



Issue 36
Spring/Summer 2017

sustain

a journal of environmental and sustainability issues

The
Kentucky Institute
for the Environment
and Sustainable
Development



Zero Waste

Editor

Allan E. Dittmer

Design/Layout

Nick Dawson

University of Louisville

Design & Printing Services

The Kentucky Institute for the Environment and Sustainable Development (KIESD) was created in July 1992 within the

Office of the Vice President for Research, University of Louisville.

The Institute provides a forum to conduct interdisciplinary research, applied scholarly analysis, public service and educational outreach on environmental and sustainable development issues at the local, state, national and international levels.

KIESD is comprised of eight thematic program centers: Environmental Education, Environmental Science, Land Use and Environmental Responsibility, Sustainable Urban Neighborhoods, Pollution Prevention, Environmental and Occupational Health Sciences, Environmental Policy and Management, and Environmental Engineering.

Sustain is published semi-annually by the Kentucky Institute for the Environment and Sustainable Development, University of Louisville, 203 Patterson Hall, Louisville, Kentucky 40292.

louisville.edu/KIESD/sustain-magazine

Send electronic correspondence to r.barnett@louisville.edu

This Publication is printed on recycled paper.



2

The Four R's – Reduce, Reuse, Recycle, and Rot (compost) – Can Change the World

Robert Reed



6

The real dirt on urban compost

Sven Eberlein



11

Ohio Stadium Goes Zero Waste

The Ohio State University



14

Collegiate Zero Waste Programs Elevate Higher Education

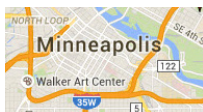
Karyn Kaplan



23

Zero Waste: A Realistic Sustainability Program for Schools

Kary Schumpert
Cyndra Dietz



28

Minneapolis Organics Recycling – from pilot to drop-off to citywide collection

Kellie Kish



36

Creating a Zero Waste Future Starts with Your Local Community

Kate Bailey
Harlin Savage



42

Sustainability at Loveland High School

Tracy Burge



44

Zero Waste in Higher Education: A Case Study

Brent Fryrear



50

The Journey to Zero Waste "Are we there yet?"

Kieth Hackett

Issue 36 - Spring/Summer 2017

Zero Waste:

Good quality compost by weight is 50 percent humus. Humus is a natural sponge that attracts and retains water. So regions hit by the double-whammy of higher temperatures and drought highly value programs that make compost.

Photo courtesy of Balazs Gardi. balazsgardi.com



The Four R's – Reduce, Reuse, Recycle, and Rot (compost) – Can Change the World

by Robert Reed
Zero Waste Advocate



Photo courtesy of Balazs Gardi. balazsgardi.com

Let's be honest. Life can be tough. That's why it is important to remain positive.

Here is something that can help individuals, communities, regions, countries, and the planet – live life more simply.

Please give me a few minutes to share some good-to-know information and highlight solutions to environmental challenges that affect our world and therefore all of us.

Twenty years ago I attended a Sierra Club meeting where committee members discussed, among other things, the San Francisco recycling program. I felt a respect for the people in charge. Environmentalists must be strong defenders of nature being outgunned by vested interests.

One man on the committee proposed the group take a position in support of the recycling program, which the group did after some interesting discussion. Supporters liked the plan to replace older recycling collection trucks with newer trucks featuring improved emission control systems.

I learned a great lesson once – listen carefully to all voices. A woman on the committee said she was not against recycling, but she felt more needed to be done to encourage people to reduce waste. She wanted to emphasize that reducing waste and reusing things are more beneficial to helping protect the environment. In reference to recycling, she advocated for structuring the program in a way to create more opportunities for people to separate their trash. She also wanted more efforts brought forth to encourage residents and businesses to take more care to sort their discards correctly.

Since that time San Francisco has taken steps and made progress in these areas. Many residents endeavor to buy only what they need and make full use of what they have. The City and

Recology, its employee-owned recycling company, encourage people to make a reuse resolution, to resolve to use items such as metal water bottles and canvas carry bags. Better to use a metal coffee mug than single-use coffee cups that are coated with thin layers to plastic that make them difficult to recycle or compost. Coffee shops usually put a lightweight plastic lid on these single-use cups. More often than not the tops end up as trash in a landfill.

Remember I started this article with the statement “life can be tough.” So do things like coffee cups and trash really deserve our attention?

Yes. And here's why. All trash goes somewhere. The contents of garbage bins go to landfills and incinerators. Materials placed in recycling bins go to recycling plants. Food scraps and other yard trimmings tossed in a compost collection bin go to compost facilities.

The moment of truth occurs when we toss our discards in a specific bin. Collectively, we make these choices countless times every day. The effects on our world differ dramatically depending even on our small actions.

Once materials go in a landfill they never come out. And landfills produce potent greenhouse gases, much of which escapes to the atmosphere. Send paper, plastics, or food scraps to an incinerator and they are burned at high temperatures. When materials are incinerated, it's the end of the road. There is nothing left to recycle or compost. And the ashes produced are toxic, the concentrated residue of burned resources.

In contrast, recycling offers many positives. Recycling saves trees and other resources, keeps materials out of landfills and incinerators, helps protect our air and water, provides materials for manufacturing, and creates jobs. In fact a study undertaken by a coalition of environmental and labor organizations states



that recycling creates 10 times more jobs than landfilling or incineration.

In the last 20 years people have learned that the environmental benefits achieved through urban compost collection programs can be even greater. Like recycling, composting keeps materials out of landfills and generates more jobs than landfilling or incineration. Compost collection programs for food scraps and plant cuttings also return nutrients to local farms, giving farmers a natural way to replenish their soils.

Compost is a soil amendment. Adding a layer of compost to farmland feeds the microbes in the soil and stimulates microbial activity. That supports soil health. Healthier soils help grow stronger, healthier plants.

Here is where the benefits multiply. Healthy plants are resistant to invasive insects and disease. Compost softens the soil and allows plant roots to travel further through the soil and reach more nutrients.

The Rodale Institute, the oldest agricultural institute in the United States, has conducted side-by-side field trials and proven that we can grow 30 percent more food in times of drought by farming naturally with compost.

When cities establish urban compost collection programs and send food scraps back to farms in the form of finished compost, farmers can grow and sell more fruits and vegetables. In this way city dwellers who participate in compost collection programs help produce healthy fruits and vegetables for family tables and neighborhood restaurants.

Robust plants also conduct more photosynthesis, the process by which plants take energy from the sun and grow. Through this process plants also transfer carbon from the atmosphere to the soil, where it belongs. Additionally, some farms and vineyards use compost made from food scraps collected in San Francisco to grow cover crops that sequester carbon in the soil. This process turns farms into carbon sinks.



Many vineyards in Northern California now use compost to grow cover crops between rows of vines. Cover crops return carbon and nitrogen to the soil and support many other benefits. (Photo courtesy of Balazs Gardi. balazsgardi.com)



Compost is a nutrient rich soil amendment. Applying compost to farms, parks, and gardens feeds microbial colonies in topsoil. (Photo courtesy of Balazs Gardi. balazsgardi.com)

Carbon sequestration, aided by compost, is also happening on grazing lands. One of the best examples is the Marin Carbon Project. In this effort rancher John Wick applied one-half inch of compost to grazing land several years ago. That switched on the life web in the topsoil on Wick's ranch. In turn, native grasses, which pull carbon from the atmosphere, flourished. The compost application was a one-time event, yet scientists from UC Berkeley measured an increase in carbon in the soil on Wick's ranch month after month. Experts believe by replicating this model on other farms and grazing lands we can offset most carbon emissions.

That is tremendously important because we continue to engage in carbon generating activities such as air transportation, which burns large amounts of jet fuel at high altitudes. Therefore, we need to take actions to offset our carbon-producing activities.

Quality compost also helps farms save tremendous amounts of water. That is because compost by weight is 50 percent humus. As you may know, humus is a natural sponge that both attracts and retains water. This is particularly important for regions around the world that suffer the double-whammy of higher temperatures and drought. That combination can kill the microbial colonies in topsoil. When that happens, deserts expand. That is occurring in North Africa and contributing mightily to the largest refugee crisis since the end of World War II.

The good news is that many cities and universities are starting to replicate San Francisco's compost collection program for food scraps and plant cuttings. It started as a test program in 1996 and became a formal program in 2001. City leaders took the next step in 2009 and made participation in San Francisco's curbside recycling and compost collection programs mandatory for all properties.

Farmers love the compost. Communities around the planet should take steps to produce more.

UC Davis adopted the program as did UC Berkeley and many other universities. Seattle, Washington and Portland, Oregon also



Six reasons we should build compost facilities, not landfills and incinerators:

1. Food scraps such as coffee grounds, fish bones, and vegetable peelings are rich in nutrients and minerals. All of these things came from the earth and should return to the earth as finished compost, a rich soil amendment.
2. Landfills and incinerators outpace compost facilities 30 to 1. Because of this infrastructure imbalance, we bury or burn most of our food scraps.
3. Food scraps dumped in landfills take up space, decompose in an airless environment, and produce potent greenhouse gases that contribute to global warming.
4. Building modern compost facilities will give many more cities the opportunity to institute curbside compost collection programs and turn their food scraps and yard trimmings into finished compost for use on farms, parks, and gardens.
5. Applying compost feeds microbial colonies in topsoil. Healthy soils support healthy plant growth. So by participating in a curbside compost collection program we help farms grow more healthy food for all.
6. Good quality compost by weight is 50 percent humus, and humus is a natural sponge that attracts and retains water. So by turning our food scraps and yard trimmings into compost we can help our communities save tremendous amounts of water.

Composting:

- Improves soil structure, thereby protecting topsoil from erosion.
- Turns cantaloupe skins, chicken bones and other food scraps into sweet carrots, juicy tomatoes, and fine wines.
- Supports green jobs.
- Gets your city closer to sustainable practices and achieving zero waste.
- Sequesters carbon deep in the soil, especially when used to grow cover crops like mustard or beans.
- Offers a local solution that is easy and satisfying and achieves multiple benefits.

instituted compost collection programs. Portions of New York City have implemented it. This spring Paris will introduce compost collection in two large neighborhoods with the goal of eventually making it a citywide program. This could be transformative in France where historically programs established in Paris extend to other regions and cities. In 2016 France passed a national law prohibiting grocery stores from sending produce they no longer want to sell to landfills or incinerators. Stores can either donate that food to food banks or compost it. More recently, French officials passed a law banning plastic cups and cutlery, both of which are made from fossil fuels, are difficult to recycle, and contribute to plastic pollution.

Source reduction, reuse, recycling, and compost collection programs are part of a movement called Zero Waste. That means sending as little as possible, and eventually nothing, to landfills and incinerators. Many cities throughout the world are setting zero waste goals. As local zero waste groups increase, they share environmental solutions (reduce, reuse, recycle, and compost) through social media, email, and face-to-face meetings at conferences. Last summer Zero Waste France, a group of nine staff and several volunteers, hosted the first Zero Waste Festival in France. More than 5,000 people attended the event at Cabaret Sauvage in Paris. Participants came from many countries, shared solutions, and are working to implement those solutions in their local communities.

Groups such as these are linking and collectively advancing the movement through organizations such as Zero Waste Europe. They advocate for producer responsibility, which asks product and packaging manufacturers to not



This compost facility, operated by Recology outside Vacaville, Calif., makes custom blends of compost that is applied to local farms. The compost is made from food scraps and yard trimmings collected in San Francisco and other Bay Area cities. (Photo courtesy of Balazs Gardi. balazsgardi.com)



make things from multiple materials that are fused together and, therefore, difficult if not impossible to recycle.

They advocate for establishing more compost facilities. There are 3,000 active landfills in the United States and fewer than 300 facilities that are permitted to compost food scraps. A typical landfill takes in far more tons per day than a typical compost facility.

So, we have an infrastructure problem. We need more compost facilities so more cities can institute curbside compost collection programs. Doing that will create opportunities for more people to send their food scraps to nearby farms in the form of finished compost. Doing so may be our best chance to slow climate change.

Had more people known all this 50 years ago, one would like to think we would have viewed trash very differently and would have more ardently strived to reduce waste and to compost. We cannot change the past, but we can alter our behavior now and going forward. Let's plan, permit, and build more compost facilities.

I believe the woman from the Sierra Club committee I encountered 20 years ago would like the improvements to San Francisco's recycling and composting collection programs. Before 1996, the compost collection program did not exist in San Francisco. Today, San Francisco sends 650 tons of compostable material per day to area compost facilities.

I suspect she would, again, advocate that we continue our efforts to reduce waste, reuse things, and make recycling and composting easy and convenient for all. I suspect she would advocate for more efforts to inform people about the environmental benefits that can be achieved through zero waste. And I suspect she would advocate for more efforts to encourage and inspire people to be attentive while sorting their discards.

For example, we should recycle all discarded paper and let no paper go to landfills or incinerators. That would be a simple commitment and help achieve several benefits. For example, recycling one ton of paper saves 17 trees.

And let's be sure to compost all coffee grounds. They are rich in carbon, nitrogen, and potassium. Coffee grounds are also small, which makes them immediately available to the microorganisms in compost. For these reasons and more coffee grounds are one of the very best materials to compost.

There are many other good points to be made. But I do not want to overstate the case. No doubt you recycled before seeing this article and after reading it will now recycle more consistently and attentively. Perhaps you will push for a compost collection program on your university campus or in your town.

There is no waste in nature. Let's try to model her good example.

Robert Reed is a zero waste advocate. He lives in San Francisco with his daughter, August, and their Boston Terrier, Peanut (a.k.a. Cacahuéte).

References:

GHG Implications of Soil Amendments on Rangelands, MarinCarbonProject.org

Farming Systems Trial, RodaleInstitute.org

More Jobs, Less Pollution: Growing the Recycling Economy in the U.S., RecyclingWorksCampaign.org

Soil Solutions to Climate Problems, CenterForFoodSafety.org

Global Alliance for Incinerator Alternatives, No-Burn.org

A secret weapon to fight climate change: dirt, *The Washington Post*

The Soil Will Save Us, How Scientists, Farmers, and Foodies Are Healing the Soil to Save the Planet, by Kristin Ohlson, Rodale Books (256p)

The Recycling Reflex, by David Bornstein, *The New York Times*

The real dirt on urban compost

by **Sven Eberlein**
TheNatureOfCities.com



“Why isn’t every city doing this?” Dave Vella asks as he intently massages a handful of succulent compost from the towering pile freshly deposited onto his vineyard’s gravel thoroughfare. Dressed in jeans and denim shirt, the veteran Grape Manager of Chateau Montelena is about as casual as can be for someone whose vineyard shocked the wine world in 1973 when Parisian judges scored its Chardonnay above all French wines and put Napa Valley on the global map for good.

A native of California’s agricultural Central Valley who says he has watched farmers screw up a lot of land using synthetic fertilizers, Vella isn’t afraid to get down in the dirt. It doesn’t take much prodding by Robert Reed, San Francisco waste management company Recology’s spokesman and the person responsible for bringing a truckload of “The Mix” that afternoon—along with a French television film crew to document the groundbreaking effects of urban composting on organic farming—to get Vella to spill the beans on the secret ingredient for his award-winning soil.

“The soil microbes flourish on humus,” Vella explains. “If you have soils low in organic matter and humus, you can tell just by the weeds that aren’t growing out there for whatever crop it

might be on. Humus is an extremely important part of your soil makeup, and recycling urban food scraps instead of burying them in a landfill is such a no-brainer, as it makes such great compost.” Like a professor trying to make sure his students will at least remember the main thesis of his research, he kicks up the fluffy topsoil with his leather boot. “It’s the black stuff, right under these leaves. If it’s wet you can actually see it.”

Growing up with a gardening mother, I’ve always had an affinity for compost piles in the backyard. As a metropolitan denizen sensitive to human consumption, I have also had a longstanding fascination with material flows in and out of the urban organism, resulting in field trips to transfer stations and recycling facilities. But it wasn’t until I wrote an article¹ about San Francisco’s efforts to achieve zero waste a few years ago when I realized that my adopted hometown was on to something beyond just reducing waste: by making the collection and composting of every disposed scrap of organic matter the linchpin of its garbage policy², it had tapped into a deeper reservoir of transformation through which a city could not only reduce its harmfulness to nature but instead have its urban metabolism mimic the life-supporting ecosystems on which all life on Earth depends, thus restoring—rather than depleting—nature’s innate biocapacity. In other words, San Francisco was becoming more ecocity-like in the way it was treating its resources.

Soil is the solution

My curiosity about how the treatment of municipal organic waste could address a whole range of hot-button issues facing humanity on a global scale had been piqued further when I received an email from Robert Reed in response to my article, with the subject line “Soil is the Solution.” In it, Reed touted the obvious benefits of a robust green bin program, such as the reduction of landfill and the creation of a marketable product: organic fertilizer. But what stopped me in my tracks was his plea to look at the treasure chest of big picture benefits inherent in urban composting, ranging from its potential to conserve water, restore soils, and—the big enchilada—sequester climate change-causing carbon out of the atmosphere.



Chateau Montelena’s Dave Vella digging the San Francisco Mix



Citing one of the findings from Rodale Institute's Farming Systems Trial (or FST)³—America's longest running, side-by-side comparison of organic and chemical agriculture—that the application of food scrap compost to one acre of land might add as much as 12,000 pounds of carbon to the soil in one year (while conventional farming releases 3,700 pounds of it into the atmosphere!), Recology's Food Rebel explained how the world could offset more than 20 percent of carbon emissions if all cities instituted urban compost collection programs and the organic fertilizer were applied to local farms, especially through the addition of cover crops. "These crops deliver two charges of carbon 14 inches into the soil. The first charge is carbon we preserve in the finished compost. The second charge is carbon the plants pull out of the atmosphere."

Reed ended his note with the kind of impassioned, bare-knuckled challenge I would come to love and expect from him. "Sven, 'Soil is the Solution' might be the most important environmental story you'll ever write. It is part of the solution to our environmental challenges. The story belongs on the front of the New York Times and on 60 Minutes." No pressure there, Robert.

Since that first email exchange with Reed, trips like the one to Chateau Montelena to document the various stages of the city's organic waste on its way back to residents' dinner tables have become regular events on my travel calendar. In the past two years alone, I've witnessed what used to be dirty napkins, banana peels, and greasy take-out boxes discarded from my own kitchen resurface as precious compost on farms and vineyards in the surrounding hinterlands of the San Francisco Bay Area.

I've walked 10 acres of diversified salad mix fertilized by SF compost with Paul Wirtz, production manager for Oak Hill Farm in Glen Ellen, CA. I've stood in the field next to Nigel Walker, founder and owner of Eatwell Farm, a 105-acre certified organic farm with a thriving CSA program in the Sacramento Valley, as he explained how he had to scale back on "The Mix" because "the fertility was getting too big." I've gotten lost in a sea of shining mustard, stringy bean, and hairy vetch with Ross Cannard of Enterprise Vineyard Management in Sonoma, learning about the extraordinary capacity of cover crops in fixing nitrogen and storing carbon.

A lot of these visits have been arranged by Bob Shaffer, a Hawaii-based agronomist whom Reed connected me with. Shaffer works as a composting consultant⁴ for farms and vineyards across the Western United States and has become a pivotal liaison between Recology and the rising number of growers in search of just the right kind of urban compost mix for their respective soils, micro-climates, and crop rotations. During our initial phone conversation, this living, breathing encyclopedia of soil recapped for me how the high density of protein, oils, complex carbohydrates, and minerals inherent in recycled food provides soil microbes with the nutrition essential for creating Dave Vella and his fellow carbon farmers' beloved



Bob Shaffer doing soil quality control at Sonoma Valley Worm Farm.

humus. He also pointed out the heavy price humanity is paying for the temporary convenience of the chemical fertilizers used in conventional farming.

"Letting all the carbon that's supposed to be in our soils go up into the air is causing us not only environmental pollution and the threat of atmospheric warming, but it's devastating our ability to produce healthy crops. If we keep wasting our nutrients like we have for the past fifty plus years, not only are we filling up our landfills, which we don't have any room for, and poisoning ourselves with methane, which is a potent greenhouse gas, but we're not getting the most precious thing that we raise—high mineral value food—back into the soil where it belongs. Now that's a full-blown crisis."

The good news, according to Shaffer, is that there is a simple, inexpensive, and effective way to revive the broken cycle, rooted in three basic areas of carbon-based, biological farming. "If we want to feed our soils again, we need to manage organic matter, we need to manage minerals, and we need to manage tillage. By recognizing the incredible synergism at work between compost, cover crops, and mulch, we can grow large volumes of organic matter and return it to the soil."

Nothing but a bug's life.

Just how simple and effective this is in practice would come into focus for me a few weeks later, when I was invited to tour some of the farms Shaffer had been working with outside the small town of Sonoma, 50 miles north of San Francisco. We met at Fowler Creek, where Ross Cannard and his partners are experimenting with cover crops as nutrient producers as well as pest control. After a quick introduction to a gaggle of chattering hens (that have made a name for themselves by laying a variety of beautifully colored eggs for such illustrious restaurants as Chez Panisse in Berkeley and Boulette's Larder in San Francisco), we quickly found ourselves in the middle of a field of twirling greenery.



“Check out the buckwheat over there, nestled between the bell beans and oats,” Shaffer pointed at the shimmering curtain of white dotting across the lush field of tall grass between two rolling hills. “That’s what you get when you put the compost on the cover crop. If you feed the roots of these plants you allow the microscopic bacteria, fungi, nematodes, and protozoa to accelerate their full food web below ground. Those plants are not only stronger nutrition-wise, but they have built-in disease prevention.”

He bent down to pull up one of the buckwheat blossoms. “See these dark spots clustered around the bud and stem? These aphids have now piled up right here to take advantage of nectar and other pasture juices. By having them over here we’re keeping their more mobile ladybug predators all over the field in large enough numbers to help take care of the crop plants. I know, the fearful mind is thinking, ‘Oh my god, kill all the aphids.’ But no, that would be like killing off all of the mice. You need to have a few mice. Either that, or you have to buy cat food.”

It’s this kind of economic calculus that gives Shaffer his biggest opening for selling a radically different way of farming to a trade he knows and understands to be on the cautious side. “There’s a couple thousand pounds or more of insects that come and die here simply because of this plant,” he reckons. “Now let’s convert that to dollars. That’s 35 percent protein and 12 percent nitrogen in the insect’s body, plus other services that are going on. If you go down to the store right now and buy 2,000 pounds of protein, you’re not gonna like it, it’s gonna cost big money. And you have to haul it and apply it.”

Pulling out his magnifying glass, he motioned for me to take a closer look at the tiny critters. “These guys are doing it on their own, they may as well be Bob’s Bug Manure,” he mused about his *de facto* business partners. “The bottom line is, you raise cover crops with your high nutrient food scraps, you’re gonna get lots of bugs. And they’re gonna end up as part of the fertility in our soil.”

