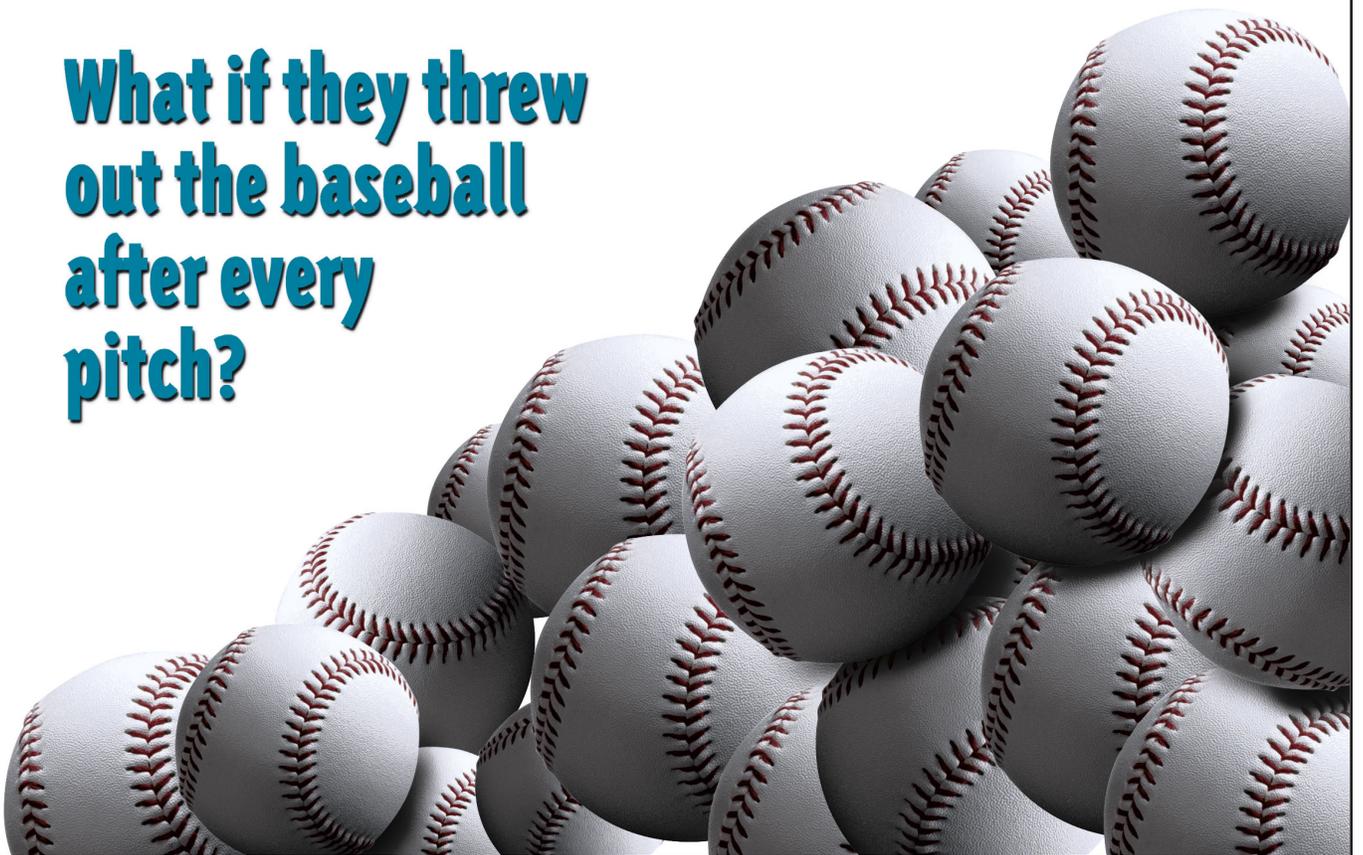


Reusables 102

A Cost Comparison Model for Reusable Transport Packaging

**What if they threw
out the baseball
after every
pitch?**



There's a better way.

What if they threw out the baseball after every pitch?

There's a better way.

It's called reusable transport packaging.

If you discard one-time or limited-use pallets and boxes after every trip, your company may be missing out on one of the last remaining frontiers in operational excellence. Making the switch from one-time or limited-use transport packaging to reusable containers (totes, boxes and bins), reusable pallets and pallet pooling systems (pallet rental) may be just the strategic tool you need to add money back to your company's bottom line.

