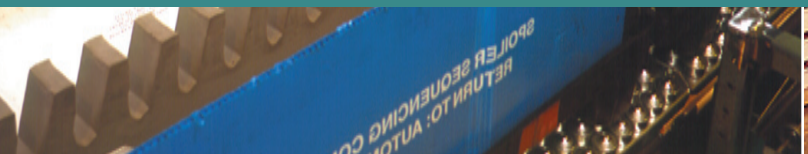
REUSABLES 102

A cost comparison model for

Reusable Transport Packaging

How Businesses Have Successfully Switched to Reusable Transport Packaging

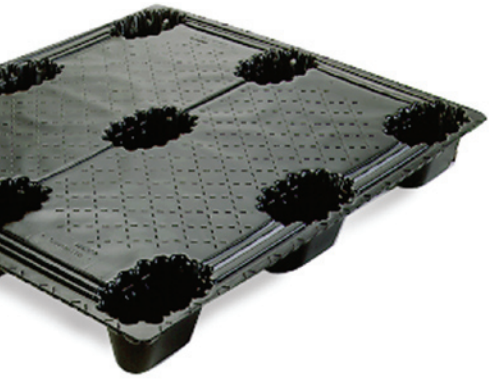


Ready to switch from one-time-use to reusable transport packaging?

The Cost Comparison Model for Reusable Transport Packaging in this document can help you determine if reusable packaging makes financial sense for your company.

Many organizations today are turning to reusable containers (totes, boxes, and bins), reusable pallets, and pallet pooling systems (pallet rental) for multiple transport trips in closed-loop and managed open-loop shipping systems. Using durable materials allows reverse logistics—or the return of empty transport packaging components—to be repeated over and over again.

You can find additional information and resources on reusable transport packaging at www.UseReusables.com. The website includes **case studies** that demonstrate the many **cost-saving benefits** of reusable transport packaging, answers to **frequently asked questions** about reusables, and a **resource center** with links to manufacturers, service providers, and packaging experts.



For more information on reusable transport packaging and how it can help your company, download the *Reusables 101 primer, Think Outside the Box: Think Reusable.*

Reusable transport packaging: Benefits and advantages

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

The primary cost-saving area is from elimination of the purchase and disposal costs of one-time or limited-use packaging. Secondary savings opportunities include:

- Lower labor costs
- Decreased product damage costs
- Lower inventory costs
- Lower shipping costs
- Fewer workers' compensation claims

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, longer-lasting materials. Other costs may include new material handling equipment and storage systems, reverse logistics (the return transportation of empty reusable packaging components), maintenance and repair, and asset tracking and depreciation.

However, these costs are offset by the savings opportunities. The frequency of reuse over the extended useful life of the packaging determines your return on investment (ROI) for the higher cost of reusable transport packaging: *The greater the frequency of reuse, the faster the return on investment.*

The Cost Comparison Model for Reusable Transport Packaging can help you determine both initial costs and potential savings from switching to reusables.

Get started with reusables

To determine if reusable transport packaging will add profit to your company's bottom line, follow the six steps below. For more information about each step, download the *Reusables 101* primer at www.UseReusables.com.

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 the 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 the one-time or limited-use packaging costs estimated in Step 2 and the cost of reusable transport packaging researched in Step 4 plus the estimated cost of reverse logistics in Step 5.

Reusables: The cost comparison model

The following model expands on Step 6 by presenting a way to identify and compare the one-time cost per use of one-time or limited-use transport packaging ("one-time cost") with the lifetime cost per use of reusable transport packaging ("lifetime cost"). Substitute your own data to identify the ROI from switching to reusables in your company.

One-time or limited-use transport packaging

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

Reusable transport packaging

To determine the cost of using reusable transport packaging, identify all estimated cost components over the lifetime of the new reusable transport packaging system and calculate the 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. Unlike with one-time cost per use, the lifetime cost per use may include net present value and ROI in the calculation.

