

ISSUE BRIEF

# FOOD MATTERS: WHAT FOOD WE WASTE AND HOW WE CAN EXPAND THE AMOUNT OF FOOD WE RESCUE



Wasted food and its effects on people, the environment, and the economy have become a major topic of national conversation, and for good reason. When we waste food, we also waste all the water, energy, labor, agricultural chemicals, and other resources that go into growing, storing and transporting it. That adds up to an economic loss of \$218 billion each year. Most of the food wasted ends up in landfills, where it generates methane, a powerful greenhouse gas that is up to 86 times<sup>1</sup> more powerful than carbon dioxide. Indeed, wasted food is responsible for at least 2.6 percent of all U.S. greenhouse gas emissions. In addition, more than 41 million people in the United States lack consistent access to adequate food in a country where up to 40 percent of the food supply is wasted every year.<sup>2</sup> If we could distribute just 30 percent of the food we currently discard, it would equate to enough food to provide the total diet for 49 million Americans.<sup>3</sup>

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This reality raises key questions:

*Where is food being wasted?*

*What type of food is going to waste?*

*How can it be prevented?*

*How much surplus food can be redirected to people in need?*

*How can cities tackle the challenge of wasted food most effectively?*

To begin to address these questions in detail, Natural Resources Defense Council (NRDC) developed two reports and a series of case studies with support from The Rockefeller Foundation. One study offers critical data about the amounts, sources, and types of food going to waste in three U.S. cities. The other study reveals opportunities for redirecting additional surplus foods to those in need at the city level. City and county governments, in tandem with business leaders, non-profit organizations, philanthropic stakeholders and citizens, can be leading players in catalyzing innovation to reduce the amount of food going to waste and increase food donation. Our analysis and methodologies are designed to provide groundbreaking tools and insights to inform and inspire cities across the country to more fully meet the challenge of wasted food.

At the highest level, our research suggests that cities may want to focus on different approaches with different sectors. Each city should conduct its own assessment to determine which sectors are likely to contribute most to wasted food overall and then use that information to help identify opportunities for outreach and intervention. For instance, although restaurants represent the greatest volume of commercial waste in our study cities, they may not present the greatest opportunity for food rescue because of their high numbers, distributed nature, and relatively small volumes of rescuable food per location. The grocery sector, on the other hand, represents a smaller portion of total commercial food waste, but holds considerable promise for increasing food rescue, primarily through expanded donation of fruit, vegetables, meat, dairy and other healthier perishable foods.

Cities' efforts with restaurants should prioritize preventing food waste in the first place, while encouraging appropriate food donation and ensuring that remaining food scraps are recycled. Similarly, grocery stores can benefit from preventative measures and are a promising source for additional perishable food donations. Institutional food service generates both a significant volume of wasted food and has strong potential for prepared food rescue. For all sectors, including the residential sector, strategies that prevent food from being wasted in the first place should be the highest priority. If a city is considering initiating or expanding residential or commercial food scrap recycling, the city should first consider to what extent the need for food scrap recycling might be reduced by allocating resources to preventing wasted food in the first place and to rescuing surplus food.



## CITIES ARE WELL-POSITIONED TO ADDRESS WASTED FOOD ISSUES WITH THE RIGHT DATA AVAILABLE

Few cities have quantified the amount, sources, or nature of food going to waste at the residential level or in institutional, commercial and industrial settings. Yet cities across the United States are often motivated and well-positioned to address wasted food for three key reasons. First, most cities grapple with food insecurity among their residents and can benefit from expanded efforts to redirect food surpluses to people in need. Second, cities are typically responsible for providing solid waste services, including the infrastructure and financing of waste systems, and food waste represents the largest component of disposed municipal solid waste in the United States.<sup>4</sup> Last, more and more cities have sustainability goals to reduce pollution-causing climate change and reducing the amount of food waste sent to landfills means less methane, a potent global warming pollutant.

NRDC's baseline food waste report, *Estimating Quantities and Types of Food Waste at the City Level*,<sup>4</sup> offers a new methodology for cities to conduct their own assessments of how much, where, and what types of food go to waste. The report also contributes data and information that help highlight opportunities for municipal policies and programs related to food waste, including research into consumer behaviors and attitudes.

