

STRENGTHENING DENVER'S FOOD RESCUE ECOSYSTEM

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EXECUTIVE SUMMARY

This assessment of Denver's food rescue ecosystem comes at a time of growing momentum and innovation in food donation and distribution, offering an overview of the current state of food rescue and recommending specific changes to enhance the system's effectiveness. Building on the local survey work, interviews and food rescue modeling that NRDC released in October 2017,¹ this second body of analysis draws from a number of additional sources: fifteen stakeholders were interviewed in mid-2018, including representatives of food rescue organizations, food pantries, and the food donor community, among others. Two focus groups were conducted to better understand the needs of end users (the individuals and families that receive rescued food). Survey data from over 1,000 food pantry end users, commissioned by NRDC and collected by Hunger Free Colorado, was gathered, analyzed and cross-tabulated. Finally, examples of relevant best practices from across the country were identified and highlighted where appropriate.

The overall picture of Denver's food rescue ecosystem is one of great strides and rapid evolution, tempered by stubborn challenges. Grocery store donations are on the rise, but additional engagement with stores is needed to fully capture and redistribute the most needed surplus foods. Food pickups from donating organizations have been streamlined and professionalized, but many of the organizations that distribute those donations to food-insecure individuals still lack capacity for cold storage and optimized food distribution. Numerous pantries have embraced client-centered systems that aim to bring dignity to the experience of receiving rescued food, yet even the most compassionate last-mile organizations struggle to provide a seamless process for these individuals and to incorporate their feedback on an ongoing basis.

Broadly, our analysis identified the following four key aims to improve Denver's food rescue landscape:


































1. **Building a unified voice and culture of collaboration among rescuers and "last-mile organizations."** The disparate stakeholders of the food rescue pipeline currently have few opportunities for systemwide collaboration. From closer coordination among last-mile organizations (LMOs)—the organizations that distribute food directly to those in need, such as food pantries and homeless shelters—to better communication between LMOs and food rescue organizations, to increasing responsiveness to end-user needs, more avenues for cross-system connection would greatly benefit the network as a whole.
2. **Improving the quality and usability of donated foods.** Recent innovations have made great strides in increasing the overall amount of food donated, especially from grocery stores. From here, the challenge is engaging with food donors to expand donation of highly sought-after perishables such as fresh produce, dairy and proteins, while ensuring that these foods have a sufficient shelf life by the time they reach end users. Where prepared foods are concerned, more can be done to work with institutional cafeterias to package prepared foods in smaller portions before donation to enable them to be more effectively used by shelters, soup kitchens and other LMOs that operate meal programs.
3. **Increasing LMO capacity.** While most philanthropic support flows to the largest organizations in the food rescue system, many of the area's last-mile organizations operate with minimal resources and heavy reliance on unpaid volunteers. A systemic effort to increase food rescue must improve the logistics of transporting rescued food to LMOs, as well as addressing the need for additional centralized and location-specific cold storage. Human resources must be bolstered, as well, through support for paid staff and systemwide efforts to attract, train and retain qualified volunteers.
4. **Innovation in end-user delivery.** Denver's shifting geography of poverty, as well as the unique needs of various end-user populations, points to the need for greater innovation in how rescued food reaches hungry families. While brick-and-mortar food pantries will likely remain the most common distribution channel, increased use of mobile pantries, home delivery and other more nimble delivery systems should be prioritized.

This assessment examines each of these themes in more detail as we explore the food rescue system from a variety of angles. We begin with feedback from the end users that the system aims to serve. We then move to food donors

¹ Berkenkamp, J. and Phillips, C. "Modeling the Potential to Increase Food Rescue: Denver, New York City and Nashville" Natural Resources Defense Council, 2017. Accessed at <https://www.nrdc.org/sites/default/files/modeling-potential-increase-food-rescue-report.pdf>

and through systems of transportation, storage and distribution. Latter sections of the assessment explore needs among last-mile organizations and strategies for expanding opportunities for end users to shape the future of Denver’s food rescue system. Along the way, we provide recommendations for action, addressing strategies for outreach and coordination, policy, infrastructure and personnel, and hearing and heeding the voices of end users. NRDC anticipates conducting a separate assessment of strategies to finance needed investments in the food rescue system. That issue will be addressed in a subsequent analysis.

SUMMARY OF RECOMMENDATIONS

	 Outreach and coordination	 City Action	 Physical Infrastructure	 Personnel	 End-user voice
1	Develop and disseminate quality standards for food donations (Colorado Food Pantry Network or similar entity)				
2	Disseminate user-friendly food safety guidance to licensed food facilities and incorporate donation education into inspector site visits as appropriate. (DDPHE)				
3	Identify incentives, avenues for recognition, shared learning opportunities and other outreach by which the City of Denver can encourage food businesses and other potential donors to expand donations of appropriate food. (DDPHE)				
4	Strengthen City policies and programs to optimize useful donations from city-owned or operated facilities. (DDPHE)				
5	Convene a local network of LMOs to build their collective voice and capacity. (DDPHE or other)				
6	Explore the feasibility of a dedicated service for transporting donated food from donors to LMOs.				
7	Explore avenues to equip smaller LMOs with cold storage capabilities.				
8	Assess the feasibility of creating shared refrigerated spaces in key neighborhoods where large donations of food could be stored and broken down.				
9	Explore mechanisms for LMOs to increase access to volunteers and paid staff.				
10	Expand educational opportunities for LMOs, including food safety, volunteer management and fundraising.				
11	Identify and/or establish funding streams and support systems to encourage the success of food rescue-related social enterprise. (DDPHE or OED)				
12	Create and lead an advisory body of end users to inform the evolution of Denver's food rescue system. (DDPHE)				
13	Secure funding to gather regular feedback from end users via ongoing surveys, focus groups and one-on-one interviews.				
14	Support and engage food pantries in adopting a client choice model through training, technical support and, where feasible, financial support.				
15	Conduct a more detailed study of the specific food security-related needs of disabled individuals.				
16	Hone and expand strategies for making donated food more geographically accessible through mobile distribution channels, home delivery, distribution points that are closer to where end users work, live and attend school, and related approaches.				
17	Convene stakeholders across the food rescue ecosystem on a regular basis to support shared dialogue and implementation of the recommendations in this assessment. (DDPHE)				
18	Engage the philanthropic sector and local business community to mobilize support for recommended investments in the rescue system. (DDPHE)				

THE FOOD RESCUE ECOSYSTEM

From volunteer efforts run out of church basements to multimillion-dollar nonprofits serving hundreds of individuals per day, nearly every neighborhood in Denver is home to a distribution point for rescued food. This section maps the major components of Denver's food rescue system, detailing the kinds of organizations it comprises, as well as how it is evolving.

According to Feeding America's meal gap data, there were over 319,000 food-insecure individuals in the Denver metro area in 2016, an overall rate of nearly 11% of the region's population². Over the past several decades, a robust network of large and small organizations has evolved to rescue surplus food and redistribute it to food-insecure individuals. This pipeline for food rescue invariably begins with **food-based businesses and institutions**—primarily grocery stores, but also a variety of restaurants, food wholesalers, entertainment venues, institutional cafeterias, farms and food manufacturers. Encouraged by federal tax deductions and the liability protections of the federal Good Samaritan Act, retailers, institutions and restaurants located in Denver collectively donate more than 2,500 tons per year. According to NRDC's earlier research, the bulk of this amount comes from grocery stores.

