

# The Day

## Recycling 101: Are you doing the right thing?



Employees sort through single-stream recycled materials on conveyors at Casella Waste System's Willimantic location, Monday, Feb. 10, 2025. (Sarah Gordon/The Day)

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Willimantic — In an eight-hour shift, the rumbling, loud machinery at the Casella Recycling plant separates approximately 200 tons of boxes, glass jars, yogurt cups, junk mail, bean cans and water bottles and sorts them into separate bales of 14 different commodities to be sold.

The steel, royal blue equipment located in an unheated, cement-floored warehouse resembles a highly choreographed series of steps like a [Rube Goldberg machine](#) by photographer Walter Wick, creator of the children's "I Spy" picture books.

Human intervention is still necessary. Twenty quality-control employees working in the unheated space, wearing winter jackets, hats, gloves and reflective vests, pluck out items that don't belong to ensure that the material being sorted meets quality specifications.

The newly installed equipment at the material recovery facility (MRF) handles single-stream recycling, known as "fully commingled," which allows accepted recyclable materials to be collected in one bin. The equipment sorts and separates plastics, glass, paper and metals put together in the curbside recycling bins of New London County residents. Torrington was the first town in Connecticut to adopt single-stream recycling in 2009; given the state's home-rule tradition, towns and cities chose when to switch to single-stream recycling.

Casella just completed a more than \$15 million renovation of its Willimantic Recycling plant to install automation equipment to sort, separate and bundle 95% of items collected through single-stream recycling. The Vermont-based company has 10 MRF facilities in the Northeast.

The Willimantic plant, one of two single-stream recycling facilities in the state — the other is in Bridgeport — serves the 12 communities that comprise Southern Connecticut Regional Resources Recovery Authority (SCRRRA) in New London County: East Lyme, Griswold, Groton, Ledyard, Montville, New London, North Stonington, Norwich, Preston, Sprague, Stonington and Waterford. Recyclables from Old Lyme also go to the plant.

The newly retrofitted facility began operating Jan. 13, and its first day at full operation was Feb. 7. It had been shut down for six months while the new equipment was installed, and material was brought to another Casella recycling plant.

### **Recycling rates**

Casella recently introduced tiered pricing contracts with SCRRRA and its other customers so that the lower the rates of 'contamination' of single-stream recycling materials collected, the lower the cost. Casella conducts more than a dozen audits of SCRRRA's materials over many deliveries by separating out 200-500 pounds of materials and weighing them, said Mike Crowell, market area manager for Casella.

The auditing team picks out all the items that are not supposed to be there and then weighs the remaining material again, calculating what percentage of the load was 'contaminated.' After multiple audits, Casella determines an average. The tiered pricing is based on contamination percentages, and in 2022, SCRRRA towns' single-stream recycling had a 25% contamination rate, said Liz Chuff, operations manager.

The better residents do at keeping the wrong items out of the recycling bins, the less Casella charges its customers like SCRRRA to accept single-stream recycling materials.

The recyclable items are bundled and sold as commodities to other companies that break them down by melting them or, in the case of paper, turning it into pulp, mixing it with hot water and breaking it down to fiber. The recyclables eventually become not just office paper, cardboard boxes, newsprint and water bottles. Recycled paper also is used in paper towels, toilet paper, egg cartons, gift boxes and panels for soundproofing rooms.

Recycled metals are used to make tinfoil, cans, pull tabs and car parts. Glass is sorted by size and sometimes color and is melted into new glass products or gets mixed into road bases. Some plastics are made into shampoo bottles, makeup tubes, carpet, clam shell food packaging, fleece fabric, auto parts, including bumpers and dashboards, and detergent containers.

Recycling keeps items out of the waste stream and creates jobs, but recycling isn't simple or black and white. Recycling has doubters because people have seen investigative stories about plastic recycling being a scam. They've seen pictures of the floating islands of plastic in the ocean and the wildlife killed by plastic waste.

Maybe recycling skeptics heard the statistic from the U.S. Environmental Protection Agency (EPA) that only about 9% of plastic is recycled into something new. That's because the nonrecyclable plastics such as those used in diapers, computers and automotive parts are included when calculating plastic recycling.

