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REPORT

TACKLING FOOD WASTE IN CITIES: A POLICY AND PROGRAM TOOLKIT



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About NRDC

The Natural Resources Defense Council is an international nonprofit environmental organization with more than 3 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, Chicago, Montana, and Beijing. Visit us at nrdc.org.

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Letter from the Director

Nationwide, cities are seeking game-changing strategies to improve quality of life and achieve equitable outcomes. Few issues are more fundamental to how we live than the food we eat. When food goes to waste, so does everything it takes to get it to our plates. The environmental impacts are staggering—from massive amounts of water and farm land, to unnecessary climate pollution. At the same time, 41 million Americans lack consistent access to adequate and nutritious food.

The good news is, cities nationwide are uniquely positioned to tackle this problem. In 2017, NRDC, with support from The Rockefeller Foundation, released a duo of Food Matters reports that looked at what we waste and how we can expand the amount of food we rescue in three U.S. cities—Denver, Nashville, and New York City.

In June and September, 2018, we announced partnerships with the cities of Denver and Baltimore respectively as part of phase two of Food Matters. Each of these two cities has made ambitious commitments to slash food waste by at least 50 percent and, in the case of Denver, reduce the number of food insecure households by 55 percent. Both Baltimore and Denver, along with a growing group of cities throughout the country are stepping up: integrating multiple strategies to prevent food from going to waste, rescue surplus food for those in need, and recycle food scraps.

These important goals require a tangible framework, concrete action steps, and flexibility to incorporate continued learning and success. We're excited to present this Policy and Program Toolkit to policymakers and implementing partners to support informed decision making about what strategies can be most feasible and effective in their communities. While there is no "one size fits all" for all cities, we believe a holistic approach is needed.

Our goal is to provide a set of resources that offer a starting point and a path toward continued progress and impact. Taking relatively small steps can have a big impact, and help achieve more resilient, economically vibrant and equitable communities. With this toolkit, we look forward to supporting cities in their journey to tackle food waste at the city level.

Best,



Elizabeth Balkan

Food Waste Director

Table of contents

A Guide to NRDC’s Policy & Program Toolkit for Wasting Less Food in Cities	5
How to Use the Toolkit	6
Introduction.....	7
What Is This Toolkit?	7
Why Cities?.....	7
A Note on Funding Recommendations.....	8
How to Use the Toolkit	8
The Problem and The Opportunity.....	8
The Problem of Food Waste	9
The Opportunity to Waste Less Food and Save Costs, Natural Resources	9
An Overview of 10 Strategies to Reduce Wasted Food.....	11
Rethink	12
What Do We Mean By RETHINK?	12
Background	12
Strategy #1: Estimate local baseline level of food waste.	12
Strategy #2: Assess potential to increase food rescue.	15
Strategy #3: Set short term and long term targets to reduce the amount of food going to waste and develop a plan for ongoing measurement.....	17
Strategy #4: Lay groundwork for broader food waste prevention, food donation and recycling efforts through changes in waste system collection and financing.....	21
Strategy #5: Lead by example.	26
Reduce	30
What do we mean by REDUCE?	30
Background	30
Strategy #6: Increase public awareness and provide concrete strategies for how households can prevent food from being wasted in the first place.....	31
Strategy #7: Engage businesses and institutions to prevent food from being wasted.....	33
Rescue.....	37
What Do We Mean by FOOD RESCUE?	37
Background	37
Strategy #8: Assess and expand food rescue system capacity.	38
Strategy #9: Address policy barriers to safe donation of food.	42
Recycle.....	45
What do we mean by RECYCLE?	45
Background	45
Strategy #10: Create and expand infrastructure for organics recycling.....	45



A GUIDE TO NRDC'S POLICY & PROGRAM TOOLKIT FOR TACKLING FOOD WASTE IN CITIES

Up to 40 percent of all food in the United States is wasted. Producing food that we don't consume also swallows up roughly 20 percent of America's cropland, fertilizers, and agricultural water—and generates greenhouse gas emissions equivalent to 37 million passenger vehicles each year. Yet, 41 million Americans lack consistent access to adequate and nutritious food.



PLANNING



POLICY



PROGRAM



PARTNERSHIPS



FUNDING



*More food is landfilled than plastic, paper, metal, glass, or any other material, making food waste the single largest component of disposed municipal solid waste in the United States.**

Cities are uniquely positioned to lead the fight against food waste. Cities can be nimble in their policy development and program implementation, and have direct regulatory control over solid waste and many public health issues that dovetail with food waste. By reducing wasted food, cities can stabilize municipal waste management costs and meet climate and sustainability goals. By rescuing surplus food, cities can address food gaps. And by recycling food scraps, cities can minimize what ends up in landfills.

NRDC's Food Matters' Initiative partners with cities to strive to achieve a sector-wide 15 percent reduction in food waste within five years through a comprehensive set of innovative policies and programs. Food Matters is piloting comprehensive, cutting-edge models for preventing food waste and improving efficiency in food systems with strategies that can be shared and easily replicated through a knowledge-sharing network for peer-to-peer learning. NRDC has also prepared this comprehensive policy and program toolkit to help cities and other partners develop and implement strategies to reduce food waste.

WHY THIS TOOLKIT

This toolkit is aimed at city policymakers and agency staff nationwide that are seeking to start a program or implement policies to prevent food from being wasted in the first place, increase donation of surplus food, and recycle food scraps. This guide is intended to provide policymakers with an understanding of the range of policy and program options that may be employed and to support informed decision making about what strategies can be most feasible and effective in their community. It is also intended to provide ideas for expansion in municipalities with existing programs. Given the variation in how cities manage waste and the number and variety of food waste generators, there is no silver bullet for curbing food waste in cities. A holistic approach is needed.

This guide presents a curated set of approaches to tackle food waste at the local level. Examples illustrate the numerous successful programs and policies that are operating in a variety of different cities around the country. Given that comprehensive food waste policies are still relatively new, this toolkit is not intended to be exhaustive, but rather to highlight strategies that

balance impact with feasibility in the near term and help cities succeed in cutting down the amount of food going to waste. We recognize that not all cities will approach each issue in the same way. Our goal is to provide a set of resources that offer a starting point and a path toward continued progress and impact.

HOW TO USE THE TOOLKIT

The toolkit is divided into four different sections: rethink, reduce, rescue and recycle. **Rethink** contains foundational strategies that span across all the sections and aim (1) to understand the scale and nature of the problem and (2) to inform future policy and program development. **Reduce** involves preventing food from being wasted in the first place. **Rescue** suggests how to redirect surplus food to those in need. **Recycle** explains how to capture food scraps as a resource through composting and anaerobic digestion.

Each section identifies one or more strategies, which can be thought of as “what” a city can do. Within each strategy are one or more actions, which can be thought of as “how” a city can accomplish it. As cities vary widely in terms of their needs and resources, multiple actions are included in each strategy where possible. In strategies with more than one possible action, actions are accompanied by a best-better-good designation, where best represents the most important and impactful actions among those listed in this guide. Some strategies contain multiple actions with the best designations to show that there are several important actions.

Each strategy discusses the actions in detail, provides examples of where it has previously been done, identifies under what conditions the policy/program change is more likely to be successful, explores the potential benefits to stakeholders, and suggests some best practices. We also note how these different strategies can work together, including which should be done in sequence and which can be used in parallel.

Using the toolkit, and other resources, NRDC is working with and supporting cities across the United States to execute these strategies as they best fit their city. We consider this toolkit to be a living document and hope to update it periodically with new strategies and lessons learned from cities around the United States. We welcome your feedback.

* U.S. Environmental Protection Agency (EPA). *Advancing Sustainable Materials Management: 2015 Fact Sheet*, available at <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/advancing-sustainable-materials-management-0>.

Introduction

In the United States, up to 40 percent of the U.S. food supply is never consumed.¹ At the same time, more than 41 million Americans are food insecure.² Food represents the single largest component of disposed municipal solid waste across the nation; more food is landfilled than plastic, paper, metal, glass, or any other material.³ In fact, the United States throws away enough food to fill the 90,000-seat Rose Bowl stadium every single day.⁴

Wasting food wastes everything. After all, an uneaten apple that is thrown away isn't just a loss in calories and economic resources, but a waste of water, energy, land, labor and the other materials that went into the growing, transportation, and storage of the apple. What is more, as that apple decomposes in landfills, it creates methane, a greenhouse gas that is capable of trapping 86 times more heat than carbon dioxide in the short term.⁵ Because most uneaten food ends up in landfills and because of the climate impacts associated with growing, processing, transporting, and storing the food that isn't eaten, food waste represents a major contributor to climate change.

This dynamic of excess and insufficiency is one of the many paradoxes of the food system, and one that comes with tremendous human and environmental costs. However, there is a better way forward. Many food businesses are recognizing that preventing food waste benefits their bottom lines. Consumers are increasingly aware of waste in their homes and are adopting practices to prevent it. Food donations by businesses and institutions such as schools, colleges, and hotels are increasing dramatically, channeling surplus foods to people in need across the country. In only three decades, the United States more than tripled its overall recycling rate from less than 10 percent to 35 percent, suggesting that similar strides are possible with food given the right incentives and opportunities.⁶

As the main entities responsible for waste collection and disposal in the United States, cities are uniquely poised to address these issues and stand to realize significant benefits. Food donation programs can help cities address the scourge of food insecurity. Even small reductions in the amount of food wasted can extend the life of existing landfills, saving cities and counties from the difficult and costly process of siting new landfills. Keeping good food from going to waste can also lead to more sustainable resource use, and lower greenhouse gas emissions.⁷ Wasted food is a major contributor to climate change, producing more greenhouse gas emissions annually than 37 million cars.⁸

WHAT IS THIS TOOLKIT?

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This guide presents a curated set of approaches to tackle food waste at the local level. Examples illustrate the numerous successful programs and policies that are operating in a variety of different cities around the country. Given that comprehensive food waste policies are still relatively new, this toolkit is not intended to be exhaustive, but rather to highlight strategies that balance impact with feasibility in the near term and help cities succeed in cutting down the amount of food going to waste. We recognize that not all cities will approach each issue in the same way. Our goal is to provide a set of resources that offer a starting point and a path toward continued progress and impact.

Wasted food is a major contributor to climate change, producing more greenhouse gas emissions annually than 37 million cars.

WHY CITIES?

Governments at all levels have a role to play in preventing wasted food, facilitating donation of surplus food, and recycling food scraps. However, cities are in a prime position to lead on this issue because they are often responsible for waste management, land use, and local health and food regulations. Each of these policy areas presents opportunities for cities to help residents, businesses, and institutions to waste less food.

Cities also stand to realize many of the economic, environmental, and social benefits that result from addressing food waste. Some potential benefits include reduced disposal costs, lowering food insecurity among city residents, reduced greenhouse gas emissions, and job creation, among many others. Through actions identified in this toolkit, significant reductions in wasted food can lead to healthier and more sustainable communities.

A NOTE ON FUNDING RECOMMENDATIONS

Given the constraints facing many city budgets, funding may be limited or unavailable. Several of the actions in this toolkit involve providing funding for specific purposes such as helping hunger relief organizations invest in needed infrastructure and grants to areas businesses. In response, some cities have created new revenue streams, such as a surcharge on garbage service to support waste prevention and reduction efforts. New revenue undoubtedly poses challenges and is not suitable in all cities.

To this end, each recommendation for funding also includes alternative suggestions. These alternatives may not yield as large an impact, but they still offer a way to achieve some of the intended benefits. Additionally, cities can consider county and state funding options, partner with philanthropic organizations, and explore other creative funding opportunities.

HOW TO USE THE TOOLKIT

The toolkit is divided into four different sections:

- 1. RETHINK** contains “foundational” strategies that often span across the categories of Reduce, Rescue, and Recycle and are aimed at understanding the scale and nature of the problem and informing future policy and program development.
- 2. REDUCE** involves preventing food from being wasted in the first place.
- 3. RESCUE** suggests how to redirect surplus food to those in need (or advance commercial strategies for surplus food).
- 4. RECYCLE** explains how to capture food scraps as a resource through composting and anaerobic digestion.

Each section identifies one or more strategies—these can be thought of as “what” a city can do. Within each strategy are one or more actions—these can be thought of as “how” a city can accomplish it.

WHY COMPOSTING ISN'T THE ONLY—OR BEST—SOLUTION FOR REDUCING WASTED FOOD

In NRDC research at the city level, we found that approximately 68 percent of the average amount of food wasted by households was edible. If composting is the only solution in the mix for keeping food from going to waste, we miss the potential to prevent food that can be eaten from going to waste in the first place.

The Problem and The Opportunity

Cities vary widely in terms of their needs and resources. To accommodate this, multiple actions are included in each strategy where possible. In strategies with more than one possible action, actions are accompanied by a BEST-BETTER-GOOD designation, where BEST represents the most important and impactful actions among those listed in this guide. Some strategies contain multiple actions with the BEST designations to show that there are multiple important and impactful actions. Where there is a recommended sequence, these are denoted by BEST 1, BEST 2, and BEST 3. Where there are only two actions provided, a BEST-GOOD convention is used.

Recognizing that different types of strategies will have different implications at the city level in terms of which agencies are involved and how relatively simple or challenging implementing the change may be, we have labeled each strategy with a designation of the type of measure it involves. The strategies are identified as:

- **POLICY:** usually requires legislative or regulatory authority and thus often can require more extensive time and resource commitment to implement.
- **PLANNING:** helps cities gain the information needed to take effective follow up action.

- **PROGRAM:** can often be implemented by city agencies or the mayor’s offices without the need for new legislation.
- **FUNDING:** involves providing financial resources to organizations that are addressing food waste.
- **PARTNERSHIPS:** involves supporting nonprofits, for-profits and government entities to work amongst themselves or together to advance food waste prevention, food surplus rescue and/or food scrap recycling.

Each strategy discusses the actions in detail, provides examples of where it has previously been done, identifies under what conditions the policy/program change is more likely to be successful, explores the potential benefits to stakeholders, and suggests some best practices. We also note how these different strategies can work together, including which should be done in sequence and which can be deployed in parallel.

THE PROBLEM OF FOOD WASTE

Few people plan to waste food, yet as much as 40 percent of our food supply goes to waste each year⁹. Massive amounts of food are discarded daily by consumers, restaurants, and grocery stores as well as in other parts of our complex food system. Most of that wasted food ends up in landfills, with more than 37 million tons of food landfilled or incinerated annually.¹⁰ All told, America wastes more than 400 pounds of food per person per year.¹¹ This results in economic losses to consumers, businesses, and municipalities, depletes natural resources, contributes to climate change, and squanders the opportunity to re-direct food surpluses to address food insecurity.

Given the serious consequences, how did we get to this point? Many factors have contributed to this predicament. The relative cost of food has declined for decades and landfilling is typically low -cost, making wasting food relatively cheap and easy. Throwing away food also largely occurs in our homes and businesses, a little bit at a time, and often by more than one person.¹² Wasted food is generally mixed with other materials and taken away on a frequent basis.¹³ These factors make gauging how much food is wasted at home and by businesses difficult and obscures the resulting costs and impacts.¹⁴

This is exacerbated by limited availability of localized data. Many municipalities conduct waste stream characterizations where they sample and assess the makeup of their municipal solid waste, but this is not a universal practice. Additionally, municipal waste characterizations often do not include specific data on how much food waste is generated (often food is measured in combination with other organics), nor any of the characteristics of that food, such as whether discarded food could have been eaten. In general, this fosters a lack of awareness and data that makes the problem of wasted food easy to ignore.

Further, although food is relatively cheap and abundant across the United States, too many Americans do not have regular access to affordable healthful food. This contributes to the undervaluing of food¹⁵ and makes it easy and economical to throw food away. The typical family of four spends at least \$1,800 per year on food that lands in the trash or down the in-sink disposer. Similarly, many food businesses have accepted food waste as a part of doing business and have not evaluated how food waste impacts their bottom line. Garbage services provided through a flat rate regardless of the amount of waste generated (or through mechanisms such as general fund expenditures that hide the cost from customers) send the signal that any amount of waste is acceptable, including food waste, and obscure the broader economic and environmental costs. These factors and many others have contributed to high rates of food waste in cities across the country.

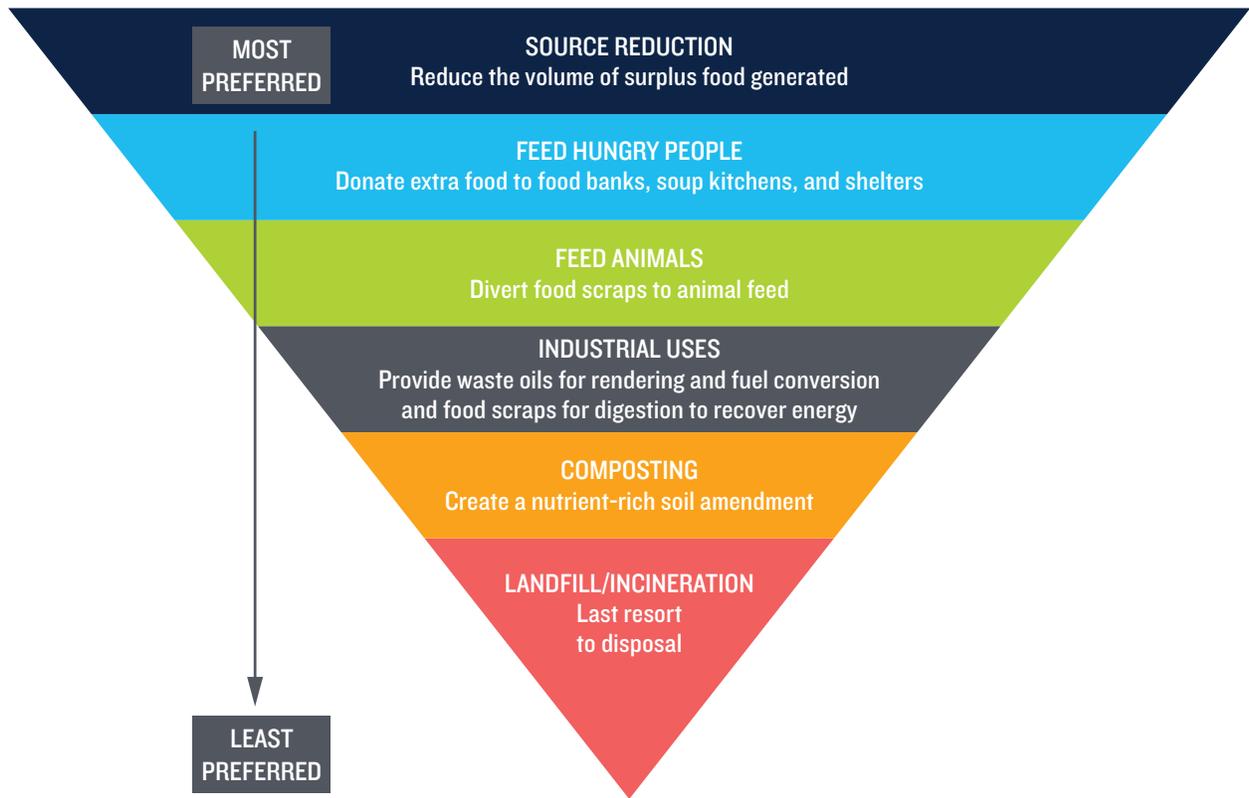
THE OPPORTUNITY TO WASTE LESS FOOD AND SAVE COSTS, NATURAL RESOURCES

It is sometimes said that “waste is a resource out of place,” and this is certainly applicable to food waste. Nationwide assessments indicate that food waste, at more than one-fifth of all waste by weight, is the single largest component of municipal solid waste disposed in landfills or incinerators.¹⁶ For individual municipalities that have analyzed their waste stream, this trend tends to hold true, often pegging food waste generated at 18 percent to 35 percent of their municipal waste.^{17,18,19} Minimizing food waste thus offers a major opportunity to reduce overall disposal burdens, including financial and logistical costs borne by municipalities, as well as providing other environmental, social, and financial benefits.

The US Environmental Protection Agency (EPA) established the Food Recovery Hierarchy (see Figure 1) to help guide priorities for managing excess food.²⁰ The hierarchy essentially applies the “reduce, reuse, recycle” approach used in materials recycling, with a bit more robustness and detail. Prioritizing action at the top of the Food Recovery Hierarchy is essential because food waste prevention efforts have much greater environmental benefits than do strategies lower on the hierarchy.

