

**EUREKA!
RECYCLING**



Development of Best Practices in Public Space Recycling

Eureka Recycling, based in the Twin Cities of Saint Paul and Minneapolis, is the only organization in Minnesota that specializes in zero waste. The organization's services, programs, and policy work present solutions to the social, environmental, economic and health problems caused by wasting. A 501(c)(3) nonprofit organization, Eureka Recycling's mission is to demonstrate that waste is preventable, not inevitable. Because this mission is realized by any person or group that chooses to prevent waste, Eureka Recycling provides opportunities for everyone to experience firsthand that waste can be prevented.

Perhaps most well-known for its \$9 million annual recycling operations, Eureka Recycling has provided

curbside and apartment recycling services, education, and advocacy since 2001. Eureka Recycling also has a wide range of other initiatives designed to prevent the needless wasting of our discards through reuse, recycling, composting, waste reduction, producer responsibility and more. These initiatives directly provide over 100 jobs for the individuals who work here and demonstrate our mission every day in the work that they do.

By its efforts in programs, services and advocacy, Eureka Recycling aspires to help individuals, organizations, and communities understand the significance of zero waste and to achieve their own zero-waste goals.

Acknowledgements

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- The Bulldog Lowertown
- Christos Greek Restaurant
- Executive Coffee & Tea
- Golden's Deli & Market
- Great Northern Bistro
- LoTo Life Café
- Rumours & Innuendo
- R.S.S. Convenience Store
- Station 4
- Trattoria Da Vinci

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Development of Best Practices in Public Space Recycling: Introduction

You may be reading this because you are a recycling coordinator working on implementing a public space recycling program. You know that part of the process involves getting recycling containers out in public spaces, but may not be sure what else is involved or what to watch out for. You know the community really wants to have recycling available in public spaces because you hear it all the time. But, at this point, you may have more questions than answers, such as:

- What is the best place to start?
- What challenges can you expect?
- How do you identify staff support for the program?
- How do you build community support and awareness?
- How do you choose containers and provide education?
- What are the best ways to measure success?

In 2007, the City of Saint Paul, MN, and its partner in waste reduction, Eureka Recycling, were in just that situation after hearing from the community how much it valued public space recycling. At that time Saint Paul, a city committed to become a zero-waste city by 2020, was looking at launching and expanding public space recycling as the next step in waste reduction. Nonprofit Eureka Recycling, the City's longstanding partner in recycling, looked around the country for examples and best practices for public space recycling and found little. This began Eureka Recycling and the City of Saint Paul's learning about the best practices in public space recycling.

Unlike curbside and other well established recycling programs, public space recycling has only recently



emerged on the recycling scene. In 2005, when the community asked Eureka Recycling and the City of Saint Paul to focus on public space recycling, there were few models throughout North America of successful public space recycling programs. In fact, few large public space recycling programs existed, and those that did offered little information about program costs and effectiveness. Communities around the country have since begun to implement public space recycling programs as the next expansion of their recycling work. In the Twin Cities metro area alone, these communities, organizations, and government entities include Ramsey County, Dakota County, and Anoka County; the cities of Minneapolis, Bloomington, Edina, Fridley, Hastings, and Shorewood; and the Recycling Association of Minnesota, to name just a few. The list grows each year.

About Eureka Recycling

Our intention with this report is to provide our perspective of public space recycling as a zero-waste strategy, and to share what we have learned about public space recycling through our work in Saint Paul. We hope this information contributes to your knowledge about developing a public space recycling program in your community, and that it answers some of your questions about collaborating with stakeholders, involving the community, building a recycling collection

infrastructure, and articulating the environmental benefit for your public space program. What follows are our lessons learned, best practices discovered, and questions uncovered during this project.

Eureka Recycling is the only organization in Minnesota that specializes in zero waste. The organization's services, programs, and policy work present solutions to the social, environmental, and health problems caused by wasting. A 501(c)(3) nonprofit organization, based in the Twin Cities of Saint Paul and Minneapolis, MN, Eureka Recycling's mission is to demonstrate that waste is preventable, not inevitable. Because this mission is realized by any person or group that chooses to prevent waste, Eureka Recycling provides opportunities for everyone to experience firsthand that waste can be prevented.

Perhaps most well-known for its \$9 million annual recycling operations, Eureka Recycling has provided curbside and apartment recycling services, education,



and advocacy since 2001. Eureka Recycling has a wide range of initiatives designed to prevent the needless wasting of our discards through reuse, recycling, composting, waste reduction, producer responsibility and more. These initiatives provide more than 100 jobs for individuals who demonstrate our mission every day in the work that they do.

By its efforts in programs, services, and advocacy, Eureka Recycling aspires to help individuals, organizations, and

communities understand the significance of zero waste and to achieve their own zero-waste goals. An essential part of Eureka Recycling's mission is to create models for other communities and demonstrate the best practices of waste reduction. By solving and investigating hard problems, Eureka Recycling develops model programs to bring us closer to zero waste. As communities across the country face steep budget deficits and are pressured to cut programs, replicable models for economically sound recycling and waste reduction programs are in demand. Eureka Recycling has completed grant projects resulting in nationally recognized best practices for curbside collection and processing, as well as multifamily (apartment) recycling. Eureka Recycling puts these practices into place to demonstrate the qualities and advantages of zero-waste strategies, and actively disseminates information about its programs.

The Beginning of Public Space Recycling in Saint Paul

As you work to develop a public space recycling program, it is important for you to know the environment in which we did this work. The support and interest of Saint Paul residents and the vision and commitment of the City of Saint Paul have been central to Saint Paul's successful waste reduction initiatives.

Eureka Recycling has been Saint Paul's partner in waste reduction for more than 20 years. Saint Paul's uniquely strong commitment to zero waste has provided a supportive atmosphere and important perspective for our work together on curbside and multifamily recycling. Saint Paul, which boasts one of the highest recycling rates in the county, is also home to one of the first and largest multifamily recycling programs. The City recognizes public space recycling as an important step in not only improving recycling, but as an important strategy in getting to zero waste. Together, Eureka Recycling and the City of Saint Paul have successfully launched recycling initiatives, as well as education, programs and services to address other strategies to move the city toward zero waste, such as composting, reuse, waste reduction, producer responsibility and more.

Saint Paul Environmental Roundtable

In 2005, Eureka Recycling, convened the Saint Paul Environmental Roundtable to provide an effective way of gaining valuable citizen participation in policy creation around environmental issues for the City. More than 500 residents of Saint Paul came together between September 2005 and April 2006 through community meetings and forums. This community-based process helped set Saint Paul's policy direction on six environmental issues: zero

waste, food systems, cleaner energy, green building, open space, and water stewardship. As part of the zero-waste recommendations, Saint Paul residents voiced an overwhelming desire to see the City establish recycling in public spaces.

In response to the Environmental Roundtable, the City of Saint Paul adopted the goal of being a waste-free city by 2020 and created the work group Sustainable Saint Paul to address environmental issues for the city based on the prioritized recommendations from the Roundtable members. Since that time, Eureka Recycling has worked side-by-side with the City to craft zero-waste policies and strategic plans to achieve zero waste on many issues, but especially public space recycling.

Zero-waste recommendations

One of the first recommendations that came out of the Roundtable Zero Waste working group (see www.eurekarecycling.org/environmentalroundtable for full Zero Waste recommendations) was that the City adopt a zero-waste goal for 2020:

Saint Paul has been recognized as a national leader in the reduction of waste, setting and meeting aggressive goals. In 1995, Saint Paul set a goal to recycle 50% of the waste stream by 2005, which we are only 5% away from achieving. This is no small accomplishment—in just ten years we successfully reduced and/or recycled almost half of the waste we generated!

While we celebrate these successes, environmental concerns about sustainable energy, growing trash volumes and global warming are on the rise, and it is time to push forward with more aggressive and optimistic goals for the future of Saint Paul. Cities,

counties, countries and businesses all over the world have already adopted zero-waste goals, and now is the time for Saint Paul to put forth a visionary initiative.

Included in the specific recommendations to achieve this goal was a clear call for increased **public space recycling**. Residents carry out the ritual of recycling at home with great dedication—Saint Paul has one of the highest recycling rates in the country. They wanted the same opportunity to recycle when gathered together as a community in public spaces. The community also wanted public space recycling, especially in the city’s treasured public spaces, because it highlights the City’s commitment to the environment and deeply held tradition of recycling for residents and visitors alike.

With this in mind, the Environmental Roundtable recommended the City put time and resources into determining some best practices for public space recycling so a citywide program would have better chances for success:

Before implementing a public space recycling program, Saint Paul should understand the best practices for public space recycling, including what containers to use, what education is best (like using several commonly spoken languages and/or basic pictures), and how to cost-effectively incorporate the containers into a collection system infrastructure.

Learning about successful public space recycling

The City of Saint Paul and Eureka Recycling have a long tradition of leading on challenging recycling issues (such as apartment recycling) and protecting the valuable materials that residents entrust to the program for the greatest environmental benefit. Before launching blindly into public space recycling, the City and Eureka Recycling committed to first learning more about how to make public space recycling successful, cost-effective, environmentally beneficial, and consistent with the values reflected in the diverse public spaces throughout the city. We set out to learn what it takes to implement an authentic recycling program in public spaces, to ensure the materials really get recycled. Como Park Zoo and Conservatory and Public Art Saint Paul joined this partnership to launch and test public space recycling in Saint Paul.

In 2007, Eureka Recycling received grants from the Minnesota Pollution Control Agency and the U.S. Environmental Protection Agency to support this work. Meanwhile, the nonprofit Public Art Saint Paul had initiated a Beyond Green program and received funding from the Saint Paul Cultural STAR program to support a series of initiatives encouraging sustainable art-making and developing demonstration projects related to environmental values, including recycling in public spaces. At Como Park Zoo and Conservatory, conservation is part of the mission. The established Green Team provided a strong base and momentum for a partnership in this project.

Public Space Recycling: A Path to Zero Waste

Eureka Recycling uses a zero-waste approach in all of its work and is grounded in the belief that there really is no waste. Public space recycling is part of the path to zero waste by providing the opportunity to capture the recyclable materials we dispose of on-the-go and creating awareness that waste is also generated away from home.

In 2006 in Minnesota, 3.6 million tons of municipal solid waste (the trash we generate every day) were buried in landfills or burned in incinerators, while 2.5 million tons of our discards were captured for recycling. More than half of what we still throw in the garbage can be recycled through curbside and other types of collection.

After all the recyclables are captured, the next step to zero waste is composting in our homes and public spaces. Approximately 25% of our trash is composed of food wastes and other materials that could be composted.

The little bit of garbage that remains after we recycle and compost can be thoughtfully addressed through a zero-waste approach (which includes extended producer responsibility) to prevent waste altogether.

The environmental need for public space recycling

One reason we waste resources by throwing them away instead of recycling them is because more and more items are consumed on-the-go to accommodate our busy lifestyles. According to the Beverage Packaging Environment Council, 31% by amount (34% by weight) of all beverage containers are consumed away from home. It's easy to recycle at home in cities with established programs, after



more than 20 years of education and building the infrastructure for residential recycling. However, it is still difficult to find recycling containers in public spaces, so most of what we take on-the-go ends up in the trash.

Take a look at water bottles, for example. According to Fast Company Magazine, Americans went through about 50 billion plastic water bottles—or 167 for each person—in 2006. About 40 billion of these bottles were wasted, becoming either litter or garbage. Burning garbage in an incinerator or burying it in a landfill contributes to global warming and releases toxic substances into our air and water. Without proven producer responsibility legislation in place (like a “bottle bill,” or container deposit

law) to increase the capture rate of these beverage containers, communities look to the convenience of public space recycling.

Recycling is an effective way to reduce greenhouse gases. When we recycle, we avoid the greenhouse gas emissions from landfills and incinerators. We also reduce the need to extract new resources from the Earth and replace logging, drilling, and mining of virgin materials with recycled materials that we no longer want. This greatly reduces the energy it takes to process and manufacture new goods.

About 94% of the materials extracted for use in manufacturing durable products become waste before the products are manufactured, and 80% of what we make is thrown away within six months of production. For every rubbish bag placed at the curb, the equivalent of 71 rubbish bags worth of waste is created in mining, logging, agriculture, oil and gas exploration, and the industrial processes used to convert raw materials into finished products and packaging. This doesn't even include the extra energy usage and climate change impacts resulting from resource extraction and processing.

Every product we use has embedded energy, which is the energy it took to extract, transport, and transform the materials needed to produce the product. Every single item we recycle results in significant energy savings because recycling takes advantage of this embedded energy. For some items, like an aluminum can, the energy savings are tremendous. Making a new aluminum can from old cans results in 90% to 97% energy savings compared with making a new can from bauxite and other raw materials. Similarly, it takes 30% less energy to make a glass bottle from recycled glass than from silica, sand, soda ash, limestone, and feldspar. Virtually every recycled material uses less energy than its virgin component.



Recycling as the foundation

By creating opportunities to recycle in public places, we not only capture more materials for recycling, but also create and support a culture of recycling and demonstrate the value of recyclable materials—elevating recycling above wasting. With the dawn of recycling about 30 years ago, people have a fairly long history of participating in the ritual of recycling in their homes. Support for curbside recycling is strong and there is a movement to see it grow to places beyond our homes. Public space recycling builds on the foundation of curbside recycling and creates opportunities for additional waste reduction in public spaces through event recycling and composting.

Public space recycling introduces the opportunity for recycling at public events, as many events take place in public spaces. Although public space recycling generally cannot accommodate the large amount of recycling that is generated by some events and does not account for the materials that can be composted (which is often the majority of what is wasted) it lays the important groundwork to bring zero-waste event services to these events in the future. Public space recycling increases visitors and maintenance staff's exposure to sorting practices and it begins to transition the collection infrastructure to manage recycling. The reservation systems at some public spaces can also be used as a conduit to coordinate event recycling with event organizers and vendors.

Public space recycling also sets the tone for future composting efforts. Without first tackling recycling in public spaces, it is unlikely composting in public spaces will be developed or successful. As composting services become more widely available in cities—via events, curbside programs, and commercial services—the public will eventually be prepared to compost in public spaces too.

The economic need for public space recycling

Public spaces are perceived by the public as linked to the city/municipality infrastructure in which they are located. These spaces are touted by tourism departments as the unique features that add significantly to the livability of a place. They include parks, indoor and outdoor attraction centers, and highly visible commerce areas. They can be located in downtowns, in the outskirts, or they can be a feature of a specific neighborhood. Wherever they are, they attract the public and are frequented by travelers and tourists from places near and far, as well as people who regularly work and play in the area.

Public space recycling provides an important addition to the infrastructure as a public amenity that impacts the overall quality of life in a community. According to Partners for Livable Communities, a national nonprofit organization working to restore and renew America's communities, "Every community and city has some form of an amenity



infrastructure already in place. Livable Communities stand out because they identify their amenities, enrich them, develop a strategy to maximize them, and implement a plan to put them to work."

Cities are serious about livability standards and how their community ranks. "The World's Most Livable Cities" is a title given to cities based on their ranking in any number of surveys about the living conditions of a city. The two best-known surveys are the Mercer Quality of Living Survey and The Economist's World's Most Livable Cities.

The annual Mercer's Quality of Living Survey is based on ten categories, five of which are directly improved by public space recycling efforts: natural environment, political and social environment, public services, recreation and the socio-cultural environment. The Economist's livability rating considers qualitative and quantitative factors across five broad categories: stability, health care, culture and environment, education, and infrastructure. Public space recycling not only improves the city's infrastructure but can be a powerful statement about a city's cultural and environmental stewardship.

Cities vie for the title of "Most Livable City" primarily because it can stimulate economic growth. The results of "livable" city surveys are published widely in business media outlets such as Business Weekly, The Wall Street Journal, and, of course, The Economist. They are also reported in The New York Times and used in travel and entertainment feature segments throughout print, television, and radio media outlets. Not only does the title garner media attention and enhance tourism efforts, companies that operate in the international marketplace use these lists to determine where they open offices or plants and how much they pay the employees.

Saint Paul, the Most Livable City in America

In 2004, Saint Paul was formally recognized as “America’s Most Livable” by Partners for Livable Communities. According to the Partners organization, this award “differs from other popular awards in that it is more exclusive and is only offered once every decade. Our criteria is also completely subjective where we evaluate each community individually rather than rating them or comparing them to one another. Partners’ ‘Most Livable’ award is bestowed on those places we have determined most deserve the award.”



**The Most Livable
City in America**

(see <http://www.mostlivable.org/most-livable-program-2004.html>)

Saint Paul has wisely branded itself as the Most Livable City in America, evidenced by its presence on the City’s website and in the design of the City logo.

This important title is one that Saint Paul will continue to seek and public space recycling is one of many steps the city is taking to maintain this status. Public space recycling will certainly aid this effort:

“Communities that continue to excel and whose leadership creatively adapts to changes in the world and new economy may be honored again. Partners criteria over the years has always reflected the current state of the world, and communities are evaluated on how they embrace innovation and change at the present time while also planning for the future.”

An Introduction to Public Space Recycling Programs

Public spaces are diverse and include a host of places such as:

- Parks
- Stadiums
- Convention centers
- Airports and other transportation hubs
- Sidewalks in commercial areas
- Permitted picnic areas and areas with picnic tables
- Tot lots and playgrounds
- Beaches
- Recreation centers and wildlife/nature centers
- Sports centers such as swimming pools, hockey arenas and baseball fields

Eureka Recycling conducted initial research of existing public space recycling programs in 2005 and 2006 to determine what methods were being used to collect recycling in spaces such as these around the country, and what challenges were being encountered. This research indicated that at the time there were no models, best practices, or benchmarks in place nationally for public space recycling. Only a handful of entities were managing public space recycling, with mixed results. Two common challenges with these programs were a lack of best practices and a lack of tracking or documentation of the startup and ongoing costs of implementing a public space recycling program.

