

Solid Waste Services
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Project Number: 208-190461
August 31, 2022

Community Food Waste Reduction Program

Municipality of Anchorage, Alaska



Cover photo provided by Anchor Gardens

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PRESENTED TO

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APPENDICES

Appendix A	Task 1 Technical Memo – Evaluation of Existing Food System
Appendix B	Task 2 Technical Memo – Develop Program Elements

ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
AFPC	Alaska Food Policy Council
ASD	Anchorage School District
CCWR	USDA Community Compost and Food Waste Reduction
CSS	Catholic Social Services
CTS	Central Transfer Station
CO ²	Carbon Dioxide
FBA	Food Bank of Alaska
GHG	Greenhouse Gas
ILSR	Institute for Local Self Reliance
ISWMP	Integrated Solid Waste Master Plan
MOA	Municipality of Alaska
MSW	Municipal Solid Waste
SNAP	Supplemental Nutrition Assistance Program
SFHFP	St. Francis House Food Pantry
SSO	Source Separated Organics
SWS	Solid Waste Services
USD	United States Dollar

1.0 INTRODUCTION

To effectively utilize the new Solid Waste Services (SWS) Central Transfer Station (CTS) Project and accomplish the associated material recycling and diversion goals, SWS is seeking long-term planning to optimize organics management and diversion. This report performed by Tetra Tech under the USDA Community Compost and Food Waste Reduction (CCFWR) Grant includes an evaluation of the existing food system to reduce food waste and identify key program elements for SWS to implement a Food Waste Reduction Program within the Municipality of Anchorage (MOA).

According to the MOA's 2019 Integrated Solid Waste Master Plan¹ (ISWMP), one of the key organics diversion initiatives recommended is to develop a **Food Waste Reduction and Prevention Program (Program)** aimed at food waste prevention and food rescue and recovery. This Program is an extension of the Organics Management Feasibility Study² that focused on organics collection and processing options to allow SWS to quantitatively determine the most suitable organics management strategy to manage existing feedstock while considering future scalability and improved organics diversion. The ISWMP provided a roadmap to optimize SWS's solid waste management systems including new practices and programs that increase waste reduction and recycling of materials currently disposed of in the landfill and protect the environment. Organics diversion through food scrap reduction, prevention and rescue, in addition to organics processing, is one of the short-term (0-5 years) recommendations for SWS to implement.

This report provides a synopsis of the existing food system and recommendations for MOA to support for broad array of food-related strategies and actions. By addressing overall food system resilience, the intent is to have a robust local food system with minimal food wasted, captured food surplus for food rescue and recovery, and well-established organics processing systems to support local food growing efforts. Strategy and action recommendations are grouped into the following themes:

1. Food System Capacity Building and Resilience
2. Local Food Production
3. Food Waste Prevention
4. Food Rescue and Recovery
5. Organics Management

This interdisciplinary approach addresses the importance of local resilient food system in northern communities such as MOA while also having an impactful waste reduction and diversion component. **While the Department of Solid Waste Services has an integral role in this initiative, it is intended that a broader stakeholder effort – across levels of government and with community organizations – is used to make the Program a success. Seeking solutions to this issue goes beyond the Anchorage SWS mission and requires a community, regional, and ultimately state-wide effort. Determining the governance structure and resources to convene these key players will be an integral part of Program implementation.**

Two Technical Memoranda were used to inform development of the Program. See Appendix A and B respectively for an overview of the existing food system and developing program elements via Case Studies.

¹ <https://www.muni.org/Departments/SWS/Documents/Master%20Plan%20DRAFT.pdf>

² <https://www.muni.org/Departments/SWS/Documents/SWS%20Organics%20Management%20Feasibility%20Final%20Report.pdf>

1.1 CONTEXT SETTING

In the United States, approximately 30 to 40% of food is wasted³. In 2010, this amounted to 133 billion pounds of food and \$161 billion USD of value that was lost. At a household level, food waste is worth about \$370 per person each year (national average in 2010). With the already high and rising food prices in Alaska, this figure is likely much higher. When food is wasted, it is also wasting the land, water, labor, energy, and other inputs used to produce, process, transport, prepare, store, and dispose of food. When food waste is disposed in a landfill, it releases methane, a greenhouse gas (GHG) that is 25 times more potent than carbon dioxide (CO₂). In the United States, the GHG emissions associated with food loss and waste is about 170 million tons of CO₂ equivalent (CO₂ eq) per year⁴. That is the equivalent to 36 million cars driving on the road for a year⁵.

Due to the short growing season and high cost of local food production compared to imports from the Lower 48, Alaska's food supply is dependent on imports. Approximately 95% of food purchased in Alaska is imported, worth about \$1.9 billion USD each year⁶. Food security and resiliency is a concern in Alaska as most grocery stores only have a 3-to-5-day supply of food and 1 in 7 Alaskans are food insecure.

Climate change is affecting Alaska much more than any other state in the United States because it is warming at a much faster rate⁷. This rapid increase in temperature is going to affect multiple sectors of the economy, including food and transportation. The cost of adapting to a warmer climate for the state is projected to be from \$3.3 to \$6.7 billion dollars from 2008 to 2030. For example, ice roads may no longer be feasible and will need to be replaced with gravel roads. In recent years, salmon stocks have been in decline in Alaska⁸ and in 2021, the snow crab stock collapsed⁹. However, with a warming climate, it may be possible to produce more types of food in Alaska due to the resulting longer growing season.

Reducing food waste and increasing local food production can have multiple benefits in reducing damage to the environment, saving resources and money, improving food security, building food resiliency, and adapting to climate change. Avoiding one metric ton of food waste avoids the equivalent of 4,060 kg CO₂ eq (Figure 1-1) because of all the embedded emissions associated with growing, processing, and distributing food¹⁰. There is a much greater greenhouse gas savings potential from source reduction than waste management solutions such as composting (53 kg CO₂ eq).

³ <https://www.usda.gov/foodlossandwaste/why>

⁴ https://www.epa.gov/system/files/documents/2021-11/from-farm-to-kitchen-the-environmental-impacts-of-u.s.-food-waste_508-tagged.pdf

⁵ <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

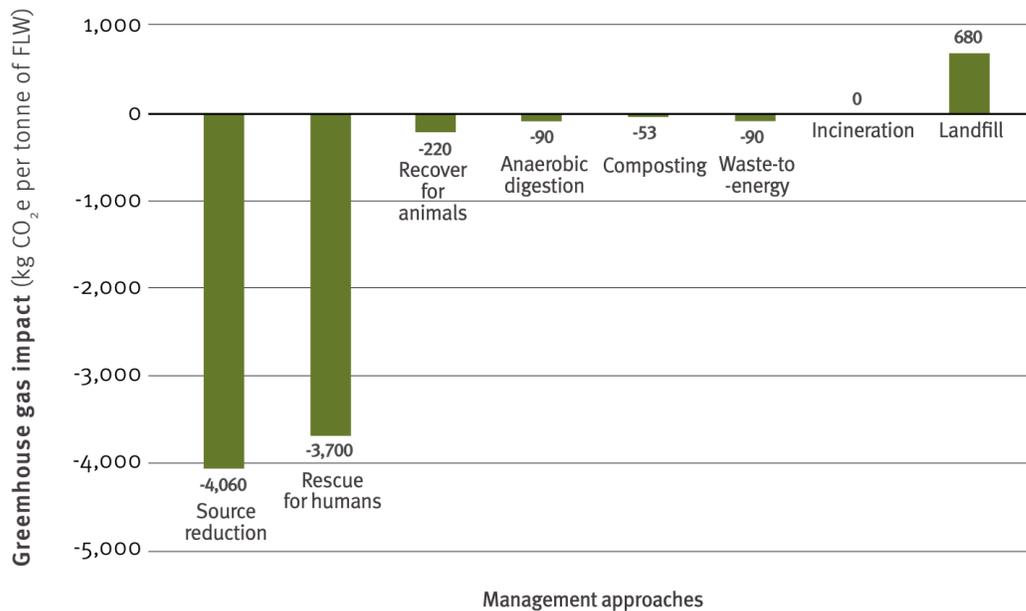
⁶ <https://www.akfoodpolicycouncil.org/blog/2021/6/22/2021-alaska-food-security-investment-recommendations>

