

RECOVERY SOLUTIONS

ANNUAL DIVERSION POTENTIAL

1.1M TONS

ANNUAL ECONOMIC VALUE

\$2.4B

INVESTMENT NEEDED OVER 10 YEARS

\$8.7B

ANNUAL MEALS RECOVERED

1.8B

ANNUAL JOBS CREATED

4,000

GHGS REDUCED

3.4M TONS CO₂e

TOP SOLUTIONS BY
DIVERSION POTENTIAL

DONATION TAX INCENTIVES

**STANDARDIZED DONATION
REGULATION**

**DONATION MATCHING
SOFTWARE**





KEY INSIGHTS

MOST PEOPLE have seen perfectly good food thrown away at a restaurant, bakery, or dinner party and wished there was a way to get it to people in need. Food recovery captures that food and transports it while it is still edible to help address the issue of food insecurity.

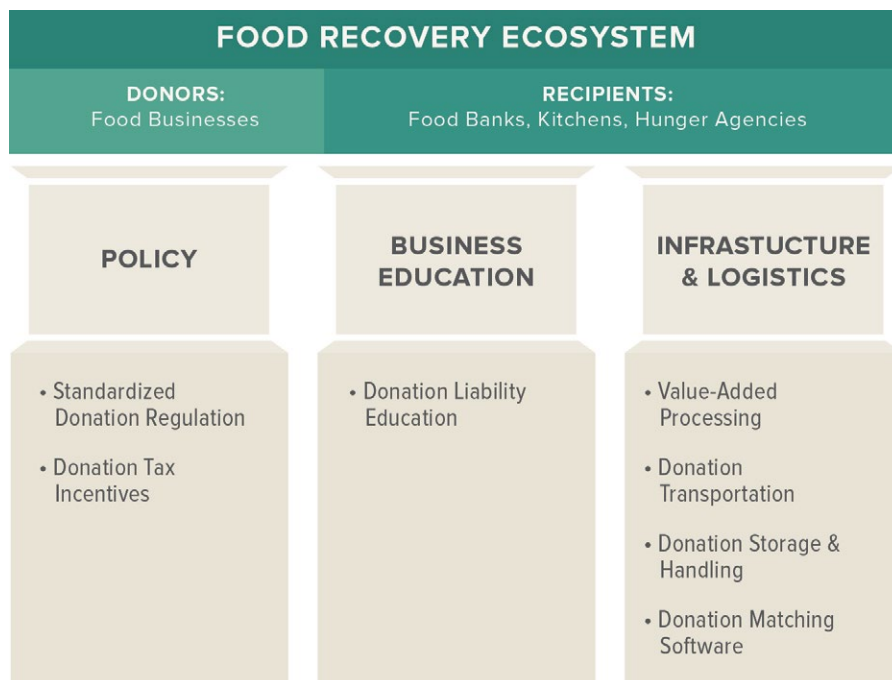
FOOD RECOVERY: THE OPPORTUNITY

Although food recovery initiatives already exist throughout the country, there is significant opportunity to increase donations. Food recovery networks in the U.S. — spanning food banks, pantries, soup kitchens, shelters, and other agencies — already receive and distribute nearly 1.7 million tons of rescued food each year. Based on ReFED's analysis, over three times this amount — up to 5.8 million additional tons — could be feasibly recovered from food businesses one day.* The *Roadmap* shows how approximately 20% of this additional recovery potential, or 1.1 million tons (1.8 billion meals), can cost-effectively be recovered over the next decade.

While prevention strategies can be implemented as one-off solutions, recovery requires an ecosystem approach supported by three pillars: 1) education for food businesses on donor liability protections and safe food handling practices, 2) enabling policy to financially incentivize donations from businesses while providing standardized and science-based food safety regulations, and 3) efficient logistics and infrastructure to transport, process, and distribute excess food. Of these pillars, two types of enabling policy, **Standardized Donation Regulation** and **Donation Tax Incentives**, would drive over half of the overall recovery opportunity analyzed in the *Roadmap*.

Food recovery can increase by 1.8 billion meals annually, nearly doubling the amount of meals rescued today and diverting 1.1 million tons of waste.

