

# Understanding Recycling Markets & Practical Tips

NHDES Solid Waste Operator Training  
June 2, 2021

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Northeast Resource Recovery Association



# Agenda Part 1

## Understanding Recycling Markets

- Intro to Recycling
- Recycling Markets
- Material Specifications
- End Markets
- *\* Break \**
- Plastics Case Study – Group Discussion

# Agenda

## Part 2

### **Practical Recycling Tips**

- Creative Storage Options
- Baling versus Loose
- Tricks of the Trade
- Peer Sharing – Group Discussion



**2019**  
**ONE YEAR**

**400+**  
**MEMBERS**

**50,351**  
**TONS OF RECYCLABLES &**  
**MUNICIPAL SOLID WASTE**

Recycling non-profit that enables communities to manage their own recycling programs



## Cooperative Marketing and Purchasing

- Connect municipalities selling recyclables to companies that purchase recyclables
- Returned \$1.8 million to members in 2020





## Education

- Meetings, facility tours, annual conference
- Hands on technical assistance
- School recycling programs

# Poll: Who's Here?

What size population is your community? (if seasonal changes, use non-peak population)

*Under 2,500; 2,501 to 5,500; 5,501 to 10,000; over 10,000*

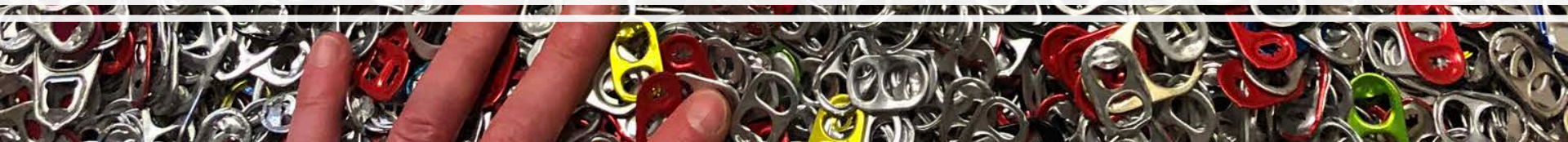


# Intro to Recycling

Foundational principles



Why Recycle?



# Conserve Financial Resources



Recycling can help avoid higher cost of municipal solid waste disposal



Though not always true with single and dual stream recycling when markets are down



Costs of landfilling and incineration will continue to rise

## Conserve Natural Resources

- Recycling saves energy and natural resources
- Saves valuable landfill capacity for waste that cannot be recycled



# Aluminum Example

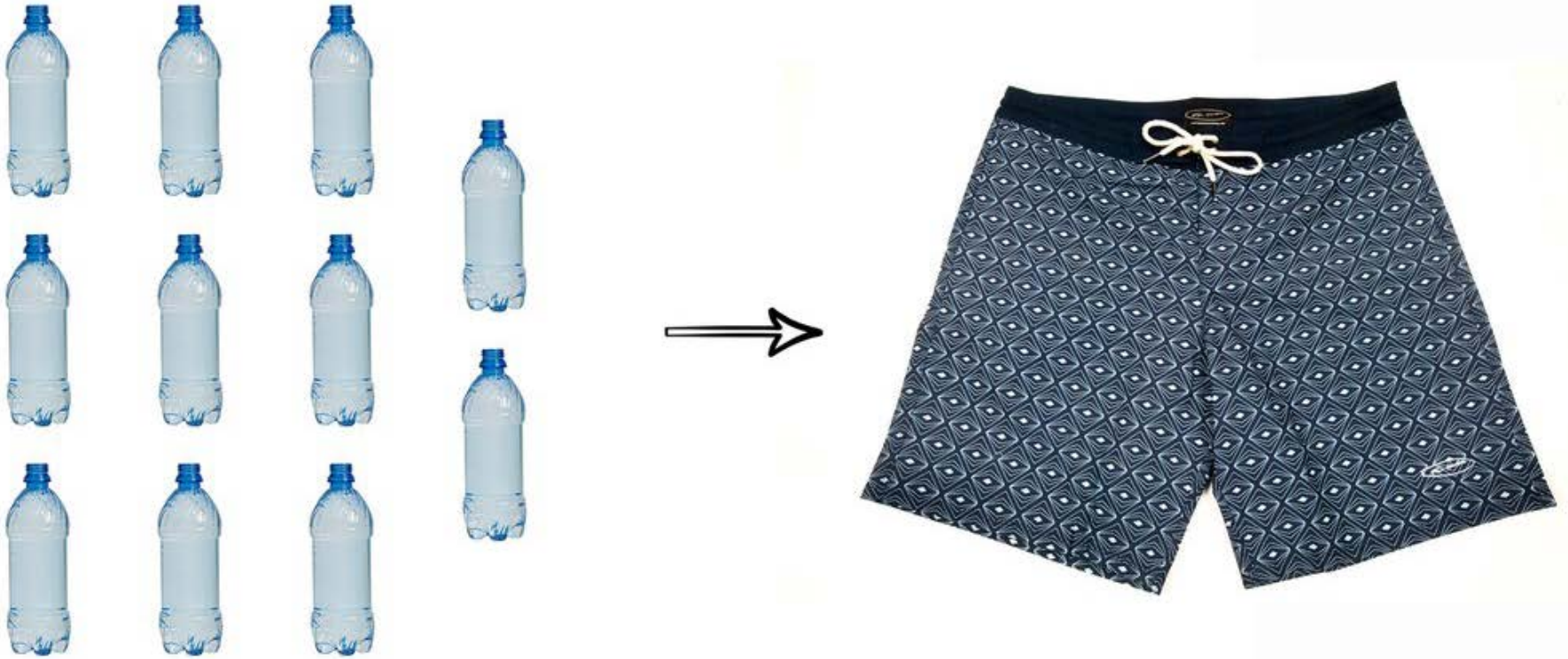
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- Recycling aluminum saves more than 90% of the energy needed to create new aluminum
- Cheaper to recycle than extract more
- Nearly 75% of all aluminum produced is still in use today