Reusable transport packaging is used for multiple trips in closed loop and managed open loop shipping systems where reverse logistics or the return of empty transport packaging components can be repeated over and over again. Companies that determined reusable transport packaging was the right choice for them report savings due to the elimination of purchase and disposal costs of one-time or limited-use packaging, better ergonomics and lower labor costs, better product protection and lower product damage costs, better flow of goods through distribution channels and lower inventory and shipping costs and better worker safety and lower workers compensation claim costs. They also reported improved housekeeping and longer useful life of packaging.

GET A JUMP START WITH

Reusables 101

Reusables 102

Are you new to the concept of reusable transport packaging?

Have you considered the benefits of replacing one-time or limited-use pallets and boxes with a system of durable, long lasting containers and pallets?

Are you familiar with reusable transport packaging but need more information to help your company decide if it should make the switch?

Reusables 101 and **Reusables 102** are helpful tools that will give your company a jump start in answering these questions and more about reusable containers (totes, boxes and bins), reusable pallets and pallet pooling systems (pallet rental):

- **Reusables 101** is an introduction to the what, why, who, when, where and how of reusable transport packaging.
- **Reusables 102** will help you begin to determine if it makes financial sense for your company to make the switch to reusable transport packaging.

To download copies of **Reusables 101** and **Reusables 102** and for more information on reusable transport packaging, visit the *There's a Better Way* web site at www.better-way.info. This web site is loaded with information, including case studies showing the many cost-saving benefits of reusable transport packaging, frequently asked questions about reusable transport packaging and a resource center with web site links to packaging consultants, manufacturers and service providers.

Reusables 102 is brought to you by:

The Solid Waste Management Coordinating Board in Minneapolis/St. Paul
and the Reusable Pallet & Container Coalition headquartered in Washington, D.C.

The development of Reusables 102 was made possible through contributions from:

Avery Packaging – Chesterfield, Missouri

Container and Pallet Services, Inc. – Livonia, Michigan

IPL Products, Ltd. – Worcester, Massachusetts

Packnet, Ltd. – Minneapolis, Minnesota

Reusables 102

A Cost Comparison Model for Reusable Transport Packaging

Generally, a company will make the switch to reusable transport packaging when it is less expensive than one-time or limited-use transport packaging, and the company will save money. There are many potential opportunities for companies to save money with reusable transport packaging.

The primary cost-saving opportunity is to:

- Eliminate the purchase and disposal costs of one-time or limited-use packaging.

Secondary cost-saving opportunities include:

- Lower labor costs.
- Lower product damage costs.
- Lower inventory costs.
- Lower shipping costs.
- Lower workers compensation claim costs.

Primary and secondary cost savings may be offset by the introduction of new costs, primarily capital investment in reusable packaging components. Other costs may include new material handling equipment and storage systems; reverse logistics or the return transportation of empty reusable packaging components; maintenance and repair; and asset tracking and depreciation.

Typically, reusable transport packaging has a higher initial cost than one-time or limited-use transport packaging because it is designed and manufactured with more durable, long-lasting materials. What determines the return on investment for the higher cost of reusable transport packaging is the frequency of reuse over an extended useful life of the packaging. The greater the frequency of reuse, the faster the return on investment.

Get Started with Reusables 101

In **Reusables 101**, there are six steps to determine if reusable transport packaging will add profit to a company's bottom line. For more information about each step, download a copy of **Reusables 101** at www.better-way.info.

Step 1: Identify potential products that are frequently shipped in large volume and are consistent in type, size, shape and weight.

- Step 2:** Estimate one-time or limited-use packaging costs for these products.
- Step 3:** Develop a geographical report for these products by identifying shipping and delivery points.
- Step 4:** Review the various types and costs of reusable transport packaging systems available to move these products through the supply chain.
- Step 5:** Estimate the cost of reverse logistics in a closed or managed open loop shipping system based on the geographical report developed in Step 3.
- Step 6:** Develop a cost comparison between one-time or limited-use packaging costs estimated in Step 2 and the amount and type of reusable transport packaging researched in Step 4 plus the estimated cost of reverse logistics in Step 5.

Reusables 102: The Cost Comparison Model

Reusables 102 expands upon Step 6 in **Reusables 101** by presenting a Model that helps identify and compare the “one-time” cost per use of one-time or limited-use transport packaging to the “lifetime” cost per use of reusable transport packaging. Here’s how it works.

One-Time or Limited-Use Transport Packaging

To calculate the current costs of using one-time or limited-use transport packaging, identify all known cost components and calculate a “one-time” cost per use for the current packaging system.

