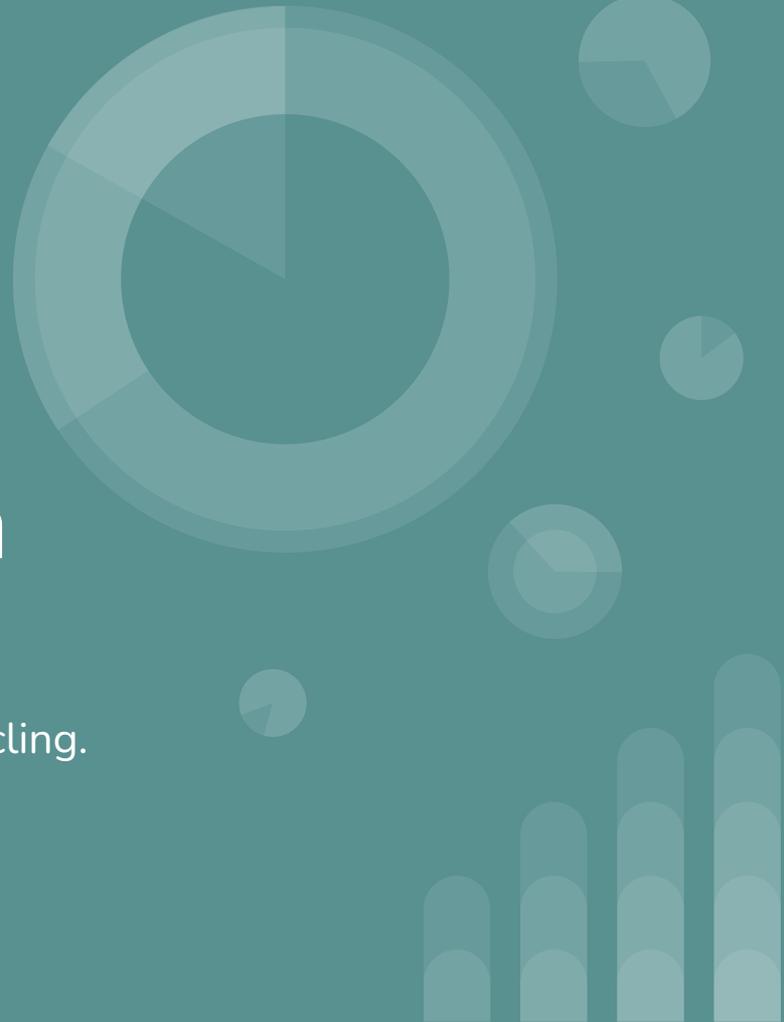


# Household Recycling Problems for Industrial Design

The challenges of a new convert to diligent recycling.





# This presentation was created for an Industrial Design class at Virginia Tech

The students were tasked with finding sustainable design solutions for everything from consumer products and packaging to community systems and the whole waste cycle, and Sustain Floyd sponsored the contest.

This presentation gives the perspective of an ordinary householder living in Floyd, Virginia, sheltered by living in the beautiful countryside from the grim ecological realities that sustainability seeks to tackle.

The presenter had always been, as she puts it, “a lackadaisical recycler at best.” This attitude was partially fueled by cynical comments over the years by people in the know all over the U.S. that a lot of recycling gets thrown away somewhere down the road because of systemic problems in the waste cycle.

**But she is determined to be a part of solutions to change that narrative!**

# Wake-Up Call: *Seaspiracy* & *Breaking Boundaries*



Both of these Netflix documentaries point to the urgent ecological situation. Despite controversies around *Seaspiracy*, *Breaking Boundaries* echoes its messages about ongoing catastrophic losses to ocean biodiversity from commercial fishing, agricultural runoff, and plastic pollution; it also goes much further to paint a stark picture of ecological tipping points we are currently crossing.



# Pick One Thing & Don't Get Discouraged

So I was feeling really overwhelmed and distraught.

Sustain Floyd's very own Fred First (he's a board member and longtime activist in Floyd) had encouraging words for me. He said, "Don't get discouraged if you can't solve everything. Pick one thing that you can do and work on that. Don't underestimate the impact you can make if you focus on your area, and just keep working on it and don't give up."

