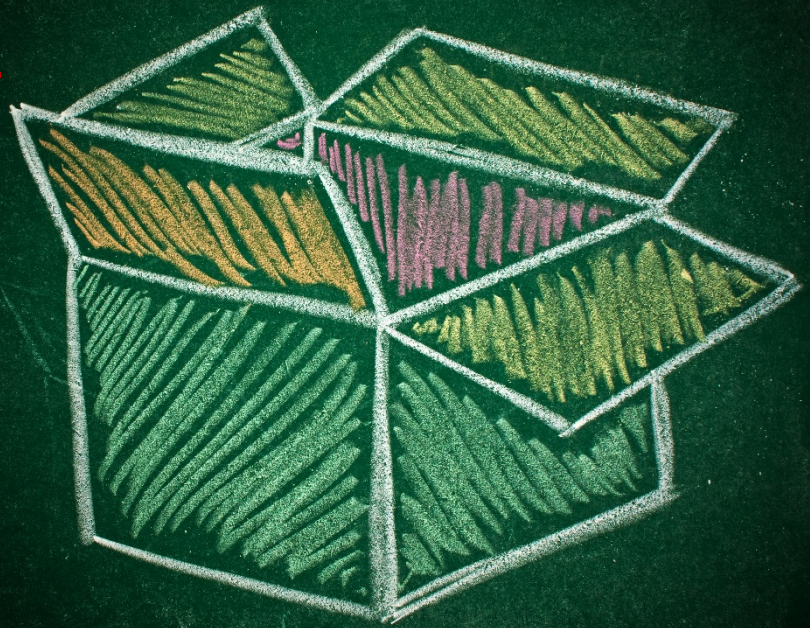


Damaged Products, Damaged Planet



Recognizing the True Environmental Impact
of Packaging Decisions

By Ryan Germann



Remember Earth Day in elementary school, where you planted a tree and learned about the green arrows to reduce, reuse and recycle? Fast-forward to today and many of us still haven't evolved our understanding of sustainability and recycling beyond the three Rs.

While most would identify as an aspirational recycler and supporter of the natural environment, recycling today has become much more complicated than in our elementary school days – even with the increase in single-stream recycling.¹

Today, there is a wider variety of more complex materials that demand their own set of recycling instructions. While the good news is that there are more options, the bad news is that many consumers don't understand how, when and where to dispose of recyclable materials.

In fact, the average contamination rate of recyclable materials sits at around 25 percent, which means that roughly one in four items placed in recycling containers is actually not recyclable through curbside programs,² which wreaks havoc on the recycling economy.

Like many things in life, we begin to see that all decisions are not unilateral. Sustainability, recycling and packaging are top-of-mind for fans of the eCommerce phenomenon, but the path to perfection is far from clear.

An Enlightened Perception of Sustainability

I recall a moment when a coworker shared a story that allowed me to see the forest through the trees. He recently shared his experience of ordering a blender online and finding that it had arrived broken at his doorstep – a fairly common scenario in today's high-volume eCommerce environment. The retailer advised him to throw it away and promptly sent a replacement. The second blender also arrived damaged, so into the garbage it also went. The third time was the charm. The blender was shipped with the proper protective packaging to survive the journey, and he finally got to enjoy a margarita in the sunshine.

As you think through this scenario, there was considerable waste throughout the process – manufacturing extra blenders, shipping them across oceans, trucking them from ports to warehouses, driving them to his home and packaging them three times instead of once. But, the most impactful moment for me was thinking about the two blenders and all of the primary packaging that went to the landfill after the initial failed attempts. This went against everything I learned during Earth Day in grade school, an unfortunate reality for those of us aiming to embrace the three Rs.

"Given all the resources required to ship a single parcel, making sure you ship each order only once might be the single biggest step an online retailer can take toward sustainability."