Reusable Transport Packaging

To calculate the costs of using reusable transport packaging, identify all estimated cost components over the lifetime of the new reusable transport packaging system and calculate a “lifetime” cost per use for the new reusable packaging system. The “lifetime” of reusable transport packaging refers to an extended useful life of the packaging and can vary from one to as many as five years or more. The “lifetime” cost per use may differ from the “one-time” cost per use because it may use net present value and return on investment in the calculation.

“One-Time” and “Lifetime” Cost Components

The cost components for one-time or limited-use transport packaging and reusable transport packaging are listed in Table 1. The list of “one-time” cost components for one-time or limited-use transport packaging and the “lifetime” cost components for reusable transport packaging are almost the same, but the definitions that follow in Table 2 are very different.

TABLE 1**List of “One-Time” Cost Components for One-Time or Limited-Use Transport Packaging and “Lifetime” Cost Components for Reusable Transport Packaging**

“One-Time” Cost Components for One-Time or Limited-Use Transport Packaging	“Lifetime” Cost Components for Reusable Transport Packaging
Equipment & Tooling Depreciation Cost	Equipment & Tooling Depreciation Cost
Packaging Material Cost	Packaging Material Cost
Packaging Storage Space Cost	Packaging Storage Space Cost
Labor Cost	Labor Cost
Shipping Cost	Shipping Cost
Product Damage Cost	Product Damage Cost
Disposal Cost	Disposal Cost
	Return Cost
TOTAL COST	TOTAL COST

TABLE 2**Definitions of “One-Time” Cost Components for One-Time or Limited-Use Transport Packaging and “Lifetime” Cost Components for Reusable Transport Packaging**

“One-Time” Cost Components for One-Time or Limited-Use Transport Packaging	“Lifetime” Cost Components for Reusable Transport Packaging
<p>Equipment & Tooling Depreciation Cost</p> <p>Includes any equipment and tooling costs associated with one-time or limited-use packaging design such as implementation costs, part or product quality-related costs (e.g, scrap & rework), depreciation and tax impacts or benefits.</p>	<p>Equipment & Tooling Depreciation Cost</p> <p>Includes any equipment and tooling costs associated with reusable packaging design such as implementation costs, part or product quality-related costs (e.g, scrap & rework), depreciation and tax impacts or benefits.</p>
<p>Packaging Material Cost</p> <p>Includes the costs for one-time or limited-use packaging components such as containers and lids, pallets, skids, slip sheets, banding, stretch wrap and dunnage.</p>	<p>Packaging Material Cost</p> <p>Includes the costs for reusable packaging components such as containers and lids, pallets, crates, skids, slip sheets, banding, stretch wrap and dunnage. Include in this number any material cost to repair, refurbish and clean reusable packaging components.</p>
<p>Packaging Storage Space Cost</p> <p>Includes the storage space costs for one-time or limited-use packaging components such as company-owned and rented warehouse space.</p>	<p>Packaging Storage Space Cost</p> <p>Includes the storage space costs for reusable packaging components such as company-owned and rented warehouse space.</p>
<p>Labor Cost</p> <p>Includes the labor costs required to prepare, stage and load one-time or limited-use packaging for shipping. Also includes the administrative labor cost required to purchase one-time or limited-use packaging components.</p>	<p>Labor Cost</p> <p>Includes the labor costs required to prepare, stage and load reusable packaging for shipping. Also includes the labor costs to repair, refurbish and clean reusable packaging and the administrative labor cost required to purchase reusable packaging components.</p>
<p>Shipping Cost</p> <p>Includes the cost to ship products in one-time or limited-use transport packaging taking into consideration weight and size.</p>	<p>Shipping Cost</p> <p>Includes the cost to ship products in reusable transport packaging taking into consideration weight and size.</p>
<p>Product Damage Cost</p> <p>Includes the cost of product damage occurring in one-time or limited-use transport packaging throughout the supply chain.</p>	<p>Product Damage Cost</p> <p>Includes the cost of product damage occurring in reusable transport packaging throughout the supply chain.</p>
<p>Disposal Cost</p> <p>Includes the costs associated with the disposal of one-time or limited-use packaging components, including labor, equipment, hauling services, disposal fees for trash disposal and labor, equipment and transportation services for recycling collection.</p>	<p>Disposal Cost</p> <p>Includes the costs associated with the disposal of reusable packaging components that are damaged beyond repair at the end of their useful life including labor, equipment, hauling services, disposal fees for trash disposal and labor, equipment and transportation services for recycling collection.</p>
	<p>Return Cost</p> <p>Includes the handling and shipping costs to return empty reusable transport packaging components for reuse.</p>

Examples of How it Works

Generally, the flow of products and goods pass from manufacturers to wholesalers and retailers and from wholesalers and retailers to consumers. As these products and goods pass through the supply chain, transport packaging travels along with them. While there are many logistical variations, products and goods (and transport packaging) flow through the supply chain in two basic ways:

- “Many to One” supply channels used by manufacturers.
- “One to Many” distribution channels used by wholesalers and retailers.