The number inside the "chasing arrows" triangle that consumers think of as a recycling symbol represents the type of plastics the item is made from, not how likely it is to be recycled. The U.S. Department of Energy produced a [one-page Consumer Guide](#) to Recycling Codes that explains what each symbol means.

Recycling rates for items that can be recycled are better than for plastics overall, according to the EPA. The recycling rate of polyethylene terephthalate (PET or PETE) bottles and jars (water bottles) was 29.1% in 2018, and the rate for high-density polyethylene (HDPE) bottles (milk jugs and laundry detergent containers) was 29.3% in 2018, the EPA reported. The former group comes with the numeral 1 inside the arrow triangle and the latter is marked with a 2. Both are easy for recycling companies like Casella to sell as commodities to recyclers.

### **Wishing doesn't make it recyclable**

Single-stream recycling has increased the percentage of residents who participate in the state's mandatory recycling program but it has also increased the amount of "wish-cycling," where people toss items into recycling that don't belong because they're "not educated enough or they're lazy," said Crowell.

When a reporter and photographer visited the recycling facility Feb. 10, they observed among the non-recyclable items a sink and faucet, a bowling ball, a string of mini lights, a metal sign, wooden dowels inside a plastic bag, lots of plastic bags, some filled with acceptable items, 5-gallon water jugs, earmuffs, full pudding containers, metallic food wrappers, a metal radiator, a waffle iron and frying pans.

Although state law has mandated recycling for 24 years, only 35% of municipal solid waste is recycled or composted, according to the state Department of Energy and Environmental Protection. This figure has been flat for a decade and falls short of the state's statutory goal of diverting 60% of municipal solid waste by 2024. Before single-stream, 24% of the state's municipal solid waste was recycled, according to DEEP.

At the Willimantic plant, the milk jugs, laundry detergent, soda bottles, food cans, newspaper and cardboard go through a coordinated series of automated phases. While on various conveyor belts throughout the sorting process, they pass by multiple teams of quality control staff who pull out items that don't belong – such as plastic bags, 5-gallon water jugs, a metal road sign, Christmas lights, earmuffs, charging cords and batteries. These items could jam or break the machine, or, in the case of batteries, start a fire, Crowell said.

“Wish-cycling” costs money. The quality control employees stand on either side of a moving conveyor belt with opened-bottom bins on their left and right to grab and sort materials that don’t belong. One sorter pulls out scrap metal and drops it into the container on her left, while plucking out hard plastic and plastic bags and dropping them into the container on her right.

MRFs have to stop the machines daily to pull out by hand items like a hose, rope, plastic bag or power cord that got past the human sorters and messed with the machinery. When the machines are down, the plant can’t move the 30 tons of recyclables per hour they were built to handle, Crowell said. Before the renovation, the plant processed 14-15 tons of recyclables per hour.

“How about we do our part for the environment? How about we actually put some effort into understanding the acceptable and the nonacceptable list and doing the best we can?” Crowell asked. “We don’t have to be cleaning out the peanut butter jar with a toothbrush. We’re not asking that. We’re just asking you to put the effort into doing the right thing.”

### **Where to take items not fit for recycling bin**

Only about 20% of people are avid recyclers. First, people don’t always know what to recycle and what not to recycle. Sometimes recyclable items are put into curbside recycling bins that don’t belong there.

“Just because it’s recyclable doesn’t mean it’s suitable for the curbside program,” said Jeff Weld, vice president of communications for Casella Waste.

And people put items in the trash that could be recycled and left out of limited landfill space. When in doubt, check the [RecycleCT.com](https://www.RecycleCT.com) website or app to find out whether it belongs in single-stream recycling, trash or elsewhere.

Electronics, textiles (clothing and linens), batteries, plastic bags, propane tanks and many other items are recyclable and will be accepted at stores that sell them and at the SCRRRA location in Gales Ferry.

Many grocery stores will recycle plastic grocery and produce bags. (Enter your ZIP code at [PlasticFilmRecycling.org](https://www.PlasticFilmRecycling.org) and get nearby stores that recycle plastic bags.) Most of these bags are sent to the manufacturer of recycled composite material that is used for outdoor decking. Hardware stores will recycle propane tanks, and office supply stores will recycle printer ink cartridges. Go to [Call2Recycle.org/locator/](https://www.Call2Recycle.org/locator/) and plug in your ZIP code; a list of nearby stores such as Johnson’s Hardware, SCRRRA, Home Depot, Lowes and Staples pop up with their address and a list of the types of batteries they’ll accept for recycling.