⁷ <https://www.climate.gov/news-features/understanding-climate/new-report-highlights-alaska's-last-five-years-dramatic-climate>

⁸ <https://onlinelibrary.wiley.com/doi/10.1111/gcb.15155>

⁹ <https://www.adn.com/alaska-news/2022/06/16/scientists-point-to-climate-change-as-likely-cause-for-alaska-snow-crab-decline/>

¹⁰ <http://www.cec.org/files/documents/publications/11772-characterization-and-management-food-loss-and-waste-in-north-america-en.pdf>



Note: Data collected by WRAP in 2016, for a tonne of average food waste in the United Kingdom. Includes embedded greenhouse gas emissions.
 Source: Adapted from WRAP 2017.

Figure 1-1: Greenhouse Gas Impacts of Management Approaches to Food Loss and Waste (Source: CEC)

The US EPA Food Recovery Hierarchy prioritizes actions government and other organizations can take to prevent and divert wasted food from the municipal solid waste (MSW) stream.¹¹ Source reduction helps to prevent food wasted in the first place, thereby reducing the volume of surplus food generated and supporting a robust primary food system. Food rescue and recovery uses remaining surplus food to feed hungry people and then animals. Industrial uses and composting are the next options for organics management to avoid sending organic materials to landfill. Using the top levels of the hierarchy produce the most benefits for the environment, society, and the economy.

¹¹ <https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy>

The Institute for Local Self Reliance (ILSR) builds on the food recovery hierarchy to highlight the importance of locally based composting solutions over larger – often out of region – composting solutions.¹² This hierarchy, as shown in Figure 1-2, addresses issues of scale and community benefit in ways that are relevant to the MOA and surrounding region.

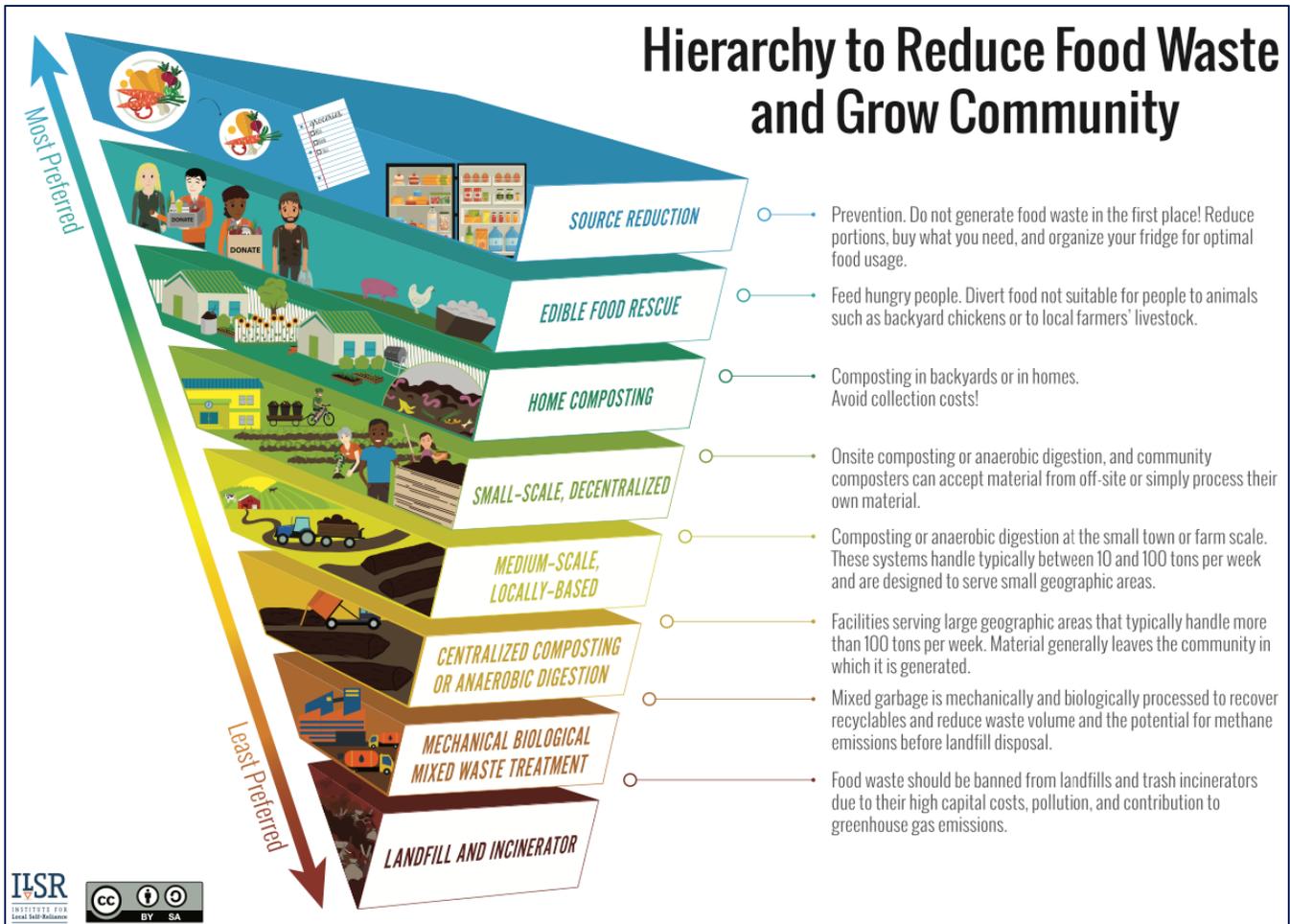


Figure 1-2: Hierarchy to Reduce Food Waste and Grow Community (Source: ILSR)

¹² <https://ilsr.org/food-waste-hierarchy/>

2.0 EXISTING FOOD SYSTEM

2.1 OVERVIEW

A series of interviews with key food system collaborators were conducted to allow a thorough understanding of the food system within Anchorage. Collaborators were identified as stakeholders within the MOA that are involved with food waste reduction and food rescue programs. Individuals within these organizations are thought to have key insights on food waste reduction and recovery in the municipality's food system. The interview results serve as the primary source of the information for the following description of the Anchorage food system and food supply chain.

The existing food system within Anchorage can be characterized as a system highly dependent on imported food with seasonal supplements from locally produced food. This system is inherently wasteful when considering the amount of resources needed to have food transported to Alaska, not to mention the resulting amount of food waste that occurs during transit. Another key issue is that many imported foods tend to be shelf-stable, inexpensive, processed food that doesn't have the same nutritional value as nutrient-dense foods that often require cold chain management, such as fresh and frozen produce, dairy products, meat, and seafood. The prices of fresh produce are often marked up due to the lack of supply. These factors create access barriers to fresh and nutritious food. Many residents rely on the Supplemental Nutrition Assistance Program (SNAP)¹³ in Anchorage to access the food they need. Many of the described issues of the existing Anchorage food system and potential action items are further laid out in the collaborative 2021 Alaska Food Security Investment Recommendations put together by the Alaska Food Policy Council's Advocacy and Policy Committee¹⁴.