Talking on eggshells

Still buzzing (pun!) from my “bug’s life” exploration with Shaffer, I returned home to a call from a producer at The PBS News Hour, the nightly newscast on American public television. They were doing a story on San Francisco’s progress in becoming a zero waste city⁵ and, after finding my article online, figured I might know a person who could show them first-hand how this whole composting thing works at the beginning of the cycle—in a residence. Seeing that my wife and I had been meticulous separators of all living things in our outbound material flow since SF became the first city in the U.S. to make composting mandatory in 2009, the logical outcome of that conversation was a camera crew in our kitchen a week later.

After whipping up a scrambled egg breakfast and tossing a bunch of egg shells, onion scraps and tea bags in our compost

bin for the cameraman, we got to share our personal experience of recycling food scraps with PBS reporter Spencer Michels. We went from the technical (kitchen bin is lined with either bio produce bags from our local food coop or just compostable paper bags and wraps from delis and bakeries) to the educational (composting at home is not yucky at all—the exact opposite, by keeping food out of your trash you are keeping your source of potential odor easily identified and separated) to the political (we don’t care whether we’re 70 percent or 80 percent of the way toward our zero waste goal as long as we are getting closer) to the philosophical (composting is fun, engages us as citizens with a stake in our city’s future, and connects a daily routine with the Earth’s ecosystems we depend and thrive on), before finishing with a dramatic live action shot of me depositing the precious scraps in the green bin that serves our multi-unit building.

Speaking of getting closer, now that I had seen with my own eyes the economic and environmental value of urban compost and shared with a major news network how eminently achievable it is to set up a city-wide green bin program, I was curious as to why it hadn’t yet become more commonly instituted in municipalities across the country, and the globe. While San Francisco is now collecting 600 tons of compostables every day (219,000 tons per year), the EPA’s latest Sustainable Materials Management Report⁶ shows only a slight overall increase of food composting in the United States, from a total of 1.84 million tons in 2013 (5.0 percent) to 1.94 million tons in 2014 (5.1 percent). This means not only that 95 percent of uneaten American food is still being thrown away, but that San Francisco alone is responsible for almost one out of every ten tons of what small percentage does get composted.

The bottleneck, I thought, must surely be in the one link of the organics recycling chain I had not yet inspected more thoroughly: the composting facility. I remembered my mom’s warnings of yore to refrain from tossing anything besides fruit and veggie peels or coffee grounds on her compost pile, and it occurred to me that perhaps the pizza cartons and chicken bones Recology was encouraging us to add to our green bins were responsible for making the composting process too complex and prohibitively expensive for most other municipalities to replicate.

There was only one way to find out, so the next time I was riding my bike past Recology’s headquarters near San Francisco Bay, I stopped in to ask Robert Reed about their flagship composting operation, Jepson Prairie Organics. “Funny you should ask,” he said as I was peeling the tangerine he handed me as a welcome-to-his-office gift. “I’ve got thirteen visitors from agricultural cooperatives and food companies in France coming to see Jepson Prairie. What are you doing next Tuesday?”

Bringing the Coquille back to the farm

We got to the town of Vacaville about half way between San Francisco and Sacramento at around 9:15 am. Reed, who had picked me up in his Prius an hour earlier bearing coffee and



apples for breakfast en route, turned onto a straight country road before pulling into what looked like an empty construction lot a few miles ahead. “This is it.” He pointed at a basin of about 50 acres that looked a bit like a quarry, with some trucks, equipment, and a bunch of piles of dirt. “The French aren’t here yet, so go ahead and check out some of the finished compost piles by the office.” I wandered behind the unassuming single story building and discovered my first big piles of virgin San Francisco Mix.

“That’s our premium compost blend of food scraps and yard trimmings. Took just about 30 days to cure and has another 15 to 30 days to go until it’s a mature, finished product.” Reed had sneaked up behind me, joined in neon-yellow Recology safety vests by a middle-aged gentleman with a robust frame and a healthy farmer’s tan. “Sven, I want you to meet Greg Pryor. Greg oversees all eight of our compost facilities and has unique insights into the art of making fine urban compost and its benefits for topsoil. Lucky for us, he will lead our tour today.” Pryor was about to launch into a story about how he was first tasked in 1994 by Recology’s previous incarnation to set up an experimental compost collection program when we heard two vans pull up. “That must be our French delegation,” Reed interjected. “Let’s say bonjours.”

With everyone gathered, Pryor gave us a quick rundown of how the operation had evolved since its early days, adapting to an ever-increasing volume of compost while complying with California’s steadily tightening air quality regulations. “We had to meet specific criteria that quantified emissions from when we received the material, while it’s being processed, while it’s actively composting, to the finished product.” Finding the right technology that would drastically reduce Volatile Organic Compounds (also called VOC) while also keeping things competitive with the (too) low cost of dumping everything in landfill led Jepson Prairie from giant Ag Bags to Aerated Static Piles (or ASP) to their current state-of-the-art negative ASP. “Rather than forcing air up through the compost and blowing all the emissions into the atmosphere the way we used to do it with the positive ASP, we’re now drawing air down where it’s collected in a series of ducts and pipes and then exhausted out through a biofilter. The negative ASP is giving us a 97 percent destruction of VOC.”

Filled with some good technical nutrients, everyone was ready to smell the dirt (though mostly in the metaphorical sense of the word, as the early morning arrival of the compost trucks coupled with the rapid breakdown of materials through the teamwork of bacteria, fungi, and lots of air renders the place largely odorless during the day). We walked the facility in sort of a “reverse rot” direction, from the pristine finished piles near the office, to the in-progress aerated static piles transected by a geometrically sculpted system of aluminum piping, to the beginning of the chain where the grinder, trommel, and conveyor belt were rattling along, doing the busy work of cutting yard trimmings to size and picking unwanted objects from the coveted organics nectar.

Pryor tells us that they process about 375 tons of finished product every day, sold to over 350 farms, vineyards, orchards, and landscapers in the region. “We have four standard blends, but a lot of our customers prefer their compost made to order with



Lots of hot air going through the ducts and pipes of a Negative ASP.

custom nutrients and minerals. Everyone has different crops and conditions, so the personalized aspect is really what makes our mixes so popular.” The biggest challenge, other than removing non-compostable items (and educating citizens to separate at the source), is that the demand for good compost is growing so fast, while most facilities like Jepson Prairie are already at capacity. According to Pryor, getting the land and permits to run a composting operation in California is prohibitively expensive, with little incentive by the powerful chemical fertilizer industry to lobby the state government to streamline and speed up the costly regulatory red tape.

So there’s one of our bottlenecks in the quest to get more of our food scraps composted. The good news that I gleaned from both Pryor and in my conversations with Bob Shaffer is that a growing number of the bigger players in the agriculture business are currently experimenting with compost, which, ironically, is contributing to the supply shortage. This, of course, makes perfect sense, as depleted soils aren’t only bad for the planet, but—as with everything else when previously externalized ecological bills come due—their ever-diminishing returns will ultimately impact the bottom line. Synthetic fertilizers worked great for a while to squeeze everything out of existing soils, but at some point you have to replenish them with nutrients if you want to keep growing and selling food that actually feeds. As more industrial farms realize the value of this product and how technologically advanced the composting process has become, the hope is that the labyrinth of archaic regulations can be disentangled more quickly.



“You want to know a secret?” Robert Reed interrupts our silent sniffing and caressing of the various piles of compost with a one word epiphany that remind me of Mr. McGuire in *The Graduate*.

“Shellfish.”

I could tell by the ensuing murmur that the French visitors did not want to miss what was obviously going to be a teachable moment that day.

“You know all the crabs and mussels that get fished and eaten at Fisherman’s Wharf in San Francisco?” he asks rhetorically. “The shells contain chitin, a great source of nitrogen, phosphorous, calcium, and magnesium. It’s a superb cleansing agent and exactly the kind of ingredient that makes our compost so rich. So when people throw these shells in the trash after their crab feast, it’s like they’re throwing away gold without even knowing it. That’s why education is such an important component of composting.”

Reed turns to one of the bilingual members of the group. “What’s ‘shell’ in French?” Someone yells “Coquille” and Recology’s intrepid resource recognition slam poet improvises the most memorable line of the day.

“We have to bring the Coquille to the farm!”

Since returning home from that afternoon, I’ve been feeling pretty optimistic about the prospects of looping our cities into the natural systems that have sustained us since the beginning of the agricultural age. If we can reactivate some of the wisdom and practices that worked for us before the industrial revolution while recalibrating the many insights and advances we’ve gained since then to align with the Earth’s naturally self-sustaining processes, the vision of cities becoming part of the solution, instead of being major problems, is not that far-fetched.

It’s true, there’s a long way to go. But I’m encouraged that there are now over 150 communities (and growing!) across the United States⁷ with source separated organics programs, spreading across a total of 16 states. I’m thrilled that over 100,000 New Yorkers are now composting their coffee cups and bagel wrappers⁸. I’m heartened that communities from British Columbia⁹ to Vermont¹⁰ are getting serious about keeping their organic assets invested in the natural loop. And fresh off the presses, I am ecstatic that Paris, which—like most of France—had thought until recently that it was prudent to just burn all its resources—just announced its new compost collection program¹¹ for the 2nd and 12th arrondissements, with the intention to service the whole city soon.

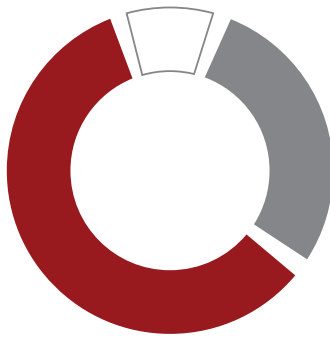
Now that’s what I call bringing the Coquille back to the farm.

This article appeared originally at *The Nature of Cities*. Eberlein, Sven. 2017. *THE REAL DIRT ON URBAN COMPOST*. *The Nature of Cities*. 8 January 2017. www.thenatureofcities.com/2017/01/08/real-dirt-urban-compost

Sven is a solutions journalist and whole systems thinker committed to the advancement of ecologically healthy cities. Covering topics ranging from biomimicry and zero waste to open streets and urban equity, his writing has been published in *YES! Magazine*, *Shareable*, *Grist*, *Resurgence*, *Mother Earth News*, *Planetizen*, and many others. Sven’s holistic approach to storytelling has served him well in his role as communications strategist and community liaison for UN-accredited nonprofit *Ecocity Builders*, while his interest in urban policy and measurable progress keeps him busy on the core advisory committee of the *International Ecocity Framework & Standards (IEFS)* initiative. Sven’s natural affinity for car-free living dates all the way back to his first tricycle ride down the middle of a city street in his native Germany. When he’s not blogging about how to bring the world’s cities into better balance with nature, Sven can be found wandering around his multicultural San Francisco neighborhood in search of new murals, tasty street food, and unicyclists in leotards.

References

1. “Where No City Has Gone Before: San Francisco Will Be World’s First Zero-Waste Town by 2020.” Sven Eberlein. *Alternet*, 18 Apr. 2012.
2. “San Francisco Mandatory Recycling and Composting Ordinance.” Wikipedia. Wikimedia Foundation, n.d. Web. 19 Jan. 2017.
3. “Farming Systems Trial” Rodale Institute. 1981-2011.
4. “Compost Expert Talks Soil, Wine, and Microbes.” Jake Richardson. *Sierra Club Green Home*, 13 January 2012.
5. “San Francisco on Track to Become Zero Waste City.” *PBS News Hour*. 25 January 2013.
6. “Advancing Sustainable Materials Management: 2014 Fact Sheet” U.S. Environmental Protection Agency. 2014.
7. “Residential Food Waste Collection In The U.S.” Rhodes Yepsen. *Biocycle*. January 2012.
8. “With Compost Program, Keeping Waste From Going to Waste.” Jim Dwyer. *New York Times*. May 21, 2015.
9. “Compost City: Vancouver to Ban All Food From Trash.” Remy Scalza. *Inside Vancouver*. August 2, 2014.
10. “The Universal Recycling And Composting Law.” Charlie Nardozzi. *Vermont Garden Journal*. Sep 16, 2016.
11. “Paris: une nouvelle poubelle orange servira à collecter du compost.” *BFMTV France*. Sep 11, 2016.



OHIO STADIUM GOES ZERO WASTE

Ohio Stadium is one of the largest and best-known stadiums in the country. In Autumn 2011, through the collaboration of the Department of Athletics and the Office of Energy Services and Sustainability, Ohio Stadium took bold steps to move toward Zero Waste. Zero Waste refers to diverting 90% of disposed materials away from the landfill by recycling, repurposing, and composting.



Zero Waste Station



The first objective was to minimize waste at the source by eliminating landfill products and switching to those that are compostable or recyclable.

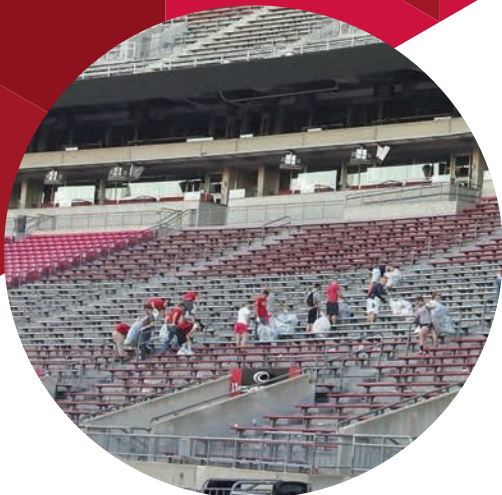
All trash cans were removed from the stadium and replaced by almost 75 Zero Waste Stations with recycling and compost bins.



At each game, up to 35 high school students are hired to assist with the program as Zero Waste Educators. They have two primary functions: to educate fans on proper disposal and to correct any cross-contamination at their Zero Waste stations. This is an innovative collaboration as students play a vital role in the Zero Waste efforts and receive exposure to sustainability, higher education and positive work ethics.

High school students hired as Zero Waste Educators to educate fans on proper disposal.





POST-GAME CLEANUP

The day after the game, the stadium is cleaned from top to bottom. The Ohio State University Naval Reserve Officer Training Corps (NROTC) program sorts the materials left in the stands. This is critical because almost 50 percent of the game day materials are left in the stands by fans. As the NROTC cleans the stands, the stadium operations staff separates the compost and recycling bags in the concourse for transportation to the processing facility.

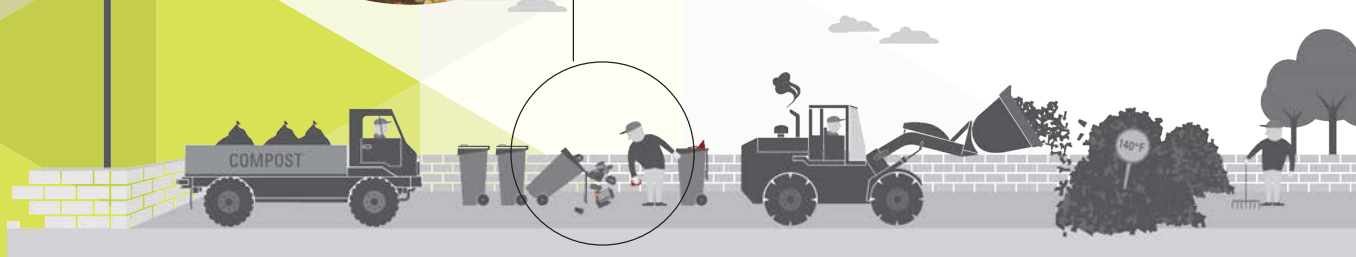
Naval ROTC cleans the stands, sorting materials into recycling and compost.



Almost 50 percent of game day materials are left in the stands by the fans.



Sifting through pre-consumer food scraps to remove contaminants.

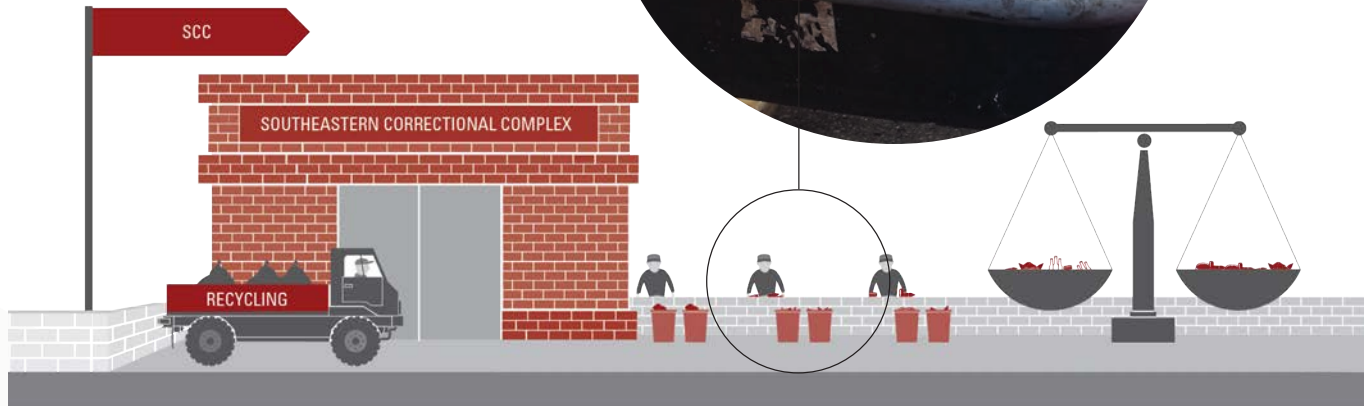


Immediately after the game, leftover pre-consumer food from the concession stand, suites, and kitchens is brought to the food concessionaire's (Levy Restaurants) warehouse. There it is evaluated for either donation or composting. Ohio State's average food donation was almost 600 pounds last season alone. The rest of the food scraps are sent to Price Farms Organics, over 7.5 tons of food scraps during the 2016 football season. There it is mixed and covered with coffee grounds and manure. The pile is turned 4-6 times to introduce oxygen, helping to reach temperatures up to 140° F, which destroys harmful bacteria.

Compost almost complete to be sold as a soil amendment mulch.



Inmates at SCC sorting recycling.



PROCESSING FACILITY

Once the stadium is cleaned, the bags of recycling and post-consumer compost are sent to the Ohio Department of Rehabilitations and Corrections' (ODRC) Southeastern Correctional Complex (SCC). Starting in 2012, SCC offered to sort the recycling as part of an initiative supporting sustainability programs at ODRC. Inmates separate materials into piles of metal, plastics, cardboard, wrappers, liners, compost, and landfill. Materials are weighed individually and sold on the recycling market, with the money being reinvested into programming for the inmates.

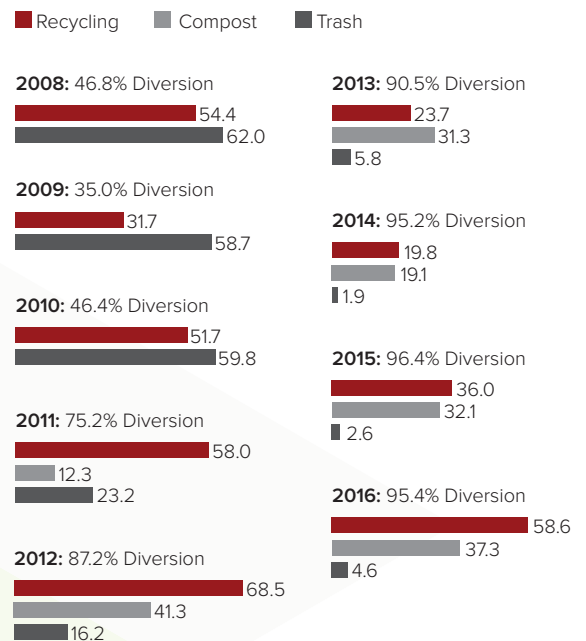
CELEBRATING A GREAT SUCCESS

Ohio Stadium is the largest stadium in the country, if not in the world, to achieve Zero Waste on a consistent basis. None of this would have been possible without the collaboration of numerous stakeholders. Through the guidance of each partners' leaders, thousands of individuals assist in setting Ohio State as the premier example of achieving Zero Waste.

The first Zero Waste game was achieved in the 2012 season and has been reached in every season after. Additionally, Ohio State has increased its diversion rate and has drastically reduced the total amount of materials disposed during games. With all this success, Ohio State has been named the Big Ten Conference Diversion Rate Champion in the Game Day Challenge, a national football recycling competition, for five straight years.

For more information, please visit fod.osu.edu/zero-waste-ohio-stadium

ZERO WASTE SEASON TOTALS (TONS)



This brochure is published here with permission from The Ohio State University.

Collegiate Zero Waste Programs Elevate Higher Education

by Karyn Kaplan
University of Oregon
Zero Waste Program
Manager



PHOTO BY DONNY ADDISON

AN AWAKENING IN HIGHER EDUCATION

In a hotel room in New Mexico, at a National Recycling Coalition conference in the early 90's, a group gathered who were working with their colleges to create and improve recycling programs. The College and University Recycling Council had been established a few years earlier at an NRC conference in Nashville. As the conversations ensued, the topic focused on how each of us started recycling programs at our schools.

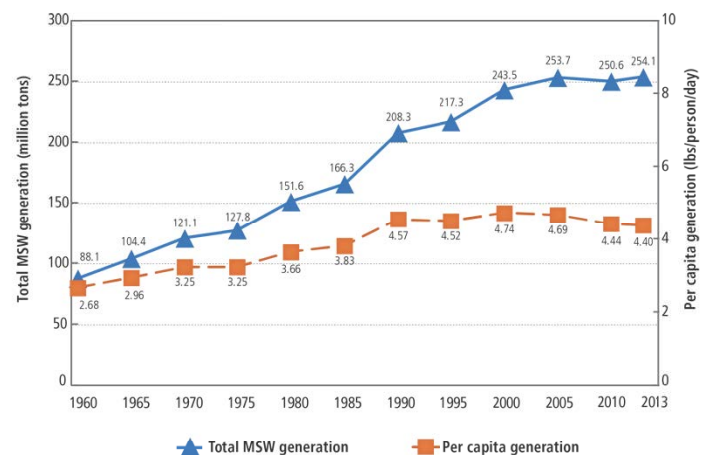
As it turned out, all of us had been students who had worked with their colleges, to implement recycling programs. Representatives gathered from University of Colorado, Vermont, Michigan, Virginia, Oregon, Georgetown, Harvard, and Yale. NRC conferences would lay the foundation and a new direction for colleges towards zero waste and sustainability. The NRC's efforts and focus on annual conferences were vital in bringing recycling to the world stage by bringing together a variety of stakeholders from government, industry, military/postal service, policy makers, municipalities, states, schools and others. The NRC was instrumental in creating a platform and network to solidify the work of colleges and universities and thus under the NRC umbrella, the College and University Recycling Caucus was established and took off running with CURC workshops being held at NRC conferences, the creation of a listserv and an active council, which additionally inspired a national collegiate recycling competition, RecycleMania, which has engaged countless colleges and over 40 million faculty, staff, administrators and students, since its inception in 2001.