Casella wants to recycle as much as it can, because the company makes money selling plastics, paper, cardboard, glass, metals and other materials to companies that turn these commodities into other products. It costs money to dispose of the 10-18% of non-recyclable items people throw into the recycling bin. They make more money when they sell commodities containing 2% or less “contamination” from items that don’t belong, Crowell said.

### **Battery hazard**

Batteries are recyclable, but they don’t belong in single-stream recycling or in the trash. Batteries can start fires and put the workers and equipment at both trash-to-energy plants and recycling facilities at risk.

When a lithium-ion battery, a type of rechargeable battery, ended up in a Casella truck that was hauling cardboard in May 2024, it caught fire while the driver was on the highway in Worcester, Mass. The driver pulled over and ejected the load, but the truck was ruined, Crowell said. The driver was not hurt, Weld said, but the whole ordeal and expense was “completely avoidable.”

### **Automation increases efficiency**

From the time the single-stream recyclables are dropped off on the tipping floor until they are put through a bailer and bound into bails weighing from 1,000 to 3,000 pounds each, they pass through 30 quality-control stations.

First, a bucket loader dumps the material from the tipping floor into a steel drum feeder, which flattens out the cardboard and plastic and feeds the main “up-feed” conveyor belt.

The belt brings the plastic, glass, paper, cardboard and cans up to an elevated “presort” area, where quality-control employees pull out bulky items and other unacceptable material that can damage the sorting equipment and cause hazards for workers. The most common items pulled off here are plastic bags, large pieces of scrap metal, bulky plastics such as cat litter containers and other items known as “tangles” like electric cords, ropes and twine.

Next, a machine called an “optical sorter” separates the cardboard by ejecting it into one slot, while plastics, metals, glass and paper products move along the conveyor belt system. Glass is then separated and cleaned, while plastics, metals and paper products continue to move onward.

Paper is next to be optically sorted out and it is sent to a manual processing point, where it is inspected for quality control and other recyclables and non-recyclables are removed. Mixed paper, newsprint and corrugated cardboard are eventually separated into three groups.

Ferrous metals, which contain iron (tin cans), are then pulled out using a magnet, while plastics, aluminum and paper products continue to move onward. Optical sorters then sort the plastics by material type, and aluminum is pulled off using an electric current called an “eddy” current.

These materials are then sent to further manual quality-control points to ensure they meet customer specifications. After being separated into 14 commodities, the material is then baled and shipped to end markets where it is turned into other materials.

In 2024, through its 10 MRF recycling locations, Casella surpassed 1 million tons of recyclable product sold and expects to do more this year, Crowell said. A company spokesman said the annual report for 2024 is not yet available, but in 2023, the reported processing revenue for processing fees, tipping fees, and commodity sales was almost \$106 million.

“That’s not going into a landfill. That’s not going into a burn plant. It is so important just to understand why you should be actually recycling. It helps everything. I’m not the smartest person in the world, but it’s really doing the right thing,” Crowell said. “I wouldn’t be sitting here for 28 years if I didn’t believe in what we were doing.”



Bales of separated plastics that were sorted from the single-stream recycling wait to be shipped from Casella Waste System's Willimantic location Monday, Feb. 10, 2025. (Sarah Gordon/The Day)



A loader moves single-stream recycling from the tipping floor to be processed at Casella Waste System's Willimantic location Monday, Feb. 10, 2025. (Sarah Gordon/The Day)



Large bulky and non-acceptable materials that were sorted from the conveyors are seen at Casella Waste System's Willimantic location Monday, Feb. 10, 2025. (Sarah Gordon/The Day)



Bales of separated cardboard ready to be shipped out after being separated from single stream recycling are seen at Casella Waste System's Willimantic location Monday, Feb. 10, 2025. (Sarah Gordon/The Day)



Paper products that were recycled move along a conveyor after being hand sorted at Casella Waste System's Willimantic location Monday, Feb. 10, 2025. (Sarah Gordon/The Day)