Deloitte.

Automotive Supply Chain:

Unlocking potential cost savings in automotive packaging

Executive summary

Limited visibility to how much your organization spends on packaging each year? Consistent challenges that disrupt current operations? Inability to scale operations to meet rising production rates? This paper sheds light on how much your organization may be spending on packaging annually, potential solutions to the challenges experienced each day, and identifies significant economic savings that could be achieved by approaching the current packaging process in a new way.

Context

A significant amount of capital is often locked in automotive parts packaging. In the automotive industry, packaging for inbound parts usually costs 2%–4% of the total part value. Thus, the value of packaging for annual North American part flows alone is estimated to be $5B–$10B, with approximately 30%–40% of that in standard returnable plastic containers. The value of packaging is growing 5%–10% year-over-year as North American production ramps up and automotive Original Equipment Manufacturers (OEMs) increase focus on local part sourcing[1,2].

Ownership of the packaging process — Who pays versus who plays?

Automotive part flows inbound to the OEM and Tier 1 plants typically use a variety of packaging materials and processes.

While Tier 2/3 suppliers usually use standard returnable containers (bulk bins and totes), there is a higher prevalence of nonstandard one-way packaging (corrugated cardboard) in their supply chain.

On the other hand, OEMs typically utilize greater standardized packaging for parts flowing into their factories. Standard plastic returnable containers (bulk bins and totes) and custom steel packaging are the primary types of packaging used by OEMs. OEMs typically own the custom steel packaging and provide it to the suppliers, whereas the standard plastic returnables can be owned by either the OEM or the supplier. The following table highlights how the ownership models can differ by OEM:

OEM Inbound Container Ownership								
OEM	**Container ownership**		**Management of the tracking, cleaning, and returns**		**Cost of containers and management**		**Containers pooled**	
	OEM	Suppliers	OEM	Suppliers	Upfront investment	Baked in piece price	Across OEMs	Across Suppliers
Sample Domestic OEM	✓		✓		✓			✓
Sample Domestic OEM		✓		✓		✓		
Sample Foreign OEM		✓		✓	✓			

Despite the large amount of capital locked in returnable packaging, it has not received the mindshare of automotive OEM and supplier executives that it deserves[2]. It is a well-known fact that there is a lot of waste in the packaging management process. The Automotive Industry Action Group (AIAG) conducts annual surveys on packaging — for the last two years, the surveys[3] have consistently shown that suppliers and OEMs frequently face difficulty in getting the right packaging to the right place at the right time. This results in parts shipped in expendable packaging because returnable packaging is lost or unavailable. We estimate the loss rate for pallets and lids is especially high (estimated to be 15%–20%[2]).

Notes: (1) IBIS World Automotive Parts Data; (2) Based on Deloitte primary research interviews conducted through Automotive Study; (3) AIAG

Deloitte conducted an automotive study to understand the specific issues and explore alternatives for unlocking the cost savings in packaging. The study involved firsthand observation at OEM plants, discussions with packaging providers, and more than 100 interviews with packaging managers, packaging engineers, packaging buyers, supply chain executives, and industry specialists from OEMs, and Tier 1/2/3 suppliers. This paper summarizes the findings of the Deloitte study (*while this paper focuses on the Automotive industry, the findings and savings are relevant to other related industries such as Commercial Truck, Heavy Equipment, and Aerospace sectors*).

Important issues in automotive packaging

In both the OEM-owned and the supplier-owned packaging scenarios, the Deloitte study found significant pain points for the players:

- **Excess containers:** OEMs and suppliers surveyed maintain multiple closed loop systems limiting the ability to share idle containers. This typically leads to 20%–25% more containers in the system than needed (requiring excess capital investments in idle containers).
- **Inconsistent availability:** Despite excess containers in the system, a lack of efficient tracking and limited visibility make it difficult to get the right container to the right place at the right time.
- **Limited visibility to total costs:** OEMs and suppliers have been challenged to quantify and track all packaging-related costs. Additionally, due to poor tracking mechanisms, OEMs can be charged multiple times for the same containers by their suppliers (from program to program).
- **High loss rates:** A significant percent (15%–20%) of packaging is lost during the life of the program due to limited tracking.
- **Inefficient returns:** The return loop logistics are not effectively utilized with many point-to-point returns. There are approximately 10%–15% empty miles on the return loop.
- **Packaging cleanliness:** Greasy and non-greasy containers are often mixed together and create excess costs for the suppliers.
- **Process complexity at the suppliers:** Suppliers have to expend significant effort in managing the different OEM requirements around container management.