- The food recovery ecosystem requires three pillars to scale: education for businesses, enabling policy, and efficient use of transportation and cold storage.
- Over half of the opportunity requires legislation, including the maintenance and expansion of tax incentives for business donations and the standardization of food handling safety regulations.
- Nearly half of new recovery potential comes from produce surpluses on farms and at packinghouses, a sector with lower levels of donations today than food retailers.



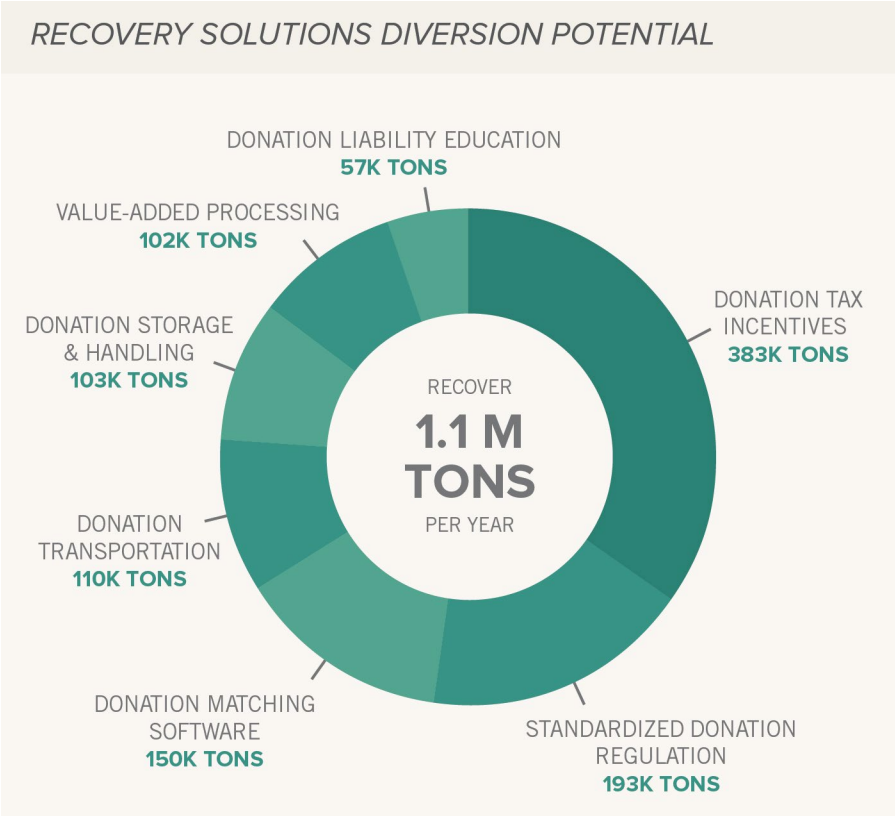
* Baseline data based on Feeding America reported recovery data and market share. Additional recovery potential is based on calculations of total waste available for recovery and does not account for increasing marginal costs of recovery or the volume of actual meals needed to end hunger.

The *Roadmap* projects that nearly half of new recovery potential comes from farms, over a third from restaurants, and the remainder from grocery retailers. ©

The large potential for on-farm food recovery is a novel finding from the *Roadmap*. While many reports have highlighted the over 50 million tons of waste heading to landfills annually, up to 10 million tons of edible food tilled into farm soils or culled in on-farm packing houses is often ignored. ReFED estimates that less than 5% of this loss is being recovered today, primarily through farm-to-food-bank programs that have emerged over the past five to 10 years in several states.

Beyond farms, restaurants and foodservice have large volumes of food available but in smaller batches, so handling and transportation costs become a limiting factor. There is more limited incremental recovery opportunity from retailers and manufacturers given that these programs have been established for many years.

LESS THAN
5% OF ON-
FARM FOOD
LOSS IS BEING
RECOVERED
TODAY.