Based on these findings, Eureka Recycling set out to quantify the cost and diversion rates of public space recycling, to test education pieces, and to explore the perimeters for creating effective public space recycling stations. From 2005 to 2009, there was an explosion of public space recycling programs that involved piloting and testing various facets of this

work. Because public space recycling is an emerging project for cities, the landscape is ever-changing. While Eureka Recycling's review of public space recycling is in no way intended to be a complete review of all existing programs, it provides a snapshot of current challenges and successes and highlights the areas in which best practices are most needed.

As we developed our pilot projects, we considered the successes and challenges we were seeing in the current landscape of public space recycling, and decided to focus on learning in-depth about recycling in three specific types of public spaces: a zoo, a park and park pavilions. We elevated recycling beyond just being a city service by incorporating public art and emphasizing education and community involvement, and included structured tracking methods to measure diversion.

Designing our pilot projects

Based on what we learned from reviewing other programs as well as our own mission and values, we considered the following when prioritizing and designing these three pilot projects.

1. The community wants public space recycling, as do government entities that are the stewards of public spaces.

Eureka Recycling heard from the community during the Saint Paul Environmental Roundtable process that residents expect to see recycling in their city's public spaces. Public spaces are a reflection of the municipality. A first step toward prioritizing initial locations is to evaluate public perception and visibility of your city's public spaces. By beginning a recycling program in a prominent space with



support from the community that uses that space, you can nurture a culture of recycling that spreads to the rest of the city, building the potential for further diversion in the future, such as composting or recycling for city events.

Now more than ever, cities are aware of their environmental image, and support from constituents in this political environment can greatly influence the feasibility of a recycling program. As cities build sustainability plans or host significant tourism events, the investment in public space recycling can be reflected back as an investment in a livability standard and efforts to mitigate climate change. This attention to the environment and the image that public space recycling provides can prove invaluable for communities. For example, in 2008, Saint Paul hosted the Republican National Convention. This created greater motivation on all levels—city, county and state—to direct resources and attention to the implementation of recycling in public spaces in Saint Paul. Similar circumstances have motivated other communities, such as recent Olympics host cities Vancouver and Salt Lake City.

2. The community wants to be involved.

The public has opinions about how public space recycling should work and how it should look, and if people are involved in the creation of a program, they are more likely to be invested in its success long-term. Any program will be more supported by the community when its members are able to provide their feedback and express their values and concerns from the beginning of the process. The public also keeps an eye on how the program is working once it is in place. In the worst case, if the recycling containers are full of garbage and materials are not being recycled, public space recycling can actually serve to decrease community support by creating or exacerbating skepticism about the materials really being recycled.

Eureka Recycling observed several examples of programs that did not first seek community involvement and resulted in negative feedback from the community in the end.

Some entities have used paid advertisements on their collection containers to generate funding for their programs. For example, in Toronto, Ontario, public space recycling containers incorporated tall billboards used to sell advertising space (above, left). The launching of this program caused a backlash from the community, which is generally supportive

of public space recycling, but strongly—and publicly—objected to the containers because the advertising and the size of the containers created what many believed to be a community eyesore. The community objected to the lack of community involvement in the process to design and site the containers.

In contrast, the town of Great Barrington, MA, in conjunction with the Center for Ecological Technology (CET), incorporated art and community involvement



in its public space recycling program. Artists from the community were recruited to design recycling containers, and local businesses sponsored the containers. The town welcomed the recycling containers, and the CET's director of recycling services reported that the containers were filling up quicker than expected.

3. The public sees recycling happen at the container, but there is much more to the process.

Because public space recycling is an emerging recycling program, the infrastructure in most public spaces is not currently set up to accommodate recycling collection. (The "infrastructure" encompasses the whole process from the point of collection in the park, to delivering the materials to end markets for recycling). In fact, nearly all public spaces have an infrastructure designed for only trash collection.

Most programs are able to make adjustments quickly to the beginning point of the infrastructure by simply putting out containers for recycling. But challenges later in the process (with collection, contamination, transportation, servicing costs, etc.) quickly present themselves and in many cases result in programs being discontinued and labeled a failure. When designing a program, it's important to plan ahead and account for materials all the way from container to market.

Reviewing characteristics, addressing common challenges

Municipalities and counties may define their public spaces differently. For example, Saint Paul's Department of Parks and Recreation defines their public spaces with these categories:

- **Neighborhood Park:** A park within a particular neighborhood usually has a tot lot (a children's play area), ball field or tennis court or other amenity.



- **Community Park:** A larger neighborhood park with several amenities, it may have a restroom building within the park or a larger building onsite.
- **Regional Park:** A park that is being preserved for its natural beauty, it usually falls under government authority.
- **Mini Park:** A very small park, usually land which has been donated to the city. These parks have no amenities.
- **Traffic Park:** A traffic island maintained by the Department of Parks and Recreation.

Though there are many different *types* of public spaces, there are certain universal, general characteristics and challenges that cross all types of public spaces. **Characteristics** are defined as the things that we likely cannot change. Different characteristics pose different **challenges**, which are defined as the things that we can change and must address in order for our programs to operate and be successful. It can be easy to misdirect our resources by focusing on what cannot be changed and it is wise to focus first on public spaces that pose challenges that can be addressed.

Addressing contamination

A **characteristic** of public space recycling containers is that most are unsupervised drop-off sites and, unlike the containers for curbside programs, they often look just like trash containers. It is also often impossible to determine who has caused the contamination because usage is communal and anonymous. This poses some significant (and

predictable) *challenges*, including the need to clearly differentiate the recycling containers from the trash containers, keeping the carts clear of contamination, and communicating clearly with everyone who may use the program to increase awareness and a sense of ownership of the program.

Contamination of trash in the recycling containers was the most common challenge reported in existing public space recycling programs and is often cited as the main reason to discontinue a program.

Education at the “moment of discard” and beyond

Like public recycling drop-off programs, public space recycling containers are all unsupervised, and contamination is usually best addressed with education at the point of discard—right on the container itself. In public space recycling programs, this may be the only place to educate people because it is difficult to distribute public education materials to visitors of public spaces.

If proper and comprehensive education for its users is missing, the presence of public space recycling programs alone will not change behavior. In order to participate, the public needs to be aware of the recycling program and needs education on how to use it. When we create a reason for people to pause and think about their choice, we can influence their “moment of discard,” the seconds in which they choose to toss materials into a trash or recycling container.

Education must be appropriate for users’ ages, familiarity with recycling, and native language. Providing text in multiple languages and making use of the recycling arrows and images of recyclable material can help eliminate contamination. Placing large, easily read signage increases the chances of proper use and also minimizes contamination. While the majority of education happens at the point of collection, community awareness is also key.



Recycling programs around the country have tried many different education strategies to bring attention to their recycling containers. With the exception of New York City in which mascots were used to promote the public recycling program, there were no examples (or reported results) of extended education beyond the container signage to increase ownership or interest in the public space recycling programs we reviewed.

In Sweden, a program called The Fun Theory introduced an element of fun to trash and recycling containers in an effort to change behavior.

- “The World’s Deepest Bin” was tested in a park to see if a simple sound effect could decrease litter and encourage the use of a public trash container. The container had a sound mechanism installed so when park visitors discarded something they heard an object falling deep into the container and crashing at the bottom. After discarding their trash and hearing the sound, visitors were observed picking up litter nearby and putting it in the container. In one day, nearly twice as much trash was collected in the container with the sound mechanism than in a conventional container nearby. You can see a video about the project at <http://www.thefuntheory.com/worlds-deepest-bin>.

• A “Bottle Bank Arcade Machine” was tested on a public sidewalk to encourage glass recycling. This interactive recycling container recorded points as residents placed their glass bottles in the receptacle. Over one evening, the flashing lights and sounds of this recycling container drew nearly 100 people to use it, while a nearby conventional container was used only twice. A video about the project is available here <http://www.thefuntheory.com/bottle-bank-arcade-machine>.

Measurement of public space recycling costs and benefits is critical to the success of the program.

Of all the public spaces we surveyed, little information was available about the cost and effectiveness of their recycling programs.

In order to advocate for the continuation or growth of a program, the costs and benefits need to be carefully weighed. This can only happen if they are tracked. By carefully tracking time, money,

and capital invested as well as the weight and composition of material collected, program managers can celebrate successes and gain more support. As we found from our survey, programs that have no information about how much (or if) materials are being recycled have a difficult time justifying long-term support.

You can't measure what you can't count. However, measuring participation, the quantity of materials, and the quality of materials can be extremely difficult. Many public space recycling programs face this challenge. Most haulers that pick up recycling and trash do not track the volume they collect at each pickup unless they are contractually required to do so. Instead, it is standard practice to weigh loads at the end of a route, making it difficult to obtain information about a specific location unless additional tracking is implemented with collection staff or estimated at the point of collection by the hauler.

Choices We Made in Designing and Implementing Public Space Recycling

When we set out to learn about public space recycling programs, we selected three public spaces with different characteristics to give us broad learning about public space recycling.

- Como Park Zoo and Conservatory is a controlled public attraction space, with staff, specific hours, and educational programming.
- Mears Park is a highly visible urban public park, encompassing one city block in downtown Saint Paul.
- Park pavilions, our third pilot project, are used by the public through a reservation system, making them a controlled public access environment.

These different characteristics provided a variety of learning opportunities, including: different current infrastructures for trash collection, different levels of public access to the spaces, and different recyclable materials present in the public spaces. We took this approach to deepen our learning in a variety of public spaces, but this may not be the most efficient way to implement a program.

While our pilot programs do not represent all types of public spaces, and how you build your programs may be different than the ways we did, it is likely you may encounter similar decision points, opportunities, and challenges along the way. As we built our three pilot programs, we considered the values we have for community involvement and education, collaborations and partnerships, and measuring success beyond diversion.

While our choices may not be the best to broadly apply to the implementation of all public space recycling programs, we made these choices based on our values and the values of the community. Throughout design and implementation, we revisited these values and used them to help guide

our decision making and problem solving. The following are choices we made and the rationale behind our decisions. Regardless of how you decide to take on public space recycling, your values should be reflected in the goals you set for your program and determine how you measure success.

Clearly define the budget and scope of the program and identify phases of implementation

Before launching an expansive public space recycling program throughout the City of Saint Paul, the City made the choice to first learn more through our pilots about how to make public space recycling successful, cost-effective, environmentally beneficial, and consistent with the values reflected in the diverse public spaces throughout the city. By starting small and building on what we learned we can now make adjustments and improvements as we add to the program.

We recognize that few cities are able to implement a public space recycling program throughout their city all at once and that phasing in allows them to build a stronger foundation to expand the program to additional public spaces. This foundation can include developing and stabilizing the recycling collection infrastructure and logistics over time as well as gaining buy-in and financial support.

For example, at Como Park Zoo and Conservatory, financial support was easier to obtain on a small scale, allowing for the program to be built into budgets over time. It was less challenging for the managers to secure funding for a small scale launch and get approval for the budget to allow for program expansions (additional containers) each year. The

managers also saw the benefit in starting with something they could measure and use results to get buy-in for additional funding, rather than seeking support and funding for a complete overhaul all at once.

Consider prioritizing visible and popular public spaces first

We selected three public spaces with different characteristics, but all were highly visible and popular. These spaces expose many visitors to public space recycling efforts. Media attention touches many more people who are exposed to and excited about the programs.

We made the decision to select popular places in part to help build public awareness and increase recycling opportunities in the city. We also knew that recycling adds value to the city's treasured spaces and helps provide a platform to discuss and show the community's environmental commitment. The City of Saint Paul provides strong support to increase public space recycling. As Saint Paul continues to seek the title of "The Most Livable City in America", the City is highlighting its environmental commitment and is responding to the public's desire for recycling in public spaces.

Build strong partnerships with stakeholders, including the community

This approach was not only a choice we made for our public space recycling programs, but is also a value in all of our work. We have a longstanding history in partnership collaboration and experience in relationship building and involving the community. We took our expertise and applied it to our work on public space recycling. We recognize that ongoing communication and support from stakeholders and the community is critical throughout the planning, implementation and maintenance phases of a public space recycling program.

Public space recycling generally requires support from the city, the involvement of decision makers at the program level, collection staff who service the containers, and the community that utilizes the public space. We selected public spaces where there was a strong indication for partner involvement. Beyond vision and commitment from the City of Saint Paul, launching public space recycling at our pilot locations required a considerable investment and commitment from our partners at Como Park Zoo and Conservatory and Public Art Saint Paul (a local nonprofit that engages artists in shaping the form and experience of Minnesota's capital city).

Selecting public spaces with strong partners also allowed for more community involvement because it provided access to the larger community already maintaining and visiting the public spaces. This was especially critical in our Mears Park pilot project where we specifically tested an artistic, community process that reflected and involved community members. This would have been impossible without motivated community partners.

An in depth discussion of building strong partnerships with stakeholders can be found in the section "Collaborating with stakeholders for public space recycling" on page 17.

Design the program around both diversion potential and ensuring that the materials really get recycled

We value authentic recycling in all of the work that we do, making sure that the materials we collect really get recycled. We design all of our programs to achieve the greatest environmental benefit. We chose to apply this value to our public space recycling programs to help us target materials to collect and educate the public on how to participate.

In addition to the visibility and popularity of a public space, we also considered the ***diversion potential***, how much recyclable material is regularly

discarded at that space. Because Saint Paul didn't have public space recycling prior to our pilot projects, there was diversion potential in all the public spaces we could have considered. However, it was important to know exactly what recyclable materials were present and what could actually be recycled through our program. Identifying the types of recyclable material present helped us to prioritize where to begin with implementing public space recycling.

We made the choice to work with **controlled public access areas** (attraction areas such as zoos, amusement parks, airports, and community centers) because they provide greater opportunity for control and oversight than **open, unsupervised areas** (such as open city parks, sidewalks, highway rest areas, and walking paths). Many **indoor** public spaces, such as locked pavilions or recreation centers, tend to be more controlled, providing greater oversight than **outdoor** public spaces such as beaches, picnic areas, and urban parks open to the public 24 hours a day. However, there are exceptions. Some outdoor spaces, like amusement parks and zoos, have more controlled access than some indoor spaces. Establishing public space recycling in spaces with controlled public access can give you traction before tackling the more complicated open, unsupervised areas. Selecting public spaces with similar characteristics or controlled public access can also help to gain efficiencies.

An in-depth discussion of designing a program around both diversion potential and authentic recycling can be found in the section "Building recycling collection infrastructure for public space recycling" on page 22.

Develop systems to track and measure diversion, and communicate results

We have more than twenty years of experience in tracking, measuring, and analyzing the results of our programs. When we applied this expertise to public space recycling, we recognized that tracking the specific results of recycling in public spaces might be one of the most challenging parts of developing a recycling program. However, this information can provide immense benefits and support the growth and longevity of a program.

We applied and would recommend considering three types of tracking when developing a new program: ongoing permanent tracking of materials collected, occasional detailed material analysis, and tracking of staff time to support the program. For a detailed explanation of these tracking methods and communicating results, see "Building recycling collection infrastructure for public space recycling" on page 22.

Collaborating with Stakeholders for Public Space Recycling

Public space recycling is a community event and needs the attention, energy and involvement of the community to succeed. Collaborating on a shared goal such as public space recycling leads to more meaningful, long-term, sustainable solutions. Establishing new partnerships takes time and attention, but paying attention to this important work up front lays the foundation for success for the project at hand as well as future projects and expansions. There are benefits and challenges to this approach, and two layers of stakeholders that are important to address—the working group, and the community.

Getting grounded in a stakeholder working group

The members of a stakeholder working group should be people who are invested and involved in the success of the program over the long haul. The working group holds the responsibility and has the power to

- make decisions about the direction, budget, and logistics of the program;
- envision the full design of the program;
- launch the program;
- service, maintain, and tweak details of the program long after the launch;
- facilitate the broader community process and external communication.

The members of a public space



recycling working group could include a wide range of community and government representatives but at the least needs to include representatives from the governing body, the “host” of the recycling program, the implementer (boots on the ground), and the designer of the program.

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Some of the most important stakeholders involved are the “boots on the ground.” While the support and input of program managers is necessary and invaluable, we found that only by working closely with people who actually service the containers were we able to get accurate data and feedback regarding the structure of the program. For example, we tapped into the knowledge of maintenance staff at Como to help select containers, design tracking methods, and identify adjustments to improve the program.

Bringing key stakeholders into the process early on gives them the opportunity to participate in a way that fosters buy-in for the project and investment in a successful outcome. Rather than being presented with new work that has been imposed on them, playing a role in the creation of that work makes most people more interested in actually doing the work, and doing it well!

Identifying, bringing together, communicating with, listening to, negotiating, and working with all the right stakeholders in the

process of establishing a new public space recycling program takes time. It is not always readily apparent day-to-day why this kind of collaborative work is worth the time and money, and it can be easy to lose sight of why it is worthwhile under pressures of timelines and budgets. However, the benefits are worth the effort.