“Many to One” – Manufacturers

An example of a “Many to One” supply channel is where manufacturers receive raw materials and supplies from many sources to make their products and goods. A “Many to One” supply channel is illustrated in Figure 1.

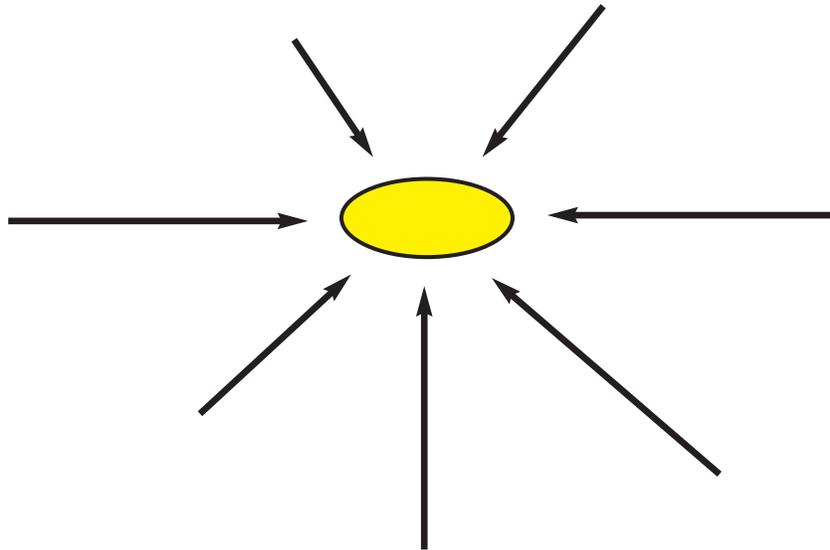


FIGURE 1

Manufacturers “Many to One” Supply Channel

“One to Many” – Wholesalers & Retailers

An example of a “One to Many” distribution channel is where wholesalers and retailers receive finished products and goods from manufacturers and then distribute finished products and goods to their customers. A “One to Many” distribution channel where manufacturers distribute finished products and goods to their customers is illustrated in Figure 2.

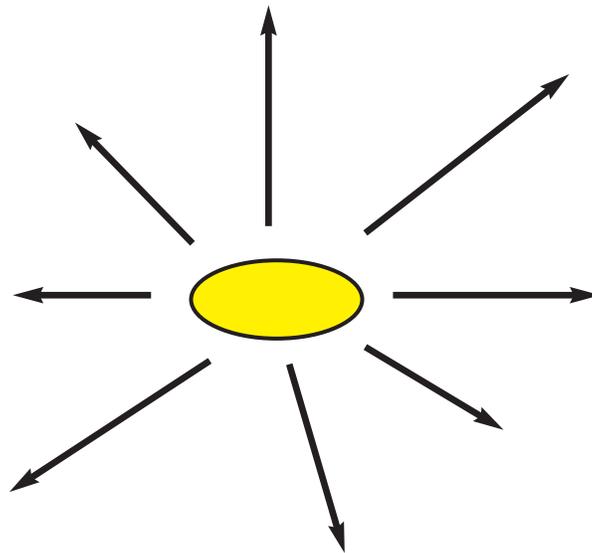


FIGURE 2

Wholesalers & Retailers “One to Many” Distribution Channel

To show how the Cost Comparison Model works, two “real life” examples of making the switch to reusable transport packaging follow:

- The first example illustrates the use of the Model by a major food manufacturer that replaced one-time-use bulk cardboard boxes and wood pallets with reusable bulk plastic containers in 2003.
- The second example illustrates the use of the Model by a major seafood distributor that replaced one-time-use, wax-coated cardboard boxes with reusable plastic totes in 2000.

