The Last Mile

Analyzing Barriers and Best Practices in Washington's Grocery Food Rescue System

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Prepared for

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GLOSSARY OF TERMS

Anaerobic digester (AD): A vessel that processes organic material into biogas and digestate through microbial decomposition under anaerobic (low oxygen) conditions

Artificial intelligence (AI): the theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages

Cold chain management: Interconnected cold storage system designed to keep food cold (reducing spoilage) from farm through the handling system to final purchase

Composting: The biological degradation and transformation of organic solid waste under controlled conditions designed to promote aerobic decomposition. Natural decay of organic solid waste under uncontrolled conditions is not composting

Edible food: Food that is suitable and safe for human consumption

Food desert: Geographic areas where access to affordable, healthy food options (aka fresh fruits and veggies) is limited or nonexistent because grocery stores are too far away

Food donation transportation: The physical transfer of donated food from donors to hunger relief organizations' facilities

Food hub: A centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products

Food insecurity: The limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways

Food manufacturer: Any business of which the primary revenue stream is derived from the sale of edible food or edible food inputs to other businesses

Food rescue: Any effort to collect unsold or surplus food and donate it to hunger relief organizations

Food system: The inter-related resources, inputs, production, transport, processing, manufacturing, retailing, and consumption of food as well as its impacts on environment, health, and society. Food systems are in a continuous state of change and adaptation

Food waste: Waste from fruits, vegetables, meats, dairy products, fish, shellfish, nuts, seeds, grains, and similar materials that results from the storage, preparation, cooking, handling, selling, or serving of food for human consumption. Food waste includes, but is not limited to, excess, spoiled, or unusable food and includes inedible parts commonly associated with food preparation such as pits, shells, bones, and peels. Food waste does not include dead animals not intended for human consumption or animal excrement (RCW 70A.205.715(5)(a)(i)(ii))

Greenhouse Gas(es) (GHG): Includes methane (CH4), carbon dioxide (CO2), Nitrous Oxide (N2O), Water (H2O), and Ozone (O3) that absorb and emit infrared radiation which in turn warms the planet

Grocery food rescue: The donation of unsold, edible food from grocery stores or distribution centers to other users (1)

Grocery food retailer: Any retail food business that offers or sells food to consumers for primarily off-premises preparation and consumption

Hunger relief organization: An organization that works to capture edible food from grocery stores, restaurants, and individual donors for distribution to those in need

Last mile: The logistics of transporting food from retailers to hunger relief organizations, including supply chain components like transportation, networks, infrastructure, labor, cost, and time

Machine learning: the use and development of computer systems that are able to learn and adapt without following explicit instructions, by using algorithms and statistical models to analyze and draw inferences from patterns in data

Micro hub: Central drop-off/pick-up location(s) for goods and services, which can be used by multiple delivery providers, retailers, and consumers (2)

Organic materials: Any solid waste that is a biological substance of plant or animal origin capable of microbial degradation. Organic materials include, but are not limited to, manure, yard debris, food waste, food processing waste, wood waste, and garden waste. Organic materials do not include any materials contaminated by herbicides, pesticides, pests, or other sources of chemical or biological contamination that would render a finished product of an organic material management process unsuitable for public or agricultural use (RCW 70A.205.015(16)(a)(i)(ii)(b))

Rescue: Refers to the redistribution of surplus edible food to other users (RCW 70A.205.715(5)(d))

Retailer: Any business for which its primary revenue stream is derived from the sale of goods to consumers

Supply chain: A network between a company and its suppliers to produce and distribute a specific product to the final buyer. This network includes different activities, people, entities, information, and resources. The supply chain also represents the steps it takes to get the product or service from its original state to the customer

Third-party facilitators/intermediaries: Organizations, businesses, and applications that act as a matchmaker between grocery stores and HROs, either in creating partnerships, finding food waste diversion streams, and/or handling food donation transportation logistics. These can also be referred to as ***connectors***

Vermicomposting: The controlled and managed process by which live worms convert organic residues into dark, fertile, granular excrement ("castings") (WAC 173-350-100)

Wasted food: The edible portion of food waste. Also referred to as surplus food (RCW 70A.205.715(5)(e))

ABBREVIATIONS

- **AI** – artificial intelligence
- **BCA** – Benefit-cost analysis
- **CO2** – carbon dioxide
- **COM** - Washington State Department of Commerce
- **COVID-19 –** coronavirus disease
- **DOH** - Washington State Department of Health
- **EPA** – Environmental Protection Agency
- **FDIA** – Food Donation Improvement Act
- **FIND** – Further Incentivizing Nutritious Donations Act
- **FLWR** – Food Loss and Waste Reduction
- **Food Center/WCSFM** - Washington Center for Sustainable Food Management
- **GDP** – Gross Domestic Product
- **GHG** – greenhouse gas(es)
- **GIS** – geographic information systems
- **HB** – House Bill
- **HRO** – Hunger relief organization
- **IGD** - Institute of Grocery Distribution
- **IPCC** - Intergovernmental Panel on Climate Change
- **ML** – machine learning
- **NFP** – Nonprofit or not-for-profit
- **NRDC** – National Resources Defense Council
- **NWFA** – Northwest Food Alliance
- **OSPI –**Office of Superintendent of Public Instruction
- **PATH** – Protecting Americans Against Tax Hikes
- **PCC** – Pacific Coast Collaborative
- **PCFWC** – Pacific Coast Food Waste Commitment
- **RCW** – Revised Cost of Washington
- **ReFED** – Rethink Food Waste through Economics and Data
- **SCTL-** University of Washington Supply Chain Transportation and Logistics Center
- **SPU** – Seattle Public Utilities
- ***UFWW Plan*** – Use Food Well Washington Plan
- **UN** – United Nations
- **UN SDG** – United Nations Sustainable Development Goals
- **USDA** – United State Department of Agriculture
- **UW** – University of Washington
- **WRAP** – Waste and Resources Action Programme (UK)
- **WSDA** – Washington State Department of Agriculture
- **WWF** – World Wildlife Fund

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EXECUTIVE SUMMARY

Food waste is directly connected to the challenges of climate change and food insecurity. In Washington State, over one million tons of food waste is generated each year (5). Food waste occurs across the entire food system—from production to distribution to consumption. Food waste has far clear environmental impacts, due to the resources used to grow, transport, process, and purchase that food also go to waste. This results in negative impacts on the environment, the economy, and societal food security.

Food waste is defined as the uneaten food from the retail and consumption phases of the food system that ends up in landfills, incinerated, disposed of down the sewer, or spread onto land. This waste can be both inedible parts of food, such as bones, rinds, and peels, or edible food waste intended for consumption. This report focuses on the grocery retail phase creating edible food waste that can be rescued, a food waste reduction strategy that redistributes edible food surplus to food insecure individuals.

In partnership with the Solid Waste Management program at the Washington State Department of Ecology, this report supports Washington State's food waste reduction goals and implementation of the recommendations from the Use Food Well Washington Plan (UFWW Plan). Building on previous Seattle-based grocery food rescue research, The phrase, "Last mile," refers to the logistics of transporting food from retailers to HROs, including supply chain components like transportation, networks, infrastructure, labor, cost, and time. Ecology and our research team determined that the last mile logistics represents both one of the largest challenges in the grocery food rescue system and a gap in current food rescue research in Washington.

Our research focused on grocery retailers and hunger relief organizations (HROs) to identify recommendations to increase the amount of food being rescued and improve the efficiency of the grocery food rescue process. We assessed the barriers and best practices in the grocery food rescue system and in food donation transportation using a comprehensive review of existing literature, a site visit, and 32 qualitative interviews across a diverse group of stakeholders.

We categorized our literature review and interview findings into systems, supply chain, and stakeholders. These categories represent different levels of the grocery food rescue system and build upon each other to detail how the different pieces of the system influence and impact each other.

The main findings of our research are summarized below in **Figure 1**.

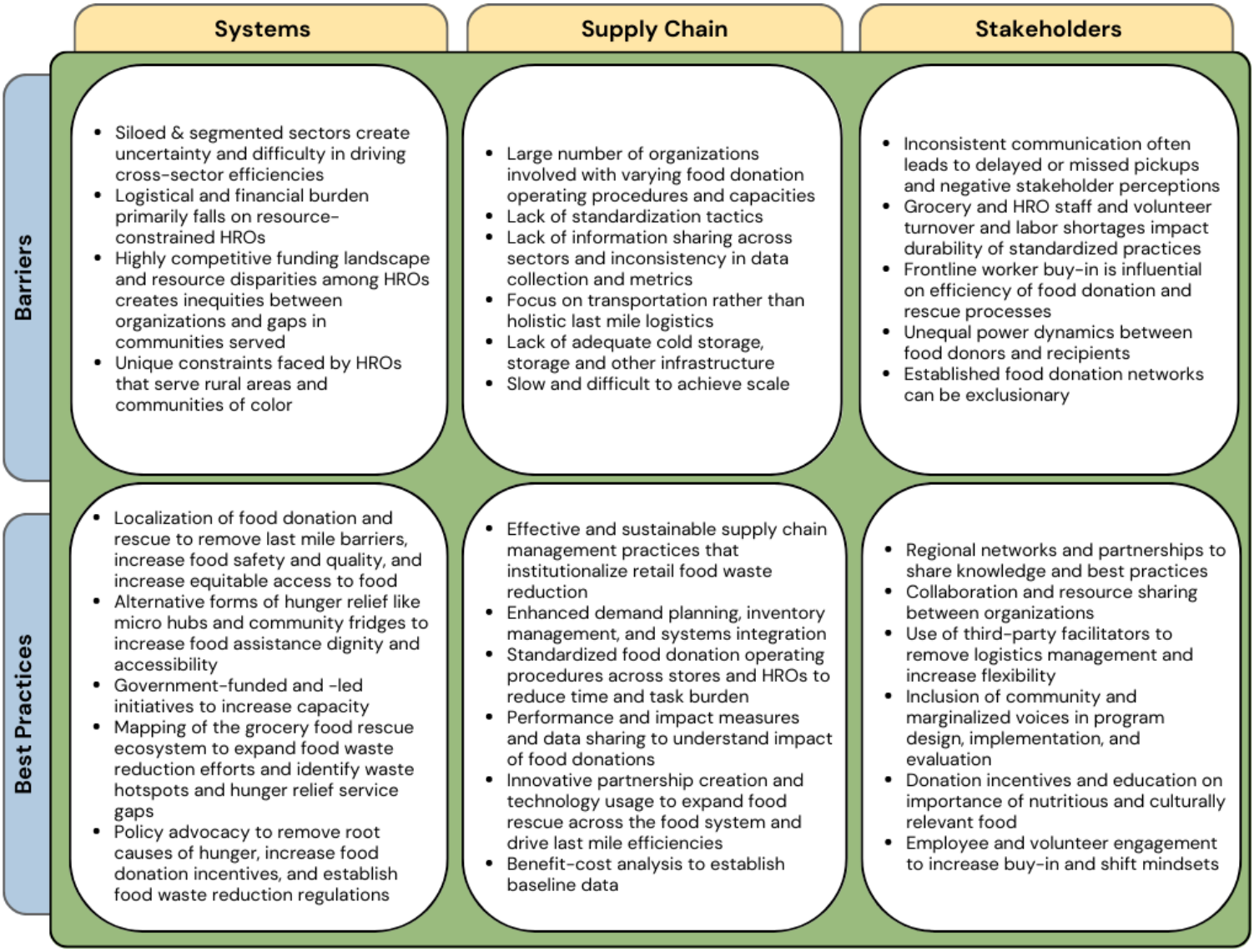


Figure 1: Grocery Rescue Barriers & Best Practices Findings

To support Ecology in meeting Washington State's food waste reduction goals, we developed a roadmap of potential policies and programs across grocery food rescue stakeholders (**Table 1**). This roadmap presents recommendations across three timeframes: short (2023-2025), medium (2025-2030), and long (2030 and beyond). Each recommendation is meant to support or complement the strategies identified in the *UFWW Plan*. As strategies are implemented over time, this roadmap is designed to model intended changes and the evolution of the grocery food rescue system as well as the larger policy environment. These policies are also intended to be used and extended to other food rescue sectors, such as farms, foodservice, restaurants, and hospitality, and food waste reduction projects.

Table 1: Grocery Food Rescue Recommendation Roadmap

Short Term Recommendations (2023 – 2025)
Determine performance measures for food donation impact and quality
Implement voluntary statewide data and standardization processes across grocery retailers
Build out, test, and evaluate alternative forms of grocery food rescue and hunger relief
Increase the use of third-party facilitation partners and technologies
Create a Washington State and Pacific Coast food waste portal, roadmap, and toolkit of grocery food rescue solutions
Encourage collaboration, network and coalition building, and information sharing between grocery retailers, HROs, governments, and food advocacy organizations
Work with corporate grocery retailers to increase investment and commitment to grocery food rescue and food waste reduction initiatives
Incorporate community voices and perspectives into program design, implementation, and evaluation
Build community awareness of food insecurity and food rescue programs
Pilot Project Option 1: Conduct a benefit-cost analysis (BCA) of grocery food rescue
Pilot Project Option 2: Create a map of the food waste and food rescue ecosystem
Medium Term Recommendations (2025– 2030)
Increase government funding of grocery food rescue infrastructure
Establish statewide grocery food rescue process uniformity
Advocate for federal date labeling standards
Long Term Recommendations (2023 and beyond)
Mandate and incentivize waste reduction through government action
Enable a just transition for HROs as food waste levels are halved in 2030
Institutionalize food waste prevention and sustainability into standard business practices
Address other forms of waste from grocery food rescue

From these recommendations, the team identified two pilot project options as opportunities for future research. The first option is a benefit-cost analysis of grocery food rescue. As our research shows, there is a lack of data on the benefits and costs of the full grocery food rescue process, from the grocery store employee labor, food donation transportation, and HRO processing, storage, and benefits to HRO clients. Establishing baseline data will increase the understanding of what goes into grocery food rescue and help to inform future programs and decisions.

The second pilot project option is mapping the grocery food rescue ecosystem. This project involves mapping all the stakeholders, resources, and connections in the grocery food rescue system to provide a resource for those currently involved in the system as well as those who hope to get

involved to expand food rescue efforts and efficiencies. This mapping will also highlight food waste hotspots and gaps in hunger relief access to allow Ecology to target its efforts and increase community-based equity initiatives. We feel these two pilot projects are foundational to implementing and scaling many of our other recommendations and the recommendations of the *UFWW Plan*.

We extend our gratitude to the Department of Ecology and to the other stakeholders engaged in this important work. Our hope is that this report will be a valuable contribution to the growing body of research on Washington's food rescue system. To meet the 2030 food waste reduction goals, we see the inherent need to build a more just and resilience food system in Washington, especially for the last mile of food donation pathways.

CHAPTER 1: INTRODUCTION

FOOD WASTE: DEFINITION AND CAUSES

According to the U.S. Department of Agriculture (USDA), an estimated 30 to 40 percent of all food in the United States goes to waste every year (3). This percentage equals 133 billion pounds of food waste or roughly 130 billion meals (4). In Washington, organic material is the largest contributor to waste disposal streams, and food waste is the largest component (61 percent) of the organics category. The state produces more than one million tons of food waste annually, with over a third of that being edible food that ends up in landfills (5).

Food waste is defined as waste from fruits, vegetables, meats, dairy products, fish, shellfish, nuts, seeds, grains, and similar materials that result from the storage, preparation, cooking, handling, selling, or serving of food for human consumption. Food waste can be both edible and inedible (6). Edible food waste, or "wasted food," refers to food that is intended for human consumption but instead ends up in landfills, incinerated, disposed of down the sewer, or spread onto the land. This can occur if retailers throw out items in damaged packaging, imperfect items, or overstock items or when consumers let produce overripen or wilt.

Figure 2 shows the scope of edible food waste at the production, distribution, and consumption stages of the food system. Edible food waste at the retail phase can be reduced when food that would otherwise go to waste is donated to HROs. The transfer of donated food from retailers to HROs, referred to as the "last mile" of food donation logistics, is the primary focus of our report.

Across all waste disposal streams, the residential sector generates 37 percent, while the commercial sector generates 60 percent of food waste annually. As shown in **Figure 2**, retail food waste is the largest driver of consumer-facing edible food waste. Our research prioritized the food waste created by consumer-facing grocery retail businesses. The main drivers of grocery retail food waste are damaged produce, short-dated products, imperfect produce, and unsold stock. An estimated 50 percent of all retail food waste is driven by date label concerns (7). Edible food waste at the retail phase can be reduced when food that would otherwise go to waste is donated to HROs.

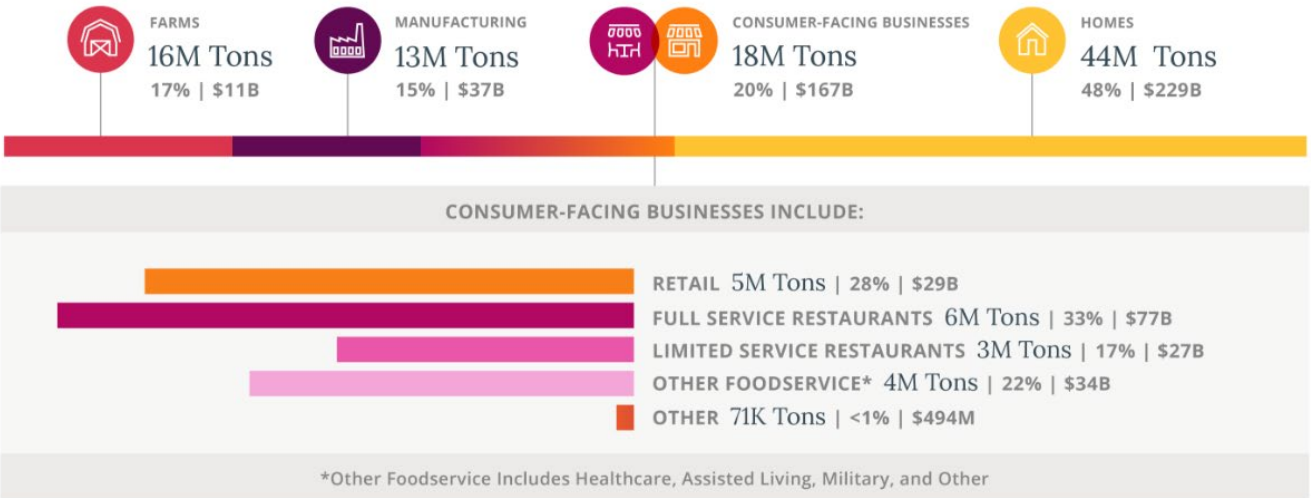


Figure 2: Distribution of Edible Food Waste in the Food System

WHY IS FOOD WASTE REDUCTION IMPORTANT?

Food waste has significant impacts on the climate and environment, economic productivity, and social welfare. A recent study found that food loss and waste contribute to half of the annual global food system greenhouse gas (GHG) emissions (8). This study revealed an 9.3 gigatons of carbon dioxide equivalent from food loss and waste—more than double previous research estimates. The environmental impacts of food waste are broad, as resources are used to grow, harvest, transport, and cook that food have all gone to waste as well. According to the Environmental Protection Agency (EPA), the resources allocated for food that are ultimately lost or wasted in a year:

- Generate a similar amount of GHG emissions to 42 coal-fired power plants,
- Use enough water and energy to supply more than 50 million homes, and
- Cover agricultural land equal to the combined area of California and New York (9).

This waste comes with a price tag. In 2021, edible food waste cost the U.S. $444 billion, roughly 2 percent of the nation's Gross Domestic Product (GDP) (7). Of this amount, $310 billion, or 70 percent, was due to food waste that ended up in landfills. The financial burden of this uneaten food falls primarily on consumers. However, the cost of food surplus to the food industry is $215 billion annually. The latest report from the Intergovernmental Panel on Climate Change (IPCC) shows that reducing food loss and waste could help reduce GHG emissions, improve food security, and enhance food system resilience (10).

Ecology uses a Prevent, Rescue, and Recover framework for food waste reduction policies. This aligns with the EPA *Food Recovery Hierarchy* (**Figure 3)** that prioritizes actions that organizations can take to prevent and divert wasted food. The upper levels of the hierarchy are the most effective ways to divert and prevent waste because they create the greatest benefits for the environment, society, and the economy. This report focuses on the second layer of the hierarchy, "Feeding Hungry People."

ReFED estimates that only two percent of the edible food waste generated in the U.S. is donated (7). Creating connections and improving efficiencies between grocery retailers and HROs rescues potentially edible food waste and redistributes it to food insecure individuals (11).

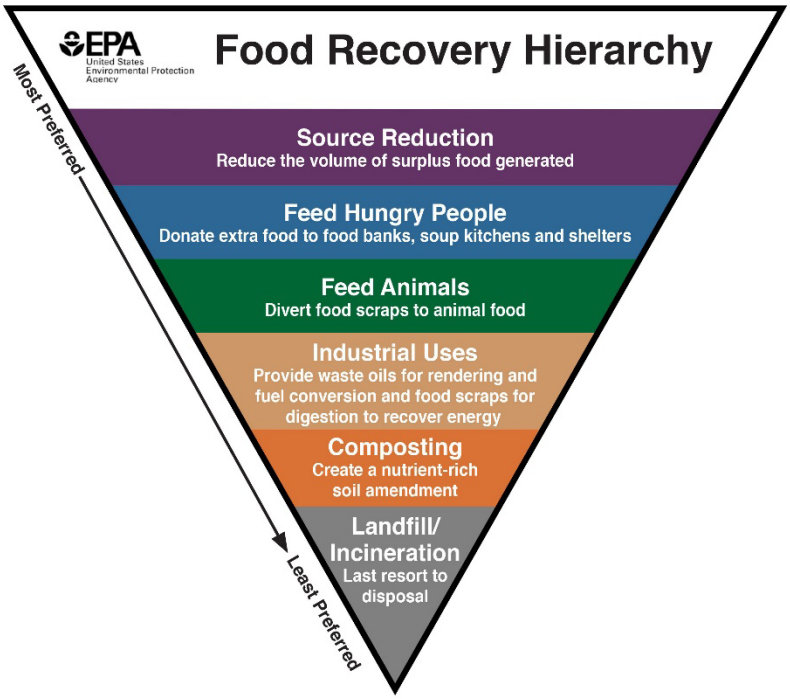


Figure 3: EPA Food Waste Hierarchy

In the U.S. and Washington State, the USDA estimates that 12 percent and 7.9 percent of households are food insecure respectively (12). However, a new study launched during the COVID-19 pandemic shows that substantially higher levels of food insecurity exist in Washington State, especially among low-income households, Black, Indigenous, and People of Color (BIPOC) households, households with children, and renters (13). According to this study, 49 percent of surveyed households experienced food insecurity in 2023, and 55 percent of respondents had used some form of food assistance in that same period. Across the survey sample, inflation-related increases in food prices were felt; however, households experiencing food insecurity cited groceries as the biggest source of financial stress over rent and utilities.

INEQUITY IN THE HUNGER RELIEF SYSTEM

In the U.S., generations of past and present racial discrimination have resulted in systemic barriers that continue to impact people of color today. Households of color earn, on average, significantly less than white households; and even after controlling for income, people of color are far less likely than White people to own or inherit wealth-building assets (14). These economic barriers have implications for the hunger relief system, as they have resulted in disproportionately high rates of food insecurity among non-white households.

The USDA defines food insecurity as “the limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways (15).” Over the past 20 years food insecurity in the U.S. has risen and fallen; however, the gap in food insecurity between people of color and whites has remained persistent. Between 2001 and 2016, research showed that food insecurity rates for non-Hispanic black and Hispanic households were double that of non-Hispanic white households (16). This racial gap is also observed locally in Seattle and Washington State. According to Feeding America, 21 percent of Black households and 20 percent of Latinx households experienced food insecurity in Washington State in 2020 compared to seven percent of White households (17). In Seattle, the 2019 Healthy Food Availability & Food Bank Network Report found that “in general, people of color experienced food insecurity at higher rates than white populations; and households in which the primary language spoken was not English were more likely than English-speaking households to experience food insecurity” (18).

Even as the economic conditions that make people of color more likely to experience food insecurity were created by systemic racial discrimination, accessing hunger relief has been shown to attract social stigma that is perpetuated by racist systems. In her 2019 book “Feeding the Other,” Dr. Rebecca de Souza discusses the stigma that surrounds the hunger relief system. Dr. de Souza notes that "embarrassment and shame are central to the experience of hunger in the United States today," and many individuals experiencing food insecurity report facing judgement and scorn when they attempt to access hunger relief. Although these social stigmas can impact all people, they cannot be disentangled from race and result from "a web of powerful political narratives in which deep-seated ideologies interwoven through politics, religion, and race come together to justify negative perceptions about…poor people, women, welfare recipients, and Black women on welfare. To be clear, stigmatizing narratives follow poor whites around as well, but they are intensified in the presence of darker skin tones (19).”

In accordance with the Department of Ecology's commitment to equity and environmental justice, we sought to keep equity implications as a priority in our research design, literature review, and recommendations, (20). We took the following steps to incorporate an equity lens throughout this report:

- We worked with Ecology to ensure that our interview sample included a diverse group of stakeholders, including organizations serving rural areas and other underserved communities.
- We sought to understand the ways in which equity is currently incorporated in grocery food rescue by including equity-focused questions in our interview protocol (see **Appendix 3**).
- We identified systemic barriers to the last mile of food donation and discuss this barrier in both literature review and findings section of our report.
- We propose recommendations that serve the goal of contributing to a more just and equitable food system.

ABOUT THIS REPORT

This report was written in partnership between Master of Public Administration students at the University of Washington's Evans School of Public Policy and Governance and the Washington State Department of Ecology. This report supports Ecology's implementation of the Food Waste Reduction Act, Organics Management Law, and the *Use Food Well Washington Plan (UFWW Plan)* by identifying best practices and solutions for food rescue. Ecology and our research team determined that food donation transportation represented one of the largest challenges in the grocery food rescue system and a gap in current food rescue research in Washington. As detailed in the *UFWW Plan* and previous Seattle food rescue research, food donation transportation is a major challenge across the food rescue system and impacts all stakeholders. Therefore, this report explores barriers, bottlenecks, and best practices across the grocery food rescue system, focusing on the last mile, meaning the logistics of transporting food from retailers to HROs.

Our research focused on grocery retail and HROs to help identify recommendations to increase both the amount of food being rescued and the efficiency of the rescue process. This was achieved by conducting a literature review and interviews on the barriers stakeholders face around grocery food rescue and food donation transportation, and then engaging in innovative, systems-level thinking to reconsider how the current system functions.