In 2015, only 5.3 percent of all food waste generated was recycled through composting and other means, which is among the lowest recycling rates for all materials in municipal solid waste (MSW) tracked by the EPA. However, there are strong examples from other materials that show a significant increase in recycling rates resulting from effective policies and

FIGURE 1: EPA'S FOOD RECOVERY HIERARCHY



strategies. For example, the recycling rate for yard trimmings increased from 22.9 percent in 1995 to 61.3 percent in 2015. Paper has seen similar gains to yard trimmings. These increases did not occur by accident and instead are the result of strong policy action.

In contrast, municipal food scrap recycling only increased from 2.4 percent to 5.3 percent in the same period.²¹ With dedicated effort from cities with assistance from the NRDC Food Matters Project, similar strides are possible with wasted food.

That said, not all policies and programs to address food waste provide equal economic and environmental benefits. Actions higher on the Food Recovery Hierarchy pyramid—namely food waste prevention and then food rescue—should be prioritized because they maximize environmental benefits through prevention and, where that is not possible, ensure that food is used for human consumption. Although recycling efforts are sometimes simpler to measure and track, recycling should be the last option after prevention and rescue options.

Throughout this toolkit we provide examples of strategies that have been implemented by cities across the country that are reducing the amount of food going into landfills each year.

Nationwide assessments indicate that food waste, at more than one-fifth of all waste by weight, is the single largest component of municipal solid waste disposed in landfills or incinerators.

An Overview of 10 Strategies to Reduce Food Waste

This toolkit highlights 10 strategies across the categories of rethink, reduce, rescue, and recycle. These strategies are listed below and described in more detail, including recommended actions, in subsequent sections of this toolkit.



PLANNING



POLICY



PROGRAM



PARTNERSHIPS



FUNDING



RETHINK STRATEGIES

- STRATEGY #1** Estimate local baseline level of food waste
- STRATEGY #2** Assess potential to increase food rescue
- STRATEGY #3** Set short term and long term food waste reduction targets and develop a plan for ongoing measurement
- STRATEGY #4** Lay groundwork for broader food waste prevention and reduction efforts through changes in waste system collection and financing
- STRATEGY #5** Lead by example

WHAT DO WE MEAN BY RETHINK?

The strategies identified in this section represent foundational efforts that help a city to understand the scale and nature of the problem and inform future policy and program development. They also represent strategies that span across the categories of reduce, rescue, and/or recycle.

BACKGROUND

Most cities do not know how much food is thrown away by residents and businesses. Yet, cities that studied their waste stream found that the amount of wasted food is significant and often represents the single largest component of what is sent to landfills and incinerators. Even fewer cities know how much edible food goes to waste that may be appropriate for human consumption. Existing food rescue efforts capture some of this food, but the untapped potential for increased

donation often goes unrecognized in city planning efforts. This lack of localized data makes the environmental, social, and economic consequences of food waste easy to ignore, and can make identifying specific opportunities for preventing the wasting of food difficult. Thus, the first two strategies in this section involve gaining a better understanding of the amounts and sources of wasted food, as well as the amounts and sources of surplus food that potentially could be rescued.

Once a city has estimated its baseline food waste generation and has an estimate of the rescue potential, it can set short term and long term targets for food waste reduction. Cities are increasingly data driven, so setting meaningful targets has the potential to drive action over time. In general, cities that set some type of waste targets as a part of their overall waste management program are more successful in reduction and recycling efforts.

Additionally, this section lays out opportunities for cities to rethink their existing waste system policies to support prevention and reduction. The financing and structure of waste management systems vary widely among cities. Because cities are often responsible for collection, financing, and/or contracting with private waste haulers, they are well positioned to influence these policies to send better signals about waste generation.

Finally, cities have a significant opportunity to lead by example by making operational changes at city facilities, educating employees about food waste, and building markets for compost through use in city projects.

STRATEGY #1: ESTIMATE LOCAL BASELINE LEVEL OF FOOD WASTE

WHAT Estimating a local baseline level of food waste involves developing an approximation of the total amount of food wasted by sector. This information helps cities more appropriately tailor future interventions, as well as raise awareness on the scale of the problem.

RECOMMENDED ACTIONS:

- BEST** Use NRDC measurement templates to conduct residential baseline measurement project in city, and NRDC calculator to estimate industrial, commercial, and institutional (ICI) measurement [Planning].
- BETTER** Use NRDC calculator to estimate city's residential and ICI baseline food waste, and supplement NRDC baseline food waste calculator estimates with more specific and localized information [Planning].
- GOOD** Use NRDC calculator to estimate city's residential and ICI baseline food waste, or the EPA's Excess Food Opportunities Map to estimate baseline food waste in selected ICI sectors [Planning].

BACKGROUND AND OVERVIEW

Estimating a local baseline involves understanding the total amount of food waste generated, broken out by sector (e.g., residential, restaurants, grocers, hotels, education), which allows a city to better understand the problem as well as develop properly scaled and targeted programs. In Nashville, for example, estimates show that restaurants generate approximately half of the food waste among businesses engaged in food service, processing, or distributing. On the other hand, there are more restaurants in the city than entities such as universities, hospitals, or hotels. Cities should adopt strategies to address specific sectors that consider not only how much waste is produced by each sector, but also the number of actors in each sector as well as any overlap with existing initiatives or goals.

In addition to total amount of food waste by sector, local baseline data should also include more specific metrics where feasible, such as:

- the types of food wasted (see NRDC report “Estimating Quantities and Types of Food Waste at the City Level”²² for sample categories, e.g. fruits/vegetables, prepared foods/leftovers, liquids, etc.)
- where the food ends up (e.g., composting, landfill, donated)
- what portion was potentially edible versus inedible (bones as inedible, for example)
- what portion of surplus food potentially could have been rescued and donated

This detailed information helps a city to identify behavioral interventions based on the attitudes, knowledge, and behavior of the city’s residents and businesses. An important thing to note is that estimating the baseline is intended to enable sector targeting and inform the development of realistic goals, but that it is not geared for ongoing measurement and comparison over time (except the residential baseline study). Ongoing measurement is discussed in Strategy #3.

RECOMMENDED ACTIONS



BEST: Use NRDC measurement templates to conduct residential baseline measurement project in city and NRDC baseline food waste calculator to estimate ICI (industrial, commercial, and institutional) measurement [Planning].

For the residential sector, NRDC templates are available to conduct a food waste baseline assessment study. These templates are based on the NRDC study (“Estimating Quantities and Types of Food Waste at the City Level”) conducted in 2016-2017 in Nashville, Denver, and New York City, in which participating households completed one-week-long kitchen diaries that tracked food wasted by type, weight, loss reason, and disposal destination. Additionally, each participating household was asked to complete two surveys (once before and once after participating in the kitchen diary) that collected basic demographic information as well as information on attitudes and behavior related to food. From the participating households, a subset was randomly selected to have their trash collected, sorted, and categorized once during the study. Data collected through kitchen diaries, surveys, and bin digs can be used to estimate the amount and types of food wasted in households in cities as well as to identify and describe individual and household behaviors related to wasting food.

Templates available include a kitchen diary and instruction handbook for tracking food waste at the household level, two surveys for household study participants, categories of food waste to use when sorting food from bin digs, and other materials which can be used to conduct an on-ground residential food waste assessment²³. (For ICI baseline estimates using the NRDC calculator, see “BETTER” description below.)



BETTER: Use NRDC calculator to estimate city’s residential and ICI baseline food waste, and supplement NRDC baseline food waste calculator estimates with more specific and localized information [Planning].

For the ICI and residential sectors, NRDC has developed a Food Matters calculator to help cities estimate sources and quantities of food waste generated in their municipality. The calculations are based on estimated food waste generation for various sectors from previous studies which are combined with demographic information for the relevant organizations in a city. To use the calculator, users enter information on sales, number of students, number of employees, number of beds,

or similar factors for food-related facilities within the city. The amount of food wasted in the residential sector is estimated using city population. The calculator estimates tons of food wasted in each sector. This information will enable the city not only to estimate total food waste produced, but also to identify the relative contribution of each sector to food waste.

For example, a city inputs it has 1,500 residential university students and 5,000 nonresidential university students, and the food manufacturing and processing businesses have total revenues of \$800,000. The calculator will report that approximately 200 tons of food is likely wasted from the university sector, compared to an estimated 21 tons of food wasted from the manufacturing and processing sector.

The NRDC Food Matters calculator does not provide information about the attitudes, behaviors, and patterns of wasting food at the household level, though, unlike the residential measurement project described earlier. The formulas used in these estimates are based on sector-specific averages of food waste generation so cannot be used to determine accurately an individual facility's food waste generation. As these formulas do not change, they can only be used to generate a baseline estimate, not to measure progress.

Cities may opt to supplement use of the calculator by conducting surveys or interviews of households and individuals on their attitudes, behaviors, and patterns, using NRDC's measurement templates. Understanding specifically why households are wasting food is useful in tailoring effective interventions. Available research in this area has identified some common reasons for wasting food, but it is still unknown what sorts of regional and local variations exist.

Cities may also further refine the estimates on the amount of food wasted by sector using new or existing waste characterization studies. Waste characterization studies assess what types of materials that are discarded and at what quantities across the municipal waste stream. These are discussed in more detail in Strategy #3.²⁴ Where information on specific amounts is known, these figures could be substituted into the calculator to provide more accurate estimates.



GOOD: Use NRDC baseline food waste calculator to estimate city's residential and ICI baseline food waste, or the EPA's Excess Food Opportunities Map to estimate baseline food waste in selected ICI sectors. [Planning].

For a description of the NRDC Food Matters calculator, see "BETTER" description above. The EPA's Excess Food Opportunities Map²⁵ displays the locations and estimated excess food generation of more than 500,000 industrial, commercial and institutional establishments. Note that estimates for the foodservice sector (including restaurants) and residential sector are not available through the EPA resource.

DISCUSSION

To determine which action is most appropriate, a city should consider the following:

■ WHAT ARE CITY'S PRIMARY GOALS IN ADDRESSING FOOD WASTE?

Since food is wasted by virtually all people and businesses along the food supply chain, and ends up in a variety of destinations, acquiring granular data is the best way to gain information that can help cities target action where it will be most applicable and effective. Understanding what food is wasted, how much, why, and where it goes is critical to understanding behavior, designing interventions, and tracking improvement. The BEST action is recommended because it allows for greater precision in understanding the characteristics of residential food that is wasted. Some of this information can be captured via the BETTER action, as well.

■ WHAT RESOURCES ARE AVAILABLE FOR ESTABLISHING A BASELINE AND HOW SOON IS THE DATA NEEDED?

Both the BEST and the BETTER actions will require more resources than using the Food Matters calculator, both in terms of staff and equipment. For example, in the three cities where NRDC conducted baseline food waste assessment studies, consultants were hired to perform on-ground research and supervise a range of temporary staff who assisted with recruiting study participants and conducting bin digs. Additional consultants were needed to enter data from handwritten waste diaries, bin dig logs, and other sources into digital spreadsheets and other formats. It can take many months to design study parameters, conduct the research, and analyze the data. It also can be somewhat costly, though costs may be able to be reduced by using volunteers, partnering with universities on research and data acquisition, finding data sources already available to the city at no or low cost, etc. In addition to the costs of staff time and consultants required to conduct and analyze research, other costs may include providing monetary incentives and scales for residents to participate in the study; trucks, bins, scales, and other equipment needed to conduct bin digs; access to a location where waste from bin digs can be sorted and logged; and other equipment. In contrast, the baseline food waste

calculator can yield baseline data as soon as the business demographic information is cleaned up and imported into the tool, though depending on your access to resources, some data for the calculator may need to be purchased.

The alternative approach is the GOOD action, which uses the NRDC Food Matters calculator to estimate baseline residential and ICI food waste levels. To use the calculator, a city will potentially need to purchase business demographic data by sector if it is not available in existing city records. Still, the cost of the demographic information is likely to be significantly less than what is required for the measurement project.

BENEFITS

CITY GOVERNMENT: Baseline data exposes the amount of food that is wasted in a given city and in what sectors it is most likely occurring. Not only is this information useful in raising awareness, but also it helps to inform program and policy planning, including where a city can achieve the greatest “bang for the buck.” This information can also be used to help cities determine where to allocate grant funding where available or to help build a case for seeking external funding for city initiatives.

BUSINESS/PRIVATE SECTOR: Making baseline data publicly available provides useful information for businesses and the private sector, as well. Understanding the bigger picture of where food waste is generated might encourage individual businesses to look at their own waste generation and think of how they can reduce their contribution. It may also expose opportunities for new businesses and entrepreneurial responses to food waste.

INTERACTIONS WITH OTHER POLICIES AND PROGRAMS

Establishing a baseline provides useful planning information for virtually **all programs and policies** identified in the remaining strategies and thus, ideally should be the first step in the development of a comprehensive plan to reduce wasted food and better manage food scraps.

In terms of sequencing, establishing a baseline should ideally happen before setting **food waste targets (Strategy #3)** because it allows for the development of more realistic and targeted goals.

KEYS TO SUCCESS

Describes the key elements of a successful program or policy design and implementation strategy

- **ESTIMATES NEED TO BE REASONABLE, NOT PERFECT.** Food is wasted by virtually all people and businesses, occurs throughout the food supply chain, and ends up in a variety of destinations. This diffuse quality of most waste management systems makes “true” and “perfect” measurement all but impossible. The goal should be to reasonably estimate current levels of food waste.

FURTHER READING AND TOOLS

“Estimating Quantities and Types of Food Waste at the City Level,” NRDC:

<https://www.nrdc.org/resources/food-matters-what-we-waste-and-how-we-can-expand-amount-food-we-rescue>

STRATEGY #2: ASSESS POTENTIAL TO INCREASE FOOD RESCUE

WHAT Assessing the potential to increase food rescue involves identifying how much surplus food may be available. This information helps cities identify currently untapped opportunities to bolster rescue efforts so that more food becomes available for hunger relief organizations and those in need.

RECOMMENDED ACTION:

Use NRDC rescue calculator or full assessment methodology to estimate the scale of under-tapped sources of surplus food that could potentially be donated [Planning].

BACKGROUND AND OVERVIEW

Most cities have some level of food rescue activity taking place but have not systematically explored how much additional food currently discarded could be redirected for human consumption. As a result, little is often known about how big a “dent” could be made in meeting their city’s “meals gap”—the number of meals being missed per year by needy residents—if that potential was more fully realized. Similarly, efforts to focus on expanding food donation may have largely been focused on individual rescue organizations or specific types of food donors. Taking a more system-wide look at opportunities and gaps in a city’s food rescue system is critical for developing sensible strategies for building food rescue capacity for the long term. This analysis should also be factored in when cities establish targets and prioritize actions.

A key first step is identifying how much surplus food may potentially be available in the community, beyond that which is already being donated. This analysis can be highly motivating and helps make a clear case for how the city stands to benefit from a stronger food rescue system both in terms of waste reduction and social impact.

RECOMMENDED ACTION

Use NRDC’s rescue calculator or full assessment methodology to estimate the scale of under-tapped sources of surplus food that could potentially be donated [Planning].

NRDC developed a methodology to estimate how much surplus food may be available for donation in a given locale. This methodology is described in the 2017 NRDC publication *“Modeling the Potential to Increase Food Rescue: Denver, Nashville, and New York City”*.²⁶ We have also distilled our methodology into an Excel-based calculator that other cities can request access to from NRDC. The food rescue component of the Food Matters Calculator allows for the quantification of donation potential from consumer-facing sectors of the food system such as groceries, universities, hotels, convenience stores and restaurants.

The calculator is fueled by a set of sector-specific donation metrics developed through NRDC’s research with leading national food rescue organizations and industry stakeholders, combined with an array of city-specific data. The methodology employed by the calculator and the underlying data on which it is based are explained in detail in the *“Modeling the Potential to Increase Food Rescue: Denver, Nashville, and New York City”* report.

To use the calculator, a city would collect data about the overall size of key sectors, such as sales for grocery and restaurant sectors and the total number of students in area K-12 schools and colleges. This type of data is often available from sources such as state or municipal government websites, trade associations for grocers and restaurateurs, and enrollment data for schools and colleges.

The calculator also allows for scenario analysis, which can be used to explore varying rates of participation by potential donors within sectors of the food economy and varying rates of donation within those sectors to suit local circumstances and action strategies. Also, estimates of the amount of food currently being donated by businesses and institutions located within the city should be identified and deducted so that untapped potential can be more clearly identified.

DISCUSSION

Use of the Food Matters calculator will yield sector-specific estimates of how much food may be available for donation. When amounts currently being donated are deducted, it yields a picture of a city’s untapped potential for food donation. It also allows a city to compare that potential to the “meals gap” in the community and identify what additional portion of the meal gap could be met through increased food donation. Although these approaches yield estimates, not hard answers, they can be highly instrumental in illuminating what’s possible and informing local dialogue about what a city’s food donation future could hold.

Additional research could explore sectors of the food system not addressed by NRDC’s models, such as farms, food manufacturers, produce distributors, airports, stadiums and cultural venues. The estimates generated by the calculator can inform efforts to capture surplus food for re-processing and commercial sale.

BENEFITS

CITY GOVERNMENT: Quantifying the city’s potential to increase food donation enables a systemic look at how food rescue efforts can simultaneously advance food waste reduction efforts while also addressing community food insecurity. This data can help provide direction when prioritizing action strategies and building support both within city government and among community stakeholders like business leaders and the civic sector. It can also inform the philanthropic sector of how investments in food rescue infrastructure could help address food insecurity.

INTERACTIONS WITH OTHER POLICIES AND PROGRAMS

Preferably, the identification of untapped food donation potential discussed above will be conducted as a precursor to related strategies concerning rescue-related efforts: **expanding food rescue infrastructure and capacity** (Strategy #8) and **addressing food rescue policy barriers** (Strategy #9).

KEYS TO SUCCESS

- **INCORPORATE AVAILABLE LOCAL RESEARCH AND INSIGHTS IN THE ANALYSIS WHERE AVAILABLE.** The Food Matters calculator combines local and national data to estimate the scale of surplus food that could potentially be rescued. If localized analyses have been conducted about surplus food and rescue potential, these should be incorporated into the calculator using the scenario analysis function.

Cities should use the best local available data, but not let data limitations paralyze efforts. Stakeholder insights about local conditions can be similarly useful, even if not backed by a formal study.

FURTHER READING AND TOOLS

“Modeling the Potential to Increase Food Rescue: Denver, Nashville, and New York City,” NRDC:

<https://www.nrdc.org/resources/food-matters-what-we-waste-and-how-we-can-expand-amount-food-we-rescue>

For estimated food insecurity data in your county, see: <http://map.feedingamerica.org>

Local Rescue Studies (Qualitative):

- Food Shift Rescue Services and Recommendations in Santa Clara County:
<http://foodshift.net/2015-food-rescue-services-barriers-recommendations-santa-clara-county-final-report>
- Seattle Food Waste Prevention and Recovery Assessment Report:
<https://depts.washington.edu/uwcpfn/reports/SeattleFoodWasteReport.PDF>

STRATEGY #3: SET SHORT TERM AND LONG TERM TARGETS TO REDUCE THE AMOUNT OF FOOD GOING TO WASTE AND DEVELOP A PLAN FOR ONGOING MEASUREMENT

WHAT Setting food waste targets involves defining what waste metrics are important for a city to attempt to meet, and ideally should incorporate not only disposal diversion goals, but also specific targets for preventing wasted food, rescuing surplus food, and recycling food scraps. These targets help drive action and, coupled with a plan for ongoing measurement, allow cities to assess progress over time.

RECOMMENDED ACTIONS:

BEST Set short term and long term targets that focus on reducing the amount of wasted food generated, increasing the amount of surplus food donated, increasing food scrap recycling, and reducing the amount of disposed food waste. Develop plan for ongoing assessment of progress toward goals [Planning].

GOOD Set aggressive short term and long term targets for broader waste stream that would require addressing food waste to achieve the target [Planning].

BACKGROUND AND OVERVIEW

Setting short term and long term targets for reducing the amount of food going to waste is an important demonstration of public commitment and allows a city to measure progress over time. Like most waste reduction campaigns, reducing wasted food and better managing food scraps is a multi-year effort. Achieving short term gains and having a shared understanding of why a city is acting can help sustain momentum over the long haul, particularly with competing city priorities that are more easily measured.