It is important to note that there are a multitude of initiatives within the municipality working to combat the issues described above through food waste reduction, food rescue, and sustainable food system advocacy. The following two sections go into more detail on the overall food supply chain and the programs aimed to support it. These ideas are covered more thoroughly in the Task 1 Technical Memo attached in Appendix A.

2.2 FOOD SUPPLY CHAIN

2.2.1 Sources of Food

Due to the northern climate and short growing season, much of the food on grocery store shelves tends to be non-perishable, imported food that can be eaten year-round. Although it comprises a small percentage of the total food available, there is a variety of food produced in Alaska. Local farms in areas such as the Mat-su Valley and Delta Junction are large producers of Alaska-grown food which includes root vegetables, hardy greens, and some grains (such as barley, rye, and oats). There is also a substantial seafood market in Alaska, but the food acquired is primarily exported due to its high commodity prices.

2.2.1.1 Challenges and Opportunities for Food Production

Potential local production should focus on expanding food items already being produced such as root vegetables, greens, grains, and seafood. Indoor farming techniques such as hydroponic systems and greenhouses are also potential options for local food production. These techniques offer an opportunity to expand the diversity of locally produced crops and extend the growing season.

¹³ <https://health.alaska.gov/dpa/Pages/SNAP/default.aspx>

¹⁴ [2021+Food+Security+Investment+Recommendations+for+Alaska-AFPCAdvocacy.pdf \(squarespace.com\)](#)

The factors affecting food sources in Alaska are seasonality, climate, and isolation. These factors not only make it difficult to produce food in the off-season, but also make transportation problematic and time consuming. Globalization of food has been a major issue for Alaskan food producers. Food has become much cheaper to import than to locally produce, resulting in very little incentive to produce food in Alaska. Lastly, the lack of food storage and processing infrastructure greatly reduces the amount of locally produced food available in the off-season. Multiple factors such as higher costs and lack of infrastructure for transportation limit the expansion of potential local food sources. Legislative intervention and funding would likely be required to develop the described food systems.

2.2.2 Sources of Food Waste

A large portion of edible food waste in Anchorage can be attributed to the time it spends in transit. In some cases, food will arrive close to the end or past its shelf-life. Large amounts of food may also be discarded in earlier stages of the supply chain due to damage or spoilage. Produce (fruits and vegetables) and temperature sensitive foods are wasted most often, as well as prepared meals.

2.2.2.1 Food Waste Prevention and Recovery Opportunities

Education and outreach have crucial roles in food waste prevention and recovery. Strategies may include educating people on the true cost of wasting food and understanding the consequences of neglecting the issue or conducting workshops to teach residents how to compost or source separate organics (SSO) properly. For food recovery, connecting potential donors and recipients is key to ensure that food surplus gets used instead of being disposed of as compost or trash.

Investment in regional food systems is a multifaceted approach for food waste prevention and recovery. Local food production would reduce transportation time, allowing food to arrive in stores fresher, ultimately increasing the likelihood that the food gets consumed. Food storage and food processing infrastructure would extend the lifespan of vulnerable food items by maintaining cold chain and/or processing food prior to spoilage. Regional processing can also be an economic opportunity to create local employment and produce local goods for residents to consume. Additionally, the implementation of programs that allow the community to work together as well as see the benefits of food rescue could be very useful. As a last resort, composting is key to keeping both inedible food scraps and wasted food out of the landfill. Implementation of a comprehensive composting program for residents and commercial businesses to participate in, along with developing local composting infrastructure, would be a highly beneficial solution.

2.3 FOOD WASTE REDUCTION AND RESCUE

2.3.1 Food Waste Reduction Programs

Anchor Gardens¹⁵ and Yarducopia¹⁶ are organizations within Anchorage that include elements that aim to divert inedible food scraps and wasted food in the community from going to the landfill. These organization also have a strong focus on education and outreach to facilitate community action and behavioral change.

Anchor Gardens is an organization with a mission to provide the residents of Anchorage the tools needed to become more involved in gardening and local food production. They accomplish this mission through conducting workshops teaching a variety of gardening skills, connecting individuals interested in gardening and volunteering, and providing support for those looking to build a garden. They have been extremely successful in their first two years of operation,

¹⁵ <https://anchorgardens.org/>

¹⁶ <https://yarducopia.org/>

being involved in the development of hundreds of individual and community gardens. They also accept food scraps and other compostable material from various donors to incorporate into their members' gardens.

Yarducopia is a program that promotes safe gardening techniques. One of their main goals has been to develop a model system for suburban organic gardening. They interact with approximately 100 volunteers who they teach and provide resources to execute clean and sustainable gardening habits. They pair homeowners who have property to share with volunteers interested in gardening and use these available spaces for garden construction. Yarducopia uses recovered food scraps and wasted food as part of their soil media. They collect 'brown materials' for carbon (leaves, cardboard, woodchips, etc.), manure, and 'green materials' for nitrogen (food scraps including spent grain from breweries, coffee grounds, etc.) and create a layered / sheet mulch-style gardening bed. Of the food scraps and wasted food collected, Yarducopia manages it using a small aerobic composting pile and incorporates it when constructing a garden.

2.3.2 Food Rescue Programs

Organizations such as The Food Bank of Alaska¹⁷ (FBA), Bean's Café¹⁸, and the St. Francis House Food Pantry¹⁹ (SFHFP) all primarily focus on the rescue and redistribution of surplus food to those in need. These organizations also employ food waste reduction tactics when faced with inedible food that can't be served.

FBA is a large organization with over 150 partners throughout the state of Alaska. Their main goal is to rescue surplus food that would otherwise go to waste and provide it to their partner organizations for distribution. They also conduct some advocacy and policy work around various aspects of surplus food rescue. They accept their food donations primarily from wholesale and retail grocers as well as the community. They also maintain an in-house produce reclamation program, where they essentially go through their produce inventory weekly and pick out the inedible food. The inedible food is typically sent to composters for processing or to pig farmers as animal feed.

Bean's Café is an organization dedicated to fighting hunger by food delivery in the Anchorage area. They have evolved into a substantial food rescue organization, currently serving approximately 1,200 meals (breakfast, lunch dinner, and a snack) a day. They also strive to be a good steward of the food that is donated to them, continually working to ensure all donations are turned into meals. This can pose great difficulty and requires them to think outside the box. Bean's Café procures surplus food through their partners (FBA, grocers, and other commercial businesses) to gather ingredients for meals. They also have partnerships with animal farmers and the local school composters for their food waste.

SFHFP is a program of Catholic Social Services (CSS), a large social service provider in the Anchorage area. They operate as one of the largest food pantries in Alaska. They primarily partner with FBA and participate in the grocery rescue program. They collect expiring food from local grocers and then distribute it to clients through their food pantry. They have partnered with Solid Waste Services (SWS) and a sister program under CSS to deal with most of their inedible food scraps.

