



## Managing and Tracking Reusable Assets

*By Keith Schall, Member, Reusable Packaging Association; Director of Business Systems and Technology, Container and Pooling Solutions, Inc. (CAPS)*

By implementing reusable transport packaging into their supply chains, many companies are gaining financial and environmental benefits. However, reaching this state requires considerable initial planning as well as ongoing fine-tuning of operations. One of the most important issues a company must address is knowing where all the packaging is within their supply chains at any given time.

This article will review and compare several different options available for tracking assets and raise some of the key decision factors to help you decide which solutions are right for your organization. For the purposes of this article, “reusables”, or “reusable packaging”, refers to pallets, containers, and dunnage, designed for reuse for its original purpose within a supply chain.

If you're not tracking and managing your reusable assets, then it is likely that someone else is benefitting from your investment. There is a strong secondary market for reusable containers, with resellers and regrinders capitalizing on companies that do not properly monitor their containers. When you're moving product from a distribution center to stores that you own, asset loss might not

# Aggregate vs. Individual Level Tracking



SYSTEM TYPE	ASSET IDENTIFICATION	ACCURACY	IMPLEMENTATION/DIFFICULTY	SOLUTION COST	ADDITIONAL HARDWARE
Aggregate Asset Tracking	Visual label None	Medium	Shorter/Easy	Low - Medium	None
Individual Asset Tracking	Barcode Passive RFID Active RFID GPS	High	Longer/Intermediate	Medium - High	Scanners/ Readers (laser/image/ RFID)

give you some direction about which option is right for your organization. For example, implementation of an aggregate tracking system will likely be easier and accomplished in a shorter timeframe than an individual tracking system. However, that depends on the type of aggregate or individual system you select.

be a big issue. But when you're going out to an open loop, asset loss is sure to be more prevalent with the potential loss compounded by the number of turns. Perhaps your loss rate per issue is only about 1 percent, but if you have 20 turns, that's 20 percent of the pool you need to replace every year. You have to understand where the assets are going and how you're going to get them back.

individual. The best way to determine which one supports your supply chain is to look at it in retrospect to the transaction itself. An aggregate example is one truck delivering 2,000 containers. Think of that as one transaction with a quantity of 2,000. An individual tracking system however would account for it as 2,000 transactions, each with a quantity of one. An aggregate system records in the net, and an individual system records each asset.

To help address the issue of asset loss, the Reusable Packaging Association (RPA) has formed an asset loss committee. The committee is working on the solution side of the problem, working with retailers and other stakeholders to define where the problem resides, and how to address it. A separate group is tackling the problem by prosecuting instances of theft, ensuring the RPA is aggressively tackling the issue from all angles.

The chart below depicts key differences between aggregate and individual level tracking. It's designed to be a guideline to

## AGGREGATE TRACKING SYSTEMS

There are four key aggregate tracking systems:

- Tribal Knowledge
- Return to Labels
- In-Out Netting Manual by Container Type
- In-Out Netting Electronic Association with Container Contents

**Tribal Knowledge** is the most simplistic of the systems. In this example, there is a dedicated supplier or customer at a manufacturing facility or a

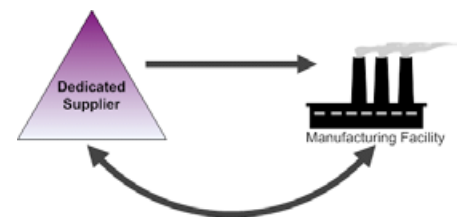
## AGGREGATE VERSUS INDIVIDUAL TRACKING

There are two primary tracking systems: aggregate and

# Aggregate Tracking System: Tribal Knowledge



- The simplest of all reusable container tracking
- Most successful in situations featuring:
  - Single origin
  - Single destination
  - Dedicated suppliers
  - Limited number individuals with long tenure involved in the logistics