Cities set waste targets and measure waste in different ways, but the prevailing method is based on diversion from disposal, including landfill and incineration. For example, a city may seek to increase the waste diversion rate to 60 percent by 2020.

To meet this target, 60 percent of all waste generated would need to be recycled, composted, or otherwise not disposed. Although helpful in promoting recycling efforts, these types of targets miss a crucial piece of waste reduction in that they do not capture the total amount of waste generated, including surplus food donated and food scraps sent to destinations such as animal feed. With diversion targets, it is possible to meet targets while overall waste generation increases so long as less waste ends up in the landfill and more is recycled. For food waste, diversion-focused targets generally mean that composting and anaerobic digestion are prioritized over efforts preventing food waste from being generated in the first place. The target a city chooses is very important for how they choose to intervene, and thus it is critical that cities define their targets in such a way that reflects their overall goals.

A better approach to diversion involves setting targets for per capita waste generation and diversion from disposal, as well as specific targets for surplus food rescue and food scrap recycling. For food, this means that the per capita generation figure would capture the amount of wasted food that ends up in all destinations, including animal feed, landfill, waste-to-energy facilities, composted, anaerobically digested, etc., as well as rescued for donation. The percentage recycled indicates the proportion of food waste that is composted or sent to an anaerobic digester (provided that the digestate is not disposed), and in some cases used as animal feed. Setting targets in this way accounts for changes in population and emphasizes prevention, rescue, and recycling efforts. It is also possible to set food waste targets more indirectly through the adoption of zero waste or other similarly aggressive goals that are applied to the broader waste stream.

The most common way to measure food waste over time is through repeat waste characterization studies, but it may also be possible in some areas for haulers to play a role in measurement with increased technology (e.g., scales on collection trucks with automated GPS tracking capabilities). Counties and states may also have waste characterization data.

RECOMMENDED ACTIONS



BEST: Set short term and long term targets that focus on reducing the amount of wasted food generated, increasing the amount of surplus food donated, increasing food scrap recycling, and reducing the amount of disposed food waste. Develop plan for ongoing assessment of progress toward goals [Planning].

In tracking the amount of food waste generated and the recycling rate, a city can assess how much waste is created and where it is going over time. Targets should be specific and include both short term and long term goals. Currently there are no cities that have yet taken this approach with food waste. However, the general idea of setting waste targets based on reducing generation over time is not without precedent. In 2001, the Oregon Legislature established the goal for no annual increase in per capita municipal solid waste generation. For their purposes, generation is the amount of waste recovered through recycling or composting added to the amount of waste disposed.²⁷ The Legislature has also implemented a food waste recovery goal, where 25 percent of food waste is recovered by 2020 and 40 percent by 2050. Recovery here is defined as including industrial composting and anaerobic digestion.²⁸

In setting long term targets, cities might consider using the targets set by the federal government. In 2015, the EPA and the USDA set the first-ever goal to reduce food loss and waste by half by the year 2030. This federal goal uses two specific metrics: for waste, the per capita amount of food sent for disposal is used and for loss, the amount that is uneaten at retail and consumer levels.²⁹ The U.S. Conference of Mayors supported this effort by resolution at their 2016 annual meeting.³⁰



GOOD: Set aggressive short term and long term targets for the broader waste stream that would require addressing food waste to achieve the target [Planning].

This option represents a more indirect way to reduce wasted food. Some cities have set aggressive targets for the whole waste stream, often represented by “zero waste” or other waste diversion targets. Because food often represents the largest component of waste streams, zero waste and other similarly aggressive targets applied to the entire waste stream cannot be achieved without policies and programs in place to address the food component.

The phrase “zero waste” can refer both to a philosophy, as well as to specific waste goals, and is defined in different ways. Although some cities seek to reach a point where nothing is sent to landfills or incinerators, others have set aggressive targets just shy of that. The City of Austin, Texas, for example, has adopted a goal of zero waste by 2040, which it defines as diverting at least 90 percent of materials from landfills and incinerators.³¹ The underlying intent of zero waste targets is to promote the highest and best use of materials, view materials in the waste stream as a resource to be captured, and send as little as possible to landfills and incinerators.

As an alternative or complement to zero waste goals, some cities have implemented landfill bans that prohibit food from entering a landfill or mandatory composting laws that function in largely the same way. These bans could be viewed as *de facto* food waste targets. Bans are discussed further in Strategy #4.

WAYS TO MEASURE PROGRESS AGAINST TARGETS

Ongoing measurement against these types of targets could be largely achieved through waste characterization studies, in which food is measured as a category distinct from other organics, repeated every five or so years. Waste characterization studies assess what types of materials are discarded and at what quantities across the municipal waste stream. Studies are based on taking samples at different points in the waste system at various times during the year to account for seasonal differences in waste generation.³² Metrics vary, but the following are commonly included in such studies: total waste tonnage, tonnage by generator type (e.g., commercial, residential, self-haul), tonnage by material (e.g., paper, plastic, glass, etc.) and submaterial (e.g., paper-corrugated cardboard, paper-newspaper, etc.), and the percentage of waste stream that is recyclable or compostable. Waste characterization studies can also supplement baseline estimates as described in Strategy #1.

For waste characterization studies to be most useful in terms of monitoring food waste, food waste must be a distinct category separate from other organic materials. In study design, cities could consider including other food-based metrics. For example, Thurston County, located in Washington state, included in their study a breakdown of edible versus inedible food to estimate the amount of food going to waste that could potentially have been prevented. In their study, edible food referred to “all food, such as vegetables, fruits, breads, meats, pastas, that appeared to be edible or that appeared to have been edible when discarded.” Inedible food in this context included “scraps resulting from food preparation and other food-related items that were never intended for human consumption.”³³ Metro Vancouver’s 2016 waste characterization study also included estimates of “avoidable” and “unavoidable” food waste.³⁴ (See NRDC’s baseline food waste assessment, “Estimating Quantities and Types of Food Waste at the City Level,” for additional definitions and examples related to edibility.)³⁵

Depending on the size of the city, this could require a relatively intensive measurement. Cities typically contract with specialty firms to conduct waste characterization studies as they require a significant amount of planning and experience in research design. The cost to conduct a study depends on the size of the city (which dictates the number of samples), level of specificity of metrics, and the type of measurement (e.g., whether they sample waste at landfills or from specific generators, number of categories they want to sort into, how large a sample and how many times they want to sample, etc.), and which sectors are included. The NRDC baseline assessment templates³⁶ can be used to guide some residential sector measurement.

Another option to consider is incentivizing or requiring haulers to regularly report on the amount of waste and where it goes. For example, the city of Austin requires private haulers to report twice a year on the amount in tons of solid waste, recyclables, and organic materials hauled to landfills, recycling facilities, and organic materials processing facilities.³⁷ The disadvantage to this approach is that it generally does not provide material-specific information and may not allow for disaggregation. In other words, food waste may not be reported separately, but instead combined with other organic waste such as yard trimmings or food-soiled paper. A related approach might be to set requirements for certain types of generators to report on the amount of food they dispose, recycle, and donate; these requirements could be based on criteria such as size of business, type of business, etc.

Waste management is increasingly a data-driven industry and as technology in this field continues to advance and become more automated, there may be other innovative ways in the near future to track specific materials in real time.³⁸ For example, some waste haulers have onboard truck scales and can weigh and track waste at each pickup, which has the potential to provide useful information to cities and food businesses. Casella Organics, which provides organic waste recycling and disposal services in Vermont, can weigh waste using their onboard truck scales and provide data to several of their college clients. For clients for whom their organics waste is all or predominantly food scraps, this real-time measurement offers useful information about food waste generated.³⁹

To estimate the amount of food being donated from businesses and institutions in the community, data can be obtained from area foodbanks and other rescue organizations. Periodic surveys and interviews are typically the best methods for obtaining this data. It is also important to assess the types of food being received by these organizations rather than simply “counting pounds.” More detailed assessment can distinguish between categories of donated food such as prepared foods, fruits, vegetables, meat, dairy, bakery and packaged grocery items.

DISCUSSION

To determine which action is most appropriate, a city should consider the following factors:

- **WHAT RESOURCES ARE AVAILABLE FOR ONGOING MEASUREMENT?**

To measure progress of food waste-specific targets, cities may need to repeat waste characterization studies at regular intervals, which can be expensive. If resources do not exist for this, broader waste stream goals may be the more suitable choice because a city could assess overall performance using more aggregate figures (e.g., the total tons annually sent to landfills, composting facilities, etc.). The disadvantage is that it will not be possible to assess future performance about specific materials such as food. (See sidebar “Ways to Measure Progress Against Targets” for discussion of other ways to measure progress toward goals.)

- **ARE THE ACTIONS ADDRESSING FOOD WASTE A PART OF A BROADER WASTE REDUCTION INITIATIVE OR IS THE INITIATIVE ONLY FOCUSED ON FOOD?**

If the focus is primarily on food, it makes the most sense to set specific food waste targets based on generation, donation, and recycling. This allows for the greatest capacity to track both amount of food waste created over time and the amount of food donated or recycled. However, if the actions addressing food waste are happening in tandem with reduction strategies for other materials, it may be better to contextualize specific food waste targets as part of more comprehensive zero waste or other similarly aggressive targets for the broader waste stream.

Note that both the GOOD and BEST actions could happen in tandem.

BENEFITS

CITY GOVERNMENT: Setting targets expresses public commitment to reducing the amount of food that goes uneaten, re-distributing surplus foods to people in need, and recycling what remains. They can help raise awareness and mobilize support for needed policies and programs, and can often spur entrepreneurial efforts or other actions in business and residential communities. Conducting ongoing measurement allows a city to assess how prevention, donation, and recycling initiatives are performing over time. As a city begins to achieve their wasted food goals, they can also realize climate benefits, as well as other ecological, financial, and social benefits.

FOOD RESCUE SECTOR: By providing cities with a more comprehensive view of how much food may be available for donation and what foods are currently being donated, this data can help inform more targeted strategies to increase the quantity and quality of food going to food rescue organizations. This analysis can help identify specific sectors that may be well poised to increase food donation or opportunities to improve the efficiency of surplus food collection to help meet donation goals.

INTERACTIONS WITH OTHER POLICIES AND PROGRAMS

Food waste targets are also useful in developing a rationale for **all programs and policies** outlined in the remaining strategies and can be a powerful way to build support. It is recommended that targets be set early in a food waste reduction initiative.

Setting realistic yet aggressive targets requires understanding some information about the current state of food waste generation. Accordingly, the **baseline data** and **rescue potential data** (Strategies #1 and #2) should be known prior to setting targets since these can inform citywide and sector targets.

Setting targets for food donation can also **inform the development of city policies and programs** to expand food donation (Strategies #5 and #9), efforts to **expand rescue capacity** (Strategy #8) and **engage the business community** (Strategy #7).

KEYS TO SUCCESS

- **TIE FOOD WASTE TARGETS TO OTHER CITY PRIORITIES AND PLANS AND INCLUDE IN COMPREHENSIVE SOLID WASTE PLANS.** Make connections between food waste targets and how they are relevant to other priorities and plans, including climate action plans, food policy council agendas, sustainability efforts, comprehensive city-level waste management plans, and economic development plans. Including targets in a variety of places helps to build momentum and buy-in across city government.

- **INCLUDE A “WHY” STATEMENT WITH THE FOOD WASTE AND FOOD RESCUE TARGETS.** In competing city priorities, it’s important to have a shared understanding of the reasons why a city is acting to reduce the amount of uneaten food. Different possibilities exist and may include: too many people are food insecure, extending the life of the local landfill; reducing disposal costs; action is needed to achieve climate change and sustainability goals; etc.
- **MEASUREMENT PLANS NEED TO BE REASONABLE, NOT PERFECT.** Food is wasted by virtually all people and businesses across cities, occurs throughout the food supply chain, and ends up in a variety of destinations. This diffuse quality of most waste management systems makes “true” and “perfect” measurement all but impossible. Look for ways to reasonably estimate progress in reducing uneaten food instead of perfection.

FURTHER READING AND TOOLS

EPA and USDA United States 2030 Food Loss and Waste Reduction Goal:

<https://www.epa.gov/sustainable-management-food/united-states-2030-food-loss-and-waste-reduction-goal>

“Thurston County Waste Composition Study,” December 2014, Thurston County Solid Waste, Olympia, Washington:

<https://www.co.thurston.wa.us/solidwaste/regulations/docs/ThurstonCountyWasteComp2014.pdf>

“2016 Waste Composition Monitoring Program,” December 2016, Metro Vancouver, <http://www.metrovancouver.org/services/solid-waste/SolidWastePublications/2016WasteCompositionMonitoringProgram.pdf>

STRATEGY #4: LAY GROUNDWORK FOR BROADER FOOD WASTE PREVENTION, FOOD DONATION AND RECYCLING EFFORTS THROUGH CHANGES IN WASTE SYSTEM COLLECTION AND FINANCING

WHAT Specific waste system policies can influence waste generation and recycling rates. Through modifying existing policies, cities can encourage reduction, donation, and recycling.

RECOMMENDED ACTION:

Evaluate your waste system to identify opportunities for policy changes that boost prevention, donation and recycling efforts, incorporating as many of those identified as BEST as is feasible [Policy].

BACKGROUND AND OVERVIEW

Certain waste management policies are more likely to encourage broader waste reduction, donation and recycling than others, and these decisions impact the amount of food that ends up being disposed versus other destinations. For example, in some areas, garbage service is a flat rate paid through property taxes. This serves as a disincentive for waste reduction and recycling in two ways: first, because the service is embedded in property taxes, the cost of waste disposal is largely invisible; second, because the cost is the same regardless of the quantity of waste generated, there is no economic incentive for a household to reduce their waste (or even think about the amount that they waste). Itemizing the garbage service on the property tax bill (or broken out in separate billing) helps make it more visible and clarify to ratepayers that it is a paid and not free service.

Further, transitioning to a Pay-As-You-Throw (PAYT) or other incentive-based pricing system such as Save-As-You-Throw (SAYT) can provide a more accurate signal regarding waste generation. A PAYT pricing system is similar in structure to what is used for virtually all other utilities that are metered. Under unit-based pricing waste systems, generators pay according to the amount of waste they generate, measured through the size of the container, frequency of collection, or through pre-paid bags.⁴⁰ Typically, recycling and composting are low-cost or no-cost compared with the cost of garbage pricing.

The diagram in the following section, although not intended to be an exhaustive list, provides a list of policies to consider boosting broader waste prevention and reduction efforts. Given the variety across waste management systems, there are likely to be several intermediate steps to successfully implement the BEST waste management policies in some areas. For example, it may make sense for a city to first encourage every-other-week garbage collection on the part of the haulers before requiring it, to ensure frequent recycling collection is already in place before expanding to organics collection, and/or to ensure organics recycling infrastructure is sufficient to handle any increases in organic waste collection. Additionally, some cities may want to consider a ban on organic materials in landfills or requirements on larger food scrap generators to divert; this type of policy often interacts with state policy and is usually most effectively employed after many of the policies in this section have been put into place (see sidebar).

RECOMMENDED ACTION

Evaluate your waste system to identify opportunities for policy changes that boost prevention, donation, and recycling efforts, incorporating as many of those identified as BEST as is feasible [Policy].

<p>BEST WASTE POLICIES</p> 	<p>TIPPING FEE. Alter landfill tipping fee so that it is higher than tipping fee at organics management facilities</p> <p>FINANCING. Transition to Pay-As-You-Throw or other unit-based pricing for garbage service</p> <p>COLLECTION FREQUENCY. Change garbage collection to every-other-week and recycling/organics to weekly</p> <p>PREVENTION FUNDING. Enact a trash disposal surcharge that funds prevention efforts</p> <p>COMMERCIAL/MULTI-FAMILY. Require businesses and multifamily buildings to submit organics/recycling collection plans to the city</p> <p>COLLECTION SERVICES. Require that recycling/organics collection be offered to all trash subscribers</p>
<p>GOOD WASTE POLICIES</p> 	<p>FINANCING. Include garbage service as a line item on property tax bill or as separate bill</p> <p>COMMERCIAL/MULTI-FAMILY. Require new commercial and multi-family buildings to have adequate space for onsite recycling/organics collection</p> <p>COLLECTION SERVICES. Ensure garbage haulers are allowed under city code to also offer recycling and organics collection (even where service is not currently available)</p>

*List adapted from: <https://www.pca.state.mn.us/sites/default/files/w-sw1-10.pdf> and <https://www.epa.gov/transforming-waste-tool/managing-and-transforming-waste-streams-tool>

DISCUSSION

Determining what policy changes are suitable depends largely on the current waste collection and management system. The table on the following page explains the policies in further detail, suggests circumstances where the policy change makes sense, and describes what the policy change is intended to achieve.

POLICY CHANGE GUIDANCE TABLES WITH EXAMPLES

	POLICY CHANGE	WHERE THE POLICY CHANGE MAKES SENSE	WHAT IT IS INTENDED TO ACHIEVE	EXAMPLE/RESULTS
<p>BEST WASTE POLICIES</p> 	<p>TIPPING FEE. Alter landfill tipping fee so that it is higher than tipping fee at organics management facilities</p>	<p>Where municipalities have authority to set the tipping fee. This is likely not possible in places where transfer stations/landfills are privately owned and the tipping fee is under private authority.</p>	<p>Incentivizes people/businesses to separate garbage from organics (food/yard waste) and reduces waste sent to the landfill.</p>	<p>Portland, OR: City charges less for mixed food/yard scraps (\$64.61/ton) compared to garbage (\$96.25/ton) at transfer stations.⁴¹</p> <p>Others include: Los Angeles County, CA⁴²; Hennepin County, MN⁴³</p>
	<p>FINANCING. Transition to Pay-As-You-Throw or other unit-based pricing for garbage service</p>	<p>Where residents are charged a flat rate for garbage service and therefore there is no incentive to reduce waste or recycle more because they are charged the same regardless of amount of waste.</p>	<p>Creates an incentive to reduce waste and increase recycling by allowing residents to potentially save money on their garbage bill if they send less waste to the landfill.</p>	<p>Gainesville, FL: After implementing PAYT, the amount of solid waste decreased by 18 percent in the first year (22,120 tons to 18,116 tons). Recyclables recovered increased by 25 percent. Change generated a savings of \$186,200 to the residential sector.⁴⁴</p> <p>Numerous examples exist in all types of cities (urban/rural, large/small, etc.)</p>
	<p>COLLECTION FREQUENCY. Reduce garbage collection and increase recycling and organics collection</p>	<p>Cities with moderate climates where recycling/organics collection services are offered. In hotter climates, more infrequent garbage collection could potentially lead to increased odor and impact customer satisfaction (unless customers sort putrescibles such as food waste into organics collection).</p>	<p>Further incentivize the proper sorting of garbage and recycling/composting, and reduce waste sent to landfill.</p>	<p>Renton, WA: City transitioned to garbage and recycling every-other-week and weekly composting.⁴⁵</p> <p>Other examples include: Vancouver, WA⁴⁶; Tacoma, WA⁴⁷; Portland, OR⁴⁸</p>
	<p>PREVENTION FUNDING. Enact a trash disposal surcharge that funds prevention efforts</p>	<p>In principle, most cities could enact a surcharge, though the appetite amongst the public and policymakers will vary across localities.</p>	<p>Ensure an ongoing funding stream for prevention efforts (similar to how trash revenues have been used to fund other preferred strategies such as curbside composting and recycling).</p>	<p>Boulder, CO: Assesses a voter-approved occupation tax on trash haulers to fund waste reduction efforts, which amounts to \$3.50 per month per household or \$0.85 per cubic yard for businesses and multi-family. Most haulers pass tax on to customer as part of bill.⁴⁹</p> <p>Other examples include: Alameda County, CA⁵⁰; Boulder, CO⁵¹; Central Vermont, VT⁵²; Hennepin County, MN⁵³</p>
	<p>COMMERCIAL/MULTI-FAMILY. Require businesses and multi-family buildings to submit organics/recycling collection plan or annual report to the city</p>	<p>Where multi-family and business composting/recycling rates are low.</p>	<p>Ensure that businesses and multi-family buildings (which are not always under direct city purview) provide recycling/composting.</p>	<p>Montgomery County, MD: Requires every multi-family property to submit an annual report covering all solid waste and recycling activities for previous year. Includes recycling and trash tonnage, staff/resident education activities, waste reduction efforts.⁵⁴</p> <p>Other examples include: Pittsburg, CA⁵⁵; Atlanta, GA⁵⁶</p>
	<p>COLLECTION SERVICES. Require that recycling/organics collection is OFFERED to all trash subscribers</p>	<p>Where recycling/organics service is available, but subscription rates are low.</p>	<p>Raise recycling/organics subscription rates in areas where infrastructure already exists.</p>	<p>Portland, OR: City requires garbage and recycling companies providing service to commercial sector to offer organics collection or subcontract with company that provides organics collection.⁵⁷</p>

	POLICY CHANGE	WHERE THE POLICY CHANGE MAKES SENSE	WHAT IT IS INTENDED TO ACHIEVE	EXAMPLE/RESULTS
GOOD WASTE POLICIES 	Include garbage service as a line item on property tax bill or as separate bill	Where garbage service is embedded in property taxes and therefore residents often do not realize they pay for service.	Provides signal that garbage service is not free.	Prince William County, VA: Solid Waste Fee appears as a separate line item on the property tax bill, fee is divided in half between biannual bills. ⁵⁸ Numerous other examples exist.
	Require new commercial and multi-family buildings to have adequate space for onsite recycling/organics collection	Appropriate for all cities.	Ensures that lack of space in commercial and multi-family buildings is not a barrier to recycling.	Fort Collins, CO: Amended land use code to require adequate recycling areas and trash enclosures for all new commercial or multi-family housing construction. ⁵⁹ Numerous cities in California
	Ensure garbage haulers are allowed under city code to also offer recycling/organics collection (even where service is not currently available)	Where city code is restrictive or vague in terms of what types of services can be offered to businesses and residents and who may provide that service.	Sets the system up to allow for future collection of recycling/organics.	No specific example identified; however, a code change can demonstrate a city's interest in seeing future recycling/composting collection.