FOOD RECOVERY: THE CURRENT LANDSCAPE

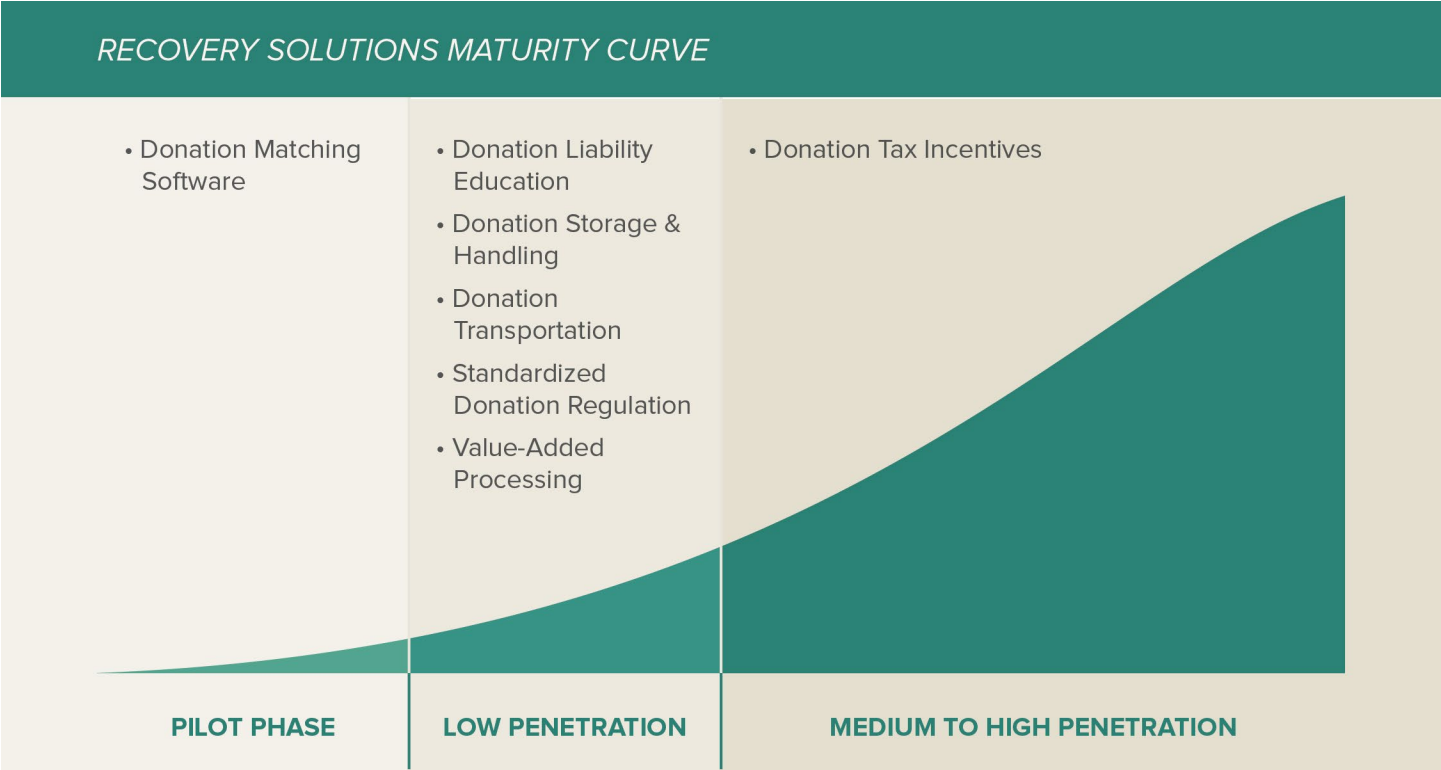
The existing food recovery system is vast. Hundreds of regional and statewide food banks supply over 60,000 food recovery and hunger agencies, which in turn collect, handle, and distribute food to the hungry.³⁰ Currently, this industry relies on donations from all types of food businesses, including retailers and manufacturers and, to a lesser extent, farmers, restaurants, and foodservice providers.

Food banks and hunger agencies have traditionally relied on canned and processed food to serve their clients. New approaches to food recovery incorporate fresh produce and other nutritious foods. Rather than rebuilding the current food recovery system, the *Roadmap* envisions leveraging existing infrastructure and resources to incorporate more perishable sources of food.

In this complex web of overlapping local networks, scale and transaction costs matter immensely. Large batches of food, such as a few dozen tons of potatoes, need significant transport, storage, and nonprofit labor and processing resources to be effectively utilized before spoiling. Conversely, if one bakery wants to donate a bag of 50 bagels, it is often hard to justify the labor and infrastructure costs needed to transport it to a donor recipient. The sector relies heavily on volunteer and philanthropic support.

© More information available in the Technical Appendix on refed.com.