In a second report, *Modeling the Potential to Increase Food Rescue*,<sup>5</sup> NRDC developed and piloted a new methodology for municipal governments to assess how much more surplus food could potentially be donated to people in need by businesses and institutions in their communities. And our case studies highlight innovations from around the country in how food is being rescued and how policy is being used successfully to curtail the amount of food going to waste, providing additional social and environmental benefits.

68% of food thrown out by households as reported in our baseline study was potentially edible.

## BETTER DATA ABOUT WHAT, HOW AND WHY FOOD IS WASTED CAN LEAD TO BETTER INTERVENTIONS

To best understand how to tackle the problem of wasted food at the local level, cities need to know more about the state of the problem. Cities in the United States have typically conducted waste characterization studies that identify the proportion of organic waste in the municipal waste stream, without breaking out food as a separate category or analyzing which types of food are going to waste. Better understanding what, how, and why food is wasted and associated behavior is critical to designing effective interventions and tracking progress in reducing both the generation of wasted food and the disposal of food waste.

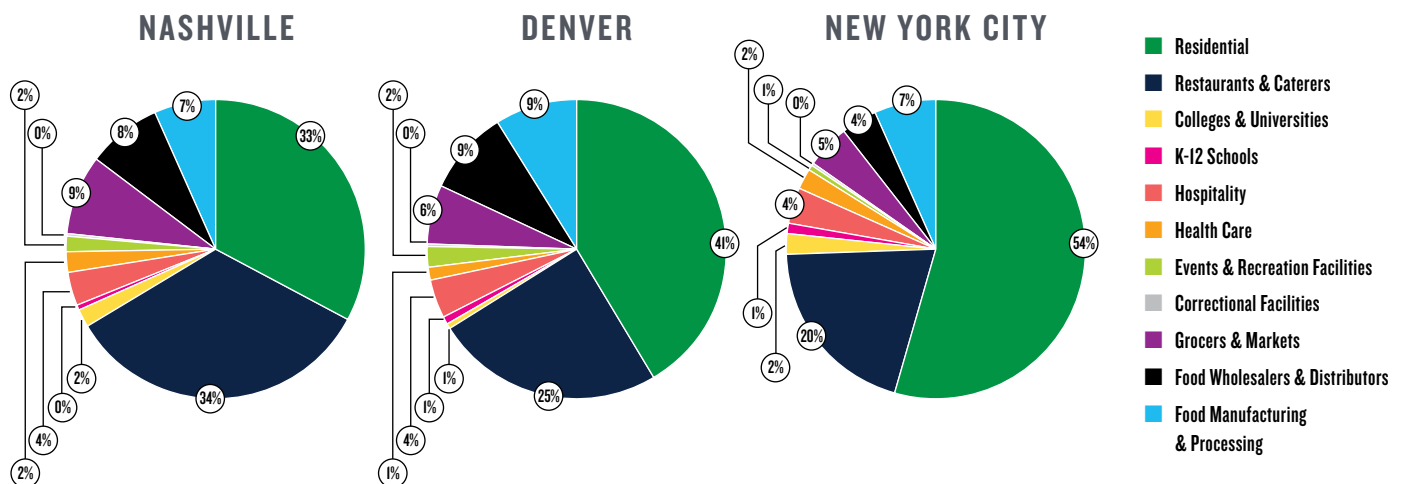
Our report, *Estimating Quantities and Types of Food Waste at the City Level*—the first of its kind in the United States—describes the results of a baseline assessment of residential and industrial, commercial, institutional (ICI) food waste in three cities: Denver, Nashville and New York City. The study differs from other waste studies in several aspects:

- For the residential sector, it:
  - Tracked the types of food and beverages discarded disposed as well as amounts.
  - Tracked food discarded to multiple destinations, such as in trash, down the drain, in compost, and fed to pets.
  - Examined reasons why the food was discarded, with an eye toward determining how much of that food was potentially edible.

- Combined surveys on demographics, attitudes and behavior related to food with kitchen diaries that tracked discards for one week, and bin digs in which we performed detailed waste audits separating food into nine categories. We received a total of 1,357 completed surveys and 613 kitchen diaries, and conducted 277 residential bin digs.
- For the ICI sectors, it:
  - Provided a method of estimating the amounts of food wasted in specific sectors of a city, such as the residential sector, restaurants, groceries, hotels, hospitals, and schools.
  - Estimated the amount of food wasted in each sector using formulas derived from previous studies and regional business information pertaining to 34,040 food-related facilities across the three study cities.
  - Included 145 bin digs for selected organizations in which we performed detailed waste audits separating food into nine categories.