FOOD LANDFILL BANS AND MANDATORY ORGANICS RECYCLING

Banning certain materials from entering the landfill is not a new idea. Many governments prohibit toxic chemicals and other hazardous materials (such as electronics and appliances), both to encourage reduction and recycling and to protect against the health and environmental impacts of improper disposal. Some areas have extended these bans to also include organics like yard waste and, increasingly, food scraps. These bans are effective at increasing the diversion rate of food waste and at encouraging separation of food from other waste. The separation is particularly important given that it is only through separation that food waste can be captured as a resource.

Most of the existing food scrap bans target commercial generators of a certain size and apply only to those with an available recycling facility within a certain distance that can accept the material.

Private sector entities are often hesitant to develop new composting or anaerobic digestion facilities until there is a consistent source of material available for recycling to ensure economic viability. Conversely, municipalities are often hesitant to move forward with a food scraps separation and collection program until there is adequate processing capability.⁶⁰ This “chicken and egg” problem is somewhat alleviated by landfill bans for food, which provide a future guarantee of material for recycling. Bans must allow adequate rollout time such that both food waste generators and recipients can adequately plan. Locations with landfill bans include: Connecticut, Vermont, Massachusetts, Rhode Island, and California.⁶¹

Mandatory food scrap recycling offers an alternative to a landfill ban that acts much in the same way (but may be more enforceable at the city level, since landfills may not be located in or managed by the cities they serve). New York City, Austin, San Francisco, and Seattle all have mandatory organics recycling laws covering at least a portion of the population.⁶²

BENEFITS

CITY GOVERNMENT: Adopting some of the policies outlined in this primer can help a city achieve broader waste reduction goals, including but not limited to food waste. This can lead to reduced disposal costs, extend the life of existing landfills and delay costs for new landfills, improve recycling and composting rates, and help to achieve climate goals. Additionally, as more waste and recycling services are offered to greater numbers of people and businesses, there are potential job creation benefits. A 2011 analysis conducted for the BlueGreen Alliance (a coalition of labor unions and environmental organizations) found that if the United States were to achieve a 75 percent diversion rate for municipal solid waste, as well as construction and demolition debris, by 2030, an additional 1.1 million jobs nationwide would be supported.⁶³

BUSINESSES/PRIVATE SECTOR: Businesses can save money in their disposal costs and meet waste reduction and climate impact reduction goals with greater access to recycling/composting services.

RESIDENTS: With greater access to recycling/composting services, residents can potentially save money in their disposal costs.

INTERACTIONS WITH OTHER POLICIES AND PROGRAMS

The policy changes identified in this strategy help set the stage for **creating and expanding infrastructure for organics recycling** (Strategy #10). Ideally, corresponding budgetary shifts resulting from implementing these policies might provide additional revenues for prevention and/or donation initiatives as well as funding increased organics recycling.

KEYS TO SUCCESS

- **THINK SMALL CHANGES TO START AND BUILD UP.** The waste system was not set up overnight, so incremental changes and refinements will be easier than major changes, which may require more time to gain buy in and support of key stakeholders.
- **WORK WITH HAULERS TO GAIN THEM AS AN ACTIVE PARTNER.** Many of these policy changes need hauler cooperation to be successful. Ensure that their input is solicited early and that they are considered as key allies. Look for ways to incorporate requirements such as measurement into hauler contracts and think ahead about what language should be included in upcoming or new contracts as well as seeking interim measures that haulers could implement under existing contracts.
- **ENGAGE WITH RESIDENTS EARLY AND OFTEN TO EDUCATE THEM ABOUT FUTURE CHANGES.** Switching from a property tax financed system to a fee-for-service system requires ample outreach to residents. Focus on the benefits to them—for example, a potentially lower garbage bill through a PAYT system.
- **BE MINDFUL OF THE NEEDS OF LOW-INCOME, SENIOR, AND OTHER SPECIAL POPULATIONS WHEN DESIGNING AND PLANNING FOR POLICY CHANGE.** Consider the potential impacts of the policy change on special populations. For example, to ease the transition between a property tax financed system to a fee-for-service system where ratepayers will think of this as a new bill, consider ways to mitigate the costs such as through providing a discounted rate for low-income households.

FURTHER READING AND TOOLS

Increasing Recycling Now! Implementing Recycling and Pay As You Throw (PAYT) Ordinances, Legislation, or Contracting: http://www.paytnow.org/PAYT_OrdinancesANDLegislationReportSERA_v4Part1withattachments.pdf

Pay As You Throw (PAYT) in the US: 2006 Update and Analysis: http://www.paytnow.org/PAYT_EPA_SERA_Report2006G.pdf

EPA Pay-As-You-Throw: <https://archive.epa.gov/wastes/conservation/tools/payt/web/html/timeline.html>

Massachusetts Pay-As-You-Throw: An Implementation Guide for Solid Waste Unit-Based Pricing Programs: <http://www.mass.gov/eea/docs/dep/recycle/reduce/m-thru-x/pguide04.pdf>

FAQ on PAYT: http://www.paytnow.org/PAYT_CO_faqpaysERA_v6.pdf

Massachusetts Sample RFP Performance Based Solid Waste and Recycling Services: <http://www.mass.gov/eea/docs/dep/recycle/reduce/m-thru-x/rmrfp.pdf>

Harvard Law School Food Law and Policy Clinic/Center for EcoTechnology toolkit on organic waste bans (no link yet; to be released early 2019): <https://www.biocycle.net/2018/09/11/organic-waste-bans-recycling-laws-tackle-food-waste>

STRATEGY #5: LEAD BY EXAMPLE

WHAT Cities can demonstrate their commitment to reducing wasted food, donating surplus food, and better managing food scraps by implementing policies and programs within and across city government. These actions can be undertaken relatively quickly since in many circumstances do not require legislative action.

RECOMMENDED ACTIONS:

BEST Demonstrate best practices in food waste measurement, prevention, donation, and recycling at city-run facilities. Conduct a food waste audit at government food service operations, institute food waste prevention programs for both pre- and post-consumer food waste, expand food donation efforts, and ensure that remaining food scraps are recycled [Policy].

Implement organic waste collection at city offices and city-leased properties, as well as front-of-house and back-of-house of government food service operations [Program].

BETTER/BEST Encourage (and potentially require) use of compost on city properties for landscaping and with new government construction of municipal facilities [Program].

Encourage (and potentially require) events held at public facilities or requiring a city event permit to implement appropriate food waste strategies, prioritizing prevention and donation [Program/Policy].

GOOD Alter city procurement policies to encourage vendor action on food waste, including preventive strategies and food donation [Policy].

BACKGROUND AND OVERVIEW

There are ways a city can lead by example and institute policies and programs within and across city government to raise awareness about food waste, increase donations and composting, and encourage vendors to adopt similar behaviors. Many of these suggestions represent low-barrier actions that can be undertaken relatively quickly. More importantly, by implementing programs and policies across city departments, cities can show their strong commitment and interest in addressing food waste.

RECOMMENDED ACTIONS



BEST: Demonstrate best practices in food waste measurement, prevention, donation, and recycling at city-run facilities. Conduct a food waste audit at government food service operations, institute food waste prevention programs for both pre- and post-consumer food waste, expand food donation efforts and ensure that remaining food scraps are recycled [Policy].

City-operated and city-contracted food service operations such as those in stadiums and cultural event centers, health care facilities, K-12 cafeterias and jails offer excellent opportunities to demonstrate best practices. These facilities can prevent pre- and post-consumer food waste and promote donation of surplus food.

Optimally, a food waste audit would be conducted to identify what food items are being thrown away, in what quantities, and the reasons for disposal and to clarify what portion of food waste is generated in commercial kitchens versus after food has been served to consumers. Tracking this data provides insight into opportunities to adjust practices like food purchasing, staff training, portion options and food donation. Several guides exist on how to conduct an audit as well as software (e.g., LeanPath) available for purchase that provides additional automation and ongoing monitoring specifically for pre-consumer waste.⁶⁴

Back-of-house staff should be trained in best practices for food waste prevention, how to safely donate surplus food, and how to comply with food scrap recycling protocols. Examples of possible prevention strategies include:⁶⁵

- Better synching of food purchasing and demand projections to ensure that food is purchased only when needed

- Synching food production closely with demand to avoid over-production, including cooking to order and cooking in small batches
- Repurposing leftover food (e.g., incorporate wilting salad toppings in stir fries; turn vegetable scraps into soups, sauces, and stocks; transform day-old bread into croutons or breadcrumbs)

Where possible, in situations where reusable serviceware is not feasible, cities should consider using compostable or recyclable food serviceware in their food service operations. Using compostable serviceware can increase the amount of post-consumer food that can be recovered for compost (provided that the local compost facility can accept the serviceware for processing) as it's often otherwise difficult to separate food scraps from the container they are in. It also can help reduce contamination when customers toss plastic cutlery and other serviceware into the organics bin by mistake.

Additionally, staff should be trained on what types of food can be donated and how best to package and store surplus food for donation. Vendors should establish a relationship with an appropriate food rescue organization and protocols for arranging pick-ups and reporting of donated food.

Staff should also be trained on how to properly use food scrap collection bins based on the requirements of the facility's hauler and/or organics waste processing facility.



BEST: Implement organic waste collection at city offices and city-leased properties, as well as front-of-house and back-of-house of government food service operations [Program].

Cities should arrange for compost collection (that includes food waste) at all city buildings, government food service operations, and city-owned housing. Organic waste bins should ideally be placed near garbage and recycling bins in a convenient location, and in places where organic waste is generated. Bins should have signage that clearly designates what materials go into the bins. Cities should ensure that back-of-house employees are trained on how to use the bins in a manner consistent with hauler or processor requirements.

Planning for organics collection should be included in the design of new city facilities, including city-owned housing. This means that all new projects should be designed such that they have adequate space for organics recycling (and other material recycling) collection.



BETTER/BEST: Encourage (BETTER) and potentially require (BEST) use of compost on city properties for landscaping and with new government construction of municipal facilities [Program].

Using compost on city properties, such as parks and roadsides, and with new government construction of municipal facilities can “close the loop” on organics recycling and help drive market demand for compost products. Private sector entities are often hesitant to develop composting facilities unless there is a consistent source of material available for processing, as well as a market for the resulting product to justify the investment.

Amending soil with compost provides a host of environmental benefits: reduced stormwater runoff and associated pollution, reduced erosion, improved water retention in the soil, reduced need for chemical fertilizers and pesticides, and improved soil quality.⁶⁶

But because compost quality can vary, the U.S. Composting Council (USCC) tests and certifies compost products, analyzing for properties concerning nutrient content, moisture content, pathogens, contamination, etc. Facilities that have received the USCC's Seal of Testing Assurance can be found at: <http://compostingcouncil.org/compostmap/>

There are situations where a city can encourage or require the use of compost, including:

- Landscaping of city-owned or city-leased properties
- New municipal buildings, facilities and road construction projects
- Maintaining parks and roadside buffers
- Habitat restoration and other conservation projects

The Denver Water District requires that all new construction projects of any type must amend their soil with compost before landscaping. Projects must provide documentation demonstrating purchase of a soil amendment product and a map of the amended area, as well as be subject to spot checks by Denver staff and fines for noncompliance.⁶⁷

Road construction projects offer another potential opportunity for compost use. At the state level, the Texas Department of Transportation collaborated with the state Commission on Environmental Quality and the EPA to use compost for road projects.

*The Texas DOT compost program is one of the largest markets for compost in the nation and the policy change has resulted in an entire new industry of subcontractors who apply the compost.*⁶⁸

Other areas with similar laws requiring or otherwise incentivizing use of compost include: Washington State; Fort Collins, CO; Greeley, CO; Castle Rock, CO; Colorado Springs, CO; Westminster, CO; Prince George County, MD; Montgomery County, MD.⁶⁹



BETTER/BEST: Encourage (BETTER) and potentially require (BEST) events held at public facilities or requiring a city event permit to implement appropriate food waste strategies, prioritizing prevention and donation [Program/Policy].

Cities are increasingly encouraging or requiring events held at public facilities or those requiring a city-issued event permit to implement sustainable practices. At a minimum, cities can provide information and best practices on how to prevent food from going to waste, donate surplus food, obtain organic waste bins and arrange with a hauler to collect materials at end of the event. Some municipalities require event hosts to offer collection of recyclable and compostable materials as a condition of permit issuance or space rental.

San Antonio requires all medium and large events held on city property or requiring a right-of-way permit to obtain a “green event certification,” requiring a recycling and waste plan and a one-to-one ratio of recycling to garbage bins. Event hosts unable to meet certification criteria can also purchase certification points, with the proceeds going into a fund for local environmental projects. Another novel feature of the program is that events receive a green event rating to use in advertising and publications.⁷⁰

The City of San Francisco offers the “gold standard” for green events. All events held within the city are required to offer collection of recyclable and compostable materials, as well as submit a recycling plan to the city. City staff provide free training and consultation for event organizers, printable signage for waste and recycling bins, and a list of approved compostable food service items and where to buy them. The San Francisco Environment website also provides information about how to donate excess food.⁷¹



GOOD: Alter city procurement policies to encourage vendor action on food waste [Policy].

Procurement policies that incentivize specific market practices, such as buying local or avoiding harmful ingredients, by contracted vendors are relatively commonplace. Similarly, city vendor policies can drive action on addressing food waste and demonstrate a city’s commitment. City contracts, procurement policies, and processes for selecting foodservice contractors can give priority to vendors that deploy food waste prevention strategies, donate surplus food, recycle food scraps, and/or measure and report their food waste. Cities may also consider encouraging vendors to purchase imperfect produce.

DISCUSSION

To determine which strategies are most appropriate, a city should consider the following factors:

- **DOES THE CITY MANAGE OR CONTRACT FOR ANY FOOD SERVICE OPERATIONS?**

If a city operates a food service operation in a public hospital or arena, for example, conducting a food waste audit and training staff to prevent and manage food waste is an excellent place to start, as there can be significant cost savings to the city and its taxpayers. If the city contracts for food service with a private entity, it will be important to work with the vendor to encourage action on food waste and, optimally, make food waste monitoring and reporting, food donation and recycling a requirement in future contracts. Also consider whether the city issues event permits or hosts events in city facilities that could be modified to feature recommendations in this section.

- **DOES ORGANICS PROCESSING AND COLLECTION EXIST LOCALLY?**

Arranging for compost collection at city facilities is contingent upon available composting infrastructure and collection available locally. Even if processing and collection are not currently available, it may still be useful to issue a Request for Proposal soliciting organics collection and processing, as it signals a desire for future service.

- **DOES THE CITY CURRENTLY ENCOURAGE OR REQUIRE THE USE OF COMPOST OR SOIL AMENDMENTS FOR ANY ACTIVITIES?**

If a city department or agency already encourages or requires the use of soil amendments in any of the ways earlier mentioned, consider expanding on existing policies to ensure there is a preference for compost products, modify for other agency applications, making existing recommendations mandatory, etc.

BENEFITS

CITY GOVERNMENT: In leading by example, cities demonstrate that they, too, are a part of the solution and are not putting the onus solely on businesses and residents. Cities may be able to save money in their food service operations through reduced food purchasing and food scrap disposal costs, while providing community benefit through food donation. Additionally, requiring compost application in construction projects can result in job creation, as well as a host of environmental benefits (e.g., reducing stormwater runoff and erosion).⁷²

FOOD INSECURE POPULATIONS: Some of the actions in this strategy involve promoting the donation of surplus food in city food service operations. Where this is implemented successfully, hunger relief organizations may see an increase in donations and be better able to meet the needs of food-insecure members of the community. The donation of high-quality foods should be prioritized, particularly fruits, vegetables, meat, dairy and quality prepared foods.

BUSINESS/PRIVATE SECTOR: When the city leads by example, this may open opportunity for participation or innovation by businesses and institutions in the city. Cities may encourage this development by, for example, awarding businesses who adopt initiatives to support new city policies or practices. This helps shift standard practice for the community and can improve the potential for success for both the public and private sector. Additionally, encouraging or requiring the use of compost can contribute to the growth of composting businesses helping to ensure there is a market for their products.

INTERACTIONS WITH OTHER POLICIES AND PROGRAMS

City efforts to prevent food from going to waste, donate surplus food, and recycle food scraps within their own foodservice operations can increase the credibility of city government, demonstrate best practices, and inform the food waste prevention and food donation strategies discussed throughout this toolkit. Cities requiring use of compost in construction projects should do this before or in tandem with the actions identified to **create and expand composting and anaerobic digestion infrastructure** (Strategy #10).

KEYS TO SUCCESS

- **IDENTIFY A CHAMPION TO HELP PROVIDE COORDINATION AND IMPLEMENTATION LEADERSHIP.** Leading by example will require planning and coordination across city departments. This is best facilitated where there is a point person to champion efforts and provide leadership during implementation.

FURTHER READING AND TOOLS:

EPA Reducing Wasted Food & Packaging: A Guide for Food Services and Restaurants:

https://www.epa.gov/sites/production/files/2015-08/documents/reducing_wasted_food_pkg_tool.pdf

EPA: A Guide to Conducting and Analyzing a Food Waste Assessment:

https://www.epa.gov/sites/production/files/2015-08/documents/r5_fd_wste_guidebk_020615.pdf

Rebalancing the Food Waste Equation: A Case Study for Santa Barbara:

<http://www.cecsb.org/wp-content/uploads/2015/10/CEC-rebalancing-the-food-waste-equation.pdf>

Building Healthy Soils with Compost to Protect Watersheds:

<http://ilsr.org/wp-content/uploads/2013/05/Compost-Builds-Healthy-Soils-ILSR-5-08-13-2.pdf>

“Landscape Policies and Ordinances,” StopWaste, Alameda County, CA:

<http://www.stopwaste.org/preventing-waste/landscape-policies-ordinances>

To find a composter who has met the USCC Seal of Testing Approval, see:

<http://compostingcouncil.org/compostmap/>

Reduce

REDUCE STRATEGIES

STRATEGY #6 Increase public awareness and provide concrete strategies for how households can prevent food from being wasted in the first place

STRATEGY #7 Engage businesses and institutions to prevent food from being wasted

WHAT DO WE MEAN BY REDUCE?

The strategies identified in this section represent efforts that prevent food from being wasted in the first place.