# When Does Recycling Happen?





Recycling only works when turn materials into new products people use

# Source Separated Recycling

Residents separate out  
recyclables individually  
at local transfer station







## Dual Stream Recycling

Fibers separated from containers



## Single Stream Recycling

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Containers and fibers all mixed together

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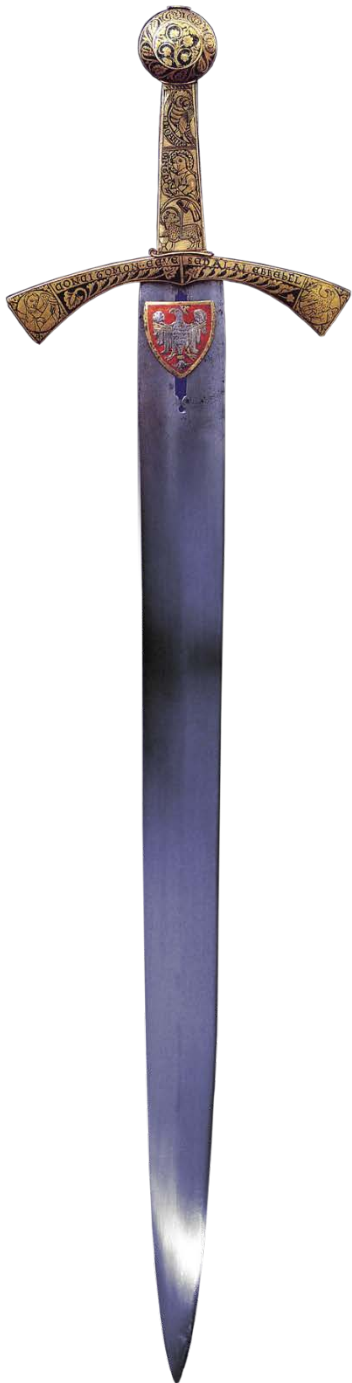
Higher cost to “unscramble the egg”

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Typically lower value commodities because more contamination

Recycling  
Markets

China's National Sword &  
COVID-19 Impacts



## China's National Sword Policy

- Ban effective Jan. 1, 2018
  - All plastics, unsorted mixed paper & textiles
  - Some glass and metals
- Expanded Jan. 1, 2021 to ban all imported waste



Fibers (cardboard  
and mixed paper)

- Biggest impact from China's National Sword
- Pre-Sword, China purchased 55% of world's scrap paper

# Silver Lining



Domestic investment in paper mills



28 new and existing mills increasing capacity for recycled fibers (mostly cardboard)



[Source: Northeast Recycling Council \(Jan. 2021\)](#)

# What a difference a year makes...

In March 2020, we were all knee deep in COVID-19 concerns.