Pain points in packaging

Industry studies have highlighted many pain points faced by industry participants with regard to the packaging process:

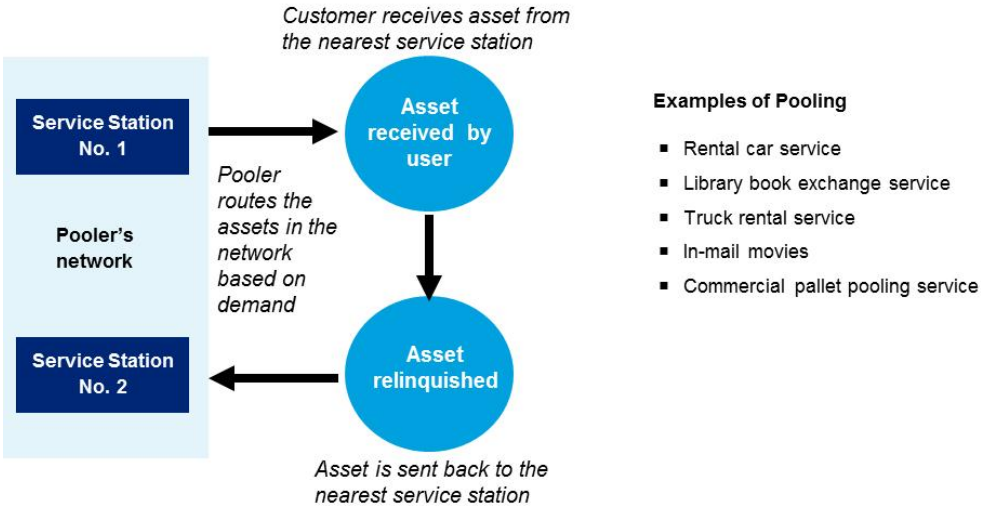
	Relevant Quotes[4]
Excess containers	"Our experience and research indicates that up to 30% of containers are excess in a manufacturer's supply chain"
Transferring containers to new programs	"OEMs are being charged multiple times for the same container with each new program [though piece price]"
Limited visibility to total costs	"OEMs and Suppliers don't have the discipline nor the data to identify this as a costly burden"
Inconsistent availability	"More than 50% of the time we ship out on wood pallets [one way packaging]"
High loss rates	"Typically OEMs order 10–15% more returnables to account for loss and shrinkage over time"
Inefficient returns (excess empty miles)	"There's a significant number of empty miles on trucks (approximately 10–15%) due to point to point returns"
Packaging cleanliness	"Greasy and non-greasy containers are mixed; clean containers are not normally available when needed"
Process complexity (at suppliers)	"Large suppliers serve most OEMs and develop packaging based on OEM specific instructions. Complexity of dealing with these differing packaging requirements can be an issue"

A potential solution — Pooling

A "Pooling-based" solution is one potential option to address these pain points, as well as reduce annual expenditures for standard returnable packaging. In the "Pooling" solution, the pooler would own the fleet of standard returnable containers and would manage the entire process — shipping, cleaning, preparing, and tracking of the containers.