Cost components

Table 1 lists the cost components for one-time or limited-use transport packaging and reusable transport packaging, as well as definitions of what is meant by each component. Though every supply chain is unique, these cost components are a factor in most cases regardless of what material is used for transport packaging.

The rewards of switching from one-time-use packaging to reusables are many:

- Elimination of the high purchase and disposal costs of single-use packaging
- Safer ergonomics and lower labor costs
- Product protection and lower product damage costs
- Smoother flow of goods through distribution channels
- Lower inventory and shipping costs
- Higher worker safety and fewer workers' compensation claims
- Substantial environmental benefits, including reduced greenhouse gases

TABLE 1. One-time (or limited-use) transport packaging and reusable transport packaging share similar cost components; reusable packaging also includes the cost of reverse logistics.

Cost components	One-time (limited-use) transport packaging	Reusable transport packaging (RTP)
Capital equipment and tooling depreciation	Costs associated with packaging machinery such as box erectors and tooling if custom, depreciated, or amortized over useful life.	Initial RTP investment and tooling if custom. Washer or other equipment, depreciated or amortized over useful life.
Packaging materials	Costs for one-time or limited-use packaging components such as containers and lids, pallets, bags, skids, slip sheets, banding, stretch wrap, and dunnage.	Costs for RTP leasing or rental as well as disposable secondary packaging used, such as bags, pallets, slip sheets, banding, stretch wrap, and dunnage. Also costs for materials to repair, refurbish, and clean reusables.
Packaging storage space	Packaging storage costs such as company-owned and rented warehouse space used.	RTP storage costs such as company-owned and rented warehouse space used.
Labor	Cost to prepare, stage, and load packaging for shipping. Also includes the administrative labor cost of purchasing packaging components.	Cost to prepare, stage, and load packaging for shipping. Also includes the labor costs to repair, refurbish, and clean reusable packaging components, as well as the administrative labor cost of managing RTPs.
Product damage, shrink, or spoilage	Cost of product damage, spoilage, or shrinkage due to limited-use packaging throughout the supply chain.	Cost of product damage, spoilage, or shrinkage due to reusable transport packaging throughout the supply chain.
Shipping	Cost to ship products, taking into account weight and size.	Cost to ship products, taking into account weight and size.
Disposal	Costs associated with disposal of limited-use packaging components: labor, equipment, hauling services, fees for trash disposal and labor, equipment and transportation services for recycling collection. Net of recycling revenues.	Costs associated with disposal of secondary packaging as well as RTPs damaged beyond repair at the end of their useful life: labor, equipment, hauling services, fees for trash disposal and labor, equipment and transportation services for recycling collection, net of recycling revenues..
Return	N/A	Handling and shipping costs to return empty packaging components for reuse.

How the cost comparison model works

Typically, the flow of products and goods passes 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 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 flow to manufacturers

Manufacturers receiving raw materials and supplies from many sources to produce their products and goods is an example of a many-to-one supply channel (see Figure 1).

FIGURE 1. **Many-to-one** supply channel of manufacturers.

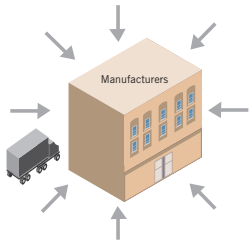


FIGURE 2. **One-to-many** distribution channel used by wholesalers and retailers.

One-to-many flow from wholesalers and retailers

Examples of one-to-many distribution channels are wholesalers and retailers receiving finished products and goods from manufacturers, then distributing the finished products and goods to their customers (see Figure 2).

To show how the cost comparison model works, two real-life examples of companies making the switch to reusable transport packaging are discussed:

- A major food manufacturer used the model when replacing one-time-use bulk corrugated (cardboard) boxes and wood pallets with reusable bulk plastic containers.
- A major seafood distributor used the model when replacing one-time-use, wax-coated corrugated boxes with reusable plastic totes.

Food manufacturer: Replacing one-time-use containers with reusable bulk plastic containers

Provided courtesy of Container and Pallet Services, Inc.