2.3.3 Other Local Programs and Initiatives

There are a variety of other organizations that work towards enhancing the Anchorage food system. For example, The Alaska Food Policy Council²⁰ (AFPC) is a non-profit organization that acts as an advocacy group. It is a culmination of representatives from various sectors of the food industry in the state of Alaska. Their main goal is to bring stakeholders together and look at the food system within Alaska through a broader lens and identify any

¹⁷ <https://foodbankofalaska.org/>

¹⁸ <https://beanscafe.org/>

¹⁹ <https://www.cssalaska.org/our-programs/st-francis-house/>

²⁰ [Alaska Food Policy Council \(akfoodpolicycouncil.org\)](http://AlaskaFoodPolicyCouncil.org)

potential issues. They then coordinate and make recommendations on how to address the identified issues. Recommendations are typically presented to policy makers to facilitate change in the Alaskan food system.

The Anchorage School District (ASD) has also been involved with some education, outreach, and hands-on programs related to food waste reduction and food rescue. FBA ran a pilot program with the school district in the past that included food rescue of surplus school meal components. ASD also operates school gardens and accepts food scraps for composting and incorporation into garden beds. Another initiative that has been employed in school districts across the state is the push to increase the amount of local food served during school meals. The Sitka Conservation Society has developed a comprehensive guide on how to get locally procured fish into school lunches²¹. The guide also lays out lesson plans covered in the supplemental “Stream to Plate” resource. These programs take a compound approach to demonstrate sustainable food habits.

The Anchorage Parks and Recreation Department also plays a role in promoting sustainable food habits in the community. They manage 5 community gardens with close to 250 plots open for residential use²². They also manage the Chanshtnu Muldoon Park which is home to one of the community gardens as well as a food forest²³ that contains 40 Alaskan fruit trees and various plants and shrubs that are anticipated to yield large amounts of locally grown food each year.

2.3.4 Challenges and Opportunities for Existing Programs

Something that many of the existing initiatives take advantage of is the strong community support and interest in involvement and participation from the community at large. This presents a major opportunity for programs to expand their operating capacity. Investment into these programs is crucial, as many lack the funding and resources to expand despite community desire. There is also potential in regional food system investment and promoting local food production relationships. This aligns with the goals of many organizations and would encourage local food production, reduce food travel time, and ultimately reduce the waste involved in food transit.

The main challenge faced by many organizations is lack of funding and resources for growing local food, collecting rescuable food, and difficulty in storing and managing collected food. Common challenges for development of an organics management facility are residents not wanting to host a new facility in their neighborhood as well as environmental factors that might make operation difficult (e.g., climate, bears, and pests). There also seems to be a lack of institutional and legislative support for these initiatives which is a major hinderance on their success. There lacks a clear path for many residents and businesses to get involved despite community interest. This speaks to the need for a comprehensive and simple food waste reduction and food rescue program with legislative backing.

²¹ [A Guide to Serving Local Fish in School Cafeterias - Sitka Conservation Society \(sitkawild.org\)](https://www.sitkawild.org/guide-to-serving-local-fish-in-school-cafeterias)

²² [Parks and Recreation Community Gardens Locations](#)

²³ [Chanshtnu Muldoon Park Food Forest and Community Garden | Anchorage Park Foundation](#)

3.0 RECOMMENDATIONS

As referenced at the outset, engaging a broad range of stakeholders to implement a robust Food Waste Reduction and Prevention Program is critical to supporting food system resilience while reducing organics going to the landfill. The strategies and actions listed in Table 3-1 are an initial call to action that can be adjusted and refined further over time as a coalition is created to support program implementation over time. Infrastructure needs and priorities will likely adjust over time; these strategies and actions offer springboard to further refine as partners are established and resourcing is put into place.

Access to internal and external resources will be another important consideration for what priorities are established and what recommendations are pursued. Federal grants will be one way to boost initiatives, as an example, the USDA Community Food Projects Competitive Grants Program.²⁴

Recommendations are based on what can be done to optimize efficiency and effectiveness of food systems across stakeholders from production through end-of-life management. The following definitions are provided to better understand the strategic groupings. Specific actions are defined further following Table 3-1 and reference the Task 2 Technical Memo Case Study examples.

- **Food System Capacity Building.** Food is a cross-cutting topic and involves stakeholders in many sectors. Collaboration between these diverse stakeholders is therefore necessary to build the capacity of the local food system because it cannot be done by one department, business, or organization alone.
- **Local Food Production.** Greater capacity in local food production not only improves resiliency by being less reliant on imported sources of food, but also contributes to better nutrition and less food waste. However, it also requires land access, supportive policies and incentives, harvesting capacity, appropriate storage and distribution systems, and education.
- **Food Waste Prevention.** Preventing food waste from happening in the first place was shown to be the best way to reduce food costs, maintain the lowest carbon footprint, and support an equitable and accessible-to-all food system. Strategies to prevent food waste can take place throughout the food supply chain through improving collaboration, communication, and education.
- **Food Rescue and Recovery.** Seeking ways to manage edible food surplus for people and then animals is another important aspect for avoiding wasted food. Strategies can support better communication between those with surplus food and those that need it, as well as infrastructure to support food recovery.
- **Organics Management.** For inedible food scraps and wasted food, using an integrated organics management approach can be quite beneficial. This includes strategies to increase the collection of organics and expansion of infrastructure for composting.

²⁴ [https://www.nifa.usda.gov/grants/funding-opportunities/community-food-projects-competitive-grants-program#:~:text=In%20FY%202023%20NIFA's%20CFPCGP,Community%20Food%20Projects%20\(CFP\),&text=Dates%20may%20vary.,see%20RFA%20for%20exact%20details](https://www.nifa.usda.gov/grants/funding-opportunities/community-food-projects-competitive-grants-program#:~:text=In%20FY%202023%20NIFA's%20CFPCGP,Community%20Food%20Projects%20(CFP),&text=Dates%20may%20vary.,see%20RFA%20for%20exact%20details)

Strategies and actions were identified based on the opportunities from the Task 1 Technical Memo (attached in Appendix A), and examples of programs for food waste reduction and prevention in the Task 2 Technical Memo (attached in Appendix B).

These strategies and actions were then assessed based on criteria for implementation consideration. Each strategy and action were assigned a ranking of potential impact: high (H), medium (M), or low (L). These rankings are relative to the other actions in the table. For example, the action or strategy with the highest potential was assigned "H", and the lowest potential was assigned "L". Actions or strategies that fell in between were assigned "M". Note that these are preliminary rankings based on general knowledge of how these actions and strategies were implemented in other jurisdictions. The criteria are defined as follows:

- **Food System Resilience.** Potential for the food system in Anchorage to be more self-sufficient and less reliant on imported food.
- **Food Waste Reduction (Prevention).** Potential to prevent food waste from being created.
- **Food Waste Reduction (Recovery).** Potential to recover surplus food.
- **Cost Savings Longer Term.** Potential for reducing the cost associated with managing food waste in the longer term.
- **Greenhouse Gas (GHG) Emission Reduction.** Potential to reduce greenhouse gas emissions associated with food waste. Note that this considers both the embodied greenhouse gas emissions from the food supply chain and emissions from disposal so avoiding food waste would have a greater impact compared to composting.
- **Local Jobs.** Potential to create local jobs.
- **Ease of Implementation (by lead).** Potential for implementation by a local stakeholder given existing resources.