Our study found that the amount of food being discarded in each sector varied by city; however, there were observable trends. In Denver and New York City, the residential sector was estimated to produce the most food waste, followed by restaurants and caterers. In Nashville, the residential and restaurant sectors were virtually tied as the top two generators of food waste. Other sectors contributing significantly to total estimated food waste generation included food wholesalers and distributors, food manufacturing and processing, grocers and markets, and hospitality.

### ESTIMATED FOOD WASTE GENERATED BY SECTOR



## NEW INSIGHT INTO HOUSEHOLD DISCARDS

The residential study unearthed a wealth of detailed information on the character of residential food waste. Some of the highest level findings include:

### *1. A majority of food discarded in households in our study was potentially edible.*

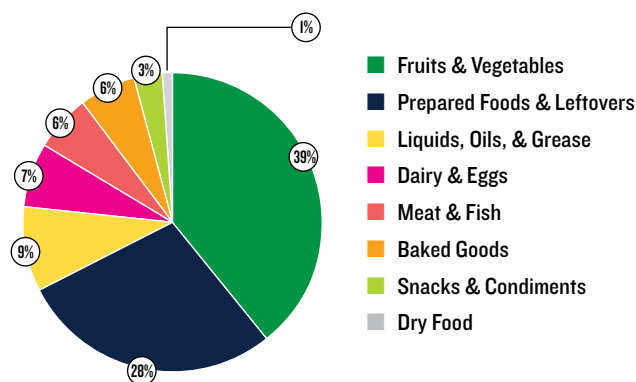
Including questionably edible food, an average of 68 percent of all food discarded as tracked in kitchen diaries was considered edible. The average amount of total food wasted per capita (includes typically edible, questionably edible, and inedible) across all three cities was 3.5 pounds per person per week. The average amount of edible food wasted per capita (includes typically edible and questionably edible) across all three cities was 2.5 pounds per person per week.

It is important to note that edible food is not the same as rescuable food. For one thing, excess edible food from the residential sector or that has already been served is rarely rescued for redistribution due to food safety restrictions; for another, rescued food may contain inedible parts (e.g. donated whole fruit may include inedible parts such as peels).

### *2. Fruits and vegetables and prepared food and leftovers were the two largest categories of wasted food.*

Kitchen diary data indicated that the largest three categories of food wasted by participants were inedible parts, edible fruits and vegetables, and prepared foods and leftovers. After that came liquids, including beverages, oils, and grease. Meat and fish, dairy and eggs, and baked goods were all wasted in similar proportions. Participants in all cities tended to discard similar types of specific food items in the highest quantities. More specifically, when including both edible food and inedible parts, three items—coffee, banana, and chicken—appeared in the top five most wasted food types in all three cities. Items appearing in the top ten most wasted edible foods for all three cities included coffee, milk, apples, bread, potatoes, and pasta.

EDIBLE FOOD WASTED BY CATEGORY



## CATEGORIES OF FOOD ITEMS CLASSIFIED IN NRDC'S BASELINE FOOD WASTE ASSESSMENT

**EDIBLE FOOD:** any substance intended for human consumption; does not reflect the state of food at any point in time.

**TYPICALLY EDIBLE:** a subset of edible food; food intended for human consumption, such as pizza, liquid coffee, and bananas without the peel.

**QUESTIONABLY EDIBLE:** a subset of edible food; food that can be safely eaten, but may not be considered edible by a portion of the population due to culture or preference, such as potato peels, beet greens, and carrot peels/tops.

**INEDIBLE PARTS:** components of food which are not typically consumed in the United States, such as banana peels.

### *3. The most common reasons for discarding food were inedibility, spoilage, and undesired leftovers.*

Residential participants also recorded the reasons for discarding each food item. Most often, food tracked in kitchen diaries was reported as discarded due to being inedible parts (44 percent), moldy or spoiled (20 percent), or simply not wanted as leftovers (11 percent).