For its production of numerous snack products, a major food manufacturer receives marshmallow "slurry" in bulk from five suppliers at one of its manufacturing plants in a closed-loop distribution system. The manufacturing plant receives 60,000 bulk containers of slurry from its suppliers annually. Each bulk container holds 1,850 pounds of the marshmallow mixture, and 22 containers are shipped per truckload.

COSTS OF ONE-TIME-USE BULK CARDBOARD BOXES AND WOOD PALLETS

Initially, the suppliers used 40" x 48" x 44" bulk cardboard boxes with plastic liners and 4" cardboard lids, placed on wood pallets for transport. To secure the load during shipment, the suppliers used banding to keep the boxes on the pallets.

Upon receipt of the slurry, the food manufacturer recycled the cardboard boxes and lids, and threw away the plastic liners and banding after a single use. They reused the wood pallets 50 times. From time to time, the cardboard boxes would fail due to moisture or penetration from forklift-truck handling. The food manufacturer estimates that $13,000 worth of marshmallow slurry was damaged annually.

Table 2 lists the annual costs to ship 60,000 one-time-use bulk cardboard boxes of 1,850 pounds of marshmallow slurry on wood pallets. Then the one-time cost per use is calculated.

TABLE 2. Annual costs to ship marshmallow slurry in one-time-use bulk cardboard boxes on wood pallets.

One-time (limited-use) packaging costs	What's included	Annual
Capital equipment and tooling depreciation	Bulk cardboard box assembly and closing equipment purchased and fully depreciated; costs not included.	$0
Packaging materials	Cost to purchase 60,000 bulk cardboard boxes and lids, plastic liners, wood pallets (reused 50 times), and banding.	$610,000
Packaging storage space	Cost for warehouse space to store unassembled boxes and lids, plastic liners, wood pallets, and banding. Requires 500 sq. ft. at $8.25 per sq. ft.	$4,125
Labor	Costs to: • Assemble cardboard boxes and lids, prepare and place plastic liners, prepare cardboard boxes and place on pallets, seal plastic liners, close cardboard boxes, secure with banding. • Open and empty contents, recycle empty cardboard boxes and lids, dispose of plastic liners and banding, and manage	$101,000
Product damage, shrink, or spoilage	Estimated cost for damaged marshmallow slurry due to failed cardboard boxes. Failure is due to moisture-soaked boxes or boxes penetrated by forklift-truck handling.	$13,000
Shipping	Costs to ship 60,000 cardboard boxes on wood pallets from suppliers to the manufacturing plant. Each truckload holds 22 containers; 2,727 truckloads are shipped annually at a cost of $1,000 per truckload. These costs are not included in this calculation, as they are comparable to the reusables shipping costs.	$0
Disposal	Costs to recycle empty cardboard boxes and lids (adjusted for recycling revenues) and to dispose of empty plastic liners, banding, and wood pallets.	$17,000
TOTAL COST		**$745,125**

Calculation of one-time cost per use:

Annual total for one-time packaging transport costs divided by Number of cardboard boxes shipped

$745,125 ÷ 60,000 = $12.42

The annual cost to ship 60,000 one-time-use cardboard boxes full of 1,850 pounds of marshmallow slurry on wood pallets is $745,125. The one-time cost per use is $12.42 per cardboard box.

COSTS FOR REUSABLE BULK PLASTIC CONTAINERS

In 2003, the food manufacturer made the switch to a reusable transport packaging system using 40" x 48" x 39" reusable bulk plastic containers and lids with built-in fork pocket entries on all four sides. 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.

For the switch to reusable packaging, the food manufacturer:

- Purchased an initial fleet of 1,000 reusable bulk plastic containers and lids at $165 each
- Purchased five bulk plastic container washers and sanitizers at $7,600 each, for a total investment of $38,000
- Doubled the amount of storage space for the reusable bulk plastic containers and lids, from 500 square feet to 1,000 square feet
- Each year repairs or replaces one out of ten reusable bulk plastic containers due to normal wear and tear

The annual costs of the reusable transport packaging system to ship 60,000 bulk plastic container loads of 1,850 pounds of marshmallow slurry are described in Table 3.