Pros:	Cons:
<ul style="list-style-type: none"> <li>• Simple</li> <li>• Cheap</li> </ul>	<ul style="list-style-type: none"> <li>• Manually Intensive</li> <li>• Error-Prone</li> <li>• Not Scalable</li> </ul>

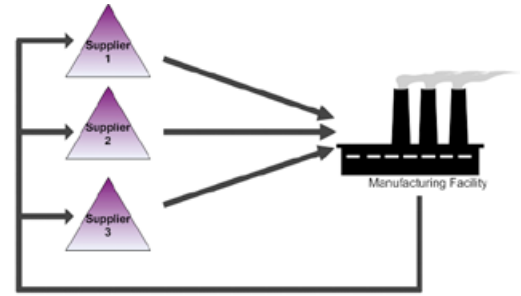
plant. There is only one origin and one single destination. It is a closed loop with a one-to-one relationship. A Tribal Knowledge system centers on individuals who execute their jobs well. They know which containers belong to which manufacturers, and have an established process to sort and return the assets. This is a very simple and inexpensive system; however, it is prone to errors, and it is not scalable for growth.

The system of **Return to Labels** is a bit more sophisticated, but still fairly simple. A manufacturing plant sends the containers out to three different suppliers, and they in turn, send them back to the plant. "Return to labels" refers to actual identification on the asset that says something along the lines of "return to", or "property of" and it usually includes the company name and phone number. The worker at the dock knows the asset needs

## Aggregate Tracking System: Return To Labels



- Features generic "Return-To" tag or mark on each bin (potentially a "Please Call" phone number as well)
- Most successful when:
  - Limited number of origins are sending to a single destination
  - Each container is marked with:
    - "Property of Company A" designation
    - "Return to Supplier B" or "Return to Supplier C" as appropriate



Pros:	Cons:
<ul style="list-style-type: none"> <li>• Visual and clear instructions</li> <li>• Low cost</li> </ul>	<ul style="list-style-type: none"> <li>• Identification can be removed</li> <li>• Extremely low accountability</li> </ul>

to be sorted, set aside, and the company called to come and retrieve the assets. This model is successful when there is a limited number of suppliers and a limited number of container types.

Although this is not very sophisticated, it can be powerful. The labels alert handlers that someone is monitoring and tracking the assets. It sends a message that misplacing the asset

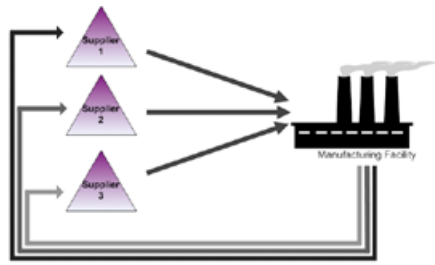
might have a financial impact on the receiving company. This model is visual, very clear and rather low cost. Of course, labels can be removed, and ultimately, there is extremely low accountability.

The third aggregate tracking system is **In-Out Netting Manual by Container Type**. This is simply the recording of the asset through a tool, like Excel or an Access database. It enables the recording in and out of ships and receipts from one location to the next, almost like a debit/credit system. This model works well with a low amount of suppliers, or a low amount of containers, and it can be up and running quickly. However, it is susceptible to errors when a supply chain starts getting more complex.

## Aggregate Tracking System: In-Out Netting Manual by Container Type



- Users record shipments and receipts out of each geographic location
- Accounting process begins with manual counts, which are compiled, documented and transmitted electronically or manually
- Works best with:
  - Minimal number of reusable container types (1,000 or less)
  - Generic containers that are part of a larger pool (3 or less container types)
  - Works best with 4 or less supply chain points



Pros:	Cons:
<ul style="list-style-type: none"> <li>• Quick to implement</li> <li>• Self balancing</li> </ul>	<ul style="list-style-type: none"> <li>• Increased assumptions</li> <li>• More frequent discrepancies</li> </ul>

The fourth and final aggregate tracking system - **In-Out Netting Electronic Association**

You are **1** degree of separation from changing your world.

Which 1 will it be?