To achieve these objectives, this report explores the following research questions:

1) **What are the major challenges stakeholders in the hunger relief and food rescue system face in effectively and sustainably rescuing edible food from grocery retailers, particularly in the last mile of food donation?**

2) **In the face of those barriers and state climate goals, what are the best practices stakeholders can implement to reduce food waste and increase food security, particularly in the last mile of food donation?**

This report builds on previous research by Seattle Public Utilities (SPU), Northwest Food Alliance (NWFA), Cascadia Consulting, and the University of Washington Supply Chain Transportation and Logistics Center (SCTL) in partnership with PCC Community Markets and Safeway/Albertsons, with the aim of distilling best practices Ecology can use to achieve systematic regional food rescue goals in partnership with regional groups, such as the Pacific Coast Food Waste Commitment (PCFWC), as well as retailers and HROs.

STRUCTURE OF THIS REPORT

This report begins with a short background detailing relevant Washington State food waste reduction legislation and the previous research this report builds upon as well as a description of the research methods used to scope, gather, and analyze data collected from stakeholders across the grocery food rescue system. We then present a literature review that focuses on barriers faced by hunger relief and community organizations and grocery retailers, best practices either currently in use or being testing by different stakeholders and a short introduction on how the grocery food rescue system works and its major stakeholders. Our findings build on this using information from our research interviews and a site visit to draw out systemic challenges, supply chain bottlenecks, and stakeholder dynamics to build a roadmap of recommendations across all sectors of the grocery food rescue system. Outcomes and areas of future research are intended to support Ecology's work to meet Washington's statewide food waste reduction goals.

CHAPTER 2: BACKGROUND

THE ROLE OF THE WASHINGTON STATE DEPARTMENT OF ECOLOGY

The Solid Waste Management program at Ecology is responsible for keeping toxics out of the environment, safely managing waste, and reducing waste that ends up in landfills by promoting efforts to prevent and reuse waste (21). As a result, Ecology is responsible for informing the development of food waste reduction laws, adopting a food waste reduction plan, and measuring and tracking progress towards statewide food waste reduction goals. Ecology and other state agencies partner with local, state, and regional businesses, nonprofits, jurisdictions, and governments to reduce food waste and drive systemic change. This repot supports statewide food waste reduction by building our knowledge of barriers and opportunities to reduce food waste in Washington State.

RELEVANT WASHINGTON STATE FOOD WASTE REDUCTION LEGISLATION

FOOD WASTE REDUCTION ACT

In 2019, the Washington State Legislature unanimously passed the Food Waste Reduction Act (codified as RCW 70A.205.715) to address food waste and wasted edible food in Washington. The law established a statewide goal to reduce the amount of food wasted annually by 50 percent by 2030, grounded on a 2015 baseline. As a subset of this larger goal, Washington also set a target to support the prevention of edible food waste.

To inform this law, Ecology was required to identify and develop Washington's baseline food waste data. This data showed that in 2015, Washington generated approximately 1.2 million tons of food waste annually, with over 390,063 tons of that being wasted edible food (**Appendix 1**). The commercial sector generated 60 percent of food waste annually, and the residential sector generated 37 percent. To achieve the 2030 food waste reduction goals, Washington needs to reduce the amount of food waste generated annually by at least 579,373 tons and the amount of edible food wasted by at least 195,032 tons, against the 2015 baseline data (5).

The passage of the Food Waste Reduction Act aligned Washington with other global, national, and regional goals to reduce food waste by 50 percent by 2030. These goals include the United Nation's Sustainable Development Goals (UN SDG) 12.3, the USDA and EPA's Food Loss and Waste 2030 Champions and Champions 12.3 initiatives, and the PCFWC.

USE FOOD WELL WASHINGTON PLAN

The Use Food Well Washington Plan is the result of the Food Waste Reduction Act (22). In addition to developing baseline data, Ecology was tasked to develop a food waste reduction plan to meet the 2030 goals based on three key strategies:

Prevention: Prevent and reduce the amount of food that is wasted

Rescue: Rescue edible food that would otherwise be wasted and ensure the food reaches those who need it

Recovery: Support productive uses of inedible food materials, including using it for animal feed, energy production through anaerobic digestion, and for off-site or on-site management systems including compositing, vermicomposting, or other biological systems

To draft the plan, Ecology consulted with the Washington State Departments of Agriculture (WSDA), Commerce (COM), Health (DOH), the Office of Superintendent of Public Instruction (OSPI), and over 100 experts to identify ways to reduce food waste and wasted food in Washington. The UFWW Plan prioritized public-private partnerships over regulations to reduce burdens across the food system, particularly for the hunger relief sector. The UFWW Plan identified a total of 30 recommendations to reduce food waste through this collaborative process, including a mix of federal and state policy changes, increased program funding and investments in public education, food management systems, and recovery infrastructure. The full list of recommendations is presented in **Appendix 2**.

Using economic analysis to estimate the UFWW Plan's costs, impacts, and the diversion potential of the recommendations, Ecology found that with a comprehensive implementation of the UFWW Plan, the 2030 goals are achievable. As presented in the UFWW Plan, the implementation of these strategies will result in real environmental, social, and economic benefits to reducing food waste and wasted food in Washington State such as:

Environmental Benefits: If the actions in the UFWW Plan are all implemented, they have the potential to reduce annual food waste generated in Washington by 1.3 million tons. This prevents 1.9 million metric tons of GHG emissions by, which the EPA's Waste Reduction Model estimated to be equivalent to the energy needed to power over 346,000 homes annually.

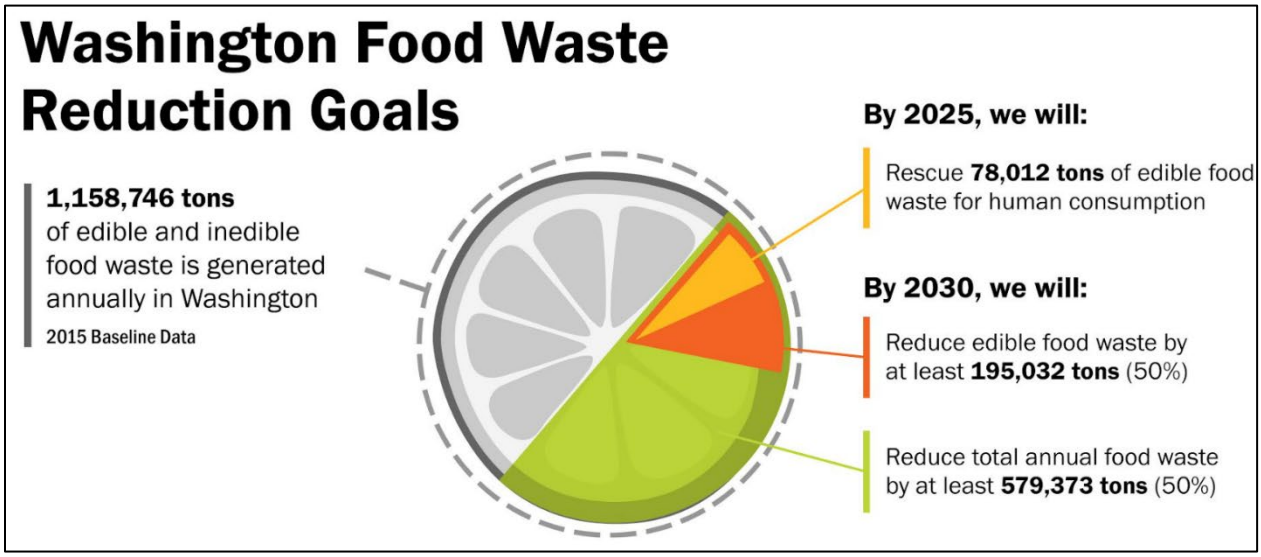
Social Benefits: UFWW Plan recommendations have the potential to reduce wasted edible food by at least 295,000 tons per year. This is critical to the over 2 million food insecure Washingtonians who realize the most benefits from rescued food.

Economic Benefits: Full implementation of the recommendations would create $4 in benefits for every $1 spent, and potentially garner net benefits over $1 billion annually in Washington (21).

Our research prioritized food waste in the retail portion of the commercial sector and the food waste strategy we focus on was rescue; however, our research showed that the three food waste reduction strategies work most effectively in tandem rather than in siloes. As detailed in the UFWW Plan, collaboration and a cross-sector approach are crucial to build efficiencies and drive systemic change.

ORGANICS MANAGEMENT LAW

The most recent piece of Washington State legislation related to food waste and edible food waste rescue is the Organics Management Law (HB 1799). Passed in 2022, the Organics Management Law does not ban the disposal of food and yard waste in landfills, but it does require the diversion of organic materials away from landfill disposal and toward food rescue programs and organics management facilities. This law works as a strategy to reduce the methane emissions associated with the ineffective disposal of organic materials. The food waste reduction goal established by the Organics Management Law calls for 78,012 tons of edible food waste to be rescued for human consumption by 2025. Together with the goals of the Food Waste Reduction Act, Washington's food waste reduction goals are summarized in **Figure 4**.



The Organics Management Law establishes a phased approach to eliminating landfill disposal of

Figure 4: Washington State Food Waste Reduction Goals

organic materials by businesses. By July 1, 2023, and annually thereafter, Ecology must report which jurisdictions with solid waste management plans already offer organics collection and whether their facilities have the capacity to accept more material. This report will help local jurisdictions determine if they are required to offer organics collection to businesses. By July 1, 2024, with some exceptions, businesses will need to arrange for organics collection. The law also amends Washington's Good Samaritan Donation Act (Section 301) to reduce the legal liability risk barriers food businesses and manufacturers face in connection with edible food donation. These amendments allow for food to be donated past the date given on a date label, provided that the date label is not safety related, and permit qualified donors to donate food directly to consumers. Both amendments aim to make it easier to donate excess food to hunger relief and food rescue groups.

The key sections of the Organics Management Law that are relevant to this report include:

> **Section 402**: Washington Center for Sustainable Food Management (Food Center)
>
> Ecology must establish the Food Center by January 1, 2024, to help coordinate statewide food waste reduction, as recommended by the *UFWW Plan*. The Food Center will work to meet statewide food waste and recovery goals.
>
> **Sections 403 and 404**: Voluntary food donation tracking
>
> Ecology must coordinate with WSDA to establish compatible voluntary reporting protocols to track food donations from both businesses and recipients of donated foods in support of the goals of the Food Center.

The findings and recommendations presented in this report support the goals of the Organics Management Law by exploring strategies to increase the amount of food rescued and supporting the reduction of organic waste in landfills.

PREVIOUS SEATTLE-FOCUSED GROCERY FOOD RESCUE RESEARCH

Our research built off two recent grocery food rescue studies conducted by SPU in partnership with NWFA, the University of Washington SCTL, PCC Community Markets, and Safeway/Albertsons. These studies are discussed more thoroughly in the literature review section but are presented here to introduce key stakeholders and provide context on the foundations of our research.

SEATTLE PUBLIC UTILITIES "GROCERY RESCUE ASSESSMENT"

Seattle Public Utilities oversees solid waste management for the City of Seattle and develops policies for waste prevention and recycling. The 2021 "Grocery Rescue Assessment" was prepared by and completed in partnership with NWFA, a purpose-led organization working to develop strategies for a more efficient, equitable, and nourishing food system. The report was also completed in partnership with PCC Community Markets and Safeway/Albertsons, both of which are signatories to the PCFWC and committed to improving their grocery food rescue practices within their distinct business operations.

The purpose of the "Grocery Rescue Assessment" was to develop recommendations that would guide SPU and participating grocery retailers toward actionable steps that reduce wasted food and increase quality donations in Seattle. The report does this by establishing a benchmark of current grocery rescue practices, collecting baseline data, and identifying overarching findings and actions for SPU and grocery retailers (1). Since the report was published, SPU has launched a successful pilot program testing standardized grocery food rescue bins at several Seattle Safeway stores and NWFA is currently working with the corporate retailer to analyze and streamline its grocery food rescue model in its Seattle stores in hopes of scaling up nationwide.

UNIVERSITY OF WASHINGTON SUPPLY CHAIN TRANSPORTATION AND LOGISTICS CENTER "IMPROVING FOOD RESCUE IN SEATTLE"

Completed in partnership between SPU and the University of Washington SCTL, the "Improving Food Rescue in Seattle: What Can Be Learned from a Supply Chain View?" report conducts foundational research on the logistics of food rescue in Seattle as a part of SPU's broader food rescue work. The research challenges one commonly made assumption about grocery food rescue in Seattle: that if hunger relief and nonprofit organizations had more trucks and more drivers, then the grocery food rescue system would operate at maximum efficiency. While this research demonstrated that organizations often do face transportation resource shortages, the main issue is the uncertainty faced by HROs and grocery retailers at almost every step of the food rescue process (23).

CHAPTER 3: RESEARCH METHODS

LITERATURE REVIEW

To identify barriers and best practices, we reviewed academic, government, industry, and nonprofit research and reports on grocery food rescue and adjacent systems. This included research on the broader hunger relief system, food waste policy landscape, waste management, supply chain logistics, and sustainable transportation. We included regional, national, and international pilot programs in our review to inform the design of our pilot programs and to understand what strategies and solutions have already been tested within food rescue. In our research, our focus on last mile transportation barriers and solutions was central to how we identified and scoped the resources we reviewed and included in our analysis.

STAKEHOLDER INTERVIEWS

We conducted cross-sectoral interviews with expert stakeholders to connect information from the literature review to the on the ground realities of how grocery food rescue works in Washington. The purpose of these interviews was to obtain a deeper understanding of the barriers different stakeholders face in grocery food rescue in addition to seeking stakeholder expertise in the formulation of best practices. Interviews were approximately 30 to 45 minutes in length and spanned the topics of grocery food rescue and food donation transportation processes, barriers, and potential solutions. The full interview protocol can be found in **Appendix 3**.

We worked closely with Ecology, SPU, NWFA, and the SCTL to draft our initial interview participant list. This initial group consisted of approximately twenty-two individuals across a variety of public, private, and nonprofit stakeholder groups that are actively involved in food rescue or have participated in previous food rescue research. From this initial sample, we used a snowball sampling to ask interview participants to recommend other contacts from their networks for us to interview. We concluded the snowball sampling once we had exhausted contact referrals and started to hear common responses across interview participants. A full list of organizations interviewed is presented in **Table 2** below.

Our interview participants spanned the following stakeholder groups:

- Grocery retailers
- HROs
- Local and regional government employees
- Local and regional nonprofits
- Academic professors and researchers
- Non-grocery food retailers, food businesses, and food manufacturers
- Waste reduction application representatives
- Third-party intermediaries focused on facilitating food rescue between retailers and HROs

All interviews were recorded and transcribed. The team analyzed interview transcripts and wrote informal memos on an ongoing basis to identify major themes across interview participants and refine interview questions as needed. Once all interviews were completed, team members

individually analyzed interview transcripts to identify preliminary trends before aligning on final themes. The team used these themes to identify and count the frequencies at which barriers and best practices emerged across interview participants. These frequencies were then used to build out the findings and recommendations for our report.

Table 2: Interview Participant Organizations

Organization	Sector
Amazon	Retailer
PCC Community Markets	Retailer
Safeway/Albertsons	Retailer
Starbucks	Retailer
Bellingham Food Bank	HRO
FareStart	HRO
Food Lifeline	HRO
Lake Chelan Food Bank	HRO
Northwest Harvest	HRO
Olympia Food Pantry	HRO
Rainier Valley Food Bank	HRO
Second Harvest	HRO
University District Food Bank	HRO
West Seattle Food Bank	HRO
White Center Food Bank	HRO
Harvest Against Hunger	Nonprofit
Miracle Food Network	Nonprofit
Sustainable Connections	Nonprofit
Wasat	Nonprofit
Washington Food and Nutrition Coalition	Nonprofit
World Wildlife Fund/Pacific Coast Food Waste Commitment	Nonprofit
University of Washington, Environmental & Occupational Health Sciences	Academic
University of Washington, Urban Freight Lab	Academic
King County Local Food Initiative	Government
Seattle Public Utilities	Government
Too Good To Go	Marketplace for selling surplus food
Bob's Red Mill	Food Manufacturer
Food Donation Connection	Food Rescue Intermediary
Food Mesh	Food Rescue Platform
Northwest Food Alliance	Nonprofit Strategy & Consulting

SITE VISITS

We conducted on-site observations of the end-to-end grocery food rescue process, from vehicle preparation, stakeholder communication, pickup, and transportation, to unloading and weighing donations at an HRO to understand the realities of the grocery food rescue and food donation transportation processes. These site visits were in collaboration with the Rainier Valley Food Bank, and we rode along to donation pickups at a Safeway and a QFC. Our observations included informal interviews with key participants from the retailers and HRO, focusing on standard operating procedures, pain points, and areas for improvement. Images from the site visits can be found in **Appendix 4**.

DIVERGENT THINKING FRAMEWORK

Divergent thinking is a framework to spark creative, free flowing, unlimiting idea generation. Strategies include brainstorming sessions, free writing, subject mapping, asking "what-if" questions, making web-like connections between multiple ideas, taking creative risks, and exhausting all possible options when ideating (24).

The team held a half-day divergent thinking session leveraging these strategies to create a mind map of findings and recommendations linking to the barriers and best practices we identified through our literature review and interviews. These recommendations were then culled down and prioritized to build the roadmap presented in our recommendations.

RESEARCH LIMITATIONS

While this research aims to be as comprehensive as possible, there were several limitations.

TIMELINE AND SCOPE

Grocery food rescue and the wider ecosystem of food rescue is a broad and complex issue that includes numerous diverse stakeholder groups. Given our six-month timeline and our work capacity as students, we narrowed our research to focus on food donation transportation and last mile logistics. While our research touches other parts of the greater food rescue system, it would be valuable to research the entire food and organic waste diversion and rescue chain to drive synergies and build efficiencies across the system.

LIMITED ACCESS TO QUANTITATIVE DATA

The lack of data was one of the main barriers identified in SPU's "Grocery Rescue Assessment" and a common barrier uncovered in our literature review research and interviews. As part of our research, we wrote surveys for HROs and retailers to gather quantitative data. These surveys can be found in **Appendices 5 and 6**. However, due to low response rates we were not able to gather a representative sample or include that data in our report. This small sample size impeded our ability to quantitatively analyze the grocery food rescue system. While we recommend several strategies to increase data collection and sharing related to the Organics Management law voluntary data tracking, it would be beneficial to track this space as more cohesive data emerges across the industry leading up to 2030 food waste reduction goals.

RESTRICTED INTERVIEW PARTICIPANT SUBSET

Our timeline and scope also limited how many interviews we could complete and whom we could interview. With additional time, we would have liked to increase the number and diversity of our interview participants. We recommend expanding this research to include more HROs, grocery stores, and food businesses in rural areas; increasing the sample of community organizations and smaller HROs serving communities of color; and interviews with grocery store employees who are responsible for facilitating grocery food rescue to gain a better understanding of the frontline experience. We also recommend interviewing HROs and retailers that use food waste reduction apps/platforms to further understand the benefits and challenges of these technologies.

SIMULTANEOUS RESEARCH

King County is fortunate to have several pioneering organizations, government agencies, and academics working on food and waste diversion. These organizations, such as NFWA, are engaged in ongoing work with local and national grocery chains and HROs to test new standardization processes and food donation transportation innovations. Based on our limited timeline, we were not able to pull in findings from pilots and programs currently being tested. As this work is occurring simultaneously, we recommend a cross-reference analysis to bring these works together upon completion.

CHAPTER 4: LITERATURE REVIEW

WHAT IS GROCERY FOOD RESCUE AND HOW DOES IT WORK?

Grocery food rescue is a subset of food rescue that redistributes unsold, edible food donated by grocery retailers to hunger relief and other community organizations to feed people in need. Grocery food waste occurs for a multitude of reasons: consumer preference shifts, store or customer-specific quality standards, date label concerns, or inventory mismanagement can all drive edible food waste.

Over the past couple of years, the COVID-19 pandemic and inflation led to increased fluctuations in consumer demand for food, resulting in both product shortages and increased waste. Each year, the U.S. generates around 80 million tons of surplus food. Of that amount, only 2.78 million tons, or 1.2 percent, is donated (7). This is a crucial gap as donations from grocery food rescue comprise a significant portion of HROs' food supply. In Seattle, some HROs receive up to 80 percent of their food supply through grocery donations (1).

Although grocery food rescue is a common practice in the hunger relief sector, it is a complex system. To establish a basic understanding of the grocery food rescue process, below we describe each phase of the process. This serves as an example of how grocery food rescue works; however, variation exists within each phase.

- **Partnership Creation**: The first stage of grocery food rescue is the establishment of donation partnerships between grocery stores and HROs or community organizations. Partnerships can emerge either through direct engagement between stores and HROs or through an intermediary organization. In Washington, several large HROs work with grocery stores and smaller HROs (such as food banks and food pantries) to help foster donation partnerships. Part of partnership creation is creating donation guidelines outlining the types of food grocery stores are able to donate.
- **Pickup:** Once store and HRO connections are made, a pickup schedule is created. A single retail store may have multiple HRO partners with pickups across different days of the week. HROs typically pick up during a set window of time, or potentially multiple times, each week. Pickup is done by either HRO staff or volunteers. The pickup person will park their vehicle and then usually travel from department to department to pick up donations. Many stores will have signage or a specific staging area in each department to designate donations. Some stores consolidate and stage donations in one location. HROs typically use tools such as carts, six-wheelers, or dollies to move donations, as well as banana boxes and other dunnage to pack and palletize donations for transportation.
- **Transportation**: HROs use a variety of vehicles for transportation. Many HROs have large vans or trucks, some use personal vehicles, and some have refrigerated trucks that allow for temperature control during transit. Donations can only be transported in non-refrigerated transit for a maximum travel time of 30 minutes (25).
- **Processing & Storage**: Once donations arrive at an HRO, staff or volunteers will sort through all received products to make sure they are suitable for human consumption. Some HROs sort donations at the grocery store to cut down on transporting food waste. Once sorting is complete, staff or volunteers will store, label, repack, or box product either for immediate or

future customer consumption. Any poor quality, expired, or damaged food and dirty packaging will be thrown away.

- **Data Collection**: HROs weigh and fill out donation slips tracking pounds and categories for all food donations received. This data is submitted by HROs weekly to regional food distributors who aggregate the data and send it to corporate retail offices for tax deductions. This data is also used by HROs to report to corporate donors and other funders.
- **Service Delivery**: The result of grocery food rescue is the redistribution of edible surplus food to those in need. The hunger relief sector itself serves customers in a variety of ways, such as food pantries, soup kitchens, and community meal programs. Food may be provided through different service delivery models, including grocery/client choice, pre-boxed or bagged food allocations, mobile markets, or little free pantries among many others.

STAKEHOLDERS INVOLVED IN GROCERY FOOD RESCUE

Grocery food rescue involves a large network of stakeholders and several key influencing actors. One factor contributing to the complexity of this system is the different public values that underpin the motivations and outcome definitions of different stakeholders. While stakeholders work together to implement grocery food rescue through the redistribution of edible food waste, the purpose and engagement in this system can be vastly different and often leads to inefficiencies or bottlenecks in the system. In our findings, we discuss this interplay of power, interest, and resource disparities, but here we briefly introduce grocery food rescue stakeholders to establish an understanding of who is involved in this system.

Primary Stakeholders: The primary stakeholders in the grocery food rescue system are grocery retailers and stores, HROs, nonprofits/community organizations (NFP), third-party facilitators, and people in need of food Grocery retailers are the sources of donated food and the main location where donation pickup occurs. HROs, nonprofits, and community organizations receive donated food and generally handle last mile food donation logistics and transportation. In Washington State, there are several regional food distributors that receive large-scale food donations and then redistribute smaller quantities of food to other HROs. Third-party facilitator organizations, businesses, and applications act as intermediaries and connectors between grocery stores and HROs, either in creating partnerships, finding food waste diversion streams, and handling last mile food donation logistics. The end consumers are food insecure individuals who receive donated food and ultimate beneficiaries of this system.

Influencing Actors: The main influencing actors in the grocery food rescue system are corporate grocery retail chains, national, state, and local governments and jurisdictions, national nonprofits, and international and regional climate and food waste commitments. These stakeholders can be directly or indirectly involved in the grocery food rescued system and exert influence upon the system through legislation, advocacy, corporate-level initiatives and policies, and connections to other stakeholder networks.

Figure 5 below presents the connections and stakeholders in the grocery food rescue system.

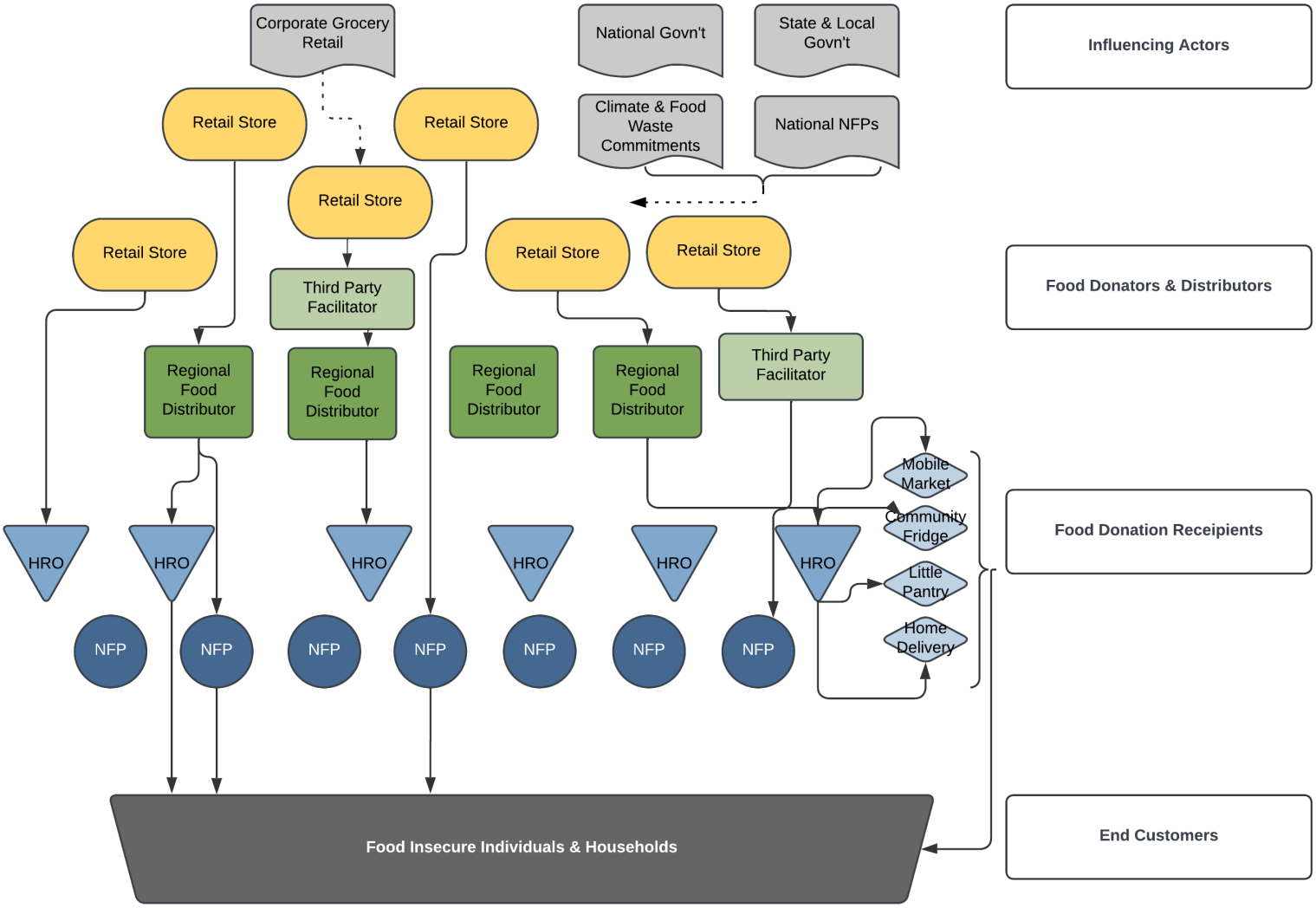


Figure 5: Grocery Food Rescue Process & Stakeholder Map

GROCERY FOOD RESCUE AND FOOD DONATION TRANSPORTATION BARRIERS

Our literature review found several barriers that impact the effectiveness of grocery food rescue and food donation transportation. The segmented nature of the food donation system is a systemic barrier that inhibits collaboration and complicates efforts to develop efficiencies. This segmentation contributes to other challenges including data, communication, and standardization issues. Additional barriers to the last mile of food donation include funding and infrastructure limitations, staffing difficulties, and overreliance on HROs to shoulder the costs and operational burden of grocery food rescue. Finally, systemic inequities can create barriers to access that impact both HROs and their clients in a variety of ways.