The donations of food-based businesses are accepted and handled by a number of **food rescue organizations** (FROs). The largest FRO by volume is Food Bank of the Rockies (FBR), which operates across a multistate region, has extensive warehouse and food handling infrastructure, and operates a fleet of refrigerated vehicles that pick up food donations from grocery stores and manufacturers several days per week. FBR also serves as the local distributor of the USDA's Commodity Supplemental Food Program, which gives monthly boxes of nutritious food to low-income individuals over 60. While FBR plays a central role in Denver's food rescue landscape, it is far from the only FRO serving metro Denver; in the past decade, multiple organizations have emerged to capture additional streams of surplus food. We Don't Waste, for instance, accepts donations from a wide variety of non-grocery sources, including food manufacturers, food distributors, event centers and catering companies. Denver Food Rescue receives donations from grocery stores via bicycle and redistributes them at a network of over a dozen "no-cost grocery programs," held at local schools and community centers throughout the metro area. And multiple for-profit organizations have begun to emerge that seek to "upcycle" unused food into saleable or donated products.

Regardless of the source, most rescued food is channeled to **last-mile organizations** (LMOs) throughout the metro area that interact directly with end users. These range from larger food pantries with permanent facilities and full-time staff members to volunteer-run soup kitchens housed in community centers and churches, as well as homeless shelters and numerous other avenues by which donated food reaches those in need. As compared with FROs such as Food Bank of the Rockies and We Don't Waste, LMOs tend to be much smaller and more numerous: NRDC has estimated that the City of Denver alone has nearly 200 LMOs. Some organizations, such as Denver Food Rescue, serve as both rescuers and LMOs. As with other parts of the food rescue system, LMOs in Denver are changing quickly, with multiple leadership transitions, pantry closures and relocations occurring in the last year.

Ultimately, rescued food is directed to food-insecure individuals themselves ("**end users**"). Despite the fact that the needs of this population ostensibly drive the entire system, end users have historically been poorly incorporated into the food rescue planning process. In response, several LMOs have begun to adopt a "client choice" model for food distribution, in which end users select their own food in a grocery store-style format, while others are employing mobile pantries and other ways to bring food closer to end users.

In particular, focus group participants interviewed for this assessment were effusive in their praise for client-choice pantries, remarking that it made them feel more empowered while reducing the amount of food that later goes to waste. The success of these and similar efforts will depend on deepening lines of communication between end users and LMOs. Hunger Free Colorado (HFC) has helped bridge this gap by conducting a statewide survey of end users. NRDC collaborated with HFC to expand its survey effort in Denver, ultimately gathering input from more than 1,000 pantry end users to inform development of this assessment report. Below we discuss results from that survey in detail.

² "Food Insecurity in The United States", Feeding America, accessed at <http://map.feedingamerica.org>

FOOD-INSECURE INDIVIDUALS IN DENVER: A SNAPSHOT

As part of this assessment, NRDC provided support for Hunger Free Colorado to expand its survey efforts among individuals who utilize food pantries in Denver. In 2017 and 2018, end users participated in in-person surveys designed to illuminate their needs, preferences and requests for service improvements. Surveys were conducted in English and Spanish at three local pantries, located in Arvada, central Denver and Aurora, and were administered by staff of the participating pantries. Although the survey cannot be considered representative of all Denver pantry users, the number of responses allows a high level of confidence in the accuracy of results for the pantries where surveys were conducted. All three pantries use a “client-choice” model while allows clients to select foods of their choosing. Key findings include the following:

Demographics

Survey respondents live throughout the Denver metro area, with the highest concentrations found in the high-poverty communities close to the pantries where surveys were conducted. In addition, there was also a reasonably high concentration of respondents from certain ZIP codes relatively far from the participating pantries including ZIP codes in Southwest Denver, East Aurora, Commerce City and Thornton—perhaps reflecting a shortage of food pantries in those communities.

Survey respondents were split nearly evenly between SNAP recipients (51%) and those not receiving food stamps (47%). However, of those not currently receiving SNAP benefits, more than 80% had either applied and been turned down or had previously received food stamps and had later stopped getting benefits.

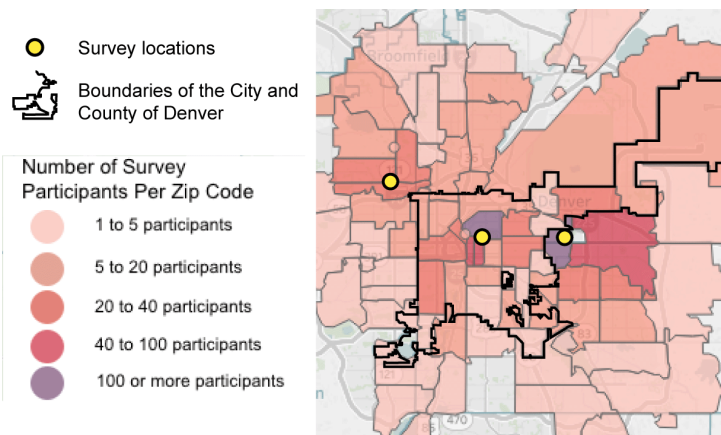


Figure 1: Respondents by ZIP code and food pantry locations

To help evaluators gain a deeper understanding of the data set, respondents were given a “food insecurity score” based the number of “yes” responses to the series of questions asking if they had done the following in the previous six months:

- Worried that food would run out before you can buy more
- Ran out of food before you could buy more
- Had to skip a meal so that someone else in the household could eat
- Gone to bed hungry

The food insecurity score ranged from 0–4, where the larger number was an indicator of a greater level of food insecurity. In all, **participants reflected a relatively even spread along the spectrum of food insecurity** (Figure 2).

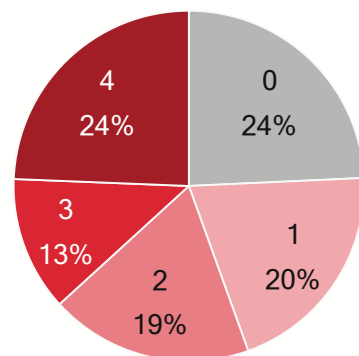


Figure 2: Percentage of participants by food insecurity score

Survey participants were much more likely than the metro area average to have children. Nevertheless, no correlations were found between number of children in the household and levels of food insecurity, how often end users visited pantries, or the percentage of their total food received from the pantry.

40% of respondents indicated that they or another adult in their household was disabled—over six times the city average of 6.4% (figure 3). A similar proportion (42%) had an adult working full or part time in their household. Although only 18% of respondents reported having a retired adult in the household, those that did were more likely to receive a smaller portion of their food from a pantry and were less likely to report indicators of food insecurity.