From a local recycling perspective, two major concerns were:

- 1) how to safely operate essential recycling facilities in a pandemic
- 2) uncertain recycling markets and pricing during a pandemic

# COVID - More Residential Material

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- Residential recycling and trash tonnage way up because everyone home
- Commercial and school waste dropped dramatically







# Initial Market Impacts

- Fibers Pricing:
  - Climbed April & May 2020
  - Dropped in June 2020
- Why?
  - Low supply when businesses shut down
  - Then market adjusted when price rose

# Current Markets - Fibers

Overall, increased in value compared to a year ago due to decreased supply for businesses and schools




	March 2020	March 2021
NRRA Members Marketed	550 tons	775 tons (UP 225 tons)
Average Revenue	\$57/ton	\$96/ton (UP \$39/ton)
Average Net Revenue for a Tractor Trailer Load	\$1,300	\$2,112 (UP \$812/load)
Net Revenue to Members	\$28,904	\$71,666 (UP \$42,762 to Members)

Baled Cardboard  
(OCC – Old Corrugated Containers)



Tuftonboro,  
NH's OCC  
Bales



## Current Market Impacts - Aluminum

Can shortage due to massive increase in demand during pandemic

Some increase in revenue, but lower than this time last year

Current Revenue: \$.47/lb. for loose; \$.63/lb. for baled

# Scrap Metal / Light Iron

Current Revenue \$155 -  
\$160 gross ton





## Glass Recycling

- Limited markets in the Northeast
- Predates China's National Sword

# Challenges with Glass Recycling

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- Heavy and therefore expensive to transport (and dispose)
- Ardagh bottling plant closed in MA in 2018
- Contaminants like Pyrex and ceramics detrimental when creating new glass or fiberglass insulation
- Broken glass can create wear and tear on equipment





Single or  
Dual Stream

Vendor may provide financial incentive  
to remove glass



# What about Plastics?

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Will discuss in depth in  
case study after the break





Single  
Stream  
Regional  
Costs per  
Ton

**March 2020**

\$149 - \$165/ton

**March 2021**

\$91 - \$118/ton

57% of NH's Population and 29% of NH  
Communities are Single Stream

# Single & Dual Stream Communities



Higher tipping fees than pre-China's National Sword, but recent improvements



Additional fees if exceed set contamination limits



Some switching back to source separation



Some burned or landfilled recyclables temporarily

# Source Separating Communities

- Less impact from China's National Sword
- Why? Higher quality commodities and not dependent on materials recovery facilities
- But still impacted by market fluctuations



Material  
Specifications

Get the most for your  
commodities

# Specs, Specs, Specs

Key words for *all* materials (loose or baled) are:

Clean

Dry /Under Cover Storage

2 Stage Separation



Two Stage  
Separation

Sunapee,  
NH



# Cardboard Specs



CORRUGATED CARDBOARD  
ONLY



NO waxed cardboard (will  
not break down in the mill  
pulper)



NO chipboard (as in cereal  
boxes)



NO wet-strength (as in  
soda/beer cartons – have  
plastic coating)

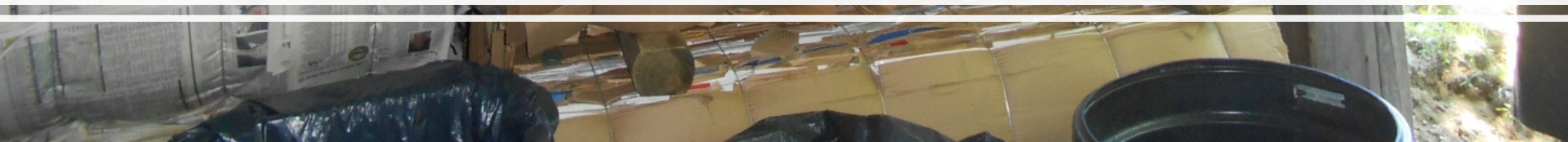


Lempster NH's Loose OCC in 40 cubic yard container



## North Hampton NH's OCC Bales

Clean, dry, under cover & use of separators for ease in loading trailers





SAMPLE Spec Question from Lisbon NH  
Q: Can pizza boxes be baled with mixed paper?

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- Corrugated pizza boxes (the non-greasy part) ok with corrugated cardboard
- Paper pizza boxes (the non-greasy part) ok with mixed paper
- Frozen food pizza boxes (wet-strength) are not recyclable due to plastic coating (please treat as trash just like soda and beer cartons)



# Plastics Specs

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- Stored under cover (not only for weather but to limit ultraviolet degradation from sunlight)
- Some markets accept cardboard headers; some do not
- Some markets accept 5-gallon water jugs; some do not



**Hancock, NH's #1 PET Bales**  
Clean, no cardboard headers, under cover





# Aluminum Cans

- UBC's (used beverage containers) ONLY
- NO pet food cans (even if aluminum), steel cans, foil or foil plates

# Steel Cans

- Steel cans, pet food cans, empty paint cans, empty aerosol cans and foil/foil plates
- Measured in gross tons (2,240 lbs.) British standard; not net tons (2,000 lbs.) US standard