SEGMENTED SECTORS

Unlike in for-profit food supply chains where uncertainty is driven primarily by demand, the principal sources of uncertainty in HRO food supply chains are supply (the amount of donated food available) and capacity (the quantity of food that HROs can receive and distribute) (26). SCTL described grocery food rescue in Seattle as "less [of] a coherent, coordinated logistics system than a loose network of largely siloed food donators and hunger relief organizations" (23). An efficient grocery food rescue 2management is complicated by the segmented nature of the grocery food rescue system.

Grocery food rescue is further complicated by competition between stakeholders in the sector. A study by the Rand Corporation noted that efforts to promote information and resource sharing between HROs may be undermined by systemic disincentives to collaborate given the competition for resources in the food rescue space (27).

DATA CHALLENGES

Due to the quantity of organizations involved in grocery food rescue and the lack of information sharing across the system, last mile data collection and data sharing practices are often varied and disconnected among retailers and HROs. SPU's Bin Pilot and "Grocery Rescue Assessment" found that grocery retailers and HROs use separate data collection systems. Data between retailers and HROs is often conflicting and incomplete, and information is often proprietary. As such, the full cost of grocery food waste and the full benefit of grocery food rescue is difficult to quantify. SPU noted that "without data, it is difficult for all parties to understand the potential impact of an improved food donation program, cost savings, and progress over time" (1, 28).

The most frequently recorded metrics in grocery food rescue are the pounds of food rescued and the number of meals served, given this is how HROs tell the story of impact and retailers receive tax incentives for donations (4).[2] While food waste recovery data from food and organic waste streams that enter solid waste facilities is captured, Ecology is still at a learning stage when it comes to the last mile data (5).

Gaps in grocery food rescue data include the fact that there is no established method for grocery stores and HROs to measure and document the quality of food donations (1). Information on the environmental impact of food donation transportation is sparse, and data on GHG emissions, fuel usage, and miles travelled is highly limited. This lack of information happens because GHG emissions are difficult to track and transportation logistics primarily falls on HROs who are not equipped to handle supply chain analytics (29). Additionally, most U.S. grocery retailers do not track or publicly report their total volume of wasted food, which prevents accurate reporting on the full scope of grocery food waste (30). Finally, equity-focused data that tracks who is being served and who is missing from the grocery food rescue system is not universally currently captured.

[2] The USDA estimates that 1.2 pounds equates to one meal. This figure is used to turn pounds of rescued food into number of meals.

In addition to data collection gaps, studies show that “poor practices concerning information sharing can not only create waste, but also undermine confidence in the information provided” (31).

COMMUNICATION CHALLENGES

Poor communication between retailers and HROs creates uncertainty and inconsistency in the last mile of grocery food rescue, leading to distrust and negative perceptions between stakeholders. Through interviews with grocery store staff, SPU identified the most common communication challenges to be inconsistent, delayed, or missed pickups without notice from HROs. Another study underscored this theme, finding that HRO pickups are often perceived by store managers as time-consuming, unreliable, and infrequent (32). For HROs, SPU’s research observed that grocery store staff are sometimes unaware of scheduled donation pickup times, which can lead to delays (1).

SPU highlighted the root causes of this fragmented communication to be constrained staff and volunteer time, staff and volunteer turnover, and imbedded behaviors like a lack of routine contact and information exchange between retailers and HROs. These dynamics result in a lack of proactive communication, miscommunication, and conflicting information (2, 28) SPU also found that the human impact of donations is oftentimes not adequately communicated to grocery store staff, and as a result, employees do not understand the importance of food donations and efficient pickup hand-off. These perceptions and communication gaps impede effective transport of food donations between retailers to HROs and can impact donation relationships (32).

Studies also show that retailers sometimes do not understand the type and quality of food that is eligible for donation. As such, recovered food may not align with safety standards and nutrition guidelines, leading HROs to waste time and resources recovering food that they cannot use. Many Seattle HROs “expressed discomfort with rejecting any food donation, even when they lack the staff or infrastructure to pick up or store the item that is not needed in the first place”. This discomfort appears to be driven by agency concerns that the food donator will cease donating if the HRO rejects a donation (23).

STANDARDIZATION CHALLENGES

SPU found a “lack of standardization across operations fosters uncertainty and inconsistency, resulting in more food wasted, compromised food safety, operational inefficiencies, and added/hidden costs” (1). In addition to different understandings of which types of food are eligible for donation from grocery staff, date labeling standards were cited as being especially confusing and frequently led to food that could be donated instead going to waste (31). Grocery staff also often fear punishment if the food rescue process is not completed accurately, an especially challenging task without consistent standardization or training (1).

SPU's Bin Pilot showed that using assorted boxes, bags, and carts to collect and transport food donations often results in overhandling of product, packaging contamination, inaccurate data collection, and food safety concerns. Implementing standardization processes is shown to have ripple effects on stakeholder relationships, buy-in, data collection and sharing, food quality, and donation policies (28). ReFED highlights the need for standardization not just locally between

retailers and HROs, but across the entire industry (33). This includes the need for standard definitions, data metrics, and date labels across grocery food rescue (31).

FUNDING CHALLENGES

Given the personnel, infrastructure, and time required, HROs incur significant costs to participate in grocery food rescue. HROs receive funding through governments, businesses, foundations, and community grants and donations (34). The availability of funding impacts HROs' ability to implement grocery food rescue programs safely and successfully (35). However, without proper tools like data collection, it can be challenging for HROs to demonstrate the value of their programs and to obtain and retain funding from stakeholders (36). Grant funding can also be highly competitive, creating a rivalrous funding landscape, especially for smaller organizations. In 2022, food banks with over $5 million in revenues received 86 percent of all grant dollars (3).

Over the past year, the quantity of food donations has been on the decline, negatively impacting HRO's operating budgets. Feeding America's annual report shows a year over year decline in grocery food rescue donations, with 1.6 billion meals provided by retail donations and 575 million meals provided by food manufacturing donations in 2022, down from 1.7 billion and 688 million, respectively, in 2021 (38). This decline is due to food shortages and delays in product shipments owing to labor shortages and supply chain constraints, and the need for retailers to adopt increasingly efficient online ordering practices during COVID, leading to less surplus food available for donations (39).

Additionally, inflation and increased fuel costs have negatively impacted HROs' finances (40). At the same time, federal COVID-19 emergency relief funding that has been in effect since 2020, is ending. For many HROs, this has resulted in an estimated loss in funding of $3 per person per day (41, 42). Even before the pandemic however, HROs expressed difficulty meeting client needs. In a survey of Seattle food banks, 65 percent reported a need to reduce variety with another 41 percent reporting the need to reduce the overall quantity of food offered on a per client basis. Less donations, higher costs, and less government funding strains HROs who are already working on a tight budget to sustain food rescue. That same study found that 84 percent of participating Seattle food banks reported difficulty securing predictable and long-term sources of funding. (18).

INFRASTRUCTURE CHALLENGES

Lack of access to infrastructure, such as cold storage, storage space, and vehicles, is frequently cited as a barrier to participation in and expansion of grocery food rescue. To ensure appropriate temperature regulation and food safety of donations, HROs need access to refrigerated vehicles and cold storage space (27). Although many HROs that lack access to temperature-controlled vehicles still participate in grocery food rescue, this increases food safety risks. Lack of access to temperature-controlled vehicles is particularly impactful for rural HROs that are not located near their retail partners. The importance of cold storage is also growing as HROs are increasingly focused on meeting the nutritional needs of their clients through perishable foods that require refrigeration (35).

The cost of acquiring cold storage infrastructure often exceeds potential savings, making its procurement cost-prohibitive (43). In some cases, organizations use borrowed or donated spaces

and cold storage, but this introduces additional concerns about reliability and availability (44). Even HROs that have access to cold storage must navigate food safety concerns for perishable items, including maintaining appropriate time and temperature control as well as regular food safety record keeping. There is even some debate among donors and transporting parties as to whether refrigerated vehicles are viable for certain grocery food rescue models. Frequent stops and pickups require the repeated opening of truck doors, making temperature regulation difficult (35).

Space outside of cold storage can also be scarce. Both HROs and grocery retailers voice that they often have insufficient space to store food, leading them to throw out otherwise edible products (33). On the retailer side, store managers and employees state that they have neither the space to store products awaiting pickup nor for staging areas for food donations. HROs likewise describe frequently running out of space to store food or serve their clients (18, 32).

LABOR SHORTAGES AND TURNOVER

The day-to-day implementation of grocery food rescue is done by grocery store employees and HRO staff and volunteers. According to 2019 estimates, on average, HROs in Seattle have three full time employees, 1.5 part-time employees, and 52 volunteers each week (18). For many HROs, food donation pickups are done by volunteers who frequently use personal vehicles (35). As such, volunteers are invaluable to HROs; however, overreliance on volunteer labor can result in bottlenecks and uncertainty. High turnover, a lack of labor consistency, and an increased administrative burden on paid employees to manage volunteers are all potential problems for HROs (43). Furthermore, volunteerism in Seattle declined during the COVID-19 pandemic and has yet to rebound despite restrictions being lifted (45).

Employee turnover is an issue for grocery retail businesses and HROs alike (27). For HROs, even though many wish to expand paid staff, retention and recruitment are difficult due to the relatively low wages available for nonprofit workers (18). In the grocery retail sector, turnover rates have historically been quite high, particularly for part-time employees, for similar wage-related reasons. According to the Food Industry Association, the turnover rate for part-time grocery employees rose from 52 percent to 74 percent between 2019 to 2020. Though full-time retention is better, turnover remains high with the rate rising from 13 percent to 22 percent over the same period (46). In addition to the costs accrued by organizations due to constant training and hiring, turnover makes it difficult to take advantage of economies of learning or the implementation of standardized practices.

BURDEN ON HROS

SCTL notes that “virtually all the logistical and financial burden of food rescue is placed on nonprofit organizations distributing and/or receiving the food” (23). This illustrates a common theme: the burden of carrying out grocery food rescue is generally assumed to fall on HROs rather than grocery retailers or government entities. As demonstrated in the grocery food rescue process map, food rescue is an intensive process, with labor required to identify food; retrieve and transport it; sort and assess the quality of food received; repackage, label, store, and display it; and dispose of food that is not distributed (35). The operational burden of supplying and training this labor is primarily assumed by the HRO.

In addition to providing the requisite labor, HROs must also supply the equipment necessary to participate in grocery food rescue. The most significant equipment needed is vehicles, with refrigerated trucks being preferred for store donation programs (25). Other equipment that HROs may be required to invest in include hand trucks, scales, bins, coolers, and pallet covers (47).

HROs are also frequently burdened by waste disposal costs that result from grocery food donations. Product recovered through grocery food rescue is frequently close to or beyond the sell-by date or, in the case of produce, cannot be sold in store due to over-ripeness or cosmetic imperfections (43). SCTL summarized these issues stating that "the net result is the effective transfer of waste disposal costs and the cost of de-packaging food and sorting each waste into compost, recycling, or garbage streams from food donors to hunger relief organizations" (23). Although this issue appears to be substantial, we could not find any data on the amount of waste typically transferred from retailers to HROs through grocery food rescue, pointing to another data-related challenge.

SYSTEMIC INEQUITIES

Racial discrimination in the U.S. has resulted in disparate rates of food insecurity, with people of color much more likely to experience food insecurity and rely on the hunger relief system to meet their nutritional needs. This systemic inequity is compounded by issues within the hunger relief system itself. Food available through hunger relief is frequently low in nutritional value, poor quality, or does not meet individuals' cultural preferences. These issues combine to create an experience that is lacking in dignity for clients. Inequities are also observed between HROs, with those established specifically to serve under-resourced communities often facing distinct barriers to accessing food and partnerships. These systemic inequities are explored in detail below.

NUTRITION

Despite the importance of donations to the hunger relief system, few policies incentivize the donation of nutritious foods (48). Consequently, HROs tend to receive a high volume of donations that are non-nutritious, processed, and high in sugar, salt, or fat and up to 25 percent of food distributed by HROs consists of unhealthy beverages and snack foods (43). Although many HROs have established nutrition guidelines, the power dynamics inherent in the donor-recipient relationship of grocery food rescue often places HROs in the position of feeling pressured to accept donations of unhealthy food (49).

CULTURAL RELEVANCE

A 2019 National Resources Defense Council (NRDC) food pantry client survey found that the food available at HROs is often not in alignment with clients' cultures or beliefs, with 38 percent of survey respondents citing this concern as a barrier to access (50). HROs that make a conscious effort to supply culturally relevant foods often find it necessary to purchase these items rather than sourcing them through donation (51).

QUALITY

The grocery food rescue process is time and labor intensive. Donated food may be handled, packaged, and sorted at multiple stages after being culled from the shelves by retail workers. As noted above, this overhandling of near-expired products can have a negative effect on food quality, leading to additional waste (1). In Seattle's 2019 Food Bank Network Report, some clients expressed frustration with the safety and quality of food distributed by HROs, such as "long expired items, rotting produce, or moldy baked goods. This was especially frustrating in the context of carrying heavy bags home only to find much of the food inedible" (18).

DIGNITY

The U.N. states that "the right to food is not a right to be fed, but primarily the right to feed oneself with dignity" (52). Quantitative metrics like pounds of food donated and meals served fail to illuminate factors such as nutrition, quality, or cultural appropriateness of food distributed, all of which are vital ingredients in ensuring a dignified experience in the hunger relief system.

RESOURCE DISTRIBUTION

Smaller, less-resourced HROs serving primarily people of color or rural communities face a unique set of barriers impacting their ability to source donations and rescue food from retailers. According to a 2018 study in the European Journal of Operational Research, small nonprofits such as food pantries and soup kitchens frequently face budget, transportation, workforce, and storage constraints (26). Several large national HROs, such as the Food Bank of Western Massachusetts and Maine's Good Shepherd, have acknowledged that the emergency food distribution system often perpetuates existing racial inequities. "We realized that Good Shepherd getting really significant amounts of donations was another avenue of white privilege playing out. We were the trusted organization because we were the familiar one," said the organization's president in 2021 (53, 54).

GROCERY FOOD RESCUE AND FOOD DONATION TRANSPORTATION BEST PRACTICES

Retailers, HROS, and third-party facilitators have developed several innovative approaches to increase the efficiency of the food rescue and food donation transportation systems. Best practices in supply chain management – including demand forecasting, new technologies, and innovative last mile delivery systems – have been successfully applied to food donation programs in a variety of studies and pilot projects. Efforts to facilitate cross-sector collaboration have resulted in various collaboration networks that have ideated solutions, consolidated data, and driven impact at scale. Finally, legislative reforms have been vital in creating a policy landscape that facilitates and incentivizes participation in food donation programs.

EFFECTIVE AND SUSTAINABLE SUPPLY CHAIN MANAGEMENT

Understanding grocery retailer and HRO landscapes, sharing data, creating and testing standardizing operations and procedures, and tracking and measuring inventory to align supply with demand are critical to ensuring a successful supply chain (23, 28). Grocery stores like Raley's have been able to divert significant food from landfills (26 million pounds of food diverted in 2021) through inventory management software and markdown pricing (55). Other waste diversion strategies include lean

supply chain practices, communication with supply chain experts, traceability, inventory policy, improved storage, waste reduction oriented operational systems, technology and sensors for food quality, application of thermal control in packaging and facilitating, training for staff and volunteers, and more precise demand forecasts (41). ReFED predicts enhanced demand planning between retailers and HROs could have an annual $832 million net financial benefit, 265,000 tons of food waste diversion, and 1.08 million metric tons of carbon dioxide (CO2) emissions reduction in the U.S. However, these improvements require significant funding. ReFED estimates enhanced demand planning alone requires an investment of $112 million annually (33).

Automation of ordering can reduce overordering and increase supply chain resilience (56). Current and developing technologies can help identify areas of improvement for reducing food waste and shrinkage. In a pilot conducted in conjunction with two national grocery retailers and over 1,300 stores, artificial intelligence (AI) software like Shelf Engine and Afresh was used to create algorithms that determine inventory management and demand forecasting. This approach led to an approximately 15 percent reduction in food waste per store and lessened CO2 emissions (57). Machine learning (ML) can also help analyze weather and seasonality to improve forecasting and fulfillment (33).

Outside of grocery retailers and HROs, leveraging third parties to improve last mile transportation logistics by forecasting the number of vehicles needed, coordinating the timing of pickup, and tracking environmental impacts is valuable to enhancing last mile food donation supply chains and taking the burden off HROs (30).

Software applications also support improvements to last mile logistics. Applications like Careit, a free food donation and rescue application and online marketplace, make it easy for retailers and HROs to connect and transfer food (58). The application uses algorithms and geographic information systems (GIS) to provide HROs of different sizes with equal access to food (an example of Careit's interface is presented in **Appendix 7**). These types of applications are critical in the food rescue system as they bring transportation logistics onto a digital platform (e.g., matchmaking, inventory, pickups, shipping). Other tools like Date Check Pro can allow grocery staff to manage inventory and get alerted when food is near expiration (59). Crowdsourced volunteer models facilitated by software applications have also helped HROs overcome scheduling challenges (60).

Micro hubs are another strategy to improve supply chain management. Micro hubs are "central drop-off/pick-up location[s] for goods and services, which can be used by multiple delivery providers, retailers, and consumers (2)." Due to their proximity to grocery stores, HROs, and communities, the use of these hubs for last mile delivery can result in economic, environmental, and community benefits (60). E-cargo bikes are another type of infrastructure that has been shown to improve access to donated food and produce these benefits. For instance, in a 2018 SCTL pilot in downtown Seattle, e-cargo bikes reduced CO2 emissions by 30 percent per package delivered (61).

Building the right infrastructure for grocery food waste prevention and rescue is key for a successful supply chain. This will not only improve the efficiency of last mile logistics but will also help to cut down on food waste and environmental harm before and after food is donated (29).

Collaboration and cross-sector relationship building are key ingredients to an effective grocery food rescue system. At the local level, these values may be fostered through interventions targeting individual HRO or retail employees. Initiatives aimed at increasing retail employee buy-in to food donation are frequently reported to be effective at changing behavior. In a 2013 pilot study conducted by Quebec-based HRO Moisson Montreal, implementation of a training program for grocery store employees that focused on who benefits from their donations resulted in the doubling of meat donations (43). Similarly, in 2022, Bob's Red Mill, a food manufacturer and signatory of the PCFWC, developed a multi-faceted employee engagement campaign around reducing food waste. This six-month project, which placed a heavy emphasis on education and engagement, saw a more than 70 percent reduction in food waste on manufacturing lines targeted by waste reduction initiatives (62).

At the state-wide level, governments and funders can increase the strength of the overall food rescue system by investing in both the infrastructure and personnel of HROs, and by exploring funding models that incentivize cross-sector collaboration (31). In a local example of this type of funding structure, King County has recently committed to funding a 40,000 square foot Community Food Hub, to be run and operated by community-based organizations (63). Regional networks such as the PCFWC and NWFA's Collaboration Network are needed to share solutions and learnings and consolidate data across public and private sector stakeholders. Speaking to the importance of cross-sector networks, the PCFWC noted that preventing food waste "requires broader collaboration, coordination, and communication, thus the sharing of implementation costs among city, state, and philanthropic funding sources" (64).

A powerful illustration of accomplishments that become possible when stakeholders come together at scale can be found in the United Kingdom. In 2019, the U.K. nonprofit Waste and Resources Action Programme (WRAP) and Institute of Grocery Distribution (IGD) developed a call-to-action and an industry-wide road map and toolkit to accelerate food waste reduction. This effort brought together the region's largest retailers, food producers, manufacturers, and hospitality and food service companies to 'Target. Measure, and Act' on food waste. An example of WRAP's food waste reduction roadmap in **Appendix 8**. In 2022, WRAP reported a seven percent increase in businesses implementing 'Target, Measure, and Act' and an eight percent reduction in food waste. This collaboration has created incentives for businesses to publicly record data, track progress to date, and share sign-on commitment forms. Additionally, the industry-wide standardized processes and resources made available through WRAP have generated consistency and clarity across sectors (65).

LEGISLATION

Food waste reduction advocacy reports identify three main areas of opportunity for improving regulatory authority: increased liability protections, standardization of labeling requirements, and increased tax incentives for donations.

LIABILITY PROTECTIONS

The 1996 Bill Emerson Good Samaritan Food Donation Act is the foundational piece of legislation for food donation in the U.S. This act was designed to protect food donors who donate products in good faith. The bill was amended in 2023 with the Food Donation Improvement Act (FDIA), which expanded protections for businesses to make it easier for them to donate food. This improvement

provided liability protections for organizations donating directly to end recipients as well as for donations offered at a discounted cost to end recipients (66). With the passage of the FDIA, only a few states still offer additional legal protections on top of federal policy, with most of these protections concerning date labels (67). Washington State offers additional liability protections for food donated past sell and use by dates since these dates do not accurately reflect the safety or quality of product (68). Increased protections for donations encourage increased participation in food rescue.

DATE LABELING STANDARDS

Date labelling is unregulated by the federal government, leaving states to fill the regulatory gap. In 2021, Congress proposed the Food Date Labeling Act to require the usage of "best if used by" and "best by" to refer to an item's quality and safety, respectively (69). The law would also remove misunderstandings about a food's potential to be donated clarifying that foods past their "best if used by" date is still acceptable for donation. Within the *UFWW Plan*, the Department of Ecology recommends the Washington State Legislature pass a joint memorial to support federal legislation on a national date labeling standard.

TAX INCENTIVES

The federal government offers tax incentives to motivate businesses to donate food. Since the passage of the Protecting Americans Against Tax Hikes (PATH) Act in 2015, all business classifications are eligible for a tax deduction if all criteria are met, with some qualifying for an enhanced deduction (70). However, these tax incentives can be minimal and difficult to claim, especially for smaller businesses lacking capacity. The Further Incentivizing Nutritious Donations (FIND) Food Act of 2022 was proposed with these difficulties in mind and offers up to 100 percent of the cost of transporting donations (71). While state level tax incentives can be leveraged to help offset the costs associated with edible food rescue, at present only ten states and Washington D.C. offer incentives for food donation on top of PATH (67).

OTHER LEGISLATION

The 2018 farm bill established provisions to increase funding for food loss and waste reduction (FLWR) programs as well as creating a new FLWR Liaison position at the USDA to oversee food loss and waste programs and progress (72). The 2023 proposed farm bill includes proposals to increase funding for food recovery infrastructure and the development of organic waste processing infrastructure (73). Other proposed federal food waste reduction policies include the National Food Waste Reduction Act which seeks to establish grants as well as a food waste research and technical assistance program under the FLWR Liaison, and the School Food Recovery Act which aims to educate consumers and collect useful data on food loss and waste (74).

At the state level, several states have implemented policies focused on reducing organic waste with implications for food rescue. In 2016, California passed SB1383 requiring some food service businesses to donate edible food to HROs by 2022 and expanding to other businesses by 2024. The law also includes enforcement mechanisms and service requirements for organics, both of which are expected to increase donations to food recovery organizations (75). Vermont similarly passed their Universal Recycling Law (Act 148) in 2012 which banned the disposal of food scraps, resulting in a nearly threefold increase to food rescue in the state (76).

CHAPTER 5: FINDINGS

This chapter presents findings from our 32 research interviews across 30 organizations while also building off information gathered from our literature review. Using the transcripts from our recorded interviews, we analyzed each interview and established roughly 50 key trends across barriers and best practices.[3] We separated interview trend frequencies by HRO, retailer, and "other organizations." "Other organizations" includes 15 of our interview participants not categorized as HRO or retailer.[4] This analysis is presented in **Appendices 9 and 10**.

We present our findings under four categories: systems, supply chain, stakeholders, and solutions. These categories build upon each other and focus on different levels of the grocery food rescue and food donation transportation system.

- **Systems:** the overarching factors shaping and influencing food rescue, grocery food rescue, and food donation transportation. In this section, we discuss the inequitable distribution of resources in this system, how the COVID-19 pandemic impacted grocery food rescue, and the role of regulation and legislation.
- **Supply Chain:** the logistics and processes involved in food donation distribution and transportation between donors and HROs. This section covers barriers and best practices relating to data, communication standardization, and last mile logistics.
- **Stakeholders:** the people and organizations involved in grocery food rescue. This section describes the complex relationships and power dynamics between donors and receiving organizations as well as the outsized role frontline workers play within the system.
- **Solutions:** the actions organizations are taking or are interested in taking to enhance the efficacy of the grocery food rescue system. These solutions are the culmination of our findings and illustrate the variety of innovations possible.

SYSTEMS

"Systems" describes the macro-level factors that impact and influence the grocery food rescue system. Through interviews, we identified systemic inequities and resource disparities, impacts from the COVID-19 pandemic, and government regulation as the key macro factors impacting grocery food rescue.