- When a working group has broad representation, it has more resources in terms of information, press, community relations, and legwork to contribute to the success of the project.
- Establishing public space recycling is a long process, and many of the same players will need to be in communication over a period of several years. Taking the time to establish a working group provides the forum to do this work together over the long haul.
- It takes many people, often coming from different perspectives, to make public space recycling a success, so maintaining focus on the goals of the project is crucial. It is someone's job to make sure that the materials get from point A to point B, and it is someone else's job to make sure the park isn't sullied by the recycling containers. These individual objectives can sometimes seem at odds, but most often the solution lies in a greater understanding of each perspective and the working group can provide a format for gaining this understanding.
- There will be many bumps in the road, there will be challenges that need to be addressed, and there will be compromises that need to be made. Giving each of these stakeholders a formal place at the table throughout the project—not just when their “job” is most affected—establishes trust, formal communication channels, and decision-making processes.

Navigating conflict and staying focused

To navigate all of the assumptions and competing needs, you need the right tools and the commitment to address these challenges directly, keeping all partners on the same page and moving in the same direction. Based on past experiences, Eureka Recycling used the following two tools to build collaborations around this project and keep the working groups moving forward:

Working Together: A Toolkit for Cooperative Effort, Networks and Coalitions, published by the Institute for Conservation Leadership. This manual lays out models of how to structure collaborations, and provides useful exercises that bring to light groups' assumptions and motivations: Why are we all involved with this public space recycling? What do we all expect to get out of it? What do we expect to give as part of the working group to make it happen? Overlaps and commonalities in the answers to these questions may be easy to spot, and even if not, you will have at least gained a more realistic understanding of how much work it will take to come to an agreed path.

Human Action Framing Tool. The Humphrey Diamond is a “human action framing tool” that uses the conceptual framework of the Action Wheel outlined in Robert W. Terry's 1993 book *Authentic Leadership: Courage in Action*. It is designed to give a framework for how to address project limitations while maintaining meaning and relationships in our work. The general principal relies on organizing our work into four areas—Mission, Power, Structure, and Resources. When a challenge arises, we tend to want to address it at the Structure and Resources level (throwing more money or staff at a problem, for example) when oftentimes the root of the problem is actually coming from Mission or Power (Do all project partners still hold the same goals and objectives? Can the whole group articulate a similar mission, or have we drifted?).



Involving the community

In general, a community process can be anything from a series of meetings to an online survey, but the ultimate goals are to get to know who is using this space, what level of involvement or investment there is and from whom, so you can bring those invested community members along in the process and cater your program and communications to the right audience.

1. Broadening your process to involve the community is going to take time. You'll need to be prepared to manage opinions (positive and negative), and this can be a drag on the initial momentum on the front end of the project. However, because you have given people an opportunity to be heard and contribute their ideas, this will help temper backlash and criticism on the back end after you've launched the program.

2. Community input will also allow you to design a program that reflects the values of the community it's serving, which creates a culture of ownership and care around it. If you know your audience, you will be able to design more effective education, and those residents can

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The press event that launched our Mears Park pilot was a great success and a shared celebration with most everyone who had a hand in the project throughout its development. In the park with us were City staff, park visitors, community members and many past interns and volunteers—all representing their stewardship and investment in the program.

be extremely helpful in getting the word out and spreading awareness.

3. The park's community stakeholders can also be a network for extended education—education that goes beyond the label on the container. Where else you can talk to the users of the park beyond when they are actually in the park? What kind of groups use the park? Church groups? School groups? Business people on their lunch break? Is there a reservation system for the park that can remind people that there is recycling available (and encouraged) in the park?

4. Most everyone is motivated to recycle for similar reasons even though the community around each public space may value different things about that particular space (art, sports, music, etc.). Said simply, people recycle because it is good for the environment. Digging a little deeper, we've learned that people value their green spaces and want to see recycling there because it reflects health, happiness, and a more livable city. And all recycling programs should represent that.

The value of public art

Public art throughout the world has proven to stimulate environmental renewal and propose new ways to co-exist with our environment. Public art

has a way of garnering ownership and excitement from the community, and when paired with recycling, we believe it can inspire people to participate and take ownership of the program.

For this project, we were interested in exploring questions such as:

- What role can artists play in promoting behavior change among an urban population?

- Why can't public space recycling be functional and beautiful, too?
- Can we create a public space recycling model that is consistent with the aesthetic of landscape design and the beauty of the natural environment?
- Can we elevate the act of recycling to clearly distinguish it from wasting?
- Can artists not only create a better more artful container but also foster the "ritual" of recycling too?

In partnership with Public Art Saint Paul, we created a process for a team of artists to work with us and the City to design and create a recycling program that would reflect the community in and around Mears Park. Mears Park is in the Lowertown area of Saint Paul, where many artists work and live. Involving local artists in the creation of the bins and the education was appreciated by the surrounding businesses and community members who frequent the park, and increased their sense of ownership and support of the program.

The artists were engaged from the recycling program inception, and their contributions went far beyond the artistic bin and public engagement strategies. As part of the team, their artistic sensibilities led them to creatively problem-solve, ask provocative questions, and define (and redefine) the role art and artists can play in public space recycling programs. You can read more about this process beginning on page 46.

A word from the artists

"I've always maintained that public art informs and inspires. Our artwork in Mears Park was designed to inspire recycling of bottles and cans. Our recycling containers convey a message of hope and personal responsibility while integrating artwork into infrastructure. It is our collective vision that our sculptural installation can be used to inspire and promote public recycling in St. Paul. I hope that this project will also inspire the City of St. Paul and others to use art to improve the urban landscape." —*Seitu Jones, artist*

"It was an honor to be a part of this project. The artist in residence for New York City's Department of Sanitation [Mierle Ukeles] taught us that dealing with waste is to deal with the daily survival and maintenance of lives. I take inspiration from her.

As an artist working in the medium of behavior and the realm of the inner life, I ask what is in the hearts of the people who want to recycle. How do I transform our longing, responsibility, excitement, and hope for a better world into tangible behavior change? As an artist more familiar with systems and time than with objects, I look at the complex factors and lived moments of our current circumstance that needs repair and new health. As an artist interested as much in next century as in this year, I try to keep unabashed idealism close by as we create the immediate and practical solutions we all need. It is a joy to know I am helping do this necessary work and contributing to our collective dream." —*Marcus Young, City Artist in Residence, Saint Paul*

A word about green teams

Green teams are emerging in institutions, companies, municipalities, schools, and communities, so it is likely that there will be a green team (or two) that will be involved in any new public space recycling program. It is important to understand how any green team (or other kinds of existing working groups such as sustainability teams, etc.) can play a role in the implementation of public space recycling. It can be tempting to think of an existing green team as a working group that can implement public space recycling, but that may or may not be the case.

“Green team” is a loose term—but usually it consists of employees or community members who share a common interest or have expertise in environmental issues in addition to their current position. The most common structure includes representatives from various departments within an organization or government. Unless the group truly has decision-making power, and has members of leadership and maintenance at the table, and focused time to dedicate to the project, it will most likely not be within the capacity of a green team to implement a new public space recycling program.

If there are green teams working in your organization, you will need to tap into them appropriately for the greatest success. Green teams can be a great asset to the development of a program, especially when their role is clearly defined. They can be invaluable for their direct lines to the extended stakeholders in the process, and for helping to set direction and scope for a project that will accurately represent the environmental goals of the institution. In fact, if you leave them out of your process, you may be working at odds. In terms of community process, green teams can often provide access to larger community groups and are a community in and of themselves that should weigh in on public space recycling. Be aware, however, that they do not represent all of the stakeholders within the community.

Building Recycling Collection Infrastructure For Public Space Recycling

Careful consideration in building the recycling collection infrastructure at the start of a public space recycling program supports long-term success and involves far more than setting out new recycling containers. A successful program consists of containers that are supported by staff and the community, where the materials really get recycled. This is rare and truly something to celebrate.

The public space recycling collection infrastructure generally includes the following components:

- **Public containers:** Specially designed containers to collect recyclable materials are placed in areas frequented by the public, where recyclable materials are generated.
- **Public education:** Labels or signs are placed on or around the containers to explain what materials are accepted.
- **Collection method:** A city department (such as Public Works or Parks and Recreation) or a hauling company is responsible for servicing the containers, which involves gathering material from the containers (generally by pulling bags out by hand or through mechanical collection) and transporting the material. Ideally this collection should include a tracking system or feedback loop to monitor the program so that the manager of the recycling program is able to evaluate it regularly.
- **Transportation:** A collection vehicle hauls the materials out of the public space—this vehicle may or may not be outfitted with a mechanical collection system.
- **Holding area:** This area stores materials until a significant amount has been collected and is ready to be transported for processing.
- **More transportation:** Materials need to be hauled from the holding area to a recycling facility.

- **Processing:** Materials hauled to a recycling facility (sometimes called a MRF or Material Recovery Facility) are processed (sorted, condensed into bales, etc.) before they are sold to end markets.
- **End markets:** To truly recycle a material, there must be end markets available to purchase the material and use it to make new products.

Although the above elements are crucial pieces of infrastructure, policy infrastructure also plays a key role in designing your system. For example, a bottle bill (or container deposit legislation) can be more effective than a public space recycling program. States that have a bottle bill encourage residents to recycle their bottles individually, thus changing the need for collection and transportation systems to center around drop-off sites instead of many public containers. A bottle bill is generally implemented to encourage recycling, complement existing curbside recycling programs, and to specifically reduce beverage container litter. Additionally, states that have significantly higher fees for trash than for recycling are better able to demonstrate the value of recycling to individual citizens and encourage more recycling in general.

Recycling and waste collection infrastructures are different

Ensuring that materials are getting recycled is at the heart of a successful recycling program, regardless of what sector it is serving. However, most of our public spaces have not been designed with recycling in mind. Many of them do have a garbage collection infrastructure, which is designed to prevent litter in public spaces rather than ensure a material can be recycled. A recycling collection infrastructure must be able to keep the recyclable materials in

marketable condition in order to sell them to be made into new products.

When curbside programs began, entirely new operations were put in place to handle these valuable resources—different containers, different education, different trucks, and more. ***To implement a public space recycling program, there are generally two paths: Alter and use the current garbage infrastructure for recycling or create a new recycling infrastructure altogether.***

Identifying the current collection infrastructure and determining how you will incorporate recycling

Before making any changes to an existing garbage collection infrastructure or investing in new recycling collection infrastructure, use these questions as a guide to understanding how garbage is collected in your public space and what equipment, processes, and systems you currently use:

- What is the infrastructure for collecting waste?
- What other maintenance infrastructure exists around the public space? For example, is there a separate infrastructure for regularly picking up litter in the parks? Who gardens or removes snow in the park? Can either of these programs be used to help the success of your recycling program?
- Where are the containers and how are containers serviced?
- What are the steps involved in transporting garbage from the container to a garbage facility?
- Who is involved and what are their roles?

Gathering this information will help you map out and understand the larger garbage collection infrastructure as well as the general public space maintenance infrastructure. The garbage structure may be dramatically different from the recycling collection infrastructure. Another part of the public space maintenance infrastructure may be a better place to start. The next step is to think through the options (in terms of costs, efficiencies, and

environmental benefits) of operating within the garbage collection infrastructure or developing a new infrastructure for recycling.

- What materials will be collected for recycling?
- How will you maintain the quality of these materials throughout the collection process so they can really get recycled?
- If you collect recycling in the same way you collect garbage (mechanically, by hand, under a trash contract, etc.), are you limited to using certain containers? This may or may not give you the ability to distinguish the recycling containers from garbage containers or provide additional education.
- What are the steps involved in transporting recyclables from the public container to a recycling facility? (These will most likely be different from garbage—different trucks, different carts, different dumpsters, different facilities.)
- Where will the recyclables be taken for processing and selling to end markets? This affects how your materials need to be collected and what materials you can collect.
- How will quantities be tracked?
- How will contamination be monitored?
- What are your measures of success?

The collection infrastructure you choose will have a significant impact on the long-term development of your program. It will affect the cost of your program, the staff that carries out the transition, the ongoing maintenance of the program, public perception, and the environmental benefits of your program.

The size of your public space(s) and the scope of your program as a whole may require a long-haul transition and a long-term investment in a public space recycling program. It is best to consider options completely before making a decision. Concessions made in the short term to get a new system up and running may create bigger problems and expenses down the road. Building recycling collection infrastructure on top of an existing garbage collection infrastructure

is a large remodeling project, which at times can feel inefficient and backwards (like when you find yourself washing your dishes in the bathtub during a kitchen remodeling project). On the other hand, starting from scratch and investing in an entirely new recycling infrastructure is cost-prohibitive for most communities and can lock you into a new system before you even have the opportunity to test it out. Either way, you'll need to be prepared to look at the infrastructure as a whole system to make an informed decision about where to modify what you have and where to create something new.

Working within a garbage infrastructure

Altering the current garbage system can appear cheaper and easier because it does not require an upfront investment in new equipment, different containers, and a shift in operations. However, when working within a garbage infrastructure, you are constrained to using containers, collection methods and transportation that are designed for garbage, which may or may not be appropriate (or

available) for recycling. Also, the more recyclables are treated like trash throughout the chain, the more adjustments must be made to address contamination and getting the material actually recycled. It is possible to make these changes, but it is difficult and can be expensive. There are consequences to using waste systems to collect recyclables. It is likely that you will encounter challenges if you value recycling more than garbage but you use a garbage infrastructure. If this is the route chosen for your program, here are some challenges you might encounter (you may identify other issues as well).

Collection, storage and transportation methods must be compatible for both trash and recycling

Trash collection systems in public spaces can be highly automated systems designed to handle large amounts of trash. The storage containers specific to the garbage collection equipment may or may not be serviceable by recycling trucks to transport the materials to a recycling facility and may require altering to make sure materials are getting recycled.

NOTES FROM THE FIELD

The transition period of building a public space recycling infrastructure from a garbage collection infrastructure is hard. We met many of the challenges described above in our pilot project at Mears Park. Our art-inspired recycling containers needed to be designed to work with the mechanized garbage collection infrastructure. The initial plan was to collect recyclables using the City's automated collection vehicle, with a dumpster attachment that needed to be emptied by a front-loading truck. This path created an obstacle when we found that there were no recycling trucks in the area that could service this type of dumpster.

Parks and Recreation researched options to modify a front-loading dumpster so that it could be emptied by a rear-loading truck. However, this modification wouldn't prove cost effective unless there was a significant amount of recyclables collected—much more than would be generated at Mears Park. Until the route would be expanded beyond Mears Park, it was more feasible for staff to pull out the recyclables from the collection

dumpster by hand, rather than modifying the dumpster. Staff would then put the recycling in 90-gallon carts that could be collected by local recycling trucks.

Ultimately, there was another solution identified. Parks and Recreation tapped into an existing resource, and are having staff who regularly pick up litter in the park also monitor and service the recycling containers. They pull recycling out of the containers by hand and put it in bags. The bags are then transported via a pickup truck to the central holding area. The city has identified this as a short-term solution to be used only until a recycling collection route is filled out enough to make the original, more mechanized collection system efficient.

While the mechanized trash collection infrastructure for Mears Park needed much adjustment to add recycling, in contrast, the trash collection infrastructure for Como Park Zoo and Conservatory needed very little change to be used for recycling. Como's infrastructure now involves pulling bags by hand and transporting them via golf carts to centralized dumpsters for trash and carts for recycling.

Efficiencies may only be gained with high volumes of material

A trash collection system based on high volumes will be inefficient when applied to public space recycling. At the onset, there aren't the higher volumes of recycling that will come as the program matures.

Efficiencies for trash collection may inhibit the ability of staff to report on the recycling program

For example, the mechanized nature of trash collection infrastructures creates less opportunity for collection staff to recognize contamination and report problems at the point of collection.

Efficiencies may decrease the value and recyclability of the material collected

Although you can gain some cost efficiencies the quality of recyclables may be compromised by using a trash collection infrastructure. For example, many garbage trucks use compaction, which increases the capacity of trucks but actually damages the recyclables by crushing glass and embedding it into other materials. This collection method has raised serious issues about the quality of materials (especially when glass becomes embedded in paper) and adds significantly to processing costs.

The public is observant and may perceive the mishandling of recyclables

Observant park visitors will notice if recycling and garbage are being collected in the same way, by the same vehicle, or even at the same time. This can lead to skepticism about public space recycling.

Specialized containers, as well as collection and transportation methods designed for recycling collection, and systems that protect the quality of materials contribute to the success of public space recycling. Although an entirely new collection infrastructure designed especially for recycling is ideal because it is more likely to yield long-term benefits, most communities do not have the

resources for such a major overhaul all at once. It takes time to build a public space recycling program and to transition from wasting to recycling.

Establishing effective recycling collection contracts

The basic process for getting recyclables (and garbage) collected and delivered to a facility involves entering into a contract with a hauler. This begins by issuing a Request for Proposals (RFP) for collection services. RFPs are public information and examples are widely available. The criteria for selection of the "hauler" can be established in the RFP documents, and that document usually serves as the basis of the service and contract itself. The decisions you make about the containers, education, the materials to collect, and the level of involvement of your staff in servicing the individual containers must all be solidified prior to writing an RFP; however, these choices may limit who can respond to your RFP, so it is wise to survey the landscape as you go.

Collection contracts for public space recycling either require a hauler to pick up recycling from a central holding location (most common) or require the hauler to collect materials from each individual container. Either way, it is important to follow existing best practices for contracted collection services that already exist. Many counties and cities have staff or consultants who assist with contract development to ensure these best practices are followed. The contract should clearly outline the reporting you require from the hauler.