TABLE 3. Annual costs to ship marshmallow slurry in reusable bulk plastic containers.

Reusable packaging costs	What's included	Annual cost
Capital equipment and tooling depreciation	Cost to purchase an initial fleet of 1,000 reusable bulk plastic containers and lids (with built-in fork pocket entries on all four sides) at $165 each ($165,000). Also cost to purchase five washers and sanitizers for the containers at $7,600 each ($38,000). All costs ($203,000) are depreciated on a five-year, straight-line basis.	$40,600
Packaging materials	Cost to repair and replace reusable bulk plastic containers ($16,500), assuming that 1 out of every 10 containers (100) will require replacement ($165). Also includes the $21,000 cost to purchase plastic liners.	$37,500
Packaging storage space	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	Costs to: • Assemble empty, collapsed reusable bulk containers, prepare and place plastic liners, seal plastic liners, and seal reusable container lids. • Wash and sanitize reusable containers and lids.	$97,460
Product damage, shrink, or spoilage	There are no failed reusable bulk plastic containers and lids to damage marshmallow slurry.	$0
Shipping	Costs to ship 60,000 reusable bulk plastic containers of marshmallow slurry from suppliers to the manufacturing plant. Each truckload holds 22 containers; 2,727 truckloads are shipped annually at a cost of $1,000 per truckload. These costs are not included in this calculation, as they are comparable to the reusables shipping costs.	$0
Disposal	When bulk plastic containers reach their end of useful life, they are usually recycled. Scrap value may be recovered for the materials, but is not included in this calculation.	$0
Return	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		**$468,810**

Calculation of lifetime cost per use:

Total annual cost divided by
Number of bulk plastic containers shipped

$468,810
÷ 60,000
$ 7.81

The annual cost to ship 60,000 reusable bulk plastic containers full of 1,850 pounds of marshmallow slurry is $468,810. The lifetime cost per use is $7.81 per bulk plastic container.

First-year savings

The food manufacturer's first-year savings are calculated by subtracting the initial investment in the 1,000 reusable bulk plastic containers ($165,000) and five reusable bulk plastic container washers and sanitizers ($38,000) from annual savings:

Initial investment =

1,000 reusable containers	$165,000
Washers and sanitizers	+ $38,000
	$203,000

First-year savings =

Annual savings minus	$276,315
Initial investment	– $203,000
	$ 73,315

During the first year that the food manufacturer switched to reusable bulk plastic containers, the company saves $73,315.

Second-year savings and beyond

During the second year and beyond, annual savings for the food manufacturer will be $276,315:

Annual savings =

Total one-time-use annual cost minus	$745,125
Total reusable annual cost	– $468,810
	$ 276,315

Return on investment =

Initial investment	$203,000
Annual savings	÷ $276,315
	0.73 years

The food manufacturer's return on the initial expenditures for the reusable bulk plastic container system occurred in 0.73 years, or approximately nine months:

Seafood distributor:
Replacing one-time-use, wax-coated cardboard boxes with reusable plastic totes

Provided courtesy of IPL Products, Ltd

A major seafood distributor procures fresh fish and other seafood products from Atlantic and Pacific Ocean fisheries. Seafood products are packed in ice and then air-freighted to the distributor, where they are processed into portion sizes specified by hundreds of restaurants.

The seafood distributor re-ices, packs, and ships-to-order the seafood to restaurant customers in boxes 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.

COSTS OF ONE-TIME-USE, WAX-COATED CARDBOARD BOXES

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. Typically, restaurant staff flattened these boxes and disposed of them in garbage dumpsters after a single use.

When the shipping occurred in summer months, melted ice caused 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 products at the restaurants. The seafood distributor estimated that 0.5 percent, or 0.2 pounds, of seafood was damaged per box due to breakdown of water-soaked boxes.