OVERVIEW OF WASTE IN THE US

According to the US EPA, in 2013, Americans generated about 254 million tons of trash and recycled and composted about 87 million tons of this material, equivalent to a 34.3 percent recycling rate. Recycling and composting prevented 87.2 million tons of material from being disposed in 2013, up from 15 million tons in 1980. This prevented the release of approximately 186

million metric tons of carbon dioxide equivalent into the air in 2013—equivalent to taking more than 39 million cars off the road for a year. (<https://archive.epa.gov/epawaste/nonhaz/municipal/web/html/>)

Over the centuries, waste has become an important medium in defining cultures and uncovering history. Even in pre-industrial times, waste has been a threat to public health and an issue that has impacted societies for centuries. Though consumables and inputs have changed over time, the waste management paradigm



Waste Generation Chart from the EPA.

has evolved much more slowly. The modern day post-industrial waste management practices came forth with urbanization, but managing waste continues to be a problem that burdens our world in many ways from loss of valuable resources to being a foundation source of pollution, greenhouse gasses, public health and economic impacts. The tide is turning and now the question is being asked "Is creating and managing waste sustainable?"

Over the past 40 years, with the creation of the US Environmental Protection Agency and concern for public health,



Recycling
ONE TON of paper saves
17 mature trees
7,000 gallons of water
3 cubic yards of landfill space &
4,000 kilowatts of electricity.

That's enough energy to power the
average home for **5 months.**

 **VANGEL**
SECURE DATA DESTRUCTION AND RECYCLING
vangelinc.com

#recyclingfacts

Environmental Savings from recycling one ton of paper. IMAGE BY VANGEL INC.

resource conservation and climate change, public policy has been working to address the issue of waste and it's making a difference. The EPA has been crucial in promoting waste diversion and reduction through education, policy development, providing resources and advocacy, throughout the country. The State of Oregon created the first bottle bill in 1971, moved to create the Opportunity to Recycle Act and now is working on the Materials Management 2050 vision. Other Oregon legislation covers product take-back such as tires, light bulbs and other electronics. Other states have implemented bottle bills and recycling legislation as well. This important public policy is working and saving states money while helping to further protect resources. These are just some of the examples of how this is an important issue to the public and how public policy is helping to create solutions to waste management that include favoring conserving resources over producing waste.

According to the principle of "Natural Capitalism," (<http://www.natcap.org/>) waste is a sign of an inefficient system as in nature there is no waste, waste has no value and is a product of loss in any form of production. Even in the 21st century we are still struggling to deal with waste. Waste management is big business and a large part of our economic structure. Yet, waste is what it is-waste. It's something that takes up space, creates leaching in groundwater, pollution in the air and on the land that is costing us to deal with the impacts not only economically, but environmentally. With recycling, the model changes by reducing pollution, saving resources and turning waste into a commodity. While opponents assert that recycling is too costly, in reality waste management and disposal costs money to handle and manage disposal mechanisms, while creating nothing valuable in the process. Recycling creates value on many levels.

Modern day waste management is big business that has been evolving to a commodity, instead of a waste based model. The industry as a whole is moving towards resource recovery over producing waste. With virgin resources becoming more scarce, collecting and marketing recycled materials is creating resources and value by adding to the material that is collected. Recycling is filling an important niche of generating feedstock and closing the loop on resource extraction, while simultaneously reducing energy use. Using recovered materials instead of mining virgin materials saves money and uses less energy to produce new consumer goods. Recycling is good for business and the consumer. Taking it to the level of zero waste, everything is treated as a discard, something that serves as a resource.

CREATING JOBS

America's recycling and reuse activities accounted for 757,000 jobs, produced \$36.6 billion in wages and generated \$6.7 billion in tax revenues in 2007, based on the most recent census data. This equates to 1.57 jobs for every 1,000 tons of materials recycled. For this update, the Agency used a revised waste input-output methodology that focuses on the life cycle of materials, and defining recycling.

"Recycling is not only an asset to our environmental and social goals, but a boost to our economy," said Mathy Stanislaus, Assistant Administrator to the Office of Land and Emergency Management. "America's great strides toward prioritizing recycling are evident. We've educated our communities, citizens and businesses to recycle more, quadrupling our recycling rate since 1976 and creating a more sustainable world." (<https://www.epa.gov/newsreleases/epa-celebrates-america-recycles-day-and-750000-jobs-supported-recycling>)



Bottle and can recycling after end of the year move-outs. David Buchan and Stephanie Granthier from the UO Zero Waste Program. PHOTO BY JEFF ZIGLINSKI



BACK TO COLLEGE

College campuses have been dabbling in recycling collection for decades but now, more than ever, colleges and universities are embracing waste reduction, recycling, composting and moving towards zero waste systems. These efforts are being carried forth and modelled in communities as students take this knowledge and experience back into the world. Graduates are transforming waste management in their homes, communities, at their jobs, in their businesses and creating public policy that is looking to preserve valuable resources for generations to come. Colleges are vital in demonstrating successful environmental practices and thus raise the bar for the rest of us in all aspects of our society. Collegiate recycling/zero waste programs are laying the foundation for Sustainability. Fast forward to 25+years since that time in the hotel room and there are now thousands of institutions of higher education that have embraced waste reduction and recovery while collegiate sustainability efforts are being built off of this momentum. Sustainable waste management programs that favor zero waste, are becoming the new paradigm for collegiate campus operations and paving the way for communities to follow suit.

Many organizations have evolved because of the movement towards zero waste and are growing to highlight the work with recycling, composting, waste reduction and zero waste. The US Zero Waste Business Council, National Recycling Coalition, US Composting Council, College and University Recycling Coalition, the US Zero Waste Business Council College and University Technical Council, the Association for the Advancement of Sustainability in Higher Education, Solid Waste Association of North America, Keep America Beautiful and the US Green Building Council are among the most prominent organizations that are working on waste related issues especially affecting higher education. Most states have a State Recycling Organization which also is fostering legislation, best practices, community involvement and efforts in schools and institutions of higher education. Industry is setting new standards and policy makers are taking steps to further address production and disposal. The State of Oregon, is working on a 2050 Materials Management Vision with conservation of resources and zero waste practices as core principles.

FROM RECYCLING TO ZERO WASTE

Recycling has been around for centuries and during times of resource scarcity, it has been an important practice to help get through lean times. Recycling is the act of collecting a material, either from the industrial process or from post-consumption and turning it back into a feedstock for new consumer goods. A large percentage of waste generated can be recycled but not all. Composting is a natural process that is a building block of nature. Farmers especially, have been practicing composting as part of their food production, land management and conservation of resources. More recently, compost processors have been evolving and are taking industrial, commercial and residential food waste and turning it into soil, ground cover and other material that can

be used as soil amendment. Additionally, there has been a focus on compostable food ware, from plates to utensils, that is now available for single use applications that can be recovered in a composting processing operation.

With waste reduction, recycling, composting and reuse/repair, zero waste is becoming more of a viable goal. Additional work is being done to determine best practices for managing the hard to recover materials that are holding us back from being able to achieve 100% zero waste, while currently 90% can be diverted through many options currently available. San Francisco, Seattle and Portland are some of the examples of cities that have high diversion rates of 60-85% while continuing to focus on the goal of no waste. As waste production is tied to purchase and policies, cities are going through every aspect of infrastructure to address waste production and it's not only saving resources but saving financially. For example, the City of San Francisco banned bottled water at any city meeting, which reduced countless plastic bottles from being produced and saves the city an average of \$500,000 annually. Now they are working on banning the sale of bottled water on any city property. These types of actions are being implemented in cities and towns such as Seattle and Concord, Massachusetts. Waste reduction and diversion yields notable benefits.

FROM RECYCLING TO ZERO WASTE, A CASE STUDY FROM THE UNIVERSITY OF OREGON

The University of Oregon's Zero Waste Program turns 26 in March 2017. What started as a student effort to get recycling into the day to day operations at the University, laid the foundation for the campus core values of sustainability. Started as a student based initiative, the University of Oregon's Campus Recycling Program started from a small group of students from a student environmental group which was comprised of student activists and students in an "Introduction to Environmental Studies" class in 1988. After decades of efforts to capture recyclables and reduce waste, compost became a viable possibility taking these efforts to a new goal of zero waste. In 2012, when composting became viable, the UO Campus Recycling Program was re-branded to the UO Zero Waste Program in 2012. The program was started from students and has grown to be one of the largest employers of students on campus. This alone creates a major benefit to a college. Currently the program employs 1 Program Manager, 2 Operations/Administrative Managers, 2 Zero Waste Coordinators (materials), 1 Compost/Zero Waste Events Coordinator and 1 Marketing Coordinator and approximately 50 student employees.

The program is multi-funded through the following mechanisms:

- Administration
- Student Government
- Materials Revenue-recently this money is put in an income account and is no longer used to fund the program. Additionally, the administration understands

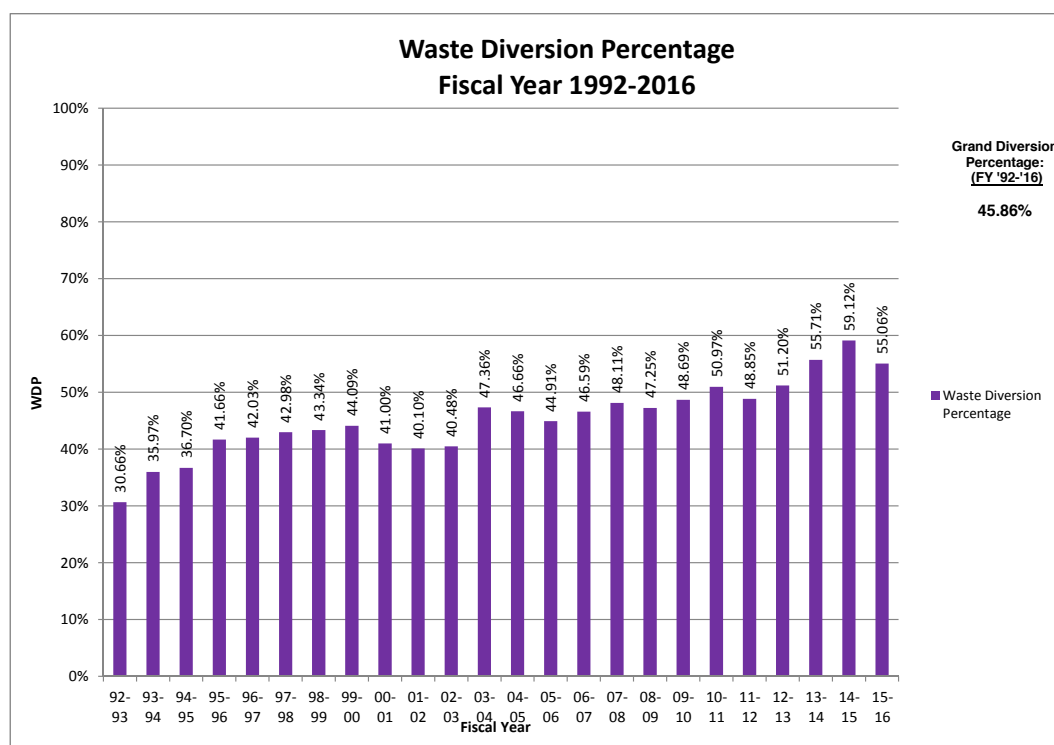
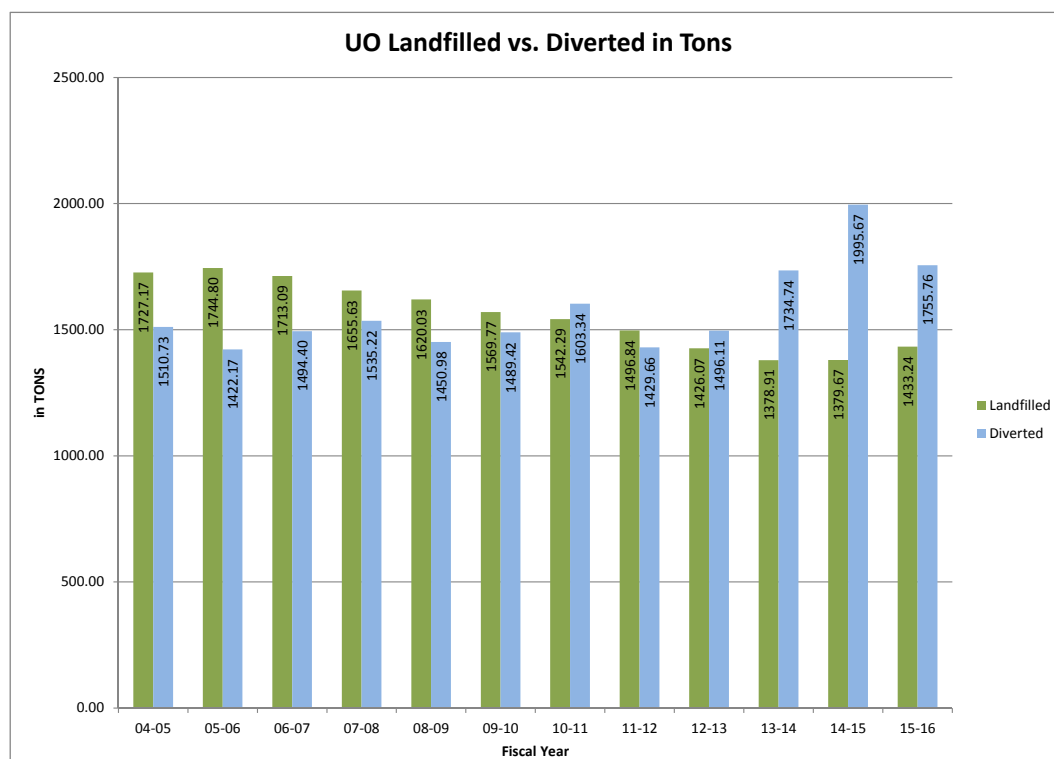


that there are direct cost savings from not handling material as garbage. Cost avoidance and revenue are key components of justification for zero waste efforts. If material wasn't recovered, it would increase the burden on handling material as waste.

extensive tracking systems, working with other colleges on best practices, is all essential to a successful Zero Waste Program and Sustainable Waste Management effort. Property Management is in the Business Office and Surplus Property is operated by the Central Support Team from Facilities.

- Campus Vending Contract
- Charge-outs to campus auxiliaries (Housing, Athletics, Student Union)
- Grants have been looked at for funding equipment but to no avail. The program maintains a university foundation account where people can donate to the program. Being an operational function, it is difficult to find outside monies to assist with any aspect of the program.

Unlike most colleges the University of Oregon Zero Waste Program was founded, and continues to operate as a stand-alone program. Though this is not ideal, it is often how programs need to evolve to become successful operations within a university. It also gives the program full ownership of the operations, which maximizes the outcome from this important work. The Custodians handle the inside building waste collection (including landfill materials found at the Zero Waste sites), the Garbage Services handles the outside building dumpsters, the Exterior Team handles the outdoor garbage cans and the UO Zero Waste Program handles recycling and composting inside buildings and out and much more. Innovating and implementing waste reduction programs, performing outreach, engaging in networking, participating in committee work, developing campus policies, involvement in public policy, working with academic courses, maintaining



University of Oregon waste stream tracking.

CHARTS BY CIMMERON GILLESPIE



This is unique in that many campuses have the custodians handle all the building waste including recycling and composting. Many programs handle all parts of the waste management. It varies from school to school depending on the organizational structure of the college or university. As the recovery and diversion rates have trended over 50% in the past 5 years, the UO Zero Waste Program is working to incorporate Garbage Services by 2020. Additionally, there is new reason to look at the waste stream in a holistic manner and consolidate functions. As the UO has steadily been recovering over 50% of the waste stream, it is now a good time to look at the total waste collection on campus. Ideally, the more that is recovered, the less materials are being handled by areas collecting and disposing of waste. Managing the campus waste as a system is an opportunity to reduce costs, streamline operations and engage the public while accomplishing sustainability goals that reduce greenhouse gas production and integrate sustainable practices into collegiate facilities.

At the University of Oregon, the Zero Waste Program has implemented over 2000 pick-up points, in public, office and outside building locations that contain over 5000 collection bins. For public sites, the program has evolved to a dual stream system where compost is determined by material generation. Each public “zero waste site” has collection for paper, cartons, glass, metal, plastic and landfill. Due to fire code, cardboard must be transported to outside cardboard cages. Composting is done in all campus kitchens and food service outlets behind the scenes (pre-consumer materials) and there is collection available to the public at all campus food service locations. The Program has an opt-in service for zero waste services at campus catered events and campus conferences/fairs/commencement and other events. Campus Housing is a partner in zero waste and all new students receive an in-room residence hall bin that they service to central waste collection areas. The UO Zero Waste Program works to capture and reduce waste generated from move-in and move-out days while managing a campus Reusable Office Supply Program, a mug/beverage container/ bottle capture program where these are washed and given away at drop locations and at campus events. The Program does trainings with kitchen staff, stations educational monitors at key sites to help engage the public, and incorporates zero waste information into all new employee and student orientation. Zero Waste is an important part of day to day life on campus.

The Program maintains detailed tracking records that record: all materials (including waste, recycling, composting and other materials) that are disposed of generated from UO general fee funded areas; tallies from individual areas; analyses of labor distribution; cost savings and revenue, among other records as needed. The Program achieved a 55% recovery in FY 16 and a 59% recovery in FY15. A report is produced annually and allows an analysis of the recovery rate. The important thing to note is that the trend is upwards and has been over 50% the past 5 years with demonstrated growth in public efforts on diversion and reduction.

ZERO WASTE EXTENDS TO ALL AREAS OF CAMPUS

Colleges around the country, including the University of Oregon, are taking creative steps to put zero waste on the forefront of a sustainable campus. Here are some projects that have been successfully implemented at the University of Oregon and on other campuses:

- Zero Waste Football and Basketball Games
- Business partnerships with vendors to give-away free filtered water bottles and revenue from campus sales of these go back to Zero Waste Program
- Green fees from students to fund sustainability projects including zero waste
- Studies on purchasing inputs, work with manufacturers on packaging reduction
- College classes that assign projects such as: Go Plastic Free for a week; carry your garbage with you for a week; development of advertising and social media campaigns and competitions to promote waste reduction; waste audits; assignments on the life of a consumer good
- Incorporating zero waste practices into LEED building certifications
- Creating campus contracts and policies on materials management (purchasing reduction and vendor take-back programs)
- Creating a listserv to communicate to campus on all aspects of Zero Waste operations, education, administration
- Reusable Office Supply Exchanges
- Repair Fairs
- Reuse and Free Stores that help low income students
- Mug/beverage container take back to be washed and re-distributed as give aways
- Trayless dining
- In-room Residence Hall recycling and composting bins
- Move-in and Move-out material and reusables capture program
- Re-sale programs for materials captured in move-outs
- Campus yard sales for students
- Issuing all new students refillable mugs/water bottles, pared with eliminating disposable cups from Residence Hall cafeterias
- To-go food rental boxes
- Food donation programs for cooked but not served food
- Refillable discounts to encourage refillable mug/beverage container use
- Reuse workshops-art from reusable materials
- Student Sustainability Fairs, Earthweek, RecycleMania and America Recycles Day events
- Landfill Cemetery displays
- Water refill stations, bottled water bans
- Greek Houses Zero Waste Certification and Green Practices program
- Many colleges have built their own facilities, sorting systems and material recovery facilities
- Many colleges have built in-house composting operations which close the loop as the end product is used on campus as soil amendment and ground cover, that saves money and reduces pesticide use
- The USZWBC created certifications for campus buildings that is just starting. 90% diversion rates for buildings is the goal for certification

The University of California System set a zero waste goal for all state colleges and universities by 2020 There are countless innovative projects and programs that colleges are embarking on to engage the public in waste reduction and zero waste efforts, while creating assets in all aspects of college academics, operations and administration.



Other complimentary waste diversion/reduction programs not directly run by the UO Zero Waste Program include:

- surplus properties (including electronics recovery) and the reusable furniture program
- off campus building recycling and waste reduction
- Athletics zero waste
- Environmental Health and Safety

The important thing to note is that, as with the UO Zero Waste Program, waste diversion/recovery programs are organizationally challenged in that they perform a different mission than traditional shops that perform maintenance functions, yet often fall under the Facilities organization. Some programs fall under the Purchasing arm of the college. Being under Purchasing or Administration is a forward-thinking organizational structure in that purchasing manages inputs and zero waste programs (that incorporate solid waste operations) manage outputs. This is a materials management paradigm. Due to the focus and nature of Zero Waste Programs, which are concentrated on operations, it is not a good fit generally, to house Waste Management of any degree, under an Office of Sustainability. Sustainability Programs on campus are heavily administrative and are not involved in day to day operational functions. However, it is key for Sustainability functions to partner with Zero Waste and campus waste management programs, thus housing Zero Waste under Facilities or Purchasing is an important fit and organizational arrangement.

In addition to day to day Operations, Zero Waste Programs (including the University of Oregon), perform other functions such as: material and collection tracking, identifying waste reduction opportunities through waste audits, strategy and long range planning, committee involvement, work with campus construction projects on zero waste equipment and implementation, education/marketing/social networking, academic engagement (using the program as an incubator for hands-on experiences), work with other colleges, networking, creating and giving presentations/tours/workshops/webinars, development of toolkits/training videos/informational “how to” and program videos, involvement with local, state, national work on policy, research on markets/trends/economics/new product development and identifying best practices and moving zero waste to a higher level in society. The program also serves as a resource for the campus, local, state and national community through development of resources, an extensive website and regular volunteer opportunities that are open to the public.

MOVING TOWARDS A ZERO WASTE CAMPUS

The UO Program started in 1991 and due to lack of funding, purchased 20 gallon galvanized garbage cans for collection. These currently make up the majority of the collection equipment. Grants and funding have been sought for the life of



Azul Dahlstrom-Eckman, Student employee at UO Zero Waste Program, and the Bottled Water Waterfall display. PHOTO BY ROBYN HATHCOCK

the program, to upgrade equipment but to no avail. Zero waste is represented in the campus construction standards and has been an important mechanism in moving the program forward. The goal is to identify small amounts of money annually to phase out the galvanized garbage cans and implement aesthetically pleasing collection equipment.

With a small investment, the Program started a zero waste pilot project in 2 buildings in 2014. The project involved implementing zero waste stations, providing desk siders for building occupants- where individuals would now be responsible to centralize waste to zero waste sites thus eliminating the custodial desk side service of waste. Ideally, this includes elimination of stand-alone garbage cans, which is slowly being looked at as the program is in the process of upgrading sites, consolidating materials collection and upgrading signage to new zero waste signs.



