# Should you Replace Your Warehouse Management System with the latest License-Plate-Number Container Tracking Technology?


## Introduction

It is not by accident that the largest and most profitable distribution organizations, such as Amazon, FedEx, and UPS all use License-Plate-Number (LPN) container tracking technology to track all the materials that flow through their supply chains. Yet many smaller distributors and manufacturers are still using obsolete Warehouse Management Systems.

In this white paper we look at the operational and economic reasons that many of these smaller organizations should switch to LPN container tracking as a way of cutting costs and improving their operational efficiency.

## Difference between a WMS System and an LPN Container Tracking System

A Warehouse Management System (WMS) is basically an "item locator" system that tracks the quantity of material at a location. Often containers of material have barcodes which contain the part number, lot number and quantity of materials in a container. When materials are moved from one location to another they have to be withdrawn from one location and entered in another location.

A WMS typically has a reserved location for each part, so parts can easily be found and picked. There is typically no traceability, within the WMS, between parts received, parts or ingredients used on each job, products made and products shipped to customers

An LPN container tracking system tracks materials in containers using a tracking barcode attached to each container or individual item we need to track.

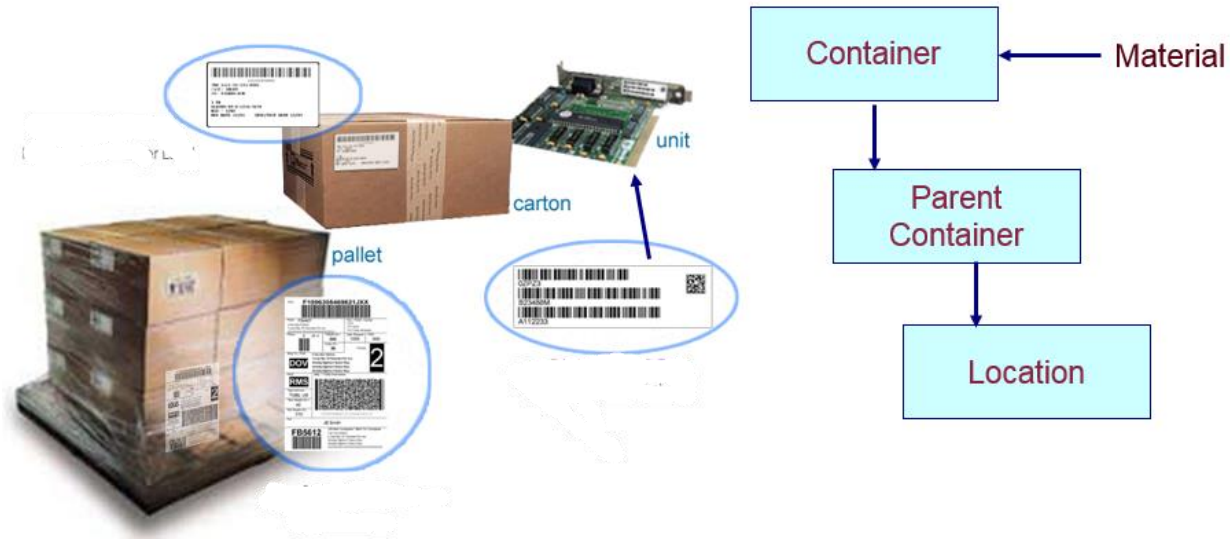
This LPN tracking barcode, or could be an RFID tag, contains an alphanumeric identifying "number" just like the license-plate-number on a car or truck. It does not encode any information, such as part number, or quantity, for the container to which it is attached.

The tracking barcode is scanned when materials are received and data such as part number, quantity, and lot number for the materials in the container are entered and stored in a database with the record referenced by the LPN. If an item has a serial number and expiration date, then it is recorded at the same time.

The LPN is scanned whenever the container moves, along with a location barcode of the shelf, rack, or floor location to which it is moved. The LPN is scanned whenever materials are added to or taken out of the container. It is also scanned when the contents of the container are picked, packed and shipped to customers.

This methodology, also supports the tracking of nested containers, such as having serialized items within cartons, with their own LPN, stacked on a pallet with its own LPN.




This LPN can then be used to track the loading of a pallet onto a truck/trailer plus the movement of the materials in the supply chain, including delivery to off-site warehouses, Distribution Centers, and to customers. The LPNs can also be used to record the delivery and installation of materials on a construction site or field repair operations.

LPN barcodes can be as simple as sequential barcodes from a preprinted roll of tracking barcodes, such as that shown here, or can be GS1 (Global Standard One) format barcodes which will uniquely identify a container anywhere in the global supply chain.