The annual costs to ship 240,000 one-time-use, wax-coated cardboard boxes of fresh seafood products are discussed in Table 4, followed by calculation of the one-time cost per use.

TABLE 4. Annual costs to ship fresh seafood products in one-time-use, wax-coated cardboard boxes.

One-time (limited-use) packaging costs	What's included	Annual cost
Capital equipment and tooling depreciation	Wax-coated cardboard box assembly and closing equipment purchased and fully depreciated; costs not included.	$0
Packaging materials	Cost to purchase 240,000 wax-coated cardboard boxes at $2 per box, not including plastic liners.	$360,000
Packaging storage space	Not included in calculation: Storage cost is about the same for one-time-use, wax-coated cardboard boxes as for reusable plastic tote systems.	Comparable to reusable packaging.
Labor	Cost to assemble wax-coated cardboard boxes, prepare and place plastic liners, seal plastic liners, and close cardboard boxes. Equivalent to one full-time employee.	$40,000
Product damage, shrink, or spoilage	Cost of damaged fresh seafood products due to failed water-soaked cardboard boxes. Damaged seafood estimated to be 0.5% per box. Each box contains 40 lbs. of fresh seafood valued at $4 per lb.	$160,000
Shipping	Not included in calculation: Outbound shipping cost is the same for one-time-use, wax-coated cardboard box as for reusable plastic tote systems.	Comparable to reusable packaging.
Disposal	Cost to dispose of empty nonrecyclable, wax-coated cardboard boxes. Disposal fee is estimated to be $100 per ton. Each box weighs 2 lbs.	$20,000
TOTAL COST		**$580,000**

Calculation of one-time cost per use:

Total one-time cost divided by Number of cardboard boxes shipped

$580,000
÷240,000
$ 2.42

The annual cost to ship 240,000 one-time-use, wax-coated cardboard boxes, each containing 40 pounds of fresh seafood products, is $580,000. The one-time cost per use is $2.42 per box.

COSTS OF REUSABLE PLASTIC TOTES

The seafood distributor switched to a reusable transport packaging system based on 24" x 16" x 9.6" heavy-duty plastic totes 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 switch to reusables, the seafood distributor purchased an initial fleet of 20,000 plastic totes at $6 each and a reusable plastic tote washer and sanitizer for $50,000. The seafood distributor uses each plastic tote about once a month and purchases approximately 4,000 new plastic totes a year to replace lost totes.

The annual costs to ship 240,000 reusable plastic totes containing 40 pounds of fresh seafood products are listed in Table 5. These annual costs assume that the "lifetime" of each reusable plastic tote is five years or about 100 uses.

TABLE 5. Annual costs to ship fresh seafood products in reusable plastic totes.

Reusable packaging costs	What's included	Annual cost
Capital equipment and tooling depreciation	Cost to purchase initial fleet of 20,000 reusable plastic totes at $6 each ($120,000). Also includes purchase of a plastic tote washer and sanitizer for $50,000. All costs ($170,000) are depreciated on a five-year, straight-line basis.	$34,000
Packaging materials	Cost to replace 20% of the fleet of 20,000 reusable plastic totes lost per year (4,000 plastic totes at $6 each). Also includes $20,000 to reflect the cost of water, electricity, and cleaning detergent, at about $.08/unit. The cost for plastic liners is not included.	$44,000
Packaging storage space	Not included in calculation: Storage cost about the same for one-time-use, wax-coated cardboard boxes as for reusable plastic tote systems.	Comparable to one-time packaging cost.
Labor	Includes the time to wash and sanitize reusable plastic totes. Also includes the time to prepare and place plastic liners in totes, seal plastic liners, and close reusable plastic totes. Equivalent to one full-time employee.	$40,000
Product damage, shrink, or spoilage	There are no damaged fresh seafood products due to failed reusable plastic totes.	$0
Shipping	Not included in calculation: Outbound shipping cost is the same for one-time-use, wax-coated cardboard box as for reusable plastic tote systems.	Comparable to one-time packaging cost.
Disposal	If and when reusable plastic totes reach their end of useful life, they are typically recycled for scrap value. In this case, no totes were broken, but some were lost, so no value is recovered.	$0
Return	In this closed-loop distribution system, there are no additional costs to return empty plastic totes to the packing plant.	$0
TOTAL COST		**$118,000**