Given the highly local nature of most recovery efforts, it is not surprising that most innovations have not spread widely. **Donation Matching Software** is the only recovery solution in the pilot stage. The majority of solutions have low penetration. There are examples of the solutions across the country, but they have not scaled widely. **Donation Tax Incentives** is the only solution with relatively high penetration. The maturity curve below shows the range of penetration of recovery solutions analyzed.



REGIONAL CHALLENGES

Geographic variance in where unrecovered food is available versus where hunger is concentrated makes overarching national solution implementation impractical. While rural households are typically close to farms with excess food, families facing hunger are typically spread out making delivery of food more difficult. There are also fewer nonprofit agencies operating with resources to support these communities. On the other hand, urban solutions benefit from population density and resource efficiencies but may lack food sourcing and procurement channels if farms and manufacturers are located further away.

Food recovery is also complicated by the different types of food available for donation. California, where almost half of all fruits, nuts, and vegetables are grown in the U.S., yields different food surpluses than Midwest states that focus more on grain and livestock.³¹ In regions such as the Northeast that have smaller agriculture sectors, food banks have not prioritized relationships with local farms, although this is starting to shift.³² At retail and foodservice facilities, perishability introduces yet another layer of considerations; produce grown in California and sold in New York has significantly less remaining shelf life than locally grown produce.

Produce terminals and port cities, such as Los Angeles and New York City, also offer large recovery opportunities, and certain border towns generate truckloads of blemished or otherwise unmarketable produce that could be recovered to a much greater extent than current practice.³³ For example, over half of the produce that is imported from Mexico comes through a single border crossing in Nogales, Ariz.³⁴

BARRIERS TO FOOD RECOVERY

LIABILITY CONCERNS: The federal Good Samaritan Food Donation Act protects donors and recipients from civil or criminal liability short of gross negligence and misconduct. However, this legislation remains unproven and untested in court leaving corporate legal departments without a precedent to follow that would allow them to fully support food donation. Brand protection is another concern. As one retailer explained, “It doesn’t matter if I can’t be sued; it’d almost be worse to have the company’s name on the front page of the *Wall Street Journal* in conjunction with someone dying from eating our food.”³⁵

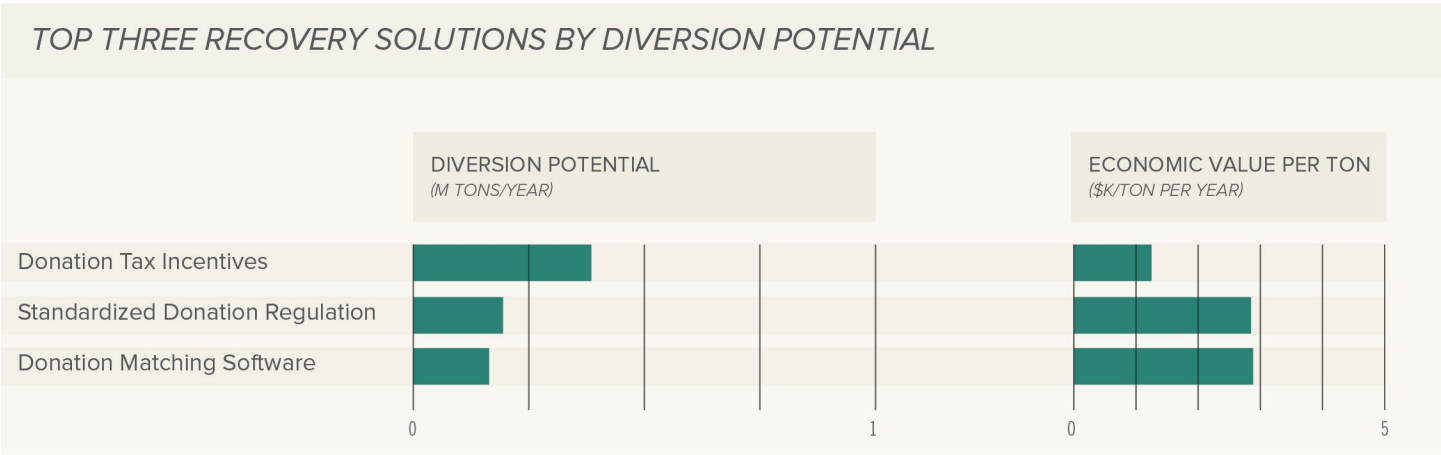
FRAGMENTED REGULATION: Health regulations vary by city and state, arising from “home rule” authority in some localities and differing interpretations of the FDA Food Code, which only loosely defines basic requirements for food safety. This hampers national and global companies from developing uniform food donation policies across their organizations.