So I picked recycling, because it's close to home, it's something I can do, and Sustain Floyd was beginning to work on it. I didn't know that much about it and had a lot to learn!

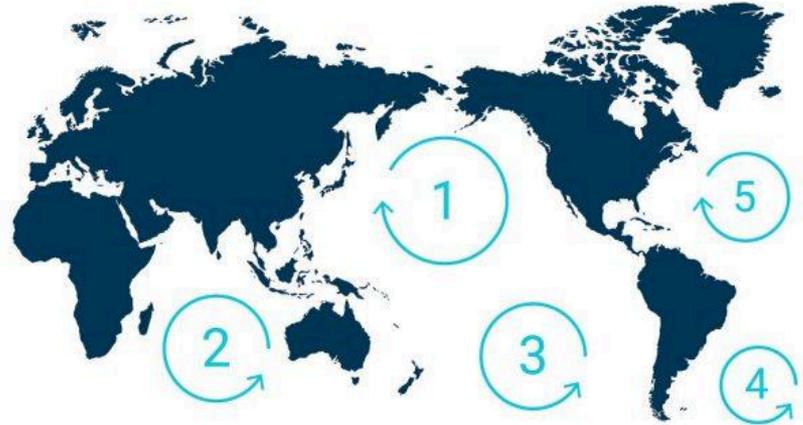


# The Threat of Plastic Pollution

Frankly, it was also images of albatrosses and whales with their bellies full of plastic that woke up my urgency to tackle recycling and plastic in the environment.

You may have heard of the Great Pacific Garbage Patch or the Gyre. There are actually 5 gyres where ocean currents collect plastic floating garbage →

Animals eat it because they don't know it's not food.





# The Albatross

Midway: Message from the Gyre (2009 – Current) photo collection by Chris Jordan.

This photo has become famous. The albatross, usually a symbol of good luck for sailors, has become a metaphor for a psychological burden and a sense of guilt.

Photo by [Chris Jordan](#) (via [U.S. Fish and Wildlife Service Headquarters](#)) / CC BY 2.0, Public domain, via [Wikimedia Commons](#)

*Will we learn to  
really understand  
whale song before  
they're gone?*

A dead sperm whale washed ashore  
in eastern Indonesia with 13 pounds  
of plastic in its stomach.



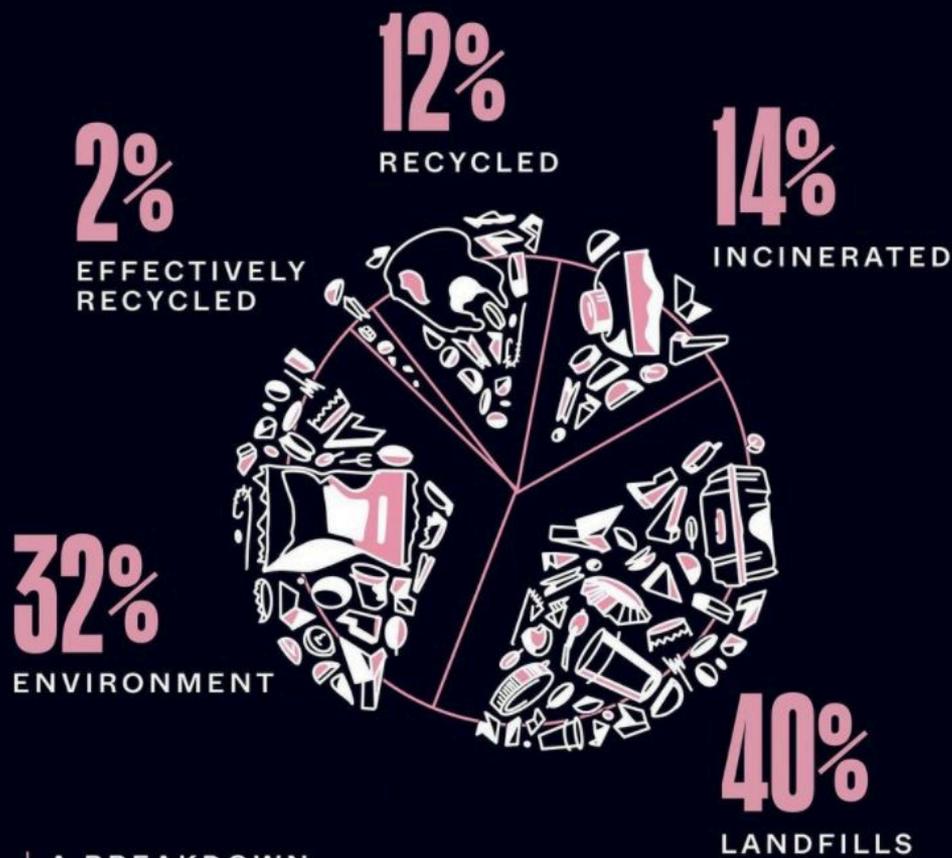
National Geographic: “A dead sperm whale washed ashore in eastern Indonesia with 13 pounds of plastic in its stomach. The trash included 115 drinking cups, 25 plastic bags, plastic bottles, two flip-flops, and more than 1,000 pieces of string.”



