ASTRX:
A Collaboration between The Recycling Partnership and the Sustainable Packaging Coalition

Trina Matta
Who are we?

We are a membership-based collaborative that believes in the power of industry to make packaging more sustainable.
TOGETHER
Transforming Recycling For Good

recyclingpartnership.org
We’re all in this bin together

National Nonprofit (501c3) bringing recycling to those that don’t have it and improving it for those that do.
What is ASTRX?

A bridge between the Sustainable Packaging Coalition and The Recycling Partnership

Allows collaboration that enhances existing SPC and Partnership projects

Leverages systems thinking to generate new understanding and information
NAVIGATING THE RECYCLING SYSTEM

- End Markets
- Reprocessing
- Consumer Engagement
- Collection
- Sortation
How2Recycle
Empowers people to recycle more, and better
How2Recycle is designed with the consumer in mind.

Widely Recycled
At least 60% of Americans can recycle this package at curbside recycling or drop-off recycling.

Sometimes Recycled
Between 60% and 20% of Americans can recycle this package at curbside recycling or drop-off recycling. Check your local program.

Not Yet Recycled
Either less than 20% of Americans can recycle this package, or, it could cause a problem in a recycling facility.

Store Drop-off
Anyone who lives near a store that accepts plastic bags and wraps for recycling can take this packaging to that store and recycle it there.
**ASTRX tool: Navigating Worksheet**

- Thoughtful way to assess how packages might flow through recycling system
- Available at astrx.org/resources
For packaging to be recycled successfully, we must consider how it flows through each of the five elements of the recycling system: manufacturing, reprocessing, sorting, collecting and engaging consumers. To start thinking about the criteria that can help assess the recyclability of a product and its ability to create reliable and valuable manufacturing feedstock, use the table below. Think of this as a starting point for a conversation about the recyclability of a product. Start by considering the ultimate goal: that a recycled product finds an end market.

### END MARKETS
(Feedstock for Manufacturing)

<table>
<thead>
<tr>
<th>Supply/Demand</th>
<th>Design</th>
<th>Specifications</th>
<th>Contamination</th>
<th>Infrastructure</th>
<th>Education</th>
<th>Profitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there demand to use the recycled material in products?</td>
<td>Are brand companies creating a “Demand Pull” by using recycled materials?</td>
<td>Do the product specifications allow for the use of recycled content in it?</td>
<td>Are there contaminants in the material that hinder the end application?</td>
<td>Does it have a positive profitability analysis?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### REPROCESSING
(Paper Mills, Plastic Reclaimers, etc.)

<table>
<thead>
<tr>
<th>Supply/Demand</th>
<th>Design</th>
<th>Specifications</th>
<th>Contamination</th>
<th>Infrastructure</th>
<th>Education</th>
<th>Profitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there demand for the reprocessed material?</td>
<td>Are there design flaws that prevent reprocessing and recoverability?</td>
<td>Can material be combined or is it compatible with other currently recycled material?</td>
<td>Does the material cause harm or contamination to other materials?</td>
<td>Does it have a positive profitability analysis?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SORTATION
(MRF – Materials Recovery Facility)

<table>
<thead>
<tr>
<th>Supply/Demand</th>
<th>Design</th>
<th>Specifications</th>
<th>Contamination</th>
<th>Infrastructure</th>
<th>Education</th>
<th>Profitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do reprocessors want to buy the material?</td>
<td>Are there design flaws that impact sortation? Does its form enable it to be properly and consistently sorted (size, flatness, 3D, labeling, etc.)?</td>
<td>Do new bale specifications need to be developed? Do bale specs allow for inclusion of the material?</td>
<td>Can the product damage the recovery of other materials? Are there contaminants (moisture, food, etc.) that impact sortation?</td>
<td>Does it have a positive profitability analysis?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### COLLECTION
(Curbside and Drop-Off)

<table>
<thead>
<tr>
<th>Supply/Demand</th>
<th>Design</th>
<th>Specifications</th>
<th>Contamination</th>
<th>Infrastructure</th>
<th>Education</th>
<th>Profitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there a defined common suite of outreach materials that includes this material?</td>
<td>Does this material hurt the recyclability of other materials?</td>
<td>Is an investment required to collect the material? Are there collection carts or bins? Vehicles? Drop-off locations?</td>
<td>Do MRPs know that it is possible to sort the material? Are pick line workers trained to identify the material?</td>
<td>Does it have a positive profitability analysis?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CONSUMER ENGAGEMENT
(Access and Participation)