This is currently the direction of the UO Zero Waste Program. With that, the program offers a voluntary composting program where individuals or departments can collect compost, but it must be hauled to a loading dock compost toter. This has helped enculturate the campus to participate in composting and also provide a mechanism for participation.

The Zero Waste effort began with including composting at all zero waste sites, but this became unwieldy to service as compost collection requires more frequency than a building might need. It was scaled back and now composting is implemented strategically but composting is the area of the largest growth in material collection. The UO Zero Waste Program is continuously seeking improvement and opportunities for diversion, waste reduction and efficiencies.

USING CAMPUS CONSTRUCTION STANDARDS

The program has been successful in using the Campus Construction Standard Specifications to help grow the program and to include equipment costs in building new construction and remodeling projects. With new and improved facilities, buildings are embracing an opportunity to get rid of the original garbage can equipment and implement more aesthetically pleasing containers. The program has identified a variety of zero waste units and collection equipment that gives the building users and construction projects an opportunity to have a choice. This has been working well as over 10 buildings now have implemented zero waste systems.

This process also has allowed for specifications to be added that include other waste reduction opportunities such as: refill spouts on drinking fountains, sinks for cleaning mugs for reuse and installation of hand dryers. The Program is engaged in every aspect of campus and is always looking to participate in campus work to help facilitate waste reduction. The campus construction process has been an excellent vehicle to raise the bar, further engage decision makers with zero waste and create a more aesthetically pleasing system that engages participation.



Marissa Ryals finishing residence hall bin cleaning for re-distribution. PHOTO BY JEFF ZIGLINSKI



Alex Fallenstedt in Zero Waste material processing area. PHOTO BY JEFF ZIGLINSKI

BENEFITS TO COLLEGES

Sustainable waste management paradigms on college campuses are demonstrating far reaching benefits and results. Cost avoidance from handling materials as garbage, savings from waste reduction efforts in reusable office surplus, reusable office supply rooms and material revenues, demonstrate economic viability of recycling, composting and zero waste efforts on college campuses. With just managing garbage, there are tipping fees, whereas there are markets for recyclable materials.

These programs employ students providing jobs for them by providing an experiential job and an opportunity to gain real life skills. Academic classes use these programs as opportunities to enhance education through demonstrating viable business models and living laboratories. Students come and do tours and use the program as a case study and opportunity to learn about waste generation and sustainable practices for managing waste. The UO Zero Waste Program offers additional volunteer opportunities and academic internships as well.

Zero Waste Programs are making a notable impact in reducing GHG production and maximizing precious resources, which for campuses includes financial best practices and labor as well.

IN SUMMARY BEST PRACTICES

- find a supportive home for this effort
- analyze current cost of handling waste as a whole process and determine options for collecting, processing and marketing all areas of waste production- there are many options- contracting? Single stream? Dual enhanced stream? Baling? Waste is big business and there are many directions to maximize income and reduce costs



- organize or partner all aspects of waste such that custodians handle inside recycling, composting and landfill collections, with the Zero Waste Program handling the marketing of materials/education/administration of the Zero Waste portion and managing the garbage services
- create a logo, use academic classes to help develop logo, social marketing, analysis of waste stream-a college has a large population of students looking for hands on opportunities that can be valuable to the college
- market, promote, educate, gain media attention as is possible
- implement programs such as: zero waste events, refill discounts, refill water stations, reusable mug collection and programs
- ensure reuse opportunities such as reusable office supply exchange, surplus office equipment etc....
- create a listserv to communicate with departments and building managers
- work with all food service locations to: buy in bulk, eliminate disposable cups (give all new students a refillable mug and water bottle), consider rentable to-go containers
- ensure campus catered events have zero waste services built into the event
- work with printing and mailing services on: standardizing use of maximize post-consumer paper, double-sided copying and soy based inks, reducing unsolicited bulk mail, reduce fliers sent to campus
- work with purchasing on vendor take back programs and create contracts that favor reduced waste production
- consider adding zero waste equipment and systems to campus construction standards

- create campus paper use policy and campus environmental policy
- implement voluntary composting program where people can participate and get buy in to add composting
- Treat waste management as a business to maximize revenue and marketing of materials
- Network with other schools, join CURC and the Recyc-L listserv
- Attend conferences and workshops with other schools to learn best practices and to stay informed on the industry
- Form partnerships, share resources, build bridges

Since the time in the hotel room in New Mexico, there have been thousands of emails, discussions and meetings in hotel rooms at conferences around the world. From what started as a grassroots effort on a few college campuses has grown into a new paradigm for waste management, being embraced at colleges, in local communities, throughout the United States and worldwide. The stakeholders are all of us and we are citizens, college students, administrators, industry, legislators, manufacturers, industry, sustainability professionals, the list is endless. The conversations continue with the young inspired recyclers, aging gracefully with a little gray that comes with wisdom, determination and dedication to a better world, one that provides clean air, clean water and healthy land, for all of us. I am so thankful for an amazing community and I am glad to welcome you into this conversation.

“Never doubt that a small group of thoughtful, committed, citizens can change the world. Indeed, it is the only thing that ever has.” – Margaret Mead

Karyn Kaplan is the Zero Waste Program Manager at the University of Oregon.

RESOURCES

The University of Oregon has an extensive website and has co-authored a book, a Zero Waste Campus Toolkit. The Program has created training videos and educational media which has been widely received and modelled at other campuses. The Zero Waste Campus Toolkit has become an important guiding document in moving the University of Oregon towards Zero Waste. The Zero Waste Campus Toolkit has additional resources listed that might not be on this list.



The UO Zero Waste Student Crew at a Crew meeting.

PHOTO BY KARYN KAPLAN



Resources from the University of Oregon

UO Zero Waste Program Webpage - zerowaste.uoregon.edu

How to Use the UO Zero Waste System - <https://youtu.be/zmIF5IFnSKw>

Recycling and Beyond: A College Campus Primer (co-authored by Christine Cooley from Medical University of South Carolina and Karyn Kaplan, University of Oregon Zero Waste Program Manager) - <http://recycle.uoregon.edu/Book/index.htm>

University of Oregon's Greeks Go Green Program - <http://recycle.uoregon.edu/PDFdocuments/Program%20Binder%209-23-2016.pdf>

UO Zero Waste Program Facebook Page - <https://www.facebook.com/UO-Zero-Waste-Program-214823355233580/>

UO Zero Waste Program Student Employee Training video - <http://youtu.be/XQHQJJzldbA>

UO Zero Waste Program You Tube Channel - <https://www.youtube.com/user/UOCampusRecycling>

UO Zero Waste Program Materials Handling List - <http://recycle.uoregon.edu/Material.htm>

Zero Waste Campus Toolkit - http://recycle.uoregon.edu/ZWCampusToolKit_text.htm

Join In-Networking And Training Resources

College and University Recycling Coalition - <http://curc3r.org/>

National Recycling Coalition - <http://nrcrecycles.org/>

Recyc-L (free listserv) - <http://curc3r.org/resources/recyc-l-listserv/>

RecycleMania - Recyclemaniacs.org

USZWBCUTC - <https://uszwbc.org/about-uszwbc/zwcutc/>

Other Resources

EPA Waste Wise - <https://www.epa.gov/smm/wastewise>

Natural Capitalism - <http://www.natcap.org/>

Oregon's Materials Management Vision 2050 - <http://www.deq.state.or.us/lq/pubs/docs/sw/2050vision/MaterialsManagementinOregon.pdf>

Oregon's Materials Management Division - <http://www.oregon.gov/deq/LQ/Pages/SW/MaterialsManagement.aspx>

University of California Berkeley - <http://sustainability.berkeley.edu/waste>

University of California's Zero Waste Goal - <http://ucop.edu/sustainability/programs-initiatives/zero-waste/index.html>



Zero Waste: A Realistic Sustainability Program for Schools

by Kary Schumpert and Cyndra Dietz

Take a look behind most schools and you'll see dumpsters full of plastic bags of classroom paper, discarded cafeteria food, milk cartons and paper towels. Day-to-day operations in a typical school require lots of resources, very little of which gets reused, reclaimed or recycled.

Visit one of the 43 Eco-Cycle Green Star Schools (18,000 students and staff) in Boulder County, Colorado, and the story is different. Hallways and classrooms are still bustling, but outside you find dumpsters not only for garbage, but for compost and recycling. More than likely the trash container is less than half full while the compost and recycling containers are brimming. How is that possible?

From Recycling to Zero Waste

Eco-Cycle, one of the nation's oldest and largest non-profit recycling organizations, has coordinated recycling services and environmental education programs to the two area public school districts (80 schools) since 1987. In 2005, Eco-Cycle launched the Green Stars Schools program in four pilot elementary schools with the goal of moving these schools to Zero Waste. This award-winning project includes four main components:

1. increased recycling of commingled containers, paper and cardboard
2. composting of food waste and non-recyclable paper from all areas of school (kitchens, cafeterias, classrooms, bathrooms and offices)

3. special waste-reduction projects
4. extensive staff training and environmental education for students

With these steps, schools have been able to reduce their waste by as much as two-thirds. Unlike other programs where only cafeteria waste is targeted, the Green Star model is the first in the nation to recycle and compost waste from all areas of the school. Waste reduction projects and extensive training/education also set the program apart.

Phases to Success

The program has three phases. The first phase, including the following, is completed in the semester prior to the school's kick-off:

1. meet with principal and staff to ensure adequate support of the program
2. establish a student group (class of a supportive teacher, student council or eco-club)
3. perform a school waste audit to see what types of waste can be diverted

The second phase involves a high degree of training and education. The entire school community is involved. All-school kick-off assemblies, the setting up of containers for compost and recycling, classroom and staff trainings and lunchroom monitoring are all done in the second semester of each school's involvement.

The third and last phase ensures that the program is ongoing. To keep student enthusiasm high and school staff supportive, education is crucial. Offering a variety of ongoing benefits is key to keeping schools involved. These benefits include:

1. restart assemblies, classroom refreshers and faculty retraining
2. newsletter distribution to share innovative ideas between schools.
3. classroom clean-out events to recycle and reuse excess school supplies at the end of the year
4. waste-free lunch promotions (tips, signs and announcements) to encourage waste-reduction in the lunch room (promoting reusable lunch bags and containers, etc.)
5. assistance in coordinating Zero Waste all-school events, such as pancake breakfasts, school carnivals and dances
6. promotion of the schools' efforts with website links, newspaper ads, signage and banners
7. a five-year anniversary celebration that includes award assemblies, lunchroom monitoring, classroom trainings, and reuse craft projects and prizes for students

The Green Star model has been successful due to the partnership between Eco-Cycle and the two local school districts. However, most school districts don't have an award-winning nonprofit to implement a comprehensive Zero Waste program for them. What then?



Cyndra Dietz, Eco-Cycle's Program Director, recommends implementing any program in phases. "It's always a good idea to take stock of what is happening in your school and district and then move in stages. Start with waste reduction. These are projects that can work for schools and communities of any size. If recycling programs exist locally, but aren't implemented in the schools, explore options to begin recycling. Lastly, look at composting and see what collection services are in your area."

"No matter what project your school is working on, it's important to include education. Focus completely on operations and the project will fail. Effective education and training ensures that materials will have less contamination and the program will be around for the long-term, not just until the initial excitement dies down."

Waste Reduction, the Frontline

Zero Waste cannot happen without recycling and composting. However, waste reduction efforts can be implemented in any school or community, even when recycling and compost facilities are not available.

The cafeteria is the site of much school waste. Eco-Cycle works extensively with local school districts to phase out disposable paper and polystyrene plates, cups and trays, and to move district-wide to durable, washable alternatives. One district has moved to bulk milk machines and washable glasses to avoid the waste from paper milk cartons. Other efforts can be implemented on many levels:

1. purchasing practices (school and district) to buy more recycled, reusable and recyclable products
2. Waste-free lunch promotions for students and staff who bring lunch to school. Encouraging students to eat their food and simple reminders like "take only one napkin" can make a difference.
3. classroom tips (such as using both sides of paper, and having an area for scrap paper for writing assignments and craft/art projects) give teachers and students ownership.
4. donations (from parents and restaurants) of used cutlery, cups and plates for classroom parties and cafeteria use. Parent volunteers can take the classroom kit home after the party to wash and return the next school day.

Getting Started with Recycling

Beginning a new recycling program, or invigorating an old one, can reduce waste by up to one-third. Here are some recommended first steps:

Contact local waste haulers and municipalities to find out what recycling options exist.



Monitor current waste levels and, after implementation, reduce trash service (fewer collection days and/or smaller dumpsters). Savings in trash service will help fund the recycling.

Establish consistent signage, colors and containers to make recycling recognizable throughout the building.

Include ongoing education of teachers, students, custodians and administration.

Why compost?

As schools look at “greening” their practices and shrinking their environmental footprints, the collection of compostable materials can help to accomplish these goals. In addition, school composting provides endless educational opportunities and can be tied in with the growing popularity of school gardens.

Composting has the potential to reduce waste in schools by significant amounts. Various estimates show that organics

(food, yard waste and non-recyclable paper) comprise as much as twenty to thirty-five percent of discarded waste. Adding compost collections to an existing recycling program is often the next logical step in waste reduction efforts, but compost programs can also be successful in areas where recycling facilities don’t exist. The beauty of composting is that there are several methods that can work for a variety of budgets, and for different administrative or educational priorities. These include composting with worms, schoolyard composting and large-scale collection of compost.

Working with worms

Vermicomposting, or composting with worms, is an easy method for teachers and students to do in the classroom. All that is needed is a small bin (wooden or plastic) no larger than 36 inches (length) x 24 inches (width) x 18 inches (height), a pound or two of red worms and some ripped-up newspaper for bedding. The resulting compost is wonderful fertilizer for classroom or home use. The worms also lend themselves to numerous math and science activities.

Things to consider:

- **Make sure the worms are *Eisenia fetida*** (commonly known as red wigglers), because a different species of worm won’t work very well. Check with local garden supply stores and bait shops or search online. There are several online suppliers.
- **Make sure to have an ongoing supply of bedding.** Ripped-up newspaper (in strips 2-4 inches wide) is a readily available source that works well, but leaves and gardening soil can also be used.
- **Measure the waste going into the bin.** Stick to fruits, vegetables and small bits of used paper towels. A pound of worms can eat approximately 3-4 pounds

COMPOST PROGRAM OPTIONS

Composting with worms	<p>Uses small-scale classroom-based bins</p> <p>Produces small amounts of compost</p> <p>Composts small amounts of fruit, veggies, bread, and paper towels</p> <p>Requires maintenance, but little coordination with rest of school</p> <p>Is great for classroom-based curricula, variety of ages</p> <p>Can be done year-round</p>
Schoolyard composting	<p>Can be done on a small scale or medium scale</p> <p>Requires outside space and maintenance</p> <p>Can be tied to and used with school garden</p> <p>Needs established leader/group for maintenance</p> <p>Composts small to large amounts of fruit, veggies, bread, and paper towels</p> <p>Can be affected by weather and change of seasons</p>
Large-scale composting (off-site)	<p>Diverts a large amount of waste</p> <p>Requires hauling away from school</p> <p>Requires in-school coordination for maintaining and emptying compost containers</p> <p>Has potential for composting all food waste, yard waste, and nonrecyclable paper</p> <p>Can be done year-round</p>

of food in a week, but it takes time for the food to be digested by the worms.

- **Bury the food scraps and prevent pests.** Keeping a close eye on the worms and how much they are being fed will help to maintain a pest-free bin and classroom. Start a fruit fly trap as a preemptive measure with a funnel, small plastic container and vinegar.
- **Read *Worms Eat My Garbage* and *Worms Eat Our Garbage*** (curriculum), both by Mary Appelhof, for in-depth tips and classroom activities.

Schoolyard composting

Schoolyard composting is similar to backyard composting. There are a variety of outdoor methods and bins which may be used. This can be small-scale where one or two classes contribute food waste, or larger scale where waste from the cafeteria and classrooms is collected for on-site composting.

Things to consider:

- If the school has a garden, work with the gardeners to establish a compost site nearby.
- Almost every community has a composting expert. Recruit a parent or community expert to help.
- Decide on the scale – is the entire school participating or just one or two classrooms?
- Consider the project site, local climate and scale to choose a bin or multiple bin system. Bins can be constructed or purchased from hardware or garden supply stores.
- Establish a collection system inside the school (see below).
- Establish a teacher and student group to be in charge. Composting is often a favorite project for parent volunteers.

Large-scale composting

Large-scale composting is increasingly available as more communities add composting collection to their waste and recycling programs. Schools in these communities can take advantage of local infrastructure and hire a local company to haul away the compostables for processing at a large-scale facility. Trash will be reduced and trash hauling fees can be cut by 30% or more to compensate for this cost. The big advantage to this method is that large amounts of food-waste, non-recyclable paper and yard waste can be collected and composted, quickly and efficiently.

Things to consider:

- Check with school's current garbage (and recycling) hauler to see if they offer the service of collecting and hauling compost.
- Inquire if there are community-sponsored compost collection programs available. There may be a way that the school can be included.
- Inside the school, be sure to use consistent signage and color for collection containers. Colors and shapes that differentiate from trash and recycling containers will help to reduce contamination.
- Check that compost containers in classrooms get emptied often. Set up a system so that students and teachers deliver compost to a designated larger bin to cut down on custodial time. Non-recyclable paper (tissues, paper towels, construction paper, etc.) and food waste can be collected in the classroom.
- Set up collection in the cafeteria. Work with cafeteria staff and custodians to set up a waste station, so that students now dump food waste and napkins into the compost bin instead of the trash.



- Bathroom trash containers can be replaced with compost bins, because most bathroom trash is paper towel waste (use separate trash bins for sanitary products).
- Use ongoing training to motivate student and staff involvement and to lower contamination.
- Have a student group lead waste audits to keep track of school progress and to promote successes and where improvements are needed.

Keeping Compost Clean: What to Include and What to Keep Out.

When establishing a school compost program, it is very important to promote clear and easy-to-understand guidelines for which materials are and are not accepted. Compost collection programs are gaining in popularity and participation throughout the U.S. It has become increasingly important to insure that the materials collected are truly compostable so that the finished compost does not contain contaminants that will be distributed into the greater environment when the compost is applied to soil.

1. Collected compostables should consist only of food waste, non-recyclable paper and yard waste. All metal, glass and plastic must be kept out of the compost.
2. Plastic-coated paper products such as paper plates, bowls, cups and milk cartons must be kept out. Recent studies have shown that they produce non-biodegradable micro-plastic fragments that contaminate finished compost. Micro-plastic fragments are known to be an increasing source of plastic pollution in the environment, with potentially harmful effects on living organisms.
3. Non-coated paper plates and plates, cups, bowls and flatware made from (or coated with) plant-derived materials, that are certified as compostable, can be collected.
4. Purchase only compostable paper and plastic food-service ware (including cutlery) that have been certified by the Biodegradable Products Institute. This organization uses international standards to certify products. Their website (www.bpiworld.org) is the best way to ensure that the products you purchase are truly compostable.
5. Beware of purchasing oxo-degradable plastic products (foam plates, cups and trays, plastic bags, plastic films) that are marketed as degradable. They do not meet international certification or BPI standards for compostability.

6. Visit www.ecocycle.org/microplasticsincompost for more information on micro-plastics, oxo-degradables and guidelines for choosing certified compostable food-service ware.

Kary Schumpert is an environmental educator at Eco-Cycle in Boulder, Colorado. Email: Kary@ecocycle.org

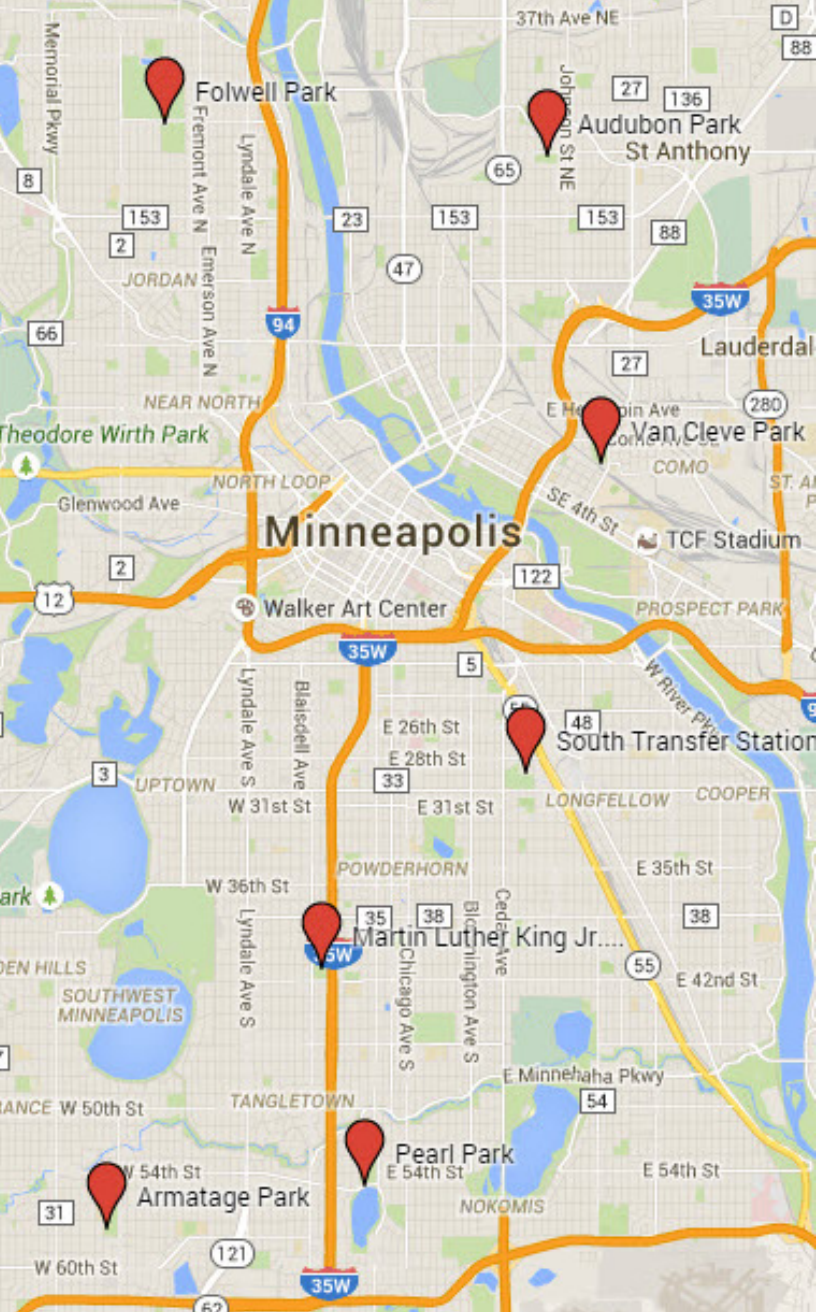
Cyndra Dietz is program manager for the Boulder (Colorado) County School Recycling and Environmental Education Program, Eco-Cycle. Email: cld@ecocycle.org

References

- The Complete Book of Composting (various editions) by R. I. Rodale (Rodale Press)
- Worms Eat My Garbage by Mary Appelhof (Flowerfield Enterprises) (www.wormwoman.com)
- Worms Eat Our Garbage (curriculum guide) by Mary Appelhof (Flowerfield Enterprises) (www.wormwoman.com)
- Microplastics in Compost, www.ecocycle.org/microplasticsincompost/ Micro-plastics, oxo-degradables, guidelines for purchasing compostable food-service ware
- Biodegradable Plastics Institute, www.bpiworld.org
- Eco-Cycle Zero Waste programs, www.ecocycle.org, Cyndra Dietz, 303-444-6634

Resources

- Contact Cyndra Dietz at Eco-Cycle: cld@ecocycle.org, 303-444-6634, X122
- www.ecocycle.org/atschool/ For information on Eco-Cycle's Green Star Schools program
- www.ecocycle.org/microplasticsincompost For information on Eco-Cycle's research on micro-plastics in compost
- <http://www.bpiworld.org/BPI-Public/Approved/1.html> For information on the Biodegradable Products Institute list of certified compostable items

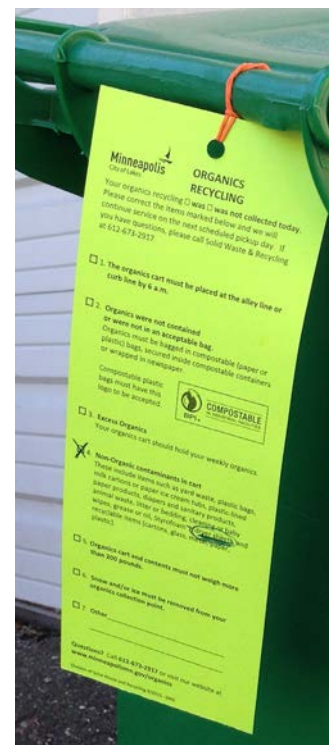


Minneapolis Organics Recycling – from pilot to drop-off to citywide collection

by Kellie Kish
Recycling Coordinator,
Minneapolis Solid Waste & Recycling

collectors look in each and every cart prior to emptying them to survey the contents. If there is contamination in a recycling or organics recycling cart or illegal materials are found in the garbage cart, crews will leave the cart, contents and all, and will hang an educational tag identifying what the resident did wrong. A letter will also be mailed identifying the issue and how to correct it. This unique aspect of Minneapolis' collection program results in very clean recyclable materials and even more impressive, very clean organics materials that are diverted for composting through the citywide organics recycling program.