# Bottled Water

A tributary of the Wouri River in Douala, Cameroon, completely clogged with plastic

It really makes you think twice about sending disaster relief supplies in the form of pallets of single-use drinking water bottles! Many developing countries don't have a plastic recycling program, and it turns out there's a reason for that.



A BREAKDOWN:  
HERE IS WHERE PLASTIC  
PACKAGING ENDS UP

## Where plastic ends up (in 2021)

Source: Only One. Learn more at <https://only.one/series/not-disposable>

Obviously, my cynical sources weren't far off, at least about plastic recycling.

What's more, according to my research, most types of plastic are only recyclable once. And that is IF they ever make it to recycling!

**We need to eliminate plastic wherever we can!**

# Two Approaches: Eliminate Hazardous Materials & Improve Design for Reclamation

As industrial designers, you will be specifying materials and hopefully influencing these kinds of choices at the production level.

You also have the opportunity to design products that don't fall prey to some of the daily problems that most householders face when trying to recycle!

# Recycling Dilemmas Found in Everyday Life

## #1: Lids



Lids are almost always a different material than the bottle.

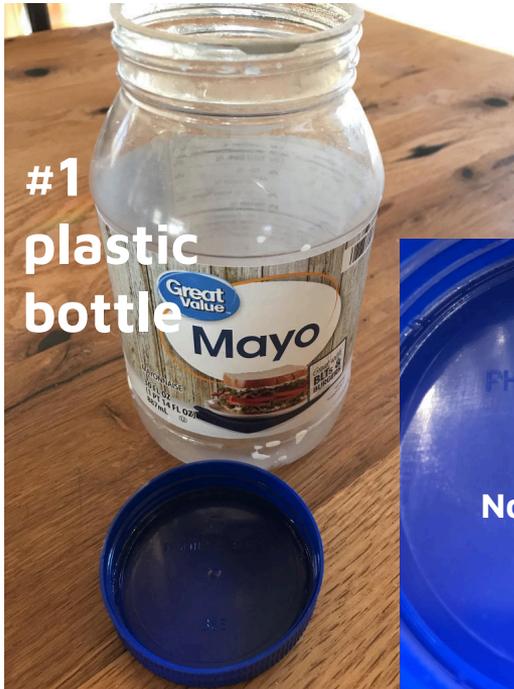
Worse, they may complicate recycling of the bottle. Like this ring. Are we supposed to clip it off when we recycle it??



# Recycling Dilemmas Found in Everyday Life

## #1: Lids

#1  
plastic  
bottle



Very often, the lids simply aren't recyclable, or they aren't labeled with any recycling information, like this mayo lid.



#5 is a common lid material, but is harder to recycle - none of the municipalities in the NRV have a program for #5 plastic. Sustain Floyd is working with [Preserve](#) in Roanoke to collect and recycle #5.



# Recycling Dilemmas Found in Everyday Life

## #1: Lids



Industrial Designers will probably be dreaming of designing beautiful award-winning bottles, and beautiful design is a real gift to us all! However, as is so often the case in the beauty industry, those pretty lids are almost never recyclable, or if they are, they usually aren't labeled for it.