<table>
<thead>
<tr>
<th>Supply/Demand</th>
<th>Design</th>
<th>Specifications</th>
<th>Contamination</th>
<th>Infrastructure</th>
<th>Education</th>
<th>Profitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there demand to use the recycled material in products?</td>
<td>Does it have a “How2Recycle” label to describe recyclability and any actions consumers need to take to recycle it, such as removing components or returning to a store drop-off location?</td>
<td>Do consumers know how to prepare their materials for recycling (no food residue)?</td>
<td>Do consumers know the material is accepted?</td>
<td>Does it have a positive profitability analysis?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Why did we develop this?

- **Stimulate** a discussion about important considerations in packaging recyclability
- **Empower** packaging designers with a mental framework for approaching recyclability
- Share a systems thinking exercise to help us **understand** why there are rarely perfect solutions or silver bullets to complex systems (and recycling is complex!)
• More confident than not? **Green.**

• Potential problems, or unsure? Or, need more information? **Yellow.**

• Definite problems, or significant concerns or lack of data? **Red.**

• At each step, ask yourself, do I have data to support this?

• Embrace ambiguity and interconnectedness.

### Navigating the Recycling System

<table>
<thead>
<tr>
<th>Elements</th>
<th>Will Successfully Navigate?</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>End Markets (car parts, caps, totes, pallets, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply/Demand – Is there demand to use the recycled material in products?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design - Are brand companies creating a &quot;Demand Pull&quot; by using the recycled materials?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specifications – Do the product specifications allow for the use of recycled content in it?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contamination – Are there contaminants in the material that hinder the end application?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profitability – Does it have a positive profitability analysis?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Reprocessing

<table>
<thead>
<tr>
<th>Elements</th>
<th>Will Successfully Navigate?</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply/Demand – Is there demand for the reprocessed material?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design - Are there design flaws that prevent reprocessing and recoverability?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specifications - Can material be combined or is it compatible with other currently recycled material?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contamination - Does the material cause harm or contamination to other materials?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure - Is there an investment required to reprocess the material? Are there markets in different geographic areas?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profitability - Does it have a positive profitability analysis?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**ASTRX**

Applying Systems Thinking to Recycling

**SUSTAINABLE PACKAGING IMPLANTATION**

**THE RECYCLING PARTNERSHIP**
Let’s talk about this plastic bottle.

Navigating the Recycling System

<table>
<thead>
<tr>
<th>Elements</th>
<th>Will Successfully Navigate?</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>End Markets (e.g., caps, lids, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply/Demand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specifications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contamination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profitability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reprocessing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply/Demand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specifications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contamination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profitability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

ASTRX | Sustainably包装 | 合作伙伴

Applying Systems | Thinking to Recycling | The Recycling Partnership
Let’s talk about this plastic bottle.

Clear PET bottle

Full body shrink sleeve label

Polypropylene closure
Reprocessing (Paper Mills, Plastics Reclaimers)

- Are there design flaws that prevent reprocessing and recoverability?
- Does the material cause harm or contamination to other materials?
- Is an investment required to reprocess the material?
<table>
<thead>
<tr>
<th>Reprocessing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design</strong> - Are there design flaws that prevent reprocessing and recoverability?</td>
</tr>
<tr>
<td><strong>Contamination</strong> - Does the material cause harm or contamination to other materials?</td>
</tr>
<tr>
<td><strong>Infrastructure</strong> - Is an investment required to reprocess the material at scale? Are there markets in different geographic areas?</td>
</tr>
</tbody>
</table>
# End Markets

**Supply/Demand** - Is this material being consistently used in the manufacturing of new products?

I know that PET is a widely recycled material in the US and regularly goes back into drink bottles, textiles, and more. The APR Design Guide says that clear unpigmented PET has the highest value in the recycling stream since it has the widest variety of end-use applications.

**Contamination** - Are there contaminants in the material that remain after reprocessing that hinder the end application?

The APR Design Guide says that some additives to PET bottles can be detrimental to recycling if they can’t be removed in the recycling process. Some could negatively impact the end value of the PET. I need to learn whether our bottle has any additives.