Table 3-1: Strategy and Action Options Ranking Matrix

Program Strategies and Actions	Food System Resilience	Food Waste Reduction (Prevention)	Food Waste Reduction (Recovery)	Cost Savings Longer Term	GHG Emission Reduction	Local Jobs	Ease of Implementation (by lead)
Food Systems Capacity Building							
Integrate waste prevention and food rescue into Food Policy Council food system policies	M	M	M	M	M	M	M
Cross sector collaboration and resource mobilization to implement strategies and actions	M	M	M	M	M	M	M
Local Food Production							
Augment local business and community food production network	H	M	M	M	H	H	L
Improve local food storage / processing infrastructure	H	H	L	M	H	H	L
Food Waste Prevention							
Local awareness campaign using the US city-based savethefood.com (residential)	M	M	L	H	M	L	H
Collaboration between government, businesses, and institutions on food waste prevention actions (supply chain)	H	H	M	H	H	M	M
Food Rescue							
Mobilize partners to facilitate more connections between surplus food producers and those who need it	M	L	H	M	M	M	H
Increase awareness about laws that protect well-intentioned food donors	M	L	M	M	M	L	H
Organics Management / Diversion							
Establish local and community-based composting sites (e.g., work with Alaska Waste to expand their pilot)	M	L	L	M	L	H	L
Educate all sectors on how to compost (e.g., compost certification class)	L	L	L	M	L	M	M
Educate all sectors on food scraps collection	L	L	L	M	L	M	M

3.1.1 Description of the Various Strategies and Actions

Additional explanation is provided for the strategies and actions listed in Table 3-1. While the Case Study examples referenced from Task 2 Technical Memorandum give some context for how each action could be implemented, they will need to be customized for Anchorage and what key players join an implementation coalition.

1. Food Systems Capacity Building

Integrate waste prevention and food rescue into Food Policy Council food system policies. There can be significant benefit to integrating waste avoidance goals into food-related policies. It broadens the stakeholder group that is invested in such efforts – beyond solid waste. As shown in the Case Study 2 example, the Douglas County Kansas 2017 Food System Plan integrated food access and ensuring an equitable food system in their goals to promote food rescue along with a goal to ‘eliminate waste in our local food system’. This policy driver has been critical for supporting related implementation efforts.

Cross sector collaboration and resource mobilization to implement strategies and actions. Given the nature of food systems from production through transport, processing, retail, consumption, and end of life management, there are several key players to support optimizing capacity. The Case Study 2 from Douglas County shows what can be accomplished when multiple departments within city and regional governments come together, including but not limited to solid waste, health, social welfare, and agriculture. Government actively partners with community and grassroots organizations, local food businesses, and has also leveraged grant funding and support from federal government.

2. Local Food Production

Augment local business and community food production network. Gardening and farming efforts require land access, educational programs, harvesting capacity (including on-farm gleaning), and appropriate storage and distribution systems. When community members are engaged in growing food, there is an inherent value added to the items harvested; this can be harnessed to leverage waste reduction efforts. Case Studies 2 (Douglas County) and 4 (Community Greenhouses) both focused on food production. Douglas County’s efforts were informed by a Food Policy Council while the northern greenhouse food production initiatives had their own drivers and resources to support food growing efforts.

Improve local food storage / processing infrastructure. Having ways to store and process food grown or rescued is integral to supporting an efficient and effective food system. Having appropriate cold chain management to optimize food life is an important aspect of storage. The shared-use kitchens in Case Study 2 Douglas County fostered smaller scale food processing by local entrepreneurs.

3. Food Waste Prevention

Local awareness campaigns. There are several food prevention campaigns that have emerged in the US and beyond to support consumer behaviour change such as savethefood.com. In the City of Los Angeles Case Study 1, these resources are leveraged as part of the core messaging, so residents had access to food waste prevention tips for shopping at home first, meal planning, and creative ways to use leftovers.

Collaboration between government, businesses, and institutions on food waste prevention actions. Preventing food waste from happening in the first place was shown to be the best way to reduce food costs, maintain the lowest carbon footprint, and support an equitable and accessible-to-all food system. Efforts can be made to strengthen the food supply chain by optimizing farm harvest as shown in Case Study 2 (Douglas County) by reducing transportation distances and storage needs by supporting local food growing and selling (Case Studies 2 and 4) and educate residents at large on ways to prevent food waste as shown in the LA Case Study 1 are specific ways to prevent food waste.

4. Food Rescue

Mobilize partners to facilitate more connections between surplus food producers and those who need it. Seeking ways to manage edible food surplus for people and then animals is another important aspect for avoiding wasted food. In Douglas County Case Study 2, strong partnerships between government and community groups help to optimize food rescue to food insecure individuals and families. They also actively pursued on-farm gleaning initiatives. Case Study 3 showcases how online food sharing apps, in particular Too Good To Go, can support business to consumer connections for selling smaller quantities of food surplus from food retailers at discount prices.

Increase awareness that protect well-intentioned food donors. Many food donors are concerned about liability issues related to giving food away to those who need it. Seeking ways to explain how state and federal legislation protect donors, as shown in Case Study 2 with Kansas vs federal law, can help to alleviate concerns and increase donations.

5. Organics Management

Establish local and community-based composting sites. For inedible food scraps and wasted food, using an integrated organics management approach can be quite beneficial. Case Studies 2 and 4 both emphasized the importance of composting to support soil building for food production as well as avoiding having food to go landfill as waste to generate greenhouse gases. For Anchorage, there is an opportunity for Alaska Waste to expand their compost pilot.

Educate all sectors on how to compost. When community members understand how composting works, there can be greater appreciation for its value in food growing and completing the nutrient cycle, and less contamination in collection programs. Case Studies 2 and 4 examples both integrate compost education programs in their food growing and diversion efforts.

Educate all sectors on food scraps collection. The LA Case Study 1 showcases multiple steps for understanding organics management: prevent food waste, keep home composting to generate soil amendment without the extra transportation efforts, and recycle remaining food scraps using the green bin (that goes to an organics processor). They use a simple three step model for showing how residents can place food scraps into a kitchen catcher, transfer the contents of the kitchen catcher into the green bin, and place the green bin at curbside. These efforts should be managed to maintain food scraps out of sight and smell from potential pests; food scraps recycling is often done with better pest mitigation success than when trash is set out given the extra diligence applied by residents who want to participate in an organics recycling program.

APPENDIX A

TASK 1 TECHNICAL MEMO – EVALUATION OF EXISTING FOOD SYSTEM

To: Shaina Kilcoyne, Mike Rhodes
Solid Waste Services, Municipality of Anchorage

CC: Debra Darby, Wilbert Yang, Belinda Li, Tamara Shulman

From: Randy Eblacker

Date: August 8, 2022 (Revised August 29, 2022)

Subject: Food Waste Reduction Program Study
Task 1: Evaluation of Existing Food System

INTRODUCTION

The objective of Task 1 is to conduct an evaluation of the Municipality of Anchorage's local food system. Tetra Tech conducted an analysis of existing food waste reduction and food rescue initiatives in the Municipality of Anchorage (MOA). This will establish a baseline for the broader initiative of developing a Food Waste Reduction and Prevention Program, building upon the previously submitted Organics Management Feasibility Report¹. This initiative aims to better inform residents of the benefits and importance of food waste reduction, and in turn, change behavior towards food waste within the municipality. Ultimately, this study looks to address issues around food access and food security within the MOA.



Photo provided by Catholic Social Services

Collaborator Interviews

To thoroughly understand Anchorage's food system, a series of collaborator interviews were conducted. Collaborators were identified as stakeholders within the MOA that are involved with food waste reduction and food rescue programs. Individuals within these organizations are thought to have key insights on food waste reduction and recovery in the municipality's food system. A list of each organization contacted, their representatives, and representative contact information can be seen in the Appendix.