### *4. Three-quarters of respondents think they waste less food than the average American.*

Some 76 percent of our survey respondents indicated they believe they throw out less food than the average American. This result seems consistent with our respondents' beliefs (70 percent across the three cities) that they could reduce food wasted in their home only a little or not at all through changes in behavior (e.g. through planning meals ahead of time or changing food shopping habits). In addition, several survey respondents noted that they believe household food waste is not as great a contribution to overall food waste as waste in retail and other sectors, with restaurants and groceries specifically mentioned. This suggests that household-level food waste prevention programs should include not only tips on wasting less food, such as habits for buying the right amount of food and how to store food properly, but also information on the scope of wasted food in households and the extent to which consumers contribute to the problem.

### *5. Nearly a quarter of respondents felt that the actions of their individual household would not make a meaningful difference in the amount of food being wasted.*

These results suggest consumer education should note that the overall effect of wasting less food at the consumer level is not just about reducing the quantity wasted by individual

households, but in creating cumulative effect, including a cultural shift in attitudes and behaviors toward food, which can lead to changes farther up the supply chain as well.

***6. Although more than half of respondents try to waste less food, more than half also felt less guilty about wasting food that was then composted.***

Residential surveys included several questions about behaviors related to shopping for, storing, preparing, and consuming food. Food is wasted at all these stages of consumer interaction, and behaviors at each stage may also influence whether a food item is ultimately eaten or discarded. For example, more than half of respondents said they regularly engaged in strategies to waste less food such as eating leftovers and freezing food, and agreed that it is important to them to finish all food put on their plates for a meal. However, a majority also preferred fruits and vegetables with no blemishes, and nearly half felt less guilty about wasting food that has been in the refrigerator for a long time. More than half (58 percent) felt less guilty about wasting food if it is subsequently composted.

***7. More than half of food in studied cities was trashed, but significant amounts were also composted.***

Kitchen diary participants were asked to track food discarded to multiple destinations: trash, compost, down the drain, or feeding to pets. Across the three cities, trash disposal represented more than half (53 percent) of the kitchen diary discard destinations; down the drain was another 11 percent; and feeding to animals, including chickens, was 2 percent. Some 31 percent of food was discarded to composting, both for home and community use.

***8. For the most part, demographics and other respondent characteristics did not relate directly to amount of food wasted.***

Our analysis compared per capita-level total and edible food waste generated (as determined by kitchen diaries) to household demographics and attitudes and behaviors collected in the first survey (e.g. age, education level, frequency of eating away from home). Most of the statistically significant relationships we found applied to one city only; the findings below applied to all three cities.

Household size was found to be related to amount of food wasted in all three cities, though with slight variations. The general trend is that smaller households waste more food per capita; as household size increases, per capita total food waste generation decreases.

There were also areas where no significant relationship was found, across all three cities:

- Income level and primary language spoken at home were not shown to be related to the amount of food that was wasted.

- For the most part, the amount spent on food eaten either at home or away from home also was not related to wasted food generation.
- We found no link between wasted food generation and households that know about the issue of wasted food versus households that do not know about the issue of wasted food.
- Also, for the most part, race/ethnicity and national origin were not related to amount of food wasted.

Part of the challenge underlying this research is that not much similar research has been previously conducted; as more of this type of research is conducted in the future, it will be easier to identify trends and potentially aggregate data for better extrapolation.

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***58% of baseline survey respondents felt less guilty about wasting food if it is composted.***

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## **FOOD RESCUE CAN BE EXPANDED, ENHANCING FOOD AVAILABILITY FOR VULNERABLE POPULATIONS**

Roughly one in eight households in the United States now experience food insecurity. Indeed, low-income adults and children lacked the financial resources to obtain more than 7.6 billion meals in 2015.<sup>7</sup> This meal gap characterizes the extent of unmet food needs and provides an important reference point for food assistance efforts.<sup>8,9,10,11</sup>

To date, there has not been a methodology for city governments to evaluate how much additional food could potentially be rescued from within their community, beyond current donations. In NRDC's study, *Modeling the Potential to Increase Food Rescue: Denver, New York City and Nashville*, we aimed to quantify the scale of additional foods that could potentially be rescued at the sector level from business and institutional sources located within the three cities. The study was designed to explore three inter-related questions:

- How big is the untapped supply of surplus food within our focal cities that could potentially be donated, focusing on the retail, restaurant and institutional foodservice sectors?
- What additional investments in food rescue infrastructure would be needed for a city to more fully realize its food donation potential from sources within its city boundaries?
- If food donation efforts were optimized, to what degree could a city address unmet food needs among its residents?

