,” says Cameron, “but we can very easily turn it on to see how the facility or individual operators are performing.” That creates an opportunity for further process changes or further operator training.

### Continual improvement

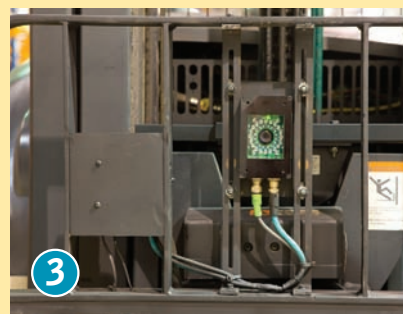
Total productivity improvements over the last several years have increased by 47%. But the benefits of the system haven’t been limited just to worker productivity. The system has led to additional savings in operational costs in several key areas.

For instance, because the system provides 100% real-time accuracy of pallet IDs and locations, Genco ATC is realizing indirect labor savings associated with auditing paper logs, cycle counting and searching for pallets that weren’t

## How it works?

The real-time locating system (RTLS) from Sky-Trax used by Genco ATC is sometimes confused with other RTLS systems using RFID. But while it provides the same level of real-time visibility as an RFID system, it uses an optical recognition system, a fundamentally different technology. In fact, in this instance, it replaced an RFID-based system.

To track lift trucks, special 2D bar codes are installed in the ceiling of the facility. (1) These bar codes act as location markers. A dark L shape is included in the bar code symbology.



Camera-based imaging technology mounted on the top of each lift truck (2) scans the overhead location markers as the lift truck travels. Based on the images captured by the camera and the angle at which the images are read, the system is able to calculate the exact position and speed of each lift truck. The orientation of the L shape in the bar code tells the system which direction the lift truck is headed and whether the operator turned right or left into a location. According to Cary Cameron, Genco ATC’s senior vice president of strategic solutions, the system is accurate to within an inch.

A second camera on the lift truck mast (3) reads a 2D bar code applied to each pallet (4) when the system’s pallet detector determines that the pallet is on the forks. The lift truck and the specific pallet it is carrying is then tracked throughout the warehouse. Combined with a laser height sensor on the lift truck (5), the system automatically captures the rack location when a pallet is putaway into storage.

Both cameras are put to use to capture a putaway location. The lift truck locating system provides the X and Y coordinate for the aisle and rack location. The height sensor on the lift truck mast provides the Z coordinate, or the level within the rack. Scanning the 2D bar code confirms the identification of the pallet that is either putaway or retrieved from that location. The pallet sensor indicates that a pallet has been picked up or dropped off and time stamps each on or off event. That time and location information updates the warehouse management system.





where they were supposed to be. "When you included all of the functional areas affected by this change, our total labor savings were 61%," Cameron says.

While the cost of the cameras were comparable to the cost of RFID readers, there have been ongoing operational savings from printing 2D bar code labels versus the purchase price of the passive RFID tags used to track pallets. "We were paying 18 cents per RFID tag, that cost adds up over time," says Cameron.

Likewise, Genco ATC no longer has the maintenance, repair and replace-

ment costs associated with RF units since operators are no longer scanning pallets.

The improvement in productivity allowed Genco ATC to use just four to six lift trucks per shift for putaway and picking operations, compared to 10 in the old system. Fewer lift trucks translates into reduced maintenance and replacement costs.

Team satisfaction has also improved. "Morale is harder to measure, but the



**Returned items are received from the retailer in corrugated cartons, inspected and then placed in returnable plastic totes for processing.**

teammates love working with the system," says Cameron. "You know you're on to something if the team is upset when he have to take the system down to reboot the server. That tells me we hit a home run." □

## Putting RTLS technology to work to handle returns

The real-time locating system (RTLS) is an integral part of receiving, putaway and picking operations.

**Receiving:** Everything arrives on pallets from the retailer's stores through common carriers. Those pallets include a mix of any of the products sold by the retailer.

Newly arrived pallets are received into the warehouse management system (WMS) and staged temporarily on the dock. The contents in the cartons won't be identified until the cartons are depalletized and conveyed to a workstation, where the cartons are opened and the individual item contents are scanned into the WMS system.

Based on the item scan, the WMS identifies the product that will be processed, determines a disposition for that

product and prints a license plate bar code to identify the item. Genco ATC personnel can override the system based on a visual inspection. For instance, an item that is broken or may raise a safety concern can be disposed of or delivered to another zone for additional handling.

Once the items have been identified and processed, they are put on the takeaway conveyor and sorted into various categories based on final ship to points. Full pallets are stretch wrapped, labeled with the 2D bar code used by Sky-Trax, and scanned into the WMS system for putaway.

**Putaway:** Based on the location of the stretch wrapping station, the WMS determines a putaway location for that pallet based on the best available storage location and notifies a lift truck operator that a pallet is ready for putaway. The WMS system calculates the best available location based on horizontal and vertical travel of the forklift; horizontal travel is quicker than the vertical travel of the mast. The system visually confirms to the operator if they are at the proper put-away location or not. The operator has the flexibility to override the WMS's recommendation based on certain criteria, such as if the location

### Genco ATC, McDonough, Ga.

**SIZE:** 223,000 square feet

**PRODUCTS:** Retail return center handling clothing, small appliances, tools and exercise equipment

**UNITS:** 23 million units handled in 2010

**SHIFTS:** 1 shift/4 days/10 hours

**EMPLOYEES:** 120 employees in operations

is blocked by another larger pallet. Once the operator places the pallet into the location, the optical real-time location system updates the exact put-away location in the WMS. That pallet is now available for shipment.

**Picking:** When Genco ATC receives authorization to release returns that have been processed, the system directs an operator to a storage location to retrieve a pallet. Once the camera-imaging system validates that the 2D bar code on the pallet belongs to the shipment being picked, it is taken to the dock for staging and shipping. This validation prevents incorrect pallets from being picked.

**Shipping:** During the shipping process, the forward-looking camera verifies that the right pallet is being loaded while the upward facing camera reads the overhead location markers to confirm that the pallet is being loaded into the right trailer. Once the trailer is full, the load is ready for shipment. □

### System suppliers

**OPTICAL REAL-TIME LOCATION SYSTEM:** Sky-Trax, [www.sky-trax.com](http://www.sky-trax.com)

**ENGINEERING:** Versona Systems, [www.versonasytems.com](http://www.versonasytems.com)

**LIFT TRUCKS:** Crown Equipment, [www.crown.com](http://www.crown.com)

**MOBILE COMPUTING:** Intermec, [www.intermec.com](http://www.intermec.com)