76 affordable degrees of distinction – 100% online, including:

Transportation & Logistics Management  
Information Technology Management  
Business Administration  
Management

Or, consider a certificate in areas such as Strategic Leadership or Organizational Management.

Let us help you get started today.  
1.877.777.9081  
[www.studyatAPU.com/degrees](http://www.studyatAPU.com/degrees)



would be identified when the containers were scanned upon receipt at the next location. This is an “exception handling process” and you can create and define the business rules that suit your supply chain.

#### FOUR METHODS FOR INDIVIDUAL TRACKING

With an individual system, each asset is uniquely identified.

#### THERE ARE FOUR COMMON WAYS TO IDENTIFY INDIVIDUAL ASSETS:

- Barcode scanning

- Passive RFID tags
- Active RFID tags
- GPS

The system with the longest history is **barcode scanning**, which has been around about 35 years. Barcode scanners, which process linear/2D barcodes, are fairly simple to use, are the lowest cost of the asset labeling methods, work in any industry, and provide the capability for instant reconciliation. Additionally, the scanners can be in the form of a handheld or fixed scanner. The challenges with this method include the inability to handle all the data moving

through your system today without additional hardware or software and a very manual intensive scanning process that requires a line of sight to the bar code, with ongoing hardware maintenance and improvements.

A second method is **passive RFID tags** (radio frequency identification), which is the use of an object applied to a product for the purpose of identification and tracking using radio waves. Passive is the relatively inexpensive RFID model since these tags are not powered by a source and only receive their charge when they pass through a reader. When that signal hits them, it bounces back to an antenna and says, “I’m here” so it can be read.

You have probably heard of RFID before. There was considerable hype about it when it first came out and proponents said it would dramatically change asset tracking. Since that time, the hype has died down considerably, and along with it, the costs. It is more affordable today in part because of standardization. That was a big barrier with RFID initially. There were nearly 50 different models, and different standardizations, across different industries and companies. One example of standardization today was developed by the Automotive Industry Action Group (AIAG). They have created their own

passive manufacturing RFID standard. Some of the key benefits of passive RFID are automatic data reading (when the reader is fixed). This capability eliminates the manual labor associated with barcode scanning. And passive RFID tags provide RTI tracking at the individual level.

Passive RFID is a lower cost per tag than Active, but be aware that there are other associated costs including consulting resources and environmental challenges such as liquid and steel that impact the viability of RFID reading.

You also need to be aware that RFID is open, which creates security risks. Even if you encrypt your data, it can still be stolen, so be careful to ask about and weigh all security risks before implementing an RFID solution. Additionally, if you are using these in the form of a handheld device, they are still manually intensive like barcode scanners and passive RFID tags require higher equipment costs than barcode scanning.

# Tracking Model Summary



Feature/Description	Aggregate Tracking Models				Individual Tracking Models			
	Tribal Knowledge	Return to Labels	Manual In/Out Netting	Electronic In/Out Netting	Barcode scanning	Passive RFID	Active RFID	GPS
<b>Ideal for:</b>								
Low container volumes	✓	✓	✓		✓		✓	✓
High container volumes				✓	✓	✓	✓	✓
Number of container types	Small	Small	Small	Medium	Large	Large	Large	Large
Number of locations (plants/suppliers/customers)	Small	Small	Small	Medium	Any	Any	Any	Any
Container value (\$)	Low	Low - Medium	Low - Medium	Low - Medium	Any	Low - Medium	High	High
<b>Data</b>								
Accuracy	Low	Low	Moderate	Moderate	High	Moderate	High	High
Bill back accountability	Low	Low	Low	Moderate	High	Moderate	High	High
Reporting capabilities	Low	Low	Low	Moderate	High	High	High	High
<b>Cost</b>								
Software	Low	None	Low	Moderate	Moderate	High	High	High
Hardware	None	None	None	Low	Moderate	High	High	Moderate
Tags	None	Low	None	None	Low	Moderate	High	High
Implementation	Low	Low	Moderate	Moderate	Low	High	High	High
Overhead	Low	Low	Low	Low	High	Moderate	Low	Low