HANDLING, TRANSPORTATION, AND STORAGE: Many consumer-facing businesses lack sufficient facilities to store food for donation.³⁶ Food banks and pantries may similarly not have sufficient infrastructure or labor capacity to accept large donation volumes, especially of perishable foods requiring refrigeration or freezing.

FINANCIAL VIABILITY: Donating food for recovery often involves additional handling costs beyond regular disposal. For instance, state and federal tax benefits for recovered food rarely cover the farm labor costs involved. Without a way to recoup these costs, businesses are more likely to default to the path of least resistance: disposal.

RECOVERY SOLUTION DESCRIPTIONS

The top three solutions represent 66% of the total recovery diversion potential: **Donation Tax Incentives, Standardized Donation Regulation, Donation Matching Software.**



SPOTLIGHT ON FOOD DONATION TAX INCENTIVES

In December 2015, Congress signed into law a tax break package with provisions making permanent the charitable giving tax incentives for donating food. Supported by a coalition of nonprofit organizations including Feeding America, the Protecting Americans from Tax Hikes (PATH) Act made various new business entities eligible for food inventory enhanced deductions that had previously only been accessible to large C corporations.

Under the previous standard food donation deduction, a business could only claim the cost basis of donated inventory. An enhanced deduction passed in this legislation allows businesses to claim both the cost basis and half of potential profits if the inventory could be sold at fair market value. This new legislation is expected to spur increased donations from farms and smaller retailers and restaurants.

1. DONATION TAX INCENTIVES

DEFINITION

Expanding federal tax benefits for food donations to all businesses and simplifying donation reporting for tax deductions

DIVERSION POTENTIAL

383K TONS

ECONOMIC VALUE

\$470M

MEALS RECOVERED

638M

TIMEFRAME

NEAR TERM

PENETRATION

MEDIUM - HIGH

WHO CAN TAKE ACTION

STATE AND FEDERAL GOVERNMENT

RESEARCH AND ADVOCACY ORGANIZATIONS

BUSINESSES

FOUNDATIONS

OVERVIEW

Tax incentives, whether in the form of credits or deductions, induce farms, retailers, restaurants, and foodservice providers to undertake the behavioral and operational changes needed to donate additional food instead of sending it to disposal. It is expected that the tax benefits will roughly equal the incremental costs of donation, leading to a net breakeven financial impact for businesses.

In total, up to \$750 million of additional annual federal tax deductions should be funded to achieve 380,000 tons of additional donations: \$620 million in incentives to farms would yield an additional 525 million donated meals, while \$130 million provided to restaurants and retailers would generate 115 million meals annually. There is a lack of data regarding the portion of food donors that receive tax incentives today. Anecdotal evidence from ReFED interviews suggests that a large portion of businesses may not go through the effort of claiming small tax benefits after donating, which could significantly reduce the net cost of this solution.

While enhanced deductions were passed in December 2015 as part of the Protecting Americans from Tax Hikes (PATH) Act, food donation tax incentives will require ongoing support from food recovery organizations, foundations, and businesses to make them a priority in the face of future tax reforms.

CHALLENGES

- Successful food donation reform at the federal level requires a clear demonstration of expected societal benefits.
- Businesses may have practical difficulty claiming the tax benefits. For example, a recently passed food donation state tax credit in California requires an inventory-based method of valuation that is only accessible to large farming operations with well-established record-keeping practices.³⁷

STAKEHOLDER ACTIONS

- Businesses should actively educate themselves on how their eligibility for tax incentives has changed to spur an increase in food donation efforts.
- Foundations and nonprofits can identify and promote additional donation policy opportunities — such as state-level tax credit programs — while helping measure the impact and success of existing food donation legislation.
- Nonprofits can lead efforts to analyze the cost-effectiveness of tax deductions to ensure ongoing and additional funding at the state and federal levels.
- Various types of food business need to collectively identify deficiencies in existing food donation laws and help draft new legislation that will meet the needs of donor and recipient organizations and fully incentivize businesses to engage in food recovery.