## Differences between WMS and LPN Inventory Tracking Systems

1. A WMS is generally simpler to setup as it is simply tracking the quantity of parts entered or withdrawn at a location. An LPN tracking system, in contrast, tracks the receipt, put away, usage, production, picking, packing and shipping of containers of material and so can be more complex to setup.
2. An LPN tracking systems can track materials in nested containers. WMS systems cannot.
3. An LPN tracking system can track the lot number and expiration date of each container of material and the serial numbers of individually barcoded items whereas a WMS cannot.
4. An LPN tracking system can track containers of materials with the same part number, in many different locations, whereas a standard WMS system cannot. This enables an LPN system to use dynamic binning where containers of material are placed wherever there is

space in the warehouse. It also enables materials, which are placed in overflow locations, to be tracked.

5. An LPN tracking system can track floor stock in factories, as well as materials that have been picked, packed, and staged for shipment. This is typically beyond the capabilities of a WMS.
6. An LPN tracking system can track work-in-process as it is manufactured, assembled, tested and repaired. A WMS cannot do this.
7. An LPN tracking system can track containers of material and individually barcoded items at many different geographically separated locations, including in plants, warehouses, in vehicles, trailers, and on building and other field sites. A WMS cannot do this.
8. An LPN tracking system can be use preprinted rolls of LPN barcodes for tracking, whereas a WMS cannot. Also an LPN can use a combination of tracking barcodes and RFID tags, to track containers and individual items, whereas a WMS cannot.
9. Through its use of nested containers, an LPN system can collect the ASN (Advanced Shipment Notice) data for a shipment that is increasingly being required by upstream Distribution Centers and Customers. A WMS system cannot do this.

### Which System do we need?

If you are simply looking to track the number of widgets in a stock room bin then all you need is a simple WMS system. If you need to use wave-picking or robots to pick undifferentiated products from pre-assigned bins at high speed then an advanced WMS system is the way to go.

If, however, you:

- Have a continually changing mix of parts and products in your warehouse and want to optimize the use of space by using dynamic binning.
- Need to track parts by lot number, serial number, expiration dates, or other characteristics such as PH or Hardness.
- Need to track materials with different dimensions, such as rolls or sheets, with the same part number.
- Need to track raw, intermediate, and finished goods parts, as well as work-in-process, in a manufacturing or repair facility.
- Need to track materials at many different geographic locations.
- Need to collect ASN data to feed to upstream customers and distribution centers in the supply chain.
- Make or distribute products, such as food and pharmaceuticals, which impact human health and safety, and/or for which it is required to maintain materials traceability history.
- Need to track and ship materials in nested containers.

Then you need an LPN container tracking system.

## Economic Considerations

If you need an LPN container tracking system but are still using a legacy WMS system then, even if the WMS system is a sunk cost, your WMS is probably costing you a lot of time and money in the following ways:

1. Time taken to fill out paper forms and Excel spreadsheets to enhance the capabilities of the WMS to meet your operational needs. Also time taken to correct mistakes made by this manual data capture.
2. Time taken looking for materials shown by the WMS to be in stock but placed in overflow locations, which were not recorded, as they were not the "standard" location for the part.
3. Carrying excess inventory to account for inventory errors due to "lost" inventory because of cycle counting errors.
4. Stock outs because inventory shown to be in WMS cannot be found because it has been placed in the "wrong" location.
5. Shutdown time for a warehouse for stock taking. These inventory auditing shutdowns, which can last days or weeks, are needed because the warehouse is treated as an entity by the WMS system. With an LPN system inventory auditing can take place one rack, shelf, or floor location at a time, thereby avoiding shutting down the warehouse.
6. Time taken to manually prepare Bills of Lading and Advanced Shipment Notice data.

An LPN based inventory tracking system, based on the BellHawk software, is available from KnarrTek for under $1,000/month. Replacing a legacy WMS systems with an LPN based system can easily save the time of at least one full-time equivalent person, at a cost of $5,000 or more per month, in work-arounds using paper forms and Excel spreadsheets, for the shortcomings of the WMS. As a result it is well worthwhile replacing your legacy WMS if what you really need is an LPN container tracking system.

## Commentary

LPN tracking methods have been adopted as the basis for tracking materials in the global supply chain. They are now being rapidly adopted by US Government Agencies such as the FDA, FAA, USDOT, DoD, and many others, as the basis for their materials tracking and traceability standards. These methods are now incorporated into ISO standards as well as materials tracking and traceability standards adopted by the EU and China.

LPN tracking methods now form the basis for supply chain tracing and traceability safety requirements for food and pharmaceutical products, veterinary products, as well as for medical instruments and biologics.

As supply chains become more interconnected, increasing amounts of data are expected to be exchanged upstream and downstream between supply chain partners. LPN materials tracking methods form the basis for almost all of this data exchange.

As a result, I expect that, in industrial, medical, and construction supply chain applications, there will be an ever increasing transition from traditional WMS systems to the use of LPN container tracking methods.

For more information about license-plate container tracking methods, please see the KnarrTek Technical Note "License-Plate-Number Tracking of Materials Explained", which is available for download as a PDF file from the Tech Notes tab at the bottom of www.knarrtek.com.

## Author

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