Through the conduction of these interviews, Tetra Tech has been able to identify and speak to the objectives laid out for Task 1 in the Scope of Work (SOW). The interview results serve as the primary source of the information discussed in the subsequent sections.

¹<https://www.muni.org/Departments/SWS/Documents/SWS%20Organics%20Management%20Feasibility%20Final%20Report.pdf>

ANCHORAGE FOOD SUPPLY CHAIN

Sources of Food

It is no surprise that according to collaborators interviewed, the vast majority, between approximately 90 and 98 percent, of food in Anchorage and Alaska as a whole is imported. A commonly referred to statistic in written sources is that 95 percent of food, valued at approximately \$1.9 billion USD, is imported². Due to the northern climate and short growing seasons, much of the food on grocery store shelves tends to be non-perishable, imported food that can be eaten year-round. Although it comprises a small percentage of the total food available, there is a variety of food produced in Alaska. Local farms in areas such as the Mat-su Valley and Delta Junction are large producers of Alaska-grown food including root vegetables, hardy greens, and some grains (such as barley, rye, and oats). Respondents also mentioned that the fish and seafood market within Alaska is very large, but the food acquired is primarily exported due to their high commodity prices.

Opportunities for Alaskan Food Production

Interviewees were asked what types of food have the greatest potential for local production. The consensus for potential local production should focus on expanding food items already being produced such as root vegetables, greens, grains, and seafood. Specifically for grain production, there is a need for further research and crop development in order to identify grain types that grow best in Alaska's short and often difficult to define growing season. Additionally, seafood is another major source of food produced in Alaska, but as previously stated, it is primarily an export market. **Determining a way to keep a higher percentage of seafood yields in Alaska presents a significant opportunity to increase the percentage of local food being consumed by Anchorage residents.**



Photo provided by Anchor Gardens

The respondents also identified key emerging opportunities for local food production. Many of the interviewees discussed indoor farming techniques such as hydroponic systems and greenhouses as potential sources of locally grown produce. These techniques offer an opportunity for expanding the diversity of locally produced crops and extension of the growing season, enabling food production year-round. The respondents also spoke on the potential for the development of local meat production and dairy farming. It is important to note that the respondents acknowledged that there are many factors that prohibit the expansion of these potential local food sources. Legislative intervention and funding would likely be required to develop some of these food systems.

Key Factors Affecting Food Sources

The obvious factors affecting food sources in Alaska are seasonality, climate, and isolation. These factors not only make it difficult to produce food in the off-season, but also make transportation problematic and time consuming due to the long distance from the Lower 48 and between population centers in Alaska. Additionally, and partially due to the factors described above, the respondents spoke on how the globalization of food has been a major issue for Alaskan food producers. Food has become much cheaper to import than to locally produce, resulting in very

²https://static1.squarespace.com/static/584221c6725e25d0d2a19363/t/59a04ad6f9a61e091b836459/1503677150479/Building+Food+Security+in+AK_Ken+Meter_July+2014_web+version.pdf

little incentive to produce food locally in Alaska. Lastly, the lack of food storage and processing infrastructure greatly reduces the amount of locally produced food available in the off-season.

Sources of Food Waste

The interviewees were asked what they thought were the biggest sources of edible food waste and subsequently what types of food were most commonly wasted. The respondents seemed to agree in their assumption that a large portion of food waste was attributed to the transportation of food to Alaska. They spoke about the amount of time it takes for food to get transported to Anchorage and the resulting amount of food that is at or past its shelf-life upon arrival. They also speculated that significant amounts of food are probably discarded in earlier stages of the supply chain due to damage or spoilage. Respondents had varying opinions when it came to commercial versus residential food waste generators. Some thought that commercial food waste was slightly higher, while others noted that food waste from residential consumers was higher. **The key takeaway here, however, is that there is a significant amount of food waste generated both by commercial businesses and residential consumers.** Of these different sources, respondents agreed that produce (fruits and vegetables) and temperature sensitive foods are wasted most often. Some respondents also noted that prepared meals are more susceptible to being wasted.



Photo provided by Catholic Social Services

Prevention and Recovery Opportunities

Interviewees were asked what they thought were key opportunities for avoiding wasting food and optimizing food rescue and recovery. **A common item discussed was the crucial role of education and outreach.** Strategies include educating people on the true cost of wasting food and understanding the consequences of neglecting the issue or conducting workshops to teach residents how to compost or source separate organics (SSO) properly. Another theme mentioned was the importance of communication. **Connecting potential donors and recipients is key to ensure that food surplus gets used instead of being disposed as compost or trash.**

Many of the respondents also consider investment in regional food systems a multifaceted approach for food waste prevention and recovery. It is believed that incentivization of local food production would reduce transportation time, which would in turn allow food to arrive in stores fresher, ultimately increasing the likelihood that food gets consumed. Another suggested regional food system investment is food storage and food processing infrastructure, which would extend the lifespan of vulnerable food items by maintaining cold chain and/or processing food prior to spoilage, making them more likely to be used. Regional processing can also be an economic opportunity to create local employment and produce local goods for residents to consume. Additionally,



Photo provided by Anchor Gardens

the implementation of programs that allow the community to work together as well as see the benefits of food rescue could be very useful. As a last resort, composting is key to keeping both inedible food scraps and wasted food out of the landfill. Implementation of a comprehensive composting program for residents and commercial businesses to participate in, along with developing local composting infrastructure, would be a highly beneficial solution.

Food Supply Chain Characterization

In general, the Anchorage food supply chain can be characterized as a system highly dependent on imported food with seasonal supplements from local food producers. Fundamentally, this system is wasteful, as there are many resources used to get food transported to Alaska, not to mention the amount of food waste that results during transit. Another key issue is that many imported foods tend to be shelf-stable, inexpensive processed food that doesn't have the same nutritional value as nutrient-dense foods that often require cold chain management such as fresh and frozen produce, dairy products, meat, and seafood. The prices of fresh produce are often marked up due to the lack of supply. These factors create barriers to access fresh and nutritious food. Many residents rely on the Supplemental Nutrition Assistance Program (SNAP)³ in Anchorage in order to access the food they need. Many of the described issues of the Alaskan food supply chain and potential action items are further laid out in the collaborative 2021 Alaska Food Security Investment Recommendations put together by the Alaska Food Policy Council's (AFPC) Advocacy and Policy Committee⁴.

Greater Alaska Parallels

It is believed that the food system in Anchorage is somewhat comparable to municipalities such as Fairbanks, Kenai, Homer, and Juneau. Many respondents considered rural Alaska to be part of a significantly different food supply chain due to further isolation. The culture around food is thought to be different in rural communities in Alaska. For example, what is considered past shelf-life elsewhere may still be considered edible in these rural communities. Food is likely considered much more valuable in these communities and sustainability is a fundamental part of their subsistence due to their limited resources.

FOOD WASTE REDUCTION AND FOOD RESCUE INITIATIVES

The collaborators identified in the introduction are organizations involved in food waste reduction and food rescue in the Anchorage area. The following section describes each of these organizations' initiatives.

Food Waste Reduction Programs

The following organizations include elements that aim to reduce inedible food scraps and wasted food in the Anchorage community from going to the landfill. These organization also have a strong focus on education and outreach to facilitate community action and behavioral change.