[3] Interview analysis frequencies represent the themes that emerged through our interviews and should not be considered to cover the full perspectives and experiences of our participants. While we aimed to be consistent across interviews, it is likely that participants held views or opinions that may not have come to light in their respective interview.

[4] The grouping of "other organizations" was done to preserve anonymity for these stakeholders.

EQUITY AND RESOURCE DISPARITIES

HROs vary in size, resources, and service delivery models, and these factors shape the constraints they face. We heard that access to and allocation of resources is one of the biggest drivers of HROs' ability to effectively participate in grocery food rescue, with 53 percent of interview participants mentioning resource disparities. These resources include vehicles, funding, ambient and cold storage, commercial kitchens, and staff as well as access to grocery retail donors and other partnerships.

"SO YOU HAVE TO UNDERSTAND THAT WITHIN THIS WORLD OF FOOD BANKS, SOME ORGANIZATIONS JUST HAVE MORE RESOURCES THAN OTHERS."- HRO

Our interviews suggested that resource disparities often manifest in the hunger relief system in the following ways:

BIG VERSUS SMALL

Larger HROs, typically those that are more established and have a greater quantity of grocery donation partners and community connections, tend to have greater resources compared to smaller HROs. Well-resourced HROs are better positioned to build flexibility into their grocery food rescue programs. This flexibility can be created by having staff fill in for volunteers who call out or by leveraging a second vehicle to take advantage of a last-minute donation opportunity or address a vehicle maintenance issue. Smaller HROs often rely primarily on volunteer labor and have shorter operating hours, making logistics and labor reliability a challenge. Smaller organizations, especially those that emerged during COVID to address gaps in the hunger relief sector, are likely to struggle to gain access to resources and donor partnership. Resource inequalities that currently exist in the hunger relief system may be perpetuated by the fact that already well-resourced HROs are more likely to have staff dedicated to procuring grant funding and building partnerships, whereas smaller and newer HROs must establish partnerships and donor connections through word of mouth and community networks.

RURAL VERSUS URBAN

Thirty percent of interview participants expressed that rural HROs face distinct challenges that are not present in an urban environment. These challenges include lack of potential donors since many small rural communities have only one or two major grocery stores, and a greater distance to the donors that do exist. One rural HRO noted that this proximity challenge goes beyond HROs' ability to access donations and extends to clients' ability to access HROs, with many individuals experiencing food insecurity in rural communities lacking the transportation necessary to get to food banks and return home with a large box of food. Although this HRO does make deliveries, it is constrained by charter requirements that deliveries be limited to a particular area. Rural HROs are also more likely to have limited operating hours, often opening only once or twice per week. This limitation can make the timing of food donation pickup and distribution challenging, leading to quality issues and further service constraints.

KEEPING FOOD IN COMMUNITY

Ninety-one percent of interview participants viewed localization of grocery food rescue as best practice to keep donated food within the community in which it originated. Localization of food has important implications from an environmental and last mile perspective. It also raises considerations regarding equal access as HROs located in food deserts or other traditionally underserved areas have fewer donation partners located near them. Proximity to stores is a common criterion in establishing donor partnerships, with HROs that have several grocery stores within five miles reporting more confidence about their transportation processes and food safety than HROs with fewer or farther store options. Equity of access as well as the availability of alternative food distribution models – such as micro pantries or bike pickups – is critical in discussions on food localization and empowering more local food businesses to get involved in community-based grocery food rescue. Keeping food in the community can reduce quality loss in transit, reduce transportation times, preserve food safety, and create environmental and equity benefits. However, it also requires community outreach to increase participation in hunger relief and food rescue systems and to deploy more innovations in service delivery models.

HOW COVID-19 DISRUPTED GROCERY FOOD RESCUE AND HUNGER RELIEF

Over 80 percent of interview participants discussed different ways the COVID-19 pandemic impacted the grocery food rescue and the hunger relief and food assistance systems. This common impression may be due to recency bias, the lingering threat of COVID-19, and the fact that the pandemic cast a light on existing problems in the grocery food rescue and hunger relief systems.

AMPLIFICATION OF SYSTEMIC CHALLENGES

The biggest impact of COVID was that it amplified existing challenges for both HROs and retailers in the grocery food rescue. As one HRO highlighted, “If the current hunger relief system was working well, then those pockets of inequity would have never surfaced during COVID. These folks were just absolutely left out. And they had to do something. They were screaming, ‘My community is not being served.’ There are all of these resources being brought in to mitigate the challenge of this pandemic and they’re still not making their way into my community.” These pockets of inequity include specific geographic areas, racial and ethnic populations, and income levels. Many HROs mentioned a growing need for food assistance even before the pandemic, especially in rural areas; however, COVID illuminated how the current system is unable to serve all people, especially those who are most vulnerable.

> “IT IS A MINDSET OF RESOURCES AND POWER. YOU KNOW, RESOURCES ARE POWER. THAT'S HUGE. FOOD RESOURCES ARE POWER.” - HRO

COVID also highlighted the inequity in the hunger relief system itself. During COVID, an existing power and resource differential became more evident as all organizations faced growing demands for services and changing inflows of donations from grocery food rescue. Some HROs described initial large quantities of donations as grocery retailers adjusted to new levels of consumer demand transitioning to smaller donation amounts as grocers adjusted

their ordering and inventory management strategies. This led to competition among organizations, especially as new smaller organizations entered the field to address increased demand and service gaps.

As one HRO stated:

> "I see some of the traditional services saying 'Hey, all of these people are coming in and they're taking our resources. They're taking away from our resources, and so how do we stay viable?' I see the side of, well, if we had access to your resources, we wouldn't exist, right? Or if we had equitable access to your resources we wouldn't exist. And that is a really interesting dynamic because they're serving the same need. They're serving the same people. It is a mindset of resources and power. You know, resources are power. That's huge. Food resources are power. If you have all the food resources coming to you, then you get to dictate who you work with, who you serve, how you serve, when you serve. And that just may not work for the communities who are being left out."

INCREASED PARTNERSHIP

While participants mentioned this increased competition for resources and food donations, there were also examples of a transition away from a competitive mindset to one of collaboration and partnership between organizations. Some organizations that received large donations from grocery retailers described working with smaller organizations to create a resource sharing network. In one example, a larger food bank described receiving a huge amount of produce from a grocery partner and driving it out to smaller food banks to redistribute what they could not use themselves. In turn, those smaller food banks started to exchange large amounts of eggs from their partners to this larger food bank. In another example, a food bank explained that they realized that "group power" was greater than the individual and started teaming up with smaller organizations on grant applications to achieve successful outcomes.

LABOR SHORTAGES

Seventy-five percent of retailers and 55 percent of HROs described facing staffing and volunteer shortages during COVID, resulting in capacity constraints for both types of organizations. For retailers, staffing shortages and turnover caused previously standardized practices to fall off and HROs observed stores prioritizing the business over food donation. For HROs, this appeared in the form of lower quality food donations, with over half of our interview participants stating that the quality of donation worsened during the pandemic but has now begun to recover. COVID affected volunteer engagement and staffing levels for HROs, which led to missed pickups, halted partnerships, and in one instance, a movement away from grocery food rescue altogether. One retailer we interviewed is currently brainstorming a large-scale call-to-action campaign to entice more volunteers in the face of shortages. In the current market, there is concern about volunteer and staff burnout as a high demand for food assistance continues, COVID funding programs have ended, and we face economic uncertainty.

PROGRAM DELIVERY INNOVATION

The strain the pandemic placed on the grocery food rescue system led to the emergence of new and innovative program delivery models. To keep customers and staff safe, many HROs transitioned from

a client choice model where clients come into a food bank and shop for food to a prepackaged model where the food is selected by food bank staff and boxed or bagged for pickup or delivery. For some clients, the prepackaged model is more efficient and the option for delivery can be useful for targeting vulnerable populations. However, the prepackaged model can also lead to more waste if clients are not familiar with or do not like the food they receive, as well as impacting the dignity of the food assistance experience by removing the individual client's choice. Retailers also launched new programs to address increased food insecurity in safe and innovative ways. Amazon launched a home delivery model in just six weeks to deliver food from HROS directly to vulnerable families, seniors, and youth using its Flex drivers.

Overall, the impact of COVID-19 on the grocery food rescue and hunger relief systems highlights the need for increased flexibility, collaboration, innovation, and a focus on building programs and systems through a lens of equity. Now that the influx of pandemic funding has expired for both hunger relief programs and food assistance, this is a pivotal time to address the issues that surfaced during the pandemic and build a more resilient grocery food rescue system.

ROLE OF REGULATION AND LEGISLATION

Seventy-three percent of HROs, 75 percent of retailers, and 63 percent of total interview participants discussed the importance of regulatory support in grocery food rescue. Interview participants highlighted the role that government can play in funding infrastructure, building out food safety guidelines, increasing equitable food donation and nutrition practices, running pilot programs, activating ecosystems, deploying innovations at scale, and creating an environment conducive to sharing learnings between stakeholders.

In addition to setting the policy context and establishing legal protections for grocery food rescue, decisions made by state and local governments and jurisdictions play an important role in informing the "business case" for grocery food rescue and determining the economic implications for retailers and HROs. The four retailers interviewed for this report expressed that their commitment to engage in food rescue was motivated, at least in part, by environmental (e.g., waste reduction) and social welfare concerns. Many HROs echoed this sentiment, expressing that their most dedicated retail partners were driven to donate food primarily by the desire to give back to the community. However, interviewees across all sectors, especially those in the private sector, generally recognized the importance of the "business case" of grocery food rescue.

WASTE AND COMPOST DISPOSAL COSTS

Waste and compost disposal costs impact the costs and benefits associated with participation in food rescue for retailers and HROs. Food that is not donated to HROs must be disposed of by grocery retailer, and as it stands retailers are not penalized for this waste beyond the basic cost of disposal. One interview participant argued, "at the end of the day waste is too cheap. I think [we] need to consider the economic [and] the environmental burden."

While government mandates or penalties for failing to divert food from landfills may play a role in reducing waste, others suggested that positive reinforcement such as funding incentives are also important. Waste and compost disposal costs were referenced as a burden on HROs for 36 percent of interviewees, and this burden could potentially be alleviated through policy or subsidies.

DATE LABELING STANDARDS

In line with the research presented in our literature review, date labeling standards emerged as a key barrier to food rescue with 45 percent of HROs expressing that retail employee confusion on date labeling standards frequently leads to food that could otherwise have been donated going to waste. State or national regulations to clarify date labeling standards are likely be a powerful lever in improving donation programs and reducing wasted edible food.

TAX INCENTIVES

Forty percent of interviewees shared the sentiment that tax breaks are important in incentivizing retailers to donate food. One retailer, which is active in U.S. food donation programs and is now working to scale abroad, noted that it can be challenging to influence international licensees to prioritize food donation when they are in markets that do not provide a tax incentive for doing so. Several interviewees highlighted the connection between data collection and tax incentives, as retailers are not able to take advantage of the available incentives unless donation data is accurately recorded.

GOVERNMENT FUNDED AND LED INITIATIVES

Our interviews illustrated that leadership or funding from the public sector has played an important role in supporting innovative new programs within the food rescue system. For example, the PCFWC's work is largely funded by participating states and jurisdictions. The King County Local Food Initiative is another example of a government-led initiative working towards systemic improvements in the food system. Its' priorities include supporting the development of the new South Seattle Community Food Hub, increasing land access for farmers of color and community organizations through the Conservation Futures Program, and supporting the work of the King County Famers Share program. This last program increases access to produce for food-insecure populations by providing funding for HROs to purchase produce directly from small-scale local farmers. Another government-funded initiative is the Washington Food Coalition, which is working with over 300 food pantries to develop nutrition policies. Our interview with the Washington Food Coalition emphasized the importance of increasing awareness of nutrition in the hunger relief sector and creating mechanisms at the government level that encourage the donation of nutritious food to be prioritized. These examples illustrate how government funding and initiatives can be deployed to develop and test innovations at scale.

SUPPLY CHAIN

"Supply chain" refers to the logistics, processes, and resources involved in moving food from its original location to the end consumer. We focus on the last mile of grocery food rescue and the transfer of food from retailers to HROs. Like the literature review, our research interviews highlighted the barriers around data, communication, and standardization, and the importance of effective and sustainable supply chain management.

DATA, COMMUNICATION, AND STANDARDIZATION

The need for strong data, communication, and standardization in grocery food rescue emerged as the most important supply chain best practices across all interview participants. In line with key themes of the literature review, 90 percent of interview participants noted the importance of communication, 83 percent noted the importance of data, and 73 percent noted standardization successes. At the same time, 43 percent of interview participants noted data challenges, 43 percent noted communication challenges, and 57 percent noted standardization challenges. A key learning from our interviews is that when aiming to sustain and improve communication, data collection, and standardization processes, there will inherently be challenges, nuances, and trade-offs.

DATA

Data is collected by grocery store employees, regional food distributors, and HROs. The primary data collected is the amount of food being donated and the number of meals and individuals served. In the past, data collection was primarily the responsibility of HROs, with corporate retailers solely relying on their data for reporting. Now, data is collected by both retailers and HROs. Retailers record food donations by scanning product barcodes before HRO pickups. On the HRO side, food donations are weighed under set categories (e.g., dairy, meat, dry goods) either at the store or before being stored (**Photo 1** shows this process from our site visit). Weight data is then entered into a centralized reporting platform, such as Food Lifeline's MealConnect. Third-party facilitation organizations and regional food distributors then aggregate this information for retailers to use for tax incentives. These facilitators aid in data capture and aggregation between retailers and HROs and help to alleviate data collection barriers by using technological systems. One third-party facilitator even compensates HROs for data entry as an incentive.

Photo 1: Weighing Food Donations

For retailers and HROs alike, data collection can be technologically challenging. Data collection is a manual process which can lead to errors. Food is grouped together by category (e.g., "dairy," "meat," "dry goods") without capturing any additional detail on the type of food provided. While data can be analyzed by regional food distributors to understand food donation trends, there is no visibility into this process across the system. Several HROs underscored the importance of using data to make operational decisions; however, this often arose in the context of historical data and what data is currently available versus what could possibly be available in the future. Retailers rely on data to inform their bottom line, especially as they focus more on reducing "shrink" or unsellable product. For retailers that have contracted with third-party transportation providers in lieu of HROs, additional data is required to coordinate logistics while also still ensuring profitability.

Among the 83 percent of interview participants who referenced the importance of data, many expressed excitement about the idea of rethinking industry metrics and creating new tools like

databases to cross-share and reference data. At present, data is almost exclusively used for retail tax write offs, food donation tracking, and grant and funding requirements. As one HRO interviewee put it, “Weights and customers, that’s it. You will find that that’s the only thing people care about in this world.” On a system, national, state, and local level, stakeholders are reconsidering what is the correct data to be capturing and analyzing and how it can be most easily recorded, especially for HROs already under resources constraints. Collectively, there is a desire for more cohesive and streamlined data for data-driven decision making and testing the viability of solutions.

While stakeholders emphasized grocery food rescue data and metrics, last mile and food donation transportation data is equally important, as it is necessary to optimize the movement and transfer of food. One retailer shared another data gap: the importance of inclusive data, considering those that are not included in service coverage, and why that might be the case (e.g., users without a smartphone who would benefit from home delivery.)

"SOMETHING THAT'S REALLY COMMON IN THE GROCERY INDUSTRY IS IDENTIFYING THE NUMBER OF MEALS THAT YOU'VE DONATED…WE NEED TO MAKE SURE THAT WHAT WE'RE DONATING HAS VALUE TO THE COMMUNITY." –RETAILER

ENVIRONMENTAL IMPACTS

While few HROs and retailers track emissions associated with transportation, more are interested in beginning to do so. As noted in the literature review, this has only been done in a few cases to date as emissions are difficult to track and are often a second priority. Nonetheless, these organizations recognize the increasing importance of climate impacts as well as reducing food waste and food insecurity. The seven interview participants that track transportation emissions do so in various ways. This includes tactics like using electric vehicles that produce zero emissions, designing pilots to reduce emissions, and leveraging emissions calculators from ReFED.

COMMUNICATION

The majority of grocery food rescue communication occurs during face-to-face interactions between grocery store managers and HRO staff and volunteers as well as through ad hoc email and phone conversations. Third-party facilitators typically communicate by email or phone with retailers and HROs to manage and coordinate logistics. In one example, Food Donation Connection onboarded all Whole Foods stores on its food rescue operations in-person individually and offers 24-7 availability for store manager questions or issues. Instances of positive communication largely occur through personal relationships developed at the store level. As expressed by one organization, “relationship[s] and communication have to be so strong that everything else falls into place from there.” An HRO explained that this facilitates a feedback loop of information and areas for improvement at the local level. During our site visits, we observed this interaction between an HRO employee and store department managers during a routine food donation pickup. Store employees indicate what is available for donation and the HROs communicate what they are able to take as based on supply and demand. Communication challenges from the retailer perspective often involve HROs failing to notify stores of pickup schedule changes. For HROs, common communication challenges often involve navigating potentially difficult conversations with retailers about food quality and handing off inedible waste.

STANDARDIZATION

For retailers and HROs, standardization refers to training for grocery staff regarding which food items can be donated, data labelling and quality requirements, and uniform pickup processes, such as the use of food donation bins, refrigerated or colored totes to hold, sort, and transport food. One interview participant highlighted that when it comes to standardization, "above all else, [food donation] has to be safe, then it has to be reliable." For most interview participants, documentation and implementation of processes is a priority; however, for one HRO, uniform standardization is less of a necessity across stores as long as the quality of the food remains high. A major takeaway across interview participants was that even if standardization processes are in place, they may not be consistently followed due to staff turnover, indifference, time constraints, or confusion. As one HRO interview participant experienced, "After a decade of being involved with this stuff… I'm so cynical about grocers' abilities to standardize and then maintain those practices. Because the people who create those standardizations are so removed from the people who are actually there at five in the morning, pulling the produce, and that person doesn't care."

Standardization is a key part of third-party facilitator business models as they strive for consistency across all users. For third-party connectors like Food Donation Connection, this means having an established point of contact, consistent pickup schedules, and set onboarding and tax valuation paperwork. For online platforms like FoodMesh, this shows up through uniform digital websites that house company profiles, product listings, and order and shipping management, as well as standardized operating procedures such as signed waivers.

Many of these data, communication, and standardization practices are in development, making these processes both current and aspirational best practices.

GROCERY FOOD RESCUE SUPPLY CHAINS

As more than a quarter of food is being moved around the urban freight system at one time, understanding perceptions and dynamics around grocery food rescue supply chains is critical (21). One interview participant conveyed that "the global problem of hunger is that the problem is not supply, the problem is distribution."

TRANSPORTATION VERSUS SUPPLY CHAIN EFFICIENCIES

This research found that a disproportionate focus on supply chain efficiencies, enhanced demand planning, and scale is present among retailers and "other organizations" versus HROs. Seventy-three percent of HROs interviewed own trucks and generally suggested transportation is not an issue for their grocery food rescue operations (zero HROs shared a focus on supply chain efficiencies). On the other hand, while only 25 percent of retailers own trucks for food donation transportation, all four retailers mentioned a focus on supply chain efficiencies. A possible reason for this is that HROs define transportation as availability of trucks and drivers, whereas retailers' definition of transportation incorporates the broader supply chain. Even though HROs are primarily responsible for the pickup and transport of food, some retailers are re-considering where the onus of food donation transportation lies and how they can support HROs using their supply chain expertise. As retailers are focused on their bottom lines, enhanced demand planning is a priority for all four retailers when it comes to managing inventory in the prevention stage of grocery food rescue.

Throughout the interviews, retailers expressed ongoing commitment to food donation to reduce food insecurity in the communities they serve while also emphasizing the importance of cutting food waste at the ordering stage.

Of interview participants from "other organizations", ten out of 15 focused on supply chain efficiencies and seven highlighted the importance of enhanced demand planning. As these organizations are often a conduit working to improve effectiveness between the retailers and HROs, they help to facilitate everyday operations and make the transfer of food more seamless and streamlined. This includes conducting route analyses to understand proximities and improve efficiency. Understanding available inventory, distances between stores and food banks, and timing of logistics is essential for these stakeholders in matching and scheduling pickups.

"HOW HARD CAN IT BE TO GIVE AWAY FREE FOOD? IT IS A LOT MORE DIFFICULT THAN YOU THINK." – "OTHER ORGANIZATION"

Consistent with previous research on this topic, this research showed that retailers and HROs frequently vary in their perceptions of HROs' capacity to consistently pick up food. One retailer perceived HROs to have enough trucks but not enough drivers. On the other hand, retailers often have a limited understanding of HRO operations and what goes into the transporting and handling of food donations after they leave the store. Among the HROs we spoke to, some have pickups seven days a week, some five days a week, and some two days a week. Some have limited hours of operation while others are more flexible. While most HROs have enough trucks, many of these vehicles have been acquired recently through grant collaboration or truck sharing, and several HROs mentioned that they could use more vehicles. Some HROs have volunteer drivers, some have paid drivers, and some have a mix. Within and across HROs, there can be refrigerated trucks, non-refrigerated trucks, refrigerated totes, and the method of transport can vary or remain the same depending on the type of food at issue (e.g., produce, meat, dry goods). This variation was observed during our site visit. Previously, the Rainier Valley Food Bank had two volunteer donation pickup drivers; however, when the volunteers moved away, food bank staff had to step in and conduct pickups, pulling them away from other responsibilities. Additionally, the food bank recently experienced several maintenance issues with their refrigerated truck and have needed to rely on their non-refrigerated vehicle (**Photo 2** shows some of the food bank's vehicles). Lastly, even though we were in South Seattle, our first pickup was over 20 minutes away on Mercer Island. This store partnership was driven by a historical donor match.

Photo 2: Food Bank Vehicles

SCALABILITY

Only 18 percent of HROs, but 75 percent of retailers, noted it is "slow or difficult to scale" grocery food rescue efforts. This makes sense as HROs primarily operate as stand-alone food banks, whereas retailers are often nationwide chains. For retailers, focusing on the bottom line comes with

strategic growth and growth challenges. In addition to difficulties in scaling, even maintaining current food donation transportation processes presents opportunities and complications. As one interview participant mentioned, "[food rescue] has in some ways become more complex than it maybe needs to be."

Starbucks shared a shift in its food rescue model based on the premise that the cost of food rescue should not fall on HROs and communities. Previously HROs picked up food from Starbucks stores; now, through Starbucks FoodShare, the majority of the stores' food is rescued via contracted third-party transportation funded through tax breaks (see Solutions below). The remaining stores' food is still picked up by HROs, but facilitation is handled by Food Donation Connection. Starbucks noted opportunities and challenges in shifting to this model given the need for a positive return on investment, coordination of additional logistics with uncertain supply, and complexities with reaching rural stores not on the third-party transportation provider's route. Safeway/Albertsons is another retailer exploring how they can transfer the burden of transporting food away from HROs to a possible donor. This includes vetting possible solutions, funding mechanisms, and last mile logistics that suit its HRO partners.

Amazon is working to scale its food donation transportation efforts through its home delivery program, currently in effect in a couple dozen cities (see Solutions below). Amazon operates this program in much the same way as their business, setting up agency partners as if they were their own distributional warehouses and managing drivers in the same way as their consumer business. Amazon shared that technological difficulties are the greatest barrier to scaling this operation. The company is in the process of setting up a trained and qualified customer service team to field inquiries from HROs—a process now handled by a designated program manager. Since food rescue is so local and granular, even retailers like Amazon that are experts in achieving growth, are navigating new problems in novel contexts. One additional challenge Amazon described was the need for frugality, especially in the current market, which puts a premium on optimizing scarce resources.

Scalability requires growth across private and public sectors. As one interview participant stated, "At the highest level, I think about how to build capacity for the program. And, you know, I think of it as a stool with three legs. So, there's donating businesses, recipient agencies, and volunteers, and each one of those legs needs to grow in height at the same time as the other legs for it to be feasible for the program to be able to handle the growth." HROs focused on scaling up mentioned the labor and infrastructure constraints as the greatest challenges to doing so. "Other organizations" noted funding as the biggest challenge to scale. One third-party facilitator also underscored when it comes to scaling, on the ground realities can be very different, leading to difficulties in implementation.

COLD CHAIN, STORAGE, AND FOOD SAFETY

Seventy-three percent of HROs, 50 percent of retailers, and 80 percent of "other organizations" spoke about cold chain and storage constraints as the biggest barrier when discussing grocery food rescue last mile logistics, which also links to food safety risks. Simultaneously, four HROs, one retailer, and eight "other organizations" spoke to cold chain and storage capabilities. Some organizations answered both, underscoring the cold chain and storage capacity and limitations they have. Consistent with our literature review, the high cost of refrigeration equipment and the restricted space at retailers and HROs contribute to these constraints. Since large quantities of food

are often refrigerated or frozen and need to be moved in a short amount of time if not in cold storage, this adds a layer of complexity in coordinating last mile logistics. Food may become damaged or unsafe if not properly stored or moved. While 57 percent of interview participants specifically shared the importance of food safety in their grocery food rescue work, this does not necessarily mean the other half of interview participants discount food safety, especially as there are regulations in place to ensure food safety protocols are followed.

LAST MILE LOGISTICS WITH FACILITATION AND MATCHMAKING SERVICES

Fifty-five percent of HROs and 100 percent of retailers spoke about the importance of facilitation and matchmaking services from intermediaries, regional food distributors, applications, and online marketplaces. This includes organizations like FoodMesh, Too Good To Go, Food Donation Connection, Food Lifeline, Northwest Harvest, and Second Harvest, all of whom we interviewed. Interview participants also mentioned Food Rescue Hero and Replate, technology platforms that provide applications allowing volunteers and drivers to deliver food to those in need. Third-party facilitators can increase efficiency, trust, and allow for greater flexibility when transferring food between retailers and HROs. Online marketplaces help to reduce friction by matching retailers and HROs for inventory and delivery and housing communication and logistics in one place. As with most of our findings, there are trade-offs; while these third-party facilitators and applications are found to be helpful most of the time, challenges such as unreliable pilot technologies or differences in perceptions between stakeholders (e.g., an HRO and a third-party facilitator) arise in some cases. Nonetheless, third-party facilitators were described as "ecosystem builders," "connectors," and "holistic models" for grocery food rescue and last mile food donation logistics between retailers and HROs.

STAKEHOLDERS

"Stakeholders" refers to the people and organizations involved in grocery food rescue and the ways in which they interact within this system. While grocery food rescue participants are connected by a common purpose, each stakeholder has a unique social structure, position, and resource level that shapes the way they interact and participate in the broader system. In this section we discuss the power dynamics between stakeholders, the role of facilitators, how frontline workers impact grocery food rescue implementation, and the growth of collaboration.