BACKGROUND

Few people plan to waste food and still the average American throws away more than 400 pounds of food per person annually.⁷³ Nationwide, consumers collectively produce 43 percent of all food waste, which is more than restaurants and

grocery stores combined.⁷⁴ Businesses and institutions are also major generators of food waste. According to nationwide figures, collectively this group generates approximately 40 percent of all food waste, just shy of the overall food waste generated at the household level.⁷⁵ Generators include food processors, distributors, grocers, restaurants, caterers, hotels, schools, colleges and universities, health care facilities, as well as stadiums and event centers, among others.

The reasons for this are complex and numerous, but a major reason is that the way in which food is disposed makes it easy to overlook. Throwing away food often occurs privately in homes and businesses, a little bit at a time, and often by more than one person.⁷⁶ It is also generally mixed with other materials and taken away on a frequent basis.⁷⁷

Food waste reduction involves activities that prevent food from being wasted in the first place. For example, a restaurant might decrease the purchasing of certain food items that are not customer favorites. Preventing food waste from occurring offers the greatest environmental, social, and economic impacts since it reduces the need for waste management, directs more food to people, and conserves the resources such as water, energy, land, and labor that are used to produce wasted food.

STRATEGY #6: INCREASE PUBLIC AWARENESS AND PROVIDE CONCRETE STRATEGIES FOR HOW HOUSEHOLDS CAN PREVENT FOOD FROM BEING WASTED IN THE FIRST PLACE

WHAT Few people want to waste food, and yet many do not know how to waste less. Cities can help raise public awareness and share strategies that individuals can implement in their homes to reduce the amount of food that goes to waste. Prevention efforts such as these offer the greatest economic and environmental impact because less waste needs to be managed and food is eaten, which is its highest and best use.

RECOMMENDED ACTION:

BEST Use Ad Council/NRDC tools from “Save the Food” campaign, along with the Food: Too Good to Waste toolkit [Program].

BACKGROUND AND OVERVIEW

Given the magnitude of consumer household food waste, cities can play an important role in both raising awareness and providing action-oriented strategies that consumers can implement in their homes to prevent food from being wasted in the first place.

Preventing food from being wasted involves more than simply telling people how much food goes to waste. Shopping for, preparing, serving, and consuming food are deeply personal acts that are impacted by a variety of conscious and unconscious attitudes and beliefs.⁷⁸ Household practices around generation and handling of waste are also governed by a variety of influences related to things like consumption and identity.⁷⁹ For example, a study of consumers and food waste identified that, for families with children, many parents (but most notably mothers) felt pressure to have an array of healthy food options such as fresh fruit and vegetables available for their children in order to feel they are “a good provider.” If more is purchased than can be reasonably consumed, this practice contributes to food waste. However, this practice is unlikely to be reversed purely by a food waste awareness raising campaign that focuses on illuminating the problem but not on the underlying reasons for that problem.⁸⁰ In general, the most successful programs do not rely solely on the desire to not waste food as the main motivator; they connect with other important consumer needs like convenience and cost savings.⁸¹

Cities do not need to reinvent the wheel and can instead tap into existing materials to educate consumers. The Ad Council and NRDC partnered in 2016 to develop *Save the Food*⁸², a national public service campaign to raise awareness about the importance of reducing food waste and the simple lifestyle changes that can add up to less wasted food. Cities may also wish to consider using the *Food: Too Good to Waste*⁸³ toolkit, developed by the Environmental Protection Agency and the Materials Management West Coast Forum, as a complementary tool. Other cities may be able to pick and choose from these tools or develop their own materials to enhance existing messages or campaigns related to food waste.

For example, when developing a messaging strategy about city organics collection, cities can add prevention tips to outreach materials, particularly as research indicates that people tend to feel less concerned about wasting food if they recycle food scraps.⁸⁴

RECOMMENDED ACTION



BEST: Use Ad Council/NRDC tools from “Save the Food” campaign [Program].

The campaign includes professionally developed video, print, radio, and web advertisements and community outreach materials that can be used free of charge so long as a few conditions are met.⁸⁵ Media can be used on city property or cities can work with NRDC and the Ad Council to get donated ad space. All advertisements direct viewers to a website (www.savethefood.com) that provides concrete tips on how households can reduce the amount of food that they waste to save money and reduce the environmental impacts of wasted food. The campaign also includes general social media posts and graphics that a city could use across their social media accounts.

In addition to traditional radio and television spots, cities can use these materials in a variety of other ways. Some examples include:

- Online: post materials on city websites, share information via social media platforms or email
- Print/Digital: hang posters in parks and public facilities, post ads on buses and waste trucks, post on bus shelters or benches, use local billboards, include inserts in utility bills

Dozens of cities and counties have used the tools or plan to in the future. The City of Burbank placed ads on 25 waste trucks and 23 bus shelters. The Minneapolis-St. Paul International Airport played a public service announcement (PSA) video on screens in the baggage claim area.⁸⁶ With \$5,000 to cover the cost of printing advertisements, Santa Clara County secured donated ad space on local billboards and at bus shelters, an estimated media value of \$463,000.⁸⁷

Results after the first year and a half of the campaign demonstrate that adults who have viewed the ads are more likely to agree that their actions can make a difference in reducing food waste (78 percent of “ad aware” adults versus 65 percent of “ad unaware”). Furthermore, people who have viewed the ads are more likely to seek information about how they can waste less food. 58 percent of people aware of the ads sought information compared to only 17 percent of “ad unaware.”⁸⁸

Cities may also want to consider using the Food: Too Good to Waste toolkit as a complement to the “Save the Food” resources:

Created by the Materials Management West Coast Forum and the Environmental Protection Agency, the FTGTW toolkit was designed to focus on preventing food from being wasted inside the home. The toolkit includes tips on how to perform a home food waste audit to understand existing waste levels and patterns, as well as numerous strategies for how to shop smarter, prep and store fresh items properly so that they last longer, and other ideas such as how to turn leftovers into something new.⁸⁹ The tools were originally created to be used as a part of a “challenge” where households were recruited to measure the amount of food wasted before and after implementing some of the strategies.

This toolkit has been piloted in cities and counties across the nation, many of whom have tailored it to their city or specific populations.⁹⁰ For example, a group of counties and cities in Oregon adapted the toolkit into a website also translated into Spanish.⁹¹ An evaluation of pilot programs from seventeen locations nationwide conducted by the EPA found that participating households reduced preventable food waste by between 11 percent and 48 percent by weight and between 27 percent and 39 percent by volume.⁹²

DISCUSSION

Virtually any city can use the *Save the Food* or *Food: Too Good to Waste (FTGTW)* materials. The chief difference between the two tools is that the *Save the Food* materials are oriented for one-way communication and require minimal staff time to implement. In contrast, the *Food: Too Good to Waste* toolkit is designed more for one-on-one or small group outreach with follow-up, which requires staff and other materials, though some cities have posted the FTGTW resources on their city websites as a standalone resource.

BENEFITS

CITY GOVERNMENT: The major benefit is that because tools already exist, cities can implement these recommendations quickly and with relatively minimal resources. If using the *Save the Food* materials, cities can leverage the Ad Council’s access to donated media. As mentioned above, Santa Clara County secured \$463,000 worth of ad space with only a \$5,000 investment to cover printing costs. The *Save the Food* campaign has not been in use long enough to document measurable results in reduced food waste. However, a similar advertising and outreach effort, *Love Food Hate Waste* in London,

demonstrated a 14 percent reduction in avoidable food waste in just six months, suggesting that quantitative impact is possible with media campaigns. The campaign used radio, online and print advertising coupled with community events and a volunteer network.⁹³

BUSINESS/PRIVATE SECTOR: Save The Food has developed materials especially for use by food service operators including line signs explaining how the provider is engaging in food waste reduction techniques. These materials can be downloaded from savethefood.com and used by food service companies. Using the Ad Council and NRDC tools may also encourage businesses to examine their own behaviors or how they can influence others. After the Save the Food campaign was rolled out, the investment firm Christian Brothers Investment Services contacted the NRDC and reported that the campaign had motivated them to explore how they as investors could use their influence to encourage the companies in their portfolio to reduce food waste.⁹⁴

RESIDENTS: Consumers are made more aware of the issue and costs of wasting food and are equipped with tools to prevent food from being wasted. With simple lifestyle changes, households can save money in food purchase costs and feel that they are making a difference. Save The Food offers tools to make it easier for consumers to adopt these behaviors to reduce the amount of food they waste.

INTERACTIONS WITH OTHER POLICIES AND PROGRAMS

The public outreach strategies identified here complement most other strategies in the toolkit, but are not a precursor or prerequisite for any other strategies of the toolkit. However, prevention efforts should be a part of any city's broader efforts.

KEYS TO SUCCESS

- **CONSIDER JOINING EFFORTS WITH OTHER CITIES AND PARTNERS TO EXPAND EFFORTS AND SHARE COSTS.** In the Twin Cities region, a group of cities, counties, and the local pollution control agency each secured a small amount of funding and banded together on the campaign to broaden their reach. The collaboration is in its early stages, but they expect to be able to leverage the \$28,350 collected from the group into over \$3.4 million in media using the Ad Council contacts.
- **IDENTIFY A CHAMPION TO HELP PROVIDE COORDINATION AND IMPLEMENTATION LEADERSHIP.** It is helpful to have a main point of contact that will assess city assets (e.g., in some cases, cities manage advertisements on bus shelters or waste trucks), develop a plan, and coordinate across departments.

FURTHER READING AND TOOLS

NRDC/Ad Council PSA and Materials: www.savethefood.com

Food Too Good to Waste:

<https://www.epa.gov/sustainable-management-food/food-too-good-waste-implementation-guide-and-toolkit>

STRATEGY #7: ENGAGE BUSINESSES AND INSTITUTIONS TO PREVENT FOOD FROM BEING WASTED

WHAT Food businesses and institutions can benefit from wasting less food, but do not always know how to improve their operational process. Cities can facilitate these operational changes by sharing best practices, and providing technical and financial support.

RECOMMENDED ACTIONS:

BEST Provide ongoing technical assistance for food businesses and institutions to conduct food waste audits and/or monitor their food waste on an ongoing basis [Program].

BETTER Develop a grant program for local businesses and institutions to implement prevention efforts and/or develop entrepreneurial business models to make commercial use of food scraps [Funding].

GOOD Sponsor a food waste "challenge" to engage local businesses [Program/Partnerships].

BACKGROUND AND OVERVIEW

Businesses and institutions can potentially lower food purchasing, labor, and disposal costs through improving their operating practices. A study released by the World Resources Institute in early 2017 documented the financial impact of food waste reduction efforts by 700 businesses at 1,200 sites.

WRI found that reduction efforts at 99 percent of the sites earned a positive return on investment. Further, the median rate of return on investment was a stunning 14:1. Rates of return were found to be highest among restaurants.⁹⁵

Such an analysis makes the case that businesses have a direct financial interest in reducing food waste and can help build common ground with municipal government who have an interest in seeing them succeed.

Even with this potential for cost savings, as with other areas (e.g. energy efficiency), many businesses are not currently maximizing their potential for cost-effective food waste reduction. Most of these entities want to waste less, but don't know how, don't have an accurate sense of just how much and what is going to waste, and aren't clear what the return would be for their efforts.⁹⁶ Given their potential, businesses can play a significant role in preventing food from going to waste and cities can help overcome some of these barriers through the strategies described below.

RECOMMENDED ACTIONS



BEST: Provide ongoing technical assistance for food businesses and institutions to conduct food waste audits and/or monitor their food waste on an on-going basis [Program].

Providing ongoing technical assistance to food businesses and institutions is another way to engage businesses and institutions. This assistance often starts with food waste audits (or ongoing measurement) to help identify what is being wasted, how much, and why, which allows for the development of targeted reduction and tracking waste over time. For example, doing an audit may expose that a certain menu item is rarely ordered or that a certain ingredient frequently goes to waste. Note that food waste audits differ from more typical general waste audits in that specific types of food (potentially including what may have been edible or avoidable) can be tracked, along with reasons for disposal, which can highlight areas where food waste reduction or surplus food rescue may be appropriate.

Food waste audits can take a variety of forms and range in terms of cost to carry out and the technology involved. On the low-tech end of the spectrum, audits can consist of weighing prep waste, spoilage, and plate waste using paper logs and scales or even simply separating food waste into buckets and counting buckets.⁹⁷ More advanced technologies to track food wasted in institutional and restaurant environments on an ongoing basis include software solutions such as LeanPath or TrimTrax. Both systems aid in tracking and monitoring pre-consumer food waste so that strategies can be identified to reduce waste. These offer a more automated approach, include more detailed reporting, and require a more significant financial investment.

Cities may choose to devote staff to conducting this outreach and onsite consulting, or contract with another organization. Through this type of outreach, best practices can be shared such as providing information about donation or actions like removing trays from cafeteria settings, which has been found to reduce food waste. The city of Boulder in Colorado, for example, provides funding generated through a tax on garbage service to a partner organization to offer free onsite sustainability and waste reduction assistance. Activities include assistance conducting a waste assessment, providing information about operational practices such as bin placement and signage, and help in developing a waste reduction plan. Nearly 4,000 businesses have been implementing sustainable practices since 1993. Although not specific to food waste, this model could be adapted to include a greater emphasis on food waste prevention, donation, and recycling.⁹⁸

Several government entities have also developed programs that provide partner organizations with food waste tracking software or help in cost sharing. The Smart Kitchen Initiative is a program of StopWaste, the public agency responsible for reducing the waste stream in Alameda County. This initiative works with medium and large-scale food service operators,

such as hotels and colleges, to measure and prevent pre-consumer waste. Participants receive free licenses of LeanPath software for one year, as well as staff training and support from StopWaste.⁹⁹ This represents a value in the range of \$4,500 to \$10,000 depending on what version of LeanPath is selected and how much technical assistance is provided. Smaller organizations received a less expensive tablet system and larger operations received a scale, tablet, and camera.¹⁰⁰ In exchange, businesses agree to track waste, establish goals and share their results. Through this program, Cal Dining, the residence hall dining operator of the University of California, reduced food waste by 19 percent, the equivalent of 27 tons per year and \$98,000 in reduced food costs.¹⁰¹



BETTER: Develop grant program for local businesses and institutions to implement prevention efforts and/or develop entrepreneurial business models to make commercial use of food scraps [Funding].

Some businesses are unaware of the positive economic returns that can be achieved by reducing food waste.¹⁰² Seed funding can help food businesses and institutions “get over the hump” of piloting new food waste prevention efforts in their operations or support new enterprises that make use of food scraps, such as fruit and vegetable pulp from juicing operations. In some cases, new ventures can turn surplus foods and ingredients into salable products, spurring business growth and job creation. City economic development departments can play a role in fostering connections among existing food businesses and entrepreneurs and linking them to sources of technical assistance and financing.

Both Alameda County (CA) and King County (WA) rolled out grant funding programs focused at least in part on preventing food waste in the commercial sector. The Alameda County program provides funding for innovative and replicable food waste prevention and/or surplus food rescue projects for both businesses and nonprofits.^{103,104,105} The King County program took a broader approach and included projects that emphasized recycling in the commercial sector in addition to prevention and rescue efforts. Through a competitive request for proposal process, King County has awarded between \$24,000 and \$100,000 to seven programs between 2016 and 2018. Projects with an equity and social justice element received priority consideration.

For example, the local composting facility was selected to partner with ten restaurants whose owners are people of color, foreign born, and/or whose primary language is not English. The facility will help these restaurants conduct waste audits and implement customized food waste recycling programs. All projects must track quarterly the quantity of food waste prevented or diverted from the landfill.¹⁰⁶ These programs illustrate different ways in which grant funding can be used to jumpstart efforts in the commercial sector.



GOOD: Sponsor a food waste “challenge” to engage local businesses, raise awareness about cost savings through food waste preventions, and encourage food donation [Program/Partnerships].

Food waste challenges involve recruiting businesses to voluntarily agree to certain actions geared to prevent food from being wasted or to encourage donation and/or food scrap recycling. Cities then provide resources such as best practices workshops and ongoing technical assistance. Additionally, cities offer recognition for participating businesses and publicly celebrate those that achieve reduction goals, adopt prevention practices, increase food donation, and recycle food scraps. The major advantage of these challenges is that they can be rolled out relatively quickly while other policy and program changes are being discussed.

The EPA has operated a Food Recovery Challenge for the past several years at the national level, but city-focused efforts exist as well.¹⁰⁷ In 2013, then-Mayor Michael Bloomberg challenged New York City restaurants to help reduce the amount of food sent to landfills by voluntarily agreeing to reduce their individual waste by 50 percent. More than 100 restaurants signed up. In the first six months of the program, more than 2,500 tons of food waste was diverted from disposal. The success of the program has prompted several businesses to further increase their efforts. New York City listed participating businesses on the city webpage, profiled business success stories, and provided a window decal to the businesses to show their participation.¹⁰⁸

Nashville, in Tennessee, is also following suit, and in 2017 piloted the Mayor’s Restaurant Food Saver Challenge, which was launched as an ongoing initiative in fall 2018. Participating businesses commit to implementing or expanding a minimum of five “food saving” practices. Possible practices range from offering more flexible portions and creatively repurposing surplus food to donating food to area nonprofits.¹⁰⁹

DISCUSSION OF STRATEGIES

To determine which strategy is most appropriate, a city should consider the following:

- **IS STAFF AVAILABLE FOR ONGOING TECHNICAL ASSISTANCE TO BUSINESSES?**

If a city can devote staff to providing ongoing technical assistance to businesses and institutions, a grant program directed at commercial entities may not be as necessary. A grant program may be more suitable if a city does not have the staff or the “know how” to provide ongoing technical assistance.

- **IS THE PRIMARY GOAL ONGOING IMPACT OR AWARENESS RAISING?**

Food waste challenges offer great opportunities to raise awareness and begin to engage with commercial entities; however, they usually are short-term in duration. Providing ongoing technical assistance and/or financial assistance to purchase or use tracking software is more likely to produce ongoing changes resulting in greater reductions relative to challenges. On the other hand, challenges may be relatively easy to implement and can serve as a tool to help draw attention to the need for more extensive food waste programs.

BENEFITS

CITY GOVERNMENT: Prevention and food donation efforts can also assist cities in achieving recycling and greenhouse gas emission goals by removing food-related material from the waste stream and reducing the cost of needed disposal services and infrastructure.

BUSINESS/PRIVATE SECTOR: Preventing food waste from occurring offers the strongest financial returns for participating organizations since it reduces costs associated with purchasing, handling and disposing of food that goes unused. Food donation can lead to valuable tax deductions for the donor. A food waste challenge can also build public visibility and goodwill among participating businesses.

HUNGER RELIEF ORGANIZATIONS: Some of the recommended actions may increase food donation efforts and help illuminate business concerns that stand in the way of increased food donation by area businesses.

RESIDENTS: Food waste challenges can also raise public awareness and heighten consumer expectations about how businesses address food waste.

INTERACTIONS WITH OTHER POLICIES AND PROGRAMS

These actions should occur in tandem with **food rescue efforts** (Strategies #7 and #8). It is important to note that, to some degree, as businesses become more adept at preventing food surpluses, they may have less available food for donation. Businesses have the strongest financial incentive to prevent food surpluses from being generated in the first place and are often most receptive to prevention efforts given their benefit to the bottom line. That said, the amount of food currently wasted in most communities is so large that efforts to ramp up both prevention and donation are important to overall efforts to reduce the amount of food going into the waste stream.

The commercial sector can be a useful partner when **creating and expanding composting and anaerobic digestion infrastructure** (Strategy #10). It's generally easiest to start a food scrap composting program when there is a consistent feedstock with relatively low rates of contamination. Pre-consumer waste from foodservice or food processing businesses often fits this bill and provides a useful proof of concept for a food scrap recycling program. Haulers and processors can be crucial partners in providing signage for compost, landfill and recycling containers and education/outreach to food scrap generators on the benefits of composting, ways to minimize contamination, etc.

KEYS TO SUCCESS

- **PROVIDE FOOD WASTE PREVENTION AND DONATION RESOURCES FOR BUSINESSES IN A VARIETY OF PLACES.** Post information on city website, include links or handouts with business license renewals, in food service handler classes, and with “green business” certification programs.
- **TRANSLATE MATERIALS INTO OTHER LANGUAGES.** Many business owners and food service workers speak English as a second language. To more effectively engage with these businesses, translate materials into Spanish and other languages commonly spoken across the city. It is also helpful if staff providing technical assistance are proficient in different languages.