¹ [FiveThirtyEight](#)

² [Waste Management](#)

Measuring the Impact of Damaged Items

When products are damaged in transit – never filling their intended purpose – it comes at a cost to the environment, including:



1.7 gallons of fuel



0.01 pounds of methane gas emissions



0.8 kilowatt hours (kWh) of electricity



0.01 trees



1,697 British thermal units (BTUs)
of heat produced



0.13 square feet of natural habitat lost



40.4 pounds of carbon dioxide
gas emissions



10 pounds of solid waste in landfills

Damaging Effects to the Planet

Damaged packaging and products are an unfortunate reality in eCommerce. A study by StellaService found that one in 10 of eCommerce packages arrive damaged.³ And *perceived damage* is becoming almost as important as *actual damage* due to the unboxing phenomenon. If consumers aren't satisfied with how their purchase looks, they may return the item or ask for a replacement.

The environmental impact of each damaged product may seem trivial, but when you consider the amount of goods purchased online in any given year, the environmental consequences start to quickly add up.

My coworker's story inspired me to dig deeper and determine the real environmental impact of the packaging decisions we make – and what happens when we don't do our job of protecting products. And the data points are eye-opening.

“Does your organization view sustainability holistically, balancing proper protection with packaging material choices and environmental outcomes? Your customers expect you to, and the environment demands it.”

In this paper, we're shedding some light on the broader effects of damaged products – and ways shippers can leave a lasting impact on their customers, not on the environment.

³ [PackWorld](#)

1. OVERSTUFFED LANDFILLS

The nation's landfills are being filled to the brim and are on pace to reach capacity in the next 18 years,⁴ partially because of our throwaway culture, in which replacing broken items often is cheaper than fixing them. The average landfill is 40.5 feet deep,⁵ with 20.37 pounds of mixed municipal solid waste crammed into each cubic foot.⁶

In addition to taking away habitat from wildlife, these supersized landfills emit landfill gas (LFG), including many that contribute to global warming, due to the natural decomposition of organic materials. For every 1 million tons of solid waste, 432,000 cubic feet of LFG are produced each day.⁷ That's slightly less than 50 pounds of carbon dioxide emitted into our atmosphere every day.⁸

Reducing the amount of trash we send to the landfill makes a big difference in the quality of the air we breathe. The average garbage truck gets only 4.4 miles per gallon⁹ while carrying the typical full load of 13 tons of trash.¹⁰ That rapid rate of gas guzzling is compounded by the long distances our trash travels to landfills. In Chicago, for example, the trash of 2.72 million residents travels an average of 100 miles to the dump.¹¹

The larger the landfill, the greater the potential threat to groundwater supplies. When rain falls on landfills, organic and inorganic materials dissolve, causing toxic chemicals to leach into groundwater. Water containing high levels of toxic metals and organic compounds, as well as ammonia and pathogens, pools at the base of the landfill and over time can seep into groundwater supplies. If the contaminated water reaches streams, rivers or lakes, it poses a grave threat to aquatic life.¹²

Takeaway: Properly protecting products, with recyclable packaging where possible, can decrease the amount of damaged goods that end up in our landfills.

2. WASTED FUEL

There's no way around it – a damaged product means wasted gas. The shipper either instructs the customer to throw out the damaged item, and it joins the gas-chugging caravan to a landfill, or the shipper has the customer return the item. While this practice may cut down on retail fraud, it does come with a significant environmental drawback.

The average parcel requires 0.83 gallons of gas to reach its destination, and with 5.1 billion packages delivered in the United States in 2017 (UPS), that amounted to \$2.69 billion worth of

⁴ [Global Citizen](#)

⁵ OMICS

⁶ Environmental Protection Agency

⁷ Environmental and Energy Institute

⁸ Universal Industrial Gases Inc.

⁹ National Center Biotechnology Information

¹⁰ South Carolina Dept. of Health and Environment Control

¹¹ Chicago Tonight

¹² [Sciencing](#)

fuel.¹³ Reducing the rate of returns due to damage, by even a small percentage, would make a big difference in fuel usage over time.