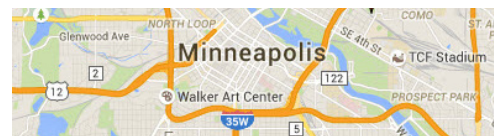
In fact, SW&R's organics processor (composter) has commented that the organics program are cleaner than any other material they receive from residential or commercial customers. The ability to educate at the curb or alley is one of the many educational efforts SW&R staff have developed in the past several years while taking their 9-year old pilot organics recycling program to a citywide program. In only a little more than a year after delivering the first organics recycling cart, 40% (42,728) of the City's eligible 106,000 households had signed-up to participate, one of the highest sign-up rates for an opt-in program in the Country.¹



SW&R does not service contaminated organics carts and leaves educational tags to identify the issue for the homeowner.

In many cities, the collection of garbage, recycling and organics is no longer a personable job and where once a person moved your cart to the truck to empty it, now a metal mechanical arm swoops out from the truck body, grips the cart and dumps it into the truck with no one knowing what was actually in the cart. In Minneapolis this is not the case. Collection of garbage, recycling, yard waste and now organics recycling remains a two person task using a semi-automated collection vehicle. Organics recycling, the city's newest collection program, includes the collection of all food, food-soiled paper, compostable food-service items and other compostable items like coffee grounds, tea bags, cotton balls and Q-tips picked up weekly for composting.

While the City largely retains their semi-automated collection system because there just simply isn't room for the automated vehicles and their mechanical arms in the narrow and T-shaped alleys of Minneapolis, the City's Solid Waste & Recycling Division (SW&R) of Public Works sees many other benefits of having two person collection crews. Unlike automated collection where a person doesn't actually look into the cart, Minneapolis'



The remainder of this article will provide an overview of the City's 9 year journey to its successful citywide organics recycling program.

Pilot Project

In 2007, an environmentally active community group from southwest Minneapolis, Linden Hills Power and Light (LHPL), contacted SW&R in efforts to begin an organics recycling composting pilot project. LHPL was awarded a grant from the Minnesota Pollution Control Agency (MPCA) to evaluate the feasibility of a community digester, and in order to complete the feasibility study the amount of local feedstock (organics) had to be determined.²



A cart hanger was placed on resident's garbage carts in the pilot areas letting them know they were able to participate in the organics pilot.

The City agreed to start a pilot project for the Linden Hills neighborhood and collection began in September 2008. To educate residents about the pilot program, the City sent out a direct mailer and placed cart hangers on garbage carts in the pilot neighborhood. The pilot project was expanded in 2009 to the East Calhoun neighborhood and in 2010 to parts of 10 different neighborhoods across southeast Minneapolis. Linden Hills, unlike the East Calhoun and other neighborhoods in the pilot program, took pilot program promotion upon themselves and signed up block leaders, held trainings and zero-waste events, and purchased compost to be given out to residents each year. Of the pilot programs, the

Linden Hills neighborhood, thanks to these extra efforts, had over 50% of their residents sign up to participate in the pilot whereas only around 30% of residents from the other pilot areas signed up to participate.

Consultant study to move to citywide organics

With more organics programs popping up around the Country and the desire to divert more waste from the trash, in early 2013 SW&R contracted with consulting company, Foth I.E., to identify issues and options related to expanding the pilot program citywide. Goals of the study were to identify collection systems, processing capabilities, compliance with local laws and an analysis of organics programs and costs for communities similar to the City of Minneapolis. Participation rates, estimated tonnage diversion and GHG emissions were also examined in the study. The completed study was presented to the Transportation and Public Works City Council committee on October 8, 2013.

Using data from the pilot areas, it was estimated that 40% of SW&R customers may sign up for the program regardless of the collection method selected.³

Collection methods evaluated included:

1. No organics collection (dispose of organics with regular trash)
2. Collect organics alone (pilot project collection method)
3. Commingle organics with yard waste
4. Co-collect organics with yard waste (Blue Bag™ style program)
5. Co-collect organics with trash (Blue Bag™ style program)

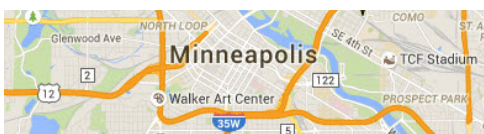
At the time of the study, the Blue Bag™ style program offered by Organix Solutions is one in which the organics would be placed in a durable compostable bag with either the yard waste or the regular trash with the intention of separating out the organics from the material with which it is co-collected. A benefit of this style program is the ability to collect two material types with one truck rather than purchase a new set of trucks to collect organics alone. Because this type of collection method was in its infancy and only one facility existed that could sort the durable compostable plastic bags from its co-collected material, these systems were found to be very costly and were not considered feasible options for a citywide collection program.

The consultant study also detailed the challenges of collecting organics with yard waste due to the restrictions put in place to reduce the spread of the invasive species, the Emerald Ash Borer (EAB). The State of Minnesota quarantined yard waste transportation from Counties known to have EAB infestations to those where EAB had not been found unless the yard waste was ground to one inch or less in size. At the time of this study, Hennepin County was a part of the quarantine area and area compost facilities where organics and yard waste could be sent for composting were outside of the quarantine area.⁴

In addition, collecting organics with yard waste with no intention of separating the two material streams is not preferred by composting facilities. When organics and yard waste are commingled, compost facilities are not able to make appropriate mixes for their composting operations. Furthermore, it would not allow for the City to track the tonnages of organics that are diverted from the waste stream separately from yard waste.

Pressure for citywide program

In December 2013, the Minnesota Pollution Control Agency (MPCA) released a Waste Characterization study that found up to 40% of waste discarded in Minnesota could be diverted for composting, of that a staggering 17.8% of discards were



food scraps alone and 9.9% was compostable paper products.⁵ Following the release of the study, in efforts to target the low hanging fruit for diversion, the Hennepin County Board of Commissioners adopted a resolution “directing staff to draft modifications to the County’s Residential Recycling Funding Policy to require cities of the first class (Minneapolis) to provide organic waste collection services to all residents living in 1-to-8-unit buildings no later than January 1, 2015, and report on a potential schedule for cities of the second, third and fourth classes for consideration by the Board by April 30, 2014.”⁶

While the City was already making strides to expand the pilot organics program, the passage of the County’s resolution in February 2014 pushed SW&R to bring a recommendation to move forward with a citywide program. In March 2014, SW&R brought forward a recommendation for an organics alone citywide collection program to City Council. To keep costs as low as possible for all residents, it was recommended that all customers pay for the program as part of their base fee for SW&R services and that those interested would still have to sign up to receive an organics recycling cart to participate in the program. The additional costs per dwelling unit were estimated to be between \$2.38 and \$3.25 per month.

Staff recommended that an additional 16-19 collection trucks and two accessory trucks (cart service and foreman vehicle) would need to be purchased and at least an additional 21 employees would need to be hired for an SSO alone collection program.⁷ To meet the deadline set by the County’s resolution, SW&R said direction to move forward on a citywide program would be needed by the end of August 2014 to have adequate time to order trucks, carts, and hire additional employees for the program.

Organics drop-offs

Knowing the implementation of a citywide program was still at least a year away, when approached by the Tangletown and Hale Page Diamond Lake neighborhood groups in South Minneapolis to start an organics recycling drop-off program, SW&R agreed to provide the collection service. The drop-off



The Pearl Park drop-off opened with six 64-gallon green organics carts. The carts have padlocks on them to prevent contamination

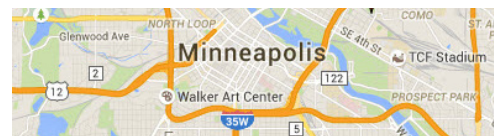
would not only provide an option for residents who wanted to divert their organics right away but it also provided the opportunity to educate residents who could help promote the citywide program to their friends, family and neighbors. After receiving approval from the Minneapolis Park and Recreation Board, Hennepin County and the MPCA, a centrally located park with a large parking lot was selected as the drop-off location. The drop-off located at Pearl Park consisted simply of locked green 64-gallon organics recycling carts in the parking lot of the park.

Each of the partnering neighborhood groups held organics recycling trainings to promote the drop-off and make sure participants were educated on what can and cannot go in the organics recycling carts and how to go about collecting organics in their home. Those who wanted to participate in the drop-off were required to sign-up using their email address. The email address was used not only to track the number of households participating, but was also used if the collection crews identified contamination in the organics carts. The crew would take photos of contamination and SW&R staff would send the photo out to the participants with a description of why the particular item could not be accepted for composting.

For the first several months, the drop-off had designated open hours for three hours on Tuesday evenings and Saturday mornings. During these times a volunteer was on site to track usage of the drop-off, gather data on what neighborhood participants lived in, how many people were in their household, how many bags of organics they brought to the drop-off, and answer any questions the participants had regarding the program. Data gathered from the volunteers after just three months of operations showed that residents from one third of the City’s neighborhoods had used the drop-off and that between two and six 64-gallon organics carts were being filled each time the drop-off was open. In just the first three months an estimated 4,500 pounds of clean organic material were diverted from the trash.

After gathering this important data, SW&R emailed the code to the locks out to all residents who had signed up to participate in the Pearl Park drop-off. Residents now had the ability to bring their organics to the drop-off site at their convenience 24-7. Due to this change, more people signed up to participate in the drop-off and SW&R had to continue to add more and more carts to hold the increasing volume of organics being delivered. At its peak, before the citywide organics program was rolled-out, a total of seventeen 64-gallon organics carts were being emptied every Monday, Wednesday and Friday from the Pearl Park drop-off alone.

Due to the success of the Pearl Park drop-off, SW&R decided to open additional drop-off sites around the City. By the fall of 2014 an additional four drop-off sites were opened, each using the same start up method as Pearl Park. Due to the potential for locks to freeze in cold Minnesota winters, SW&R removed the locks from the park drop-off carts in the winter. When springtime came and collection crews continued to find clean organics in the



carts at all but one location, SW&R decided to leave the locks off the carts. The one location where crews found continued contamination was the site nearest the University of Minnesota's campus in a high-pedestrian usage park surrounded by student housing. In the spring of 2015, the locks were put back on these carts to reduce the potential for contamination, and an additional two drop-off sites were opened in 2015 for a total of seven drop-off sites strategically located around the City.

The map on page 28 shows the organics drop-off sites in Minneapolis. It is important to note that residents in 1-4 unit buildings are required by City ordinance to have service through SW&R. Commercial buildings and apartment buildings with more than four units are in an open hauling system and do not contribute to SW&R's operating budget. A drop-off site was not placed near Lake Harriet or Lake Calhoun nor in downtown Minneapolis due to the volume of high density apartment complexes who do not have service from SW&R.

Citywide organics recycling program approval and implementation

SW&R received approval to move forward with a citywide organics recycling program with the adoption of the Mayor's budget in December 2015. Due to the lead time required to order and receive new trucks, carts, etc. the citywide program roll-out could not begin until late summer 2015. As was done when the City rolled-out its One-Sort Recycling program, the roll-out was split into two phases with a smaller roll-out to 25% of customers in 2015 and the remaining 75% in 2016. Using a phased roll-out is beneficial as it allows any kinks from the smaller phase to be worked out during the winter months when cart deliveries are suspended.

Because of the interest and excitement from those participating in the organics drop-off program to sign up for the program and receive a cart at home, a press release was issued the day people could begin signing up online to participate in the program.⁸ For those who were not already aware of the new organics recycling program, SW&R understood that clear and simple messaging would be necessary to get residents to understand what the program is and encourage them to participate. Messaging to promote the organics program answered the following questions:

1. What are organics?
2. How do I participate?
3. Why should I participate?
4. When can I start?
5. How is compost beneficial?

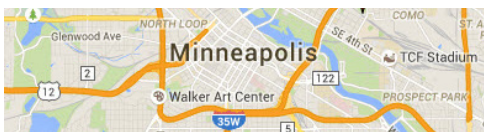
The City of Minneapolis Communications Department, Hennepin County Department of Environment and Energy and the City's Neighborhood and Community Relations Department

were partners in helping promote the program. The City's Communications Department used the tools they had available from issuing press releases, providing information for Council Members to include in their newsletters and social media posts to creating a how-to PSA on organics recycling and using earned, owned and donated media on local access and cable TV, ClearChannel billboards and more. Hennepin County was instrumental in providing the expertise of their communications and graphic design staff to develop the majority of the promotional materials for the campaign including brochures, magnets, print, digital and public space advertising, and more. Neighborhood and Community Relations dedicated staff who work with various cultural community groups in Minneapolis helped make sure materials were appropriately translated and that cultural community groups were aware of the program. In 2016 and continuing in 2017 their expertise is also used to identify the best tools and tactics to reach out to the various cultural communities in Minneapolis.

Because the program was an opt-in style program, SW&R needed to get a better idea of how many carts to purchase for the program so there weren't thousands of carts that needed to be stored. The initial mailing to all 106,000 serviced households went out in April 2016. The mailing included a letter briefly explaining the program and encouraging residents to participate, a tri-fold brochure that more thoroughly explained organics recycling and what is accepted and a postage-paid reply card to simplify the sign-up process for residents.⁹ The postage-paid reply card turned out to be one of the best decisions made at the beginning of this campaign. All a resident had to do to sign up was fill in their name, address, and phone number and put the card back in the mail – no email to send, no phone call to make. The postage-paid reply card in addition to other communication methods used in April 2017, resulted an over 25% sign-up rate by mid-May 2015 and by the time organics carts began to be delivered to the Phase 1 areas of the City at the end of August 2015, over 30% or 32,000 households had signed up to participate in the program. To continue to promote the program, SW&R mailed a postcard to all households who had not yet signed up to participate in the organics program in August 2015 as the organics roll-out was beginning. This postcard was nowhere near as successful as the first mailing and it was decided that a mailing in 2016 would again include the postage-paid reply card.¹⁰

The Phase 1 organics roll-out began on August 10th, 2015 and would continue through September 18, 2015.¹¹ To continue the educational efforts, a welcome kit was mailed to the home of every resident who signed up for the program one week before their cart was to arrive. The welcome kit included:

- Resident welcome letter
- Quick reference refrigerator magnet
- Home setup tips guide
- Starter kit of compostable plastic bags



- Coupons for compostable plastic bags, kitchen collection pails and compostable food-service products¹²

Many other organics programs across the country provide a kitchen collection pail for residents who sign up in the organics program. To keep overall program costs lower and realizing that one-size does not fit all in terms of container size, material type or color, SW&R chose to not provide kitchen collection pails to residents and instead created the Home Setup Tips guide and offered many other home setup tips ideas on their webpage. While they did not purchase kitchen collection pails to distribute to all residents, BioBag, the vendor of the compostable bag starter kits, provided 1,000 of their MaxAir containers to SW&R. These were used as incentives at events to get more residents to sign up for the program and were made available thereafter for people who had already signed up to participate. In order to receive a kitchen collection pail, residents were asked to fill out a short survey regarding their attitudes and beliefs about organics recycling. A follow-up survey was emailed to those residents to see if their beliefs and habits had changed after participating in the organics program.

Outreach and Education

The City's Recycling Coordinator has been a firm believer that public education is best done in locations where the people gather. When she began working for the City, she developed relationships with neighborhood staff and attended as many neighborhood and community events as possible with an educational table or give a presentation. With the approval to move forward with a citywide organics program and the opening of organics drop-off sites, educational opportunities beginning in 2015 were primarily devoted to teaching residents about organics recycling. In August 2015, SW&R hired an additional staff person to assist with outreach and education. The two outreach and education staff attended over 100 events in 2015 and over 100 events in 2016 to promote the program.

Organics funding provided by the State

In the 2014 legislative session, the Minnesota legislature approved additional two year funding to be used only for the development and promotion of organics programs in 2015 and 2016. Funding from the State was divvied up by County based on population. Hennepin County received \$813,764 of the funding for organics recycling programs made a decision to allocate these dedicated organics funds to its cities based on the percentage of organics sign-ups in the city compared to the County overall.¹³ While there are many cities in Hennepin County with organics recycling programs, in September 2015, 77.6% of the homes in the County were from the City of Minneapolis' Phase 1 organics recycling area therefore \$315,590 were allocated to the City to be used for the organics program. As SW&R received necessary funding in its 2016 budget to pay for capital costs and continued to emphasize the importance of education, all extra funding was to be used to continue education and outreach efforts.¹⁴

2016 Ad campaign and cultural community promotions

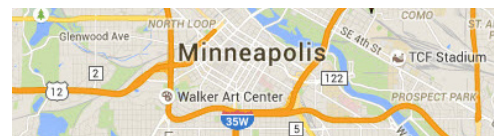
With the additional funding, SW&R wanted to not only have a wide-reaching advertising campaign, but understood the need to allocate resources for each of the cultural communities in the city (African American, Latino, East African, Southeast Asian and American Indian). SW&R enlisted the expertise of NCR's access and outreach specialists to determine the best outreach methods for each of the cultural communities. For 2016, outreach and education staff targeted working with the Native American, Southeast Asian and African American communities.

For each of the communities, they placed ads in print, radio, and other outreach sources identified by the NCR specialists. In addition, they sponsored events already planned for the various communities to make them zero-waste. Several events were sponsored for American Indian Month, a soccer tournament was hosted for the Southeast Asian community, and a concert series and a community festival was sponsored for the African American Community. Where possible as part of the sponsorship, SW&R purchased compostable food-service items for the event, set up organics collection, educated residents at the event and had bulk compost available for attendees to see what happened to organics that were diverted from the trash. The bulk compost was available for residents to take home and use in their lawns and gardens.

In addition, SW&R staff developed a large multi-faceted advertising campaign that included all of the free and donated methods used to promote the program in 2015 plus print advertising in each neighborhood newspaper, select cultural newspapers, radio advertising, digital advertising including paid Facebook posts, and public space advertising on cart delivery



Community members are happy to see the compost produced from diverting organics. They're grateful to be able to take compost home with them for use at the community garden.



trucks, bus shelters, bus tails ads and interior bus cards. The ad campaign included two styles of ads, one that matched the printed promotional materials that had already been mailed to residents and the other that featured families from various cultural communities interacting with organics recycling in their homes. Where appropriate, the family photos included both

SW&R advertising included photos of various cultural community members placing food scraps into organics recycling kitchen collection pails while preparing a meal. Each family-style ad included a quote from the family which was also translated into the appropriate language

English and translations in Spanish, Hmong and Somali and where appropriate the entire ad was translated.

Additional promotional activities

In addition to the advertising campaign, reusable ChicoBags were purchased as a promotional piece as well as a way to encourage waste reduction among residents and a Recycling Block Leader program was started to continue to expand on community based social marketing techniques. Block leaders are responsible for educating residents in their immediate area

and making their National Night Out event low-waste. SW&R provides regular email updates, printed educational materials and tips for block leaders to reach out to their neighbors. By the end of 2016, over 150 residents had signed up to be Recycling Block Leaders and over 4,000 pieces of information had been distributed to block leaders to share with their neighbors.

Lastly, funding was also used to hire two interns to go door-to-door that summer to engage residents at homes about the program. Neighborhoods with less than 20% sign ups were targeted for door-knocking. Interns left a flyer on residents' doors that was pre-translated into the major languages spoken in Minneapolis letting the homeowner know that they would be back in a day or two to talk about the organics recycling program. Interns proved to be very effective in that they were able to sign up an additional eighteen new homes for every twenty hours spent out door-knocking.

SW&R will continue to use interns in 2017 but will try not to use the flyers in efforts to cover more area.

Evaluating outreach and educational strategies used

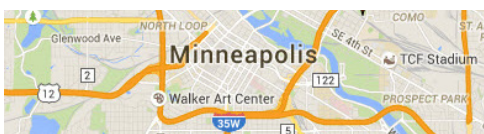
During the two month time period of the ad campaign, SW&R added a 'how did you hear about the program' drop-down menu to the online sign up form and had its call center staff track how new sign ups heard about the program as a means to determine effectiveness of various advertising strategies. In evaluating the results, word of mouth, door-knocking and direct mailers were the top three methods people heard about the program.