FURTHER READING AND TOOLS

Reducing Wasted Food & Packaging: A Guide for Food Services and Restaurants:

https://www.epa.gov/sites/production/files/2015-08/documents/reducing_wasted_food_pkg_tool.pdf

Tools for Preventing and Diverting Wasted Food:

<https://www.epa.gov/sustainable-management-food/tools-preventing-and-diverting-wasted-food>

Resources for Assessing Wasted Food:

<https://www.epa.gov/sustainable-management-food/resources-assessing-wasted-food>

Rescue

REDUCE STRATEGIES

STRATEGY #8 Assess and expand food rescue system capacity

STRATEGY #9 Address policy barriers to safe donation of food

WHAT DO WE MEAN BY FOOD RESCUE?

The strategies identified in this section represent efforts that facilitate the donation of surplus, unsold food.

BACKGROUND

Food insecurity, particularly among seniors, children, veterans, the disabled and other vulnerable populations, is a

pressing issue for cities across the country. Nationally, more than 41 million people are considered food insecure.¹¹⁰ Food donation efforts offer a unique opportunity for government, businesses, and non-profit collaboration in support of both city waste and hunger alleviation goals.

Although food donation won't address the underlying causes of poverty that drive food insecurity, donated food is a critical piece of the puzzle for connecting needy individuals with available food supplies and reducing a city's "meals gap." At the same time, food donation and re-purposing of surplus food for commercial sale are high priorities when addressing wasted food in view of the social and environmental benefits achieved by using appropriate foods for human consumption rather than recycling it.

Potential types of food donors include grocery stores, restaurants, colleges, hospitals, schools, corporate headquarters, airports, convention centers, stadiums, food distributors, food manufacturers, community events and various other food-related businesses and organizations. Key types of rescue organizations include foodbanks, which most commonly focus on securing large donations from grocery stores and food manufacturers, food rescue organizations that work with those types of donors as well as restaurants and institutions, and "last mile" organizations like homeless shelters and pantries which interact directly with needy populations.

Quasi-governmental and government-funded facilities like public hospitals, community colleges, convention centers, schools and sports stadiums can also generate significant amounts of surplus food that could potentially be donated. However, uncertainty about the city's interest in food donation and contractual limitations in foodservice management contracts can sometimes stand in the way.

STRATEGY #8: ASSESS AND EXPAND FOOD RESCUE SYSTEM CAPACITY

WHAT Current food donation efforts in most cities are under-resourced and operate without the cross-organizational coordination that could improve system efficiencies. Cities can play a leading role in assessing system gaps, facilitating partnerships and networks, and providing infrastructure-related funding.

RECOMMENDED ACTIONS:

- BEST 1** Assess assets, gaps and needed development of food rescue infrastructure [Planning].
- BEST 2** Facilitate the creation of networks and partnership to address gaps and needs and to develop innovative partnerships and models where appropriate [Partnerships].
- BEST 3** Provide grants for food rescue-related infrastructure, staffing and communication functions [Funding/Programs].

**Note that the numbers reflect a natural sequencing of actions. See more detailed explanation in the narrative.*

BACKGROUND AND OVERVIEW

Most cities have nonprofit organizations working to connect food donors with people in need. Despite this good work, current food donation efforts have not yet achieved the scale needed to eliminate the “meals gap” that exists in cities across the country. Many food rescue organizations, particularly those focusing on prepared and other perishable foods, are under-resourced, lacking the paid staff, transportation, food storage and food processing capacity needed to more fully meet community needs. “Last mile” organizations such as homeless shelters and food pantries tend to be especially reliant on volunteers and may lack the infrastructure and operating capacity to handle healthier fresh foods.

Similarly, for donors, finding a nonprofit partner that can pick-up donations promptly, safely and with sufficient frequency is critical. Difficulty finding a suitable partner to pick up food can scuttle the best intentions to donate. In that sense, donors and receiving organizations, as well as city governments, have a shared interest in bolstering food rescue infrastructure so that it can function optimally in meeting community food needs and keeping consumable food out of the waste stream.

RECOMMENDED ACTIONS

All three of the following recommendations represent the BEST actions a city can take to assess and expand the food system rescue capacity. While each could theoretically occur at any time, there is a natural sequencing found in a city first assessing the needs and gaps, and then looking to partnerships to see if needs could be met with existing assets and resources. Where gaps remain, a city can then provide funding for food rescue-related infrastructure, staffing, and communication functions. For this reason, actions in this strategy are labeled BEST 1, BEST 2, and BEST 3 to reflect this suggested sequencing.



BEST 1. Assess assets, gaps and needed development of food rescue infrastructure [Planning].

In many cities, the system for rescuing surplus food has grown unevenly over time, with some parts of that system working quite well and others struggling. For instance, many cities have a strong food banking system that recovers surplus food from grocery chains and food manufacturers. By contrast, capacity to rescue prepared food from restaurants, hospitals, airports, colleges, cultural and sports venues, schools and other sources may be in early stages of development. Even well-developed sectors such as grocery could yield substantial additional donations if sufficient infrastructure was available to fully tap much-needed healthy options including fruits, vegetables, dairy, and other items that require frequent pick up. The rescue “Potential” analysis discussed in Strategy #2 will provide insight into the scale of the opportunities to expand food rescue and thus the gaps in infrastructure and rescue models that need to be addressed.

Analyzing the city’s existing food rescue system is thus key to crafting action strategies to maximize the role of food donation in curtailing waste and addressing food insecurity. Building from the quantitative assessment of “rescue potential” discussed in Strategy #2, cities should gather information (through hosting a roundtable, distributing a survey, etc.) to assess current assets, gaps and areas of opportunity, exploring such questions as:

- What types of foods are most needed and in what quantities relative to current supplies?
How do available supplies synch with the need for culturally appropriate and healthier items?
- What additional mechanisms for coordination and communication among donors and rescue organizations would support overall effectiveness of the system?
- What innovative food rescue models (such as app-powered approaches or models for tapping underutilized transportation or cold storage facilities in the community) could increase food volumes at the lowest cost?
- What additional staffing is needed (particularly for rescue organizations that are highly reliant on volunteers) and what additional infrastructure is needed for transportation, cold storage, handling facilities and food processing, particularly for perishable foods?
- To what degree and for what reasons do donated foods go unused? What strategies could reduce waste among rescue and “Last Mile” organizations, avoid the transfer of food disposal costs from food donors to food rescue organizations, and support recycling of unusable foods?
- How can food donors play a more active role in advancing the effectiveness of the food rescue system, thereby ensuring that their surplus foods reach people in need rather than going to waste?
- How can the city government partner in new ways with food rescue and hunger relief stakeholders to advance shared aims?

Knowing the answers to these questions will allow a city to better understand local needs and tailor their rescue system investments accordingly. This information is also useful in informing the discussion and action taken by the networks and partnerships described below.



BEST 2. Facilitate the creation of networks and partnership to address gaps and needs and to develop innovative partnerships and models [Partnerships].

In many areas there are multiple nonprofits, businesses, philanthropic organizations, and government entities that intersect with food insecurity and food donation issues, but they often do so in silos. Networks and partnerships can help facilitate communication, generate solutions, and promote a comprehensive approach. Including private philanthropic organizations in these networks can help educate funders on the need for rescue support. Networks can also be fertile ground for developing innovative rescue models that could potentially support cost effective, less infrastructure-dependent approaches to rescuing food in the city. For example, Waste Not Orange County partnered with Yellow Cab to pick up and deliver surplus food when other pickup options are unavailable, such as late at night.¹¹¹ Drivers then drop off food at local 7-11 stores for temporary storage until it can be picked up by or delivered to a food pantry. This is a terrific example of nonprofits and local health authorities leveraging underutilized infrastructure in the business community.

Cities are well positioned to provide leadership and coordination for these efforts. Such networks can be standalone entities or a subgroup of an existing body, such as a food policy council. Waste Not Orange County, mentioned above, is a coalition made up of businesses and hunger relief organizations led by the Orange County Environmental Health Department and the Orange County Food Bank.¹¹² Alternatively, the Los Angeles Food Policy Council has established a Food Waste Prevention and Rescue Working Group to advance food recovery efforts.¹¹³



BEST 3. Provide grants for food rescue-related infrastructure, staffing and communication functions [Funding/Programs].

Cities can be instrumental in using grant dollars to address strategic infrastructure needs in the food rescue system. These can include funding to purchase equipment, such as vehicles, coolers, storage and processing facilities, cover key staffing costs, and support real-time coordination between donors and rescue groups. Insufficient transport and storage space, as well as inadequate staff capacity, often limit the type and amount of food that can be rescued and channeled promptly to people in need. Facilities where large donations can be split into more workable volumes for distribution through smaller organizations can also address a key barrier.

Similarly, given the need for real-time coordination between donors and rescuers, having nimble forms of communication is also critical. Grants to select and adopt donation coordination software can be very helpful in this regard. Examples of app-based platforms operating in various sectors include [Spoiler Alert](#), [Food Cowboy](#), [Re-Plate](#) and [Food Rescue US](#).

For instance, both Thurston County and the City of Seattle have grant programs targeting food recovery. Seattle Public Utilities (SPU) launched its Food Recovery Program in 2006 with the goal of diverting surplus food from food businesses to organizations serving those in need. Since then, SPU has provided nearly \$400,000 to 19 hunger relief organizations to purchase storage, transportation, and food processing equipment. This investment is estimated to divert about 23,000 tons over 10 years at a cost of \$29 per ton. Compared to a disposal cost of \$53 per ton, the investments will yield about \$1.2 million in savings over 10 years from avoided disposal costs. SPU also subsidized compostable organics collection costs for these agencies helping them cover costs of switching from garbage collection only, to both garbage and compost collection.¹¹⁴ The Thurston County program is similar, though much newer. They solicited proposals in 2015 from non-profit community organizations for projects that enhance the capacity of food donation system to safely collect, process, store, and distribute surplus edible food.¹¹⁵

Where funding is not available, cities may also consider providing grant writing assistance to hunger relief organizations or offer opportunities to city employees to volunteer in a rescue capacity. Additionally, cities may evaluate what existing assets could be repurposed for food rescue. Cities may also consider organizing and hosting a funding roundtable, bringing together local philanthropic organizations and businesses to think creatively about funding, innovations in rescue models, and opportunities to leverage under-utilized infrastructure in the community.

DISCUSSION

The quantitative assessment of untapped food donation potential in Strategy #2 should inform the planning, coordination and investment efforts discussed above. Planners should identify the sectors of their food system where opportunities are strongest to rescue more of the types of foods that synch best with the needs of the community while doing so in a cost-efficient way.

As new communication technologies and transportation models proliferate, cities will benefit from exploring their options. As the Orange County example illustrates, it can be highly beneficial to open dialogue with the business community to identify under-utilized infrastructure that could potentially be leveraged to support rescue efforts at low cost.

Cities should also pay attention to the unique needs of the “last mile” segment of the food rescue system. Organizations playing that “last mile” function (such as food pantries and homeless shelters) are a critical, but often particularly under-funded and challenged, link in the chain between food donors and needy populations. Many are highly reliant on part-time volunteers, have limited organizational capacity to raise funds, have limited hours of operation, and may lack the training and equipment to handle more perishable foods. As more attention is paid to offering fresher, more perishable foods, the “last mile” stage is sometimes a key bottleneck in the overall system. Cities should also explore additional, innovative models of food distribution such as mobile pantries and popup food distribution events that connect donated food with populations in need in locations where people “already are”, while using less bricks-and-mortar infrastructure.¹¹⁶

BENEFITS

CITY GOVERNMENT: Most cities have both food insecurity needs that have not yet fully been met and a desire to ensure that surplus food is donated rather than added to the waste stream. The above assessment and action strategies are key for identifying needs and opportunities to expand food donation in a strategic way and integrating them into the city's broad waste reduction strategy and targets.

BUSINESS/PRIVATE SECTOR: Involvement in food rescue assessments can ensure that the perspective and needs of food donors are considered when designing strategies for improved food donation efforts. That dialogue may also illuminate opportunities for entrepreneurs to leverage currently discarded food into new businesses and jobs. Food donors also benefit when they donate smoothly and avail themselves of available tax benefits and reduced disposal costs.

HUNGER RELIEF ORGANIZATIONS: Food rescue organizations often have unrecognized and underfunded needs for staffing, transportation, storage and processing infrastructure, coordination, and research. Their concerns about desired types of food, food quality and cultural appropriateness also must be recognized and woven into goals for further development of the community's food rescue system. The strategies above can help identify opportunities to increase donation of appropriate foods, while also highlighting avenues to position food rescue efforts for greatest impact.

INTERACTIONS WITH OTHER POLICIES AND PROGRAMS

The strategies identified in this primer should be completed following the **Rescue Potential Assessment** (Strategy #2) and can be conducted in tandem with the strategies to **address policy barriers to support safe donation** (Strategy #9) and to **engage local businesses and institutions** (Strategy #7).

KEYS TO SUCCESS

- **ENGAGE A RANGE OF ORGANIZATIONS AND COMMUNITY STAKEHOLDERS IN IDENTIFYING OPPORTUNITIES, GAPS AND STRATEGIES FOR STRENGTHENING THE COMMUNITY'S CAPACITY FOR FOOD DONATION.** This should include City staff from the Mayor's Office, health, human services, and economic development departments as well as food rescue organizations, "last mile" organizations such as homeless shelters and food pantries, hunger advocacy groups, current and potential food donors, food insecure populations themselves, and other stakeholders concerned with hunger, food equity, nutrition and waste reduction.
- **LOOK AT THE COMMUNITY'S FOOD RESCUE SYSTEM HOLISTICALLY,** identifying opportunities which are underleveraged and bottlenecks that limit the effectiveness of the system.
- **EXPLORE PHILANTHROPIC AND PRIVATE SECTOR FUNDING OPPORTUNITIES.** In addition to city funding for the efforts described above, other funding options should be explored including foundations, corporate philanthropy, and county and state funding. It is also important to recognize that it's often easier to fund infrastructure (such as vehicle purchases) than to fundraise for the ongoing operating costs needed to maximize effectiveness and responsiveness to community needs. Some states, such as Washington State, offer waste reduction grants to municipalities.¹¹⁷ Depending on how they define waste reduction, rescue efforts may be included.

FURTHER READING AND TOOLS

Beyond Beauty: Lessons from Minnesota's Hunger Relief Community, May 2016. JoAnne Berkenkamp and the Real Food Challenge. <http://ngfn.org/resources/ngfn-database/Beyond%20Beauty%20-%20Hunger%20Relief%20Report.pdf>

2016 Update of Comprehensive Guidelines for Food Recovery Programs;

<http://www.foodprotect.org/media/guide/comprehensive-resource-for-food-recovery-2016-version.pdf>

Food Shift Rescue Services and Recommendations in Santa Clara County:

<http://foodshift.net/2015-food-rescue-services-barriers-recommendations-santa-clara-county-final-report>

Rebalancing the Food Waste Equation: A Case Study for Santa Barbara:

<http://www.cecsb.org/wp-content/uploads/2015/10/CEC-rebalancing-the-food-waste-equation.pdf>

Seattle Food Waste Prevention and Recovery Assessment Report:

<https://depts.washington.edu/uwcpfn/reports/SeattleFoodWasteReport.PDF>

STRATEGY #9: ADDRESS POLICY BARRIERS TO SAFE DONATION OF FOOD

WHAT Current food donation efforts in most cities are under-resourced and operate without the cross-organizational coordination that could improve system efficiencies. Cities can play a leading role in assessing system gaps, facilitating partnerships and networks, and providing infrastructure-related funding.

RECOMMENDED ACTIONS:

BEST Streamline, clarify and disseminate health department regulations that pertain to food donation with the goal of ensuring food safety without imposing undue barriers to donation [Program].

Provide inspectors with the training and tools to more explicitly integrate food donation issues into their work [Program].

BACKGROUND AND OVERVIEW

Health and food safety regulations in many cities and states are based upon the U.S. Food Code, which does not provide food safety guidance specific to food donation. As a result, many city health departments do not publish food donation-specific guidance either. This can contribute to confusion among food business about what city regulations need to be followed, discouraging them from donating. In some instances, the lack of explicit guidance on food donation can also lead to inconsistencies in how related regulations are enforced and communicated when restaurants and other regulated food facilities are inspected by health inspectors. In some communities, perceptions among potential donors that the city “won’t let you donate food” are widespread.

Confusion about regulatory requirements can be complicated by the fact that many donors (such as businesses with multiple locations) and receiving nonprofits like pantries and shelters also operate in multiple adjoining cities and counties, and need to transport the food, for instance, from one jurisdiction where it is donated to another jurisdiction where it can be utilized. Donation efforts can be impeded if relevant health regulations differ from one jurisdiction to another, and where inconsistencies in regulations raise questions about what food handling practices are needed to ensure food safety. This puts a premium on coordination across jurisdictions in establishing and communicating the food safety regulations that pertain to food donation.

At the same time, health inspectors are uniquely well-positioned to ensure that donated foods are handled safely to the benefit of needy individuals, food rescue organizations and donors themselves. Since they work every day with food businesses in course of routine inspection visits, inspectors can play a valuable role in educating donors about what they need to know “to do it right” when they channel surplus foods to charitable organizations in the community.

FEDERAL AND STATE LAWS PROTECTING DONORS AND PROVIDING TAX INCENTIVES FOR DONATION

Food donors are protected from legal liability through the federal Bill Emerson Good Samaritan Food Donation Act.¹¹⁸ If a donated food item later causes harm to the recipient, they are exempt from civil or criminal action so long as the donation was made in good faith.

The federal government also provides enhanced tax deductions for food donations. These benefits were extended to all types of businesses, including smaller donors like independent restaurants, small grocery chains and farms, and made permanent as of December 2015, increasing financial incentives for businesses of all size to donate food. Some states offer additional liability protections and tax incentives for food donations.¹¹⁹

Many potential food donors, particularly smaller businesses, are unaware of these federal protections and tax incentives. City health departments and health inspectors can be instrumental in sharing this information, encouraging donors to donate while helping them do so safely.

RECOMMENDED ACTIONS



BEST: Streamline, clarify, and disseminate health department regulations pertinent to food donation with the goal of ensuring food safety without imposing undue barriers to donation [Program].

Cities should review existing health department regulations to identify which regulations are pertinent to food donation and identify opportunities to streamline and/or clarify any regulations that are not critical for ensuring food safety or other specified goals. Incorporating food rescue organizations and food donors into this review can go a long way in fostering community buy in and identifying situations where existing regulations might be misunderstood or cause unintended logistical challenges for donors or rescuers. City health regulations that pertain to donation should be compiled into one clear set of guidance, posted in an easy-to-find location on the health department's website, and shared when food facilities are inspected. This guidance should clearly indicate the city's interest in encouraging the safe donation of food to address food insecurity issues in the community.

Los Angeles County Public Health Department started the Food Redistribution Initiative to provide resources on safe food donation. The Health Department created a straightforward and clearly written food safety guidelines document addressing topics such as appropriate sources of donated foods and food temperature control. The guidelines also clearly express the department's support for food donation. Included with the document is a food donation delivery form that enables donors, transporters, and recipients to document chain of custody and that appropriate temperature checks were undertaken.¹²⁰ The program helps connect donors of food to organizations that pick up and deliver surplus food and to hunger relief organizations through providing contact information on the program's website.¹²¹



BEST: Provide inspectors with the training and tools to more explicitly integrate food donation regulations into their work [Program].

A variety of helpful actions can position the Health Department to communicate optimally about food donations during interactions with licensed food facilities:

- Health inspectors should be provided with training on relevant issues like food insecurity in their city, the city government's desire to increase safe donation of food to people in need, and the importance of clearly communicating with regulated facilities about the guidance on the city's donation-related regulations developed above. This type of training can help inspectors and city staff see the importance of their work through a broader lens and support effective communication of related regulations.
- The above guidance on safe food donation should be incorporated into the materials provided by health departments to licensed food facilities and built into site inspection protocols.
- City government can also encourage donation by communicating with potential donors about federal liability protection, tax incentives for food donors, and myths that might impede donation. This information can be woven into health department and business permit renewal applications, food handlers permit classes, and green business certification programs. For example, a helpful series of one-page bulletins that provide information about liability and dispel donation-related myths has been developed by the Orange County (CA) Environmental Health Department and the Waste Not OC Coalition. These materials are available on the city's website and health inspectors provide them during inspections.^{122,123,124} They also offer a brief, compelling, and engaging video of a food inspector explaining "the facts to know when donating food" and conveying the county's encouragement of safe food donation.¹²⁵
- Communication with donors can be facilitated by providing a single point of contact for food donation questions within the health department. This allows donors to reach out—ahead of time—when they need advice about how to donate safely.