Yarducopia

Yarducopia⁵ is a program that is part of the non-profit Alaska Community Action on Toxics (ACAT). They promote safe gardening techniques and one of their main goals has been to develop a model system for suburban organic gardening. They interact with approximately 100 volunteers who they teach and provide resources to execute clean and sustainable gardening habits. They pair homeowners who have property to share with volunteers interested in gardening and use these available spaces for garden construction.

³ <https://health.alaska.gov/dpa/Pages/SNAP/default.aspx>

⁴ [2021+Food+Security+Investment+Recommendations+for+Alaska-AFPCAdvocacy.pdf \(squarespace.com\)](https://www.squarespace.com/2021+Food+Security+Investment+Recommendations+for+Alaska-AFPCAdvocacy.pdf)

⁵ <https://yarducopia.org/>

For the gardens they construct, Yarducopia uses recovered food scraps and wasted food as part of their soil media. They collect material such as ‘brown materials’ for carbon (leaves, cardboard, woodchips, etc.), manure, and ‘green materials’ for nitrogen (food scraps and wasted food including spent grain from breweries, coffee grounds, damaged produce from hydroponic systems, etc.) and create a layered / sheet mulch-style gardening bed. Of the food scraps and wasted food collected, Yarducopia manages it using a small aerobic composting pile and incorporates it when constructing a garden.

Anchor Gardens

Similar to Yarducopia, Anchor Gardens⁶ is an organization with a mission to provide the residents of Anchorage the tools needed to become more involved in gardening and local food production. They accomplish this mission through workshops where they teach composting, gardening, and other valuable techniques such as worm composting (Vermicompost). They also connect individuals interested in gardening with the resources they might need to get started. In their first two years of operation, they have culminated over 500 official members and been involved with the creation of hundreds of individual gardens and multiple community gardens. They have established an Anchor Gardens Coach in each of the 36 community councils within Anchorage to help facilitate their work. They also take in food scraps and compostable material from various donors to incorporate organic matter into their members’ gardens.

They have expressed some difficulty in having the proper resources to keep up with the organization’s rapid growth. There is a need for community spaces where workshops can be held and a growing need for increased outreach into the community.



Photo provided by Anchor Gardens

Food Rescue Programs

Each of the following organizations’ primary focus is rescue and redistribution of surplus food to those in need. These organizations also employ food waste reduction tactics when faced with inedible food that can’t be served.

Food Bank of Alaska

The Food Bank of Alaska⁷ is a large organization with over 150 partners throughout the state of Alaska. Their main goal is to rescue surplus food that would otherwise go to waste and provide it to their partner organizations for distribution to those in need. They also conduct some advocacy and policy work around various aspects of surplus food rescue. They accept their food donations primarily from wholesale and retail grocers as well as the community. They also help facilitate relationships between their partner agencies and partner donors. Lastly, they maintain an in-house produce reclamation program, where they essentially go through their produce inventory weekly and pick out the inedible food. Typically, this inedible food is sent to composters for processing or to pig farmers as animal feed. When food scrap acceptors are at capacity, however, some food does end up going to landfill. The Food Bank

⁶ <https://anchorgardens.org/>

⁷ <https://foodbankofalaska.org/>

of Alaska has expressed a desire for a robust, comprehensive composting program within Anchorage, so wasted food and inedible food scraps do not get disposed as trash.

Bean's Café



Photo provided by Food Bank of Alaska

Bean's Café⁸ is an organization dedicated to fighting hunger in the Anchorage area. Food delivery has always been their mission. They began operation in 1979 on a very small scale, serving homemade sandwiches to the homeless population. Bean's Café has evolved into a substantial food rescue organization, serving approximately 1,200 meals a day currently. At their peak operating level, they were serving as many as 3,200 meals a day. They offer four meals a day, breakfast, lunch, dinner, and a snack. Another mission Bean's Café aims to accomplish is to be a good steward of the food that is donated to them. They continually strive to ensure all food donated is turned into a meal. This can pose great difficulty and requires them to think outside the box. Lastly, an ongoing goal for the organization has been to promote and educate the value of all food.

Bean's Café spends a lot of time procuring surplus food through their partners to gather ingredients for meals. Their partners include farmers, the Food Bank of Alaska, grocers, and other commercial businesses. They also have partnerships with animal farmers and the local school composters for their food waste. They send their leftovers to these partners for use in animal feed or to create compost to be used in the school garden. Bean's Café has established a presence in the community and has earned a lot of respect and support for their mission.

⁸ <https://beanscafe.org/>



Photo provided by Catholic Social Services

St. Francis House Food Pantry

The St. Francis House Food Pantry⁹ (SFHFP) is a program of Catholic Social Services (CSS), a large social service provider in the Anchorage area. CSS is comprised of eight (8) different programs that provide a variety of services for those in need of shelter, family support, and food.

SFHFP is one of the largest food pantries in Alaska. They primarily partner with the Food Bank of Alaska and participate in the grocery rescue program. They pick up and collect expiring food from local grocers several days per week. The recovered food is then distributed through their food pantry for clients to access. Their inventory typically has a very quick turnaround, every two days or so. One challenge they face is

sometimes receiving food that is not suitable for consumption. They have partnered with Solid Waste Services (SWS) and a sister program under CSS to deal with most of their inedible food scraps. They have organized a curbside pickup with SWS to collect the inedible food scraps for composting. SFHFP considers this a significant opportunity for educating their staff and volunteers on SSO. When there is a need for it, they also send some of their inedible food scraps to Fresh International Gardens (FIG), a farming co-op ran by CSS's Refugee Assistance and Immigration Services (RAIS). Inedible food scraps are incorporated into their garden bed media material in plots such as the one they operate at the Grow North Farm in Anchorage. The Grow North Farm is Anchorage's largest urban farm and is run through a partnership between CSS/RAIS and the Anchorage Community Land Trust (ACLT)¹⁰. The Grow North Farm provides various business and educational opportunities for members of the FIG community.

Alaska Food Policy Council

AFPC¹¹ is a non-profit organization that acts somewhat like a coalition. It is a culmination of representatives from various sectors that deal with food in the state of Alaska, such as food production, food transport, private businesses, government agencies, etc. They strive to get as much input from as many different places as possible. Their main goal is to bring all of these stakeholders together and look at the food system within Alaska through a broader lens. They aim to analyze how the system is working and identify any potential issues. They then coordinate and make recommendations on how to improve any identified issues. They then typically present these recommendations to policy makers in an attempt to facilitate change in the Alaskan food system. AFPC is largely an advocacy group, as they also host conferences and commission research to encourage education and outreach surrounding local food systems.

Anchorage School District

The Anchorage School District (ASD) has been involved with some education, outreach, and hands-on programs related to food waste reduction and food rescue. The Food Bank of Alaska ran a pilot program with the school district in the past that included food rescue of surplus school meal components. A share table was set up to capture food that wasn't used, such as whole apples and milk cartons. The food was then redistributed for use in afterschool programs or donated to the Food Bank and its partners for distribution in the community. This program

⁹ <https://www.cssalaska.org/our-programs/st-francis-house/>

¹⁰ [Fresh International Gardens & Grow North Farm - Catholic Social Services - Alaska \(cssalaska.org\)](https://www.freshinternationalgardens.org/grow-north-farm-catholic-social-services-alaska)

¹¹ [Alaska Food Policy Council \(akfoodpolicycouncil.org\)](http://www.akfoodpolicycouncil.org)

has stopped due to the COVID-19 pandemic. The program provided an opportunity to demonstrate not only food waste reduction and food rescue, but also education and outreach to the community's youth.