EXAMPLES

- The Protecting Americans from Tax Hikes (PATH) Act of 2015 made permanent an enhanced tax deduction for donating food, increasing business incentives to participate in food recovery. See “Spotlight on Food Donation Tax Incentives” on page 43.



2. STANDARDIZED DONATION REGULATION

DEFINITION

Standardizing local and state health department regulations for safe handling and donation of food through federal policy

DIVERSION POTENTIAL

193K TONS

ECONOMIC VALUE

\$553M

MEALS RECOVERED

322M

TIMEFRAME

NEAR TERM

PENETRATION

LOW

WHO CAN TAKE ACTION

FOOD RECOVERY ORGANIZATIONS

FEDERAL GOVERNMENT

LOCAL AND STATE HEALTH DEPARTMENTS

FOUNDATIONS

BUSINESSES

OVERVIEW

State and local health departments across the country have food safety laws that may prohibit or hamper the donation of food that is still safe to eat. These regulations generally add an additional burden on donors and recipients to navigate the differences between states and cities.

The FDA Food Code is not law but a model code, allowing states and local governments to adopt all or just portions of it. Once states determine which portions to adopt, it becomes part of state law and is open to interpretation by the state health agents who are responsible for enforcement.

“Home rule” states may also allow county and local units of government to establish different regulations. For example, Massachusetts state law requires that past-date food be separated and labeled, with no additional stipulations barring these items from being sold or donated. However, Boston health department regulations strictly prohibit the donation of past-dated foods despite the lack of evidence that this poses an additional risk to food safety.³⁸

Standardizing local and state health department laws through federal legislation to create a common policy will enable businesses nationwide to more easily track food regulations and understand their donation options with fewer liability concerns. Alternatively, ensuring any voluntary guidelines are up to date and disseminated widely may be a faster path than regulation. The Conference for Food Protection is voting on updated guidelines for food safety handling in spring 2016.

CHALLENGES

- Political bureaucracy may delay any efforts to enact sweeping legislative changes that would define a national standard for safe food handling and donation practices.
- Successful advocacy for regulation reform requires balancing a clear demonstration of societal benefits with an assurance of food safety. For example, language could be recommended that allows for canned or other nonperishable items to be donated past code date but only for a defined length of time.

STAKEHOLDER ACTIONS

- Businesses and food recovery organizations should map jurisdictional local and state health regulations to identify overly strict regulations that are not science-based and inhibit donations, as well as commonalities that should form the basis of national policy.
- Foundations can provide funding to develop research for new health policies and support effective advocacy strategy. Since many regulations are set at the state level, this fits well with interests of regionally focused foundations.
- Nonprofits can educate businesses and food recovery organizations once new regulations are enacted, particularly staff who will be directly handling and processing food donations. Additionally, local governments should provide updated training for health inspectors.
- Nonprofits can contribute to furthering science-based food safety research to bolster the case that food donation regulations align with strong safety protections.

EXAMPLES

- In Massachusetts, RecyclingWorks worked with a multi-stakeholder group of state and local health officials, food rescue organizations, and businesses with food donation programs to develop Food Donation Guidance documents to help clarify local policies for food donation.³⁹



DONATION

3. MATCHING SOFTWARE

DEFINITION

Using technology platforms to connect individual food donors with recipient organizations to reach smaller-scale food donations

DIVERSION POTENTIAL

150K TONS

ECONOMIC VALUE

\$432M

MEALS RECOVERED

250M

TIMEFRAME

NEAR TERM

PENETRATION

PILOT

WHO CAN TAKE ACTION

ENTREPRENEURS

FOOD RECOVERY ORGANIZATIONS

IMPACT INVESTORS



OVERVIEW

Donation matching software provides dynamic, real-time information about food available for donation to enhance the operational efficiency of food recovery partnerships between nonprofits and businesses with smaller-volume batches of edible food, such as cafes, restaurants, hotels, and other foodservice settings.

Smaller donations (under 50 pounds) are expensive for food recovery organizations to pick up, leading many to set minimum amounts for donation. Online donation matching software enables local food recovery agencies to identify multiple small pickups at once and design efficient routes to recover food that otherwise would go to waste.