DISCUSSION

Virtually all cities can review, clarify, and compile city regulations on food donation being a recommended starting point. Leadership and engagement by city health departments are a key factor in the success of efforts to ensure that food donation guidelines are clear and consistently applied and communicated. Cities with a robust rescue ecosystem often have health departments that emphasize the importance of food rescue in addressing food insecurity and maintain strong communication with food donors and rescue organizations. Food rescue organizations operating in the community can be a valuable source of insight and critical allies in ensuring that food is donated, transported, and distributed safely.

BENEFITS

CITY GOVERNMENT: Many cities are engaged in efforts to reduce food insecurity and these strategies represent relatively low-cost measures towards those ends. Although food donation won't address the root causes of poverty that drive hunger, it can help address gaps in food availability within the community. Clarifying food donation protocols can also lead to safer food handling practices as well as a reduction in citations for food businesses, which can lower costs for both cities and businesses.

BUSINESS/PRIVATE SECTOR: Increased donation can mean community goodwill, lower disposal costs, and potential tax benefits for businesses and institutions.

HUNGER RELIEF ORGANIZATIONS AND THE PEOPLE THEY SERVE: Hunger relief and food rescue organizations often report having greater need for food than they supply. These strategies seek to remove barriers to increased food donations among businesses and institutions and facilitate beneficial interactions between health inspectors and the facilities they regulate where food donation is concerned. Including food rescue and hunger relief organization in city-led dialogue about related food safety regulations and how they are communicated by health inspectors can lay the foundation for consistent compliance with applicable regulations.

INTERACTIONS WITH OTHER POLICIES AND PROGRAMS

The actions identified in this primer should be completed after a city **assesses its rescue potential** (Strategy #2), but in tandem with **expanding food rescue infrastructure and capacity** (Strategy #8).

KEYS TO SUCCESS

- **ENGAGE FOOD RESCUE ORGANIZATIONS OF ALL SIZES AND DONORS IN VETTING FOOD SAFETY REGULATIONS THAT PERTAIN TO FOOD DONATION AND RELATED GUIDANCE DOCUMENTS.** Input from food rescue organizations and donors should be sought in reviewing existing regulations and developing guidance to identify potential pitfalls early in the process and ensure that the regulations can be readily understood and are feasible to implement. Furthermore, food rescue organizations are likely to vary widely in terms of their size and operating circumstances. Perishable foods, particularly prepared foods from restaurants and institutions, involve greater handling challenges than non-perishables, so input from prepared food rescuers should be a priority.
- **COORDINATE EFFORTS TO STREAMLINE REGULATIONS WITH NEIGHBORING JURISDICTIONS.** To the extent possible, food safety regulations and donation-related guidance should be coordinated with neighboring government jurisdictions to facilitate donations by those donors and rescue organizations that operate across city/county lines.
- **COMMUNICATE DONATION REGULATIONS TO BUSINESS GROUPS AND ASSOCIATIONS.** The city, working in tandem with partners like the chamber of commerce and trade associations, can communicate with businesses about hunger issues in the community and the role of food donors in helping address it. It is also important for businesses to hear proactive messaging from the city that it is concerned about food insecurity, supports food donation and is taking steps to streamline and address concerns about health regulations that businesses may view as barriers to donation. Perceptions in the business community that “the city won't let you donate” can be a significant impediment. More actively engaging with businesses and institutions can be a very helpful and typically low-cost strategy for responding to food insecurity and avoiding the landfilling of consumable foods.

FURTHER READING AND TOOLS

Hennepin County, Minnesota “Food Donation Guidelines for Licensed Food Facilities”:

<http://www.minneapolismn.gov/www/groups/public/@health/documents/webcontent/wcmssp-206440.pdf>

Metro Nashville Public Health Department “Guidelines for Donating Food & Handling Surplus Foods”:

<https://www.nashville.gov/Portals/0/SiteContent/Health/PDFs/FoodProtection/20161202FoodDonationGuidelines.pdf>

RECYCLE STRATEGIES

STRATEGY #10 Create and expand infrastructure for organics recycling

WHAT DO WE MEAN BY RECYCLE?

The strategy identified in this section entails capturing food scraps as a resource through anaerobic digestion or composting.

BACKGROUND

In a holistic and comprehensive city agenda to address food waste, efforts should be prioritized upstream on reduction and rescue to achieve the greatest economic and environmental benefits. However, even with the most concerted efforts directed upstream, there will always be some food that cannot be eaten, including inedible parts of food, that will have to be managed. Recycling food scraps through composting and anaerobic digestion (AD) allows food scraps to be captured as a resource.

Composting and AD reduce the amount of waste directed to landfills or incinerators (and the associated greenhouse gas emissions) by transforming organic waste into useful fertilizer, other soil amendments, and energy. Composting involves the controlled decomposition of organic materials such as food scraps in the presence of oxygen and produces a nutrient-rich soil amendment. Anaerobic digestion is a natural process whereby bacteria break down organic material in a heated and sealed container with no or low oxygen. The process generates biogas and digestate, the liquid and/or solid material remaining after processing. The biogas can be used to create electricity or heat, or be converted to vehicle fuel. The digestate can be further processed into a fertilizer.¹²⁶

Compost as a product has broad benefits when applied in landscaping and agriculture settings. Just as recycling returns usable materials to the manufacturing cycle, composting returns nutrients to the nutrient cycle. In addition to adding nutrients, using compost can improve soil structure, restore depleted soil, offer erosion control, increase water retention, and reduce the need for chemical fertilizers, which can run off into bodies of water and result in pollution.¹²⁷

Directing food scraps to animal feed is another strategy to manage food scraps, and removes the need for the city to collect or process that material through recycling or disposal. Some food scrap generators are already partnering with local animal production operations to direct food scraps to animal feed; this is rarely facilitated at the municipal level, so is not listed as a strategy in this toolkit, though cities may want to take note of the extent to which generators are already engaging in this method of keeping food scraps out of the waste system and seek opportunities to encourage additional partnerships where appropriate.¹²⁸

STRATEGY #10: CREATE AND EXPAND INFRASTRUCTURE FOR ORGANICS RECYCLING

WHAT Even with the most concerted efforts directed at reduction and rescue, there will always be some food that cannot be eaten that will have to be managed. Recycling food scraps through composting and anaerobic digestion (AD) allows food scraps to be captured as a resource. Assessing gaps in existing infrastructure and planning for investment can help a city develop needed capacity to recycle at scale.

RECOMMENDED ACTIONS:

- BEST 1** Identify and map existing local food scrap recycling capacity and large generators of food waste [Planning].
- BEST 2** Develop a plan to assess opportunities to invest in centralized composting and anaerobic digestion infrastructure [Planning].
- GOOD** Provide funding and technical assistance for onsite/self-managed food scrap recycling for businesses and community organizations [Funding/Program].

BACKGROUND AND OVERVIEW

Some cities, such as Seattle and San Francisco, have robust and long-standing curbside organics collection programs for both commercial and residential sectors that include the collection of food scraps. These types of programs offer a way to divert large amounts of food waste from landfills and return nutrients to the soil through compost. While interest in establishing similar programs in other communities is growing, many local areas lack the infrastructure necessary to fully recycle all food waste citywide. There are several steps that cities can take to position themselves to both create and expand opportunities for organics recycling such that implementing or expanding curbside collection is possible in the future.

RECOMMENDED ACTIONS



BEST 1. Identify and map existing local food scrap recycling capacity and large generators of food waste [Planning].

The first step in expanding organics recycling infrastructure is to understand the current recycling capacity available locally. This involves identifying all composting and AD facilities in the region and collecting information about what materials they accept and how much they currently process. Cities should also include information in their data collection about the capacity of existing anaerobic digesters at wastewater treatment facilities that either accept food waste or could potentially be retrofitted to include food waste. Important data points by facility include:

- **MAXIMUM THROUGHPUT ALLOWED BY PERMIT:** allows city to estimate the maximum processing capability of the existing organics recycling infrastructure;
- **AVERAGE ANNUAL THROUGHPUT:** allows city to see where additional organics recycling capacity currently exists;
- **WHETHER CURRENT PERMIT ALLOWS FOR FOOD SCRAP PROCESSING AND THE MAXIMUM PERCENTAGE ALLOWED:** allows city to estimate the maximum current processing capability for food scraps;
- **WHETHER FACILITY IS INTERESTED IN IMPLEMENTING OR EXPANDING FOOD SCRAP PROCESSING:** allows city to estimate the future processing capability for food scraps.

Some of this data may be collected at the state level. Where data gaps exist, cities can survey each of the processors. The Illinois Food Scrap Coalition, a diverse group of stakeholders interested in promoting food scrap recycling within the state, modified a survey created by the *Institute for Local Self-Reliance* to better understand their state's existing and future food scrap recycling capacity.^{129,130} New York City also conducted a similar study.¹³¹ BioCycle magazine hosts an online clearinghouse of composting facilities that may also be useful (www.findacomposter.com).

The second step involves using information collected in Strategies #1 and #2 to identify large generators and estimate their food waste. Although imperfect, these estimations for major generators can be useful in infrastructure planning as it can illustrate a consistent source of material available for processing, known as the feedstock. Because of the upfront capital investment needed for new composting or anaerobic digestion facilities, private sector entities are often hesitant to plan new facilities without good estimates of future feedstock.

The final step is to map the locations of recycling facilities and the major generators. If the maps are made publicly available, they can help play a facilitative role in linking up major generators with recyclers who are currently under capacity. Maps also provide useful planning data in that they enable a city to assess the location of processing “gaps” relative to major generators and can help haulers design future collection routes. Connecticut and Massachusetts have both conducted mapping projects.

Because organics recycling infrastructure planning is often a regional effort, it is worth reaching out to neighboring cities, as well as county and state agencies, to leverage this effort at a larger scale. That said, lack of interest at the county or state level should not prevent a city from conducting this analysis on their own.



BEST 2. Develop a plan to assess opportunities to invest in centralized composting and anaerobic digestion infrastructure [Planning].

Like most infrastructure planning, developing centralized composting and anaerobic digestion collection and processing infrastructure is highly localized without a “one size fits all” set of recommendations. This section identifies some investment opportunities to consider in the planning process.

Investment opportunities to consider:

- **MAXIMIZE THE EFFICIENCY OF CURRENT FACILITIES:** If the current system is operating under capacity, the easiest and quickest way to expand organics recycling is to enable existing facilities to maximize their throughput according to their permitted capacity where appropriate, noting that some facilities may be operating under capacity for specific reasons (e.g., odor control, facility doesn’t operate year-round, etc.). Cities can help facilitate linkages between major generators not currently recycling food scraps with haulers and facilities interested in expanding throughput of food scrap recycling. Additionally, some food waste may be able to be co-digested at existing anaerobic digestion facilities at wastewater treatment facilities, which offers a way for cities to begin processing food waste without significant capital investment. To realize the maximum environmental benefits, directing food scraps to wastewater AD should be done in a way that prioritizes processing of digestate for nutrient recycling and other soil benefits.
- **HELP EXISTING RECYCLERS TO MODIFY THEIR SYSTEM TO INCLUDE FOOD SCRAPS AS AN ALLOWABLE MATERIAL OR TO ALLOW FOR GREATER FOOD SCRAPS THROUGHPUT:** Where facilities are interested in accepting food waste as a new material or in expanding the amount they process, cities can help the recyclers in the process to modify their permits. Permitting processes vary by state and locality, but in general, composting and AD facilities must secure land use permits from the city or county, must comply with environmental laws, and may also require state and other permits from one or more agencies. Cities and states can help facilities navigate the permitting process, and can potentially partner with state agencies to streamline permitting.
- **CREATE NEW FACILITIES:** Cities may find that even with maximizing the efficiency of the current system or with expanding the maximum throughput, insufficient capacity exists to process the desired level of food waste and that new facilities are needed. To ensure that a new facility can be economically viable, thorough consideration should be given to: facility ownership (municipal vs. private sector vs. hybrid approach), how organic materials will be collected, site evaluation (including impacts on local communities), impacts on existing facilities as well as neighbors, the market for the compost or energy products that would be produced, and other economic issues. Cities may consider investing both in collection and/or processing infrastructure themselves or by providing financial and technical assistance to private operators.



GOOD: Provide funding and technical assistance for onsite/self-managed composting for businesses and community organizations [Funding/Program].

While composting can occur in a large scale, centralized manner, it also can happen locally onsite at businesses, schools, and other locations at a smaller scale. In providing startup costs and/or technical assistance, cities can help individual locations manage their own food scraps without the need for haulers or processors. In some cases, once onsite or self-managed recycling projects have begun, they can become financially self-sustaining.¹³²

Cities can also support community-level composting projects by donating use of land, such as that near schools, waste management facilities, or other city-owned property, and/or providing grant funding to support the development of community compost sites. Co-locating community compost sites with other city resources, such as schools or community gardens, can provide the opportunity to enhance education and engagement as well as keeping food scraps out of the municipal waste stream. The compost produced at these sites can be used in community gardens or directed to various municipal uses.

King County in Washington state developed a commercial onsite food composting pilot where the Solid Waste Division helped nine schools and seven businesses purchase in-vessel composting systems. In-vessel composting systems are typically fully contained systems and thus are typically more odor and vermin resistant. One program participant diverted more than 1,000 pounds of food scraps per month. Additionally, the school participants found these systems to be particularly valuable teaching tools.¹³³

DISCUSSION OF STRATEGIES

As previously noted, organics recycling infrastructure planning is highly complex and the decision to develop new composting or anaerobic digestion facilities (and corresponding materials collection) requires an in-depth look at local conditions. This discussion offers a high-level look at the differences in requirements of both facilities in terms of land area, waste streams, technologies, and costs.

Composting can be adopted at many scales: home composting, community composting, onsite business composting, and large-scale centralized composting. Large-scale centralized compost facilities may be located within city limits, or may be located outside city limits, which might require or benefit from partnering with other nearby municipalities or with the state to provide land and funding. While individual compost facilities will vary in terms of what materials are accepted, the general process of composting is suitable for all types of organic materials. It should be noted, however, that food scraps must generally be combined with other organic material to achieve an optimum process. AD processing, on the other hand, is not typically suitable for woody waste, food-soiled paper, and yard waste. AD facilities should be integrated into an organics recycling system that includes composting facilities to manage the additional organic waste (e.g., yard waste, AD digestate).¹³⁴

AD facilities tend to have a smaller footprint than centralized composting facilities relative to their processing capabilities and thus may be more suited for urban areas where available land is limited. These facilities require greater capital costs, but lower labor costs whereas composting operations tend to be the reverse. (Note though that AD typically produces liquid and/or solid digestate that may need to be further processed for use, which often requires connection with composting or other curing systems.) An additional consideration is local energy prices. Because AD facilities allow the capture of energy from food scraps, local energy prices may impact the economic viability of such facilities.

Other considerations for implementing or expanding composting or digestion of food scraps include how “clean” the feedstock is (e.g. pre-consumer food waste collected from foodservice or food processing businesses may be less contaminated than postconsumer feedstock) and which materials are accepted at a particular facility given its specific processes (e.g. some compost facilities will only accept certain compostable plastics; AD facilities may not accept any organic materials beyond food waste). Collection of materials for processing is also a critical factor, including considering whether municipal services can provide residential and/or commercial collection, how to integrate collection services with other material collection, etc.

BENEFITS

CITY GOVERNMENT: Because composting is a place-based industry and not easily outsourced, economic benefits and job creation are realized locally.¹³⁵ The state of Massachusetts saw a 150 percent increase in jobs supported by the organics industry after the state’s commercial food waste disposal ban was implemented.¹³⁶ Another study in Maryland found that composting employs twice as many workers as landfilling per ton.¹³⁷ Additional benefits of diverting food waste from disposal include extending current landfill capacity and reducing greenhouse gas emissions that would otherwise result from food decomposing in landfills.

BUSINESS/PRIVATE SECTOR: Investing in composting and anaerobic digestion infrastructure may result in new businesses and job creation, as described above. Businesses with on-site composting may also save money through reducing disposal costs.

RESIDENTS: Residents in many areas are interested in composting food scraps and expanding recycling options helps to meet that demand. Additionally, in areas where composting expands, new compost-related jobs may be available.

INTERACTIONS WITH OTHER POLICIES AND PROGRAMS

As indicated previously, the preferred strategies of reduction and rescue must be prioritized to achieve the greatest economic and environmental benefits. Further, there is some evidence to suggest that individuals who know that their uneaten food is going to be recycled may actually be less motivated to reduce their wasting of food, because they think composting is a good outcome.^{138,139} It is critical to include in public outreach that while recycling is preferred to landfilling, it is still not the highest and best strategy for avoidable food waste. The options highlighted in strategies #6 through #9 to first prevent food from being wasted and then to rescue surplus food should be prioritized over recycling of edible food.

Other interactions with policies and programs identified in this toolkit include:

- **Estimating the baseline data** (Strategy #1) on the amount of food wasted is useful in infrastructure planning because it identifies the current feedstock potentially available for composting and anaerobic digestion, as well as identifying large generators.

- Cities should consider how to best deploy expanded food scrap collection for recycling by cities and haulers to support expanding processing infrastructure; **lay groundwork for broader recycling efforts through changes in waste system collection and financing** (Strategy #4).
- Because one of the barriers to developing greater composting infrastructure is a low demand for the resulting compost product, it is important for the city to lead by example in **promoting markets for compost** (Strategy #5). Without a viable market, composted material is sometimes sent to the landfill. Another barrier for the development of increased recycling infrastructure is found where landfilling costs are low relative to recycling. If possible, cities should consider **restructuring their tipping fees** (Strategy #4) such that the fee for organic materials is lower than garbage to encourage recycling to save money.
- Further, it should be noted that facilities will need to be right-sized to account for reductions in feedstock that will result from the **food waste reduction and rescue efforts** (Strategies #6 through #9).
- Finally, it is important to consider how to encourage source separation and other ways to reduce contamination of the organics waste stream. Food scraps cannot be effectively captured as a resource unless they are separated from other wastes. Because households and businesses may associate this process with a certain “yuck factor,” there may be some resistance to voluntary upstream separation. Some jurisdictions have implemented mandatory organics recycling for generators of a certain size or landfill bans that are phased in over time.

KEYS TO SUCCESS

- **CONDUCT EARLY, ROBUST PUBLIC OUTREACH ON THE BENEFITS OF FOOD SCRAP RECYCLING.** It is important that policymakers and the public understand the benefits and need for new or expanded facilities. Education is needed to describe the value of food scrap recycling compared to landfilling to shift the conversation towards uneaten food as a resource. Note though that outreach about the benefits of food scrap recycling should be sure to emphasize the food recovery hierarchy and in particular that prevention and donation are preferred to recycling wherever feasible.
- **ENSURE THAT THE FACILITY SITING PROCESS ACCOUNTS FOR ENVIRONMENTAL JUSTICE AND EQUITY CONCERNS.** Permitting processes for both anaerobic digestion and compost facilities can meet resistance from community members with concerns about odor, aesthetics, noise, and traffic. Historically, waste facilities of all types have often been sited in low-income neighborhoods and have disproportionately impacted communities of color. Effective and intentional community involvement is critical. For best practices and other materials, see the *Model Guidelines for Public Participation* produced by the National Environmental Justice Advisory Council.
- **CONSIDER OTHER OPTIONS TO KEEP FOOD WASTE FROM ENTERING THE CITY’S WASTE STREAM, SUCH AS THROUGH THE PROMOTION OF HOME OR COMMUNITY COMPOSTING.** This primer focuses on scaling up organics recycling infrastructure due to the large potential for quantitative impact, but other smaller-scale options exist to promote composting and keep food out of a city’s waste stream. Providing free or discounted compost bins and training Master Composters are both examples of actions a city can take.