Example 1: Food Manufacturer

A Major Food Manufacturer Replaces One-Time-Use Bulk Cardboard Boxes & Wood Pallets with Reusable Bulk Plastic Containers

*Provided Courtesy of
Container and Pallet Services, Inc. – Livonia, Michigan*

A major food manufacturer headquartered in the Midwestern United States produces various snack products for the consumer market. To produce these products, the food manufacturer receives a marshmallow “slurry” in bulk from five suppliers at one of its manufacturing plants in a closed loop distribution system. Annually, the manufacturing plant receives 60,000 bulk containers of slurry from its suppliers. Each bulk container contains 1,850 pounds of the marshmallow mixture, and 22 containers are shipped per truckload.

One-Time-Use Bulk Cardboard Box & Wood Pallet Costs

Initially, the suppliers used a 40” x 48” x 44” bulk cardboard box lined with a plastic liner and covered with a 4” cardboard lid to package the slurry for shipment to the food manufacturing plant on wood pallets. To secure the load during shipment, the suppliers used banding to keep the cardboard boxes on the wood pallets. Upon receipt of the slurry, the food manufacturer recycled the bulk cardboard boxes and lids after a single use. The manufacturer reused the wood pallets 50 times and threw away the plastic liners and banding. From time to time, the bulk cardboard boxes would fail due to moisture soaked boxes and penetrated boxes from fork lift truck handling. The food manufacturer estimates that \$13,000 of marshmallow slurry was damaged annually.

The annual costs to ship 60,000 one-time-use bulk cardboard boxes of 1,850 pounds of marshmallow slurry on wood pallets are listed and defined in Table 3. A “one-time” cost per use calculation follows.

TABLE 3**Annual Costs to Ship Marshmallow Slurry in One-Time-Use Bulk Cardboard Boxes on Wood Pallets**

"One-Time" Cost Components	Definition	Annual Cost
Equipment & Tooling Depreciation Cost	Costs not included. Bulk cardboard box assembly and closing equipment purchased and fully depreciated.	\$0
Packaging Material Cost	Includes the costs to purchase 60,000 bulk cardboard boxes and lids, plastic liners, wood pallets (reused 50 times) and banding.	\$610,000
Packaging Storage Space Cost	Includes the cost for warehouse space to store unassembled bulk cardboard boxes and lids, plastic liners, wood pallets and banding. Requires 500 sq. ft. at \$8.25 per sq. ft.	\$4,125
Labor Cost	Includes the labor cost to assemble bulk cardboard boxes and lids, prepare and place plastic liners, prepare and place cardboard boxes on wood pallets, plastic liner sealing time, cardboard box closure time and banding time. Also includes the labor cost to open and empty contents, recycle empty bulk cardboard boxes and lids, dispose of plastic liners and banding and manage wood pallets for reuse or disposal.	\$101,000
Shipping Cost	Includes the costs to ship 60,000 bulk cardboard boxes of marshmallow slurry on wood pallets from suppliers to the food manufacturing plant. Each bulk container contains 1,850 pounds of slurry, and 22 containers are shipped per truckload. Annually, 2,727 truckloads are shipped at a cost of \$1,000 per truckload.	\$2,727,000
Product Damage Cost	Includes a cost estimate of damaged marshmallow slurry due to failed bulk cardboard boxes. Failure is due to moisture soaked boxes and penetrated boxes from fork lift truck handling.	\$13,000
Disposal Cost	Includes the costs to recycle empty bulk cardboard boxes and lids (adjusted for recycling revenues) and to dispose of empty plastic liners, banding and wood pallets.	\$17,000
TOTAL COST		\$3,472,125

$$\text{"One-Time" Cost Per Use} = \frac{\text{Total "one-time" cost}}{\text{Number of bulk cardboard boxes shipped}} = \frac{\$3,472,125}{60,000} = \$57.87$$

The annual cost to ship 60,000 one-time-use bulk cardboard boxes full of 1,850 pounds of marshmallow slurry on wood pallets is \$3,472,125. The "one-time" cost per use is \$57.87 per bulk cardboard box.

Reusable Bulk Plastic Container Costs

In 2003, the food manufacturer made the switch to a reusable transport packaging system comprised of a 40" x 48" x 39" reusable bulk plastic container and lid with built-in fork pocket entry on all four sides of the container. While the food manufacturer continues to line the containers with plastic liners, the reusable bulk plastic container eliminates the use of wood pallets and banding. When empty, the reusable bulk plastic container collapses and stacks for the return trip back to suppliers where the container is used again and again.

To make the switch, the food manufacturer purchased an initial fleet of 1,000 reusable bulk plastic containers and lids at \$165.00 each and five bulk plastic container washer and sanitizers at \$7,600 each for a total investment of \$38,000.