An **active RFID** tag has its own power source. For this reason, they are much more expensive when compared to a passive tag. The price per tag can typically range from just under \$20, all the way up to \$80, depending on the features and functionalities. The costs of the readers and installation are also high. The benefits include an extended range: more than 400 feet, and it requires less manual labor than a passive RFID tag because it doesn't have to pass through a portal or a handheld reader. A fixed reading device sends out an intermittent signal and hits the active tag which is constantly sending a signal saying, "I'm here, I'm here, I'm here." The tags have more storage capacity than passive ones, and they have advanced monitoring and read/write capabilities. These

capabilities can let you monitor and capture information on motion, temperature and other factors that might affect your product.

Some of the challenges, in addition to cost, are the limited life of the tags. Most last three to five years, although some have been known to last up to seven years. However, eventually you will need new tags and this will require you to re-label your whole fleet; a big cost to operations.

**GPS** stands for global positioning satellite. We are all familiar with this technology that enables cell phone use. There have been hints of GPS being used on reusable packaging, but moreso in terms of an overall solution. GPS is really a high value tracking

system. If you have a container or a product that is very high value, then you might want to explore this option. However, there are still challenges that need to be worked out, such as limitations of receiving signals indoors.

Which solution makes the most sense for your supply chain? The matrix below will give you some direction. For example, if your container value tends to be higher, you want to invest in better technology to track individual items and give you better accountability. An aggregate system would not be sufficient.

There are strong correlations with implementation costs. If you don't have a lot of money to get a tracking system going, you're probably not going to look toward passive or active RFID.

Also, it is possible to have someone else host and provide your tracking system rather than developing it in-house. This service would come through a Software as a Service (SaaS) provider. The downside of a SaaS provider is that you will continually have ongoing fees. You will keep paying for the system, but you will never own it. Also there are some customization limitations.

A benefit of SaaS is that you

don't need to spend resources developing a tracking system in house. Also, with a SaaS provider, the service is scalable. You don't need to worry about adding more containers or more locations. And keep in mind that several companies, including RPA members, are innovating with different types of solutions so the field of possibilities is likely to change.

### ADDITIONAL CHALLENGES TO CONSIDER

There are additional issues to weigh when choosing and implementing a tracking system.

These include:

- Freight repositioning
- Loss/damage/maintenance
- Fleet sizing
- Manufacturing lead time
- Pallets and lids
- Storage
- Compliance

In previous years, asset tracking was looked at as a luxury. More and more it is becoming a necessity. With compliance standards and governing entities such as Sarbanes Oxley, its becoming more critical to implement reliable tracking solutions into our supply chains. If a company has \$10 million of returnable containers on their balance sheet, Sarbanes Oxley will require that the company know exactly where and when those assets passed what point.

This is a significant development and will greatly accelerate the use of tracking systems.

Lastly, it is not enough just to track your containers. You must also incorporate key performance indicators (KPIs) and continual improvements to monitor and optimize your fleet. Even the best technology won't deliver optimal results if you don't have adequate operational procedures.

RLM

The content of this article was originally delivered at the Reusable Packaging Association Fundamentals of Reusable Packaging Workshop at PACKEXPO in 2010.



Keith Schall  
– Director of Business Systems and Technology, CAPS (Container and Pooling Solutions)

Mr. Schall is an expert in finance and technology with more than 12 years of experience. Previously, he was a controller and a network administrator, where he was responsible for finance technology and was the head of ERP implementation. He was brought on to the CAPS team in 2005. Since then his contributions have included the implementation of the recently enhanced CAPS-TRACTM and CAPScan web-based tracking solutions, increasing accountability and efficiency. Mr. Schall is currently in the Association for Corporate Growth, holds a B.A. Accounting degree from Alma College, and received his M.B.A. from the University of Detroit Mercy.