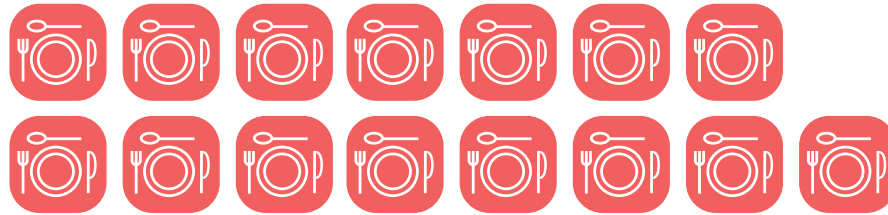
In gauging the potential to increase food donation from within each city's local economy, we explored two scenarios. The first was a "maximum" scenario that used our most optimistic assumptions about the amount of surplus food that could potentially be available for donation to establish an upper-most limit of what's theoretically possible.

# EXPANDED FOOD RESCUE COULD MEET AN ADDITIONAL 46 PERCENT OF DENVER'S MEAL GAP

**POTENTIAL MEALS FROM EXPANDED FOOD RESCUE**



**MEALS NEEDED**



Each square represents one million meals

The second was an “ambitious” scenario that used more realistic assumptions and existing donation patterns to estimate ambitious yet attainable expansion of food donation efforts.

All told, we estimated donation potential in sectors covering more than 30,000 retail, restaurant and institutional foodservice establishments across the three cities. We compared that potential to annual, estimated food needs, as characterized by meal gap data. In Denver, we also modeled the financial investments in food rescue infrastructure that would be needed to more fully realize the city’s potential for food rescue.



## *There is substantial potential to increase the amount of food donated and address cities’ meal gap*

Our analysis showed substantial potential for increased food rescue in the three cities and that as many as 68 million additional meals (or 41,000 tons of food), beyond what is already donated by the sectors under review, could potentially be rescued annually under our maximum scenario. We believe this to be the upper-most limit of what is hypothetically possible from businesses and institutions located within the three cities combined.

In Denver and Nashville, we estimated that the cities could meet an additional 46 percent to 48 percent of their cities’ meal gap under our maximum scenario, suggesting that food rescue from area businesses and institutions could play a much more significant role in addressing food insecurity. We estimated that New York City could meet an additional 23 percent of its meal gap under the maximum scenario.

Under our ambitious scenario, we found that nearly 24 million additional meals could potentially be donated in the three cities combined. This would position them to meet an additional 8 percent to 18 percent of their respective meal gaps, beyond current food donations.