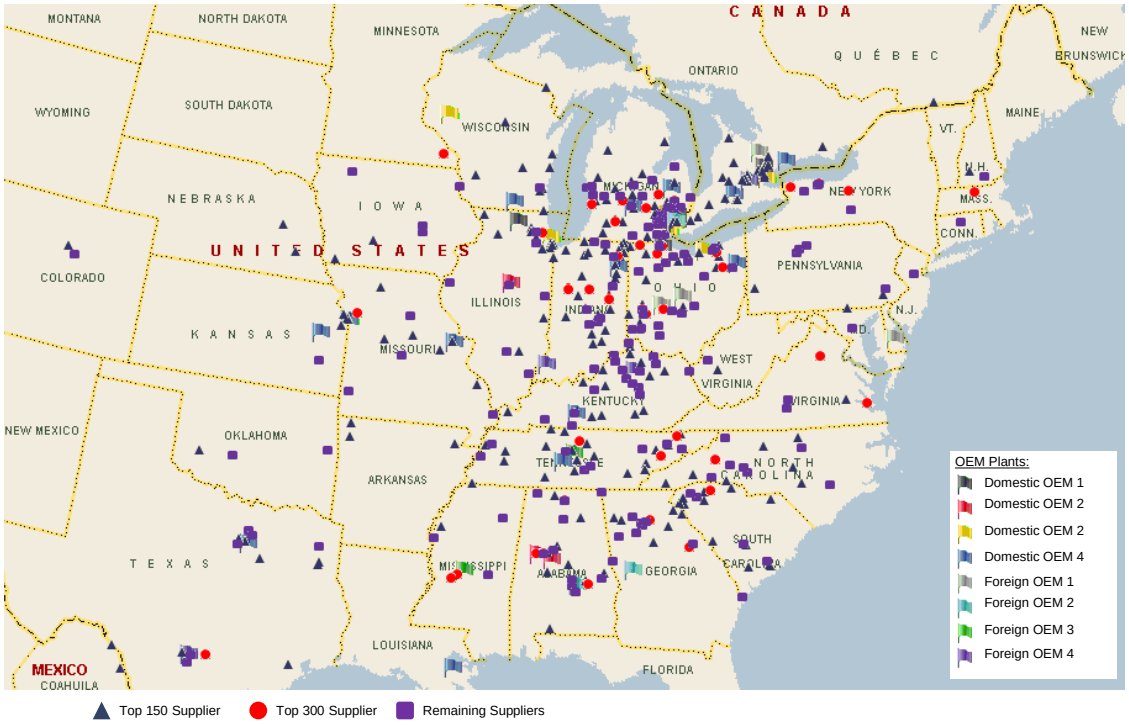
If the pooler is able to serve a sufficiently large number of programs, it can likely generate efficiencies through reduced variability and economies of scale to lower the system-wide cost of packaging services. This would be a significant advantage over the "Supplier Owned" systems. While OEMs that own their packaging partially achieve these benefits, they could potentially extend these benefits through pooling.

The pooling concept



Notes: (4) Based on Deloitte primary research interviews conducted through the Automotive Study

The pooling concept is most effective in driving cost savings when there is scale and a concentration of customers and suppliers. The following map shows the concentration of the Automotive Supply chain network in the United States[5].



Specific benefits of pooling

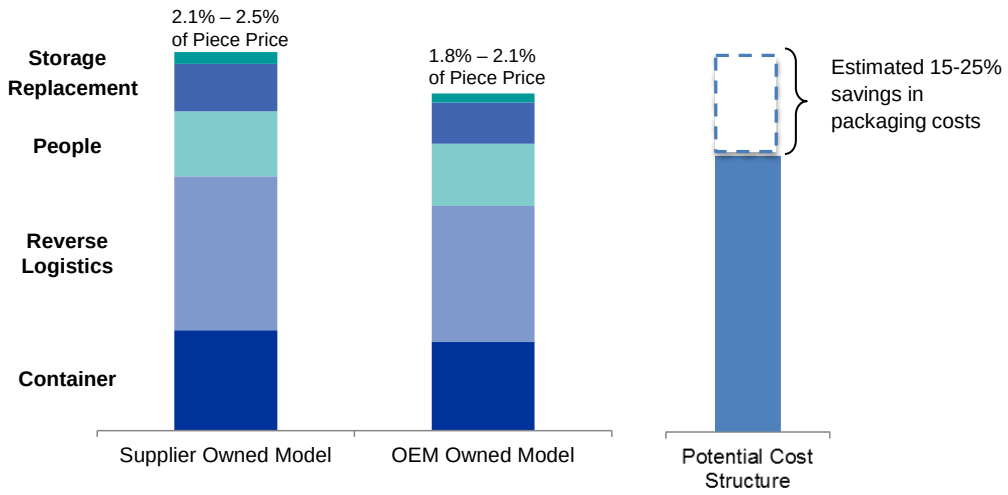
Pooling can reduce total enterprise costs