PUSH VERSUS PULL: POWER DYNAMICS BETWEEN STAKEHOLDERS

In our literature review, we introduced the primary and influencing stakeholders in the grocery food rescue network. As illustrated in **Figure 6**, stakeholders in grocery food rescue exist on a spectrum of power and interest and are subject to varying external pressures that can create capacity constraints and hinder the ability to achieve the goals of the overall system.

The power dynamic inherent in the food donor-recipient relationship can make it difficult for HROs to navigate communication with their retail partners. This challenge appeared especially prevalent in conversations about donation quality. Several interview participants described feeling as if they need

to accept all the food donations given to them for fear of harming or losing donor partnerships. As one participant noted, “The issue with food coming from grocery rescue creates an inherent power dynamic and equity issue. Some programs feel obligated to accept all donations, damaging their partnership if they decline." HROs reported varying approaches to navigating a partnership that yields poor quality donations. Interviewees familiar with the hunger relief system agree that it is exceedingly rare for a retailer to drop an HRO partnership due to quality complaints, yet this fear appears to persist in the sector. As such, some HROs expressed a preference for taking everything offered to make the donation experience easier for the donor, while others said that they regularly quality check donations at the store and are comfortable refusing to accept food they cannot use.

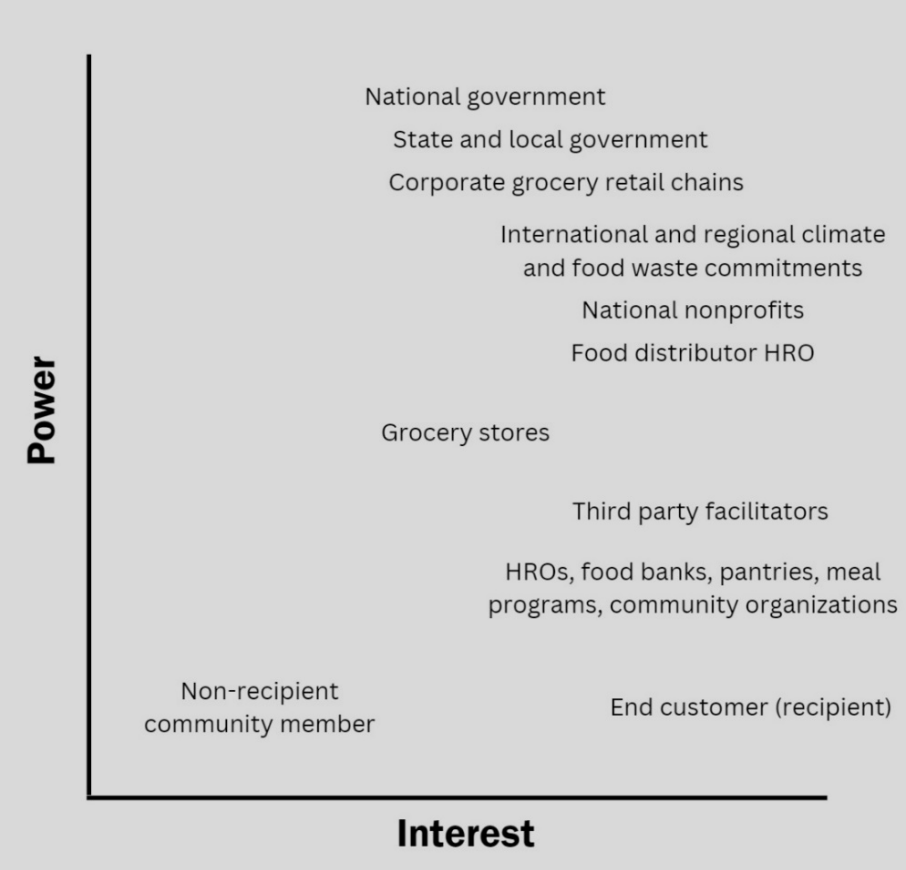


Figure 6: Power and Interest Stakeholder Map

When poor quality donations do end up at HROs rather than being refused at the store, this can result in bottlenecks in processing, sorting, and staging donations, and wastes the resources used to rescue inedible or low-quality food donations. Over a third of HROs expressed concern about the added waste disposal work and costs caused by grocery food rescue, with many expressing that the volunteer labor necessary to sort out bad quality donations far exceeds the labor needed to engage in store pickups. As one organization put it, “a lot of pantries are burdened by having to dispose of the waste from larger corporations. These are small nonprofits with a tiny budget, and having to pay for disposal of waste eats into that budget and just takes time.” HROs’ inability to refuse donations was echoed not only by HROs but was acknowledged by several retailers, nonprofits, and “other organizations” who understood how this expectation can burden HROs. These issues were severe enough to cause one HRO in our sample to recently step away from grocery food rescue entirely; however, many HROs that rely on donations do not have the ability to terminate difficult partnerships.

The idea that HROs take what is offered and have little control over the types of food they receive was described in one interview as a “push” model for distribution. In a push model, organizations lack choice and are expected to take whatever they can get. In contrast, a “pull” model involves HROs making conscientious procurement decisions based on community preferences, nutrition

guidelines, and demand. Our interviews suggested that HROs engage in both push and pull distribution. HROs are interested in assessing community preferences and providing high-quality, nutritious, and culturally relevant food. Six HROs mentioned that they conduct client surveys to assess community preference and seven HROs identified the provision of culturally relevant food as a best practice. Although HROs generally had positive views of their grocery food rescue partnerships, viewing them as important sources of food to meet growing levels of need, HROs also indicated that these partnerships must be supplemented by purchasing to meet community demand for culturally relevant food or other pantry staples that are available in insufficient quantities through grocery food rescue.

"THE ISSUE WITH FOOD COMING FROM GROCERY RESCUE CREATES AN INHERENT POWER DYNAMIC AND EQUITY ISSUE. SOME PROGRAMS FEEL OBLIGATED TO ACCEPT ALL DONATIONS, DAMAGING THEIR PARTNERSHIP IF THEY DECLINE." - NONPROFIT

HOW FACILITATORS IMPROVE AND BOTTLENECK THE GROCERY FOOD RESCUE SYSTEM

In grocery food rescue, regional food distributors and several large nonprofits play an important role in creating partnerships between HROs and grocery retailers, establishing donation guidelines and practices, acting as an intermediary and problem solver, and advocating for hunger and food assistance policies. The largest national nonprofit in this space is Feeding America, which has partnerships at the corporate level with many grocery retailers and other food businesses. Every HRO in our interview sample either works with Feeding America directly or with a Feeding America "member" food bank to source food and coordinate some or all of their grocery food rescue partnerships. Some HROs said that before Feeding America's grocery donation program was in place, many grocery stores did not donate food. After, grocery retailers felt more protected and willing to provide donations. HROs also noted that quality greatly improved for stores in the Feeding America network. For the two Feeding America affiliates in our interview sample, benefits of the network include access to grocery store donation partners, alerts of new grocery store openings, and increased diversity of product received.

FACILITATOR BENEFITS

Facilitation organizations can lower barriers in the grocery food rescue system. These organizations can be within the hunger relief system, or they can be intermediary third-party businesses that provide matchmaking and last mile logistics support services as noted in the Facilitation and Matchmaking section of *Supply Chain,* above. Organizations like Food Lifeline, which do not distribute food directly to consumers but instead distribute food or coordinate partnerships for other HROs, play an important part in the hunger relief system. We spoke to several regional food distributors in Washington State and each of them described themselves as a "food bank for food banks." While they all used this language, the ways they interact with HROs differ. Some primarily work in establishing relationships between donors and HROs, while others are more involved in managing donation relationships. These organizations work with hundreds of grocery retail and HRO partners. Organizations in our sample discussed several important benefits of facilitators:

- Establishing food donor partnerships

- Food donor partnership network access
- Development of standardized donation guidelines, baseline policies, and procedures
- Providing training and retraining for store partners
- Centralized logistics coordination and scheduling information database
- Providing limited donation infrastructure such as thermal blankets and scales
- Access to free, diverse, and consistent food
- Acting as a neutral third party or mediator between stores and HROs
- Consolidation of food donation poundage data for corporate tax benefits

These benefits remove some of the burden from HROs, build standardization and flexibility into the system, and help establish a grocery food rescue network. Given their size, large regional food distribution organizations are better suited to implement and scale standardization programs and have more leverage to negotiate with corporate grocery chains. They also have access to technology and infrastructure that enables them to build a partnership network. This network could facilitate work outside of just grocery food rescue with warehouses, farms, and other food distributors.

Several HROs suggested that it would be helpful for these organizations to use their "clout" to create uniform grocery food rescue practice across the state and activate more food donation partnerships, especially in areas where there are fewer grocery and food businesses. The benefits of other forms of facilitation and intermediary stakeholders like third-party businesses and applications include much from the above list, particularly building networks and matching food donation and HRO partners. Our research suggests that intermediary organizations can also help centralize information, map food donation ecosystems, identify waste streams, bring new parties into grocery food rescue, function as mediators to solve problems, conduct trainings, and increase the amount of food recovered. As a retailer said, "Just having that intermediary to go to that both parties trust is great."

FACILITATOR BOTTLENECKS

The first facilitator bottleneck that emerged was that the Feeding America network can be exclusionary, preventing other organizations from gaining access to donation partners and food. Some HROs and nonprofits discussed instances in which retailers that had pre-existing donation partnerships through a facilitation organization refused to donate product to other organizations, even when the primary partner was unable to accept the donation.

We also heard that HROs differ on the types of donations they will accept from grocery partners, which can lead to confusion and frustration for both HROs and retailers. In the current process, donation guidelines are established on the retail side based on what the retailer is willing to donate; however, many HROs also have preferences based on the communities they serve and their operational and infrastructure constraints. These differing viewpoints can get lost in translation between retailers, HROs, and even some intermediaries, which can lead to confusion and frustration among partners.

Several HROs mentioned it can be difficult to get responses from large regional facilitators and that if new intermediary partnerships are not introduced appropriately, they can be blindsided by new processes or feedback that they were not previously aware of. There was mixed sentiment on whether HROs prefer having an intermediary to direct store relationships; however, even with intermediaries, the importance of relationship building between partners was a key theme across all

interview participants. Other concerns around intermediary organizations are their longevity, ability to scale, and the potential to add more steps in the grocery rescue process.

Finally, our interviews highlighted that new complications can be introduced when existing processes are changed in order to leverage an intermediary. One retailer discussed recent changes to its donation process; where previously the retailer had followed the traditional food rescue model of HROs coming to pick up donations and it is now using third-party contractors to consolidate donations at its central warehouse to disperse large-scale donations to regional food distributors. This is a great example of a model that shifts the burden of food donation transportation from the HRO to retailer; yet in interviews, two former HRO partners were entirely unaware of this new model, and both independently mentioned their perception that this retailer had recently ceased to donate food entirely. Although intermediaries have the potential to improve the efficiency of food rescue, this case study illustrates the risk implicit in disrupting existing relationships.

THE IMPORTANCE OF FRONTLINE WORKERS

Frontline workers, grocery store employees, and HRO volunteers and staff play crucial roles in how the grocery food rescue system functions and how new standardization practices and other programs are implemented. These are the individuals on the ground doing grocery food rescue work every day, and they have an enormous influence on the effectiveness of the process. A theme heard over and over was that every store is different. These differences include where and how stores and departments stage food donations, the quality of the food donated, and the type of food donated. Variability between stores creates bottlenecks and uncertainty for HROs. As one organization put it, "some stores make that process of [food donation] discovery very, very simple and have good respect for the hazard, the temperature controls and making sure that the food is also kept away from pests. And then we have some other pickup locations where I think we see a little less caregiving to those donations. And so, for us, it requires a lot more processing at the store site as we have to kind of cull through where the donations are to find what's edible, or we basically take it back with us and process it on site here."

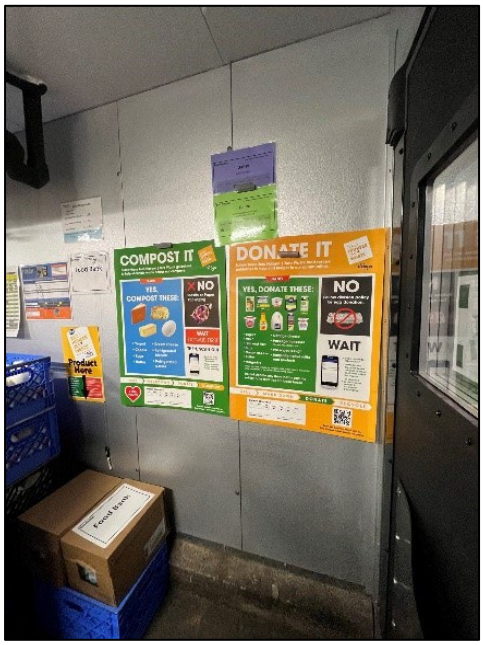


Photo 3: In-store Food Donation Signage

TRAINING

Many interview participants stressed the important role that training plays in developing an effective grocery food rescue program and preventing food waste. In one example, Food Lifeline went to a new store before it opened and trained the staff on grocery food rescue as a part of the onboarding process. This resulted in long-term, consistent high quality food donations from that store. **Photo 3** shows an example of posters from our site visit which act as visual training reminders to employees about what food they can donate to HROs. Almost half of the HROs interviewed mentioned challenges around retailer training and identified areas of opportunity for training such as donation date labeling requirements.

BUY-IN

Forty-seven percent of interview participants emphasized that frontline buy-in is as important as, if not more important than, training and other standardization strategies. As one HRO put it, "at the end of the day, it also comes down to the stores wanting to invest in the success of the food recovery program and the staff wanting to invest in the success of that program…I would say that we have one or two store partners that it wouldn't matter if they use the same consistent plastic bins. They would likely be dirty or not well maintained. They still wouldn't store their at-risk product in the proper temperature controls, and so we're regularly discarding your donations. And so, for us, that is an issue around the people doing the work rather than the kind of practical system or tools that they have."

For HROs, the importance of frontline buy-in applies to how store employees impact day-to-day grocery food rescue operations and the ability to achieve sustainable improvement in food donation processes. In stores where employees are less engaged or motivated to participate in grocery food rescue, HROs recalled receiving trash, spending more time processing donations, feeling unable to give feedback to partners, and in rare cases would exit partnerships where the costs were greater than the benefit. Lack of frontline buy-in is made more difficult due to employee turnover and disconnection between corporate level and store-level employees, which can lead to differing perceptions of whether a rescue program is working and how effective it is. Contacts across sectors referenced the challenge of translating corporate commitments into on-the-ground practice. Notably, all retailer contacts interviewed for this project were at the corporate level rather than store-level employees responsible for pulling products for donation.

RELATIONSHIP BUILDING

HROs repeatedly mentioned the importance of building relationships with store employees and department and receiving managers. These face-to-face relationships helped HROs build trust and put a human face to grocery food rescue. Several HROs made a point of having staff visit stores at least once a week to ensure there was mutual accountability with grocery store partners. Sharing impact stories is another relationship-building best practice. Some HROs use posters or other in-store visualizations to illustrate how many pounds of food or number of meals stores had donated in the last year. One HRO also used impact stories to motivate volunteers, particularly food rescue drivers, to make sure they understand the impact they have on the organization. Another best practice example that surfaced several times was the idea of having store employees and managers visit HROs to understand their operations and see the impact of donated food on communities. On the retail side, two retailers mentioned their organization provides free food for store employees during shifts to internally motivate and support workers, some of whom are food insecure themselves.

MOVING FROM COMPETITION TO COLLABORATION

Beyond the emergence of partnerships during COVID, collaboration to move past competition, increase the capabilities of individual organizations, and increase equity in the grocery food rescue system was a major theme throughout our interviews. Participants were excited to share their perspectives to try to get more people on board and connected. They saw themselves as a link in the

system—the more people participate, the more waste you get out of landfills, and the more food you get on people's plates.

COLLABORATION NETWORKS

Collaboration appears in many forms. The first is formalized collaborative networks or groups like SPU and Mary's Place Food Innovation Labs, NWFA's Collaboration Network, and PCFWC. These networks bring together diverse stakeholders with differing expertise who are trying to address systemic food waste and food rescue issues. They analyze and problem solve food waste challenges in addition to working together on pilot projects and sharing learnings. Collaborative networks and corporate commitments help pivot organizations that may traditionally be competitors into partners by creating safe spaces built on mutual goals and shared values.

RESOURCE SHARING

Resource sharing helps smaller organizations leverage the resources and expertise of larger organizations and is beneficial to both organizations, as larger organizations can gain access to more grant funding, funnel resources elsewhere that would otherwise go to waste, and keep their existing donor partnership strong. As an HRO interview participant described:

> "[Food rescue] is kind of a competitive industry to some extent. People have their territories, and they don't want you in their territory. And I'll admit it, I've gotten defensive when other food banks have come in and picked up food from a store that I know that, you know, it's our store, our food. So it's just working with other agencies. When a large agency has something to give to a smaller agency that's always good for the partnership and good for people who need the food, because it makes sure that that smaller food bank can pick up larger amounts of food. Especially rural food banks that are growing a lot."

For small organizations that face tighter constraints, partnerships allow them to expand their service and access more food and other resources. As one organization that was committed to building local partnership networks put it—"it's a way to support food recovery and support local."

HROs often function as hubs for other community organizations, schools, mobile markets, and much more. Some HROs interviewed expressed a desire for increased awareness of and connection to other organizations to expand their capabilities and to serve more people. An interest in shared resources, such as food hubs, commercial kitchens, or other infrastructure was also mentioned frequently. Shared resources and network building are understood to increase the flexibility and capacity of the overall grocery food rescue system; however, there is also a need to test and scale the use of shared resources.

PARTICIPATORY DESIGN

Participatory design or co-design is the intentional involvement of those impacted by food insecurity in the creation of hunger relief programs as well as the incorporation of HROs into the design of grocery food rescue programs. This was described as ensuring all the current stakeholders are included from the very start of a program, holding launch meetings for new grocery food rescue programs, surveying clients to understand their experience and needs, and elevating marginalized voices. As one HRO put it, "We certainly don't want to pretend to be the expert in the room. It is about receiving feedback from the folks who are really doing it and hoping that they are getting the voice of

the customer right. We really want to get past everybody in that supply chain and understand the experience of the person that is going to receive the food when they're in need." This is a balancing act of using human-centered and community-based design while also making sure processes are efficient. However, the feedback loop participatory design helps to connect frontline workers with other stakeholders and processes.

COLLABORATION CHALLENGES

A collaboration challenge that surfaced was the disconnect between retailers and HROs stemming from different perspectives, conflicting priorities, and lack of awareness of each other's circumstances, constraints, and operations. Another was the challenge of balancing competing interests between the large number of stakeholders in the grocery food rescue system. Additionally, everyone wants to see change occurring on the ground in their own jurisdiction or operation and there is a need for data to build the business case and understand social and environmental impacts on the local level. The longer timeframe of change in grocery food rescue also amplifies the challenge of keeping organizations and individuals motivated.

SOLUTIONS

Many individuals interviewed for this report shared innovative approaches to overcoming barriers in grocery food rescue. This section covers themes surrounding solutions, such as the need to add value to rescued food, shift mindsets around food rescue, and create systemic, just localized grocery food rescue solutions. Current and potential best practice solutions surfaced during our interviews and from our literature review are summarized in **Table 2**.

ADDING VALUE TO RESCUED FOOD

Many nonprofits and HROs we interviewed are pursuing innovative approaches to add value to the food they rescue. For example, the nonprofit organization Wasat works with local chefs to transform rescued food into prepared meals that cater to the needs of cultural communities. The HRO Farestart also spoke at length about the importance of value-added food processing, where rescued food is processed, frozen, or otherwise transformed into a stable product to maximize its useful life. Farestart has found that stale bread – which many HROs agree is not a desirable product – can be ground into flour and substituted for all-purpose flour in recipes and baked goods. PCC Community Markets, a Washington-based grocery retailer, referenced an upcycling opportunity as well. Working with Farestart and their food processing infrastructure, they are piloting a program to transform stale bread from their stores into croutons and breadcrumbs for use in their prepared food department. This example reinforces the importance of developing a grocery food rescue system capable of matching donation opportunities to HROs who are positioned to make use of that product. Our conversation with Farestart illustrated the ways in which grocery food waste solutions can expand if stakeholders are equipped to think creatively about rescuing food. "My dream is to find a huge stream of waste and valorize it, turn it into really awesome product," shared our interviewee from Farestart.

Interviewees also highlighted ways to expand food rescue to support other parts of the food system, particularly through partnerships with local farmers. For example, the previously mentioned King

County Farmers Share provides funding for HROs to purchase produce directly from local farms. The King County Local Food Initiative shared that a secondary benefit to this program is to provide opportunities for farmers who may be too small to sell on the wholesale market to scale up their distribution capacity. Similarly, Farestart highlighted a potential "buy-out" program in which donors commit to purchase any food a farmer is unable to sell on the open market, thereby allowing the donor to support both food security and local agriculture.

SHIFTING MINDSETS AROUND FOOD RESCUE

The food rescue system is generally framed with the understanding that retailers are givers and HROs are the beneficiaries of charity. However, many of our interview participants highlighted the need for a shift in this narrative, arguing that HROs who engage in grocery food rescue are providing a valuable service to retailers and governments alike. A nonprofit interview participant highlighted the similarities between an HRO which transports rescued food in order to save it from the landfill, and a waste management company which transports wasted food to the landfill. The waste management company is compensated by the city, but the HRO must go out in search of grants to fund their operations. The HRO shared, "I think what should be happening is that we should be seen as providing a service that the local municipality is willing to pay for." Other interviewees highlighted the tax benefits retailers receive by rescuing food, noting retailers gain substantial financial benefits for donating food that would otherwise have been thrown away.

NO ONE-SIZE-FITS-ALL SOLUTION

Seventy percent of our interview participants mentioned the idea that there is no one-size-fits-all solution for grocery food rescue and last mile food donation logistics. As interviewees from the HRO and retail sector, respectively, stated, "[I'm] opposed to a monolithic solution. I think it's not wise to have just one-all-be-all," and "at this time we're very much open to ideas or collaborations because one solution doesn't solve everything. It has to be a combination of many, and it needs to be diverse. It's an art you know, we're all working to improve how we can address food access."

There are numerous and diverse stakeholders, needs, processes, constraints, and goals across the grocery food rescue system. Neighborhoods hold different communities, communities have different food needs, HROs face different constraints, grocery retailers have differing priorities, and food donation supply and demand varies. Currently there is a lot of innovation in the food rescue space; however, there is also a huge need to pilot technologies and strategies to assess their effectiveness and applicability to different contexts. In our interviews, several areas emerged around no-one-size-fits-all solutions: activating and mapping the food waste ecosystem, promoting alternative hunger relief models, localizing food rescue, and leveraging systems design thinking to create a toolkit of solutions that allows organizations and communities to choose the solutions that work best for their scenario.

ECOSYSTEM MAPPING

Eighty-three percent of interview participants discussed the importance of creating a food rescue ecosystem mapping current and potential connections between donors and receiving organizations. This network mapping could extend beyond just grocery food rescue to incorporate other parts of the

food system to increase the amount of food rescued, drive efficiencies, and feed more people. This ecosystem mapping would include:

- Current connections between HROs, nonprofits, and community organizations to grocery stores
- All HROs, nonprofits, and community organizations involved or wanting to be involved in food assistance and food rescue
- All grocery stores, food businesses, foodservice, restaurants, food manufacturing, food processing, and farms involved or wanting to be involved in food rescue
- Shared infrastructure, such as food hubs, commercial kitchens, and processing plants
- Food waste hotspots identification
- Hunger relief service gaps or food desert identification

Ecosystem mapping was described by interview participants as a way to understand the current grocery food rescue network, expand to other sectors of the food system, identify waste hotspots and gaps in waste reduction coverage, surface food rescue opportunities, and bring more stakeholders into the system. This mapping would also create a catalog of resources, adding flexibility into the system. Other ideas included leveraging network mapping to create value-added opportunities, such as extending the life and usefulness of food through shared facilities, equipment, and knowledge. Ecosystem mapping also ties into collaboration and helps build system resilience by increasing the flexibility and connections of single organizations.

ALTERNATIVE FORMS OF GROCERY RESCUE AND HUNGER RELIEF

Seventy-seven percent of interview participants mentioned alternative grocery rescue and hunger relief models. Some of these solutions emerged during COVID, while others are used to remove barriers in hunger relief and food rescue, expand food rescue, increase accessibility to vulnerable populations, serve communities in food deserts, and build localized solutions *(see Solutions below).*

LOCALIZATION OF FOOD RESCUE

Localization of food rescue relates to the idea of keeping food within community as a form of equity, but also allows for the customization of solutions to specific organizations and businesses. As one interview participant stated, “all of this communication and coordination must happen at the local level because there's no one-size-fits-all solution.” Localizing food rescue through alternative grocery food rescue and hunger relief models can get more food waste sources involved in the system, such as restaurants, hotels, and other foodservice businesses, while simultaneously increasing the equity of the hunger relief system.

SYSTEM DESIGN THINKING

Sixty percent of interview participants highlighted system design thinking as a way to think about the full food system value chain and institutionalize food and waste reduction practices. Although solutions may need to be tailored to the specific context, interview participants agreed that standardization and uniformity must tie into local implementation to drive systemic improvements and increase overall levels of food rescue. This systemic thinking is crucial to creating lasting and scalable change.

GROCERY FOOD RESCUE SOLUTIONS

Table 3 presents grocery food rescue and last mile food donation best practices and solutions shared by our interview participants. These solutions include programs that have already been implemented and strategies that are desired for the future. While many of these will work across different geographies, grocery food rescue is in a learning phase on last mile strategies and many of these solutions will need to be tested in both urban and rural environments. However, we believe these solutions serve as a playbook of potential options for cities and communities to use based on their specific needs. In the recommendations chapter, we go into further detail about some of these practices and examples of organizations that have conducted them.

Table 3: Grocery Food Rescue Solutions

Grocery Food Rescue Solutions	Description
Collaboration networks (e.g., PCFWC)	Organization of stakeholders to problem-solve together
Community food hubs	Center where people can go to pick up food
Community fridges	Community fridges are monitored by local businesses where people can freely access food and food businesses can drop off food at any time
Customer service centers	Trained government or retailer experts that can field logistical challenges for HROs
Data reimbursement	Third-party facilitators pay HROs to input data
Dynamic pricing	Discounted food on the shelves of grocery retailers when it is near expiration
E-cargo bike transport	Movement of food donations on zero emission bikes
Ecosystem mapping	Full analysis of stakeholders and connections in the grocery food rescue system (not yet in development)
Electric refrigerated vehicles	Movement of food donations in zero emissions trucks
Employee engagement campaigns	Integrated, interactive campaigns to get grocery store employees invested in food waste reduction efforts
Third-party facilitators (e.g., Food Donation Connection)	Third-party management of food donation logistics
Government-funded third-party transportation[5]	Government funded and operated fleet of trucks and drivers for use by HROs in Washington (not yet in development)
Grant collaboration	Pooling of shared resources to apply for and obtain grant funding for food donation transportation efforts

[5] The government-funded third-party transportation fleet came up early on in our discussions with our consultant experts from NWFA, SPU, and UW as an area of excitement. We included the idea of the fleet as an example of an alternative form of grocery food rescue and hunger relief in our interview questions.