One of the most expensive paid advertising methods, the outdoor advertising (interior bus cards, back of bus ads, bus shelters, and city vehicles) only made up for 2% of the ways residents heard about the program. This campaign was the first time the City had used a boosted Facebook ad and both SW&R and Communications Department staff were surprised how many people were reached for such a little cost.

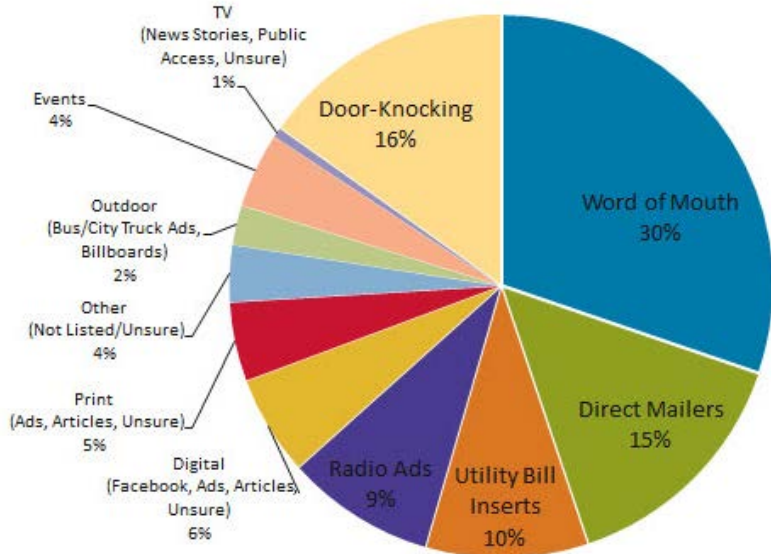
Continued education post roll-out

The official roll-out of Phase 2, the citywide organics program, was completed June 17, 2016.¹⁵ In mid-July, the City sent another mailer to all households who had not yet signed up to participate in the program. In continuing efforts to promote the organics program to cultural communities, the mailer was pre-translated into Spanish, Hmong and Somali and again included the postage-paid reply card.¹⁶ For a second time, the postage-paid reply card proved to be rather effective and because the program is opt-in, residents continue to sign-up each and every day. On October 12, 2016, a little over a year after the first cart was delivered, the program reached a 40% sign up rate, the participation rate anticipated by the consultant study.¹⁷

In the Fall of 2016, SW&R performed a smaller, more targeted outreach campaign to neighborhoods whose sign up rates remained under 20%. This campaign included additional



Ad Campaign All Methods Summary



Ad Campaign Measurement Period: 5/23/16 - 7/17/16

The pie chart shows responses from new sign ups on how they heard about the organics program during the ad campaign time period.

print advertisements, radio ads, and a direct mailer to resident's homes. In addition, local neighborhood groups were offered a supply of the kitchen collection pails. The mailing told residents that if they signed up soon they would receive an additional packet of the compostable bag starter packets and that they had the option to pick up a free kitchen collection pail at participating neighborhood groups.

2017 outreach and education plans

SW&R continues to include information about the organics program in packets that are mailed to new utility bill payers in the City and continues to receive sign ups for the program through the online form, phone calls, and through the postage-paid reply cards. In September 2016, SW&R's program had increased to be 91% of organics sign-ups in Hennepin County resulting in an additional \$291,845 in funding for outreach and education for the organics recycling program.¹⁸

As staff and time were not able to reach out to each of the cultural community groups in 2015, they will be developing targeted outreach for the Latino and East African communities in 2017. Efforts to attend as many neighborhood and community events as possible will be continued and up to four interns will be hired to continue door-knocking efforts from 2016. They are developing their plan to effectively use the remainder of the funding available for education in 2017. SW&R has not closed

any of the drop-off sites and will actually be seeking approval to open additional drop-off sites in areas with high-density housing for non-SW&R customers to provide those residents with an opportunity to divert organics as well.

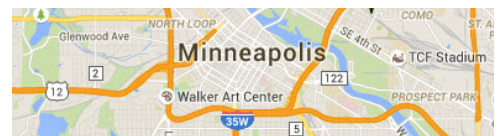
Calendar year 2016 saw a 310% increase in organics collected, from 823.9 Tons in 2015 to 3,385 Tons of organics in 2016. While the increase in organics tonnages is impressive, SW&R is most proud of its feedback from the compostor that the material is cleaner than material from any other residential or commercial organics customer. The cleanliness of the material and achieving a 40% sign up rate in a little more than a year after beginning the cart roll-out prove that not only are their educational efforts from office staff at events to leaving contaminated materials and educational tags on carts worth the work, but that they're instrumental in creating a very successful program. Other cities in the area have requested to use images, text, and designs from Minneapolis' program to use for their own and data from the City's advertising campaign is being evaluated by other cities to help determine the best methods to use funding they have available.

In December 2016, SW&R received a Local Government Innovation Award from the University of Minnesota's Humphrey Institute for Public Affairs for the Organics Recycling Education and Outreach.¹⁹

SW&R are proud of its efforts in taking the pilot organics program to a citywide program and they're grateful for the partnerships they have with other City Departments, Hennepin County, neighborhood and community groups and their customers in efforts to make the program a success. SW&R looks forward to seeing the program continue to be a success and using new and innovative ways to provide education to residents through their field and office staff.

More information about Minneapolis' organics recycling program and its history can be found online at www.minneapolismn.gov/organics.

Kellie has worked as the Recycling Coordinator for the City of Minneapolis since April 2013 and has served on the board of the Minnesota Composting Council since 2012. Before coming to the City, Kellie conducted research at an organics composting demonstration site while working for Carver County. Kellie's responsibilities for the City of Minneapolis include development, implementation and outreach for the City's residential waste reduction, reuse, recycling, organics recycling programs. She oversees the City's container rental program, approves event recycling plans, coordinates enforcement of the City's multi-unit recycling ordinance, and aides other city offices in educating staff and implementing new programs such as the Green to Go ordinance and plastic bag ban.



References

- 1 Minneapolis Communications Department. (10.12.16) Organics recycling reaches 40 percent opt-in rate. Retrieved Jan. 15, 2017 from <http://www.minneapolismn.gov/news/WCMSP-188003>
- 2 John Christopher Madole Associates, Inc. (June 2008) Linden Hills Power and Light Anaerobic Digester Feasibility Study. Retrieved from http://www.lhpowerandlight.org/uploads/1/1/6/1/11619011/lhpl_feasibility_study_nov_20_2008_pdf.pdf
- 3 Foth. Assessment of Residential Source Separated Organics Collection Options prepared for the City of Minneapolis. (October 2013) Retrieved from <http://minneapolismn.gov/www/groups/public/@publicworks/documents/webcontent/wcms1p-121817.pdf>
- 4 Emerald Ash Borer - Minnesota Quarantine. Minnesota Department of Agriculture. (January 15, 2017). Retrieved from <http://www.mda.state.mn.us/plants/pestmanagement/eab/eabquarantine.aspx>
- 5 Burns & McDonnell Engineering Company. 2013 Statewide Waste Characterization prepared for the Minnesota Pollution Control Agency. (December 2013) Retrieved from <https://www.pca.state.mn.us/sites/default/files/w-sw1-60.pdf>
- 6 Hennepin County Board Action Request 14-0058-1R. (2014, February 14). Retrieved January 15, 2017 from <https://board.co.hennepin.mn.us/sirepub/cache/246/lpfkq0zg5cvibzz4pbnsimb1/26456102012017091321423.PDF>
- 7 Herberholz, David. (March 18, 2014) Organics Collection in Minneapolis – staff presentation to Transportation & Public Works Council Committee. Retrieved from <http://minneapolismn.gov/www/groups/public/@publicworks/documents/webcontent/wcms1p-122507.pdf>
- 8 Minneapolis Communications Department. (Jan. 26, 2015) Minneapolis Solid Waste customers will have an organics recycling option starting in 2015-2016. Retrieved Jan 15, 2017 from <http://minneapolismn.gov/news/WCMS1P-136636>
- 9 Herberholz, David. (March 2, 2015) Organics Recycling Strategic Communication and Outreach Plan – staff presentation to Transportation and Public Works Council Committee. Retrieved from <http://minneapolismn.gov/www/groups/public/@publicworks/documents/webcontent/wcms1p-149447.pdf>
- 10 Brenny, Angela and Kish, Kellie. (October 8, 2015) Citywide Organics Recycling Roll-Out: Education, Outreach and its Impacts. Presentation at the Recycling Association of Minnesota and Solid Waste Association of North America Conference. Retrieved from <http://minneapolismn.gov/www/groups/public/@publicworks/documents/webcontent/wcms1p-150386.pdf>
- 11 Minneapolis Communications Department. (August 10, 2015) City begins cart rollout for citywide organics collection. Retrieved Jan 15, 2017 from <http://www.ci.minneapolis.mn.us/news/WCMS1P-147045>
- 12 Brenny, Angela and Kish, Kellie. (October 8, 2015) Citywide Organics Recycling Roll-Out: Education, Outreach and its Impacts. Presentation at the Recycling Association of Minnesota and Solid Waste Association of North America Conference. Retrieved from <http://minneapolismn.gov/www/groups/public/@publicworks/documents/webcontent/wcms1p-150386.pdf>
- 13 Herberholz, David. (August 25, 2015). Request for Committee Action. Retrieved from <http://www.minneapolismn.gov/www/groups/public/@clerk/documents/webcontent/wcms1p-147707.pdf>
- 14 B. Knudson (personal communication, September 18, 2015)
- 15 City of Minneapolis. 2016 Tonnages from Solid Waste & Recycling Customers. Retrieved Jan. 15, 2017 from http://minneapolismn.gov/solid-waste/about/solid-waste_aboutus-history & City of Minneapolis 2015 Tonnage. Retrieved Jan 15, 2017 from <http://minneapolismn.gov/solid-waste/about/stats/WCMSP-173640>
- 16 Kish, Kellie and Horner, Laura. (October 6, 2016) Citywide Organics Recycling Roll-Out: Education, Outreach and its Impacts. Presentation at the Recycling Association of Minnesota and Solid Waste Association of North America Conference. Retrieved from <http://minneapolismn.gov/www/groups/public/@publicworks/documents/webcontent/wcmsp-187850.pdf>
- 17 Minneapolis Communications Department. (10.12.16) Organics recycling reaches 40 percent opt-in rate. Retrieved Jan. 15, 2017 from <http://www.minneapolismn.gov/news/WCMSP-188003>
- 18 B. Knudson (personal communication, October 10, 2016)
- 19 University of Minnesota. Minnesota Local Government Innovation Awards: LGIA 2016: Winners. Retrieved Jan 15, 2017 from <http://lgia.umn.edu/lgia-2016-winners>



Creating a Zero Waste Future Starts with Your Local Community

by Kate Bailey
Director, Eco-Cycle Solutions
and Harlin Savage
Communications Director,
Eco-Cycle

Introduction

Whether you're passionate about mitigating climate change, building healthy soils, keeping plastics out of the ocean, or creating green jobs, Zero Waste strategies can support your efforts and improve our world. Zero Waste is one of the fastest, easiest, and most cost-effective local solutions to some of the greatest challenges facing our planet. As a nation and world, we need to stop wasting and start recovering materials quickly, reduce greenhouse gas emissions immediately, and move quickly to redesign our communities for sustainability NOW.

To expedite this change, the Zero Waste movement needs spirited and informed citizens, working in partnership with local government and civic groups, to advance initiatives that will transform our throwaway society.

Eco-Cycle has been at the forefront of the Zero Waste movement since its inception. The organization got its start in 1976 when a small band of visionaries launched a curbside recycling program in Boulder, Colorado. Driving repurposed yellow school buses, volunteers went from neighborhood to neighborhood collecting recyclables on a weekly basis as a fundraiser for a local nonprofit that served homeless youth. By the time the fundraiser ended, residents were hooked on recycling and Eco-Cycle was launched.

Today, the organization is one of the nation's oldest and largest nonprofit recyclers. With deep roots in Boulder County,

Eco-Cycle is a driving force within the Zero Waste movement leveraging community-based Zero Waste models to catalyze change at the state, national, and global levels.

To shift societies away from destructive consumption and waste patterns, Eco-Cycle begins at the local level where the organization is deeply involved in every aspect of Zero Waste and with every sector of the community— businesses, governments, neighborhoods, schools, and public events.

As national politics and policies shift, focusing at the local community level, while keeping an eye on the bigger picture—is a strategy that is particularly effective. Now more than ever, cities and towns are where many key decisions about Zero Waste are made with states being important for building infrastructure, developing markets, and leveraging technical resources and support.

As a social enterprise (and a nonprofit), Eco-Cycle engages in the business of recycling to support mission-driven activities including community education and advocacy. The organization is deeply involved in every aspect of Zero Waste, engaging in the following activities:

- Running a successful Zero Waste hauling service for commercial businesses
- Supporting Zero Waste facilities and infrastructure as the operator of the Boulder County Recycling Center,



a publicly owned materials recovery facility, and the operator and co-founder of the Center for Hard-to-Recycle Materials (CHaRM)

- Delivering Zero Waste and environmental education to thousands of students and staff in the Boulder Valley and St. Vrain Valley Schools systems
- Conducting public outreach and education including comprehensive recycling, composting, and Zero Waste guidelines and an A-Z Recycling Guide
- Advocating for new government policies and investments to support local communities as they move towards Zero Waste

What is Zero Waste?

Zero Waste starts with changing mindsets and challenging the very idea of waste: Everything we once thought of as “waste” has value and our job is to discover that value.

Building a Zero Waste community is about more than changing individual behavior, and more than recycling. Zero Waste addresses the fundamental social and economic systems that determine how we make, consume and dispose of our “stuff” and our food.

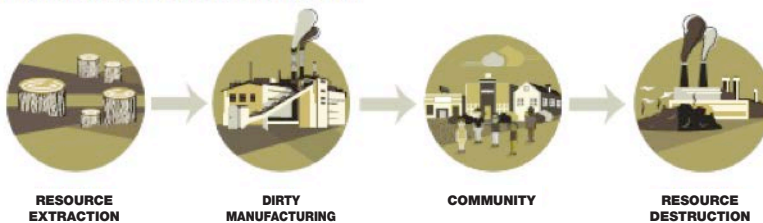
A Zero Waste System is cyclical, as in nature, and does two fundamental things: It redesigns our systems and resource use—from product design to disposal—to prevent the wasteful and polluting practices that lead to so much waste. It then captures discards and uses them, instead of natural resources, to make new products, creating a much cleaner manufacturing process with far less pollution. This new system carries with it new businesses and jobs to feed local economies.

As a goal, Zero Waste is typically defined as diverting 90 percent of the community’s discards from landfills and incinerators. Materials are diverted through a combination of reducing consumption, reusing, recycling, composting, and other practices.

A Zero Waste System has five key elements:

1. **POLICIES** that take a responsible approach to using fewer natural resources, urging participation from all sectors, putting public dollars toward conservation programs, and investing in resource recovery infrastructure.

Our current production system goes one way - FROM THE EARTH TO THE DUMP.



A Zero Waste system is cyclical, as in nature, where there is no waste.

THE RESULT IS A THRIVING ZERO WASTE COMMUNITY.



Zero Waste addresses the entire social system of how we make, consume and dispose of our “stuff.”

2. **PROGRAMS** in every sector of our society to shift our culture away from wasting and toward a sense of responsibility for our planet and its future.
3. New **MANUFACTURING and DESIGN** processes where manufacturers are held responsible for the full lifecycle of their products, giving them the incentive to make products that are non-toxic, reusable and recyclable.
4. Resource recovery **INFRASTRUCTURE** to replace landfills and incinerators and recover 90 percent or more of our discards through reuse, composting and recycling.
5. An **ENGAGED COMMUNITY** where everyone plays an active role in recovering our discards.



Is that achievable? Definitely! Hundreds of U.S. cities and towns already have some form of residential recycling and more than 200 have curbside composting. On average, most municipal waste streams break down this way:

- 40 percent is compostable
- 30 percent is recyclable (glass, paper (fiber), metals, plastics)
- 10-15 percent is hard-to-recycle materials

So once a community has curbside recycling and composting programs for residents and services for businesses, as much as 70 percent of its discards can be recovered, drastically reducing its waste. The next step is to go after the hard-to-recycle materials, so named because markets for these materials are not as large and stable as markets for traditional recyclables, such as glass, paper, and aluminum.

SIDEBAR: Spotlight on the CHaRM

One facility that deserves special attention is the Center for Hard-to-Recycle Materials (CHaRM). Eco-Cycle co-founded the first CHaRM in the nation in 2001 in partnership with the City of Boulder, Colorado. Since then, three more have sprung up in Athens and Atlanta, Georgia and in Logan County, Ohio.

Eco-Cycle's CHaRM is a one-stop drop-off that recycles more specific items than any other single location in the nation, including electronics, clothing, books, small and large appliances, mattresses and box springs, block foam polystyrene packaging (Styrofoam), cooking oil, plastic bags and shrink wrap, plastic lawn furniture and other bulky durable plastics, bicycles and parts, fire extinguishers, porcelain fixtures like toilets and sinks, and even yoga mats (it's Boulder after all).

These are the 10-15 percent of the discards that we call "hard-to-recycle" materials, so named because there are not well-established markets for them. Recycling these materials is worthwhile because it creates local jobs and business opportunities, curbs greenhouse gas emissions, and reduces air and water pollution by handling electronics and other items that contain toxics.

A CHaRM also creates social and economic value to the local community. Here are a few examples from the CHaRM in Boulder:

- Books collected support literacy by being distributed to local schools and low-income clinics, getting into the hands of kids who, in some cases, have never even held a book.
- Mattresses go to a program that creates jobs for former felons who are working through recovery programs for a second chance.
- Bikes go to a community bikes program where anyone can get a bike and learn how to maintain it, increasing bike use.

RECYCLE: CHaRM

eco-cycle/City of Boulder Center for Hard-to-Recycle Materials

6400 Arapahoe Rd. Boulder, co-located with ReSource—see Recycle Row map on p. 11
 Open Mon – Sat: 9 am – 5 pm; Closed Sundays • www.ecocycle.org • 303.444.6634

These materials are accepted at the CHaRM only. (fees apply)
Please do not put them in your curbside recycling bin.

see fees and guidelines on next page

Computers & Electronics	TVs & Monitors	Copy Machines, Printers & Fax Machines	Printer Cartridges	Mattresses & Box Springs
Mobile Phones, Office Phones Tablets & Cameras	Scrap Metal	White Block Foam Packaging with a #6 (AKA Styrofoam)	Cooking Oil	Bubble Wrap & Foam Packing Sheets
Plastic Bags with a #2 or #4	Big #2 Plastics	Large Appliances	Small Appliances	Textiles
Paired Reusable Shoes	Porcelain Sinks and Toilets	Books & Manuals	Bikes & Bike Parts	Yoga Mats

We can pick these materials up from your business too!
 303.444.6634 • businessrecycling@ecocycle.org
www.ecocycle.org/charm

Funded in part by City of Boulder trash tax dollars.

Hard-to-recycle materials can be 15% of the waste stream, making a Center for Hard-to-Recycle Materials (CHaRM) one of the six key facilities for a Zero Waste community. See the full list of materials accepted at www.ecocycle.org/charm.

- Electronics are dismantled on site through a partnership that creates work opportunities for those with disabilities.
- Yoga mats and bike tires go to local for-profit businesses who use them to make accessories and computer bags.

Where landfills and incinerators create long-term health and financial liabilities, CHaRMs build community, boost economies, and reduce pollution.

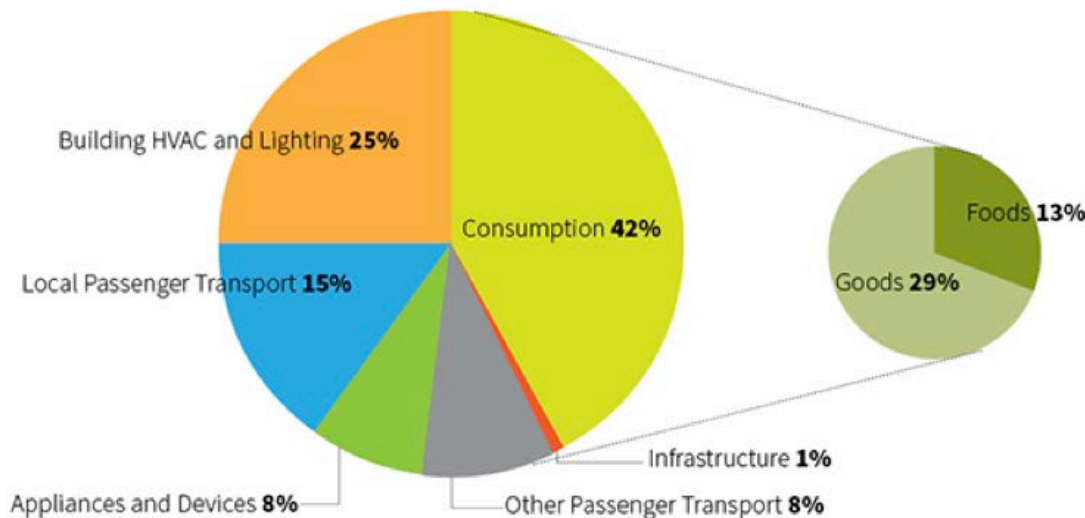
Why Zero Waste Matters Locally and Globally

Zero Waste is first and foremost about natural resource conservation and protection. With more than 7 billion people now living on Earth, supplies of finite resources essential for life—fresh water, fossil fuels, and metals, among others—are becoming increasingly strained. Zero Waste helps us live within our planet's means by using natural resources more efficiently, so we have the raw materials to sustain future generations of humans and other species.



Problematic Emissions

The EPA published a report in 2009 that described how “materials management and food systems” in America are responsible for 42 percent of all greenhouse gas emissions.



Source: EPA

nreionline.com

When we look at the lifecycle emissions from how we make, use and dispose of our stuff, and not just the GHG emissions from landfills, we see consumption and waste are more than 40% of U.S. GHG emissions.

There is a social element to our resource use as well: As we run out of the resources that support us, wars will be waged. In fact, we're already fighting over scarce supplies: At least 40 percent of global conflicts in the past 60 years had links to natural resource shortages. A Zero Waste system designs products and packaging to use fewer resources and to reuse those materials many times over. This means less mining, less logging, and less demand for natural resources. With less pressure on scarce supplies, there will be fewer resource-driven conflicts.

Zero Waste is responsible stewardship for our generation and those to follow. By recycling, we are sharing resources with future generations, so they'll have enough to support themselves peacefully too. Through composting, we are replenishing our soils, so our children can grow healthy food.

Fastest, Most Cost-Effective Local Climate Solution

Zero Waste also has a tremendous role to play in reducing greenhouse gas emissions and the impacts of climate change. While changing our energy and transportation systems require long-term infrastructure shifts, moving toward Zero Waste can be done quickly at the local level.

