



RECYCLING NEWS BULLETIN

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This month's Recycling News Bulletin follows the Waste Management Sustainability Forum, where corporate leaders, municipalities, government officials, experts, innovators and influencers came together to share insights and exchange ideas. As part of the discussion, Brent Bell, Vice President of Recycling Operations for Waste Management gave a recycling update on recent trends and next steps for improving the sustainability of recycling. His speech (condensed and edited for brevity) is below:

2018 was a challenging year for recycling programs across the globe. I know I am happy to have 2018 behind us!

I thought it would be great to take you all through the journey of contamination, hard to recycle items and finally, how we are managing through difficult market conditions with education and technology. I'll use a couple of short videos to highlight some of our challenges and more importantly, our solutions.

Let me first tell you a quick story of when I realized that we really do have a problem with recycling.

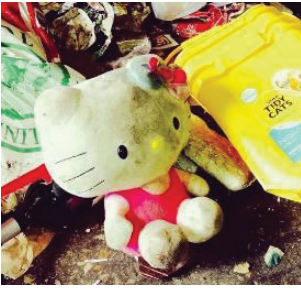
- It wasn't when we started in January 2018 with a complete ban of mixed paper into China, which was 30% of the fiber we collect – no that wasn't it.
- And it wasn't when I walked down the hall to tell our senior leadership team that the recycling

No, the moment I realized recycling was in trouble came at the dinner table with my mom. Now my mother knows that I check her recycling cart - every time I go to my parents' house because their cart is in the garage right as you walk in the house – (how many of us flip the lid for a quick peek at a relative's house?). No, the moment came when my mom asked, "Can I put our old Christmas lights in the recycling cart?" That was the moment when I realized that my mom, my very own mother, is a "wish-cycler."

Wish-Cycling

Wish-cycling is a term used to describe recyclers who want to do the right thing and hope that everything they toss in the bin is recyclable – they have the best intentions but need some education to recycle the right items. Wish-cycling is one of the leading causes of contamination in our country today.

Currently, contamination levels average around 25% - that means for every ton of recyclables we collect, we must remove 500 pounds to meet our customers' quality standards. Contaminants can impact good recycling programs by increasing costs, reducing the efficiencies of processing, and lowering the value of commodities. And the most serious problem with



contamination are items that cause injuries to recycling professionals responsible for sorting those materials. Employees who work in the recycling facilities could be injured with the wrong materials – batteries that cause fires or propane cylinders that explode. These do not belong in curbside programs, and neither do plastic bags or bowling balls.



We get some really unusual items in recycling carts. We recently surveyed our facility managers and asked about the types of items they see coming across the sorting line. This list included everything from hoses (lots of these) to engine blocks, grenade launchers (of course, they're metal, right?), a deer, a black bear and even a python snake. However, the number of bowling balls that we receive is one that is really fascinating to me.

It amazes me how many bowling balls we receive. Through a Google search, I learned there are only 3,000 bowling alleys in the US. But our recycling facilities receive over 100 bowling balls each week. That works out to about 5,000 bowling balls every year – or 82,000 pounds of bowling balls annually!



I've never seen any recycling program that accepts bowling balls, however, once a week, 100 wish-cyclers decide – I'm going to take my lucky 16 lb. ball and drop it in the good old 96 gallon wishing well, better known to us as the recycling cart.

The good news is I know my mom doesn't bowl – so I can't blame her for this one.

How can we do a better job with education programs? We thought that it would be great to hear from our front-line workers who are physically fighting the battle against contamination every day.

I'd like to show a video that we recently created that will give you a glimpse into what contamination looks like when it shows up at the curb and in our recycling facilities.

CONTAMINATION VIDEO

The single biggest improvement that will help any recycling program is to remove contamination – not only will this help on the operating side – but the cleaner materials will always improve the economics of any recycling program.

Education and Technology

My final segment is really geared around next steps. What are we as an industry going to do about contamination and what is Waste Management doing to lead the efforts. If I had to pinpoint two potential solutions, those solutions would be focused around education and technology. Most wish-cyclers are not out to contaminate their recycling - they just don't know any better. We need to invest in education programs to help reduce contamination levels. Waste Management's Recycle Right education and outreach program offers tested education materials to help our customers know how to recycle correctly.

The second solution has to do with investments in technology. In 2018 we had a full year of data/productivity from our first robot, and by the end of this quarter, we will have three different robots active in our recycling facilities. We are learning a lot about robotics and how great they work alongside our additional investments in the latest screens and optical sorting technology to better improve our material quality.

Here are some video highlights showing how we're tackling education programs and technology investments.



Closing

We know we must invest in recycling education programs – we know we must work together as an industry to resolve contamination issues and other issues that are impacting recycling programs. We know that Waste Management can't solve these issues alone - we have to educate the wish-cyclers and work alongside manufacturers, municipalities, customers, and end users.

The technology advancements that we are seeing today on the recycling side are impressive. We have a vision for our future recycling facilities to use data combined with technology to process material more accurately and efficiently than ever before. Not just today's stream, but technology that can handle material in future streams. Technology that can change and adjust as materials in the stream evolve over time. Technology that sorts each targeted material into separate categories. We call this "positive sorting" and it will ensure that our end markets receive material that are free of any contamination levels.

That vision and concept of our new Material Recycling Facility or MRF, was presented to Waste Management senior leaders last year, who approved it whole-heartedly. The concept is now an active project with a building purchased and equipment arriving daily. We are excited to put all these pieces together and expect to have a running system by the end of this year – no longer the MRF of the future, but the MRF of today.

As the nation's largest residential recycler, we continue to look for technology to advance processing of recycled materials and invest in great education programs. Technology and education programs that will tell my mother (and all wish-cyclers) that Christmas lights and bowling balls never belong in the recycling cart!

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