**Profitability** - Does it have a positive profitability analysis?

I think so, but am not sure. Clear PET is the most valuable plastic in the recycling stream, but I need to make sure that we don't have any detrimental additives in it.

## Reprocessing

**Design** - Are there design flaws that prevent reprocessing and recoverability?

Good news - polypropylene closures on PET containers are preferred for recyclers, according to the APR Design Guide. But, the label requires testing because it may contaminate the PET. And again, need to check on whether we use any additives.

**Contamination** - Does the material cause harm or contamination to other materials?

I don't believe so, but will wait for more information on how our label performs in testing to make an assessment here.

**Infrastructure** - Is an investment required to reprocess the material at scale? Are there markets in different geographic areas?

Based on my knowledge of plastics recycling, PET recycling is mainstream and robust. This is not a niche material where I believe this line of thought may apply.

## Sortation

**Design** - Are there design flaws that impact sortation? Does its form enable it to be properly and consistently sorted (size, flattened, 3D labeling, etc.)?

I see in the APR Design Guide under information about full body shrink sleeves, that sorting can be compromised.

**Specifications** - Do new bale specifications need to be developed? Do existing bale specifications allow for inclusion of the material?

Yes, MRFs have PET bottle bales. I learned this from APR's website - especially their model bale specifications that teach me what plastics processors are looking for when they buy bales from the MRF.

**Contamination** - Can the products damage the recovery of the recovery of other materials? Are there contaminants (moisture, food, etc.) that impact sortation?

I will wait to learn more about how our full body shrink sleeve label performs in testing and then investigate if this is a separate consideration to give my attention to. Additionally, since our bottle contains a plant milk, we will use the How2Recycle label to tell consumers to “Empty & Replace Cap” so that the liquid is not placed in the recycling.

**Infrastructure** - Is an investment required to sort the material?

No, an infrastructure already exists to sort PET bottles.

**Education** - Do MRFs know that it is possible to sort the material? Are pick line workers trained to identify the material?

Bottles seem classic for MRFs to recycle, they are such high volume of the recycling stream. I think we are OK here.

## Collection

**Contamination** - Does this material hurt the recyclability of other materials?

Not that I am aware. Quick research online didn't reveal any hints that this could be a problem for PET bottles.

**Infrastructure** - Is an investment required to collect the material? Are there collection carts or bins? Vehicles?

The Recycling Partnership’s State of Curbside Recycling Report showed how many communities need carts and more vehicles in order for the quality of collection to be improved. I want to talk to my colleagues further about how we can support a grant to help a community get higher quality collection so we can increase the amount of bottles that get recycled.

**Education** - Do local governments know all the materials that their MRF will accept?

Yes, PET bottles included in many recycling programs (see consumer engagement notes). For example, on my curbside recycling cart at home, there is a picture of a plastic bottle that tells me I can recycle it.

## Consumer Engagement

**Design** - Does it have a How2Recycle label to describe recyclability and any actions consumers need to take to recycle it, such as removing components or returning to drop-off locations?

We are already a member of How2Recycle. So, I will get in touch with the How2Recycle team to get a label for us to apply to this package before it goes into the marketplace.

**Contamination** - Do consumers know how to prepare their materials for recycling (no food residue)?

Yes, The How2Recycle label will instruct, “Empty & Replace Cap.” If we learn that our full body shrink sleeve causes problems and needs to be removed by the consumer, then the How2Recycle label will instruct that.

**Education** - Do consumers know the material is accepted? Do they know how to recycle it (via curbside, or community or Store Drop-off)?

The SPC Centralized Availability of Recycling Study answers what packaging types communities tell their residents they can recycle. PET bottles have over 60% availability to recycling via curbside and drop-off in the US. The How2Recycle label on the bottle will remind them to recycle it.
What happened next...
End Market Industry Leadership Committee

Exploring how companies can create more demand for recycled materials.
Target Sponsored Material Flow Research

Qualitative research that will explore the recycling system from the perspective of the MRF and reprocessor, provide needed transparency about where the industry is at today, and identify gaps that inform how to build a roadmap for the future of the recycling system.
Thanks to EPA Region 4 for support of the worksheet
Thank You!

trina.matta@greenblue.org