It is usually the responsibility of the maintenance staff to transport the recycling from individual containers to a central holding location for servicing. This arrangement gives the maintenance staff a more intimate relationship with the public space recycling program and makes it easier to make improvements and address issues. However, if you are contracting with a hauler to pick up recycling from individual containers, you will need to be specific

about requiring reporting so that you can get the information you need. This includes:

- data on the amount of recyclables collected;
- route information (which containers are serviced on what days);
- information about contamination problems at containers;
- procedures for servicing contaminated containers and for setting up new containers;
- a requirement to place containers in locations that are convenient for the public;
- distribution of approved or provided labeling systems and educational material; and
- clear levels of expected customer service. Include language that gives you authority to charge damages for poor service (called liquidated damages).

Examples (and best practices) for public space recycling are still surfacing; Eureka Recycling will continue to explore public space recycling contract design and will make findings available as they surface.

Identifying what materials to collect

There are several methods and tools that can be used to identify which materials to collect in a particular public space. A **baseline study**, the documentation of what you find before implementing your program, can include waste sorts and visual audits, and gathering information from maintenance staff. This tool is crucial for designing your program, communicating with stakeholders, and evaluating its effectiveness after implementation.

Conduct waste sorts

Sorting the waste generally includes pulling out recyclables and measuring the potential recycling as well as the current trash generated at a potential recycling site. Waste sorts are an opportunity to look closely at the discard patterns of public spaces. A waste sort can be designed to provide detailed

or vague results. Waste sorts can be conducted both before and after a recycling program is implemented. Before implementation, a simple waste sort can tell you the recycling potential, or diversion rate. After a program is in place, you can conduct a waste sort to identify what recyclables are still being discarded and to measure the contamination in the recycling. This information can inform future education efforts.

A waste sort can be designed to provide information about composition by separating the recyclable materials by type (glass bottles, cans, plastic bottle, paper, etc.) This can help inform the materials to collect in the program.

Most waste sorts measure weight, volume, or both depending on the goals of the waste sort. Measuring volume (or quantity) of recycling will give you a better view of the social implications of recycling (how many people recycle) and costs by volume. Sorting by weight will help you compare to industry standards and calculate the energy savings from the program and the costs by weight. Keep these results in mind as you plan your waste sort and determine your data collection needs.

Waste sorts can also provide information about the future diversion potential of a program. If you sort out compostable material, you can identify the diversion potential if a composting program would be implemented in the future. You can also identify other waste reduction opportunities with producer responsibility. For example, at Como we separated trash generated by vendors from the trash that visitors brought in themselves. This allowed us to understand how much Como would be able to reduce its trash by changing what it sells onsite.

Waste sorts can be used as a community-building tool. By using volunteer and stakeholder energy at waste sorts, you keep them involved in the process and build their understanding of the actual recycling potential in the public space.

It's important to keep in mind that waste-sort

results are all just a few snapshots in time. Long-term tracking is crucial for evaluating a program. Additionally, careful planning should go into deciding when and how much waste to sort. Consider the climate of your area and the impact of seasonal fluctuation on the recycling program. For example, because of cold winters in Minnesota, most parks are used much less frequently in the winter. Those that are used throughout the winter still tend to attract fewer discards and fewer bottles and cans.



a field for active team sports? If so, it's likely to produce many bottles in the trash. Is it a public library where food and drink aren't allowed? In this case, paper may be the most prominent recyclable material (unless recycling containers are at the entrance where people discard their bottles and trash before entering).

Communicate with maintenance staff and other connections within the infrastructure

Conduct visual audits

A waste sort is the ideal tool used to gather information needed to build a program. However, if there aren't resources available to conduct a full waste sort, visual audits can provide important information. A visual audit involves looking at the waste discarded in trash containers and estimating recycling potential. A visual audit can reveal if there are any recyclables in the trash at all (but can't provide details of volume) as well as what sort of recycling is typically discarded at the location you are observing. A visual audit can also include observing behavior and identifying how people use the public space. For example, do visitors read a lot of newspapers? Do they consume many beverages?

Learning more about how the park is used can help you identify the types of recyclable materials that may be present. Is there

Regardless of whether you can do waste sorts and/or visual audits, much can be learned by talking to staff who service the containers and by observing the amenities in the public space. Program managers can also make other connections within the infrastructure, such as reservation systems, maintenance programs, or volunteer programs as well as other support staff such as security guards, maintenance staff, or gardeners for additional program support. It's important to know about these

connections because they can affect your program in ways you may not be aware of, or may have valuable information you can tap into.

Maintenance staff can provide invaluable information about the current collection infrastructure, collection methods, and opportunities for tracking and monitoring the recycling collection. They have the experience to identify a feasible

NOTES FROM THE FIELD

At both Como and Mears Park, the staff who empty the trash containers made excellent recommendations regarding where we should place new recycling containers. They were familiar with traffic patterns, materials discarded and the containers that fill most frequently.

Beyond the development of the program, maintenance staff continued to provide valuable feedback. By staying in contact with the staff who collect recycling in Mears Park, we learned that they pull contamination out of the recycling when they empty the containers. Now we know that as long as the recycling is being collected by hand, there will be minimal contamination. We can also get feedback from staff concerning whether there is much initial contamination.

infrastructure for the recycling program. They can also identify other public space maintenance programs that might be available to help manage the recycling program—for example, can staff who pick up litter also be asked to remove contamination from recycling containers? Lastly, they can be instrumental in developing tracking tools to measure the daily volumes of trash and recycling once the program is in place. Your public space recycling program will have more success if you have support from the people who interact with the program and are crucial to its operation.

Determining the collection method

Most public space recycling programs focus on collecting bottles and cans, because this is the most prominent recyclable material we discard in our on-the-go lifestyles. Conducting a baseline study can help inform the choice of materials you target for collection. If you are considering single-stream collection to include paper, contamination will compromise the quality of the materials you collect.

Single-stream collection, where cans, bottles, paper and cardboard are all collected in the same container, adds to the confusion about recycling vs. trash. A whole container of mixed recyclable materials looks much more like trash than separated items. This confusion is even more problematic when the containers for recycling aren't easily distinguished from the trash containers or information about the program is not clear, labels are not obvious, or information is not well designed. When you design a program to capture recyclables in public spaces, collecting

more trash is not the goal. If you do choose single stream, make sure to design signs, labels, outreach, and education that is simple, clear, and ongoing to help residents discern between trash and recycling.

Selecting containers

Public space containers have similar characteristics and challenges to multifamily recycling containers and drop-off sites. The primary issue to address is contamination. To best address contamination, recycling containers must be:

1. easily distinguished from trash containers;
2. consistent in visual appearance;
3. easily and regularly serviced;
4. designed with restricted openings (this design yields lower levels of contamination);
5. at least as convenient as trash containers (an equal ratio of trash containers to recycling containers; if this is not feasible, pair two trash containers with each recycling container so that recycling is an option at each discard location).

In an ideal world, we could pair every trash container with a recycling container (or containers), but few communities have the resources to add a complete recycling program at once. Consider purchasing fewer containers that are well-designed and well-monitored. This phasing-in method provides several benefits:

- Purchasing fewer containers and tracking success helps justify the investment in more containers in the future.

NOTES FROM THE FIELD

The budgets of our three pilot locations required that we install fewer recycling containers than there were existing trash containers. This ratio varied from 1 recycling container for every 2 trash containers at Mears Park to 1 recycling container for every 12 trash containers at Como. In all cases we found that the amount of recycling collected was higher than expected, considering the simple ratio of containers. Based on this learning, we believe that if you have to limit the design of your program because of budget constraints, focus first on design elements 1 through 4 above and then work on number 5 to implement more containers over time. Education about the program and visitor interest can go a long way in raising awareness and increasing participation in the meantime.

NOTES FROM THE FIELD

Eureka Recycling created a best practices guide for multifamily recycling. Because both multifamily recycling and public spaces share qualities such as being an unsupervised public space, this guide may be a useful tool as you design a collection program for an unsupervised public space. The toolkit can be downloaded at www.eureka recycling.org.

- By phasing in the program, you provide maintenance staff with an opportunity to work out the challenges of the transition, before the program is more widely implemented.
- Monitoring and servicing fewer containers may require fewer resources at the onset, but it's also important to recognize the possibility for inefficiencies until the program is more widely implemented.
- You can maximize the use of the containers by investing in additional education so visitors are more aware that recycling is available. When the public is aware that recycling containers are available, they can make the choice to hold on to their discards until they make their way to a recycling container.
- A phase-in plan allows you to budget for the program over a number of years.
- If considerably more trash is generated in a park than recycling, consider placing two trash containers next to a single recycling container.

Designing education

Unlike trash containers that need little accompanying education, recycling containers need lots of accompanying education to help people understand how to use the container, and inspire them to do so!

Due to the unsupervised nature of public spaces, education for public space recycling programs is similar to multifamily (apartment) recycling education. The containers are unsupervised, and the users are fairly anonymous (compared to curbside

recycling). Designing clear and motivating education on and around the containers is the most effective way to help the public understand how to use the containers at the “moment of discard.”

Create effective labels and signage

Every trash container everywhere accepts the same materials, but recycling programs differ from place to place. However, people will not learn a lot of detailed information about what is recyclable and what is not from a label, so this is not the place for an extensive “Yes & No” list. Labels are intended to keep large amounts of trash out of the containers.



Signs are an effective tool for identifying recycling areas and distinguishing between garbage and recycling containers. It is well worth the investment to make your signs permanent and high quality, such as an aluminum sign or a weatherproof banner. You can use these signs to demonstrate ownership and support for your program and reinforce the sense of community involvement in recycling. Signage throughout the area can even direct visitors to recycling stations, especially if you have a limited number of recycling containers available.

Essential elements for any recycling signs and containers

- The recycling “chasing arrows”
- The word “recycling” (and translations if appropriate)
- Images of recyclable materials
- Color coding that distinguishes the recycling (usually blue) from the trash

Additional tips

- Consider messages such as “We Recycle” and “Do Not Put Trash in Our Recycling Containers” to create a sense of community.
- Signs should be simple, with few words, clear messages, and widely recognized symbols such as the recycling icon of the chasing arrows.
- You can add a bit more detail by showing pictures of specific recyclable items.
- Consistent labeling is necessary to visually distinguish the recycling containers from trash containers, which are typically unmarked.
- Pictures or illustrations can be used to provide simple instruction for people on the go, and can communicate to those who do not read (children) and those who do not read English.
- Education can be tailored to reflect the specifics of your recycling program. For example, use single-serving beverage containers as images on labels’ and signs’ pilot locations. Other types of public spaces may have different compositions, which you can learn through waste sorts as you build baseline data.
- We know from our years of experience in recycling that the most motivating factor for people to recycle is the environmental benefit. Recycling containers and accompanying education that are designed to remind people of the environmental benefit of recycling can be much more inspiring than containers that closely resemble trash containers and are generically labeled.

Educating the public beyond the container

As mentioned above, it’s ideal to make recycling just as convenient as trash by pairing every trash container with a recycling container. However, ***if you don’t have the resources to install an abundance of recycling containers, you will need more education with motivating messages to encourage the public to use the recycling containers that are available.*** Look for additional education opportunities away from the

container to raise community awareness, minimize contamination, and maximize the recyclable material you can capture from the waste stream in your public spaces.

By adding education at additional locations where visitors interact with the space, you can further increase awareness and community ownership of your program. The following areas provide opportunities for additional recycling education beyond the container:

- Literature or other means of informing the public: websites, maps, reservation forms, brochures, etc.
- Banners on poles can add height to education at a recycling location, so visitors can see them from afar.
- If the public space includes a lobby, gathering space or reception area, this can be a great place to display information about your recycling program.
- Educating staff who work in the public space can empower them to share information with park visitors. Staff will also further understand the importance and unified support for the project. Recycling education should be included in new employee orientation as well.

Measuring the success of the program

Implementing a public space recycling program isn’t enough. Simply having recycling containers out in a public space cannot be the sole measure of success. To truly understand the impacts of your program, to support those involved and to inform improvements, you must gather more information. When you value recycling and elevate it above garbage, you can take measurements to justify your public space recycling program. These will help you demonstrate the larger benefits to stakeholders, including the environmental benefits and community support for your program.

Ongoing permanent tracking

Perhaps most crucial is the ongoing measurement of the weight of the recycling collected throughout the life of the program. This can be used to regularly update stakeholders about the benefits of the program. These benefits include the environmental or economic value of diverting this material from the trash, as well as the community participation in the program.

A garbage collection infrastructure doesn't usually involve detailed tracking systems and is generally set up to gain efficiencies. If you design a recycling program just like your garbage infrastructure, you may prioritize efficiency over the design of a system that can easily be tracked and measured. Without tracking the results and costs of your efforts, you won't be able to advocate for your program.

NOTES FROM THE FIELD

We encountered this challenge in our park pavilion pilot. Seeing an opportunity for efficiency, Parks and Recreation manually hauled the recycling collected at park pavilions back to a central location where it was combined and collected with all other recycling generated at the central facility. While this strategy may seem more efficient for collection, it limited our ability to track the quantity and quality of materials that were collected at the individual pavilion locations. We have applied our learning from waste sorts and recycling sorts to provide information about general materials and quantities at each location, but moving forward we will work with our partners to balance the value of tracking additional information with the need for efficiency.

Waste sorts and recycling sorts

A detailed material analysis involves waste sorts and recycling sorts to learn more about recycling potential and composition at recycling locations. This is much more labor intensive and tends to involve more community support through planning,

staff time, volunteers, and actually sorting the materials. The results of a detailed analysis can be applied for future projections when combined with the results of ongoing permanent tracking. Also, by using these two measurements together, you can calculate social and environmental benefits of your programs and communicate success.

While measuring pounds is crucial to evaluating environmental and economic benefits of a program, an additional measurement and calculation can give you an estimated total number of bottles and cans collected, which helps demonstrate community participation. Essentially, each bottle or can collected in your program was recycled by an individual. Knowing the number of residents, citizens, or visitors who were able to recycle at a public space can be very moving.

You can estimate the number of bottles and cans collected using a measurement tool called a **recycling sort** combined with the total weight of recycling collected to date. A recycling sort measures the material placed in the recycling container by weight and can include sorting by material type (aluminum can, glass bottle, plastic bottle, trash). Once you find your program's average composition, you can either use industry standard weights for bottles and cans or count them yourself to find the average number of aluminum cans, glass bottles and plastic bottles collected per pound. Recycling sorts can

NOTES FROM THE FIELD

From our ongoing permanent tracking at Como, we calculated that in the first 15 months of the public space recycling program we collected 2.47 tons of recyclable material. By combining this tonnage amount with composition data learned from our waste sorts, we estimate that Como's 13 containers allowed guests to recycle more than 50,000 times. By providing this opportunity for visitors to recycle, we send a message of environmental and community stewardship and encourage visitors to recycle on the go, as well as at home.

NOTES FROM THE FIELD

Using a waste sort before we implemented recycling at Como, we learned that 25% of the trash was recyclable bottles and cans. After the program was started, we used recycling sorts to learn about contamination. From these sorts we learned that contamination (trash in the recycling) was minimal (less than 5%). Additionally, by sorting discards from the both the trash and the recycling containers after the program was implemented, we learned that 30% to 50% of the recyclables were still getting thrown in the trash container right next to the recycling container. This knowledge helped us decide to focus on educating the public about the importance of recycling.

be done a few times to ensure you are getting an accurate average composition. However, once you arrive at the average, this information can be applied throughout the life of your program to update information you share with stakeholders.

A recycling sort can also measure the **contamination** of trash in the recycling and help you assess if it is a problem (based on program goals). Other measurements you employ can be tailored depending on what you want to learn about your program.

Another common measurement used when evaluating recycling programs is the **diversion rate**. A diversion rate measures percentage of recycling diverted from the total amount of materials collected, which includes both recycling and trash. For example if you have collected 2 pounds of recycling and 8 pounds of trash, the diversion rate would be 20%. However, it can be difficult to measure the success of emerging programs by diversion rates. In order to calculate an accurate diversion rate, you need to measure both the trash and recycling collected in your program, which can be challenging, particularly if tracking is not already a part of your trash collection infrastructure. Furthermore, for emerging programs, where the infrastructure is still being built, the diversion

rate can be minimal. If you aren't able to measure the trash produced in your public space, tracking recycling alone can still provide information needed to measure the benefits of your program.

Tracking staff time

In addition to understanding the type of materials and the amount of materials you are collecting, another important measurement is the staff time required to support the program. Not only is this helpful for budgeting purposes, but to measure the success of any program, you need to balance the cost against the benefits. With this knowledge, public space stakeholders are able to move forward and make informed decisions about how the program can continue and expand.

Calculating the environmental benefits of your program

There are many models to convert the environmental benefits of recycling to terms of energy saved, pollution reduced, water saved, or greenhouse gas emissions reduced. Carbon and carbon dioxide, common greenhouse gases, are emerging as a common currency in measuring the beneficial environmental impact of recycling. The most recognized and standard model for measuring carbon equivalents is the Environmental Protection Agency's Waste Reduction Model (WARM). For more information on WARM and calculating greenhouse gas reductions, visit www.eurekarecycling.org to read

NOTES FROM THE FIELD

Using WARM, we were able to calculate that the 5,000 pounds of recycling we collected over the study periods at Mears Park and Como Park Zoo and Conservatory are the equivalent of 7.3 metric tons of carbon dioxide (MCTO₂). Using the EPA's Greenhouse Gas Equivalencies Calculator, we are able to translate this number into everyday examples that people can relate to such as the energy equivalent of 821 gallons of gas.