Grocery cards	Gift card-like stiped for use at retailers
Home delivery	Free delivery of food from HROs to homes of vulnerable populations
Micro hubs	Central point where HROs can pick up food
Micro pantries[6]	Like community fridges but for dry goods
Volunteer mileage reimbursement	HROs pay volunteers for the miles traveled to pick up donated food
Mobile markets	Fresh food on wheels that can move closer to vulnerable populations and food deserts
Online food waste reduction platforms and marketplaces for selling surplus food (e.g., FoodMesh, Too Good To Go)	Manage inventory and orders in an online marketplace
Re-training	Intentional recurring employee training
Recipes and repurposing food	Chefs and HRO/retailer partnerships transform food donations into meals or new forms (e.g., bread to croutons)
ReFED Insights Engine	Online center of data, insights, and guidance to inform food waste reduction solutions
Corporate reinvestment of tax incentives	Retailer use of funds from food waste tax incentives to fund transportation in place of HROs
Retailers and HROs trade places for the day	Opportunity for retailers to see HROs grocery food rescue process and vice versa
Ride share transport	Movement of food donations by delivery carriers like DoorDash
Social supermarkets	Preserves dignity and consumer choice by offering food at discounted prices for food insecure individuals via a "shopping" model
Standardized food donation totes and bins	Use of uniform tools to store and transfer food donations
Toolkit and food waste reduction information hub	Shared database of tools, best practices, and standards across Washington (not yet in development)
Volunteer matching software	Online databases that facilitate logistics like volunteer scheduling for pickup shifts
Waste scorecards	Dashboard of food waste diverted and tracking of progress toward food and waste reduction goals

[6] Micro pantries arose early on in our discussions with experts from NWFA, SPU, and UW as an innovation that had been gaining traction. We included the idea of micro pantries, in addition to the vehicle fleet, as another example of an alternative form of grocery food rescue and hunger relief in our interview questions.

CHAPTER 6: RECOMMENDATIONS

To support Washington's 2030 food waste reduction goals, we present a potential roadmap of policies and programs across grocery food rescue stakeholders. This is not an exhaustive list of recommendations, but rather a prioritized grouping of best practices that emerged through our research. Grocery food rescue does not happen in isolation and the below strategies can and should be used across other food rescue formats and food waste reduction projects.

This roadmap presents recommendations across three timeframes:

- Short (2023-2025)
- Medium (2025-2030)
- Long (2030 and beyond)

As strategies are implemented over time, this roadmap was designed to model intended changes and show the evolution of the grocery food rescue system and the larger policy environment. As more data is collected and progress is made, we recommend incorporating learnings and results into the proposed solutions. This is meant to be an adaptive process, rather than a concrete framework.

The intended audience for these recommendations is Ecology, the Washington State Legislature, PCFWC, Food Policy Forum, retailers, HROs, nonprofits, third-party facilitators, and transportation providers. Each recommendation advises who the leader of the suggested tactic should be and includes implementation considerations and opportunities for future research, as applicable. These recommendations are presented in order of priority, with the most important recommendations presented first.

Accompanying the short, medium, and long-term recommendation sections are a series of graphics (**Figures 9, 10, and 11**) indicating which stakeholders the strategy most applies to, or which stakeholder groups will be most involved in the implementation of the recommendation. These stakeholder groups mirror those established in the *UFWW Plan*, as shown in **Figure 7**. We also indicate which *UFWW Plan* strategy each recommendation best supports, and the barriers it best addresses.

Figure 7: Food Sector Stakeholders

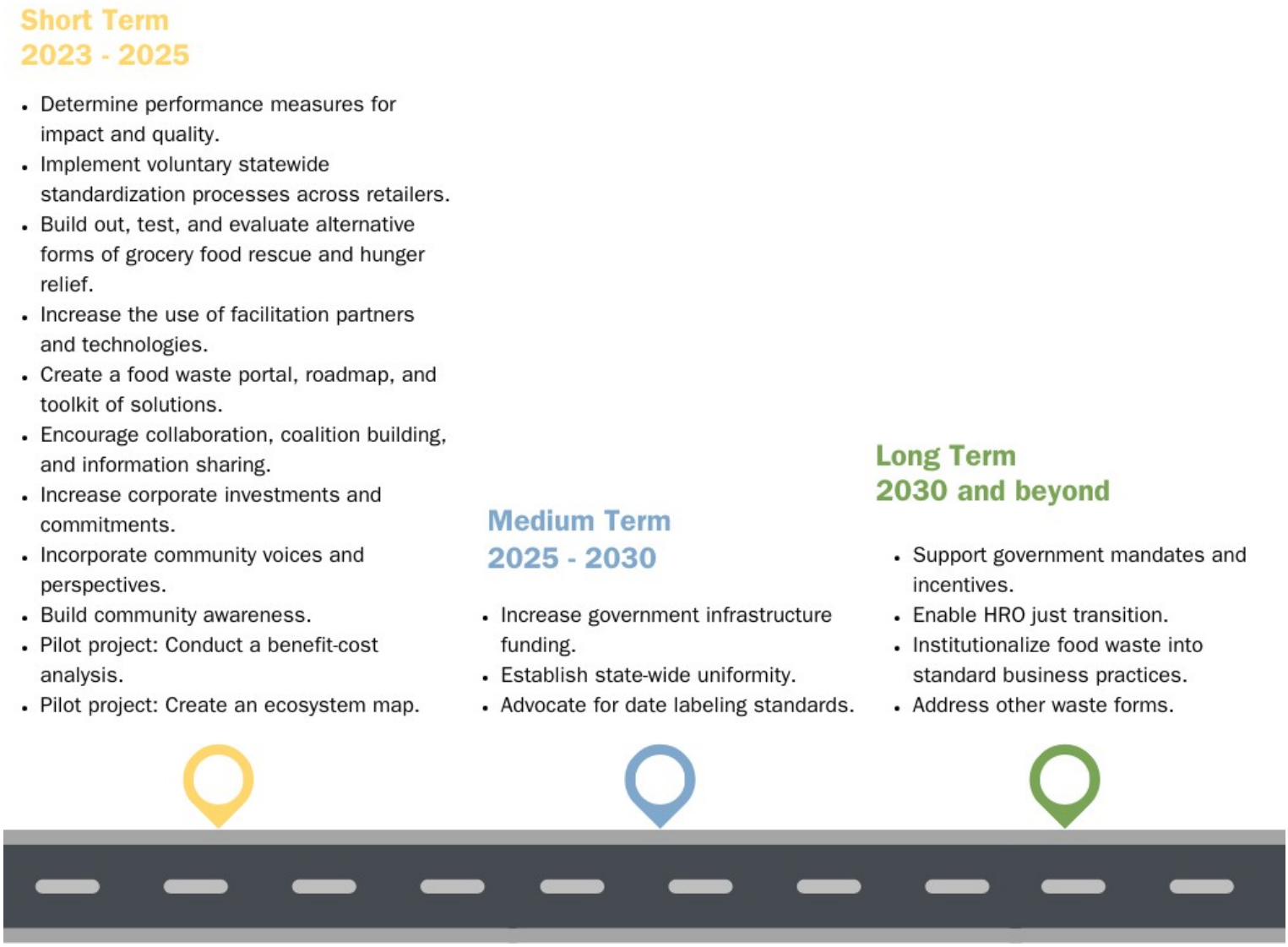


Figure 8: Roadmap of Recommendations

SHORT TERM - 2023 - 2025

Washington State has a unique opportunity to implement food waste reduction initiatives. There is strong momentum through statewide food waste reduction legislation, Seattle-based leadership, and dedicated research to continue acting on grocery food rescue. Our team identified the following recommendations to be both the most achievable and pressing in the short term (6 months to 2 years). These recommendations are prioritized based on key learnings from stakeholder interviews. The recommendations are also foundational and serve as building blocks for medium and long-term recommendations.

RECOMMENDATION: DETERMINE PERFORMANCE MEASURES FOR FOOD DONATION IMPACT AND QUALITY.

ACTIONS:

- The quantity of food donated by grocery retailers is regularly tracked as this information is necessary to take advantage of tax incentives. However, we are not aware of any existing data that tracks how much donated food was used by HROs as opposed to being thrown away. Where possible, HROs should be encouraged to collect data on what portion of food recovered through grocery food rescue is usable and report this information within the food waste portal (see portal recommendation below). This data will help to quantify what portion of donated food is of acceptable quality.
- To further incentivize retailers to donate high quality and nutritious food, Ecology should encourage the PCFWC to develop waste scorecards, like that of Raley's, for participating retailers that incorporate information on donation quality.
- Ecology should convene a working group of stakeholders to determine alternative metrics that better capture factors such as nutrition, quality, or cultural relevance of food distributed.
- Ecology should encourage stakeholders to consider equity-focused metrics that better capture which groups, if any, are inadequately served by the hunger relief system. While the number of meals provided and number of people fed are primary metrics used today in hunger relief, this data does not necessarily illustrate the extent to which distribution corresponds with need. The disproportional impact of food insecurity on people of color means that data is needed to understand if grocery food rescue is addressing this inequitable outcome.

IMPLEMENTATION CONSIDERATIONS:

- It is crucial that as data collection, sharing, and analytics practices are built, an emphasis is placed on removing administrative burden on HRO and grocery store staff. As other research shows, this will increase the viability of new practices and help promote buy-in from stakeholders.
- This recommendation can build off Supporting Wellness at Pantries (SWAP), an evidence-based program that helps promote healthy food choices in food banks and food pantries. Shared with us by the Washington Food Coalition, SWAP is a spotlight system which ranks food nutritionally (green choose often, choose yellow sometimes, red choose rarely) and can be used by food pantries to guide conversations with donors about prioritizing healthier options.

RECOMMENDATION: IMPLEMENT VOLUNTARY STATEWIDE DATA AND STANDARDIZATION PROCESSES ACROSS GROCERY RETAILERS.

ACTIONS:

- Encouraging retailers to implement consistent packing, sorting, storing, and measuring of food donation will aid in streamlining pickups and transportation. It will also drive efficiency, save time, and reduce confusion and frustrations. This strategy will increase the efficiency of grocery

food rescue regardless of who handles last mile food donation logistics. A convening organization should lead the continued work to standardize grocery food rescue processes at the store and grocery chain level as has been done with the SPU Bin Pilot at Safeway/Albertsons.

- Strategies for consistent standardization include:
    - Clear signage and bins identifying where food donations are located in stores and what is for donation versus what is part of the store's inventory.
    - Signage describing what items and quality can be donated.
    - Documented standardized operating procedures, training, and re-training on logistics, quality, and date labeling standards.
    - Signage celebrating the pounds of food donated per quarter.
    - Sharing stories celebrating food waste reduction and food rescue milestones.
    - Consistent data collection methods, including metrics and tracking processes.

IMPLEMENTATION CONSIDERATIONS:

- These strategies will require relationship and partnership building, pilot projects, documentation of processes and learnings, and agreement across parties as seen in the SPU Bin Pilot.
- Standardizing grocery food rescue processes comes with the following challenges: ensuring accuracy and sustainability of standardized practices, gaining alignment across retailers at the corporate- and store-level that compete and have different sustainability strategies and business models, and managing a slow to scale timeframe (takes time to roll out and projects often get delayed due to speedbumps).
- To establish these standardization processes, the convening organization can test strategies using pilot projects, leverage AI to develop trainings, use software applications to support measuring and recording food, appoint store ambassadors to maintain momentum and share feedback, recognize stores with statewide awards, and integrate with the food waste portal.
- As a data standardization case study example that could be replicated, PCC Community Markets previously relied on data from HROs to estimate food rescued, but in recent years has shifted to leveraging data from scanning out products to estimate weights more accurately per product. This data then gets passed to Food Donation Connection who cleans up and shares the data record to be signed by HROs.
- While some of this work is already underway, standardizing practices across stores across the state will require substantial time. This can begin in the short term, but development and implementation will likely be ongoing into the medium term.

RECOMMENDATION: BUILD OUT, TEST, AND EVALUATE ALTERNATIVE FORMS OF GROCERY FOOD RESCUE AND HUNGER RELIEF.

ACTIONS:

- In collaboration with the WA DOH, retailers, HROS, and regional food distributors, Ecology should engage in efforts to innovate and facilitate alternative forms of grocery food rescue and hunger relief to fill gaps in service, rescue more food, and provide aid to a larger percentage of food insecure individuals, including those in historically underserved communities.

IMPLEMENTATION CONSIDERATIONS:

- The following case studies represent examples of a variety of alternative forms of hunger relief and highlight potential lessons to keep in mind when implementing similar projects. For a more complete list of alternative models of hunger relief, please refer to Table 2 in *Findings.* The efforts below and in *Findings* should be catalogued within the portal as a playbook of ideas *(see portal recommendation below).*
    - The South Seattle Community Food Hub is a community-led food share hub that emerged from research showing that access to infrastructure and cold storage were barriers preventing small farmers and HROs from getting involved in the food system. Once complete, this project will provide cold storage, a commercial kitchen, and other sought-after resources to HROs. It will additionally allow farmers access to wholesaling opportunities, particularly for farmers of color. This project is built off a community-based shared governance model that centers the needs of the South Seattle community.
    - While community fridges exist in many localities and capacities, Sustainable Connections in Bellingham is the first organization to prop up a community fridge specifically permitted by the Whatcom County Health Department. Established with the assistance of the nonprofit Freedge, the permitted fridge is the first-of-its kind in Whatcom County. Ideally, community fridges like this would be available 24 hours a day; however, current health department regulations require facility surveillance during operating hours. Sustainable Connections partners with a local nonprofit, The RE Store, to monitor the fridge and volunteers with food handlers' permits stock the fridge daily. Sustainable Connections conducted a survey of Freedge users and found 33 percent marked climate action as a reason for using the Freedge, illustrating community support of food recovery as a form of climate action.
    - Safeway is ideating about the possibility of installing micro pantries adjacent to stores to reduce food waste and preserve dignity. The current thinking is to position the free food to customers as "help us reduce food waste" versus directly calling out the need. This creative approach minimizes transportation required and increases equitable access.
    - Amazon's home delivery program leverages its Flex service, as well as Amazon-delivery service partners for 10 percent of deliveries, to transport food from food banks and pantries to disadvantaged and vulnerable communities. Amazon has also done some preliminary pilots to explore expanding this delivery model between grocery stores and food banks, but this has yet to be implemented. This functions as a strong example of a retailer leveraging its existing resources to target an identified area of need.
- These alternative distribution models come with some potential challenges:
    - Additional funding and infrastructure resources will be needed to set up new programs, and it is unclear how capital intensive each model is.
    - For free-standing distribution models like unmanned pantries and fridges housing perishable food, food safety is a major concern. Monitoring these pantries can remedy this, but adding labor constraints lessens the likelihood of being able to provide service at all hours. Strong partnership with the DOH and local health jurisdiction is needed to establish clear guidance and requirements for these programs.

RECOMMENDATION: INCREASE THE USE OF THIRD-PARTY FACILITATION PARTNERS AND TECHNOLOGIES.

ACTION:

- As discussed in *Findings,* third-party facilitators benefit retailers and HROs by managing last mile grocery food rescue logistics. Ecology's toolkit of solutions *(see toolkit recommendation below)* should include strategies for retailers looking to leverage third-party facilitators.

IMPLEMENTATION CONSIDERATIONS:

- The following case studies are examples of third-party facilitation partners and technology. For more information on third-party facilitation partners and technologies, see *Findings.*
    - Based in Canada, FoodMesh offers an online marketplace which helps to decentralize and digitize the food redistribution system by allowing businesses to list food for discounted sale or donation. Items can be claimed by HROs on a first-come, first-served basis and shipping logistics can be coordinated through the FoodMesh platform. FoodMesh also offers food diversion services to retailers by matching them with HROs able to collect and redistribute their unsalable food.
    - While FoodMesh works with HROs and retailers, Too Good To Go is another technology platform which is consumer-facing. Nonetheless, key learnings from its model – in which consumers pay to pick up a surprise bag of significantly discounted food items from surplus or best before dates food from stores –can be creatively leveraged when rethinking grocery food rescue. For instance, Too Good To Go hosts a centralized help center, is conducting a pilot with a national grocery chain, and partners with any food-selling businesses to join the platform, including gas stations selling prepared foods.
    - Other examples that could be replicated to increase engagement are Sustainable Connections and FoodMesh's innovative funding incentives, like reimbursing volunteer drivers for miles traveled in their own vehicles and paying HROs to enter data, respectively.

RECOMMENDATION: CREATE A WASHINGTON STATE AND PACIFIC COAST FOOD WASTE PORTAL, ROADMAP, AND TOOLKIT OF GROCERY FOOD RESCUE SOLUTIONS.

ACTIONS:

- In partnership with the PCFWC, Ecology should create an online portal that consolidates all food waste reduction and rescue strategies and resources in one place for state and regional stakeholders. This will help to generate greater visibility and alignment to food waste reduction goals and operational synergies.
- The U.K.'s WRAP Food Waste Reduction Roadmap offers an example of how to track food waste reduction progress, measurement, and collaboration across the food system leading up to 2030 goals. In addition to the roadmap, WRAP offers a toolkit, measurement guidelines, a data capture sheet, a sign-up list, and a whole chain analysis toolkit that standardizes processes and materials across industries in the U.K. The PCWFC and Ecology can work together to translate these materials, including WRAP's roadmap, to the Washington and Pacific Coast markets. While

the PCFWC currently refers to WRAP's whole chain analysis, this is done more so internally than externally.

IMPLEMENTATION CONSIDERATIONS:

- Resources like this report, outputs and learnings from our recommendations (e.g., data, standardization, alternative forms of grocery food rescue and hunger relief, benefit cost analysis, and ecosystem mapping), Washington legislation, pilot studies, PCFWC case studies, trainings, and future reports can be uploaded to the portal for open access. We recommend that these documents are clearly marked for ongoing action or historical reference and are positioned in context to the WRAP-developed materials.
- It is important that all documents are not simply uploaded to the portal but that the portal's user experience is intentional, customized by audience, and that the documents are socialized, leveraged, and iterated upon.
    - For example, retailers may have less bandwidth to go through these materials and will rely on the PCFWC for guidance.
    - WRAP and the PCFWC both have accountability mechanisms through signed commitments, which would need to be enforced and enhanced here, as well. This along with aggregated, anonymized data incentivizes stakeholders to share food waste data.

RECOMMENDATION: ENCOURAGE COLLABORATION, NETWORK AND COALITION BUILDING, AND INFORMATION SHARING BETWEEN GROCERY RETAILERS, HROS, GOVERNMENTS, AND FOOD ADVOCACY ORGANIZATIONS.

ACTIONS:

- Ecology should continue to build on and support existing collaboration networks, which are making great strides in bringing together stakeholders to pilot new food waste reduction strategies, encouraging information sharing on learnings and best practices, and creating networks of trust to enable better data transparency and standardization.
- Collaboration networks like PCFWC, NWFA Collaboration Network, and SPU Grocery Innovation Labs are uniquely positioned to overcome the data sharing and collection challenges and the disconnection between sectors present in the grocery food rescue system. As Ecology works to increase the voluntary statewide tracking of food waste data, the agency should identify and utilize data sources that already exist. Feedback should be sought from major regional food redistributors to further build out data collection capabilities.
- An example case study is NWFA that has hosted listening sessions to reconcile varied perceptions between retailers and HROs. Ecology and other grant-making government agencies can encourage resource-sharing between HROs by developing grant funding opportunities that reward collaboration between large and small organizations.

IMPLEMENTATION CONSIDERATIONS:

- Ecology and existing collaboration networks should seek out new partners to bring into food rescue collaboration networks that can bring unique perspectives and expertise. For example, the nonprofit Harvest Against Hunger has previously partnered with commercial trucking schools

to increase their food rescue capacity. For Harvest Against Hunger, they received donated freight transportation for rescued food. For the trucking school, trainees were able to practice driving with loaded vehicles as opposed to empty trucks. Identifying and including new partners can highlight new opportunities and increase connections between stakeholders.

RECOMMENDATION: WORK WITH CORPORATE GROCERY RETAILERS TO INCREASE INVESTMENT AND COMMITMENT TO GROCERY FOOD RESCUE AND FOOD WASTE REDUCTION INITIATIVES.

ACTIONS:

- Ecology, the PCFWC, and other organizations with existing partnerships with national grocery retailers should work with the retailers to increase their investment and commitment to grocery food rescue and food waste reduction initiatives by presenting evidence and case studies on how corporate action increases business performance while also supports the resilience of local communities.
- Retailers should consider making a direct financial investment in their HRO partners by donating funds or infrastructure to hunger relief or community partners. One retailer who has taken this step is Whole Foods Market. During COVID, the company set a goal to donate 19 refrigerated vans to HROs over the next several years (two in Seattle). This initiative creates a long-term solution to HROs infrastructure needs, while also increasing their ability to rescue food from Whole Foods Market and other grocery retailers.
- Retailers can also explore methods to contract out food donation logistics rather than relying on HROs. As discussed in *Findings*, Starbucks has implemented this strategy by reinvesting tax incentives they receive for donating food and using backhauling and their existing logistics network to transport donations. This model works by having Starbucks' employees consolidate and pack unsold food for donation daily. Donations are picked up by contracted warehouse delivery drivers when they drop off fresh products, and are then returned to centralized distribution warehouses, palletized, and delivered to regional food distributors. This model removes the last mile logistics burden off of HROs and allows Starbucks to drive food donation efficiencies.

IMPLEMENTATION CONSIDERATIONS:

- To increase store employee buy-in, grocery retailers should coordinate paid opportunities for employees to spend a day volunteering at HROs, thereby gaining more visibility into HRO operations and the impact of food donations on their local communities. Several grocery retailers and HROs already participate in similar programs, such as Trader Joe's and University District Food Bank.
    - This program should be shared among signatories of the PCFWC.
    - A convening organization may be leveraged to facilitate the organization of this exercise.

RECOMMENDATION: INCORPORATE COMMUNITY VOICES AND PERSPECTIVES INTO PROGRAM DESIGN, IMPLEMENTATION, AND EVALUATION.

ACTIONS:

- Conscious effort must be taken to incorporate feedback from traditionally marginalized groups, small HROs, and nonprofits, and community groups that serve communities of color to ensure that the implementation of recommendations does not perpetuate existing inequities. Ecology should solicit feedback from diverse stakeholders while developing implementation plans and evaluation metrics for new programs to support the building of a more equitable and just food system.
- Ecology, the PCFWC, and other collaboration network partners should also ensure community voices and a diverse group of HROs and community organizations are present in collaboration networks. This diversity should include communities of color-serving, small, and rural organizations. These organizations and communities are often overburdened by food insecurity and underrepresented in official collaboration networks.

IMPLEMENTATION CONSIDERATIONS:

- Members of marginalized communities may face increased barriers to participation in outreach or other programs. These include lack of trust, language barriers, transportation issues, and time and childcare constraints. Community members may also be reluctant to share feedback candidly for fear of retribution or non-anonymity. These factors should be kept in mind when designing outreach and communications strategies.
- Working with trusted HROs, community organizations, or community members may help overcome some of the barriers described above. It will also be important to be transparent and realistic in expectation when incorporating community feedback into program elements to not harm relationships.
- Feedback checkpoints should be built in to ensure goals and expectations are being met.

RECOMMENDATION: BUILD COMMUNITY AWARENESS OF FOOD INSECURITY AND FOOD RESCUE PROGRAMS.

ACTIONS:

- To increase volunteerism and local food business involvement in food rescue and hunger relief, Ecology should work with local stakeholders to implement community awareness campaigns.
- Building community awareness should increase volunteerism and business participation in food rescue and at HROs. This will also increase the localization of food, the usage of alternative hunger relief models, and equity in the system.

IMPLEMENTATION CONSIDERATIONS:

- The goals of this strategy are to increase community awareness of 1) the prevalence of food insecurity in the local community, 2) food rescue, hunger relief, and the requirements of getting involved, and 3) among vulnerable community members of hunger relief and social programs.

- Similar to above, to encourage community engagement Ecology should promote equitable practices that consider the timing, location, language, transportation costs, and childcare involvement to ensure equal access across populations. As one retailer observed, there are many challenges community members face in being able to be involved in building community resilience, especially if their own needs are not being met.

PILOT PROJECT OPTION 1: CONDUCT A BENEFIT-COST ANALYSIS (BCA) OF GROCERY FOOD RESCUE.

ACTIONS:

- As it stands, the costs and benefits associated with grocery food rescue are generally understood at a top line. Retailers know the estimated costs that hit their bottom-line from wasted food, HROs run budgets to conduct their operations, and all stakeholders grasp the importance for the environment and for food insecure communities of rescuing food. However, there is currently not a Benefit-Cost Analysis across the grocery food rescue ecosystem to understand inefficiencies, silos, and wasted time and dollars. There is even less Benefit-Cost information available for food donation transportation as trucks used, miles traveled, and emissions are often not tracked. Ecology should partner with ReFED and fund a six-month student or consultant pilot project to conduct a grocery food rescue BCA for the state.

IMPLEMENTATION CONSIDERATIONS:

- The project goals are to evaluate the costs and benefits of grocery food rescue and food donation transportation, quantify the dollars needed to transfer the burden of food donation transportation from HROs to government and retailers, examine trends to continue to drive cost efficiencies, and identify ways for benefits to exceed the costs of operations over time.
- A Benefit-Cost Analysis will require data, insights, models, and formulas like those existing in ReFED's Insights Finder, collaboration, and estimation as outlined further in Chapter 7. Once developed, the benefit cost template, informational guide, findings, and recommendations can be included in the portal for stakeholder use.
- A parallel example is FoodMesh that is working with students in Canada to run a BCA to understand the value of transportation.

PILOT PROJECT OPTION 2: CREATE A MAP OF THE FOOD WASTE AND FOOD RESCUE ECOSYSTEM.

ACTIONS:

- While Ecology collects data on waste characterization across commercial, residential, and self-haul sectors, there is no data tracking the movement of food waste and current connections between food donors and receiving organizations. As introduced in *Findings*, food waste network mapping extends beyond just grocery food rescue to establish a broader food rescue ecosystem that would enable more food to be rescued, more stakeholders to enter the system, and more people to be fed.