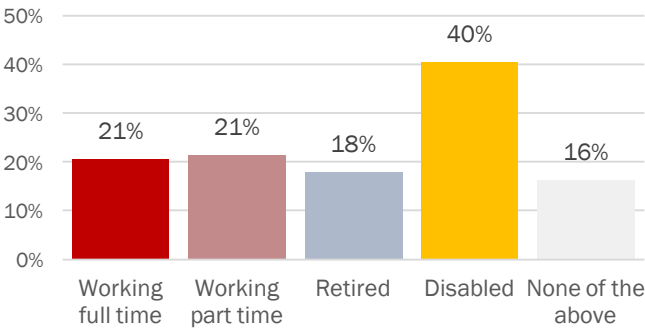


Figure 3: Work status of adults in household

Food Habits and Preferences

Overall, **end users appear satisfied with the quantity, quality and selection of food available at surveyed pantries, although there remains room for improvement.** When asked to rate the amount, choice and quality of food available to them, participants were quite positive: 94% of participants ranked the food quality as “excellent” or “good,” for instance, and 88% had similar perceptions of the choice of food options for their family.

On the other hand, open-ended questions illuminated some clear patterns around food choice and quality (Figure 3). The most commonly requested change, across all categories explored, was for more meat and protein. A smaller but still significant concern was around freshness: several respondents indicated that the foods they received had passed the date on the label, while others noted that their food frequently spoiled within days of taking it home.

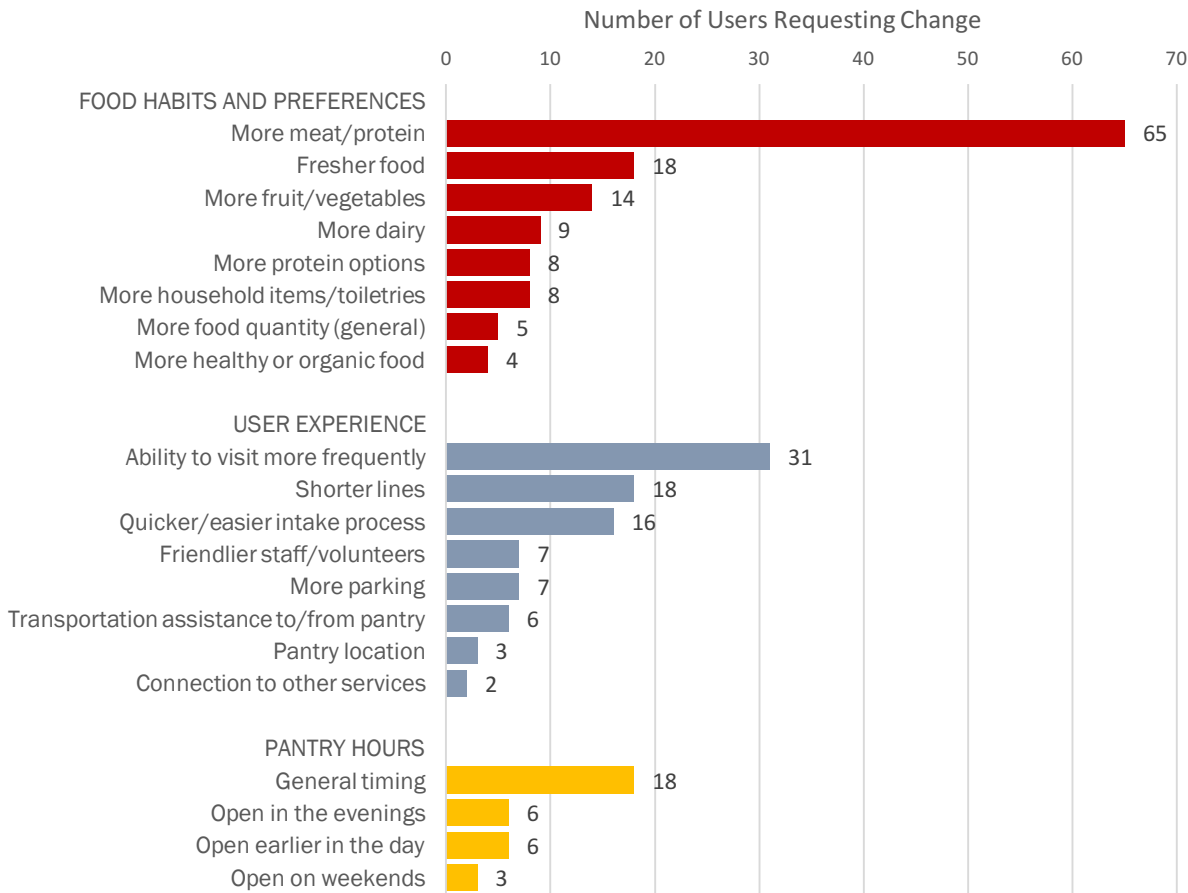


Figure 3: Most common respondent answers to open-ended question: “If you could change one thing about this food pantry, what would it be?”

Further, several findings point to the conclusion that **many food-insecure families are not able to obtain food from pantries as frequently as they need to**:

- The second-most-frequent suggestion for improvement was the ability to visit pantries more often.
- Respondents that indicated wanting to visit the pantry more frequently were more likely to report going to bed hungry or skipping a meal.
- Respondents who received less than 10% of their food from a pantry were actually 18% *more* likely to indicate they had run out of food within the last six months than those who received over 75% of their food from a pantry (Figure 4). This may point to a pattern of pantry visit limitations causing food-insecure families to find most of their food elsewhere.

As for specific food groups, **respondents clearly indicated meat/protein is the most important item to receive from a pantry** (figure 5). This preference remained steady regardless of respondents' SNAP status or presence of children in the household; the only groups to not prioritize protein were households with vegetarians and those that do not eat pork.

Reinforcing the importance of this food group to end users was the fact that, when asked “if you could change one thing about this food pantry, what would it be?” **more meat/protein was by far the most requested change** (Figure 3). Although many respondents considered receiving meat and protein to be the most critical, **fresh produce was consistently ranked as a priority, as well**: More than 27% of end users identified fruits and vegetables as the most important food group, and 30% more named them as second-most important.

Just under half of participants reported some form of dietary restriction in their household, although no single dietary restriction was identified by more than 20% of respondents. Low sugar and low salt were the most common diets, at 17% and 12%, respectively. Aside from asking about pork-free diets, the survey did not explore dynamics around the cultural appropriateness of foods and no respondents raised the issue in the open-ended questions. Future surveys could examine this issue in more detail.