The Organix bottle is especially pretty, and it exhorts recycling! But the cap is hard to get off and not labeled for recycling.

# Recycling Dilemmas Found in Everyday Life

## #1: Lids



Metal screw caps can be particularly troublesome: these are lined with plastic, and they all seem to leave a metal ring around the bottle's neck of usually glass bottles. Because glass is infinitely recyclable, this seems like a place to come up with a thoughtful design solution.



# Recycling Dilemmas Found in Everyday Life

## #2: Pump Dispensers



Pump dispensers are everywhere and they're **not recyclable!**

This is due to a combination of mixed materials and unrecyclable materials like the straws which, per my research, are just not recyclable.

Finding a genius solution to this problem would probably win awards worldwide!



# Recycling Dilemmas Found in Everyday Life

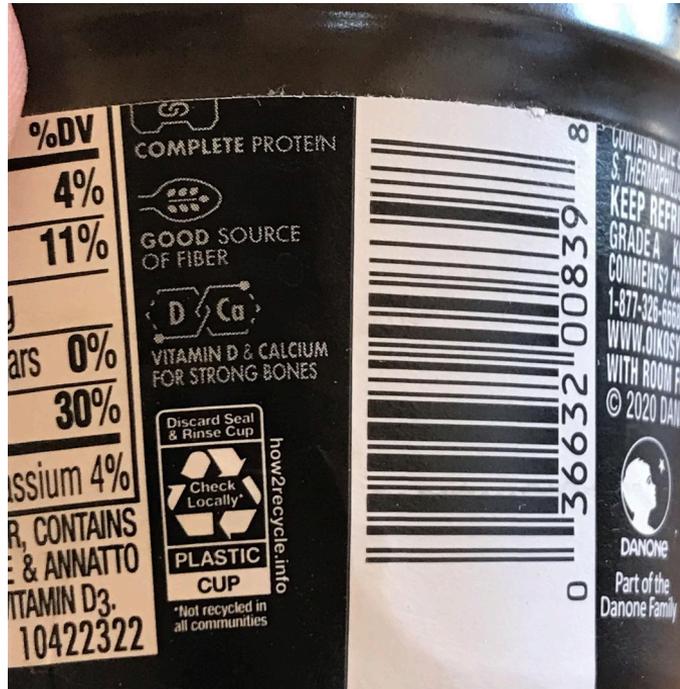
## #3: Labels



We assume that recyclers have a way to remove or deal with labels, but do labels create an obstacle to effective recycling? Is this part of that 2% statistic?

# Recycling Dilemmas Found in Everyday Life

## #3: Labels



These Oikos single-serve yogurt containers presented two different versions of a common problem:

Left: recyclable plastic cup but ONLY if the plastic label is peeled off.

Right: recyclable plastic cup, but what about the label? This one is paper. Should the end-user peel it off before recycling it?

# Recycling Dilemmas Found in Everyday Life

## #3: Labels



These labels are hard to remove. The bottle collars are removable, but not recyclable particularly because of that gold foil. Does this impact glass recycling? I don't know, but foil renders plastic film unrecyclable, so we should think twice before using it.

Foil is a stock signature of luxury branding but very problematic from an environmental standpoint.

# Recycling Dilemmas Found in Everyday Life

## #4: Mixed Materials



This mop defeated me when I went to recycle it. The handle is powder coated steel (which has a salvage value) but the various plastic pieces, which are made from different types of plastic, were factory assembled so as to be impossible with my collection of hand tools to take apart. I would have had to cut it apart with a hack saw or sawzall. The mop head itself is made from some synthetic fabric that I know nothing about! I can only hope it doesn't endure in the environment like plastic.

# Recycling Dilemmas Found in Everyday Life

## #5: Mixed Paper



As a print graphic designer, I never thought about these issues until I became a diligent recycler.