These apps are most effective when they include mechanisms for arranging and covering transportation, which removes a major cost barrier. Some smartphone apps coordinate volunteers for real-time food pickups and distribution.

It is assumed, like other real-time software platforms, that many apps and software systems will be developed and piloted and a handful of the best ones will scale nationwide. Several food recovery organizations that are in the early development of apps are assessing opportunities to share a white-labeled version of their products with other food recovery organizations.

CHALLENGES

- Food recovery organizations that have traditionally worked with donors that provide relatively reliable and consistent donations may need to adjust operations to accommodate unpredictable food donation types and volumes from new donors.
- Business employees must be trained to use a new technology platform to notify recovery agencies of available food donations. Likewise, food recovery organization staff must be familiar with the tool to identify food donation matches and plan pick-up routes.
- Businesses and recovery agencies must ensure proper cold chain management to safely store, handle, and transport perishable foods
- The cost of transportation is often a significant barrier to donation, particularly for smaller and more geographically dispersed donations.

STAKEHOLDER ACTIONS

- Nonprofit support is needed to train and educate all organizations to begin adopting a new technology.
- Impact investors are needed to fund the upfront cost of technology platforms and mentor startups and social entrepreneurs to develop sustainable software business models.⁴⁰
- Businesses can collaborate with IT product developers to address specific food recovery obstacles. For example, small-volume foodservice donations are plagued by limited labor to handle food and transportation constraints. Small donations also create logistical hurdles for food recovery networks that must track, inventory, and distribute this food on relatively short notice.
- Food recovery organizations can also collectively engage with funders, developers, and businesses to understand where a donation technology platform could interface with other infrastructural resources needed to physically collect, store, and distribute food.

EXAMPLES

- Feeding America secured a \$1.6 million grant from Google's nonprofit arm to create its Online Marketplace program and support development and training efforts among Feeding America-affiliated entities.⁴¹ The Online Marketplace overcomes logistical constraints by allowing businesses to quickly and efficiently document food donations.
- Several nonprofit and for-profit companies that have launched donation matching software platforms over the past few years include Spoiler Alert, Zero Percent, Copia (formerly Feeding Forward), Community Plates, and Food Cowboy.

4. DONATION TRANSPORTATION



PENETRATION: **LOW**
TIMEFRAME: **NEAR TERM**

DIVERSION POTENTIAL: 110K TONS

ECONOMIC VALUE: \$252M

Meals Recovered:
183M MEALS

Who Can Take Action:

**FOOD RECOVERY ORGANIZATIONS,
FOUNDATIONS, GOVERNMENT,
BUSINESSES**

DEFINITION

Providing small-scale transportation infrastructure for local recovery as well as long-haul transport capabilities

CHALLENGES

- The cost of short-distance, small-load transportation is expensive per pound compared to long-haul transportation of larger loads.
- Perishables need to be distributed quickly and efficiently to maintain freshness.
- Transportation costs are typically covered by food recovery organizations with small budgets.

STAKEHOLDER ACTIONS

- Retailers and foodservice distributors can share excess transportation capacity with recovery organizations.
- Foundations and government can provide grants or low-cost loans for physical assets such as trucks and the cost of trucking services.
- Rural recovery groups can build connections with other rural support services, including health care and education services to distribute food through existing channels.
- Recovery organizations should improve coordination to find a home for donated food that one organization cannot use due to capacity or budgetary constraints.

EXAMPLES

- The Borderlands Food Bank annually recovers 35 to 40 million pounds of rejected but safe-to-eat produce from Nogales, Ariz.,⁴² which could be replicated at produce terminals nationally. Borderlands redistributes this food throughout the U.S., with hunger-relief organizations paying two cents per pound for transportation – which can equate to less than \$1,000 per truckload for \$70,000 worth of product.⁴³

5. DONATION STORAGE & HANDLING



PENETRATION: **LOW**
TIMEFRAME: **NEAR TERM**

DIVERSION POTENTIAL: 103K TONS

ECONOMIC VALUE: \$244M

Meals Recovered:
172M MEALS

Who Can Take Action:

**FOOD RECOVERY ORGANIZATIONS,
SOCIAL ENTERPRISES, FARMERS,
IMPACT INVESTORS, FOUNDATIONS**

DEFINITION

Expanding temperature-controlled food distribution infrastructure (e.g. refrigeration, warehouses) and labor availability to handle (e.g. process, package) additional donation volumes

CHALLENGES

- Each warehouse serves a unique local need, which requires a regionalized understanding of food distribution capabilities and gaps.
- It can be difficult to finance warehouses that are capital-intense but lack significant collateral.