Eureka Recycling's report Recycling, Composting and Greenhouse Gas Reductions in Minnesota.

By stating the impact in carbon equivalents, we have a standard language for people to compare recycling with other environmental impacts such as transportation and energy conservation efforts. These environmental benefits of public space recycling projects are a powerful message to share with staff, stakeholders, and the broader community.

Whichever measurements you decide to use, think carefully about the feedback loop and who should hear about the impacts of the recycling programs. One of our key audiences was the maintenance staff who helped us during the pilot. They will continue to work on and improve the recycling program as it continues and grows. Knowing the results of their efforts can both help motivate them in their work and inform their decisions as they move forward.



Conclusion

Public space recycling programs take much more than just putting out recycling containers to be successful. Working in collaboration, involving the community, investing in infrastructure, and setting clear, realistic goals can lead to a program in which everyone benefits, including the environment. The benefits of public space recycling are measured more than just in tons of recyclables. There is value in increasing public awareness about waste reduction, an increased culture of recycling, and the massive environmental benefits of recycling the material we do collect. Public space recycling also brings us further down the road to zero waste by setting the stage for composting and furthering waste reduction efforts. Public space recycling highlights the community's commitment to the environment, and increases the livability of a community.

What we learned through our pilot projects has led to recommendations to the City of Saint Paul to build on the current pilot areas and allocate resources for expanding public space recycling throughout the city. We will support Saint Paul in implementing our recommendations, as a step toward becoming a zero-waste city. To learn more about Eureka Recycling and Saint Paul's approach to zero waste and for updates on public space recycling in Saint Paul and other zero-waste initiatives, please visit www.eurekarecycling.org.



This report reflects Eureka Recycling's learning about public space recycling to date, but there is always more to learn! Please share your comments, feedback, and ideas with us.

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Summary of Eureka Recycling's pilot projects

Como Park Zoo and Conservatory

The Como Park Zoo and Conservatory is located in Saint Paul's Como Park. Como Park is a 300-acre multi-use public park owned by the City of Saint Paul. It includes a wide variety of landscapes and attractions.

For our pilot, we focused on collecting materials within the zoo area, which welcomes nearly 2 million



visitors a year. The zoo is a Saint Paul tradition; if you grew up in the area, you've been there. It is a standard destination place for countless school field trips and daycare centers. Admission to the zoo is free, with voluntary donations to help care for the plants and animals. Conservation is part of the mission of Como. Staff members are dedicated to preserving resources and operating in an environmentally responsible, safe, and sustainable manner. An established Green Team meets monthly to monitor environmental efforts and maintain a sustainable workplace. Como's existing commitment to the environment and established Green Team was a strong base for our partnership in this project. Public space recycling at Como is viewed as a gateway to other waste reduction initiatives, such as composting, in the future.

We worked with staff to gather baseline information and to determine the best kind of education for this public space. Our baseline results confirmed that this venue has a fairly low diversion potential through bottle and can recycling when you include all waste

generated behind the scenes (LOTS of animal waste), but Como Park Zoo and Conservatory is very visible and highly regarded in public perception, and establishing a recycling program lays the foundation for further waste reduction such as composting. The infrastructure existed for trash collection, where maintenance staff serviced containers and hauled bags of trash to a holding area with a golf cart. This trash collection system was easily adapted for recycling collection, because bags of recycling could be pulled by hand and easily kept separate from trash.

With the launch of this program in June 2008, visitors gained access to recycling for their bottles, cans, milk cartons, and juice boxes. This pilot project focused on testing the educational and logistical aspects of the recycling program as Eureka Recycling and Como Park Zoo and Conservatory monitored the materials collected through the recycling program, gathered feedback from park visitors and maintenance staff, made adjustments, and documented results.

Mears Park

Mears Park is a Saint Paul treasure. This award winning park was co-designed by artist Brad Goldberg and landscape architect Don Ganje in the 1990s and has been honored by the America Society of Landscape Architects as a national landmark for outstanding landscape and architecture. The park covers a one-block area in the high-density mixed-use Lowertown area of Saint Paul and is frequented by business people on their lunch breaks and dog-walkers who live in nearby apartment and condominium buildings.



frequented by business people on their lunch breaks and dog-walkers who live in nearby apartment and condominium buildings.

A working group of stakeholders included the City of Saint Paul, Eureka Recycling, and Public Art Saint Paul. The group set parameters and goals and worked in collaboration to design and implement all aspects of the program. Because Lowertown is home to many artists and the community values public art, local artists were commissioned and brought into the working group to incorporate a community feedback process into an artistic design of recycling containers and an education ritual for the program.

Composition studies showed that the diversion potential for recycling in Mears Park is not very high. (The majority of waste in this park is from to-go food packaging and dog waste.) However, this park was chosen as a priority for public space

recycling because the visibility and public perception is high. Permanent recycling at Mears Park is also viewed as a gateway for the City to implement event recycling for the many events held in the park, and shows the potential for zero waste through the addition of composting in the future.

The highly automated waste collection infrastructure at Mears Park was more difficult to adapt to recycling than at Como Park Zoo and Conservatory. The design of the recycling containers was constrained by Saint Paul Parks and Recreation's automated collection vehicles, and additional holding and transportation methods needed to be developed to get the collected materials to a recycling facility.

Urban park pavilions

Saint Paul Parks and Recreation maintains park pavilions throughout the city. These pavilions may be reserved, and they provide a covered shelter, picnic tables, and a kitchen space. In June 2008, Parks and Recreation, with help from Eureka Recycling, launched public space recycling at six park pavilions in Saint Paul.

Park pavilions have less infrastructure and accountability to park users than Como Park Zoo and Conservatory, but more infrastructure than an open park like Mears Park. Pavilion spaces must be rented ahead of time through a reservation process, with the exception of holidays when they are open to the public on a first-come-first-served basis. Groups that rent the pavilions are as diverse as the city inhabitants and include families, churches, school groups, businesses, and other groups that come together in celebration.



Eureka Recycling provided container and label recommendations for Saint Paul Parks and Recreation, as well as pickup service for recycling collected at the parks. With the launch of this program, visitors to the pavilions were able to recycle their bottles and cans. After one year of service and nearly 1 ton of recyclables collected, Eureka Recycling conducted waste sorts to evaluate the success of the program and make recommendations for increasing diversions and expanding it to other public spaces in Saint Paul.

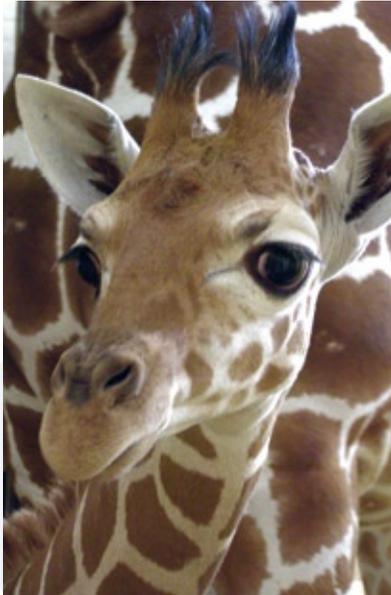
Pilot Project: Como Park Zoo and Conservatory

Como Park Zoo and Conservatory is a well-known and well-loved public zoo. A tradition for Saint Paul residents, entrance to the zoo is free, and it is frequented by area school groups, day cares, and families. Como receives nearly 2 million visitors throughout the year, most of those during the summer months. The attraction areas include a zoo, a conservatory, and an amusement park.

Saint Paul Parks and Recreation Department (which manages Como Park Zoo and Conservatory) and Eureka Recycling partnered to establish a permanent recycling program at Como.

Conservation is an important part of Como's mission, and Como had a well established Green Team already committed to lowering the environmental footprint of the facility. The Green Team is composed of staff members who meet monthly to monitor Como's environmental efforts and maintain a sustainable workplace. The full Green Team was kept abreast of the recycling project process, but a more agile and functional "recycling working group," which included two interested representatives from the Green Team, was established to implement the program.

The working group included the facility's Operations Manager, Maintenance Team Supervisor, the Marketing and Public Relations Manager, the two representatives from the Green Team, and two representatives from Eureka Recycling. This group



was able to make informed decisions about budgets, collection logistics, education and promotions, and the community process at Como.

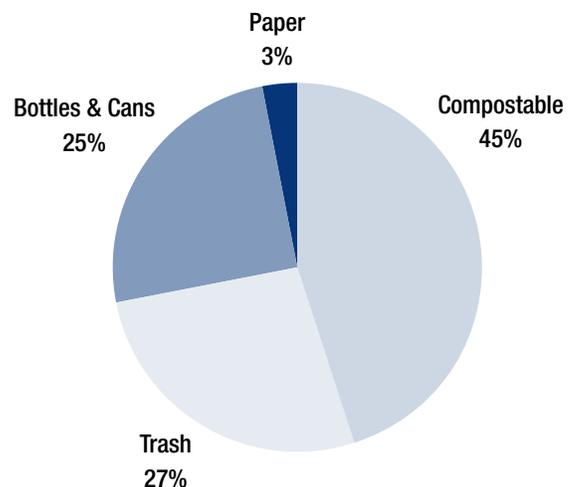
Identifying what materials to collect

Visitors to Como generate up to 282 pounds of trash per day on average, but the amount varies greatly with the seasons and holidays. A busy summer holiday can produce more than 2,300 pounds of trash in one day.

Baseline waste sorts

The chart to the bottom illustrates the composition of waste by weight from Como's baseline waste sorts. About 25% of public discards could be diverted

**COMO ZOO & CONSERVATORY
BASELINE WASTE SORT**



through recycling bottles and cans. Paper was a minimal percentage of the waste stream (3%), often contaminated with food, and primarily consisted of maps handed out at Como. To reduce waste, Como had already implemented a system for visitors to reuse maps. Results of the baseline waste sorts revealed an opportunity to capture even more maps for reuse. Rather than adding a recycling infrastructure for this minimal amount of material, staff may instead revisit the current map reuse system to identify an effective, non-invasive alternative to encourage map reuse.

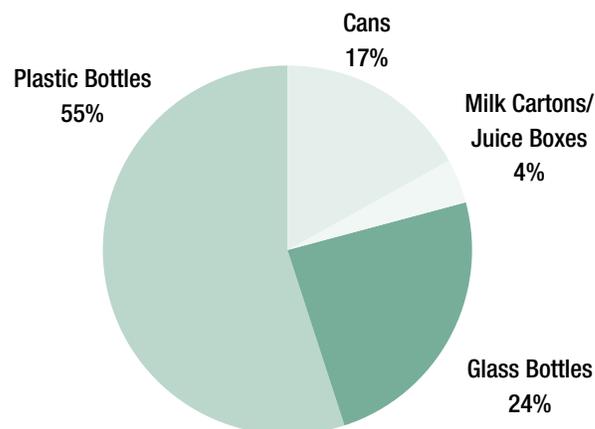
By far the most diversion could come through composting (45% of the waste at Como), but introducing a new practice such as composting before the more familiar sorting system of recycling is introduced would present challenges for collection and education. Como began its program focusing on recycling bottles and cans with the intent to build systems, education, and a culture of waste reduction that will move Como closer to composting collection in the future.

The chart at right illustrates the composition of bottles and cans by weight from Como's baseline waste sorts. The baseline data revealed that the bottles and cans at the zoo primarily consisted of plastic bottles, as well as a considerable amount of milk cartons and juice boxes, all of which are sold onsite as well as brought in by the public. Considering the many children who visit, the amount of milk cartons and juice boxes was not surprising.

Identifying the current infrastructure

Como has up to 120 trash containers spread throughout the grounds. They are serviced throughout the day. These containers are easily moveable, which enables maintenance to wash under them and rearrange them as necessary. All public trash containers throughout the park are 33 gallons or less in size and are emptied frequently to prevent

BASELINE RECYCLABLES AT COMO ZOO & CONSERVATORY



the trash bags from being too heavy for employees to lift out of the containers. Trash at Como is collected by hand-pulling bags and transporting them with golf carts to the nearest dumpster. Seven dumpsters behind the scenes around the facility collect waste generated by the public, vendors, and the animals.

During the slower winter months, the majority of these trash containers are put into storage. The remaining containers are placed in locations that are accessible to the public but out of the way of the snow removal paths.

Designing the collection infrastructure

The garbage collection infrastructure at Como was easily modified to incorporate recycling collection. Bags of recycling are collected by hand from the containers in the same way as trash and are then transported to the holding area with golf carts. The facility added 90-gallon carts in the holding area to store public space recycling for collection by recycling trucks. The carts holding materials from the public space recycling program were kept separate from carts that hold recycling generated by the facility's office buildings. This was intentional to allow for the recycling truck drivers to track the public space recycling volumes separately from the office building recycling.

Selecting containers

Como selected new recycling containers that both worked within the current collection infrastructure and looked significantly different from trash in order to prevent contamination and inspire recycling. The recycling containers have a bright blue, restricted-opening lid and room for an education label. Trash containers, matching the recycling container but without a lid, were also purchased to place alongside the new recycling containers as a paired station.

Ideally, every one of Como's 120 trash containers could be paired with a recycling container, but this was financially unrealistic. Instead, the facility began a transition by purchasing and installing 10 new paired stations in June 2008 (each pair consisting of one recycling container and one trash container), with the plan to add more each year in the coming years. In spring 2009, three additional paired stations were purchased and installed. Containers were placed at high traffic and high visibility areas, and clearly labeled with education. The cost of all 13 sets of containers was approximately \$10,250, excluding educational labels or signs on the containers.

Designing education

The labels and signage for both containers were designed to fit within the facility's aesthetics as well as provide education via words and pictures of recyclable items typically found at Como (identified through the waste sorts).



Launching the program

On June 25, 2008, Eureka Recycling, the City of Saint Paul and Como Park Zoo and Conservatory launched the new permanent public space recycling at Como, with the help of Sparky the Sea Lion and a large crowd of visitors. Sparky's trainers worked in messages about recycling, making the connection to climate change and habitat preservation, and Sparky showed the crowd how easy recycling is by taking a plastic bottle out of the water and putting it in the recycling container. Additional speakers included Susan Hubbard, CEO for Eureka Recycling; Peder Sandhei from the Minnesota Pollution Control Agency; Mike Hahm, the Director of Como Park Zoo and Conservatory; and Lee Helgen, Saint Paul City Councilmember.

Leading up to the press event, guests were asked to contribute to a poster with their thoughts on why it is important to recycle at Como. Thoughts recorded on the poster included:

"Recycling keeps our air and water clean and healthy."

"It helps stop global warming."

"If you littr anumos get sick."

Tracking recycling and trash rates at new containers

Data to measure the results of Como's recycling program was collected in two ways, by Como's maintenance staff and by our recycling collection driver. We used these two forms of data to compare and ensure we were getting a consistent and accurate measure of material collected. This method helped us to identify discrepancies in the data and clarify tracking methods with Como's maintenance staff and our driver. After a year we had a good picture of the trends in material collected, so we just continued with tracking by our recycling collection driver and discontinued tracking by maintenance staff.

Tracking by recycling collection driver

As part of regular collection service, each time our driver collected materials at Como, he tracked the volume of the recycling carts. For each 90-gallon cart of bottles and cans that was collected, he recorded that it was one-fourth full, half full, three-fourths full, or full. These amounts were totaled and then multiplied with average cart weights (identified by waste sorts). This tracking system is a regular practice for all of our collection routes and thus is a sustainable way for us to continue tracking and reviewing the public space recycling program at Como for years to come.

Tracking by maintenance staff

For a little over a year, daily data collection was implemented by the facility's maintenance staff at the new paired recycling and trash stations. Eureka Recycling provided tally sheets for staff to use as they tallied each time they collected a trash bag or recycling bag from the paired stations. To determine recycling rates at the new paired stations, these sheets were faxed to us and we converted the tallies to pounds collected, by multiplying by the average weights (identified by waste sorts).

This tracking system was a new addition to staff

responsibilities, and it took several weeks before all the kinks were worked out. We identified several challenges that prevented the collection of accurate and consistent data about the program at the onset, and worked with staff to develop solutions.

Frequent communication with maintenance staff: We worked with maintenance staff to develop a schedule for them to fax us the daily tracking sheets every week. This helped us catch questions and confusion about the new tracking system and address them right away. Maintenance staff also provided feedback for how we could make improvements to the tracking sheets, and we incorporated the changes.

Sharing the results of the data collected: To reinforce the importance of daily data collection, after a few months of tracking, we came back to the maintenance staff with a summary of the data collected so far, and what we were able to learn from it. This feedback loop helped the maintenance staff understand the importance and impact of the effort they put in to tracking every day, and it further motivated them to go above and beyond to do more than they were previously required to do.

Acknowledging and simplifying additional responsibilities: At the launch of the public space recycling program at Como, many maintenance staff were involved with servicing and tracking the materials collected and there were inconsistencies in how staff interpreted the tracking responsibilities. One way Como addressed this issue was by designating one staff person to champion the recycling program. Each day one staff person was designated to empty and track the materials collected at the paired recycling and trash containers. Staff with this responsibility were previously trained on how to track the materials and where to bring them. This is an efficient and sustainable way for Como to track and service its public space recycling program while it is in its beginning stages.

Program evaluation

Recycling collected

The data collected was used as an evaluation tool. We calculated diversion rates every month. In the first 15 months, more than 4,900 pounds of bottles and cans were diverted from the waste through Como's public space recycling program. This data was important because it gave valuable information of the potential recycling being captured (and how much wasn't...yet). It also gave us the ability to use an environmental calculator to determine the greenhouse gas reductions achieved through the program.