When asked about which items were *not* important to receive, respondents indicated that **cakes and candy were the least desirable**, followed by ramen noodles and Ensure/Boost. More than 20% of participants indicated that all

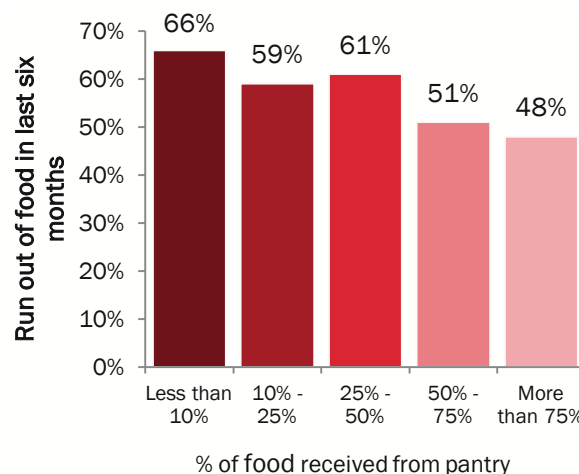


Figure 4: Percentage of respondents that have run out of food in the past six months by percentage of food received

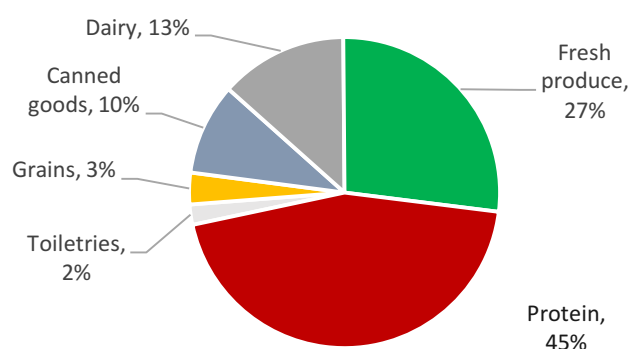


Figure 5: Most important item to receive from pantry

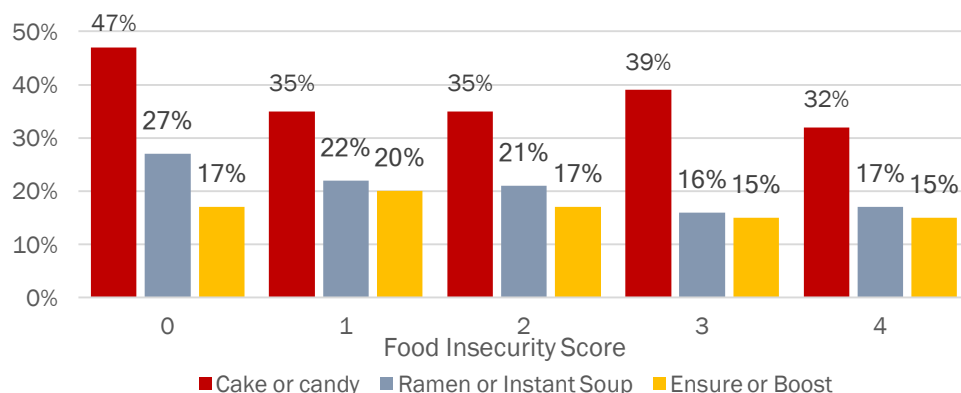


Figure 6: Key items rated least important by food insecurity score

items were important to receive; crucially, **those reporting higher levels of food insecurity were less likely to rate items as unimportant** (Figure 6).

User Experience

In addition to answering questions about food quality, quantity and preference, end users also provided valuable feedback about the experience of using their food pantry, from the sign-up process to geographic access and pantry hours. **Overall, responses were positive about their user experience**, with more than 85% strongly agreeing that they knew what information to bring to obtain services, had easy paperwork, felt welcome, and that the pantry had helpful staff. This high satisfaction rate reflects the successful work of survey host sites to create a user-friendly experience for the individuals that use their services. However, as with food preferences, several themes for improvement arose in the open-ended feedback, including the **queuing process, the length of the waiting period for appointments, and the intake process** (see Figure 3).

In terms of barriers to accessing their food pantry, the most frequently cited challenge was transportation. In particular, **respondents from households with persons with disabilities were much more likely to indicate transportation as an access barrier than others** (Figure 7)—a consequential finding given that this population represents 40% of end users surveyed. Retired adults were also more likely than working adults to find transportation to be a barrier. Participants were not asked about the mode of transportation used to access the pantry, but based on their verbal comments, there are opportunities for improvement for both car owners (increased parking) and non-car owners (transit reimbursement, more transit-accessible locations).

Finally, cross-comparative analysis also revealed a few key findings related to recent and longtime pantry users. **Both new pantry users and longtime visitors were more likely to be food insecure than respondents visiting for two months to one year** (Figure 8). This may point to a divergence in the most food-insecure pantry users between families experiencing temporary setbacks and those that are chronically food insecure as a result of disability or work status.

Another clear trend related to length of pantry usage and disabled status. While only 36% of respondents without a disabled household member reported visiting the pantry for over a year. A full **52% of disabled-member households have been visiting their pantry for a year or more**—another significant finding for this demographic.

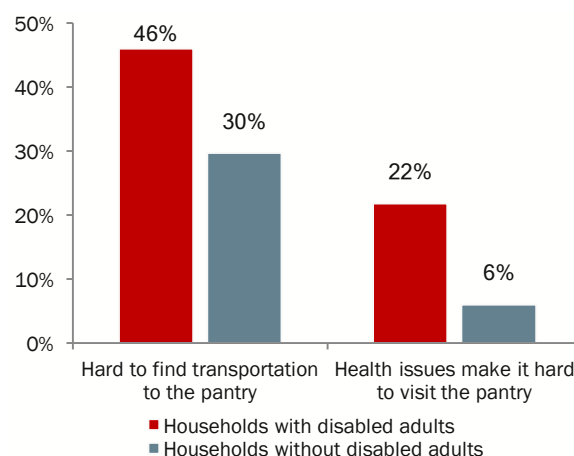


Figure 7: Selected barriers to pantry access for households with and without disabled adults

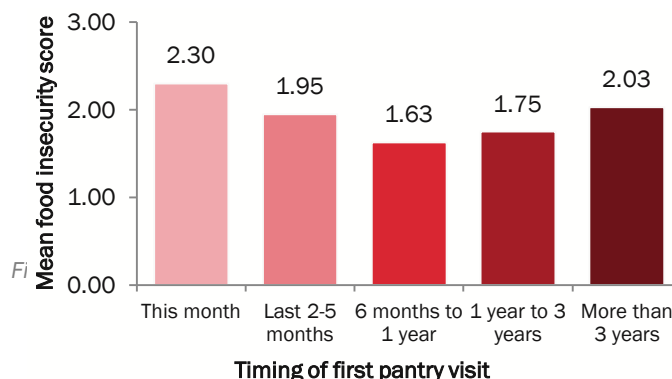


Figure 8: Timing of first pantry visit by mean food insecurity score

FOOD BUSINESSES AND INSTITUTIONS

Some of the most significant improvements to Denver's food rescue landscape could take place at the point where food is being donated by businesses and food-related institutions. This section of the report examines the current challenges and potential solutions for working with food donors, starting with grocers and moving on to other donor types.

Grocery Stores

Among Denver-based businesses, retail grocery stores are currently the largest source of donated food by far. Nine of the top 10 grocery chains in the Denver area have food donation contracts with Food Bank of the Rockies, and they cumulatively donate over 2,000 tons annually to FROs, mainly Food Bank of the Rockies. NRDC's earlier analysis of potential to expand food donation in Denver concluded that "an impressive 70 percent of the total maximum potential we see in the grocery sector is already being rescued through the work of multiple rescue organizations," a conclusion confirmed after visiting several stores throughout the metro area for this assessment. FBR picks up donations from each store four or five times per week, a number that research has shown to be appropriate given the supply of surplus foods currently coming from most participating grocers.