STAKEHOLDER ACTIONS

- Food banks can expand existing infrastructure to increase handling capacity for perishables.
- The network of over 200 U.S. food hubs can use excess capacity to store and handle donated food.
- Foundations can provide low-cost infrastructure funding in addition to existing grants for food recovery operational expenses. Funding can also be directed toward mapping where underutilized assets exist, such as surplus refrigerator space within existing businesses.
- Nontraditional transportation and storage is needed. Ride-sharing services can provide near real-time transportation for donated food that must be picked up quickly. Similarly, since donated food often becomes available at night when many food banks are closed, other late-night businesses with refrigerated capacity may be available to hold food.

EXAMPLES

- The Second Harvest Food Bank of Middle Tennessee provided a Feeding America Produce Capacity Grant to Hughes Farm and Produce to cover the cost of installing a new processing line to sort green beans that were the incorrect size for retail standards. The upgrade cost less than \$50,000, and Second Harvest expects to recover 1 million lbs. of green beans per year.⁴⁴

6. VALUE-ADDED PROCESSING



PENETRATION: **LOW**
TIMEFRAME: **NEAR TERM**

DIVERSION POTENTIAL: 102K TONS

ECONOMIC VALUE: \$285M

Meals Recovered:
171M MEALS

Who Can Take Action:
**FOOD RECOVERY ORGANIZATIONS,
SOCIAL ENTERPRISES, FARMERS,
IMPACT INVESTORS**

DEFINITION

Extending the usable life of donated foods through processing methods such as making soups, sauces, or other value-added products

CHALLENGES

- Processing requires capital-intensive commercial kitchens and other infrastructure.
- New infrastructure may need to be built or identified in the community to use during prime harvesting season when existing infrastructure capacity is often not available.

STAKEHOLDER ACTIONS

- Nonprofits and social entrepreneurs can collaborate with businesses to process donated food and work with farmers and manufacturers in food-producing regions to find excess processing capacity to handle crop surpluses during prime harvesting months.
- Foundations and impact investors can provide low-cost capital for investment in additional processing line capacity.
- The USDA could expand its grant and loan programs to help farmers and entrepreneurs invest in their own processing capabilities.

EXAMPLES

- The Alameda Kitchen in Alameda, Calif., uses a shared kitchen to transform fruits and vegetables that would otherwise be wasted into affordable food products and meals for low-income populations.⁴⁵
- Several social enterprises have emerged recently to sell value-added products from food waste at a profit. These include Barnana (banana snack bites from rejected products), Misfit Juicery (repurposing wasted food into juice), and MM Local Foods (value-added products from seconds from farmers).

DIVERSION POTENTIAL: 57K TONS

ECONOMIC VALUE: \$159M

Meals Recovered:
95M MEALS

Who Can Take Action:
**NONPROFITS, RESEARCHERS,
BUSINESSES**

DEFINITION

Educating potential food donors on donation liability laws

CHALLENGES

- The federal Good Samaritan Food Donation Act protects donors and recipients from civil or criminal liability short of gross negligence and misconduct. However, this legislation remains unproven and untested in court leaving corporate legal departments without a precedent to follow that would allow them to fully support food donation.
- In an industry with a wide variety of businesses, it is challenging to create scalable awareness campaigns and educational materials necessary to change mindsets.
- Because of high staff turnover, ongoing training is required for programs to be effective.

STAKEHOLDER ACTIONS

- Federal government can provide additional guidance on the Good Samaritan Act to increase clarity for businesses.
- Nonprofits can develop training guides for businesses and publicly recognize leading businesses.
- Businesses can include information on donation as a standard set of employee on-boarding trainings.
- Nonprofits and researchers can provide research to develop a simple data-driven framework for businesses to evaluate food-safety risks.

EXAMPLES

- Leading businesses such as Ahold and Bon Appetit Management Company have instituted donation protocols that have enabled them to adopt aggressive donation goals.



PENETRATION: **LOW**
TIMEFRAME: **NEAR TERM**