# Glass Recycling – 3 NRRA Options

Material	NRRA Host Sites	End Use
Mixed Glass (incl. ceramics, porcelain, etc.)	New London, NH Waste Management, Rochester, NH Littleton, NH	Processed glass aggregate (PGA)
Glass Jars & Bottles ONLY	Lebanon, NH Keene, NH	Glass to glass Fiberglass insulation
Glass Jars & Bottles ONLY	Dennis, MA – Cape Cod	Processed glass aggregate (PGA)

# Glass Recycling



Glass bottles and jars only



Canadian vendor cleans and  
crushes



Made into fiberglass  
insulation back in US



40 communities in NH, VT &  
MA

# Processed Glass Aggregate

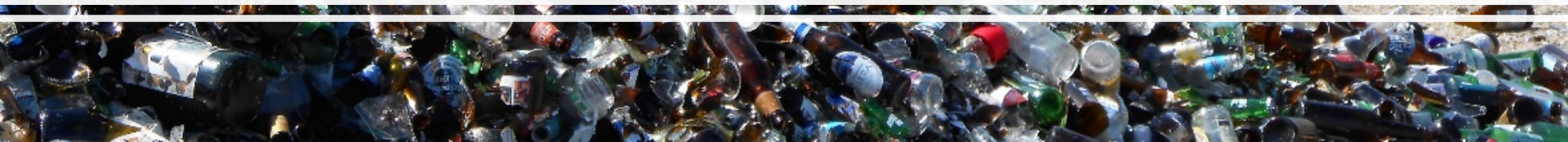
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- Glass bottles and jars
- Pyrex, ceramics, porcelain, window glass in NH & VT
- Crush into aggregate
- Subbase for road and infrastructure projects
- 60+ communities in NH, VT & MA





Glass before and after crushing into PGA





Keene, NH NRRA Host  
Site



Dennis MA – NRRA Host Site  
on Cape Cod



## Wrap Up

Meeting the highest spec gives communities the ability to market material to mills and brokers to obtain the most revenue (or least cost) for your recyclables

# End Markets

What happens with your  
recyclables?





**Magazines**



**Paperboard, Telephone Directories, Newspapers**



**Paperboard, Mixed Paper & Junk Mail**



**Paper backing on Roofing Shingles, Paper Towel Rolls, New Paperboard Packaging**



**Cardboard**



**Paper Bags, New Cardboard, Paperboard, Cardboard Medium  
(corrugated middle part)**



**Notebook &  
Computer Paper**



**Paper Towels, Facial Tissue, Toilet Paper, Napkins,  
New Notebook Paper, New Computer Paper**



**Steel/Tin Cans**



**Bike Parts, Rebar, Car Parts, Steel Beams, Appliances, New Cans**



**Aluminum Cans**



**New Aluminum Cans**



**Glass Bottles**



**New Bottles, New Jars, Fiberglass,  
Sand used in construction projects**



**Plastics**



**Carpet, Backpacks, Polar Fleece, Sleeping Bag and Ski Jacket  
insulation, Plastic Lumber for Decking and Docks, Play Sets,  
New Bottles, Buckets, Containers, Frisbees, Stadium Seats**

of  
Hollis Transfer  
Station

Bottles Only  
Why?



Hollis Transfer Station

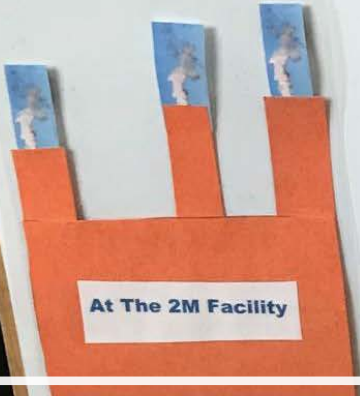


Heading to Keene



Dumped at

The Keene Facility



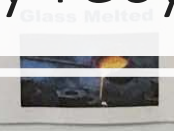
At The 2M Facility

Off To Canada 2M  
resources



Meets Inspection

Where does my recycling go?



... into thread from spinners  
like cotton candy is spun out of  
a drum.

Glass Is Washed



A close-up photograph of a person's hands holding a large quantity of crushed, multi-colored glass fragments. The fragments are in various shades of clear, green, blue, and brown, and are piled high in the palms. The background is a blurred outdoor setting, possibly a beach or a recycling site.