The more we buy and throw away stuff, the more energy it takes to make new stuff, and the faster climate change accelerates. In fact, more than 40 percent of U.S. greenhouse gas emissions come from our stuff and our food — how we make it, haul it, use it, and throw it away. These are called consumption emissions.

Zero Waste addresses the entire system of our stuff and can substantially reduce climate emissions by changing what and how much we buy, what resources went into making it, how long it's designed to last, how much gets reused, recycled or composted, and what we throw away.

Zero Waste strategies have great potential to reduce emissions quickly. By recovering 90 percent of our discards and reducing our waste by one percent per year by 2030, we could save more than 400 million metric tons of CO₂ per year, the equivalent of taking more than 80 coal-fired powered plants off the grid. This means Zero Waste offers greater annual greenhouse gas emissions reductions than expanding nuclear power, significantly improving vehicle

efficiency, carbon capture projects, and other prominent climate strategies.

Zero Waste strategies are also cost-effective climate solutions. The International Council for Local Environmental Initiatives (ICLEI) calls out recycling and composting as some of the most cost-effective actions local governments can take to combat climate change.

Beyond the Environment: Economic Impact and Jobs Creation

Zero Waste isn't just an environmental initiative: Zero Waste creates jobs — whether you're large or small, urban or rural — Zero Waste strengthens local economies by keeping dollars and materials circulating in the community.

According to the U.S. Environmental Protection Agency, recycling and reuse activities in the United States every year account for:

- 757,000 jobs
- \$36.6 billion in wages
- \$6.7 billion in tax revenues

There is the potential to have a much bigger economic and jobs impact. Raising the national recycling rate from 35 percent to 75 percent by 2030 could create 1.1 million new jobs. Recycling



creates an average of nine times more jobs than landfills per ton of materials handled, and materials reuse creates as many as 30 times more jobs than landfills per ton.

In addition to job growth, Zero Waste gives value back to the community by keeping materials – and dollars – out of the landfill. Every ton of trash that gets buried in the local landfill contains paper, plastic, metals and other materials that could have been sold for recycling. That's money that could have supported community and local businesses. The U.S. buries \$11.4 billion every year in potential revenue from materials that were trashed instead of being sold for recycling.

How to move your community forward

With all the benefits of Zero Waste to your local economy and to our local and global environment, it's no wonder more than 40 U.S. communities have Zero Waste goals, from major cities like San Francisco to rural areas like Teton County, Wyoming.

Zero Waste is a multi-year journey, and there are many steps a community needs to take along the way. Each community is different in how it chooses to move forward,

but there is a core set of policies, programs and infrastructure that every community needs.

Eco-Cycle's Community Zero Waste Roadmap is a high-level overview of the key infrastructure, policies and programs that have been proven to work in every community that is seriously pursuing a Zero Waste goal. The Roadmap is laid out as a three-phase, 10-year plan to recover 90 percent of the discards in a community and to reduce waste at the source. This simplified Zero Waste plan is accessible to every community, no matter where it is on the Roadmap.

In addition to the Roadmap, our Eco-Cycle Solutions Hub provides communities other key resources to move toward Zero Waste, including:

- About Zero Waste: Multi-media programs to inspire community action and to share the Zero Waste vision both locally and globally
- Zero Waste in Action Map: Searchable database of real-world examples of Zero Waste programs and policies around the country.
- Action Tools: Packaged, bite-sized solutions to help communities take action, with plans to expand based on user requests
- Help Desk: Services to bring together those in need and those who can help

Citizens and government working together

Creating a Zero Waste community is far more than just a technical infrastructure project. Community engagement and community partnerships are pivotal to creating lasting change, and also critical for getting the funding to build the necessary infrastructure.

An individual citizen, or even a local government official, may not have the singular power to change the world, but

CITIZENS	ELECTED OFFICIALS	CITY STAFF
<ul style="list-style-type: none">→ empower local government to take action by organizing and standing up in public as a group to ask for change;→ keep the process on track and hold government accountable to take measurable action;→ include young people, local business leaders and social or environmental organizations.	<ul style="list-style-type: none">→ hold the most power to create change;→ need the community's support to adopt new initiatives;→ want to hear from educated, organized citizens with sound proposals that support the community's established goals.	<ul style="list-style-type: none">→ handle the technical content details of the proposed initiative;→ work closely to answer the questions of elected officials;→ implement or oversee the change.

Everyone has a role to play in creating a Zero Waste community, but citizens, elected officials and city staff are the main players. Here is a look at the strengths each group brings to the project.



groups of individuals do. Groups are a stronger reflection of the community's interests and have more power to collaborate with public officials, staff, and other stakeholders and civic leaders. Plus, groups help maintain momentum when challenges are encountered. To be the most successful, you need a community group, working in partnership with local government. We call this the "inside-outside" partnership strategy.

Eco-Cycle has used the inside-outside partnership strategy successfully for decades to grow our local recycling programs in a region where the economics are truly stacked against us. In Colorado, landfill costs or "tipping fees" are among the lowest in the nation at less than \$20 per ton. It certainly wasn't the free market that helped us achieve success in diverting material from the landfill. Our success has come from partnerships between citizens, Eco-Cycle and our local governments.

Choosing the Future We Want

When it comes to waste, our choice is simple: Every day we can make the sustainable choice and move closer to a vibrant, healthy Zero Waste future. We can choose to reuse and recycle so as not to deplete our limited natural resources. We can choose to reduce our climate impact and build resilient communities to support future generations. We can choose to invest in green jobs and our local economy. Or, we can continue to throw away our "trash" and with it all these opportunities for positive change. Eco-Cycle is helping communities around the world choose a Zero Waste future—we hope you'll join us. [_____](#)

Kate Bailey is the director of the Eco-Cycle Solutions project, which empowers citizens, government staff and elected officials to implement Zero Waste solutions by providing the vision, tools and support needed to take local action.

Harlin Savage is the Communications Director at Eco-Cycle, whose mission is to identify, explore and demonstrate the emerging frontiers of Zero Waste. We believe in personal and community action to transform society's throw-away ethic into environmentally responsible stewardship.



Sustainability at Loveland High School

by Tracy Burge
Science Teacher
Loveland High School

The Sustainability Program at Loveland High School has always been and continues to be an immensely successful grassroots effort.

In its infancy, this sustainability effort began in a single classroom in which one teacher and many students felt the need to recycle and reduce their waste. Initial research revealed that Loveland High School alone shipped the waste from forty-eight dumpsters to the landfill every month. The local commercial waste company picked up two 8-yard dumpsters six days a week. The primary source of this waste was the daily removal of 60 bags of cafeteria waste. Furthermore, there was no option for recycling either on the high school campus or at any other district campus. Based on these initial findings, science teacher Tracy Burge and her students set out to prove there was not only a philosophical need to recycle but a financial reason as well.

Students began by collecting and decorating cardboard boxes for paper recycling, making videos introducing the idea, completing trash audits and making plans for collecting the recyclables. In addition to classroom collection of paper, plans to recycle in the cafeteria began as well. Recycling was initiated by students decorating four donated ICE Mountain restricted opening recycle bins for collection of bottles and cans. Environmental science students also encouraged other students to stack their styrofoam lunch trays in a campaign called "Stackinate," with the aim of reducing trash volume.

In addition, students wrote articles to introduce recycling to students, parents, and the Loveland community in general, and these articles were published both in the school newspaper and a community-based magazine. This opened up a dialogue among all of the stakeholders, as they began collaborating with custodians, teachers and students alike to gather ideas and discover problems.

Through this process, a major challenge revealed itself: Where would they put the recycling during the proving period of their initiative? Ms. Burge answered that call by bringing her own pickup every day for a month to act as a mini recycling dumpster.

She hauled away recyclables at an alarming rate, pulling away with a tall stack of cardboard strapped down over cans, bottles, and paper galore.

After one month of implementation and hauling overloaded pickups to the recycling center, students presented their program and results to their Board of Education. The students were able to demonstrate they had realized a 56% reduction in trash volume for their efforts. Students were also able to demonstrate a \$4,761 savings per year as implementation would reduce hauling fees. The school board bought into their program.

The Students made calls to the local commercial waste and recycling company and ordered cardboard and paper recycling dumpsters. They also reduced the number of pickups per week for the trash dumpsters from six days a week to three times a week. At the end of the first month, the number of dumpsters going to the landfill had dropped from 48 to 24, a full 50% reduction in waste. In the cafeteria itself, the number of bags of trash were reduced from 60 to 34 a day due to collection of bottles and cans and stacking of trays.

In 2010, Ms. Burge's Environmental students pressed for more changes and got involved in the Terracycle program. This partnership increased the number and kinds of items Loveland could recycle. Juice packs, Ziploc bags, and chip bags were added to the recycling. As a result, the cafeteria waste was further reduced from the original 60 bags a day to 13. As a bonus to the idea of recycling, Terracycle generated an income for the program as the district was paid for the items it received from the high school. At this point 86 percent of the



waste in the building outside the cafeteria and 79 percent of the cafeteria waste was being recycled by the students.

In 2012, Ms. Burge started a project-based approach to her Environmental science classes. Students were required to create, initiate and implement “Projects of Change.” Each project was required to create change that added to the sustainability of Loveland schools.

Many projects were of note. Students created a two-acre prairie and wildlife habitat on school grounds, reuseable lunch trays were piloted and implemented, community electronic recycling drives were held, environmental grants were written, murals with environmental messages were painted in the school hallways, and recycling was added to the sport venues. In each of the projects students were responsible for creating, and carrying out each step of the process. Students called community leaders and businesses and then conducted the necessary meetings, wrote grant applications, asked for donations of recycle bins and consulted with local authorities. Hamilton County Recycling and Solid Waste District was particularly helpful to our program. They were there to consult with the students, suggest ideas or vendors and appropriated three grants to assist the program.

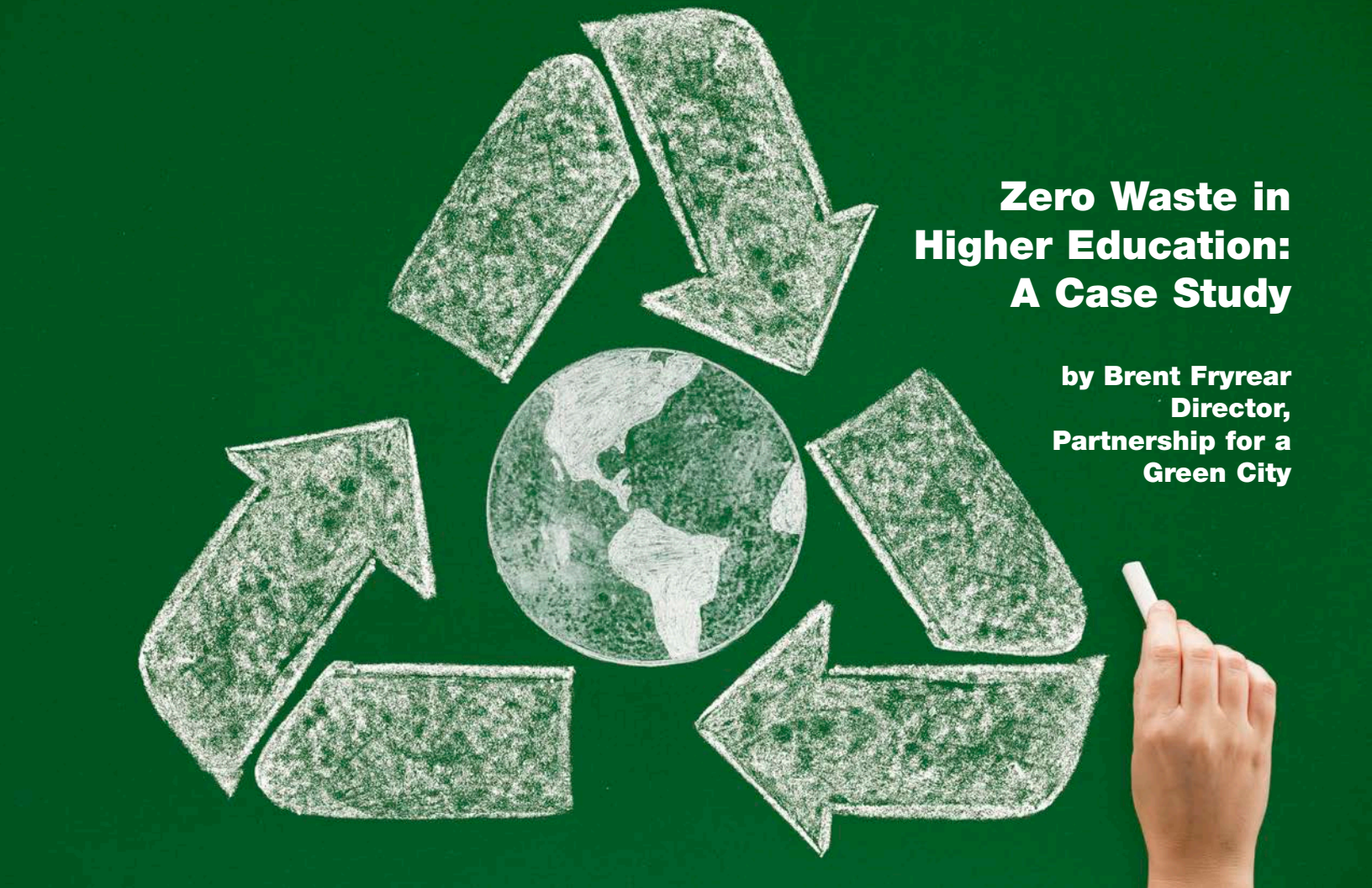


Two projects in particular propelled Loveland’s recycling to new levels. The composting of food waste was initiated and after implementation reduced our original 60 bags of waste out of the cafeteria down to two. Fifteen hundred staff and students ate lunch and only generated two bags of trash--just two. This resulted in a 97% reduction in cafeteria waste and earned Loveland the distinction of a “Zero Waste” cafeteria. Environmental students were involved in every step, assisting other students in recycling during lunch, and sorting the waste at the end of the day.

With such success at the high school, a group of students chose to move the entire project down to the middle and intermediate school cafeterias as their “Project of Change.” On

the day of implementation, the middle and intermediate cafeteria waste was reduced from 48 bags a day to three, a 96% reduction in trash to the landfill. This outstanding result allowed all three campuses to be designated as having “Zero Waste” cafeterias.

Today, environmental classes have expanded to include Waste Management and Sustainability courses. Students continue to manage the waste and recycling, solve problems as they arise, and explore future options. As a result, students not only feel a sense of ownership and accomplishment as they decide how to solve environmental problems and implement that change, but also they have gained critical thinking, communication, and research skills that they will carry with them to be agents of change in the future.



Zero Waste in Higher Education: A Case Study

by **Brent Fryrear**
Director,
Partnership for a
Green City

INTRODUCTION

Over the past two decades, colleges and universities across North America have increasingly become focused on sustainability. Kirwan (2010) recognized three transformative impacts in *The 21st Century: The Century of the American Research University* – strengthening our economy and American competitiveness; reforming health care through revolutionary discoveries in the medical sciences; and addressing the threat of climate change through sustainability efforts and developing alternative sources of energy (p. 104). Kirwan theorized that research universities were positioned to lead sustainability efforts by discovering new forms of clean energy; educating citizens; serving as laboratories and models of “best practices”, including measuring efforts; developing sound policy and leading by example (p. 108). Merkel & Litten acknowledged, “higher education has a distinctive role to play with respect to achieving sustainable progress” (p. 15).

I undertook this work during an internship for the Vice President of Business Affairs and Physical Plant at the University of Louisville (UofL); a metropolitan research university in Louisville, KY. I interviewed custodial staff and physical plant managers to find out how they would improve the materials management process as a way to increase diversion rates toward zero waste.

Colleges and universities are major employers, resource users and create huge amounts of solid waste and other materials.

Since sustainability initiatives have traditionally searched for ways to reduce risk by modifying human behavior that poses a risk, and “for higher education institutions, risk reduction increases their capacities to perform their missions and endure” (Merkel & Litten, p. 9). The traditional missions of universities are education, research and service, and sustainability efforts are a logical fit within those areas (Scully-Ross).

Zero Waste

The goal of zero waste is to divert 100% of materials from landfill disposal through reduction, reuse, recycling and composting. Increasing landfill diversion from 90% to 100% also qualifies as a “zero waste” goal as organizations set interim goals increasing diversion to the extent that is possible (http://www.academia.edu/688426/Zero_Waste_at_UCLA p.26, downloaded April 13, 2013).

The idea of “zero waste” has been around industry globally for a number of years. Toyota has been an advocate for zero waste for the past twenty-five years, announcing the company’s zero waste intentions in 1992. In 2009, Toyota plants report zero landfill status, or a 95 - 97% landfill diversion rate (http://www.academia.edu/688426/Zero_Waste_at_UCLA, p.66). Xerox is another international company that created a zero waste goal in 1990. In 2009, Xerox reported an 84% diversion rate, including life cycle design and beneficial reuse (http://www.academia.edu/688426/Zero_Waste_at_UCLA, p.72).



Many higher education institutions have achieved success in waste reduction and recycling efforts (Armijo de Vega, Benitez & Barreto, 2008). Armijo de Vega et al., state that higher education has a moral and ethical obligation with respect to the environment, and colleges and universities should lead the efforts in their respective communities. Not only does zero waste save money, it also shows leadership by example. In many parts of the world landfill space is at a premium, causing them to promote zero waste initiatives, but in much of the United States, landfills are a cheap efficient solution for wastes to “disappear” (Cardinali, 2001). In many cases, the disposal price per ton is cheaper than recycling or composting.

Sharp (2002) wrote that consumption was a factor of waste in her study of green campuses. Consumption of goods and services, energy, paper, printing, etc., are all increasing as colleges and universities grow (Sharp). As a function of American society, people regularly use disposable products for convenience and they have become accustomed to throwing things away. According to the Environmental Protection Agency (EPA), the average citizen throws away 4.6 pounds of trash daily (USEPA Solid Waste Facts, 2010). That adds up to about 1680 pounds per person per year. Sharp echoed Cardinali “that there is an “away” where you can throw things” (p. 134) and because of that, many universities do not consider that most waste can be reduced, reused, recycled or otherwise managed.

Smyth, Fredeen & Booth investigated waste management in higher education and theorized that truly comprehensive waste management programs are a big challenge for colleges and universities in working toward sustainable status (2010). Multiple researchers wrote that solid waste management necessitates knowledge of the organization’s total waste stream (Smyth et al., Mason, Oberender, Brooking, 2004, Mason, Brooking, Oberender, Harford, & Horsley 2003, and Espinosa, Turpin, Polanco, De la Torre, Delfin, & Raygoza, 2008). Smyth et al., recommend a waste characterization prior to embarking on a waste management system. They also concluded that the results should become a motivating factor in making waste management a fundamental part of a university’s sustainability efforts.

Research shows that universities must work to promote engagement of community members if the program is to succeed. Kelly, Mason, Leiss and Ganesh (2005) surveyed a university with respect to awareness, the university recycling system, attitudes toward recycling and demographic information. Their survey was mailed to a random sample of 1400 students and staff out of a population of 6500 students and 1800 staff. The response rate was 48% with more staff (58%) responding than students (45%). Kelly et al., reported that recycling awareness was high – 96% for students and 86% for staff who reported they recycled on a regular basis. They were not as aware of the signage adjacent to the recycling bins. The majority of people did not want to see things changed. The environmental attitudes were reported as

being positive in response to most questions about the natural environment being important, recycling as much as possible, a personal responsibility to recycle, etc.

Historical Analysis

The University of Louisville (UofL) entered a single-stream recycling program in 2009 where all recyclable items are collected together (comingled) in desk-side containers or hallway containers, leaving relatively little waste that should go to the landfill. The university has been recycling about 50-64% of its “waste” stream and the remainder is disposed of in the local landfill. There are enough recyclables in the refuse cans across campus that the contents are taken to the sort line at the contracted recycling vendor to remove the aluminum, plastic, paper and cardboard.

The UofL Vice President of Business Affairs convened a Solid Waste Reduction Committee to begin phase II of the university’s solid waste reduction plan. The working group formed to:

- Promote recycling, increasing awareness
- Change university-wide culture to normalize recycling
- Improve current methods and discover new reuse opportunities
- Train custodial staff and performance review standards
- Develop waste disposal policies
- Identify specific streams that can be minimized or eliminated
- Analyze purchasing modifications and packaging requirements
- Increase recycling at special events: athletics, conferences, catering, commencement, etc.
- Increase pre and post-consumer food waste composting

Purpose of the Study

The purpose of this study is two-fold, to investigate ways the university can become more sustainable. The second is to involve the custodial staff and supervisors in the decisions to improve university sustainability.

Research Questions

I interviewed an Assistant Director of Physical Plant, a Custodial Manager and two Zone Custodial Staff with a set of questions to determine what changes they would make to improve the university’s efforts toward zero waste.



Significance of Contribution

There are a number of issues that determine how individuals participate in waste reduction, reuse, recycling and composting. The easier it is for them to do it, the more likely they are to participate. This study contributes to the meager empirical literature on waste reduction initiatives in higher education moving toward zero waste goals. The research also gives voice to an underrepresented group of individuals who can make a positive contribution in the success of an institution's zero waste efforts.

Limitations/Delimitations

The limitations of this pilot project are: the number of participants is small for a research study ($n = 4$) with two having supervisory positions and two being custodial workers; the study is a single case study; there was a reluctance based on UofL culture for three additional custodians to consent to be interviewed, fearing repercussions for saying something, regardless of confidentiality; and the focus is trash and recycling, a topic few people give much thought.

METHODOLOGY

Assumptions

My assumptions entering this study were that a person's beliefs on the central issues of waste management/recycling/zero waste are formed during the individual's "coming of age" period and the home environment (including family recycling/solid waste attitudes).

I also assumed that most people do not think about what they discard, dictated in large part by the social norms or values (our throw-away society) and the ready availability and expectation of public trash disposal.

Observation of people going about their jobs while being interviewed accomplishes a number of different things. I observed if the custodian was handling the materials correctly and placed them in the correct dumpster. I also observed what areas tend to be more compliant with the recycling/disposal process – office areas versus student areas. Strategically placed, one may also observe students, faculty and staff in a public area where they purchase meals and eat. Not only can one discern recycling habits, one can see what meal packaging is recyclable and how much is actually disposed of or recycled.

Role of Researcher

I performed two roles during this study. The first was as an interviewer, gathering data from the interviewees, recording that data and transcribing it into a word processed document. The second role was that of a participant-observer, informally keeping a journal of noted recycling efforts. This allowed me to immerse myself in "everyday settings" to heighten and refine my

"awareness and curiosity" on current recycling efforts at UofL (Glesne, 2011, p. 91). Given my own personal beliefs, I took into account my own attitudes and opinions towards this pilot study and understood my views of this project from both a "reformer" and "advocate" point of view (Glesne, p. 169-170).