Reusable Bulk Plastic Container

The food manufacturer doubled the amount of space required to store reusable bulk plastic containers and lids from 500 sq. ft. for one-time-use bulk cardboard boxes and wood pallets to 1,000 sq. ft. The food manufacturer repairs or replaces one out of every ten reusable bulk plastic containers each year due to normal wear and tear.

TABLE 4**Annual Costs to Ship Marshmallow Slurry in Reusable Bulk Plastic Containers and Lids**

"Lifetime" Cost Components	Definition	Annual Cost
Equipment & Tooling Depreciation Cost	Includes the cost to purchase an initial fleet of 1,000 reusable bulk plastic containers and lids with built-in fork pocket entry on all four sides of the container at \$165.00 each (\$165,000). Also includes the cost to purchase five reusable bulk plastic container washer and sanitizers at \$7,600 each for a total of \$38,000. All costs (\$203,000) are depreciated on a five-year, straight line basis.	\$40,600
Packaging Material Cost	Includes the \$49,500 cost to repair and replace reusable bulk plastic containers. This repair & replacement cost assumes that 1 out of every 10 containers (6,000) will require container repair and/or replacement at 5% of container purchase price (\$8.25). Also includes the \$21,000 cost to purchase plastic liners.	\$70,500
Packaging Storage Space Cost	Includes the cost for warehouse space to store 1,000 reusable bulk plastic containers throughout the supply chain. Requires 1,000 sq. ft. at \$8.25 per sq. ft.	\$8,250
Labor Cost	Includes the time to assemble the empty, collapsed reusable bulk containers, prepare and place plastic liners, plastic liner sealing time, and reusable container lid sealing time. Also includes the time to wash and sanitize reusable bulk plastic containers and lids.	\$97,460
Product Damage Cost	There is no damaged marshmallow slurry due to failed reusable bulk plastic containers and lids.	\$0
Shipping Cost	Includes the costs to ship 60,000 reusable bulk plastic containers of marshmallow slurry from suppliers to the manufacturing plant. Each reusable bulk container contains 1,850 pounds of slurry, and 22 containers are shipped per truckload. Annually, 2,727 truckloads are shipped at a cost of \$1,000 per truckload.	\$2,727,000
Disposal Cost	When bulk plastic containers reach their end of useful life, they are recycled.	\$0
Return Cost	Includes the cost to return 60,000 empty, collapsed and stacked reusable bulk containers from the manufacturing plant to marshmallow slurry suppliers for reuse. Annually, 285 truckloads of 210 empty containers are shipped at a cost of \$1,000 per truckload.	\$285,000
TOTAL COST		\$3,228,810

The annual costs of the reusable transport packaging system to ship 60,000 bulk plastic containers containing 1,850 pounds of marshmallow slurry are listed and defined in Table 4.

$$\text{"Lifetime" Cost Per Use} = \frac{\text{Total "lifetime" cost}}{\text{Number of bulk plastic containers shipped}} = \frac{\$3,228,810}{60,000} = \$53.81$$

The annual cost to ship 60,000 reusable bulk plastic containers full of 1,850 pounds of marshmallow slurry is \$3,228,810. The "lifetime" cost per use is \$53.81 per bulk plastic container.

First Year Savings

The food manufacturer's first year savings is calculated by subtracting the initial investment in purchasing a fleet of 1,000 reusable bulk plastic containers (\$165,000) and five reusable bulk plastic container washer and sanitizers (\$38,000) from annual savings:

$$\text{Initial Investment} = \$165,000 + \$38,000 = \$203,000$$

$$\begin{aligned} \text{Annual Savings} &= \text{Total one-time-use annual cost} - \text{Total reusable annual cost} \\ &= \$3,472,125 - \$3,228,810 = \$243,315 \end{aligned}$$

$$\begin{aligned} \text{First Year Savings} &= \text{Annual savings} - \text{Initial investment} \\ &= \$243,315 - \$203,000 = \$40,315 \end{aligned}$$

During the first year the food manufacturer makes the switch to reusable bulk plastic containers, the Company will save \$40,315.