Using the EPA's Waste Reduction Model (WARM), we were able to calculate that recycling 4,900 pounds of bottles and cans is the equivalent of 6.7 metric tons of carbon dioxide or the equivalent of:

- taking a passenger vehicle off the road for 14.4 months;
- electricity use for one residential home for 11 months;
- energy use for one residential home for 7.2 months.

We estimate that we are currently capturing about one-quarter of Como's recycling with the existing 13 recycling containers, so the CO2 diversion potential at the zoo is equal to multiplying these results by four! It should also be acknowledged that Como Zoo's public space recycling program demonstrates further environmental benefit by promoting environmental stewardship and encouraging a culture of recycling with all zoo visitors.

Visitor questionnaires

Questionnaires were used as another evaluation tool in order to obtain meaningful feedback from the people who visited Como Park Zoo and Conservatory. We conducted two rounds of questionnaires. The initial round of 208

questionnaires not only offered measures of what people were recycling, but also what they thought of the new program. Because the goals of launching public space recycling at Como were about public perception as well as diversion, this data provided a way to measure success in that context as well. After we rolled out some additional education and infrastructure to help increase awareness about the recycling program, we slightly revised the questionnaires and polled 141 visitors to measure the impact of the additional education on visitor awareness of the recycling program.

The results of the questionnaires showed that 93% of visitors to Como care about recycling in their personal lives and are glad when it is an option in public spaces. Visitors also widely recognize the environmental benefit of recycling; 88% identified one or more reasons why they believe Como is offering recycling. Of those responses,

- 62% indicated that recycling improves and saves the zoo and the planet by reducing waste and conserving resources, space, and energy;
- 27% indicated that recycling is the responsible thing to do, and it sets a good example for the public while teaching them about the benefits of recycling;
- 11% indicated that recycling helps protect animals and keeps their habitats safe.

Overall, 74% of the visitors brought or purchased food and/or beverages to consume at the zoo. The biggest finding here is that 68% of the recyclable items visitors brought from home included plastic bottles, and 80% of the recyclable items visitors purchased included plastic bottles. Visitors were 28% more likely to bring recyclables from home than purchase them at Como. This is indicative of the large number of concessions on sale that do not come in recyclable packaging such as French fries, cotton candy, hamburgers, popcorn, snow cones, ice cream, fountain drinks, etc.

When asked to identify what they had recycled, 60%

said plastic bottles (which are the most prominent recyclable item that visitors both bring and purchase at the zoo), 19% said aluminum cans, 8% said aseptic containers (milk cartons and juice boxes), 5% said glass bottles or jars, and another 8% indicated they recycled something other than the listed categories.

Recycling sorts

While questionnaires measure visitors’ perception of the new program in a more qualitative way, sorting the recyclables collected can measure their actions in a quantitative way. Seven recycling sorts were conducted after the launch, which verified plastic bottles as the number one item recycled at Como. It also showed that contamination was minimal (5% to 6% on average).

However, liquid in the bottles was much higher than anticipated. During hot months it was over a quarter of the recyclables by weight while in colder months it reduced to about 11%. This generated discussion about including the liquid weights in the overall recycling rates. Because industry standards include liquids in recycling rates, our results included liquid weights.

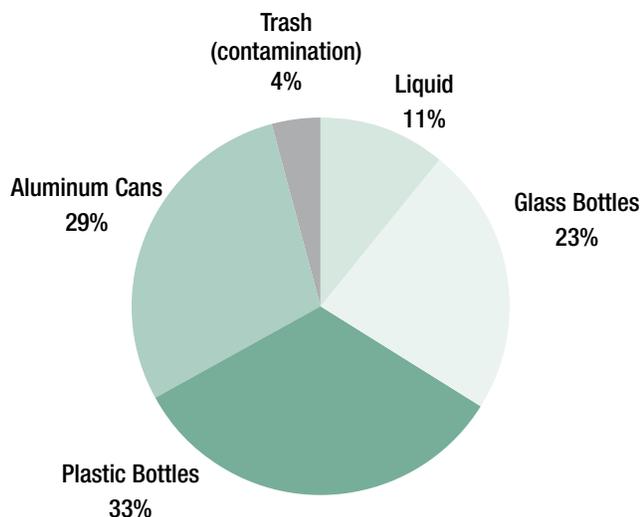
See chart below for exact composition by weight.



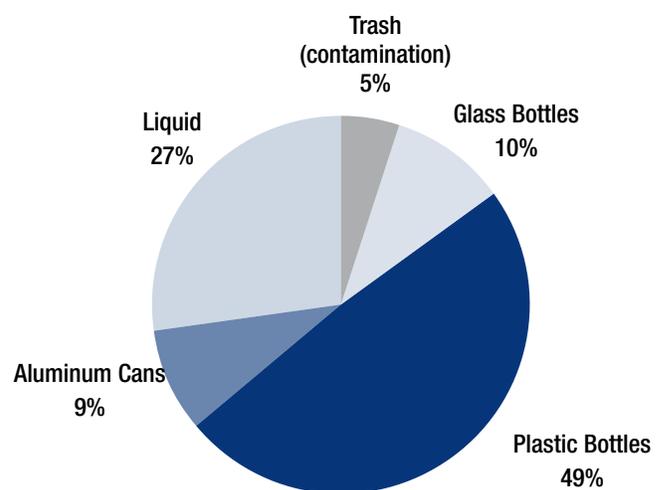
Waste sorts

We then conducted two waste sorts in the trash containers next to the recycling containers (“paired stations”) compared with material discarded at trash containers without a recycling container nearby (“solo trash”). These waste sorts demonstrated that significant amounts of recyclables were being placed in the trash even when a recycling container was next to a trash container. During the busy season, nearly a third of the recyclable material at paired stations was being thrown in the garbage. During the slow season, this increased to half.

SLOW SEASON RECYCLABLES RECYCLED



BUSY SEASON RECYCLABLES RECYCLED



These waste sorts also revealed that the percentage of recyclables found (in the trash and recycling) at paired stations dramatically exceeded those found at solo trash containers (with no recycling container nearby), which indicated that some visitors preferred one of the ten paired recycling/garbage stations among the 120 trash containers.

Category	BUSY SEASON		SLOW SEASON	
	paired station	solo trash	paired station	solo trash
Percentage of trash recyclable	9%	15%	7%	7%
Recycling rate (percentage of discards recycled)	19%	0%	7%	0%
Total Recycling rate potential	28%	15%	14%	7%

We learned that our containers were both more successful than we had planned in capturing a higher percentage of all recyclables at the park, yet some visitors were still throwing away their bottles and cans even when recycling was convenient and available.

Recycling program improvements

To address the challenge of recyclables being placed in the trash receptacles next to the recycling containers, we tested the assumption of making the trash receptacle less convenient by placing a lid on trash rather than leaving it open. Our assumption was that this would cause people to pause just enough to make a different decision when discarding their bottles and cans. By adding lids to trash containers stationed next to a recycling container we were able to increase the capture rate from 62% to 72%. However, the additional cost of maintenance staff time to add a lid (estimated at about 30 seconds per container) needs to be balanced against the

benefits of increased recycling. This additional time seems minimal for only 10 trash containers, but labor would increase considerably if incorporated for all 120 trash containers, especially during the busy season when trash containers are emptied several times per day.

Education beyond the containers

Of the hundreds of visitors who answered our questionnaire, 58% knew that recycling was available during their visit and 26% of all the visitors reported using the new recycling containers. Visitors who discarded items were 34% more likely to know about the recycling program than those who did not discard anything. However, about half (46%) of visitors who didn't discard anything still reported that they knew Como offered a recycling program. Would increased awareness increase recycling rates?



It was not an option to increase the number of recycling stations immediately to increase visibility and visitor awareness, so we tested additional



education at the zoo beyond what is on the recycling containers. By including information on the website, setting up a temporary lobby display, and adding signs to most point-of-purchase locations for bottles and cans, we were able to inform visitors about Como's new recycling program at different points during their visit. The waste sorts performed before and after this additional education was implemented demonstrated a slight increase in the amount of recyclables being recycled at paired stations—the capture rate went up from 68% pre-education at the paired stations to 71% post-education.

Following the placement of the additional education, a second round of slightly revised questionnaires helped us understand how the additional program elements may have impacted visitor awareness of the recycling program. We also measured if noticing the recycling program was dependent on whether a visitor discarded or recycled an item.

After the additional education, visitors were 8% more likely to know about the recycling program. This questionnaire identified that the majority (64%) of the visitors became aware of the program by noticing a recycling station, but many had also seen the lobby display (17%), the information on the website (9%), and the signs on vendor concession carts (7%).

This confirms the waste sort data indicating the proper education at the point of discard is crucial for a functioning system and that supporting education at a facility can increase recycling awareness. There may be cumulative benefits to this type of education as Como builds a culture of recycling and repeat visitors learn of recycling availability and importance.

Summary and next steps

Como Park Zoo and Conservatory has made a significant first step in implementing a recycling program. A large amount of recycling is already being captured at Como. Purchasing more recycling containers and increasing recycling education and outreach will only improve the capture rate at Como. As Como moves ahead with its recycling program, we recommend continuing to add recycling containers each year in order to build on the environmental benefits of recycling at the facility. Though difficult to calculate due to seasonal and other fluctuations, we currently estimate the potential average recycling rate at the facility to be 18%. Currently, the Como is recycling about 4% of its total discards. By capturing all recyclable bottles and cans, more than 19,000 pounds could be diverted annually from the garbage (vs. current diversion of 3,500 pounds).

This material can be captured by building on and expanding the current infrastructure—both the collection and education. As part of the collection infrastructure, Como can consider the cost/benefit of adding lids to trash containers. Lastly, expanded education, such as banners on recycling stations to give them more visibility, or a permanent or periodic lobby display, can continue to increase recycling awareness at the facility.

Furthermore, the recycling infrastructure developed now (collection, containers, and education) will help when Como is ready to expand into diverting compostable animal and public waste from the garbage.

Pilot Project: Mears Park

Public places are not only for play, but also provide beautiful green landscapes and quiet places where we can rest, gather, and celebrate life. Our city parks and green spaces reflect the natural environment that people are working to protect. As recycling is carried out in our beautiful public parks, we should consider the landscape aesthetic and fully reflect the environmental value that is at the heart of recycling. However, the practical side of public space recycling often presents a sight that is inconsistent with the refreshing landscape we seek. Recycling processes are generally industrial and mechanical, containers are commercial plastic, and recycling can sometimes be confused with trash, the stuff we no longer want.

Public art throughout the world has proven to stimulate environmental renewal and propose new ways to co-exist with our environment. For this project we asked, what role can artists play in promoting behavior among an urban population? Why can't public space recycling be functional and beautiful? Can we create a public space recycling model that is consistent with the aesthetic of landscape design and the beauty of the natural environment? Can we elevate the act of recycling to clearly distinguish it from wasting? Can artists not only create a better more artful container but also foster the performance "ritual" of recycling?

Mears Park, one of Saint Paul's greatest treasures, was the very best place to test these ideas.

Co-designed by artist Brad Goldberg and landscape architect Don Ganje in the 1990s, it was honored by the America Society of Landscape Architects as a national landmark for outstanding landscape architecture. In Mears Park, converting plastic garbage containers to collect recycling seemed unworthy.



Stakeholders

A working group of stakeholders came together to set goals and to collaboratively design and implement all aspects of the program. The working group consisted of representatives from the City's Parks and Recreation department and Public Works department, Eureka Recycling, and Public Art Saint Paul (a local nonprofit that engages artists in shaping the form and experience of Minnesota's capital city). All levels of involvement were represented—from budgetary and staffing decision making to the logistics and implementation of collections in the park.

A Mears Park Green Team was established to contribute to the general direction and vision of the project and to aid with the community process. The Green Team members included the entire working group, and extended to include a wider range of stakeholders including active community members, the local business association, and representatives from other interested city departments.

To truly build a public art and public recycling project that engages the Mears Park community

around Mears Park, the Capital River Council (the neighborhood association for the downtown area), Eureka Recycling and the artists met with the Friends of Mears Park, a volunteer organization of neighbors who tend the park's gardens. We also polled those who use the nearby skyways (elevated walkways connecting downtown buildings) to get a clear sense of what people love about the park. The team was able to carefully listen, catalog, and respond to the concerns and ideas they heard in association with the addition of a recycling program to the park.

An artistic approach

By working with members of the Mears Park community, we learned that they deeply value art and creativity! The park is situated in the Lowertown area, home to more than 500 artists and studios. Artists Marcus Young and Seitu Jones (both of whom have long histories in Lowertown) were commissioned to creatively re-conceive the recycling container and the ritual of recycling.

Exploring the intersection of art and recycling was a greater process than anticipated. The artists had a steep learning curve for recycling and waste reduction, just as the City and Eureka Recycling had for the process of creating public art.

Seitu Jones, a Frogtown-based leader in public art, was responsible for the physical design of the containers. In this artistic team, Seitu focused on the sculptural integrity of the containers and was challenged with making sure the recycling containers could withstand the harsh Minnesota climate and function within the confines of the existing mechanized collection system used by Saint Paul Parks and Recreation to collect the recycling in the park.

Marcus Young, City Artist in Residence for Saint Paul and a conceptual artist, focused on what the recycling containers communicate to the neighborhood about art and sustainability, and how parkgoers are educated by these objects.

Identifying what materials to collect

Visitors to Mears Park generate from less than 20 pounds to more than 100 pounds of trash per day. This quantity fluctuates seasonally, as well as with the weather and with the schedule of events in the park.

Baseline study

A *baseline study* is the documentation of information collected before any changes are made. At Mears Park, our baseline study included information about how much trash is generated in the park, which we learned by talking with the staff who service the trash containers. Our baseline study also included how much recyclable material was thrown away, which we learned by sorting the waste collected in the park before the recycling program was implemented.

Baseline waste sorts

For our baseline study we conducted two *waste sorts* in Mears Park to help us understand the potential diversion of recyclables in the park and what materials we should target in our program. In our first waste sort, we looked at the quantity and composition of material collected. Because of inclement weather, use of the park decreased over the collection period for our waste sort and we had much less material to sort than we expected. We planned a second waste sort and collected several days of material. Though we increased quantity collected for our second waste sort, the composition remained similar to the first “rainy day” waste sort.

Our waste sort results indicated the potential to collect two recycling streams, one for commingled bottles and cans and one for papers. There was also a significant amount of compostable material. Although the waste sorts indicated a slightly higher composition of recyclable papers than bottles and cans and an even greater amount of compostables, we determined that the collection of bottles and

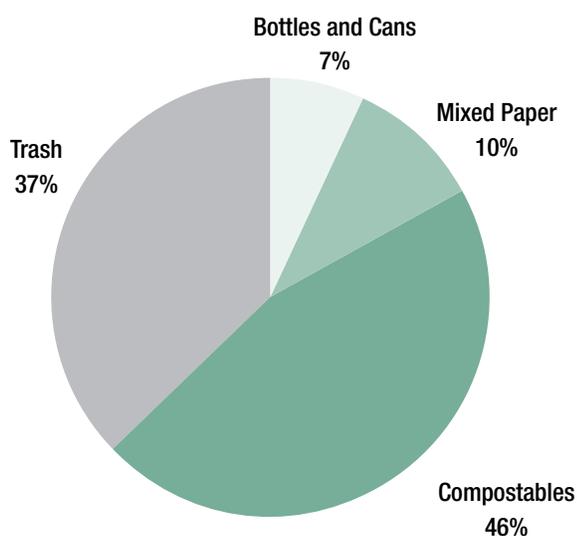
cans was the best place to start. Collecting bottles and cans was a better fit for Mears Park’s existing collection infrastructure, because the quality of the bottles and cans wouldn’t be damaged or compromised through the automated collection process. We also concluded that it would be harder to keep clean and dry for processing and sale to end markets, and would require further adjustments to the collection infrastructure. Furthermore, we focused on collecting recyclables rather than compostables because introducing a new practice like composting before the more familiar sorting system of recycling would present challenges for collection and education. The chart below illustrates the composition of discards by weight from our combined waste sorts for Mears Park.



Saint Paul Parks and Recreation currently operates two garbage collection vehicles, called Load and Pack, to pick up all the trash from city parks. The Load and Pack has an automated arm that “grabs” trash containers, picks them up and dumps them into a dumpster on the back of the vehicle. This system prevents the driver from having to lift any materials as well as prevents the City from needing to use bags in containers. The holding capacity of the Load and Pack unit is 7 cubic yards, but it can compact its contents at a ratio of about 3 to 1—effectively tripling its capacity. When the dumpster on the Load and Pack reaches capacity, the driver (traveling less than 25 mph) drives the Load and Pack to a central drop-off site within a few miles of Mears Park. The dumpster is detached from the body of the Load and Pack and is serviced with a front-load garbage truck, which empties the dumpster into the truck and hauls the material to its final destination. A full route can include as many as 272 trash containers at 35 locations spread over half of the city. On a full route, the Load and Pack dumpster may need to be emptied once mid route as well as at the end.

Occasionally, large events in Mears Park require the City to put out more trash containers. These additional trash containers use a bag liner and are serviced by hand by Parks and Recreation staff.

MEARS PARK WASTE SORT RESULTS



Identifying the current infrastructure

The current trash infrastructure at Mears Park includes eight trash containers located throughout the park. These containers are serviced daily during the peak summer months. Our baseline study showed an estimated two cubic yards of discards generated per day. During colder months, volumes drop to less than 1 cubic yard per week.