FINDINGS

The data from the interviews resulted in one central goal of zero waste. What the custodians and their supervisors believed resulted in five recommendations: education or training; infrastructure; consistent messaging and branding; and handling. There were four secondary recommendations: solid waste/recycling coordinator; benefits of zero waste; barrier – it is cheaper to trash; and a resistance to change.

Education & Training

The major recommendation was a vigorous educational effort on defining recycling, what goes where, visual representations of recyclables, or no liners in recycling cans. Education is closely tied to handling, meaning the ways that the custodians handle the waste (or mishandle it), and training about the organizational culture. Although the Solid Waste/Recycling Coordinator was a secondary issue, such an employee has a direct impact on awareness and education as well as being the point person for conducting training. Training should be light and enjoyable, but realistic including items like what goes where, what happens to the recyclables at the other end of the process, and simple ideas like breaking down a cardboard box to not leave empty space in a dumpster. Those who receive boxes should be responsible and collapse all cardboard to a flat state. Custodial staff should not be required to break down other's boxes. Overall, if education and training are thorough, solid waste reduction moving toward zero waste will be relatively successful. A good education program makes it possible to overcome barriers as well as extolling the benefits of a zero waste goal.

Infrastructure

In order to have a successful zero waste program, the infrastructure must be in place for people to know what to throw where. The containers have to be easily accessible and easily cleaned without allowing for flies and gnats to gather and breed. The types of containers should be consistent. One of the interviewees said "we are handicapped in the way that for us to incur the huge expense to go to all blue cans, because once you get focused, you go, blue can, this is recycling. My deal is they should all be the same". (Looks around where we are sitting). "See someone has come and put a green one in here and it's got little holes in the top. I don't know who does that, but we end up maintaining it. Ideally, you should always have pairs where you should have a choice. When you approach to discard your whatever, that you know and it is clearly signed what can go in there and what cannot go in there". Having a person responsible for the infrastructure would certainly decrease the likelihood of



multiple types of containers. Education and training will greatly improve the use of existing containers.

Consistent Messaging/Branding

While education and training goes a long way to increasing awareness, a consistent message or recycling brand was important to the custodial staff and supervisors as well. Messaging can be as simple as one of the supervisors said “like these little things running here (pointing to one of the LED screens in the hallway) I’m sitting here eating and there could be a message that comes up on there and it’s cute and says Hey, and it’s a student and it looks like someone who would sit next to me in class saying I have a choice here and I know that there are already some student made videos here, so we are not talking about a huge amount of cost. If it’s just wording or pictures, this is what you do with it, I think that most people will with a little ‘umph’ behind them they are okay with it, they are used to that”. There are numerous LED video screens around the campus including areas in the student buildings and office buildings that could be used to get the message out.

Everywhere there is a recycling container, there should be a reminder poster detailing all the items which are recyclable. Likewise, trash containers should also indicate what is true garbage. Kelly et al., in their study discussed how faculty, staff and students were aware of the containers, but they were typically unaware of the signage adjacent to the bins.

Handling

Handling of recyclables from one’s hands to the end recycling company was a concern of the custodial staff. People often accused the custodians of combining garbage and recyclables together in the same can. They also told the custodians that it doesn’t matter where they throw things, it all goes in the landfill anyway. Handling is so closely connected to campus infrastructure, education and training, consistent messaging, organizational culture and the solid waste/recycling coordinator. If Individuals understood the eccentricities of the program, such as the charge per tip to collect the recyclables, how pick-ups were scheduled, the volumes of waste recycled (or not), and how the recycling vendor source separated the materials into the component streams, they would be compelled to participate at a higher level.

Organizational Culture

Individuals can make choices that indicate where they fall on the green continuum. How they recycle or do not is often part of the organizational culture. If someone recycles at home, they are more likely to recycle at work according to the custodians. At UofL, the custodians report that students were much less “into” recycling than those who work in the office buildings, probably because of the feeling of ownership in having an office that one comes to each day. One of the interviewees said “in the college

setting we are used to procedures. As a student you come in and if you don’t follow the procedures, you don’t get the classes that you want, you don’t get the grades, so they understand procedures, it’s just a matter of making it where I am coming down the escalator and I am seeing like today, I am coming down the escalator and I see about Student Government Association (SGA) and how to get ahold of them. If I am riding down the escalator, that is long enough to promote sustainability and recycling along with everything else”.

Moving toward a zero waste goal often necessitates a culture shift or a change in organizational culture. At UofL, we promote our sustainability program and single stream recycling program in new employee orientation with the expectation that we instill the values the university deems important as people start to work. The Students also have a green component to student orientation.

Solid Waste/Recycling Coordinator

Having someone in an institution who can advocate for the program and is responsible for it will help to achieve the zero waste goal. Mason et al., (2003) discussed the importance of having someone dedicated to waste reduction efforts, knowing the various waste or materials streams, and having an awareness of the recyclables markets. In concert with education and training, a solid waste/recycling coordinator can achieve all of the other recommendations. This person can engage campus constituents at all levels, touting the benefits of the zero waste goal, working to overcome the barriers and those who dislike change, and slowly changing the organizational culture. More than that, the coordinator can develop the consistent messaging and branding as well as the consistent infrastructure. Such a coordinator would work with the custodial staff and supervisors on handling issues. Other schools with successful waste reduction programs employ someone who is responsible for connecting the issues at their own institution by working with purchasing and people on the front end about packaging and with campus constituencies to increase the three Rs and composting while trying to eliminate waste sent to the landfill.

Barrier – Cheaper to Trash

Many people do not understand the economics of trash and recycling collection. Because Kentucky has available land, even with intense environmental regulations, landfills are relatively easy to site. Cardinali wrote about landfills being cheap and efficient solutions for waste to “disappear”. In our recycling market, UofL pays much less for disposal (per ton) than they do for recycling as recyclable collection (per tip, whether the dumpster is half full or full). From one of the interviewees:

“It was originally thought that it was going to be \$35,000 - \$40,000 a year. And last year’s cost was right at \$48,000 for recycling. We get charged based on – let’s take this a little further...the custodians in this building; they get their trash bags and they get their recycling bags and they take them out to the



dumpster area. They put the trash in the trash dumpster and the recycling in the recycling dumpster. QRS comes and they tip these dumpsters into a truck and we are charged for each tip”. “Well, we pay \$21.50 a ton to dispose of solid waste and without having my numbers in front of me, I couldn’t necessarily tell you how much that saves. But it is cheaper for us to throw it away than recycle”. “We thought that the only way we could do it, it will always be an expense for us, unless landfill rates go up, and at \$21.50 you know, we don’t have a hope that we can even get the program to pay for itself by reducing what we take to the landfill. If the garbage rates were to double, it would offset a little bit more. If it were to triple, and we know sometime in the future we are going to be paying more to throw it away – so if we can get our recycling program in place, when those costs do go up, then we can start to offset our costs. I don’t think we will ever have a program that pays for itself, much less one that makes money”.

Dislike Change

The “nattering nabobs of negativism” are quick to say they can’t do something because we have never done it that way before. Many people are averse to change and can throw a wrench into the plans of those who work to achieve goals. In Kelly et al., the authors mentioned that students and staff were often resistant to change. As the recycling goals increase and trash is minimized, the solid waste/recycling coordinator will need to consult with those who dislike change, but not spend excessive time trying to convert them. As social norms change, peers will begin to apply peer pressure.

Code Map

The code map indicates the findings from the study.



Next Step – Draft Zero Waste Plan

Using the findings from this pilot research study, a draft Zero Waste plan was crafted with a Zero Waste Policy and a plan created to reach zero waste. This was done as the university realigned its priorities as a 21st Century University, using three questions that strategic planning groups were asking:

- Where are we now?
- Where do we want to be?
- How do we get there?

Conclusions

The results from a small sample of people who handle or manage the materials indicated that all four interviewees had strong ideas about how things could be managed more effectively. None thought zero waste was an unachievable goal and recommendations indicated ways to improve, barriers to manage and ways to overcome them. Whether it is an aspirational or an actual goal, zero waste planning not only makes people think, it makes people act at school, work and hopefully, home.

Brent Fryrear is the Director of the Partnership for a Green City, a sustainability collaboration of Louisville Metro Government, Jefferson County Public Schools, Jefferson Community & Technical College and the University of Louisville. Brent is also a Ph.D. student in Educational Leadership and Organizational Development at the University of Louisville, College of Education and Human Development.



REFERENCES

- Armijo de Vega, V. C., Ojeda, B. S., & Ramirez, B. M. E. (June 23, 2008). Solid waste characterization and recycling potential for a university campus. *Waste Management*, 28, 521-526.
- Cardinali, R. (January 01, 2001). Waste management: a missing element in strategic planning. *Work Study*, 50, 197-201.
- Creswell, J.W. (2013). *Qualitative Inquiry & Research Design* (3rd Ed.). Thousand Oaks, CA: Sage.
- Creswell, J.W. (2012). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (4th Ed.). Boston, MA: Pearson.
- Dillman, D.A., Smyth, J.D., & Christian, L.M. (2009). *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method* (3rd Ed.). Hoboken, NJ: Wiley.
- Fischman, M.W. (2000). Informed Consent. In Sales, B.D., Folkman, S. (Eds.), *Ethics in Research With Human Participants*, (pp. 35-48). Washington D.C: American Psychological Association.
- Folkman, S. (2000). Privacy and Confidentiality. In Sales, B.D. & Folkman, S. (Eds.), *Ethics in Research With Human Participants*, (pp. 49-57). Washington D.C: American Psychological Association.
- Glesne, C. (2011). *Becoming Qualitative Researchers: An Introduction* (4th Ed.). Boston, MA: Pearson.
- Graedel, T. E. (2002). Quantitative sustainability in a college or university setting. *International Journal of Sustainability in Higher Education*, 3, 346-358.
- Jay, N. (June 2011). Zero Waste at UCLA, http://www.academia.edu/688426/Zero_Waste_at_UCLA p.72, downloaded April 13, 2013.
- Kelly, T. C., Mason, I. G., Leiss, M. W., & Ganesh, S. (May 01, 2006). University community responses to on-campus resource recycling. *Resources, Conservation & Recycling*, 47, 1, 42-55.
- Kirwan, W. E. B. (2010). The 21st Century: The Century of the American Research University. *Innovative Higher Education*, 35(2), 101-111.
- Mason, I. G., Brooking, A. K., Oberender, A., Harford, J. M., & Horsley, P. G. (January 01, 2003). Implementation of a zero waste program at a university campus. *Resources, Conservation, and Recycling*, 38, 4, 257-269.
- Mason, I. G., Oberender, A., & Brooking, A. K. (January 01, 2004). Source separation and potential re-use of resource residuals at a university campus. *Resources Conservation and Recycling*, 40, 2, 155-172.
- Merkel, J., & Litten, L. (2007). The sustainability challenge. *New Directions for Institutional Research*, (134), 7-26.
- Scully-Ross, E. (January 01, 2012). Human resource development and sustainability: beyond sustainable organizations. *Human Resource Development International*, 15, 4, 399-415.
- Sharp, L. (June 01, 2002). Green campuses: the road from little victories to systemic transformation. *International Journal of Sustainability in Higher Education*, 3, 2, 128-145.
- Smyth, D. P., Fredeen, A. L., & Booth, A. L. (September 01, 2010). Reducing solid waste in higher education: The first step towards 'greening' a university campus. *Resources, Conservation & Recycling*, 54, 11, 1007-1016.
- Teddlie, C. & Tashakkori, A (2009). *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Sciences*. Thousand Oaks, CA: Sage.
- US Environmental Protection Agency Municipal Solid Waste Report, downloaded from <http://epa.gov/solidwaste/nonhaz/municipal/msw99.htm>, April 13, 2013.
- World Commission on Environment and Development (WCED), *Our Common Future*. New York: Oxford University Press, 1987, 8

The Journey to Zero Waste

“Are we there yet?”

by Kieth Hackett
Assistant Director,
Public Works for Louisville Metro Government,
Solid Waste Management and Services Division

When you think about how we can achieve zero waste in our communities, it appears to be a daunting, as well as an unachievable goal. Can you imagine a community, let alone our country with zero waste? So what is zero waste and how can we conceivably reach this goal? What would a zero waste utopia look like? Zero waste as described by the GrassRoots Recycling Network identifies it as a philosophy and a design principle for the 21st century. It includes ‘recycling’ but goes beyond recycling by tracking a ‘whole system’ approach to the vast flow of resources and waste through human society. Zero waste maximizes recycling, minimizes waste, reduces consumption and ensures products are made to be reused, repaired, or recycled back into nature or the marketplace. Other components these philosophical viewpoints include:

1. Redesigns the current, one-way industrial system into a circular system modeled on Nature’s successful strategies.
2. Challenges badly designed business systems that ‘use too many resources to make too few people more productive.’
3. Addresses, through job creation and civic participation, increasing wastage of human resources and erosion of democracy.
4. Helps communities achieve a local economy which operates efficiently, sustains good jobs, and provides a measure of self-sufficiency.
5. Aims to eliminate rather than manage waste.

Zero waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles. Its where all discarded materials are designed to become resources for others to use (internationally accepted, peer-reviewed definition adopted by the Zero Waste International Alliance, November 29, 2004). Whether you subscribe to the philosophical description or the internationally accepted definition of zero waste, it is evident if any city is going to achieve that, it is going to take an

assertive, consistent, and continual effort. It will take generational involvement and participation. Our cities will have to have the political will, financial infrastructure, technological resources, robust educational/marketing plan, and stakeholder commitment to achieve managing and/or eliminating waste.

Louisville Kentucky is embarking on this journey with a goal to reach 90% diversion of waste material by 2042. Through the leadership and vision of Mayor Greg Fischer, the city has 22 strategic goals for our city. Goal 18: Increase Diversion: Reduce, Reuse, and Recycle is one way to get to zero waste. Below is a brief fact sheet of this goal.

Pete Flood, Compliance and Enforcement Manager for Public Works and Asset – Waste Management District comments, “As a person having been heavily involved with the recent 10 year Solid Waste Management Master Plan development, I believe the biggest thing we can and must do is get stakeholders to come together and have one goal for the community. We all have responsibilities in our small cities, agencies, and businesses but we must also realize there is a bigger picture and that our individual success is tied to the larger Louisville Metro area and region. The plan will give us the ‘how to get to zero waste,’ but if we cannot come together it will be just another plan on the bookshelf.”

Each journey has its challenges, as you strive to reach the final destination. “The goal of being a zero waste community is decidedly ambitious. A significant amount of data is being evaluated as part of Solid Waste Management’s 10 Year Plan project to identify if and how we can achieve the goal. Most of us can improve our footprint and it will take a true collective effort for the city to move toward a zero waste goal,” said Maria Koetter, Director of the Office of Sustainability. Louisville had two separate governments, but in 2003 began the merged government. Although we are a merged Metro city, we still retained the over 80 small cities in our community. Each of the small cities has its own elected officials. A majority of the small cities have private contractors servicing them. The former city limits are still serviced by the Department of Public Works-Solid Waste Management Services Division. These services include residential garbage, recycling, and yard waste; bulk trash pick-up;



Louisville's 6-Year Strategic Plan

In 2012 Louisville Metro Government, with input from citizens and community stakeholders, created a Six-Year Strategic Plan outlining the bold new vision for our city. We have made significant progress on each of these goals, even completing some of them. The progress report below reflects our continued work, including the addition of new goals and amendments to existing goals. Both our advancements and adjustments have been made with an eye towards continuous improvement. As we continue our journey, we will strive to learn more about what works, what doesn't work, and how we can best meet the challenges ahead. The City's Strategic Planning website: <http://louisvilleky.gov/government/mayor-greg-fischer/strategic-plan>

Our Vision...what we want for our City

"Louisville is a city of lifelong learning, great jobs, wellness, and compassion"

Our Mission...how we will achieve our Vision

Louisville Metro Government is the catalyst for creating a world-class city that provides its citizens with safe and vibrant neighborhoods, great jobs, a strong system of education and innovation, and a high quality of life"

Goal 18: Increase Diversion: Reduce, Reuse, Recycle

Goal Description: Increase diversion of solid waste generated by Jefferson County sent to local landfills from 49% in 2012 to 90% by 2042 at a rate of 7% every five years.

gone from a waste collection system with limited recycling to a Commercial wet/dry recycling system. This program in Louisville is the first municipal program of its kind in the county. Louisville Metro Government of Public Works and QRS Recycling have partnered to divert as much material as possible from the landfill.

Commercial dry waste is a simple solution collection process which allows recyclables and solid waste to be collected in a single container; eliminating the need for onsite separation. All material goes to QRS Recycling facility to be sorted, maximizing the recovery of recyclable material and disposing of the remaining waste. Commercial dry waste (CDW) requires the majority of the material to be recycled by weight and cannot include pursuable waste. All restroom and break room waste is bagged separately in black bags for easy identification of solid waste.

Another innovative change to capture more materials for recycling was implemented in April 2015 by the waste collection operations for Public Works and Assets. All the public litter baskets that were collected on garbage routes are now collected on the recycling routes in the Urban Service District (Old city limits). This was another game changer for the city of Louisville. After several audits, it was reported 60 – 70% of the material in the public receptacles at bus stops and on street corners was recoverable.

As we conclude this portion of the journey, it is imperative to reiterate having a robust educational/marketing plan is also a key component to reaching our goal. These types of plans have to look beyond day-to-day, month-to-month, and even year-to-year projections. We have to look at the short term (10 years) and the long term (year 2042) trajectory of reaching the 90% to Zero Waste Goal. Angela Futter, Project Manager, Office of Sustainability says, "There is definitely a need for education in helping Louisville to reach our zero waste goal. But it needs to be understood education can only have so much of an impact. Short term, education and behavior change efforts can help move the needle towards increased diversion. Through these efforts Louisville might be able to reach 60-70% diversion. Although even if we had each person participating and participating correctly in all the programs we have available today, it

Figure 1: brief description of Louisville Strategic 6 year plan for Goal 18: Increase Diversion: Reduce, Reuse, Recycle.

neighborhood street sweeping (three times per year); central business district collection operations; food waste collection in the central business district. The unincorporated single/multi-family residents have a choice to subscribe to any private waste hauler licensed in the county. As you can see we are a melting pot of services and stakeholders.

In spite of these challenges Louisville had made some progress with innovative operational and policy enhancements to demonstrate that in the current system we can make value added changes in how material is collected, and processed. For example, as previously mentioned, the Central Business District has now

*** Goal 18: Key Performance Indicator**

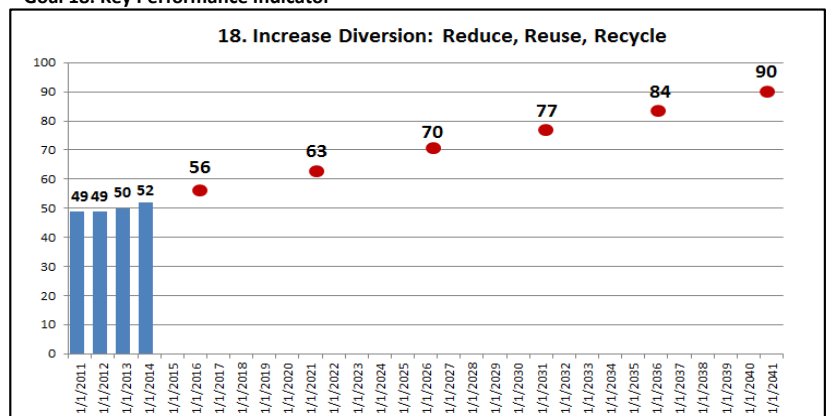


Figure 2: graph of Goal 18: reaching 90% diversion by 2042



Figure 3: Wet/Dry diagram for Central Business District Collection

won't get us to zero waste (90% diversion). In order for this to happen there must be education and behavior change measures, in addition to investment in new infrastructure, innovation in new technology, strict requirement mandates passed and robust incentive programs in place. A combination of all of these efforts will set Louisville on the long term path to achieving this goal." Not only a combination of these efforts but combinations of stakeholders have to be willing to assist in this endeavor. Residential, institutional, commercial, and industrial customers must be integral stakeholders. We will be able to move the needle with construction and demolition, self-haulers, and bulk waste reduction as a part of the expanded services in our community as well. This can be done in the short-term while preserving choices. In the long term we will continue education and outreach with increased regulation and processing if absolutely necessary.

"Are we there yet?" – No, but we are on our way!!

Keith S. Hackett serves as an Assistant Director in Public Works for Louisville Metro Government in the Solid Waste Management and Services Division. Keith is responsible for the day-to-day operations of the agency with 240 employees and a 25 million dollar budget. The operations are comprised of Waste collection, Bulk Waste, Neighborhood Street Sweeping, Suburban Street Sweeping, Night Services Collection, Compliance and Enforcement, Waste Management District Board and Advisory Committee for Louisville Metro Government.

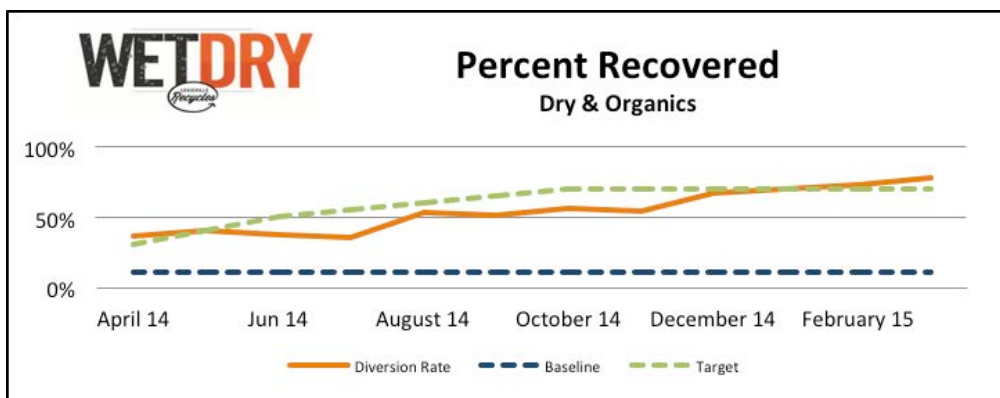


Figure 4: Graph of Wet/Dry Percent Recovered in Central Business District Collection



Figure 5: Graph of Wet/Dry Tons Waste Landfilled vs. Recovered

UNIVERSITY OF LOUISVILLE®

Kentucky Institute for the
Environmental and Sustainable
Development

203 Patterson Hall
University of Louisville
Louisville KY 40292

Non-Profit Org.
U.S. Postage
Paid
Louisville, KY
Permit No. 769