Each gallon of gasoline equates to 19.6 pounds of carbon dioxide emissions, and that figure climbs to 21.1 pounds for jet fuel and 22.4 pounds for diesel.¹⁴ This means that for every package shipped to the customer, 17.46 pounds of carbon dioxide are added to the Earth's atmosphere, and that figure doubles for each damaged product shipped back to the retailer.¹⁵

The numbers are only slightly better for intermodal shipments combining ocean carriers and freight trucks. The average parcel requires 0.15 gallons of diesel for its sea voyage and another 0.05 gallons for delivery by truck. That total of 0.2 gallons equates to 4.48 pounds of carbon dioxide emissions per parcel.¹⁶

Takeaway: Prevent the number of round trips a parcel has by ensuring it safely arrives at its final destination the first time.

3. ADDITIONAL WAREHOUSING INFRASTRUCTURE

Online retailers seeing sharp growth in business might look at their warehouses and distribution centers and wish they had a bit more space. When shippers have to fulfill excess packages – especially from returns and damage – they have to also consider the warehouse capacity needed to handle their fulfillment.

In fact, one square foot of warehousing space is required to fulfill 7.9 packages annually.¹⁷ Consider the impact if just 1 percent of parcel (FedEx and UPS) packages are damaged – that equates to shipping 86 million incremental packages per year, and requires an additional 10.9 million square feet of warehousing space to fulfill the packages. With damage rates of ecommerce shippers averaging 10 percent, this equates to a network-wide impact of 860 million additional packages and 109 million square feet of warehousing – about three times the size of New York City's Central Park.

Throw in the cost of heating and electric for that wasted space – an average of 6.1 kilowatt hours per square foot¹⁸ – and you may as well be paying to heat the outdoors, as any frugal parent surely has said a time or two. That added expense doesn't even include the energy required to manufacture items to replace damaged products – a figure that will vary wildly depending on the type of product.

Takeaway: Cut down on wasted warehousing space by strategically reducing your return rate wherever possible – including the amount of damaged items.

¹³ UPS Annual Report

¹⁴ U.S. Energy Information Administration

¹⁵ U.S. Energy Information Administration

¹⁶ U.S. Energy Information Administration

¹⁷ Curbed.com

¹⁸ Orlando Utilities Commission Energy Advisors

4. PACKAGING MATERIALS

For even the tallest tree, wasted boxes due to product returns amount to death by a thousand cuts. Approximately 0.007 trees are used for every cardboard box, meaning that the average tree can produce 151.6 cubic feet of corrugated boxes.¹⁹

Reducing the rate of product returns means fewer trees felled. When you factor in supplies such as tape, labels and protective packaging materials, a high rate of returns comes at a heavy cost, both financially and for the environment.

Takeaway: When you only ship an item once, it conserves more than the environment – it also conserves cash in the form of product, shipping and packaging costs.

Are You Committed to Conservation?

When researching this topic, I was mindful to pull from various reputable and credible resources. While there's an abundance of data to factor into the discussion, all the findings support a similar outcome: The packaging decisions we make have a significant impact on the environment around us.

For your business to limit its environmental impact effectively, think beyond the simple choice of paper or plastic. Given all the resources required to ship a single parcel, making sure you ship each order only once might be the single biggest step an online retailer can take toward sustainability.

Is your product damage rate higher than it should be? Does your organization view sustainability holistically, balancing proper protection with packaging material choices and environmental outcomes? Your customers expect you to, and the environment demands it. Don't let the trees of cost prevent you from seeing the sustained beauty of the earth's forests.

Choosing the right high-quality protective packaging materials demonstrates a commitment to customer satisfaction and conservation by greatly reducing the rate of returns. When you take the time to unpack how protecting products is good for the environment and good for the bottom line, it shines a bright light on the future.

Contact a Pregis expert to learn how you can leave a positive mark on the environment and your customers, and gauge your unique environmental impact with our EcoGauge Calculator.

Pregis EcoGauge



Calculate the environmental impact of product damages

Electricity • Forestry • Natural Gas • Gasoline • Solid Waste • CO₂ • Methane • Habitat Loss

¹⁹ Environmental Protection Agency