Calculation of lifetime cost per use:

Total lifetime cost divided by	$118,000
Number of plastic totes shipped	÷240,000
	$ 0.49

The annual cost to ship 240,000 reusable plastic totes, each holding 40 pounds of fresh seafood products, is $118,000. The lifetime cost per use is $0.49 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:

Second-year savings and beyond

During the second year and beyond, annual savings for the seafood distributor will be $462,000:

Initial investment =

20,000 totes	$120,000
Washer and sanitizer	+$ 50,000
	$170,000

First-year savings =

Annual savings minus	$462,000
Initial investment	–$170,000
	$292,000

During the first year of reusable transport packaging, the seafood distributor saves $292,000.

Annual savings =

Total one-time-use annual cost minus	$580,000
Total reusable annual cost	– $118,000
	$462,000

Return on investment =

Initial investment	$170,000
Annual savings	÷$462,000
	0.37 years

The seafood distributor's return on the initial expenditures for the reusable plastic tote system occurred in 0.37 years, or just over four months:

Make the Switch and Save

In our two examples, the cost comparison model illustrates how it made financial sense for the food manufacturer and the seafood distributor to switch to reusable transport packaging. Both companies were required to make initial capital investments in the components and equipment for reusable transport packaging. 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 in less than one year for each company.

Use this Cost Comparison Model for Reusable Transport Packaging to get a jumpstart on finding out if there is a better way for your company to save money through reusable transport packaging.

For additional assistance

If your preliminary cost comparison indicates that a reusable transport packaging system will save money, you may want to seek assistance to design and implement a reusable transport packaging system for your business.

Visit **www.UseReusables.com** for help identifying manufacturers, logistics providers, and other packaging experts. The website also includes case studies that demonstrate the many cost-saving benefits of reusable transport packaging and frequently asked questions about reusables.

If you want to do more research on reusables, see publications such as:

Inbound Logistics Magazine
www.inboundlogistics.com

Material Handling Management Magazine
www.mhmonline.com

For local assistance or questions about making your business more sustainable, contact the StopWaste Partnership at 1-877-STOPWASTE (786-7927), or send an email to Reusables@StopWaste.Org.

Visit our website at www.StopWastePartnership.Org for more information and services we can offer your company.

Reusable transport packaging is brought to you by:

StopWaste Partnership

In 1990, Alameda County voters overwhelmingly approved Measure D, with the ambitious goal of reducing waste by 75 percent by 2010. Measure D required that StopWaste.Org dedicate a significant amount of its revenue stream to recycling and reduction initiatives that help divert waste from landfills.

The StopWaste Partnership has helped hundreds of local businesses save money and local resources through innovative programs, ultimately diverting waste from our local landfills. It makes good business sense as well as being good for our local communities.

Reusable Packaging Association (formerly RPCC)

As of May 2008, the Reusable Pallet & Container Coalition (RPCC) officially became the Reusable Packaging Association (RPA).

Its members are leading manufacturers, poolers, distributors, retailers, educators, policymakers, and others with a commitment to reusable packaging systems and the message of re-use. It advocates the growth of reusables as a way to reduce energy, solid waste, and greenhouse gas emissions and to improve the system-wide productivity of industries employing reusable products and services.

RPA has a singular and powerful focus on promoting the value and expansion of reusables as the *preferred* packaging solution across supply chains in all industries.

www.UseReusables.com

This document provided by the StopWaste Partnership and the Reusable Pallet & Container Coalition (RPCC). The StopWaste Partnership would also like to recognize and thank the Solid Waste Management Coordinating Board of Anoka County, Minn., who provided the original copy and concepts upon which we based this brochure. Images provided by IFCO SYSTEMS and ORBIS Corporation.