Yet while the number of grocery stores donating food is impressive, significant opportunities remain for continuing to improve the quantity, quality and variety of donated food. For instance,

- Several LMOs interviewed for this analysis indicated that most of their current grocery store donations consist of bread products and processed/packaged foods. While these products have their role, they are typically over-represented in the donation stream and were found in the end-user survey above to be among the least desirable to end users.
- Many grocery stores have made well-intentioned efforts to expand donations of fresh produce, meat and dairy. However, not all such product has enough shelf life upon receipt to be useful. When unusable foods are received by small nonprofits, they are faced with either distributing food that may no longer be appropriate for consumption once it reaches end-users or taking on handling and disposal costs that they are ill-equipped to afford.
- LMOs may not have, or feel they can suggest, quality standards for the foods they will accept from donors. Particularly as donation of prepared food expands, it will also be important to be sure that these foods are appropriate to the needs of end users and the handling capacity of LMOs.

Recent efforts by King Soopers—Denver's largest grocery chain, with over a third of local market share—provide an instructive model for how other grocers could further improve their donation practices. King Soopers' parent company, Kroger, recently launched its national "Zero Waste, Zero Hunger" initiative with the aim of "eliminating hunger in our communities and waste in our company." As part of this initiative, King Soopers staff is being trained in the goals, benefits and procedural details of food donation. King Soopers' regional leadership is committed to making sure all stores are participating in the donation program, and now holds stores accountable for their donations through regular tracking and circling back with stores that show low or inconsistent donation poundage.

This combination of training, tracking and accountability is showing results. Since the launch of the Zero Waste, Zero Hunger initiative, King Soopers reports dramatically increasing the amount of food donated. If other grocery chains were similarly motivated to optimize donations, the benefit to end users could be substantial. As NRDC's earlier research found, the main potential for expanding grocery donation lies with produce, meat, dairy and deli—the fresher choices that tend to be under-represented in the donation stream.

Though not every grocery chain is likely to institute an initiative in the vein of "Zero Waste, Zero Hunger," a variety of external tools could help influence donation practices by grocery chains. As a unified voice for the area's pantries, for instance, the Colorado Food Pantry Network (convened by Hunger Free Colorado) could develop and disseminate quality standards to help grocers better understand which foods are appropriate and

Recommendation 1:
Develop and disseminate quality standards for food donations from grocery stores and other food donors. (Colorado Food Pantry Network or similar entity)

inappropriate for donation. In conjunction with the recommendations outlined in the next section, these guidelines will also be useful to other types of food donors as they expand their own donation efforts.

Other Food Donors

While grocery stores are a prime opportunity for increased fresh food donation, several other sectors of Denver's food system have potential, as well. As shown at right, for instance, NRDC's earlier analysis found that institutional foodservice (such as hotels, healthcare and colleges) merit deeper exploration. Small-scale retail, convenience stores and restaurants also have potential, although the small quantities of food from these disparate locations can make pickup and transportation a challenge.

In the meantime, NRDC's earlier research and the FROs interviewed for this assessment both indicate that the most promising donation sources after grocery stores are large institutions such as universities, hotels, K-12 schools and hospitals. Currently, these sources remain largely under-leveraged in Denver, due in part to the following challenges:

- Whereas grocery stores donate raw ingredients, institutions primarily tend to donate prepared food, which is more complex for rescuers to handle.
- Institutions may have a high level of weekly and seasonal variability in the amount of food donated.
- Institutions often lack refrigerator space to store donations for more than a day or two and therefore require frequent pickups.
- Institutions tend to donate prepared food in bulk containers such as foil hotel pans or large plastic bags, which can require additional time and materials for some smaller LMOs to repackage food into more appropriate sizes, particularly when end users are best served by single-portion servings that they can take and eat later.

As for the issue of bulk prepared food, one option worth exploring is asking donors to use smaller packaging for LMOs that need single-portion sizes or less-than-bulk size packaging. In Chicago, for instance, Rush Oak Park Hospital has begun to repackage leftover food from its cafeteria into single-serving portions on-site and donate it to local food pantries—an investment that it has made given that the public health benefits donating healthy food are expected to save the hospital millions of dollars in treatment costs in the long run³. Ideally, more institutions in the Denver area would take Rush Oak Park Hospital's lead and work proactively to make their donations easier for LMOs to use. Such efforts should be targeted to circumstances where smaller package sizes are critical to LMOs' operation, given the potential impact on labor and packaging costs for donor businesses. The other challenges bulleted above are addressed in upcoming sections of this report.

City Actions to Foster Expanded Food Donation

The City of Denver has a number of opportunities to encourage increased donation by all types of potential food donors. First, the city can help ensure that potential donors know that the city is concerned about food insecurity in Denver and encourages food donation. City health inspectors are key for ensuring that food donors recognize the

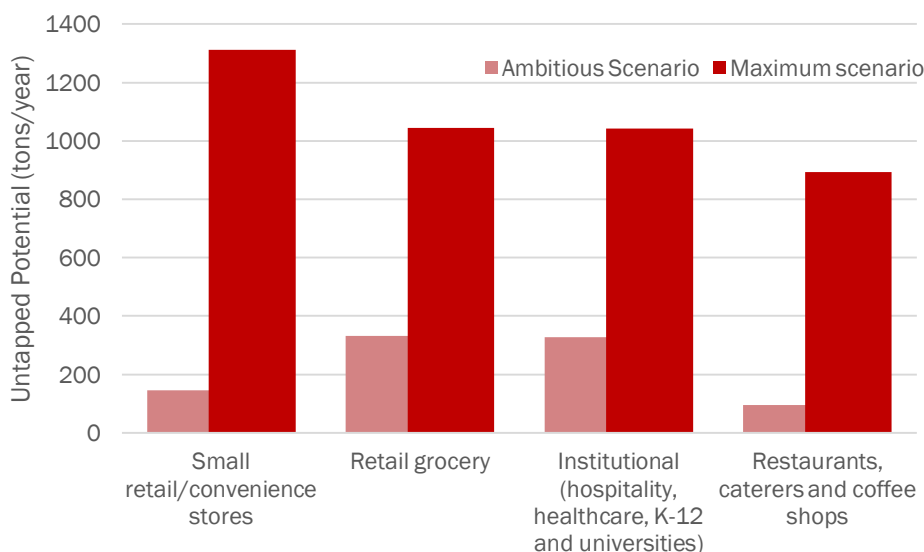


Figure 9: Untapped food rescue potential by sector, from 2017 NRDC research

³ "Surplus Project", Oak Park River Forest Food Pantry. Accessed at <https://www.oprffoodpantry.org/programs/surplus-project>.

city's support for food donation and have a good grasp of relevant food safety requirements, particularly for donated prepared foods and other perishables.

In conjunction with NRDC, the City's Department of Public Health and Environment has already prepared user-friendly information highlighting the city's interest in increased donation and outlining food safety information for potential food donors. Inspectors have been trained on food insecurity and food donation issues, and a more technical summary of food safety requirements for food donors is also being developed. Public health inspectors will soon begin disseminating donation-related information to food donors as part of their semi-annual inspection process.