Second Year and Beyond Savings

During the second year and beyond, annual savings for the food manufacturer will be \$243,315:

$$\begin{aligned} \text{Annual Savings} &= \text{Total one-time-use annual cost} - \text{Total reusable annual cost} \\ &= \$3,472,125 - \$3,228,810 = \$243,315 \end{aligned}$$

Return on Investment

The food manufacturer's return on the initial expenditures for the reusable bulk plastic container system occurred in 0.83 years or approximately ten months:

$$\text{Return on Investment} = \frac{\text{Initial investment}}{\text{Annual savings}} = \frac{\$203,000}{\$243,315} = 0.83 \text{ years}$$

Example 2: Seafood Distributor

A Major Seafood Distributor Replaces One-Time-Use, Wax-Coated Cardboard Boxes with Reusable Plastic Totes

*Provided Courtesy of
IPL Products, Ltd. – Worcester, Massachusetts*

A major seafood distributor in the Midwestern United States procures fresh fish and other seafood products from Atlantic and Pacific Ocean fisheries. Seafood products are packed in ice and air freighted to the distributor where they are processed daily into portion sizes specified by hundreds of Midwestern restaurants. The seafood distributor re-ices, packs and ships to order the seafood in boxes to restaurant customers in refrigerated delivery trucks. In a closed loop distribution system, the seafood distributor ships approximately 200,000 boxes of fresh seafood products to restaurants each year from its one packing plant location. Each box contains 40 pounds of fresh seafood.

One-Time-Use, Wax-Coated Cardboard Box Costs

Initially, the seafood distributor shipped ice-packed seafood products to its restaurant customers in 24" x 16" x 9" non-recyclable, wax-coated cardboard boxes lined with plastic liners that are disposed of by customers after a single use. Typically, restaurant staff flattened these boxes and disposed of them in garbage dumpsters at the restaurants. During warm summer months, melted ice would cause the wax-coated cardboard boxes to become wet. Eventually the boxes became saturated with water, weakened and failed leading to spilled messes and some damaged product at the restaurants. The seafood distributor estimates that 0.5 percent or 0.2 pounds of seafood was damaged per box due to water soaked boxes that broke down.

The annual costs to ship 200,000 one-time-use, wax coated cardboard boxes of fresh seafood products are listed and defined in Table 5. A "one-time" cost per use calculation follows.

TABLE 5**Annual Costs to Ship Fresh Seafood Products
in One-Time-Use, Wax-Coated Cardboard Boxes**

"One-Time" Cost Components	Definition	Annual Cost
Equipment & Tooling Depreciation Cost	Costs not included. Wax-coated cardboard box assembly and closing equipment purchased and fully depreciated.	\$0
Packaging Material Cost	Includes the cost to purchase 200,000 wax-coated cardboard boxes at \$2.00 per box. The costs for plastic liners are not included.	\$400,000
Packaging Storage Space Cost	Not included in this calculation. Storage space cost is the same for one-time-use, wax-coated cardboard boxes and reusable plastic tote systems.	\$0
Labor Cost	Includes the time to assemble wax-coated cardboard boxes, prepare and place plastic liners, plastic liner sealing time and cardboard box closure time. Equivalent of one full time employee.	\$40,000
Shipping Cost	Not included in this calculation. Outbound shipping cost is the same for one-time-use, wax-coated cardboard box and reusable plastic tote systems.	\$0
Product Damage Cost	Includes the cost of damaged fresh seafood products due to failed water soaked wax-coated cardboard boxes. Damaged seafood estimated to be 0.5 percent per box. Each box contains 40 pounds of fresh seafood valued at \$4.00 per pound.	\$160,000
Disposal Cost	Includes the cost to dispose of empty non-recyclable, wax-coated cardboard boxes. Disposal fee is estimated to be \$100 per ton. Each box weighs 2 pounds.	\$20,000
TOTAL COST		\$620,000

$$\text{"One-Time" Cost Per Use} = \frac{\text{Total "one-time" cost}}{\text{Number of cardboard boxes shipped}} = \frac{\$620,000}{200,000} = \$3.10$$

The annual cost to ship 200,000 one-time-use, wax-coated cardboard boxes containing 40 pounds of fresh seafood products in each box is \$620,000. The “one-time” cost per use is \$3.10 per box.

Reusable Plastic Tote Costs

In 2000, the seafood distributor made the switch to a reusable transport packaging system comprised of a 24” x 16” x 9.6” heavy duty plastic tote with an attached lid and all-plastic hinges. The seafood distributor continues to line the plastic totes with plastic liners. When empty, the reusable plastic totes stack and nest for the return trip back to the seafood distributor’s packing plant where they are washed and sanitized.

To make the switch, the seafood distributor purchased an initial fleet of 20,000 plastic totes at \$6.00 each and a reusable plastic tote washer and sanitizer for \$50,000. The seafood distributor uses each plastic tote about two times a month

and purchases approximately 10,000 new plastic totes a year to replace lost totes.