- Ecosystem mapping requires the mapping of several different components:
    - Current food donor and receiver connections
    - Food rescue infrastructure such as food hubs, commercial kitchens, vehicles, portable cold storage, processing plants, and other value-add facilities
    - Food waste streams and any food waste hot spots
    - Gaps in hunger relief service areas and food deserts

IMPLEMENTATION CONSIDERATIONS:

- The goal of ecosystem mapping is for governments, hunger relief, nonprofit, community organizations, and food businesses to understand the scale and scope of food that is currently being rescued, how it is being rescued, where further opportunity lies, and what resources are available. Ecosystem mapping will enable stakeholders to overcome resource disparities, move beyond competition to create partnerships, bring siloed sectors together, provide transparent information, and address food access inequities. This solution will also allow Ecology and other stakeholders to scale and track the progress of food rescue solutions.
- Due to the large scope of this recommendation and the need for Ecology to collect and analyze data from across the state and across all stakeholders, this recommendation is one of two pilot projects we suggest Ecology undertake in the next year (*Chapter 7*). Once developed, this map can live under the food waste portal so all stakeholders can access the tool.

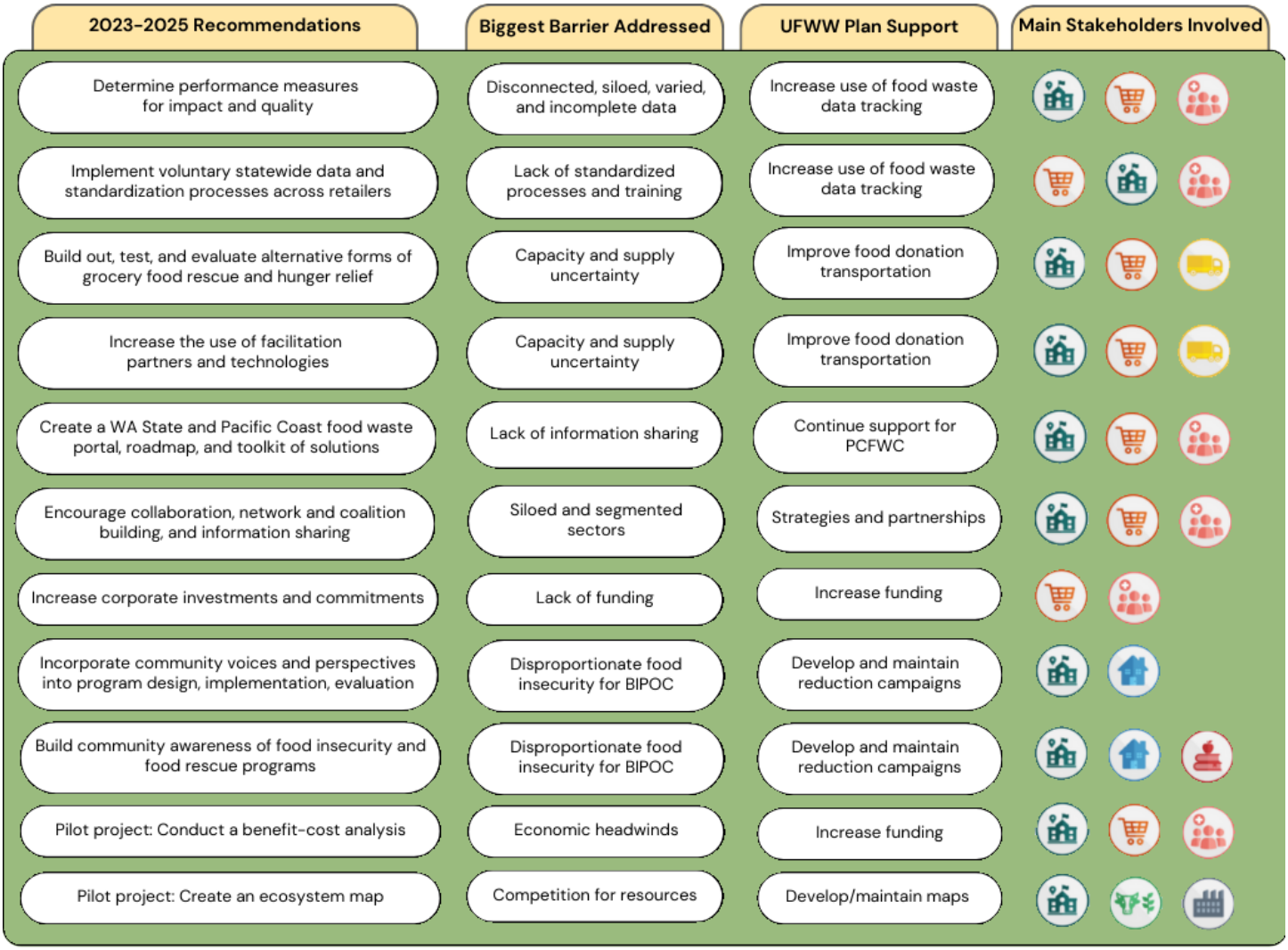


Figure 9: Short Term Recommendations

MEDIUM TERM - 2025 - 2027

The recommendations we have identified in the medium term require more time to generate movement and testing and learning from short term initiatives to continue driving scale. These recommendations may need to evolve as data is collected and strategies are tested.

RECOMMENDATION: INCREASE GOVERNMENT FUNDING OF GROCERY FOOD RESCUE INFRASTRUCTURE.

ACTIONS:

- Ecology should work with organizations operating within the food rescue space to advocate for additional funding from local, state, and federal governments, help smaller municipalities set up their own grants and funding mechanisms at the local level, and evaluate existing budgets for spend shifts.
- Infrastructure resources that could be funded include:
    - Shared facilities, such as food hubs and commercial kitchens
    - Cold storage
    - Portable cold storage
    - Vehicles, especially refrigerated and electric vehicles
    - Waste and compost disposal
- Additional dollars could also fund a government-owned transportation fleet. This transportation model will need to be tested and a benefit-cost analysis done to understand how this strategy impacts the burden on HROs and equity between organizations *(see Chapter 7).*

IMPLEMENTATION CONSIDERATIONS:

- Securing legislative buy-in from policymakers on these proposed funding initiatives may be difficult given the capital required and the lack of current data available to support the cost effectiveness of these sorts of programs. Data collected from the proposed benefit-cost analysis and other pilots should be used to build a case for this recommendation and illustrate potential returns on investment (*see Chapter 7*).

RECOMMENDATION: ESTABLISH STATEWIDE GROCERY FOOD RESCUE PROCESS UNIFORMITY.

ACTIONS:

- As standardization strategies are implemented in the short term, grocery food rescue capacities and resources are expanded, and innovative grocery food rescue strategies are tested, stakeholders will be able to scale processes state-wide to establish uniformity across donation partners.

IMPLEMENTATION CONSIDERATIONS:

- While we do not anticipate a single standardization solution, voluntarily standardization in grocery stores, food businesses, and HROs and across Washington regions will help streamline and simplify grocery food rescue across all geographies.
- Convening food rescue or hunger relief organizations as well as sharing practices and learning through collaborative networks will help scale tested standardized practices across stakeholders and geographies.
- Frequent and routinized training created by Ecology or other food rescue organizations will help support the durability and consistency of practices across the state.

RECOMMENDATION: ADVOCATE FOR FEDERAL DATE LABELING STANDARDS.

ACTIONS:

- Ecology should advocate for the passage of the Food Date and Labeling Act at the federal level or other similar legislation. Although state level legislation for date labeling standards is a possibility, state-level solutions are less effective in addressing inconsistent date labeling language due to the logistics and operations of food business and manufacturing.
- This recommendation will also reduce consumer-level food waste reduction by removing confusion about data label meaning.

IMPLEMENTATION CONSIDERATIONS:

- As with any federal legislation, gaining legislative priority from federal representatives may be difficult. As such, Ecology should work with other food rescue and food system stakeholders to advocate collaboratively. This should include coalitions both in Washington and other states.
- If new date labeling standards are passed, disseminating information, and educating stakeholders on the new standards should be factored into implementation.

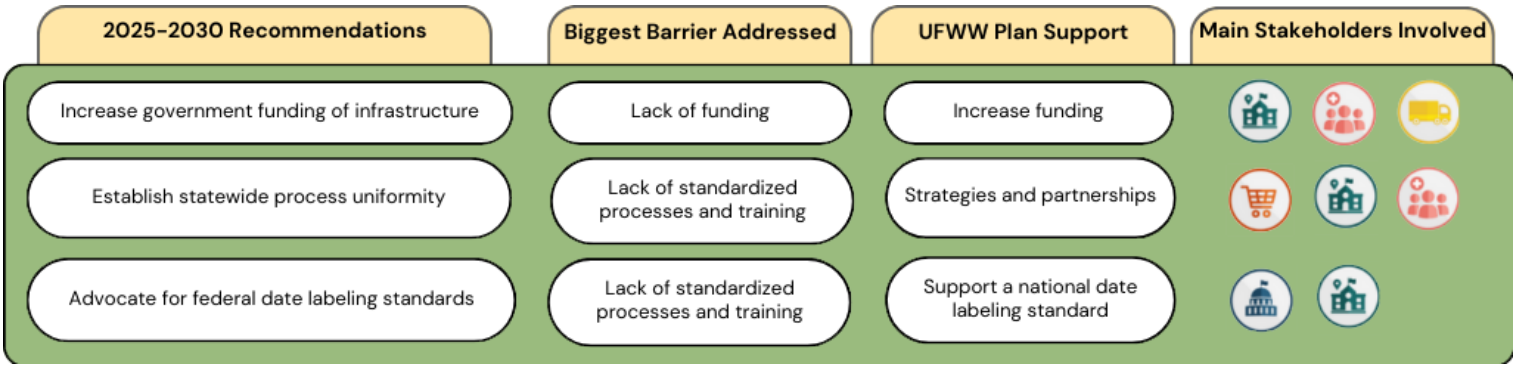


Figure 10: Medium Term Recommendations

LONG TERM - 2030 AND BEYOND

In the long term, the recommendations below are continuing to build, test, and adapt short- and medium-term strategies and then institutionalize those processes across private and public sectors.

RECOMMENDATION: MANDATE AND INCENTIVIZE WASTE REDUCTION THROUGH GOVERNMENT ACTION.

ACTIONS:

- Once the legislative buy-in is secured and relevant systems and practices are in place to allow stakeholders to effectively participate in food rescue and other methods of food waste diversion outlined in the *UFWW Plan*, we recommend that Ecology consider more stringent sanctions against retailers that fail to donate surplus food. This may include a landfill ban for organics waste.
- Although tax incentives are often a large motivation for retailers to participate in food donation, current policy does not offer any incentive to prioritize the donation of nutritious food. We recommend that Ecology advocates for adjustments to policy governing food donation tax incentives to offer increased benefit for nutritious items such as produce and proteins.

IMPLEMENTATION CONSIDERATIONS:

- Given that Ecology is not able to unilaterally pass legislation, this recommendation should be achieved through advocacy. Efforts to promote policy reform are likely to be more effective in collaboration with other stakeholders and our research found that many hunger relief and food organizations are already actively involved in policy advocacy.
- Policies can be modeled after other existing or future state food waste reduction policies, similar to those enacted in California and Vermont, or found in ReFED's U.S. Food Waste Policy Finder tool.

RECOMMENDATION: ENABLE A JUST TRANSITION FOR HROS AS FOOD WASTE LEVELS ARE HALVED IN 2030.

ACTIONS:

- While we do not expect food waste to disappear at the 2030 goal benchmark, based on decreased food waste projections, edible food waste is estimated to be at half the 2015 baseline. Some HROs currently face food donation shortages due to macroeconomic factors, causing them to purchase more food rather than being able to rely on donations. This problem is likely to worsen as food waste is reduced.
- As 2030 approaches, Ecology should work with advocacy groups, policymakers, and the State legislature to increase funding for hunger relief food procurement. This may also include advocating to increase federal programs such as the Emergency Food Assistance Program (TEFAP) or the Supplemental Nutrition Assistance Program (SNAP).

IMPLEMENTATION CONSIDERATIONS:

- Care should be taken to ensure that any additional funding made available to support HRO food procurement is distributed equitably throughout the hunger relief system.
- Other just transition program elements include HRO connection to local farms, continued corporate community investments, and increased policy advocacy to remove the root cause of food insecurity.

RECOMMENDATION: INSTITUTIONALIZE FOOD WASTE PREVENTION AND SUSTAINABILITY INTO STANDARD BUSINESS PRACTICES.

ACTIONS:

- As businesses incorporate more sustainable practices in their operations and increase their investment in grocery food rescue, it is important these strategies become standard practice. This role should align with other Washington State and local goals around transitioning to a circular economy.
- Examples of the institutionalization of food waste within business include:
    - Performance metrics related to food waste reduction and food donation
    - Corporate commitments to local community resilience and/or sustainability
    - Incorporating food donation and food waste reduction into business school curriculum

IMPLEMENTATION CONSIDERATIONS:

- Businesses involved in collaborative networks should be encouraged to share food waste reduction learnings, tools, and strategies as a way to increase their use across grocery retail and other food businesses.
- Ecology should work with the PCFWC and other partners to encourage and advocate for corporate commitments to food waste reduction and share information on the business case for these strategies.
- As sustainable business practices are tested and data is collected on their effectiveness, food businesses, governments, and organizations should work with local universities to disseminate the teaching of such practices, tools, and strategies. This will help scale and increase the durability of these practices.

RECOMMENDATION: ADDRESS OTHER FORMS OF WASTE FROM GROCERY FOOD RESCUE.

ACTIONS:

- Based on our site visit and interviews, grocery food rescue results in waste other than just inedible food. As shown in **Appendix 4**, the packaging and cardboard resulting from grocery food rescue can be immense. As grocery food rescue scales, it will be critical for Ecology and other stakeholders to find ways to reduce the amount of food packaging and cardboard as well as ensure this waste is recycled or reused appropriately.

IMPLEMENTATION CONSIDERATIONS:

- Many waste products generated through food rescue are comprised of cardboard or other materials that are recyclable or biodegradable. Landfill disposal of food packaging products may be reduced through education for retail and HRO employees on proper disposal practices.
- Washington's Organics Management Law specifies that by 2024, plastic products and packaging that are sold in Washington and labelled as compostable must meet labeling requirements and be distinguishable from non-compostable upon quick inspection in processing facilities. The implementation of this law will potentially help to reduce waste resulting from improper disposal of food packaging products during grocery food rescue.
- Ecology and local solid waste management jurisdictions should complete outreach and training to HROs and community organizations on proper waste disposal and to survey these organizations on any additional needs for meeting waste reduction goals.

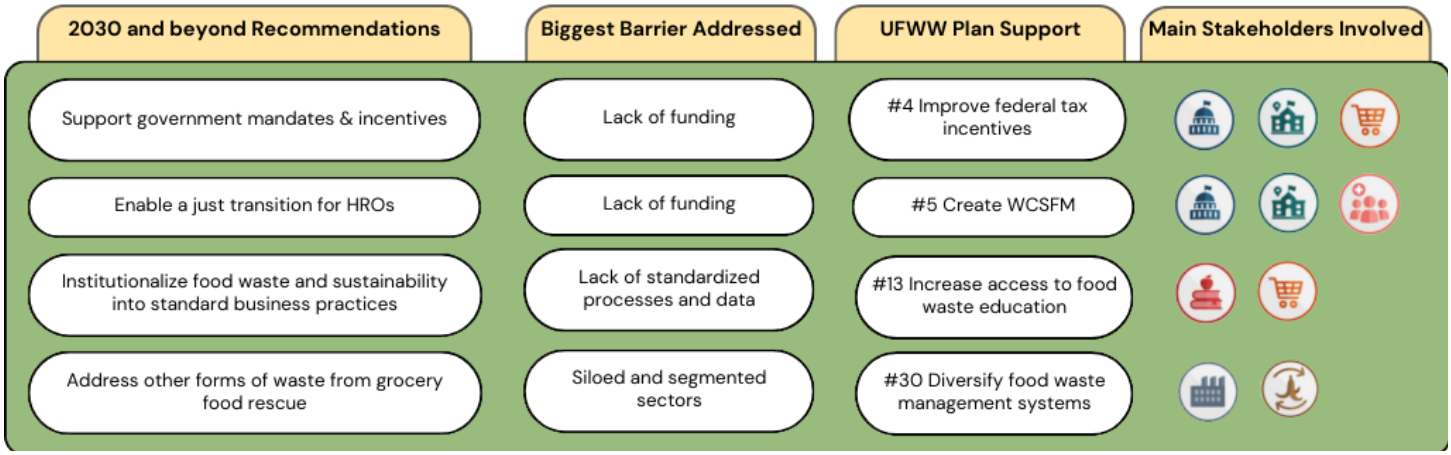


Figure 11: Long Term Recommendations

CHAPTER 7: PROPOSED PILOT PROJECTS

Ecology can facilitate the following pilot studies by contracting students or consultants. These options have been proposed for the short term as they are foundational in increasing Ecology's understanding of grocery food rescue last mile and in facilitating additional recommendations. Both studies will require statewide rural and urban stakeholder representation and may need to be completed in several geographies to increase generalizability.

OPTION #1: BENEFIT-COST ANALYSIS OF GROCERY FOOD RESCUE

PROJECT GOALS:

- Identify and monetize the benefits and costs of grocery food rescue.
- Disaggregate the costs and benefits that accrue to grocery retailers versus HROs to understand and quantify the distribution of burden and benefit.
- Establish baseline data to assess performance of future grocery food rescue pilot projects.
- Identify areas to drive cost and operation efficiencies and use data to prioritize food waste reduction and rescue strategies.

RESEARCH DESIGN AND METHODS:

- Identify benefits and costs associated with grocery food rescue using previous research, surveys, interviews, and existing data.
    - Some potential costs may include the wages paid to HRO and grocery store staff, amount of time spent on grocery food rescue, disposal costs of wasted food for HROs, HRO fuel and vehicle costs, and the cost of GHG emissions associated with food donation transportation.
    - Some potential benefits include the prevention of GHG emissions from food waste reduction, HRO budget savings from rescued food, reduction in grocery retail disposal costs, and the value placed on addressing food insecurity.
- Leverage ReFED Insights Engine Solutions Database to obtain annual estimated net financial benefit and annual investment required for solutions nationally.
    - Take 2.92 percent (Washington State's percent of U.S. GDP) of estimations to estimate benefits and costs for Washington (77).
- Collect food rescue and food donation transportation cost and benefit data, not included in ReFED's Insights Engine Solutions Database, in Seattle and extrapolate to Washington State, across a sample of stakeholder organizations outlined in the *UFWW Plan* and this report.
    - For example, gather the following data from several Seattle HROs: the cost of a truck, how many runs per truck per year, how many miles per truck per year, the time and salary of one staff per year, how many meals per truck per year. Then, average this data per HRO and extrapolate out to represent the HROs in the state.
- Connect with FoodMesh to learn from transportation Benefit-Cost Analysis in Canada.
- Input cost and benefit data across stakeholders.

    - This will create a disaggregated analysis and allow Ecology to separate the benefits and costs out by stakeholder groups to understand distributional burdens, helping to address equity in the grocery food rescue system.
- Estimate values to extrapolate data across the state.
- Analyze trends in data and areas of cost effectiveness.
    - For example, identify areas where costs outweigh benefits and major drivers of costs and benefits.
- Develop recommendations.
    - For example, partner with ReFED to incorporate this analysis into the ReFED Insights Engine to show a state versus national best practice or identify areas of resource sharing and cost savings like a government-funded transportation fleet or HROs charging for collection.
- Outline implementation considerations for stakeholders associated with recommendations.
- Build the template and information guide to support future stakeholders.

TIMELINE:

- 1-2 months: Data collection (interviews, surveys, and literature review).
- 1-2 months: Build the BCA and complete data analysis.
- 1-2 months: Prepare and present findings, recommendations, benefit and cost template, and informational guide
- **Total**: 6 months

DELIVERABLES:

- Create a template of benefits and costs to be referenced and utilized by governments, hunger relief organizations, and grocery retailers for future projects or research.
- Build an informational guide to help stakeholders understand how to use the information gathered and how to implement their own BCAs.
- Develop a final report and presentation with findings and recommendations.

OPTION #2: FOOD WASTE & FOOD RESCUE ECOSYSTEM MAPPING

PROJECT GOALS:

- Build a mapping tool that allows governments, hunger relief, nonprofit, and community organizations, and grocery retailers to understand the scale and scope of food that is currently being rescued from grocery stores and grocery distribution centers in Washington State.
- Enable grocery food rescue stakeholders to increase the number of food donors and receiver connections, increase the efficiency of current connections, and create new connections.
- Surface value-add and infrastructure sharing or creation opportunities.
- Highlight waste reduction hotspots and hunger relief gaps to rescue more food and fill in service gaps for underserved communities.

RESEARCH DESIGN AND METHODS:

- Ecology should partner with large regional distributors and local jurisdictions to identify current food donors and food donation receivers in multiple areas of Washington. We recommend Ecology work with each region in Washington to identify rural and urban cities to pilot ecosystem mapping.
- For this pilot, only grocery retailers will be identified, with the goal of expanding the mapping to other food businesses. These retailers will include individual grocery stores as well as grocery distribution centers. Food donation receivers include HROs, nonprofits, schools, religious organizations, and any other relevant community organizations. This step should include:
    - Consolidating connections and schedules between food receivers and donors, documenting hours of operation, and any existing third-party donation facilitator relationships.
    - Documenting government, public, and private food rescue infrastructure currently in use or available for potential shared use.
- Expand current data collection through outreach to individual food donors and receivers to fill in any potential gaps in information. This step should include:
    - Documenting existing or planned alternative forms of hunger relief or food assistance such as micro-pantries, community fridges, and mobile markets.
    - Zip codes served by HROs and other organizations.
    - Documenting the infrastructure of each organization and potential infrastructure needs of the organization.
- Conduct community outreach to potential food donors and food donation receivers to understand the supply and demand of food rescue in each locality. This will involve working with current food donation receivers, community organizations, and influential community members to identify organizations with need who do not currently participate in grocery food rescue.
    - Data should be gathered on the estimated amount of food needed and the estimated amount of food that can be supplied.
- Build a map using GIS to plot the locations of all existing grocery food rescue participants. Under each plotted organization, consolidated information from above should be included and accessible within additional layers. This map may require building a database to house the underlying non-geographic data such as schedules, infrastructure, and hours of operation.

    - Connections between organizations can be represented through connection lines when organizations or areas are highlighted.
    - Non-participating but interested food donors and receivers should be included in the map and identified by different icons or colors.
    - Zip code data and estimated travel times to HROs should be incorporated through shading to create an equity lens that highlights where there are gaps in food assistance or grocery food rescue.
- Ecology should use its waste characterization data or work with the PCFWC and corporate retailers to build food waste flow data into the mapping.
    - This step may be contentious and potentially cannot be made publicly available due to corporate data concerns. Ecology could establish non-disclosure agreements with retailers to build this data for internal use only. Non-disclosure agreements within signatory partners of the PCFWC have been beneficial in retrieving data.

TIMELINE:

- 6-8 months: Ecosystem data collection and community outreach.
- 2 months: Build the ecosystem map and database.
- 3-6 months: Incorporate Ecology or corporate food waste data flow.
- **Total**: 13-16 months

DELIVERABLES:

- Create a public-facing tool that maps the grocery food rescue network to understand where food waste is currently being rescued and where rescue could be expanded.
- Establish a catalog of current and potential food donors, food donation receivers, and food rescue infrastructure (e.g., food hubs, commercial kitchens, vehicles, portable cold storage, processing plants and other value-add facilities)
- Build a centralized database of food donation donor and receiver connections and schedules.
- Develop an equity mapping lens that identifies gaps in hunger relief coverage to help partner organizations prioritize service establishment or expansion.

CONCLUSION

Food waste is directly connected to the challenges of climate change and food insecurity. An estimated 30 to 40 percent of all food produced in the United States goes to waste (3). In Washington, over a million tons of food waste is generated each year and 60 percent of that waste originates from the commercial sector (5). Washington has set ambitious goals to reduce the amount of food wasted generated annually in the state by 50 percent by 2030. The Washington State Department of Ecology is working to realize these goals by promoting efforts to prevent and repurpose food waste.

This report supports Ecology's food waste reduction work by developing an overview of barriers and best practices impacting the last mile logistics of grocery food rescue. Grocery food rescue is the process of redistributing unsold, edible food donated by grocery retailers to hunger relief and other community organizations. This process diverts food to food insecure people and reduces overall food waste. Our research found that the last mile logistics related to transporting food from retailers to HROs were one of the biggest challenges facing the grocery food rescue system. Our findings are presented in **Figure 1** and breakdown the barriers and best practices into three categories—systems, supply chain, and stakeholders—as a way to understand the components of this system and identify strategy to drive efficiencies.

While the findings build our understanding of Washington's food rescue system, the research had several limitations and constraints. First, our timeline limited the quantity and variety of interviews we were able to complete, and second, there are several organizations and ongoing pilots concurrently working on grocery food rescue research we were unable to include in this research.

This report includes recommendations across the short (2023-2025), medium (2025-2030), and long (2030 and beyond) term. These recommendations are meant to support or complement the strategies identified in the *UFWW Plan* and are designed to model intended changes over time. The full list of recommendations is presented in **Table 1**. As a part of these recommendations, this report proposes two pilot project options as areas of future research:

- A comprehensive benefit-cost analysis of grocery food rescue to establish baseline data.
- Mapping the food rescue ecosystem to develop a better understanding of existing and potential food donation relationships and resources, food waste hotspots, and gaps in hunger relief coverage.

We extend our gratitude to the Department of Ecology and to the other stakeholders engaged in this important work. Our hope is that this report will be a valuable contribution to the growing body of research on Washington's food rescue system. To meet the 2030 food waste reduction goals, we see the inherent need to build a more just and resilience food system in Washington, especially for the last mile of food donation pathways.