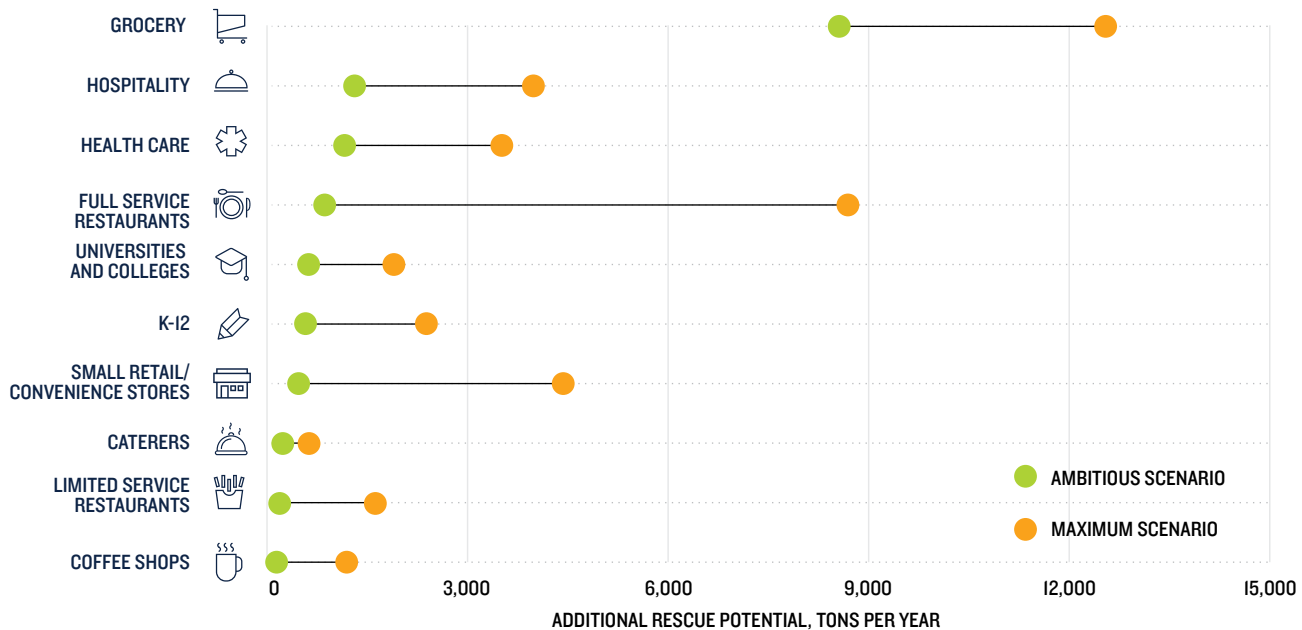
Donating this food would also help cities meet sustainability goals. Across the three cities, it was estimated that 14,075 metric tons of carbon dioxide equivalent global warming pollution could be averted.<sup>12</sup> This would avoid green house gasses equivalent to 33.7 million vehicle miles under the maximum scenario per year.<sup>13</sup> It is important to note that environmental benefits are maximized by utilizing the full spectrum of strategies: preventing food from being wasted, rescuing surplus food, and directing food scraps away from disposal toward animal feed, composting, or other recycling of organics.

**TABLE I: DUAL BENEFITS OF INCREASING FOOD RESCUE (PER YEAR)**

	<b>Ambitious Scenario: Untapped Meal Potential</b>	<b>Ambitious Scenario: Avoided Potential<sup>11</sup> (metric tons of CO<sub>2</sub>e)</b>	<b>Maximum Scenario: Untapped Meal Potential</b>	<b>Maximum Scenario: Avoided Pollution Potential<sup>12</sup> (metric tons of CO<sub>2</sub>e)</b>
Denver	1.5 million	310	7.1 million	1,456
Nashville	3.5 million	718	9.3 million	1,915
New York City	18.6 million	3,838	51.9 million	10,705
<b>Total</b>	<b>23.6 million meals</b>	<b>4,866</b>	<b>68.3 million meals</b>	<b>14,075</b>

# UNTAPPED POTENTIAL FOR ADDITIONAL FOOD RESCUE (TON PER YEAR)

BY SECTOR FOR THE THREE CITIES (COMBINED)



## Multiple sectors of the food economy have untapped potential

Although each city is unique, common themes emerged. Across all three cities, the grocery retail sector showed the greatest potential for increased food donation, representing more than 60 percent of the untapped potential under our ambitious scenario. Much of this potential lies with increased rescue of nutritious foods, such as fruits, vegetables, meat, dairy and deli items.

The hospitality, university/college, and healthcare sectors also offer great potential as they produce significant volumes of food at a relatively modest number of locations, aiding the efficiency of food rescue efforts. Restaurants accounted for the greatest share of discarded food among consumer-facing businesses, but much of it is post-consumer material and is not appropriate for donation. The restaurant sector represents about 7 percent of the untapped potential under our ambitious scenario and 25 percent under the maximum scenario. The chart above highlights the potential we estimate in various sectors of the food economy for the three cities and the number of locations reviewed.

## Expanded food rescue can help reduce the amount of food wasted

We also compared the potential for increased food rescue with amounts of wasted food identified in NRDC's baseline analysis. We found that in the restaurant sector, just 2 percent to 3 percent of the amounts identified in NRDC's

baseline analysis could be avoided through donation even under our maximum potential scenario. Figures ranged from 5 percent to 10 percent among the hospitality, healthcare and university/college sectors.