Reusable Plastic Tote

The annual cost to ship 200,000 reusable plastic totes containing 40 pounds of fresh seafood products are listed and defined in Table 6. These annual costs assume that the “lifetime” of each reusable plastic tote is five years or about 100 uses.

TABLE 6
Annual Costs to Ship Fresh
Seafood Products in Reusable Plastic Totes

"Lifetime" Cost Components	Definition	Annual Cost
Equipment & Tooling Depreciation Cost	Includes the cost to purchase an initial fleet of 20,000 reusable plastic totes at \$6.00 each (\$120,000). Also includes the cost to purchase a reusable plastic tote washer and sanitizer for \$50,000. All costs (\$170,000) are depreciated on a five-year, straight line basis.	\$34,000
Packaging Material Cost	Includes the cost to replace 50 percent of the fleet of 20,000 reusable plastic totes lost per year or 10,000 plastic totes at \$6.00 each. The cost for plastic liners are not included.	\$60,000
Packaging Storage Space Cost	Not included in this calculation. Storage space cost is the same for one-time-use, wax-coated cardboard boxes and reusable plastic tote systems.	\$0
Labor Cost	Includes the time to wash and sanitize reusable plastic totes. Also includes the time to prepare and place plastic liners in totes, plastic liner sealing time and reusable plastic tote closure time. Equivalent of one full time employee.	\$40,000
Shipping Cost	Not included in this calculation. Outbound shipping cost is the same for one-time-use, wax-coated cardboard box and reusable plastic tote systems.	\$0
Product Damage Cost	There are no damaged fresh seafood products due to failed reusable plastic totes.	\$0
Disposal Cost	If and when reusable plastic totes reach their end of useful life, they are recycled.	\$0
Return Cost	In this closed loop distribution system, there are no additional costs to return empty plastic totes to the packing plant.	\$0
TOTAL COST		\$134,000

$$\text{"Lifetime" Cost Per Use} = \frac{\text{Total "lifetime" cost}}{\text{Number of plastic totes shipped}} = \frac{\$134,000}{200,000} = \$0.67$$

The annual cost to ship 200,000 reusable plastic totes full of 40 pounds of fresh seafood products is \$134,000. The "lifetime" cost per use is \$0.67 per tote.

First Year Savings

The seafood distributor's first year savings is calculated by subtracting the initial investment in purchasing a fleet of 20,000 reusable plastic totes (\$120,000) and a reusable plastic tote washer and sanitizer (\$50,000) from annual savings:

$$\text{Initial Investment} = \$120,000 + \$50,000 = \$170,000$$

$$\begin{aligned} \text{Annual Savings} &= \text{Total one-time-use annual cost} - \text{Total reusable annual cost} \\ &= \$620,000 - \$134,000 = \$486,000 \end{aligned}$$

$$\begin{aligned} \text{First Year Savings} &= \text{Annual savings} - \text{Initial investment} \\ &= \$486,000 - \$170,000 = \$316,000 \end{aligned}$$

During the first year the seafood distributor makes the switch to reusable transport packaging, the Company will save \$316,000.

Second Year and Beyond Savings

During the second year and beyond, annual savings for the seafood distributor will be \$486,000:

$$\begin{aligned} \text{Annual Savings} &= \text{Total one-time-use annual cost} - \text{Total reusable annual cost} \\ &= \$620,000 - \$134,000 = \$486,000 \end{aligned}$$

Return on Investment

The seafood distributor's return on the initial expenditures for the reusable plastic tote system occurred in 0.35 years or just over four months:

$$\text{Return on Investment} = \frac{\text{Initial investment}}{\text{Annual savings}} = \frac{\$170,000}{\$486,000} = 0.35 \text{ years}$$

Make the Switch & Save

In these two examples, the Cost Comparison Model illustrates how it made financial sense for the food manufacturer and the seafood distributor to make the switch to reusable transport packaging. Both companies were required to make initial capital investments in reusable transport packaging components and equipment. Both companies had to repair, replace and clean reusable containers. The food manufacturer had to double storage space for reusable containers and pay for the return of empty reusable containers. Even with these additional costs, the frequency of reuse over an extended useful life of the packaging allowed a return on the investments made by both companies in less than one year.

Are you throwing out the baseball after every pitch?

Use this Cost Comparison Model for Reusable Transport Packaging to get a jump start on finding out if there is a better way for your company to save money by making the switch to reusable transport packaging.