A second strategy would be a city-led certification or awards program for exemplary food donors. The Certifiably Green Denver program currently provides a voluntary initiative for businesses to receive help and recognition for overall greening efforts; a branch of this program could be developed specifically for food donors encouraging them to reduce waste and increase donation of fresh foods. The city could also play a role in fostering learning among businesses and institutions that donate food so that best practices are shared. Financial mechanisms such as tax incentives, grants or other avenues should also be considered. Further research should be conducted to identify promising options and model examples in other cities.

Thirdly, the City and County of Denver has an opportunity to act as a catalyst by expanding food donation from its own facilities. Facilities such as Denver International Airport and the facilities managed by Arts & Venues should develop food donation plans and initiate or expand their efforts to donate appropriate foods. Training should be offered to these facilities' food service employees on best practices for food donation, and needs for additional support identified and addressed.

Recommendation 2:
Disseminate user-friendly food safety guidance to licensed food facilities and incorporate donation education into inspector site visits as appropriate. (DDPHE)

Recommendation 3:
Identify incentives, avenues for recognition, shared learning opportunities, and other outreach by which the City of Denver can encourage food businesses and other potential donors to expand donations of appropriate food. (DDPHE)

Recommendation 4:
Strengthen City policies and programs to optimize useful donations from city-owned or operated facilities. (DDPHE)

TRANSPORTATION, DISTRIBUTION AND STORAGE

Food rescue is a daunting logistical challenge, requiring close coordination among many stakeholders and an appropriate mix of physical infrastructure and human capital. Food donations from across the metro area, inconsistent in size, reliability and quality, need to be redistributed to a network of pantries, soup kitchens and alternative outlets on a near-daily basis. As part of this distribution, cost efficiency, cultural appropriateness, and a number of other criteria must be factored in. This section explores the evolution, present challenges and future opportunities for improving logistics in the food rescue pipeline.

Improving Coordination Between Food Rescue Organizations and Last-Mile Organizations

For many years, food rescue operated in a relatively ad-hoc, opportunistic manner in Denver. Food pantries, soup kitchens and other charitable organizations developed direct relationships with individual stores or institutions, coordinating pickups (or, in rare cases, drop-offs handled by donors) to transport donated food to where it could be used. However, many LMOs lacked the capacity to pick up donations consistently or at scale.

As a means of solving this problem, several food rescue organizations emerged as intermediaries between donating organizations and LMOs. We Don't Waste, for instance, carved out a niche working with sports venues and other institutions, while Denver Food Rescue's innovative bike-based transportation model helped draw regular volunteer support. The largest FRO, however, was and remains the Food Bank of the Rockies, which has slowly consolidated its relationships with chain grocers and with manufacturers through the use of exclusive national contracts

negotiated by Feeding America. These contracts, combined with FBR's extensive fleet of refrigerated trucks and warehouse operations, has resulted in a much smoother donation system for grocers, increasing their willingness to donate and raising the total amount of food rescued.

While FROs have addressed many challenges on the donor side, persistent challenges remain for pantries and other LMOs. The current system, for instance, has little ability for "market-matching" or aggregating food from donors and redistributing it to LMOs based on particular end-user needs. Instead, FBR and other FROs increasingly employ a direct store-to-LMO relationship, with a given LMO consistently receiving all the donations from a given set of stores. The direct delivery model has the significant advantages of increased freshness by eliminating transportation time to and from the FRO's warehouse and a smaller carbon footprint.

However, it can also result in LMOs receiving too much of certain items while suffering from deficits of others given the vagaries of what particular stores donate. Issues of cultural relevance are also under-addressed, with little to no connection made between foods received from a store and those commonly cooked by a given community. And because donation practices vary from store to store, a few lucky LMOs report receiving fresh, healthy produce, while others indicate that they typically receive a preponderance of past-date and/or processed foods. Finally, explicit or de facto requirements that LMOs take all the food that a grocer wants to donate can often lead to LMOs receiving large quantities of bread, desserts and other items that they can't use, transferring disposal costs from the donor to area nonprofits.

In addition to the need for clearer quality standards from LMOs discussed in Recommendation 1 above, many of these challenges are fueled by insufficient communication between food rescue organizations and last-mile organizations. Many LMOs have expressed a sense of being left out of FRO's decision-making processes, a sentiment borne out by limited LMO representation on FRO boards of directors and the lack of other formal mechanisms for LMO input. Executive staff at FBR did not respond to interview requests for this research, but their input and that of other FRO leadership will be vital in solving the distribution and communication challenges that the LMO community has identified.

Additionally, more robust channels for communication among LMOs themselves could also better enable LMOs to coordinate with one another and speak with a shared voice when needed. Several strategies could help LMOs work collectively to strengthen their communication with FROs and with each other:

- Groups such as the Colorado Food Pantry Network (CFPN) convened by Hunger Free Colorado, as well as the Food-1-1 Coalition convened by EPA Region 8, are providing platforms for mutual education and collective mobilization for food system stakeholders across the state. As these networks continue to evolve, they may prove to be increasingly useful channels for collective dialogue between LMOs and FROs.
- While the CFPN and Food-1-1 have proved to be a useful network for state and regional concerns, many key issues that local LMOs face are unique to the Denver area's urban context. Denver's Department of Public Health and Environment (DDPHE) could play a compelling role by convening a similar network focused specifically on the Denver metro area.

Recommendation 5:
Convene a local network of LMOs to build their collective voice and capacity. (DDPHE or other)

Complementary Transportation and Storage Systems

Although Denver's food rescue organizations are continuing to innovate and expand the amount of donations rescued, systemwide limitations in transportation and storage capacity remain an ongoing challenge for LMOs. LMOs must be prepared to pick up, store, sort and redistribute large volumes of food on a regular basis, often on short notice. And they must secure consistent access to enough trained workers, whether paid staff or volunteers, to perform the necessary labor.

One strategy suggested by multiple interviewees was the identification of an appropriate partner organization or creation of an entity dedicated to transporting donated food. Currently, FBR enables qualified LMOs to pick up donations directly from grocery stores, rather than FBR handling the pickups in its own trucks. This arrangement saves timing and mileage but is reported to create strain on small pantries trying to perform their own pickups. Enhanced transportation capacity could potentially alleviate this strain while capturing valuable donation streams currently missed by FROs, such as institutions or restaurants.

Recommendation 6:
Explore the feasibility of a dedicated service for transporting donated food from donors to LMOs.

Models based on owning and operating vehicles would be an expensive endeavor, and further work would be required to identify a sustainable business model and/or funding streams for such a service. An alternate approach would be to identify existing meal delivery businesses that would provide free transportation services for prepared food. The national company Door Dash has such a program that it is now deploying in select cities across the country.