Research conducted by Deloitte indicates that pooling could reduce annual packaging costs by 15%–25% annually. Extending these savings to a medium-sized production program would translate to approximately $1B in additional profit for the OEM over the course of a five-year program (Tier 1 Suppliers can also realize similar savings with their Tier 2s). The major drivers of the savings include:

- **Reduction in logistics cost:** Pooling can drive a reduction in the number of empty miles and overall logistics costs as the containers will travel shorter distances to the service centers.
- **Reduction in container costs:** Pooling assists OEMs and suppliers to ship more parts with fewer containers by reducing the safety stock (due to reduced system variability) and improving container utilization. Fewer losses (through efficient tracking) as well as ease of transfer from program to program can reduce expenditures on containers.
- **Reduction in management costs:** Pooling requires an improved tracking and management process that streamlines container management and can reduce the headcount requirements at both suppliers and OEMs.

Notes: (5) IHS SupplierBusiness North American Who Supplies Whom Database, Deloitte Analysis

Potential benefits from pooling quantified for a program (Standard returnable containers)



Savings opportunity over a 5 year program[6] **$0.75B - $1.25B**

Pooling improves the effectiveness of the packaging process

- **Improved visibility to realized part costs:** Tracking assists improved visibility to realized part costs versus forecasted costs and provides effective feedback into the parts pricing process.
- **Reduced part contamination:** Pooling assists a consistent process for sorting and cleaning the containers, resulting in reduced part contamination.
- **Reduced part damage:** Pooling requires standardization of containers and replacement of corrugated packaging with stronger materials that reduce the incidents of part damage.

Notes: (6) Savings estimates are based on Deloitte analysis of a mid-to-large sized vehicle program

Challenges and Considerations for pooling

While pooling provides significant benefits over current packaging management processes, it is often challenging to discern the value and implement a pooling based solution. A number of implementation challenges are often raised. Key considerations around implementation can help mitigate these challenges and drive towards realizing the benefits from a pooling solution:

Implementation Challenges and Considerations

Implementation Challenges:	Implementation Considerations:
Limited packaging cost data: Visibility to the true cost of packaging is limited within the OEM and supplier organizations reducing their appreciation for the savings potential. Even when packaging data is partially tracked, the savings are often assumed to be "small" compared to other competing initiatives	**Business case development**: All packaging costs within the organization need to be identified; collaboration between the OEMs, Tier 1 Suppliers, and solution provider is required to identify all of the costs, benefits and track savings
Fragmented ownership and governance: The ownership of packaging competencies is usually fragmented within the organization, thus resulting in a lack of momentum and accountability, even when there is a business case for pooling	**Robust Program Management**: an integrated team to drive and implement the program, address issues throughout implementation, and rigorously track benefits is required
Perceived lack of control in a pooling environment: Even within the owned packaging segment, OEMs and suppliers have limited visibility into packaging availability. There is often a fear that losing control over packaging in a pooling environment will lead to manufacturing disruptions	**Change Management Process:** OEMs and suppliers must have a programmatic change management process to address organizational anxiety around the new packaging approach
Utilization of non-standard packaging footprints: Within the world of standardized packaging, OEMs and Tier 1 suppliers utilize various footprints of totes and bulk bins which can limit the opportunity for pooling	**Adherence to standard packaging footprints:** OEMs and tiers need to drive to more standardized packaging footprints (totes and bulk bins). A more harmonized set of containers will lead to greater savings
Scale is required: There is perception that the benefits from a pooling based system can only be achieved if there are a number of OEMs and Tier 1 suppliers onboard throughout North America	**Opportunities for scale using Visulization Tools**: Part flows across the supply chain can be mapped out using advanced visualization tools to identify the savings even within a limited network (such as a specific region of the country). Complex algorithms can help map out in detail where in the number of empty miles will be reduced to realize savings in a specific region or location

Conclusion

Packaging continues to receive limited visibility from automotive executives despite representing $5–$10B in costs annually within Norh America. As a result, the industry continues to be plagued by significant pain points across the supply chain that have not been addressed by the current infrastructure. A differentiated approach to packaging within the automotive supply chain is likely required. The benefits can be tremendous, yielding significant savings over the current baseline and addressing a number of major pain points felt by OEMs and suppliers. However, the benefits do not come without both OEMs and suppliers coming to the table in a collaborative and integrated fashion.

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