# Through the Looking Glass

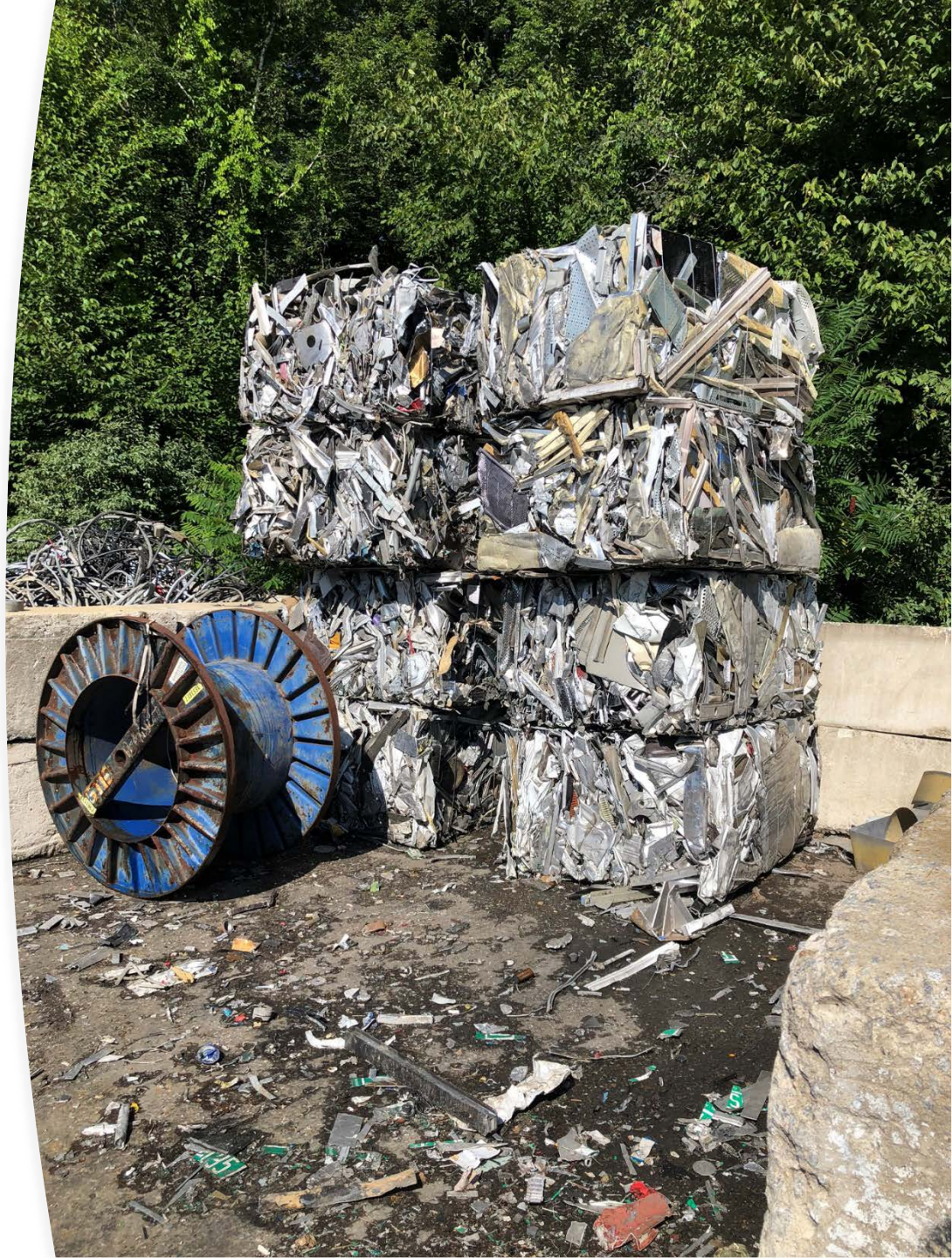
A transparent look at glass recycling in New England

Northeast Resource Recovery Association

Glass StoryMap & Video |

# Destinations

- Most Scrap Metal is shredded, loaded on to barges and currently exported to countries such as India
- Majority of NRRA's baled cardboard goes "mill-direct" in NH, MA, VT and NY (future ME)