The overall system would also benefit from increased food storage capacity, especially cold storage for the fresh produce, dairy and meat products for which end users have indicated a preference. Gaps exist at both the level of individual LMOs and centralized storage space that would enable foods to be held and redistributed at the neighborhood level. The installation of coolers and freezers at smaller LMOs, for instance, could dramatically expand their capacity to provide end users with needed produce, meat and dairy items. At \$1,000 to \$4,000 per unit, increased storage capacity is currently out of reach for most small pantries but is modest in philanthropic terms. Enhanced refrigeration equipment could be optimally targeted to LMOs in the most food-insecure neighborhoods, and it could be tied to LMOs meeting a variety of criteria, including a commitment to expanding perishable foods, enhanced food safety training, active participation in state or citywide pantry networks, and/or a commitment to more explicitly gathering and incorporating end-user feedback.

Recommendation 7:
Explore avenues to equip smaller LMOs with cold storage capabilities.

At a systems level, Denver should also explore neighborhood-scale cold storage hubs, where large donations could be stored and broken down for distribution to individual shelters and pantries. Currently, donations from grocery stores and other large donors are often too large for individual LMOs to receive and utilize. FROs that pick up pallet-size donations, for instance, would typically need to transfer that food to a central facility, break it down into increments that are appropriately sized for provision to individual LMOs, reload their truck and then take the food to its destination.

A consortium of a half-dozen local pantries, mostly based in Southwest Denver, have modeled just such a collective approach with the Food Exchange Resource Network (FERN). Since 2011, these pantries have leased and co-managed 15,000 square feet of pre-existing warehouse and cold storage space to aggregate and redistribute donated food. The Rocky Mountain Research and Prevention Institute serves as a fiscal sponsor, while one of the member executive directors oversees the space's management. All members contribute to rent based on the square footage of storage space they use, plus a flat fee of \$25/month for operating expenses.

Though not without challenges, FERN has been a success story for those involved, allowing for hundreds of tons of food to be redistributed to Denver residents in need since it started. Additional joint efforts like FERN in targeted neighborhoods of the metro area could help keep surplus food in the same neighborhood where it originates, while giving smaller LMOs the ability to offer more refrigerated items. Portions of existing storage facilities, such as the new We Don't Waste warehouse in Globeville could potentially be rented on a long-term basis. Alternatively, storage space could potentially be negotiated as part the redevelopment of Sun Valley or the National Western Complex, both located in food-insecure communities. Distribution and storage optimizations such as the ones described above will likely require outside investment for capital costs and/or ongoing operating expenses, and

Recommendation 8:
Explore the feasibility of creating or accessing shared refrigerated spaces in key neighborhoods where large donations of food could be stored and broken down.

underscore the importance of continued support from the philanthropic sector.

Capacity Building for Last-Mile Organizations

In terms of human capital, Denver-area LMOs have several common needs that lend themselves to shared capacity-building efforts. Chief among them is securing personnel, both paid and unpaid, to be able to provide administration and program delivery. From pickup to delivery to sorting and eventual distribution, most LMOs rely on volunteer support for multiple aspects of their operations. Indeed, NRDC's 2017 analysis estimated that nearly 80% of the labor for food rescue activity was unpaid. Not all last-mile organizations have consistent access to the reliable, dedicated volunteers they need, while some larger organizations occasionally turn volunteers away. Closer coordination and communication among LMOs may help solve this challenge, perhaps through the development of a shared corps of trained and committed volunteers from which LMOs could draw on an as-needed basis.

Of course, expanded volunteer support alone is insufficient for the needs of a growing food rescue system. Most last-mile organizations have extremely tight budgets and little staff capacity to expand their fundraising efforts; over 50% of the last-mile organizations surveyed by NRDC in 2017 have no staff at all. Yet as more perishables enter the food rescue system, additional food safety skills and protocols will be required, and as LMOs become more adept at engaging community voices, distribution of food will become more complex and integrated with additional social services. Without additional paid staff, LMOs will be significantly constrained in their ability to innovate, adapt and grow their impact. Avenues for building and sustaining staff capacity need to be explored, perhaps through a paid program director shared between several LMOs that are committed to innovation and growth.

Recommendation 9:
Explore mechanisms for LMOs to increase access to volunteers and paid staff.

A final need for LMOs is expanded training opportunities. LMO staff and volunteers could benefit from educational opportunities on topics such as food safety, volunteer management and fund development. This training could be delivered through the existing Colorado Food Pantry Network, the metro Denver pantry network proposed in Recommendation 5, and/or the regular gatherings proposed in Recommendation 17.

Recommendation 10:
Expand educational opportunities for LMOs, including food safety, volunteer management and fundraising.

Encouraging Social Enterprise in the Food Rescue System

While charitably based food rescue will continue to depend on philanthropic support for a large part of its needs, a growing number of social enterprises aim to address food insecurity while operating on a for-profit basis. Food Maven, for instance, is a Colorado-based company that recovers surplus food, donates 25% to LMOs, and sells the rest at a discounted cost to LMOs, restaurants and other businesses. Similarly, Copia aims to act as an integrated food waste prevention and donation platform connecting food businesses with hunger-relief nonprofits via a mobile app and delivery service. And Hibbert's Twice Rounds is reprocessing surplus bagels—an item that LMOs tend to receive in excess—into bagel chips, which are sold for profit, with a portion of proceeds going to the Food Rescue Network.

It remains to be seen how many of these businesses find their way to profitability, what others may emerge, and to what extent they actually assist food rescue efforts rather than compete with them. Nevertheless, social entrepreneurship remains a potent and underutilized source of innovation for Denver's food rescue ecosystem. Beyond seeking financially sustainable solutions to challenges of transportation and distribution, triple-bottom-line businesses may also have the potential to create new jobs and hire individuals experiencing food insecurity themselves.

The City of Denver's Office of Economic Development, in collaboration with DDPHE, could promote social entrepreneurship in service to these goals through a variety of means. For instance, a revolving loan fund or business competition could potentially provide start-up or expansion capital to qualifying businesses. A social impact bond, similar to that used by the City in 2017 for a housing-first homeless program, could incentivize businesses by paying them based on the amount of food they rescue or the number of low-income individuals they hire. Finally, city staff could be tasked with easing the path for emerging businesses in this arena by helping them navigate municipal processes of incorporation, licensing and permitting.

Recommendation 11:
Identify and/or establish funding streams and support systems to encourage the success of food rescue-related social enterprise. (DDPHE or OED)

DELIVERY TO END USERS

The ultimate measure of success for the food rescue system is its ability to meaningfully address food insecurity in the community. Denver's food rescue ecosystem has several opportunities to improve the experience of individuals seeking assistance. This section explores opportunities for strengthening the voice of end users and ways to improve their experience of the food rescue system.

Expanding the Voice of End Users

Generally, discussion of improvements to the food rescue landscape are led by policymakers, foundations, food banks, last-mile organizations and advocates—in short, every category of stakeholder except for the individuals and households that the system is intended to serve. As a result, solutions for innovation and reform often fail to incorporate the experience of these end users in a variety of ways. While LMOs work hard to provide as dignified an experience as possible, many challenges remain:

- The decision to seek free food assistance can be difficult in itself, and as a result, many people experiencing food insecurity never seek out charitable sources of food in the first place. Most would prefer a good-paying job to donated food.
- Client vetting and intake processes often entail extensive paperwork and waits of days or weeks to access food.
- Hours and locations for pantries, shelters and other sources of food can present hurdles to access, especially for individuals who work during typical business hours, depend on public transit or have a disability.
- Accessing food may mean transit challenges and standing in long lines.
- Depending on the situation, end users may not be able to choose the food they receive, which may include food that doesn't suit their taste preferences, has limited shelf life or doesn't meet their cultural preferences or dietary needs.