Designing the collection infrastructure

For the public space recycling program in Mears Park, the City decided to use the existing garbage collection equipment for recycling rather than invest in a new system. In the short term, this was a cheaper option for the City, especially considering that this was a small pilot and retrofitting the whole city's collection infrastructure for one small park would be unrealistic. In the long term, the City felt it could successfully use its investment of this equipment to collect more recycling and less trash. The four recycling containers were designed to work within this infrastructure, and be serviced by the Load and Pack (without using its compaction feature in order to protect the quality of the recyclable material).

Working within this garbage infrastructure for this project posed challenges in terms of efficiency. The automated Load and Pack system is designed to handle large amounts of trash en route throughout the city, not the small amount of recycling that is generated from just one park. In addition, the four containers in Mears Park are the only public space recycling containers in the city that use this equipment. In the end, because of this lack of efficiency and the need to use such a slow vehicle to travel to and from the central drop-off site to collect recyclables from only four containers, the City decided not to use the Load and Pack for recycling collection while the route is so small. So, although this pilot set out in part to test recycling collection with the Load and Pack, the City determined that the inefficiencies were too great to overcome. For now, the recycling containers in Mears Park are emptied as needed by hand. Staff then place the recyclables in bags and haul them by a pickup truck to the central drop-off site. The bags are emptied into 90-gallon carts and the carts are serviced as needed on route by Eureka Recycling's collection trucks.

Although the hand collection of recyclables in Mears

Park appears more labor intensive than the Load and Pack, we had a valuable opportunity for staff to monitor the materials collected. Collection staff reported that they saw minimal contamination. They reported the amount of contamination they removed from the recycling containers, and it was consistent with what we have found in our waste sorts (about 5%).

Looking forward to when the City expands public space recycling, we are working with the City to identify solutions to the challenges of working within the garbage infrastructure. In the broadest sense, efficiencies will be gained by using the Load and Pack for collection once the recycling route is filled out. At that point, the City is committed to modifying the system as necessary to ensure that the materials collected using the Load and Pack can be transferred for processing at Eureka Recycling's facility. Currently, the Load and Pack dumpsters are designed to be serviced by front-load garbage trucks. However, in the Twin Cities, there are no front-load recycling trucks for commingled containers (aluminum cans, plastic bottles, etc.) The City has researched options to modify the dumpster and will implement these changes so the dumpster can be serviced by a local recycling truck.

Designing public space recycling containers

Public space recycling containers for Mears Park needed to withstand collection by the Load and Pack and function in the same way as the trash containers so they could hold materials without the use of bags and have operating hinged lids that open when the containers are tipped upside down for collection. These requirements posed limitations for the artists in terms of form and material. As the artists grappled with the tension between form and function in their creative process, the working group met several times to address the balance between creativity and function, and to revisit the shared

mission of project by using the Humphrey Diamond (see page 18).

Local engineering and product design firm Brooks Stevens, stepped forward to lend expertise to marry form and function. With an office a block from Mears Park and a keen interest in designing for sustainability, Brooks Stevens' enthusiasm for the project and engineering expertise were a strong catalyst to keep the project moving forward.

Designing education

Education at the point of discard was included on the lids and around the outside of the containers, with the following characteristics:

- The recycling “chasing arrows” cut out along the outside of the container
- The words “Please recycle bottles and cans” sandblasted on the lid and painted blue to stand out against the metal container
- Inspirational language “recycle at peace with all things” which is an excerpt of the poem distributed by This is for You, the education ritual for the Mears Park recycling program
- Sandblasted images of an aluminum can and plastic bottle, painted blue to stand out against the metal container
- Circular restricted opening on the lid of the container, and cut-out circular holes around the container



- Blue enamel in the inside of the container appears through the cut-out circular holes around the container, further distinguishing the recycling from the trash and representing the water elements at the park



Education beyond the container

Mears Park is situated in the center of a high-density mixed-use residential and business district. Many people buy lunch from nearby businesses and bring it to the one-city-block park to enjoy the beautiful green space. Because much of the material that is discarded in the park originates from these businesses, it made sense to get their support and to get them involved in the project. Gathering this support also helped make the program more visible to the community.

Businesses within a one- to two-block radius of the park and in the skyways were contacted via phone and then visited in person just before the launch of the new containers. They were given the background of the project, offered resources to help them answer customers' questions about recycling and asked that they show support for the program by displaying posters in their establishments, and if possible, placing small stickers on beverages they sold in bottles and cans that might make their way into the park. Four businesses agreed to take rolls of 200 of the stickers that said, "New! You can now recycle this in Mears Park!"



The Ritual

Artist Marcus Young assembled a team of Lowertown artists to create a set of whimsical secret “gifts” titled *This is for You*. Designed around the idea that the art of recycling is very much like the art of giving, the intention was to engage people in the thoughtful ritual of recycling as opposed to the mindless habit of wasting.

Ten gifts were created and “seeded” in the Mears Park community following the launch. Each gift consisted of a plain hand-crafted wooden box that contains a beautifully glazed ceramic mold of a plastic water bottle. Removing the cap from the bottle pulled out a series of cloth flags that contained a poem about recycling in Mears Park, and instructions for how to log on to the website to track the journey of that particular gift at www.RecyclingInMearsPark.org.

Local web design firm Bicycle Theory designed a site that would best support *This is for You* in a way that is fun and accessible. People who receive a gift could log on with the password on the gift, enter their name, which building they live or work in, and their comments. Anyone who logged on could then follow the journey of each gift from person to person, building to building, and read what their

neighbors have to say about the project.

It is difficult to analyze how far reaching this grassroots, person-to-person effort was. Although we are not sure of its potential and whether we reached it, we know it helped to raise awareness in the Mears Park community about public space recycling. The journey of the gifts was tracked online. After five months, only two or three people posted updates for each gift before they disappeared into the community. In an attempt to determine where the gifts were, we contacted the last reported recipients, all of whom reported that they had passed the gifts along. The website itself received over 1,000 unique visitors from August to December 2009.



Launching the program

On June 26, 2009, recycling in Mears Parks was launched with a press event that was attended by more than 60 community members who felt connected to this project, as well as visitors in the park who were learning about the project for the first time. This launch event was evidence that the more effort you put into involving the community and gaining support, the bigger the impact. We celebrated the first

day of recycling in Mears Park with everyone who had a hand in the project the past couple of years. In the park with us were City staff, park visitors, community members and many interns and volunteers—all representing their stewardship and investment in the program. The highlight of the launch event was a dedication ritual for the containers in which community members and project partners and park visitors lined up and passed bottles and cans hand to hand, ending with the bottles and cans being recycled through using one of the new containers.

Four containers were placed in the park’s four

corners, each next to a trash container, and the remaining four trash containers were rearranged in the center of the park. For five months following the launch, Eureka Recycling and the City of Saint Paul tracked, monitored, and analyzed the entire system in Mears Park—from the containers in the park to collection to the recycling facility and beyond.



that sell the single-use, to-go items that are discarded in public spaces. Working with businesses and vendors to help them make different purchasing choices (e.g., selling more beverages in bottles or cans instead of Styrofoam cups) could result in less trash and more recyclable items in

the park. We have started this work in Mears Park by connecting with businesses in the surrounding community, but there is more that could be done to connect their purchasing choices to the vision of reducing waste and increasing recycling in Mears Park.

Business outreach follow-up

Several weeks after the launch we followed-up with the businesses around the park to see what they heard from customers about the program, and to collect any additional feedback they had. Business owners reported that customers noticed the posters and stickers and that they helped bring attention to recycling in Mears Park.

The businesses thought the posters were self-explanatory. However, details about what could be collected through the recycling program in Mears Park were unclear. One business was confused about what could be recycled and had put stickers promoting the program on non-recyclable products (paper cups). We spoke with the business owner (and all of the other participating businesses) to clarify that the recycling program in Mears Park is collecting bottles and cans only. This misunderstanding reminded us of the importance to reiterate the details of the program because many people have different assumptions about what can and cannot be recycled.

We know that changes “upstream” are necessary to make public space recycling a success. A crucial way to reduce waste and increase recycling in public spaces involves working with businesses and vendors

Tracking data collection

From our baseline study, we already had information about the potential *diversion rate* in Mears Park, the percentage of discards by weight that were getting diverted to the recycling. However, to measure the actual diversion rate, we needed information about the collection of both the trash and the recycling in the park. We worked with Parks and Recreation to implement a tracking system for Mears Park maintenance staff to track and report the trash and recycling volumes when the containers were serviced.

Identifying tracking opportunities within the infrastructure

We have more than twenty years of experience in tracking recycling collection and applying our data to demonstrate the value and benefits of recycling. However, we faced some challenges at Como and Mears Park as we learned about working within a garbage infrastructure to identify roles, and balance efficiencies.

In most cases, a public space recycling program is likely to be implemented internally, by city or county staff. In our pilots, we worked with Parks and Recreation staff to navigate the internal structure from an external position. Having a removed role caused challenges for us to identify maintenance staff roles and levels of access. It took more time than anticipated for us to understand the infrastructure, and identify the roles and responsibilities of staff involved. We were still learning after the program launched.

Parks and Recreation understood the importance of tracking information and holds a vision to expand public space recycling throughout the city. The department agreed to have maintenance staff provide this data for the first six months of the program.

Tracking trash and recycling volumes

Park staff used tally sheets that we provided to track both the recycling and the trash. After maintenance staff recorded collection information on the tally sheets, the sheets were faxed or emailed to us for data entry and analysis. We combined this data with information gathered from waste and recycling sorts to calculate the diversion rate over five months of the program. We tracked the volume of recycling and trash at each container for most of the first five months of the program.

The trash collection in Mears Park was designed to be efficient and had a set route with the Load and Pack collection vehicle. Asking staff to track the volumes of trash at eight containers in the middle of a route with as many as 272 containers caused inefficiencies. Additionally, since the driver was on route all day and showed up at Mears park any time in a two-hour window, our only access to drivers was through their supervisor.

Thus it took awhile for route sheets to get from the driver to his supervisor and then to us (frequently going to the supervisors' supervisor before getting to us). Additionally, if there was an error or a question

about the tracking sheets, it took a while for us to get a response as to what happened. Because of this long communication chain, there were several weeks in the middle of the tracking period for which no trash data was collected. By the time we identified the missing tracking sheets, the staff person who was collecting trash during those weeks was no longer available.

To track the recycling, maintenance staff recorded the volume of the recycling when the containers in the park were serviced. Collection (and therefore tracking) occurred five times during first six months of the program. We used these five data points to evaluate the first six months of the program.

Using the data we collected

In addition to the trash and recycling tracking by maintenance staff, our driver continues to track the volume of recycling each time it is collected from the central holding location (where Mears Park staff haul the materials when they empty the containers). We are able to combine this total quantity of recycling collected with data gathered during waste sorts to regularly calculate the social and environmental benefits of the program. By continuing with the ongoing tracking by our driver we will be able to keep updating partners and stakeholders as to the benefits of the public space recycling program in Mears Park.

Recycling collection and program evaluation

Recycling collected

Recycling is typically measured and evaluated by weight. From this measurement we are able to calculate both the environmental and economic benefits of recycling by allowing program managers to calculate cost and energy savings from avoiding disposal.

In the case of Mears Park, the first six months

yielded a total collection of 191 pounds. With this minimal collection, economic benefits are difficult to quantify. However, the energy savings and environmental benefits of recycling are so great that even 191 pounds has significant impact that can be shown using EPA's Waste Reduction Model (WARM) and the Greenhouse Gas Calculator, which takes carbon equivalents and translates them into everyday examples that are easier to relate to.

Using these tools provided by the EPA, we can show that the bottles and cans recycled at Mears Park saved the equivalent of 0.6 metric tons of carbon dioxide from being released into the atmosphere, the energy equivalent of 67.5 gallons of gas.

Beyond diversion and the energy savings and environmental benefits of recycling, it is also important to acknowledge and celebrate the shift in awareness and behavior of recycling. Measuring how often the public uses a recycling container (and uses it correctly) is another gauge of success. By calculating the quantity of recyclables not only by weight but also by the number of individual bottles and cans recycled, we can evaluate how the public actively uses public space recycling containers.

Knowing the composition of Mears Park recycling and the average weight of individual bottles and cans, we estimate that the 191 pounds of recycled materials collected is about 89 glass bottles, 647 plastic bottles, and 2,184 aluminum cans. This means that in the first six months of the Mears Park recycling program park visitors chose to recycle nearly 3,000 times!

Evaluative waste and recycling sorts

After the launch of the recycling program, we did four waste sorts during the six months we measured recycling to evaluate the program. These sorts helped us assess contamination and learn more about what was still getting thrown in the trash. Additionally, we weighed and sorted all the recycling collected during the first four months of the program. These

sorts confirmed that contamination was minimal, ranging from non-existent to 6%.

However, we did find a significant amount of bottles and cans still being thrown in the trash. While evaluating material by weight is important, evaluating these results by individual bottles and cans was even more illuminating. We learned that 88% of all glass was being thrown in the trash (both by weight and by bottle type), while just under half of the plastic bottles and aluminum cans were being discarded in the trash containers. Due to the heavy weight of glass, when we measure by weight it accounts for a higher percentage of the weight and tends to skew the data. For example, the capture rate of all bottles and cans (percentage that is recycled) when measured by weight is only 27%. However, when we measure individual bottles and cans, the capture rate increases to 47%. While the former rate is important for evaluating the overall recycling potential of the program, if we want to look at the percentage of people using the containers compared with those who throw their recyclables away, the latter rate is more valuable.

Diversion rate

The percentage of the discards diverted from the trash (most frequently through recycling though it can also be through reuse or composting) is the **diversion rate**. Diversion rate is usually calculated by weight because trash volumes fluctuate significantly either through compaction or based on the density of the material thrown away. This calculation is used frequently by cities to demonstrate how much they recycle. However, we found that in public spaces, especially spaces that have fewer recycling containers than trash cans, and where the trash can fluctuate significantly based on weather and other park use factors, the diversion rate is not the ideal measure of success for the program. The number of bottles and cans recycled or other measures of social behavior (using a survey, for example) may be a better gauge of the impact and success of a public space recycling

DATE DATA COLLECTED	AVERAGE WASTE PER DAY (LBS)	AVERAGE RECYCLING PER DAY (LBS)	AVERAGE RECYCLING RATE	# OF DAYS FROM WHICH DATA IS COLLECTED	SOURCE FROM WHICH DATA WAS COLLECTED
8/17/2009	114.66	1.75	2%	10	Tracking sheets
8/20/2009	23.36	1.16	5%	2.5	Waste sort
8/24/2009	73.13	4.38	6%	4	Tracking sheets
8/27/2009	44.64	2.60	6%	2.5	Waste sort
9/22/2009	76.25	2.42	3%	29	Tracking sheets
9/24/2009	34.88	2.28	6%	2.5	Waste sort
11/10/2009	41.82	1.11	3%	4.5	Waste sort
12/4/2009	25.35	0.66	3%	24	Tracking sheets

program.

In Mears Park we were able to calculate the diversion rate at eight data points, either from the tracking sheets the maintenance staff provided or from waste sorts where we collected and sorted trash and recycling collected from a set amount of time. These data points show the diversion rate ranged from 2% to 6% (see chart below). This seemingly low rate is primarily because of the large amount of glass discarded in the trash and the composition of the trash, which was very heavy due to the amount of pet waste discarded (one-third of the trash by weight was pet waste) as well as a considerable amount of leaves and brush (15% of the trash by weight was leaves and brush from the volunteers who maintain the park's gardens).

The chart at top lists all the data points we collected, either from waste sorts or from the tracking sheets provided by the maintenance staff who collect the trash and recycling in the park.

The overall recycling rate for the first six months of the program was 3%, much lower than the 7% potential shown in our baseline study. However, we know from the waste sorts that this discrepancy is because much recycling is still being thrown in the trash. The data collected by Mears Park staff also shows that recycling and trash quantities generated in the park fluctuate greatly and decrease

significantly during the winter.

Visitor questionnaires

Questionnaires were used as an evaluation tool in order to obtain meaningful feedback from the public that visits Mears Park. One of the most notable findings from our interviews with 112 park visitors was the overwhelming support they expressed for the recycling program and the interest they had in seeing recycling in other parks throughout the city. Feedback included:

- *This is great! We love it!*
- *This is a great way to get people thinking more about recycling.*
- *Great—I love the bins, very creative!*
- *It's a good idea, people are happy about it.*
- *This is a good program, it should be in other parks as well.*
- *I think Saint Paul needs recycling in all parks.*

The questionnaire results showed that Mears Park visitors care about recycling in their personal lives and are glad when it is an option in public spaces.

- 30% of visitors identified with being avid recyclers who carry their recycling home if it is not available in public.
- 62% of visitors identified with being glad when recycling is an option at public spaces.
- Visitors were asked an open-ended question

about what they thought was the purpose of implementing a recycling program in Mears Park. Of those who responded,

- 55% indicated that recycling improves the environment by reducing waste and conserving resources, space, and energy;
- 23% indicated that recycling is the best way to reduce litter in the park;
- 8% indicated that recycling keeps the upscale neighborhood clean;
- 5% indicated that recycling is Saint Paul's way to set a good example for the public while teaching about the benefits of recycling;
- 5% indicated that a lot of people eat their lunch at the park and can reduce the volume of recyclables from entering the trash by using the recycling containers;
- 5% indicated other reasons including the market value of recyclables.