Questions &  
Short Break





Case  
Study

Plastics Recycling



Reputable vendor with environmentally sound practices



Price – get quotes for best price



Service – responsiveness for logistics and billing



Transportation – timely pickup if handled by vendor

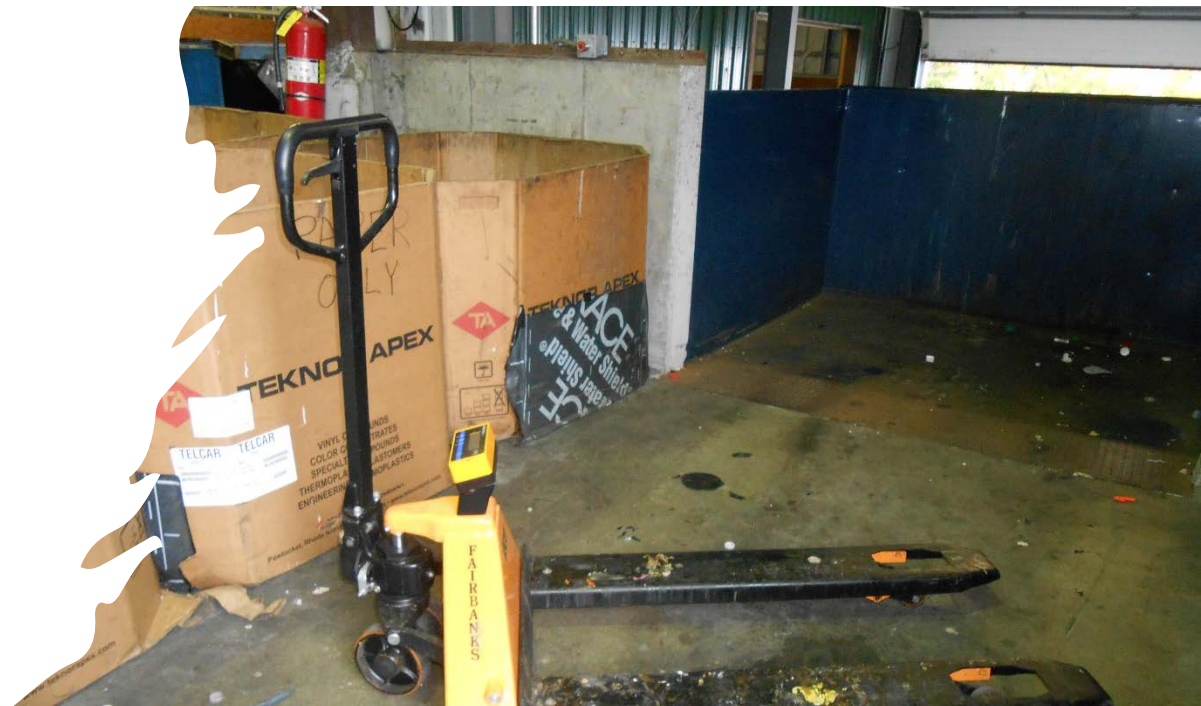


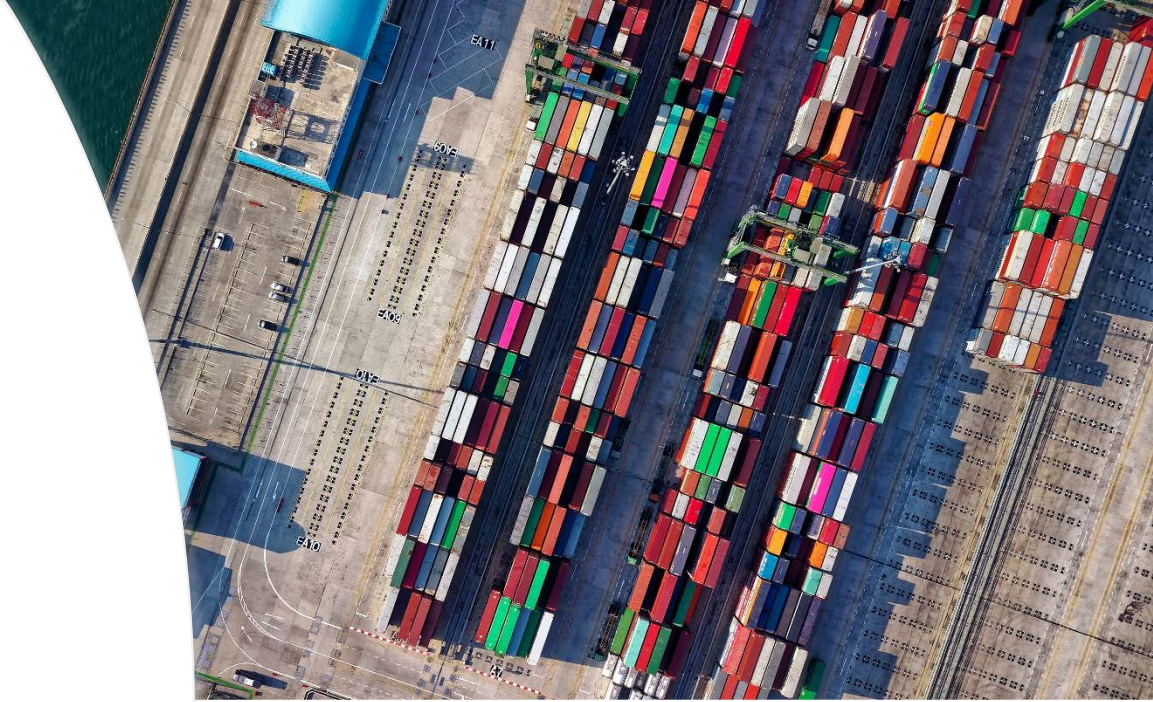
Direct to mill or to a broker

# Marketing Material Considerations



# Recycling Equipment





# Transportation

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# Know Your Specs

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Does your vendor accept:

- Cardboard headers
- Strapping versus baling wire
- Black plastic
- 5-gallon jugs
- Clamshell packaging (ex. lettuce container)

# Types of Plastics

- #1 PET (ex. water and soda bottles)
- #2 HDPE Natural (ex. milk jugs, translucent water bottles)
- #2 HDPE Colored (ex. laundry detergent)
- #3 PVC (ex. plastic tubing)
- #4 LDPE (ex. grocery bags)
- #5 Polypropylene (ex. yogurt containers)
- #6 Polystyrene (aka Styrofoam)
- #7 Other – multiple plastics combined

# Chasing Arrows Confusion

- Voluntary system with little to no regulation
- Identifies predominant type of resin in the plastic
- That's it!
- Doesn't mean item is recyclable



# Plastics Recycling

General Rule:

Greater Separation results  
in Higher Revenue



# Options for Baled Plastics

- #1 PET
- #2 HDPE Natural
- #2 HDPE Mixed Colored
- #2 HDPE “Z” (Natural and Mixed Colored combined)
- #1-7 (containers with lids)
- #3-7 (newest market)
- Rigid Plastics (underutilized market)

# #1-7 Mixed

- Responsible end markets with reputable vendor
- Lower value than if separated
- Easier for residents and transfer station staff
- Partial mill direct because make own lumber furniture with #2 natural
- But mechanical problems





Springfield  
VT's #1-7  
Plastic  
Bales



## #3-7 Mix

- Common bale type from materials recovery facilities
- Buyer recovers #2, #4, #5 and some #7 (primarily want #2 and #4)
- Materials recovery facilities often miss some #1s and #2s when sorting
- Residue to fuel replacement and landfill



#1 PET  
#2 HDPE Natural  
#2 HDPE Colored

- All have stable markets
- Requires three separate storage spaces, then rest usually thrown away
- #5 has value, but not enough volume to separate and store it for market



# North Hampton, NH's #2 HDPE Natural Bales

# Z Bales

- #2 HDPE natural and HDPE colored baled together
- Lower value for Z bale than if separate colored from natural
- But easier for residents and saves space





Tuftonboro, NH's Loose Plastics



# NRRA Monthly Pricing Guide (Excerpt)

## Sample Market Pricing for May 2021

		Revenue / (Cost) Per Ton	
		Low	High
<b>Plastic</b>	#2 HDPE Natural (ex. Milk jugs)	\$1,560	\$1,860
<b>Metal</b>	Aluminum Cans	\$820	\$1,040
<b>Plastic</b>	#2 HDPE Colored (ex. Detergent bottles)	\$760	\$820
<b>Plastic</b>	Z Bales (#2 HDPE Natural and Colored)	\$760	\$820
<b>Plastic</b>	#1 PET (ex. water bottles)	\$240	\$320
<b>Fiber</b>	#8 Newsprint	\$125	\$150
<b>Fiber</b>	OCC (Cardboard)	\$75	\$100
<b>Fiber</b>	Sorted Office Paper	\$50	\$80
<b>Plastic</b>	#1 - #7 Mix	\$0	\$60
<b>Fibers</b>	Mixed Paper	(\$25)	\$35
<b>Glass</b>	Into Aggregate or Fiberglass	(\$75)	(\$40)
<b>TRASH</b>	MUNICIPAL SOLID WASTE	(\$120)	(\$70)

(assumes material baled and shipped in full loads)

# Agenda

## Part 2

### **Practical Recycling Tips**

- Creative Storage Options
- Baling versus Loose
- Tricks of the Trade
- Peer Sharing – Group Discussion

# Creative Storage Options

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Great examples available

# Pre-Storage Solutions – Ashland, NH



Pre-  
Storage  
Containers  
– Hancock,  
NH



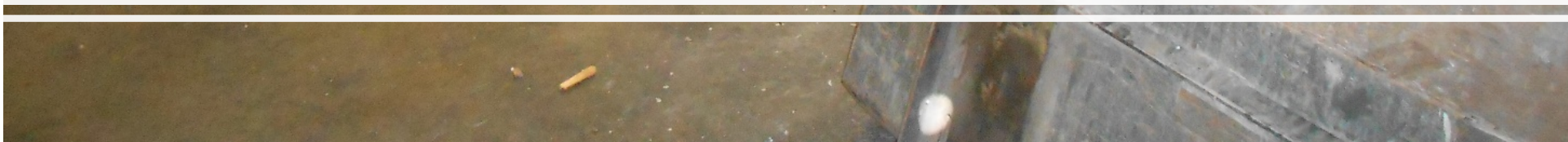


Black Plastic Gaylords

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Lee, NH Moveable Jersey Barriers