To a significant degree, these modest percentages reflect the very large portion of discarded food in these settings that is post-consumer, such as plate waste. In fact, NRDC estimates that post-consumer discards may account for 65 percent to 90 percent of all food going to waste in foodservice settings. By contrast, in the grocery sector, we estimate that more than one-third of the total volume of estimated food discards could potentially be donated under optimal conditions.

Food rescue, of course, cannot rectify the underlying causes of poverty that drive hunger such as low wage rates, unemployment and disparities in access to housing, education, healthcare and transportation. It does, however, play a vital role in meeting immediate gaps in food availability for vulnerable populations. Particularly given increasing economic turbulence and income inequality, maximizing opportunities to connect appropriate surplus foods to those in need is a critical issue and one that can complement strategies for addressing underlying structural drivers of poverty and food insecurity. Some social enterprises in the hunger relief space are also incorporating job creation and career development opportunities for low-income and at-risk individuals in their work, as highlighted in our case studies for DC Central Kitchen and Daily Table in Boston.

## ***Additional investment in food rescue and distribution can provide community benefit***

Our analysis shows the significant potential for businesses and institutions within each city to play a bigger role in addressing food needs in their community. But food rescue does not come for free. The cost of rescuing food—from enlisting donors to transporting food to where it can be used to storing it to processing it to ensuring food safety and distributing it to populations in need—are significant. These costs typically have been borne by nonprofit organizations across the country, with the associated costs generally going unseen by those who do not directly work in the hunger relief arena.

To illuminate some of those costs, we took a deeper dive in the city of Denver, estimating food rescue and distribution costs that would be associated with rescuing the additional food estimated under our ambitious and maximum scenarios. To do so, we extrapolated from current costs and distribution methods used by food rescuers and hunger relief organizations in the city. Recognizing that the base of volunteers assisting with these efforts cannot be expanded indefinitely, we incorporated volunteer labor at Colorado's current minimum wage.

The minimum operating costs to achieve our ambitious scenario (about 900 tons of additional food donations) are estimated to be \$2 million per year with an initial minimum capital investment of at least \$213,000. To achieve the maximum potential scenario of more than 4,200 tons of food, minimum operating costs are estimated at \$6.2 million annually with minimum initial capital investments of \$745,000. Public-private partnerships, coordinated philanthropic support, direct or in-kind corporate assistance and entrepreneurship-based models could be useful in raising these funds.

## **MODELS ACROSS THE UNITED STATES PROVIDE INSPIRATION TO REDUCE WASTED FOOD**

### ***Case studies highlight innovations around the United States***

Innovative communities have been experimenting with solutions to reduce the amount of food going to waste. We developed a series of case studies on the work of a range of stakeholders including non-profits, businesses, cities, and states. Although many policies across the United States focus on composting,<sup>14</sup> these case studies highlight a range of innovation, policy and strategies that continue to grow and evolve throughout the country, with attention on those that prevent food from being wasted and direct surplus food to better uses, such as feeding people in need.

For example, the importance of engaging city health inspectors to encourage safe food donation and clearly communicate applicable health regulations are highlighted in examples from Waste Not Orange County near Los Angeles, DC Central Kitchen and Daily Table in Dorchester, Massachusetts. Examples of strategies to encourage overall wasted food reduction include Vermont's University Recycling Law and San Francisco Composting. And examples of how to use rescued food to create high quality, nutritious meals and food products are highlighted in the work of Bon Appétit Management Company, Daily Table, DC Central Kitchen, Second Harvest in Nashville and Drexel Food Labs in Philadelphia.

### ***NRDC's practical tools and analytical insights help inform city-level responses to wasted food***

The data and methodologies provided in NRDC's reports provide insight on how and why food is wasted and the amount of surplus food that could potentially be re-directed to communities in need. It also guides cities in shaping their own research. A recent assessment of wasted food plans across the country discovered that most did not include numeric targets,<sup>15</sup> which are important for prioritizing efforts and measuring progress. Cities conducting their own research can use these tools and refer to the Food Loss and Waste Protocol<sup>16</sup> for additional tools and guidance.

Estimating how much wasted food likely is occurring in each sector can be matched with a city's goals to direct efforts where they will be most effective. For example, if a city is interested in targeting only a few key generators, it should use estimates or available data about its baseline food waste by sector to help determine where to get the most bang for the buck (e.g. event centers). If the city is already working with a sector on other food or sustainability initiatives, it may make sense to add wasted food to that programming.