FURTHER READING AND TOOLS

ecomaine Organics Recycling Feasibility Study:

http://www.ecomaine.org/wp-content/uploads/2017/04/ecomainefinal_11-07-13.pdf

For cities further along, the following represent resources for curbside collection programs:

Best Management Practices in Food Scraps Programs:

http://www.foodscrapsrecovery.com/EPA_FoodWasteReport_EI_Region5_v11_Final.pdf

Municipal Curbside Compostables Collection: What Works and Why?:

<https://dusp.mit.edu/sites/dusp.mit.edu/files/attachments/project/Municipal%20Curbside%20Compostables%20Collection%20%20What%20Works%20and%20Why.pdf>

Composting Council Curb to Compost Toolkit: <http://compostfoundation.org/c2c>

EPA Reducing the Impact of Wasted Food by Feeding the Soil and Composting:

<https://www.epa.gov/sustainable-management-food/reducing-impact-wasted-food-feeding-soil-and-composting>

ENDNOTES

- 1 Gunders, D and Bloom, J. *Wasted: How America is Losing up to 40 Percent of Its Food from Farm to Fork to Landfill*, Natural Resources Defense Council (2017). Available at <https://www.nrdc.org/resources/wasted-how-america-losing-40-percent-its-food-farm-fork-landfill>.
- 2 USDA Economic Research Service. Available at <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics.aspx>.
- 3 U.S. Environmental Protection Agency (EPA). *Advancing Sustainable Materials Management: 2015 Fact Sheet*, available at <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/advancing-sustainable-materials-management-0>.
- 4 Bloom, J. *American Wasteland*. Cambridge: Da Capo Press, 2010.
- 5 International Panel on Climate Change, *Fifth Assessment Report*, (2013) Table 8.7.
- 6 EPA. *Advancing Sustainable Materials Management: 2015 Fact Sheet*.
- 7 Lipinski, B, et al. "Reducing Food Loss and Waste." Installment 2 of *Creating a Sustainable Food Future*. Washington, DC: World Resources Institute, 2013.
- 8 Gunders, D and Bloom, J. "Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill."
- 9 Gunders, D and Bloom, J. "Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill."
- 10 EPA. *Advancing Sustainable Materials Management: 2015 Fact Sheet*, available at <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/advancing-sustainable-materials-management-0>.
- 11 Buzby, J, Wells, H and Human, J. *The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States*, United States Department of Agriculture (USDA) Economic Research Service Economic Information Bulletin No. EIB-121 (February 2014).
- 12 Quested, T, et al. "Spaghetti Soup: The Complex World of Food Waste Behaviours." *Resources, Conservation and Recycling* 79 (2013): 43-51.
- 13 McKnight-Yates, L. *Out of Sight, Out of Mind: What Influences Our Perception of Waste and Activates Our Intention to Live More Sustainably?* MA Thesis. Royal Roads University, Victoria BC, August 2009.
- 14 Quested, T, et al. "Spaghetti Soup: The Complex World of Food Waste Behaviours."
- 15 Gunders, D. "Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill."
- 16 EPA. *Advancing Sustainable Materials Management: 2015 Fact Sheet*, available at <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/advancing-sustainable-materials-management-0>.
- 17 Townsend, T. *Alachua County Waste Composition Study*.
- 18 Beck, RW. *2006 Waste Characterization Study: City and County of Honolulu*. City and County of Honolulu.
- 19 CDM. *Waste Characterization Study*.
- 20 EPA. "Sustainable Management of Food: Food Recovery Hierarchy," available at <https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy>.
- 21 EPA. *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2015*. Available at <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/advancing-sustainable-materials-management-0>.
- 22 Berkenkamp, J, Hoover, D & Mugica, Y. "Food Matters: What We Waste and How We Can Expand the Amount of Food We Rescue." (2017) NRDC. Available at <https://www.nrdc.org/resources/food-matters-what-we-waste-and-how-we-can-expand-amount-food-we-rescue>.
- 23 Berkenkamp, J, Hoover, D & Mugica, Y. "Food Matters: What We Waste and How We Can Expand the Amount of Food We Rescue."
- 24 <https://www2.calrecycle.ca.gov/WasteCharacterization>.
- 25 <https://www.epa.gov/sustainable-management-food/excess-food-opportunities-map>.
- 26 Berkenkamp, J, Hoover, D & Mugica, Y. "Food Matters: What We Waste and How We Can Expand the Amount of Food We Rescue."
- 27 <https://www.oregon.gov/deq/recycling/Pages/Oregon's-Recycling-Laws.aspx>.
- 28 Ibid.
- 29 <https://www.epa.gov/sustainable-management-food/united-states-2030-food-loss-and-waste-reduction-goal>
- 30 <https://www.usmayors.org/the-conference/resolutions/?category=a0F6100003rjrjEAA&meeting=84th%20Annual%20Meeting>
- 31 http://www.austintexas.gov/sites/default/files/files/Trash_and_Recycling/MasterPlan_Final_12.30.pdf.
- 32 <https://www2.calrecycle.ca.gov/WasteCharacterization>.
- 33 <http://www.co.thurston.wa.us/solidwaste/regulations/docs/ThurstonCountyWasteComp2014.pdf>.
- 34 <http://www.metrovancouver.org/services/solid-waste/SolidWastePublications/2016WasteCompositionMonitoringProgram.pdf>
- 35 Berkenkamp, J, Hoover, D & Mugica, Y. "Food Matters: What We Waste and How We Can Expand the Amount of Food We Rescue."
- 36 Ibid.
- 37 https://www.municode.com/library/tx/austin/codes/code_of_ordinances?nodeId=TIT15UTRE_CH15-6SOWASE_ART3PRSOWACOSE_DIVIGEPR_S15-6-41AP.
- 38 <http://www.govtech.com/data/3-Cities-Pilot-Cloud-Based-App-Dashboards-to-Get-Smart-About-Trash-Recyclables.html>.
- 39 Personal conversation with Abbie Webb, Casella Organics by phone, May 27, 2015.
- 40 EPA. *Decision Makers' Guide to Solid Waste Management*, Volume II. Washington, DC: EPA Office of Solid Waste, 1995.
- 41 <http://www.oregonmetro.gov/tools-living/garbage-and-recycling/garbage-recycling-hazardous-waste-disposal-portland>.
- 42 http://www.lacsd.org/solidwaste/swfacilities/solid_waste_disposal_and_recyclables_rates.asp.
- 43 <http://www.hennepin.us/~media/hennepin.us/business/recycling-hazardous-waste/documents/hauler-operations-manual.pdf?la=en>.
- 44 <https://archive.epa.gov/wastes/conservation/tools/payt/web/html/ssgaines.html>.

- 45 <https://www.epa.gov/transforming-waste-tool/zero-waste-case-study-renton-wa>.
- 46 <http://www.cityofvancouver.us/publicworks/page/business-garbage-rates>.
- 47 http://wscity01.cityoftacoma.org/government/city_departments/environmentalservices/solid_waste_-_garbage_recycling/garbage/every-other-week_garbage_collection.
- 48 <https://www.portlandoregon.gov/bps/article/402952>.
- 49 <https://bouldercolorado.gov/zero-waste/trash-tax>.
- 50 https://www.acgov.org/sustain/documents/measure_d.pdf.
- 51 <https://bouldercolorado.gov/zero-waste/trash-tax>.
- 52 http://www.cvswwd.org/uploads/6/1/2/6/6126179/surch_ord_94-01_fy14_amendment_as_approved_2013.12.pdf.
- 53 <http://www.hennepin.us/your-government/ordinances/ordinance-15>.
- 54 http://www6.montgomerycountymd.gov/apps/dep/solidwaste/store/documents/trrac/PM_Guide.pdf.
- 55 <http://www.codepublishing.com/CA/Pittsburg/html/Pittsburg08/Pittsburg0806.html>.
- 56 <https://ditweb.atlantaga.gov/mfrd>.
- 57 <https://www.portlandoregon.gov/bps/article/109782>.
- 58 <http://www.pwcgov.org/government/dept/publicworks/trash/pages/solid-waste-fees.aspx>.
- 59 <http://www.fcgov.com/recycling/enclosures.php>.
- 60 <https://dusp.mit.edu/sites/dusp.mit.edu/files/attachments/project/Municipal%20Curbside%20Compostables%20Collection%20%20What%20Works%20and%20Why.pdf>.
- 61 http://www.chlpi.org/wp-content/uploads/2013/12/Food-Waste-Toolkit_Oct-2016_smaller.pdf.
- 62 Ibid.
- 63 https://www.nrdc.org/sites/default/files/glo_11111401a.pdf.
- 64 https://www.epa.gov/sites/production/files/2015-08/documents/r5_fd_wste_guidebk_020615.pdf.
- 65 https://www.epa.gov/sites/production/files/2015-08/documents/reducing_wasted_food_pkg_tool.pdf.
- 66 <http://ilsr.org/wp-content/uploads/2013/05/Compost-Builds-Healthy-Soils-ILSR-5-08-13-2.pdf>
- 67 <https://www.denverwater.org/contractors/construction-information/soil-amendment-program>
- 68 <http://ilsr.org/wp-content/uploads/2014/07/state-of-composting-in-us.pdf>.
- 69 <https://www.biocycle.net/2014/10/20/ordinances-to-amend-soils-boost-compost-demand>.
- 70 https://www.municode.com/library/tx/san_antonio/codes/code_of_ordinances?nodeId=PTIICO_CH26POCO_ARTIIGREVCE.
- 71 <https://sfenvironment.org/article/event-recycling-and-composting/zero-waste-resources-for-event-producers>.
- 72 <http://compostingcouncil.org/wp/wp-content/uploads/2015/06/Compost-Use-for-Stormwater-Management.pdf>.
- 73 Buzby, J, Wells, HF, and Human, J. *The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States*, United States Department of Agriculture (USDA) Economic Research Service Economic Information Bulletin No. EIB-121 (February 2014).
- 74 ReFED. Rethink Food Waste available at http://www.refed.com/downloads/ReFED_Report_2016.pdf
- 75 Ibid.
- 76 Queded, T, *et al.* "Spaghetti Soup: The Complex World of Food Waste Behaviours." *Resources, Conservation and Recycling* 79 (2013): 43-51.
- 77 McKnight-Yates, L. *Out of Sight, Out of Mind: What Influences Our Perception of Waste and Activates Our Intention to Live More Sustainably?*
- 78 Flower, T. Domestic Food Waste Insights Report. London: Shift Design. Available at https://shiftdesign.org/content/uploads/2014/09/shift_Food-Waste_survey.pdf.
- 79 Bulkeley, H and Gregson, N. "Crossing the threshold: municipal waste policy and household waste generation." *Environment and Planning* 41.4 (2008): 929-945.
- 80 Graham-Rowe, E, *et al.* "Identifying motivations and barriers to minimizing household food waste. *Resources, Conservation and Recycling* 84 (2014): 15-23.
- 81 Flower, T. Survey of Existing Consumer Products and Services which Reduce Food Waste.
- 82 NRDC. Save the Food campaign available at <https://www.savethefood.com>.
- 83 EPA. Food: Too Good to Waste Implementation Guide and Toolkit available at <https://www.epa.gov/sustainable-management-food/food-too-good-waste-implementation-guide-and-toolkit>.
- 84 NRDC, "Estimating Quantities and Types of Food Waste at the City Level," available at <https://www.nrdc.org/resources/food-matters-what-we-waste-and-how-we-can-expand-amount-food-we-rescue>.
- 85 Ad Council. PSA Central Digital Library. Frequency Asked Questions available at <https://www.psacentral.org/faq>.
- 86 Presented at WasteExpo April 23, 2018 in Las Vegas, NV "Save the Food Campaign Results and Local Examples of a Nationwide Public Service Awareness Campaign to Reduce Wasted Food." By Darby Hoover and Andrea Spacht, NRDC; Hilary Landa, The Advertising Council; Jenny Kedward, Dakota County.
- 87 Ayaka Emoto, NRDC consultant on Save the Food, personal communication by email to Yerina Mugica, NRDC.
- 88 Ipsos Public Affairs on behalf of the Ad Council (2017), *Food Waste Continuous Tracking Survey*, unpublished raw data. The study, commissioned by the Ad Council and conducted by Ipsos, Public Affairs, surveyed approximately 1,800 respondents quarterly through December, 2017. OR presented at the conference referenced above.

- 89 EPA. Food too Good to Waste Implementation Guide and Toolkit.
- 90 Johnston, M. “Wasted Food Pilots Raise Consumer Awareness.” City of Palo Alto. For example see <https://www.cityofpaloalto.org/gov/depts/pwd/zerowaste/thingstodo/foodwaste.asp>.
- 91 Eat Smart and Waste Less Campaign available at <https://washco-hhs-eatsmartwasteless.squarespace.com>.
- 92 EPA. Food: Too Good To Waste An Evaluation Report for the Consumption Workgroup of the West Coast Climate and Materials Management Forum (April 2016). Available at https://www.epa.gov/sites/production/files/2016-07/documents/ftgtw_finalreport_7_19_16.pdf.
- 93 West London Waste Authority. WRAP: Household food waste prevention case study: in partnership with Recycle for London, The impact of Love Food Hate Waste. Available at http://www.wrap.org.uk/sites/files/wrap/West%20London%20LFHW%20Impact%20case%20study_0.pdf.
- 94 Save the Food: An Update on the Campaign’s First Year (April 2017).
- 95 World Resources Institute. By the Numbers: The Business Case for Reducing Food Loss and Waste by Liz Goodwin (March 06, 2017) available at <http://www.wri.org/blog/2017/03/numbers-business-case-reducing-food-loss-and-waste>.
- 96 ReFED, 2016.
- 97 Food Save. Food Waste Audit available at <http://www.foodsave.org/wp-content/uploads/2014/09/FoodSaveDIYWasteAudit-fin.pdf>.
- 98 Partners for a Clean Environment. Your One-stop Shop for Business Sustainability in Boulder County. Available at <http://pacepartners.com>.
- 99 Stop Waste. Smart Kitchen Initiative. Available at <http://www.stopwaste.org/preventing-waste/smart-kitchen-initiative>.
- 100 <https://www.biocycle.net/2016/08/15/california-county-ramps-food-recovery>.
- 101 Stop Waste. Smart Kitchen Initiative
- 102 https://champs123blog.files.wordpress.com/2017/03/report_-business-case-for-reducing-food-loss-and-waste.pdf.
- 103 Stop Waste. Food Waste Reduction Grants. Available at <http://www.stopwaste.org/preventing-waste/food-waste-prevention-grant>.
- 104 Stop Waste. Alameda County Source Reduction & Recycling Board Grant Funding Agreement. Available at <http://www.stopwaste.org/sites/default/files/RB%20Standard%20Grant%20Contract%20SAMPLE%202016.pdf>
- 105 Stop Waste. Food Waste Prevention Grant Application. Available at <http://www.stopwaste.org/resource/food-waste-prevention-grant-application?page=search>.
- 106 King County. Commercial food waste grants. Available at <https://your.kingcounty.gov/solidwaste/garbage-recycling/commercial-grants.asp>.
- 107 EPA. Food Recovery Challenge. Available at <https://www.epa.gov/sustainable-management-food/food-recovery-challenge-frc>.
- 108 New York City Government. Mayor’s Food Waste Challenge to Restaurants. Available at http://www.nyc.gov/html/sbs/downloads/pdf/neighborhood_development/nddblog/FWC_overview.pdf.
- 109 Nashville.gov. Food Saver Challenge. Available at <http://www.nashville.gov/Mayors-Office/Transportation-and-Sustainability/Food-Saver-Challenge.aspx>.
- 110 Feeding America. Food Insecurity in the United States. Map the Meal Gap database available at <http://map.feedingamerica.org>.
- 111 Washington, N. “*Driving Out Hunger, One Cab at a Time*,” National Geographic. (June 2015) Available at <http://theplate.nationalgeographic.com/2015/06/08/driving-out-hunger-one-cab-at-a-time>.
- 112 Goldstein, N. “*Coalition “Feeds The Need” In California County*,” BioCycle. Vol. 57, No. 8, p. 42 (September 2016) Available at <https://www.biocycle.net/2016/09/15/coalition-feeds-need-california-county>.
- 113 Los Angeles Food Policy Council. Food Waste. Available at <https://www.goodfoodla.org/food-waste>.
- 114 Seattle Government. Seattle Solid Waste Plan 2011 Revision. Available at http://www.seattle.gov/util/cs/groups/public/@spu/@garbage/documents/webcontent/02_015205.pdf.
- 115 Thurston County Public Works Department. Food Recovery Enhancement Grant Program. Available at <http://www.co.thurston.wa.us/solidwaste/Wastedfood/recovery/grant.html> (includes application, sample forms, grant summary, grant questions).
- 116 <http://ngfn.org/resources/ngfn-database/Beyond%20Beauty%20-%20Hunger%20Relief%20Report.pdf>.
- 117 <https://ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Waste-Reduction-and-Recycling-Education-Grants>.
- 118 Bill Emerson Good Samaritan Act of 1996. Pub. L. no 104-210, 110 Stat. 3011. (1996).
- 119 ReFED. Food Waste Policy Finder. About the Finder. Available at <http://www.refed.com/tools/food-waste-policy-finder/about>.
- 120 Los Angeles County Government. Guidelines for Safe Food Donation. Available at <http://publichealth.lacounty.gov/eh/docs/WhatsNew/FoodDonations.pdf>.
- 121 Los Angeles County Government. Food Redistribution Initiative. Available at <http://www.publichealth.lacounty.gov/eh/LACFRI>.
- 122 Orange County Government (OCgov.com). “*Expired Food: Know the Facts*.” Environmental Health Forms, Brochures and Downloads. Available at <http://www.ocfoodinfo.com/downloads>.
- 123 Waste Not OC Coalition. Donor Frequently Asked Questions. Available at www.wastenotoc.org/get-involved/food-donor.
- 124 Waste Not OC Coalition. The Facts to Know When Donation Food. Available at http://media.wix.com/ugd/c117b4_e01dbe01e6a64f74aa53879c9a1ef1c4.pdf.
- 125 Orange County Environmental Health - The Facts to Know When Donating Food. <https://www.youtube.com/watch?v=T8Un6Ft-YRM>.
- 126 NRDC, “Guide to Composting at Sports Venues,” available at <https://www.nrdc.org/resources/guide-composting-sports-venues>.
- 127 Platt, B, *et al*. The State of Composting in the U.S.: What, Why, Where & How. Institute for Local Self-Reliance, July 2014. Available at <https://ilsr.org/state-of-composting>.
- 128 EPA. Reduced Wasted Food When Feeding Animals. Available at <https://www.epa.gov/sustainable-management-food/reduce-wasted-food-feeding-animals>.
- 129 Illinois Food Scrap Coalition. Food Scrap Composting Challenges and Solutions in Illinois Report. (January 2015). Available at <http://illinoiscomposts.org/images/pdfs/IFSC-FoodScrapReportFINAL-Jan2015.pdf>.

- 130 Institute for Local Self-reliance. State of Composting in the United States. (July 2014) Available at <http://ilsr.org/wp-content/uploads/2014/07/state-of-composting-in-us.pdf>.
- 131 Citizens Budget Commission. “Can We Have Our Cake and Compost It Too? An Analysis of Organic Waste Diversion in New York City.” (Feb 2016). Available at <https://cbsny.org/research/can-we-have-our-cake-and-compost-it-too>.
- 132 Institute for Local Self-reliance. Growing Local Fertility: A Guide to Community Composting. (April 2014) Available at <https://ilsr.org/wp-content/uploads/2014/07/growing-local-fertility.pdf>.
- 133 King County Government. Commercial On-site Food Composting. Available at <http://your.kingcounty.gov/solidwaste/garbage-recycling/onsite.asp>.
- 134 NRDC, “Guide to Composting at Sports Venues,” available at <https://www.nrdc.org/resources/guide-composting-sports-venues>.
- 135 Platt, B, *et al.* ILSR, The State of Composting in the U.S.: What, Why, Where & How.
- 136 Fischer, J and Johnston, E. “Calculating Economic Impact of Commercial Organics Ban.” *BioCycle*.
- 137 Institute for Local Self-reliance. Pay Dirt Report. Available at <http://ilsr.org/wp-content/uploads/2013/05/ILSR-Pay-Dirt-Report-05-11-13.pdf>.
- 138 NRDC. “Estimating Quantities and Types of Food Waste at the City Level,” Available at <https://www.nrdc.org/resources/food-matters-what-we-waste-and-how-we-can-expand-amount-food-we-rescue>.
- 139 The Ohio State University. “Worries about food waste appear to vanish when diners know scraps go to compost.” (Jan 2017). Available at <https://news.osu.edu/news/2017/01/03/food-waste-compost>.