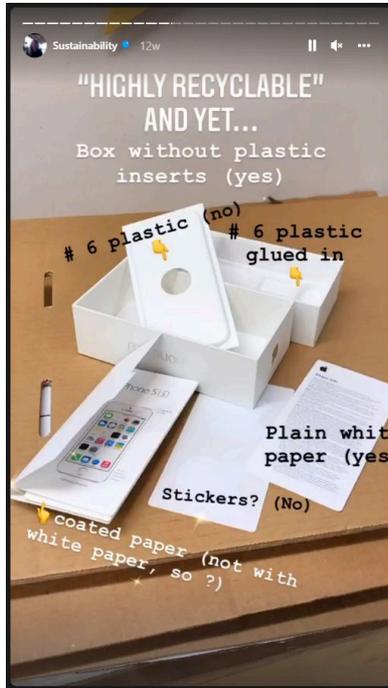
Coated (shiny) postcards, coated paper envelopes with windows: none of this stuff is recyclable, and we can't burn it in our highly efficient stove either (coatings, plastic and glue gum it up)!

Commercial composting might manage it but I wouldn't put it in a home compost pile.

What a waste!

# Recycling Dilemmas Found in Everyday Life

## #6: Not Very Recyclable & Confusing



My old iPhone box turned out to be quite a puzzle. Apple touts its packaging as “highly recyclable,” but I struggled to figure out how to sort it. The box included:

- Coated paper leaflet (mini brochure)
- Uncoated paper leaflet (legal fine print)
- Apple stickers (unknown material, shiny and vinyl feeling)
- Plastic molded inserts (labeled #6, one was glued into the box)
- The satiny coated cardboard box itself

In the end, only the exterior box and plain paper leaflet were recyclable here in Floyd. To recycle the box, I had to tear out one of the glued in plastic molded pieces. And I was a little hesitant to throw the box in the cardboard recycling... with all that fancy satin coating, is it really recyclable in a standard cardboard recycling program?

# Recycling Dilemmas Found in Everyday Life

## #7: Not Recyclable, Or Is It?



My old iPod box was even better! A #7 plastic case! This is definitely not recyclable around here.

Interestingly, a friend of mine who works as a design engineer for an instrumentation company told me that ABS plastic, which this case probably is made from, is the one type of plastic that is infinitely recyclable. If it's clean, you can grind it up, melt it down and use it again and again.

However the #7 designation includes a lot of other problematic plastics, including PC polycarbonate which they think is leaching BPA (an endocrine disruptor) into food and drink, PLA which is compostable, and others. More info:

<https://learn.eartheasy.com/articles/plastics-by-the-numbers/>

# Sustainability Dilemmas: Packaging & Branding



As I was trying to find foods which are grown more sustainably, and thinking about all the problems with coffee, I looked at some mushroom-coffees. This brand sent my first month's supply in this amazing package. It was SO PRETTY! But so many problems from a sustainability perspective:

1. High cost of producing all that packaging (carbon footprint + design + materials)
2. Mostly not recyclable, including the stickers, the bag, and maybe also the pretty mushroom card and box too? Some but not all is biodegradable but the NRV doesn't have a composting program, nor do we have a compost pile of our own. This stuff would take a while to turn into soil and would I put it on my veggies? I don't think so.
3. Plus, the exotic hardwood spoon means some tree somewhere is dead for a spoon that isn't even serving-sized! *I was very unhappy about that.*
4. Each month, they ship that plastic foil-lined bag which is not AT ALL recyclable OR biodegradable. What about sending a beautiful metal tin and a compostable paper bag refill every month??

# Sustainability Dilemmas: Concept + Packaging



Every Christmas someone sends or gives someone in my life these fancy (and delicious) pears and other fruit. This one was from Hale Groves, a popular brand. But... REALLY? Look at all that packaging for just six pears.

Not to mention the carbon footprint involved in shipping it to your door!

# Some Elegant Solutions

Add-water-at-home soaps & long lasting dispensers with a refill system that optimizes for low carbon footprint shipping, and low environmental impact packaging *to replace the massive soap aisle!*



# We need YOU to design elegant solutions for the future!

"Design creates culture. Culture shapes values. Values determine the future." -- Robert L. Peters

"Design is not just what it looks like and feels like. Design is how it works." -- Steve Jobs

"Good design is good business." -- Thomas Watson Jr.,

"Design adds value faster than it adds costs." -- Joel Spolsky

"You can't use up creativity. The more you use, the more you have." -- Maya Angelou