Bartlett, NH





Chester, NH



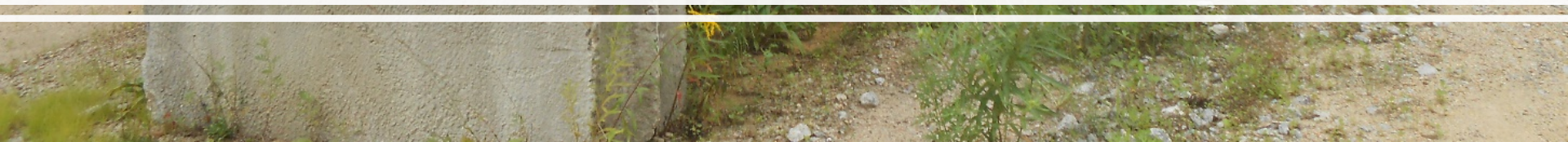
Ashland, NH Quonset Hut

# Storage Containers – Swanzey, NH





Permanent Storage Trailer- Nottingham, NH



Baling  
Versus  
Loose

Baled results in higher revenue

# Current Cardboard Revenue

- Loose \$37.50 - \$60/ton
- Baled \$105 - \$125/ton
- Current value of a 1,000 lb. cardboard bale – \$62.50
- Compared to \$28.00/bale in March 2020



## Mixed Paper

Current pricing:

Loose - \$10/ton cost to \$55/ton revenue

Baled - \$30 to \$100/ton revenue

Less wet-strength (soda/beer cartons, frozen food boxes) the lower the cost /higher the value



## Newspaper /#8 News

Current revenue:

Loose in gaylords \$90 -  
\$100/ton

Baled \$140-\$150/ton

Newspapers ONLY  
(ok to include inserts)

End-use: Insulation





## Sorted Office Paper - SOP

Current Revenue:

Loose in gaylords \$75 – 80/ton

Baled \$100 - \$105/ton

White & Colored Office Paper  
Only



# Steel Cans

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Baled: Full tractor loads up to \$264/gross ton (Canadian market)

Loose: \$80 to \$90 gross ton (Local markets)

Tricks of  
the Trade

Lessons learned over the years



# Answering Resident Questions

## Know your resources

- Refer to transfer station website
- Explain that recycling is local – what happens in another community may not be relevant in your community
- If have an app, like Lebanon, refer to that
- NRRA website or listserv

# Gilford NH's UBC Bales

Number bales  
to know your  
inventory at a  
quick glance



4" x 4"  
Spacers for  
ease of  
loading  
trailers



# Transportation – ready to haul your own material to market?

- New London purchased own trailer for storage and transport of Cardboard Bales to Claremont mill
- New London is now in control of their own destiny
  - No shuffle from storage to trailer in a live load
  - Can haul when want
  - Use of local hauler
  - Haul to local market
  - Better overall pricing



Grantham  
NH – Hauls  
rolloff  
containers to  
market







Dumping  
Hoppers – great  
for 2 stage  
separation

Bristol, NH

Hillsboro, NH



# Salisbury NH – Keeping Material Dry

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# Steel Cans in with Scrap Metal

- Some communities are putting steel cans in with scrap metal until loose steel can pricing improves\*
- Current loose steel can revenue: \$80 - \$90 gross ton
- Current scrap metal revenue: \$155 - \$160 gross ton
- \*double check with market to make sure acceptable



# Flatbed for Plastics



Small western NH community purchased baler for plastics and cardboard

Without loading dock or skid steer (yet), flatbed will be used for loading their first plastics bales to market!

# Learn More at [www.nrrarecycles.org](http://www.nrrarecycles.org)

**NRRA** NORTHEAST RESOURCE RECOVERY ASSOCIATION

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**Press Release: NRRA Conference Shares Municipal "Recycling with Results"**  
Over 185 presenters and attendees from New England and beyond participated in the Northeast Resource Recovery Association's (NRRA) virtual "Recycling with Results" Conference on May 10-11, 2021. The conference featured six key topics currently faced by the municipal solid waste and recycling industry.

On Day One, attendees learned about "Engaging Residents with Municipal Recycling" from...

[Read More](#)



# Thank You!



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### STAY CONNECTED

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