Expanding the voice of end users in informing the evolution of Denver's food rescue system is key for better meeting their needs. End users should be empowered as co-creators of food rescue strategy and programming. Experience from community organizing has created clear best practices and models that can inform that effort. The following recommendation is drawn from the experiences and advice of several local user-centered organizations and the end-user interviews conducted for this assessment, and is aimed at developing an ongoing process of collaboration, feedback and accountability between end users and other food rescue stakeholders:

- The City and County of Denver should convene and provide administrative support for an 8- to 12-member advisory group of people currently or recently experiencing food insecurity.
- Community members should be diverse in age, race, geographic location and ability status.
- Advisory group members should be asked to commit to a minimum term of six months if possible, and should be provided meaningful stipends for their time (e.g., \$100 per meeting) in addition to other incentives for participation (e.g., extra food from their LMO, monthly bus pass).
- Meetings are recommended every other month, with childcare, translation and transportation assistance provided, and should be held at times and locations deemed convenient to the community members on the advisory group.

- Meeting facilitation should be handled by an outside party trained in community engagement and familiar with the lived realities of low-income and food-insecure populations.
- The group's concerns and recommendations should be documented by City staff and shared with the Colorado Food Pantry Network, and/or the LMO networking group specific to the Denver area outlined in Recommendation 5.

Recommendation 12:
Create and lead an advisory body of end-users to inform evolution of Denver's food rescue system. (DDPHE)

In addition, a system should be established and funded to gather input from a large number of end users in Denver on an ongoing basis. The survey process conducted by Hunger Free Colorado via its network of food pantries around the state is a compelling model that should be supported. Funds should also be secured to enable deeper qualitative input via focus groups and/or one-on-one interviews with end users.

Recommendation 13:
Secure funding to gather regular feedback from end users via ongoing surveys, focus groups and one-on-one interviews.

Denver Food Rescue, Metro Caring, Bienvenidos Food Bank and Servicios de la Raza are organizations that actively involve end users in their decision-making, and have developed the trusting relationships necessary to gather honest and meaningful feedback. There are many local nonprofits outside of the food rescue landscape that may also serve as useful partners for engaging with end users. Here are several throughout the Denver area that could potentially play a role in this effort:

- **United For a New Economy**, formerly known as FRESC, is a local nonprofit using a community organizing approach to address issues of housing justice, economic justice, immigration justice and racial justice in the Denver area.
- **The GrowHaus** is a food justice nonprofit in Denver's Elyria-Swansea neighborhood that strives to engage community members throughout all levels of its organization, from program participants to paid staff to board members.
- **Montbello Organizing Committee** is a resident-led group dedicated to improving community issues in the Far Northeast Denver area. Food insecurity and hunger are among the organization's key priorities.
- **Re:Vision** is a nonprofit in Southwest Denver dedicated to community empowerment through sustainable food systems. It manages a network of over 200 *promotoras* (resident health workers) that assist residents with healthy eating and active living.
- **The Colorado Trust** is a statewide foundation dedicated to health equity, with a strong focus on racial justice and community engagement.

Making Food Distribution More User-Friendly

A growing number of local LMOs are shifting to "client-choice" pantry models, which have received very positive feedback from end users. The client-choice approach lets end users choose the items they want to receive rather than providing pre-assembling boxes or bags for them to take home. DDPHE, Hunger Free Colorado and other backbone organizations can aid LMOs in expanding adoption of a client-choice approach by offering trainings, mini-grants, technical assistance and tours of successful client-choice locations.

Recommendation 14:
Support and engage food pantries in adopting a client choice model through training, technical support and, where feasible, financial support.

LMOs may also want to consider more profound changes to their delivery model to ensure that food is offered in accessible locations close to where end users live, work and attend school, and that it is tailored to the needs of specific subpopulations. For instance, among the most startling results from the end-user survey was the disproportionate number of respondents (roughly 40%) who live in households with disabilities. Further, many of these identified transportation as a significant barrier to accessing food pantries. More study is needed to understand the needs of this specific subpopulation, but if the link between lack of mobility and food insecurity holds true, LMOs may need to seek additional avenues for connecting this population with needed food.

Similarly, many end users have to travel considerable distances to access a pantry. One solution could be mobile pantries: full- or partial-service pantries using specially outfitted trucks or buses that can serve multiple communities in a given week. Mobile pantries have become more common across the country in urban and rural communities alike, and represent a relatively low-cost and nimble solution to distributing rescued food in neighborhoods that currently lack LMO infrastructure.

Food Bank of the Rockies has operated a mobile pantry for several years, and multiple other entities are either considering a mobile pantry or are in the process of launching one in the Denver metro area. However, mobile pantries are not without their own challenges. The number of users served in a given day is limited by the size of the vehicle, and communicating clearly with community members about their schedule, location and hours is critical.

Another promising solution is delivery of rescued food directly to homebound individuals. Since 2014, The GrowHaus has been partnering with Denver Food Rescue to deliver donated food to homebound families in Elyria-Swansea through its Cosechando Salud Movil program; it may be able to offer best practices and advice for expansion of this model.

Recommendation 15:

Conduct a more detailed study of the specific food security-related needs of disabled individuals.

Recommendation 16:

Hone and expand strategies for making donated food more geographically accessible through mobile distribution channels, home delivery, distribution points that are closer to where end-users work, live and attend school, and related approaches.

CONCLUSIONS AND OVERALL RECOMMENDATIONS

This assessment seeks to provide stakeholders with a systemwide perspective on the strengths of Denver's existing food rescue system and opportunities to improve it further. Through its leadership role, the City of Denver can support innovations that respond deeply to community needs and keep more good food from going to waste. In particular, two final, overarching recommendations for City action would provide the commitment and momentum for ongoing systems-level improvement to the metro area's food rescue landscape.

First, DDPHE should consider convening regular gatherings to engage all stakeholders in the food rescue system - food donors, rescuers, LMOs, and even end users. Using a collective impact approach, these convenings would allow participants to jointly and comprehensively strategize future development of Denver's food rescue system, and would serve as the primary entity for prioritizing, advancing and providing accountability for progress on the other recommendations in this assessment.

Second, a similarly coordinated effort will be necessary to finance several of the recommendations in this report. A variety of local and national foundations, corporate sponsors and municipal agencies will need to be engaged. As part of its implementation efforts, DDPHE would be the ideal body to convene these participants in a process of education, dialogue and action planning to address comprehensive investment needs to the rescue system.

Recommendation 17:

Convene stakeholders across the food rescue ecosystem on a regular basis to support shared dialogue and implementation of the recommendations in this assessment. (DDPHE)

Recommendation 18:

Engage the philanthropic sector and business community to mobilize support for recommended investments in Denver's rescue system. (DDPHE)