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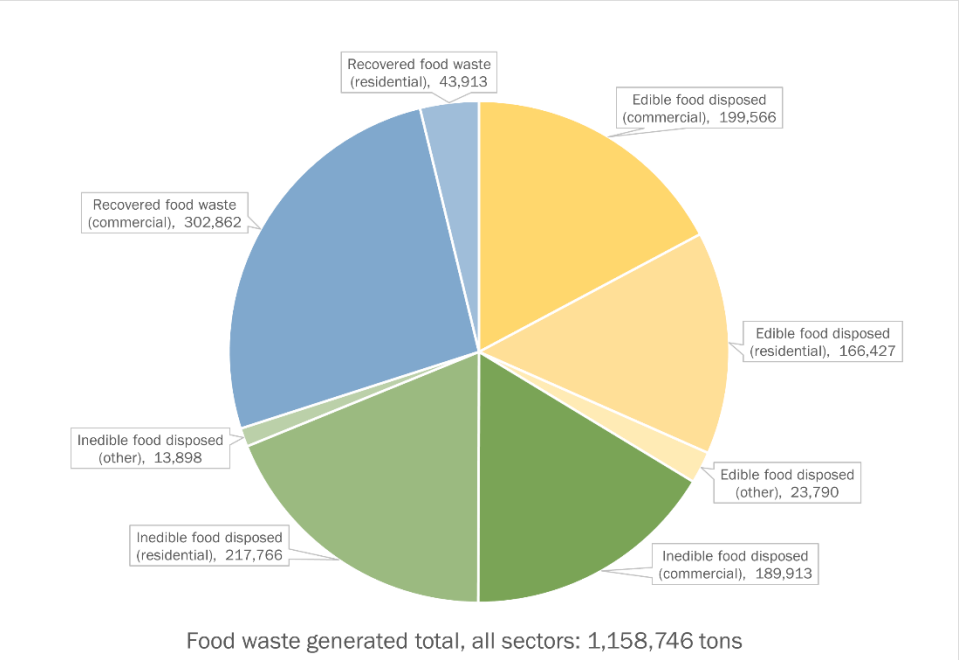
Title Page Photograph: “Solutions for Food Waste in Grocery Stores for Retailers.” ReFed, last updated April 12, 2023, https://refed.org/stakeholders/retailers/

APPENDICES

APPENDIX 1: WASHINGTON STATE 2015 BASELINE FOOD WASTE DATA



Food waste generated total, all sectors: 1,158,746 tons

APPENDIX 2: USE FOOD WELL WASHINGTON RECOMMENDATIONS

Federal policy

- Strengthen the Bill Emerson Good Samaritan Food Donation Act
- Support a national date labeling standard
- Increase markets for lower-grade or "imperfect" produce
- Improve federal tax incentives

State policy

- Create the Washington Center for Sustainable Food Management (WCSFM)
- Continue support for the Pacific Coast Food Waste Commitment (PCFWC)
- Connect the Use Food Well Washington Plan to the Food Policy Forum
- Research strategies and develop partnerships to prevent food and food waste from entering landfills
- Improve regulatory certainty for organics facility operations
- Develop an emergency food distribution plan for Washington schools
- Support 20-minute seated lunch minimum in Washington elementary schools
- Support recess before lunch in Washington elementary schools
- Increase access to food waste reduction education in Washington schools

Funding

- Dedicate state grant funding for statewide food waste reduction
- Increase funding for local health jurisdictions
- Increase funding for local government food waste reduction work
- Build more farm to school partnerships

Public education

- Develop and maintain statewide food waste reduction campaigns
- Develop and maintain statewide food waste contamination reduction campaign

Infrastructure development

- Increase use of food waste and wasted food data tracking
- Develop and maintain maps of food and wasted food flows
- Improve food donation transportation
- Increase access to cold chain management
- Build more community food hubs
- Support value-added food processing and manufacturing
- Increase infrastructure investment in schools
- Expand anaerobic digesters at Water Resource Reclamation Facilities, compost facilities, and farms
- Develop high-solids anaerobic digesters for mixed organic residuals
- Increase use of small-scale anaerobic digesters
- Diversify food waste management systems

APPENDIX 3: INTERVIEW PROTOCOL

Introductory Script:

Thank you for participating in this interview. My name is [team member 1 name] and off-camera taking notes is [team member 2 name]. We are Masters of Public Administrative candidates at the University of Washington. As stated in our emails, the purpose of this interview is to inform improvements to the edible food rescue process (or food donation), specifically on how food donations are transported between retailers and hunger relief organizations aka HROs. Our findings will be shared in a report to the WA Department of Ecology. The interview includes a variety of open-ended questions, many focused on food donation transportation. As confirmed with your permission in email, this interview will be recorded. You may ask questions and/or stop the interview at any time. [if relevant] Following the interview, I will send a post-interview survey and would greatly appreciate your participation as we look to gather quantitative data to inform our report.

- **Food donation**: the process of getting donated food into the hands of people by recovering it from grocery retailers or other food-providing organizations.
- **Food donation transportation**: the process of moving donated or rescued food from a retailer to an HRO.
- **Equity:** the execution of fair or just practices. This means recognizing that we do not all start from the same place and must acknowledge and adjust "to correct for" historical or current imbalances.
- **Your organization**: your take on your company's perspective
- **You/your**: your own individual perspective either as an employee or an individual

Do you have any questions, comments, or concerns, before we start?

Introductory Questions: ***(5-10 mins)***

I want to start the interview by getting to know you and your organization a little better.

1. Please describe the organization you work for and your role in the food donation process.
    a. [if not described] Can you tell me anything more about how your organization is involved in food donation?
2. Does your organization consider equity in the decisions or strategies it uses within the food donation system and if so, how do you operationalize this?
    a. [if food bank] For example, with the food you redistribute, the hours you are open, who you attempt to serve beyond brick and mortar, etc. [if food donor] For example, when it comes to your employees or what type of food you are donating.

Food Donation Transportation Questions: ***(10 minutes)***

In the next set of questions, we will dive deeper into food donation transportation so we can better understand how your organization is currently operating and who is involved in that process.

3. Thinking about the transportation portion of food donation, can you describe how your organization handles its part of the food donation transportation from beginning to end?
    a. What, if any, standardization tactics are in place regarding food donation transportation?

4. Who are the primary partners you work with to transport or facilitate the transport of donated food?
    a. [if not described] What role does each partner play in food donation transportation?
    b. [if not described] Is there anyone else involved in the process? Or other partners you wish were more involved in the process?
5. What does the communication process look like when you are coordinating food donation transportation between your organization and partner organizations?
    a. Can you tell me about a time when communication about transportation between partners or even within your organization was especially difficult and what stood out?
    b. From your perspective, what would help improve communication around transportation?
6. What kinds of data do you currently collect and/or use to track donated food? [if not described] Are there any other key data points or metrics you leverage?
    a. How do you share this data within your organization and with other partners?
    b. What, if any, technology or software do you use in this process? Is that technology or software effective?

Food Donation Transportation Barriers & Best Practices Questions: *(10-20 minutes)*

Now that we've discussed the current processes, I want to dive deeper into the barriers you face within food donation transportation and potential solutions or areas of opportunity for us to explore.

7. What, if any, specific transportation barriers have your organization encountered in the past month? [if relevant] are there any other notable events outside of this time frame?
    a. [if not described] What makes food donation transportation harder for your organization?
    b. [do not read] Examples: Missed pickups, timing of pickups, when HROs are open, lack of resources/infrastructure (data, communication, standardization)
    c. What do you think is missing when it comes to the food donation transportation process?
    d. [skip here if transportation if not a barrier] Are there any strategies or practices your organization uses that make food donation transportation easier for you?
8. What solutions do you think could help improve food donation transportation? [if not described] Any others?
    a. [if not described] What resources or capabilities would allow your organization to improve food donation transportation?
    b. [if not described] Are you aware of any other organizations, food donation programs, or examples that you think have done a good job of overcoming barriers or trying innovative approaches to transportation?
9. Within our research the idea of a third-party transportation provider has emerged as a potential solution to the difficulties of accessing transportation. From your perspective do you think this will help solve the transportation problems you face. Why or why not?
    a. [HROs only] If transportation was provided by a third party, what would this allow your organization to do instead?

10. Have you seen examples of outside-of-the box food donation solutions that diverge from the typical retailer to HRO pathway? (For context, we have seen roadside food pantries and community fridges or small-scale meal delivery services that emerged during COVID)
    a. If so, what are those examples, and do you think there is a role for alternative forms of food rescue?

Concluding Questions: ***(5 minutes)***

11. Before we end our interview, is there anything else you would like us to know?
12. As we continue our interview process, do you have any recommendations for contacts we should also interview about food donation transportation? [if yes], can you please provide contact information? We are doing our best to interview as many people as possible, within the short timeframe we have available.

Thank you for your time. Before we end our call, I'm going to drop a link to a survey into the chat to make sure you can access it. We will also be sending you a post-interview follow-up survey and would greatly appreciate your participation.

APPENDIX 4: SITE VISIT PHOTOS

Picture 1: Food Bank Vehicles

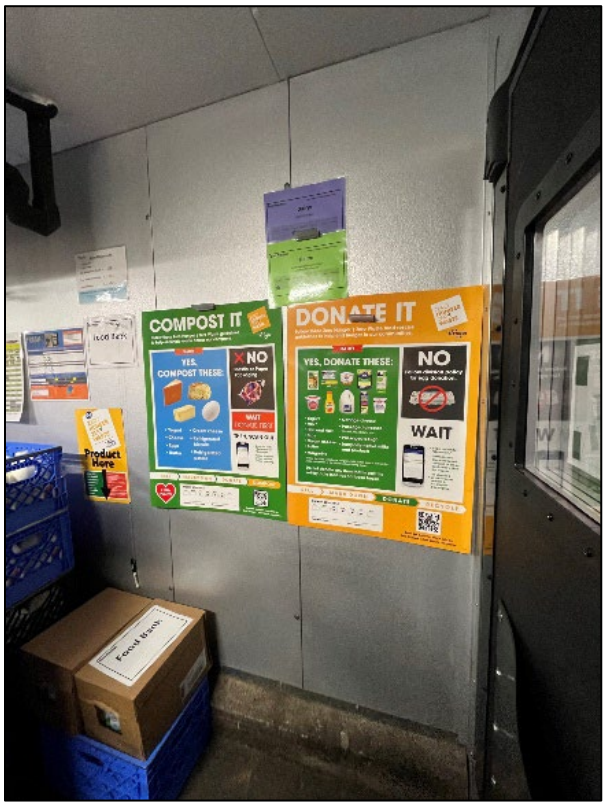
Some of the trucks the food bank staff or volunteers use to transport food from grocery stores back to the food bank. The refrigerated truck pictured in the center had its catalytic converter stolen and was in an accident.

Picture 2: Donation Pickup Bins

These are bins the food bank staff or volunteers take with them when going to pick up food from a grocery store. These are not yet standardized bins as seen in the SPU Bin Pilot.

Picture 3: Store Department Pickup

This is an example of picking up food from the Safeway meat department. We spoke to the department manager and while the product looks similar to the store's inventory on the shelf, our driver, who has done this route many times, knew exactly where to go to pick up the product.



Picture 4: Storage Donation Signs

This signage in the dairy department of the Safeway showcases what to compost, what to donate, and even an arrow that says, "food bank product here." This was the only instance of clear signage we saw on our two store visits.

Picture 5: Loading the Vehicle

After going to each department in the Safeway, we brought the carts full of rescued food to load back into the truck. At QFC, our second stop, the food was consolidated in one cart in the back of the store.

Picture 6: Weighing the Donations

Upon getting back to the food bank, we helped the staff and volunteers put the product by category by store on the scale to measure the poundage to be reported back on the Food Lifeline website.

Picture 7: Store Donations

As you can see, there is quite a variety! The white trailer in the background is refrigeration and freezer units to keep the food cool.

Picture 8: Portable Cold Storage

Since the HRO moved to a new, smaller location, they use these portable freezers to maintain temperature control.

Picture 9: Donation Cooler

In the warehouse of the food bank, there is a specific cooler for food rescued from grocery stores.

Picture 10: Packaging and Cardboard Waste

As the result of grocery food rescue and other food procurement, the food bank must deal with a lot of packaging and cardboard waste.

APPENDIX 5: POST INTERVIEW SURVEY – HROS

1. What is your name?
2. What is the name of your organization?
3. During an average month, how many retailers do you receive donations from?
4. How does your organization identify which grocery stores or food retailers to partner with and receive donations from? Please describe any methods, data, or other strategies used.
5. During an average month, about how many pounds of food does your organization rescue?
6. On a scale of 1-5, with 1 being exceptionally poor and 5 fantastic, how would you describe the average quality of the donated food you receive?
7. Do you request specific types of food to be donated? (i.e., Culturally relevant food)?
8. If you answered yes to the above question, please briefly describe the process used for sourcing specific food requests.
9. During an average week, about how many hours do your employees and/or volunteers spend facilitating the transport of donated food?
10. On average, how many weekly pickups from grocery retailers does your organization complete?
11. If it were logistically feasible, would you like to have more, less, or the same amount of food donation pickups per week?
12. Who generally handles your food donation pickups? Please mark all that apply. (Staff at your organization, volunteers at your organization, third-party providers, or other___)
13. In response to the above question, if you did not select third-party providers, has your organization ever explored the possibility of working with a third-party organization for food pickups and/or deliveries?
14. During an average month, does your organization ever miss food donation pickups?
15. If you answered yes to the above question, about how many times a month, on average, would you say this occurs?
16. If your organization occasionally misses pickups, what would you say are the main reasons for this?
17. Does your organization have staff and volunteer training focused on food donation? Yes/No
18. If your organization offers training focused on edible food rescue, what training resources have you found most helpful?
19. If your organization DOES NOT offer training focused on edible food rescue, what training resources do you think would be most helpful?
20. Which days of the week does your organization currently conduct food pickups on? Please mark all that apply.
21. Do you ever find yourself in need of additional drivers/volunteers? Please select the most appropriate response. (Never, some of the time, most of the time, always, other)
22. Do you feel you have access to adequate cold storage, including but not limited to, refrigerated trucks?
23. On a scale of 1-5 with 1 being not at all, and 5 being exceptionally so, how effective do you consider you and your partners' food donation transportation process?
24. On a scale of 1-5 with 1 being not at all, and 5 being exceptionally so, how conscious do you think your organization is of food donation transportation-related emissions?
25. Does your organization currently have the capacity to expand its food donation work? Yes/No

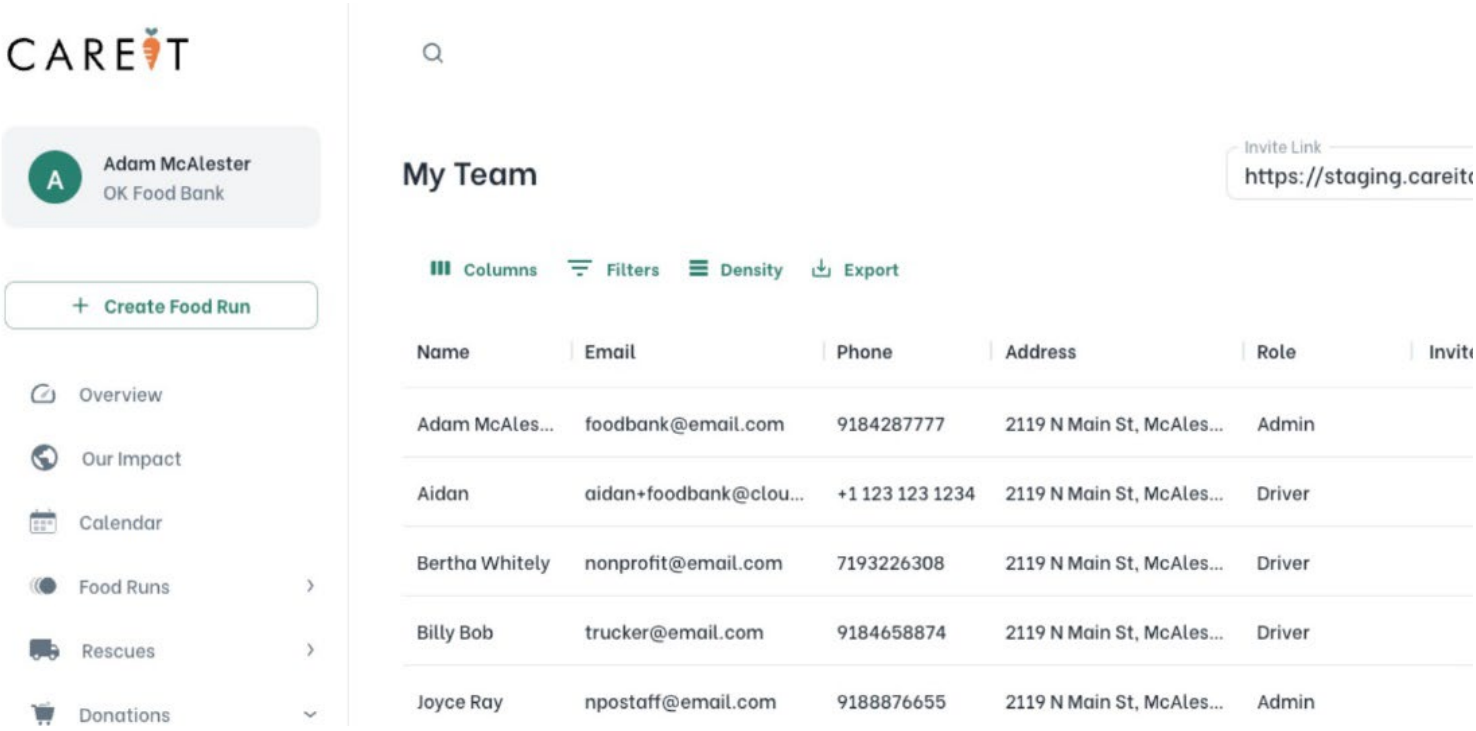
26. If your organization were to attempt to expand its capacity for food donation, what barriers would you likely encounter?
27. Optional: Do you have any additional questions or comments regarding this project that you have yet to share with us?

APPENDIX 6: POST INTERVIEW SURVEY – RETAILERS

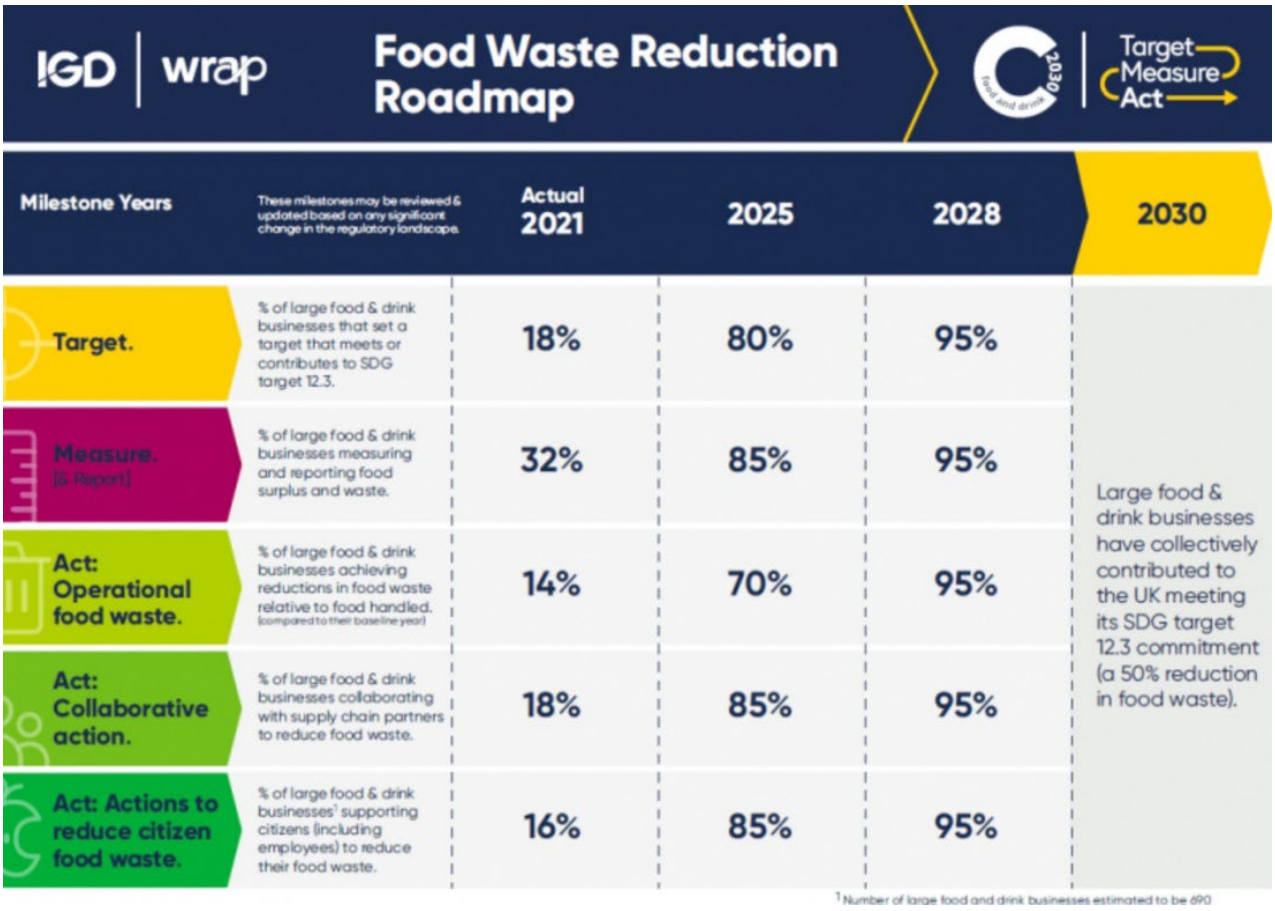
1. What is your name?
2. What is the name of your organization?
3. Are you answering the following questions on behalf of "one of your organization's stores," "a group of your organization's stores," or "all of your organization's stores?"
4. Where is your [store, group of stores, or all stores] located? (e.g., city, state(s))?
5. During an average month, how many hunger relief organizations (HROs) would you say your [store, group of stores, or all stores] donates food to? Please specify by store or total.
6. How does your [store, group of stores, or all stores] decide which HROs receive donations? Please briefly describe any methods, data, or strategies used.
7. During an average month, about how many pounds of food does your [store, group of stores, or all stores] donate? Please specify by store or total.
8. How is the total weight of food donations across your [store, group of stores, or all stores] tracked?
9. On average, about how many hours a week would you say your [store, group of stores, or all stores] employees spend preparing or working with food that is designated for donation? Please specify by store or total.
10. Does your [store, group of stores, or all stores] typically donate specific types of food to different HROs (e.g., culturally relevant food)?
11. If you answered yes to the above question, could you please briefly explain the process used for determining or learning which foods different HROs may need?
12. On average, about how many times a week does your [store, group of stores, or all stores] receive pickups? Please specify by store or total.
13. Who generally handles your [store, group of stores, or all stores] food donation pickups? Please mark all that apply.
14. Do you feel that there are enough food donation pickups a week?
15. During an average week, does your [store, group of stores, or all stores] typically experience missed pickups?
16. If you answered yes to the above question, on average, how many pickups would you say are typically missed each month? Please specify by store or total.
17. Does your [store, group of stores, or all stores] have employee training focused on food donation?
18. If your [store, group of stores, or all stores] offers training focused on food donation, when do your employees undergo this training? (If you select “other,” please briefly explain.)
19. If your [store, group of stores, or all stores] offers employee training focused on food donation, what training resources have you found most helpful?
20. If your [store, group of stores, or all stores] does not offer employee training focused on food donation, what training resources do you think would be most helpful?
21. On a scale of 1-5 with 1 being not at all, and 5 being exceptionally so, how effective do you consider your organization’s and your partners’ food donation transportation process?
22. On a scale of 1-5 with 1 being not at all, and 5 being exceptionally so, how conscious do you think your organization is of food donation-related emissions?
23. Does your organization currently have the capacity to expand its food donation process?

24. Optional: Do you have any additional questions or comments regarding this project that you have yet to share with us?

APPENDIX 7: CAREIT FOOD RESCUE AND DONATION APPLICATION USER INTERFACE



APPENDIX 8: UNITED KINGDOM IDG AND WRAP FOOD WASTE REDUCTION ROADMAP



APPENDIX 9: INTERVIEW ANALYSIS KEY THEME FREQUENCIES

Barriers	HRO	Retailer	Other	Total
Cold storage and storage constraints	8	2	12	22
Disconnected/siloed from partners	6	2	9	17
Standardization challenges	6	3	8	17
Competition/resource disparity	4	2	10	16
Staff/Volunteer labor shortages and turnover	6	3	6	15
Communication challenges	5	4	4	13
Data challenges	2	3	8	13
Lack of quality of food donations (including nutritious, variety)	8	2	3	13
Added work composting/discarding inedible food for HROs	4	1	7	12
Politics/power dynamics	5	0	7	12
Inequitable distribution of food	1	2	8	11
Lack funding/grants	5	1	4	10
Need more buy-in from partners (including retailer ownership)	3	0	7	10
Slow to scale/difficult to scale	2	3	5	10
Challenges stemming from COVID	6	1	2	9
Limited HRO hours	2	1	6	9
Proximity challenges in rural communities	3	3	3	9
Regulatory confusion	1	2	5	8
Training challenges (including date labeling standards)	5	0	3	8
Supply (quantity of donations)	5	1	1	7
Demand (requests from food insecure communities)	3	2	1	6
Do not track transportation emissions	2	3	1	6
Missed HRO pick-ups	0	1	3	4
Lack of culturally relevant food	2	0	0	2
Lack of trucks/vehicles	1	0	1	2

Best Practice	HRO	Retailer	Other	Total
Importance of communication	11	4	12	27
Importance of partnership/collaboration	10	4	12	26
Alternative food waste markets/value-add (ecosystem)	10	4	11	25
Importance of data	8	4	13	25
Alternative hunger relief models (community fridges, mobile markets, home delivery, social supermarket, community hubs, micro pantries, customer service centers, government funded transportation, bike transport)	8	4	11	23
Localization of food/keeping food within community	10	3	10	23
Standardization successes	6	4	12	22
One size does not fit all	8	2	11	21
Provide/receive high quality food (including nutrition, variety)	9	4	7	20
Facilitation/Matchmaking (intermediaries, food distributors, applications/online marketplaces)	6	4	9	19
Regulatory support	8	3	8	19
Leverage systems design thinking	4	4	10	18
Importance of food safety	4	2	11	17
Participatory decision-making (survey for customer needs, elevating marginalized voices, inclusion)	6	3	7	16
Emphasis/focus on supply chain efficiencies	0	4	10	14
Cold storage/storage capabilities	4	1	8	13
Clear training materials (including date labeling standards)	2	2	8	12
Enhanced demand planning (including inventory, business case data)	1	4	7	12
Using own trucks/vehicles	8	1	3	12
Provide/receive culturally relevant food	7	0	5	12
Tax incentive benefits	5	2	5	12
Focus on dignity	2	3	4	9
Opportunities stemming from COVID	3	2	2	7
Policy advocacy	2	1	3	6
Track transportation emissions	0	0	7	7
Flexible HRO hours	1	0	4	5
Employee incentives (incl free food for employees)	1	2	1	4

APPENDIX 10: INTERVIEW THEME FREQUENCY CHART (TOTAL ORGANIZATIONS)