Our data also indicates that expanded food rescue can play a meaningful role in meeting gaps in food availability in all three communities studied. Realizing that potential will require a strategic focus on those sectors that hold the greatest promise for significant volumes of high quality food and efficient rescue operations, active engagement by potential donors and food insecure populations, and investment in systems to rescue appropriate foods and distribute them promptly to individuals in need. Our analyses aim to spark a deeper dialogue among city policymakers, businesses, philanthropists, anti-hunger advocates and food insecure communities themselves about the potential to prevent wasted food, reduce the meal gap in their communities through increased food donation, and expand food scrap recycling. Our case studies show that there are solutions for cities to do so.



## ENDNOTES

- 1 International Panel on Climate Change, *Fifth Assessment Report* (2013,) Table 8.7. Methane packs 36 times the heat-trapping punch of carbon dioxide, pound-for-pound, over the course of a century after it is released. However, over a shorter period of 20 years, non-fossil methane is 86 times more powerful than carbon dioxide.
- 2 Economic Research Service, “Household Food Security in the United States in 2016,” United States Department of Agriculture (2017), available at <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us.aspx> (accessed on October 16, 2017).
- 3 Dana Gunders, et al., “Wasted: How America is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill,” 2nd edition, Natural Resources Defense Council (2017), available at <https://www.nrdc.org/resources/wasted-how-america-losing-40-percent-its-food-farm-fork-landfill>.
- 4 Darby Hoover, “Estimating Quantities and Types of Food Waste at the City Level,” Natural Resources Defense Council (2017), available at <https://www.nrdc.org/resources/food-matters-what-we-waste-and-how-we-can-expand-amount-food-we-rescue>.
- 5 JoAnne Berkenkamp, “Modeling the Potential to Increase Food Rescue,” Natural Resources Defense Council (2017), available at <https://www.nrdc.org/resources/food-matters-what-we-waste-and-how-we-can-expand-amount-food-we-rescue>.
- 6 United States Environmental Protection Agency, “Advancing Sustainable Materials Management: 2014 Facts and Figures Report,” <https://www.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures-report> (accessed September 20, 2017).
- 7 NRDC extrapolation based on <http://map.feedingamerica.org>. Accessed August 24, 2017.
- 8 Feeding America Map The Meal Gap One-Pager, 2015, <http://www.feedingamerica.org/hunger-in-america/our-research/map-the-meal-gap/2015/2015-map-the-meal-gap-tech-brief.pdf>.
- 9 See Feeding America Map the Meal Gap One Pager. Feeding America’s Map the Meal Gap initiative estimates “how many people, including children, are food insecure in every county and congressional district in the country. We also estimate how many are likely to qualify for federal nutrition assistance programs based on their incomes, how much money they report needing to buy just enough food, and how food prices vary from county to county... We use publicly available local data that research has shown to be associated with food insecurity, including unemployment and poverty, as well as homeownership and median income.” Reported food budget shortfalls identified through surveys conducted by the Current Population Survey are translated into meal equivalents based on estimated average meal costs for each locale, yielding an estimate of the “meal gap” for that area. A “meal” is assumed to weigh 1.2 pounds.
- 10 Feeding America Map The Meal Gap One-Pager, 2015, <http://www.feedingamerica.org/hunger-in-america/our-research/map-the-meal-gap/2015/2015-map-the-meal-gap-tech-brief.pdf>.
- 11 Personal communications, Adam Dewey, Feeding America. Various May – August 2017.
- 12 Estimations based on Environmental Protection Agency, The Waste Reduction Model (WARM), March 2016, <https://www.epa.gov/warm>.
- 13 Ibid.
- 14 Irena Gorski, Sameer Siddiqi, and Roni Neff, “Government Efforts to Reduce Wasted Food Gaining Traction,” Johns Hopkins Bloomberg School of Public Health, <https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-a-livable-future/news-room/News-Releases/2017/government-efforts-to-reduce-wasted-food-gaining-traction.html>, published by CLF on August 17, 2017 (accessed September 20, 2017).
- 15 Ibid.
- 16 Food Loss + Waste Protocol, “Food Loss and Waste Accounting and Reporting Standard,” <http://flwprotocol.org/> (accessed September 20, 2017).