The results of the questionnaires showed that nearly 70% of visitors we spoke with were already aware of the recycling program. The most prominent ways they learned about the program was by seeing the containers in the park and by hearing about the launch of the program on the news.

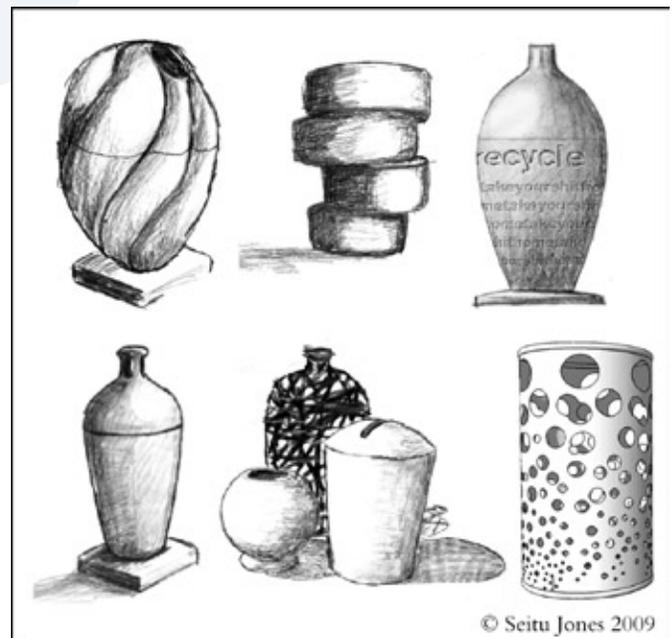
When asked to comment about the design of the containers, the majority of the visitors we spoke to indicated that the recycling containers are more noticeable, they stand out and the design is eye-catching. Many visitors said the container design fits in well with the décor of the park, that the design of the container engages the community, and that the containers are aesthetically pleasing and add to the architecture of the park. Feedback included:

- *The recycling containers add to Mears Park artistically and environmentally.*
- *The art design of the containers encourage people to recycle.*
- *Supporting local artists helps get people more interested.*
- *The design adds to the beauty of Saint Paul.*

Some of the concerns we heard from visitors

included that from far away they found it difficult to tell that the containers were for recycling, and that we should consider adding more containers so they weren't so far apart or adding large signs or larger lettering on the containers.

These conversations confirmed that the public is using the recycling containers in Mears Park. Of those who had recyclable items in the park, 93% reported that they did recycle it. The questionnaires also confirmed that the area businesses contribute greatly to the packaging that is disposed of in and around the park. Overall, 61% of the visitors we spoke with brought and/or purchased food or beverages near the park. Of these items, 25% were in recyclable packaging that could be recycled in the park: 58% were plastic bottles, 47% were aluminum cans, 5% were milk cartons or juice boxes, and 3% were tin cans.



The value of art

While there are challenges to incorporating art, we found many benefits. Artists bring a certain sensibility and capacity to stretch thinking in both directions –bringing holistic, long-term and cutting-edge vision about the system and program design, as well as the brass tacks of turning concept into

functional object and creatively problem solving challenges on the ground. Moreover, thinking artistically about recycling allows us to address and inspire the culture shift and behavior change that will be required of all residents for any city to achieve zero waste.

The containers created for Mears Park were a success in many ways, but we think the process through which we incorporated public art into the Mears Park recycling program could be improved. We learned a great deal about the many contributions artists have to offer a project. For example, if an artist is going to play the role of a container designer/fabricator for automated collection, more time and money must be allotted in anticipation of the challenges that come with designing and engineering an industrial product with such specific requirements (like equipment compatibility). Outside of container fabrication, artists can play a valuable role at the planning table to design the program as a whole, and/or to creatively address specific questions or challenges such as contamination, awareness, community buy-in, and more as evidenced by the success of the ritual and community education portion of this project.

Summary and next steps

From the data provided by the maintenance staff and what we learned through waste sorts, we identified the following discernable patterns:

- Quantities generally declined as the weather became colder and the days became shorter.
- The amount of recycling and trash generated in the park varies greatly with no clear pattern other than the weather.
- The recycling collected has an extremely low contamination rate of 0 to 6%.
- More than half (by individual container) to two-thirds (by weight) of the recyclables still get thrown in the trash.
- The recycling rate varies between 2% and 6%.

The public is using the recycling containers in Mears Park and is using them appropriately. These are two successes we can celebrate. There is still much room for improvement in increasing the amount of recyclables recycled in the park. Glass gets thrown away more than any other material, but many plastic bottles and aluminum cans are also discarded in the trash. To help increase recycling, the City could add more recycling containers in Mears Park and place at least one in the center of the park. Ideally, there should be a recycling container by every trash container.

Implementing recycling in Mears Park is a significant step in providing recycling in Saint Paul's public spaces, especially throughout downtown parks. This pilot project provided the opportunity to explore the implementation of recycling in a garbage infrastructure and helped us to understand what is needed to make the collection process more efficient. As we recommend the City bring public space recycling citywide, we learned through this pilot project the need to identify containers and education that will work within the collection infrastructure, generate minimal contamination, and fit within the City budget.

Pilot Project: Urban park pavilions

Saint Paul has six large urban park pavilions throughout the city: at Lake Phalen, Newell, Lake Como, Streetcar, Highland, and Harriet Island. The pavilions are locked facilities with kitchen amenities and are staffed by maintenance when in use. There are many other open pavilions in the city, but it was more manageable for Parks and Recreation to start recycling in the handful that have more monitored and controlled environments.

The city's pavilions are used widely and are generally rented through a reservations system (except on holidays). Most reservations are for gatherings of 200 people or less for celebrating family events, clubs events, or workplace gatherings. For events with more than 100 people, an additional charge covers the cost of extra garbage removal.

Eureka Recycling worked with the City of Saint Paul's Department of Parks and Recreation to add recycling at the park pavilions in the summer of 2008. Five pavilions were successful in adding recycling. Parks and Recreation decided to hold off on adding recycling containers for the sixth pavilion, Harriet Island, until they had room in their budget to purchase containers that matched the upscale décor of the pavilion, which is frequently rented for events such as weddings and proms.

Identifying the current infrastructure

Before the recycling containers were added, the pavilion garbage infrastructure was designed for trash collection by hand-pulling bags and replacing new liners in the receptacles. Maintenance staff then transported the garbage bags to a dumpster located nearby, within walking or driving distance (in the latter case the trash is transported via a golf cart or pickup truck to the dumpster).



Parks and Recreation has a reservation system for park pavilions. At the point of registration, residents are informed of rules for alcohol and trash, but currently they are not instructed about the recycling program. This reservation system has been identified as an opportunity to raise awareness about the program and build in accountability for participation through a deposit system.

Designing the collection infrastructure and selecting the containers

To modify the garbage infrastructure to accommodate recycling, Saint Paul Parks and Recreation added recycling containers inside the pavilions to collect bottles and cans. These containers were primarily bottle-shaped recycling containers, which the city obtained at no cost. The City also used an occasional blue tote with a restricted opening and simple label on the lid. All containers used are lined with a bag, which City staff pull by hand and haul to a 90-gallon cart. Eureka Recycling provided a set of 90-gallon carts for each location to hold the recycling for collection. These carts are serviced by our recycling trucks and the materials are hauled to our facility for processing.

Evaluation

To learn about recycling at pavilions, we worked with Parks and Recreation to identify a system for tracking. Parks and Recreation decided to keep most of the carts at its headquarters, which are centrally located, and haul the recycling back from the pavilions in a pickup truck. At their headquarters these bottles and cans are mixed with recycling from the office and other programs. Because we were unable to learn about quantities generated from individual park pavilions, we conducted three waste sorts to gather detailed information about what is being collected through this program.

Waste sorts

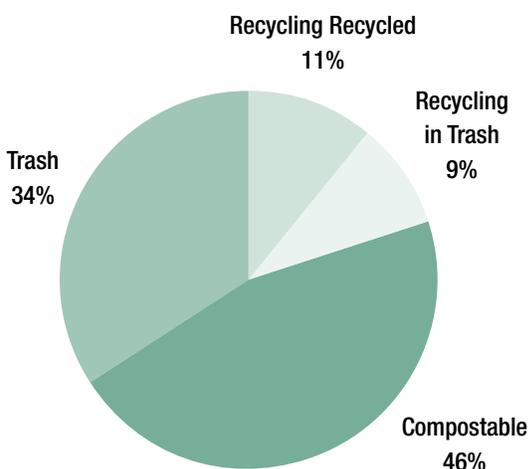
We used our three waste sorts to look into some specific assumptions about behavior and accessibility. Two waste sorts were done on days when the pavilions were reserved by one specific person or group. This provided more accountability than the other waste sort we conducted on a holiday weekend. On holidays, no reservations are accepted and the pavilions are open to the public as they arrive.

Ideally, recycling should be as accessible as trash, with both types of containers next to each other. However, new programs rarely have the budget to roll out a new recycling container for every trash container already in existence. Thus, we attempted to quantify exactly how recycling rates are associated with container ratios.

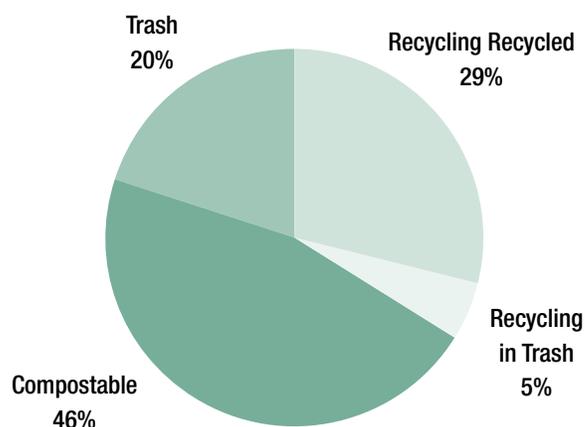
All of the waste sorts indicated that a considerable amount of compostable material is generated at park pavilions. One environmentally minded church group had even used compostable utensils, cups, and plates, indicating the growing awareness about compostables and the potential to add composting to the infrastructure in the future. (Waste sort results by weight at bottom.)

When we compare the results of 10 trash containers to 3 recycling containers with 10 trash containers to 10 recycling containers, we can see the recycling rates dramatically increase. However, contamination rates increase as well from 0 to 10%. One-tenth (1% overall) of this contamination was cups, which people frequently think are recyclable. This could be addressed with targeted education.

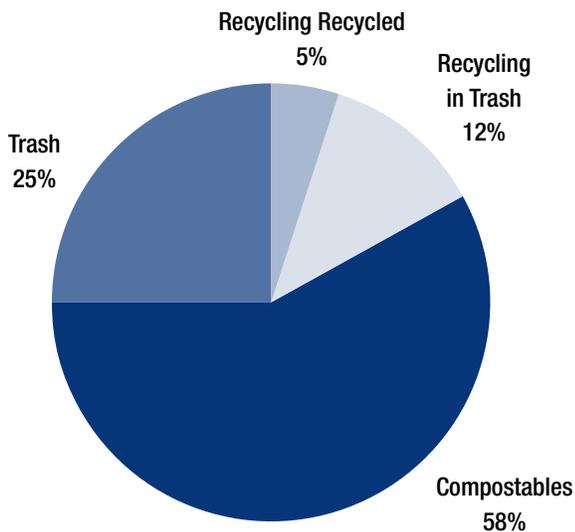
**RECYCLING & TRASH AT RENTED PAVILION
10 TRASH CANS: 3 RECYCLING CONTAINERS**



**RECYCLING & TRASH AT RENTED PAVILION
10 TRASH CANS: 10 RECYCLING CONTAINERS**



RECYCLING & TRASH AT PUBLIC PAVILION (HOLIDAY) 10 TRASH CANS: 7 RECYCLING CONTAINERS



Discards were collected over a holiday weekend for the third waste sort. On this day contamination was minimal (2%) but less than one-third of the recyclables were recycled. See graph to the left of waste sort results by weight.

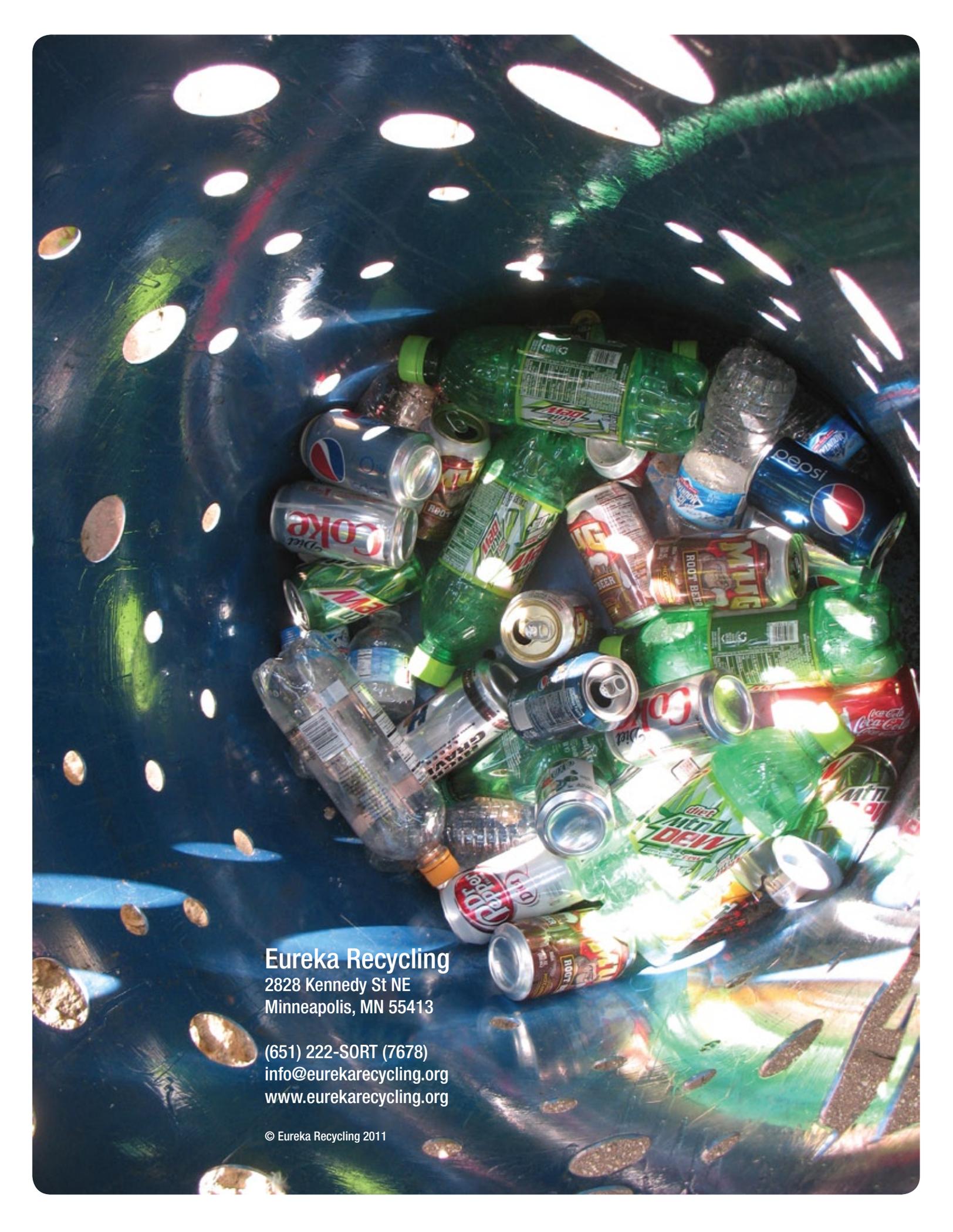
Lastly, while the bottle-shaped recycling containers used in the pavilions proved effective at capturing bottles and cans with minimal contamination, it did not capture any aluminum foil or pans. Many public spaces do not have a significant amount of this material, but we found considerable amount at the pavilions because picnics are a common activity at these venues. Aluminum pans and foil are convenient disposable containers to hold large volumes of warm food (or whole pies) served to many people on disposable dinnerware. During one waste sort, these pans consisted of 18% of all the recyclables thrown in the trash (2% of total trash) by weight. Not all recycling facilities are able to sort and sell this grade of aluminum, but in cases where this is possible, this is an important item to consider.

Summary and next steps

From these waste sorts we conclude contamination is minimal and even during holidays many recyclables are making it into the correct containers. We found that an increase in recycling containers does increase recycling rates. In fact, when the ratio was one to one (seven recycling containers paired with seven trash containers), and the pavilion was reserved, 85% of the recyclables were captured. In contrast, during a free-for-all holiday where there were ten trash containers available and only seven recycling containers, only 30% of the potential recyclables made it into the recycling.

Furthermore, pavilion maintenance staff who are at the park throughout all reserved event (though not always in the pavilion) have indicated that when the trash is not serviced regularly visitors will take the lids of recycling containers and use them to collect trash. By increasing service levels (or even self-service levels) and education, or using containers where the lid cannot easily be removed, this issue can be averted.

The next steps to expand this program will include adding recycling education to the reservation process, training for the maintenance staff who are onsite when pavilions are reserved, expanding the program to include unmonitored pavilions, and considering the addition of the composting infrastructure in the long term to enable select groups to hold their own zero-waste events when they rent pavilions. However, as long as there is no tracking of the recycling collected at the pavilions, Parks and Recreation will be unable to identify if changes have any effect on the recycling collected.



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