Another partnership mentioned was between the ASD and Bean's Café. Bean's Café donates some of their inedible food scraps and leftovers to the school gardens for composting and use in their garden beds, also demonstrating food waste reduction and composting education.

An additional initiative that has been employed in school districts across the state is the push to increase the amount of local food served during school meals. The Sitka Conservation Society has developed a comprehensive guide on how to get locally procured fish into school lunches¹². The Fish to School Resource Guide provides an all-inclusive compilation of information ranging from fish procurement and processing tips to legalities. The guide also lays out lesson plans covered in the supplemental "Stream to Plate" resource that focuses mainly on salmon, their ecological significance, and how they play into the Alaskan food system. This program takes a compound approach to address student nutrition, sustainable food practices, and food justice.

Additional Programs and Initiatives

When asked about other leading initiatives for food waste prevention and recovery, many of the interview respondents often referred to each other. While there may be other, smaller organizations focused on this work, the



Photo provided by Anchor Gardens

collaborators identified in this report appear as the main players in the community. There was reference to Food for Thought Alaska's Community Fridge Project¹³ in Anchorage, which is a food sharing program where people can drop off unwanted food in a designated fridge for others to take. This program is relatively new and may expand in the coming years by establishing more refrigerator locations around the community.

The Anchorage Parks and Recreation Department also plays a role in promoting sustainable food-related habits in the community. They manage 5 community gardens with close to 250 plots open for residential use¹⁴. They also manage the Chanshtnu Muldoon Park which is home to one of the community gardens as well as a food forest¹⁵ that contains 40

Alaskan fruit trees and various plants and shrubs that are anticipated to yield significant amounts of locally grown food every year. Another organization that looks to promote gardening within the municipality is Alaska Master Gardeners Anchorage¹⁶. Their goal is to ultimately support local gardening and gardening education through educational programs, events, and community.

It is important to note that there is strong community support for the existing initiatives from commercial and residential entities. There is interest in involvement and participation from the community at large, but there lacks a clear path for them to do so. This speaks to the need for a comprehensive and simple food waste reduction and food rescue program for businesses and residents to participate in.

¹² [A Guide to Serving Local Fish in School Cafeterias - Sitka Conservation Society \(sitkawild.org\)](https://sitkawild.org/)

¹³ [Community Fridge Project – Food for Thought Alaska](#)

¹⁴ [Parks and Recreation Community Gardens Locations](#)

¹⁵ [Chanshtnu Muldoon Park Food Forest and Community Garden | Anchorage Park Foundation](#)

¹⁶ [Alaska Master Gardeners Anchorage - About the AMGA](#)

Challenges and Opportunities

The interviewees were asked what they thought were the biggest challenges and opportunities for food waste reduction and food rescue within Anchorage.

Respondents identified several challenges and opportunities for reducing food wasted and optimizing surplus food rescue. Challenges include supply chain interruptions and damage, lack of funding and resources for collecting rescuable food, and difficulty in storing and managing distribution for food rescue programs.

Interviewees saw opportunities in reducing food waste at the source by implementing order control and reducing portions, as less food ordered and transported will inherently lead to less waste created. Implementation of an education program that explains ways to avoid food waste at home and at work could also be helpful. Interviewees also saw a lot of potential in regional food system investment and promoting local food production relationships. This would encourage local food production and in turn reduce food travel time and ultimately reduce the waste involved in food transportation.

Related to organics management, the respondents noted that some common challenges included NIMBYism (not in my backyard), in other words, residents not wanting to host a new facility in their neighborhood, and environmental factors that might make operation of an organics management facility difficult. They spoke on the issues of bears, making it difficult to stockpile food scraps outside for composting (not so much of an issue within the MOA). They also spoke on the fact that the climate may make composting difficult due to extremely low temperatures.

The interviewees saw opportunity in expansion of what is already working well. Many of the collaborators want to see an expansion of the SWS curbside organics collection program. They would like to see more investment in these programs and in education and outreach. Another common theme that respondents pointed out was a lack of institutional and legislative support for these initiatives. They believe if they gained that support there would be a major opportunity to change the food system within Anchorage.

Legislation

As previously stated, many respondents would like to see increased institutional and legislative support for local food production, food waste reduction, food rescue initiatives, and establishing organics collection and processing systems. Most interviewees believe that legislation is moving in the right direction but would like to see it go further to make food waste recovery and food redistribution easier for all stakeholders. In fact, they would like to see these initiatives incentivized. One specific policy mentioned that collaborators would like to see changed is the limitation on residential animal capacity. In Title 17, Chapter 17.15.060 of the Anchorage Code of Ordinances, it states that “A person or facility, including a dwelling unit, residence, or business premise, that owns, possesses or is the custodian of four or more dogs, four or more cats, four or more rabbits, four or more ferrets, four or more horses or any combination of seven or more of the above animals, shall be required to obtain a multi-animal facility license¹⁷.” This doesn’t necessarily limit the number of animals any one resident can have but does implement barriers for those looking to manage multiple animals.

Animals play a major role in food waste management and are excellent recyclers. The Douglas County, Kansas Food Policy Council acknowledges the benefits and difficulties of urban animal husbandry and has developed an



Photo provided by Food Bank of Alaska

¹⁷ http://anchorage-ak.elaws.us/code/coor_title17_ch17.15_sec17.15.060

Urban Agriculture Program for the City of Lawrence¹⁸. They've laid out best management practices and requirements for small animal agriculture¹⁹ which helps guide residents to participate in sustainable and local agriculture. Anchorage can consider this option to encourage residents to raise animals such as chickens, goats, and sheep for inedible food scraps processing.

Some collaborators would also like to see a ban on chemicals such as RoundUp²⁰, as these types of weed and grass chemicals remain in the soil and have severe health implications for humans and the environment. A carbon tax implementation for imports was another initiative discussed that could incentivize local food production and the tax revenue gain could potentially be directed to initiatives that promote local food production. Ultimately, the collaborators would like to see legislation to make it easier to donate and rescue food, as well as incentivize local food systems.

SUMMARY

The food supply chain within Anchorage is not sustainable and relies heavily, almost solely, on imported food. There are many implications that go along with being so reliant on imports. There are many barriers in place that limit residents' access to nutritious food. The globalization of food has made it extremely difficult for farmers and local food producers to compete with low transportation costs, leaving very little incentive for local food production. Low transportation costs aren't necessarily representative of the resources required and greenhouse gas emissions from the transport of food to Alaska. Additionally, the time it takes to transport certain foods, such as produce and cold-temperature sensitive items drastically reduces the shelf life of the food, as it spends so much time in transit. This in turn results in more wasted food when compared to food that is grown locally. An investment in regional food systems is an option to overcome these issues.



Photo provided by Anchor Gardens

There are various successful food waste reduction and food rescue initiatives within Anchorage. These local organizations have a “grass-roots” feel to them as they’ve grown out from community needs. There is a clear need for an overarching, comprehensive organics management program within the municipality that offers a path to participation for both residents and commercial businesses. Based on the existing programs, there appears to be a significant level of interest in the community for a more robust organics management program that respects the food recovery hierarchy²¹, with the most preferred method to reduce food waste as avoiding it in the first place, then feeding people, then feeding animals, and then process the remaining organic material through composting and/or anaerobic digestion with landfilling and waste-to-energy being the least preferred method.

¹⁸ [Urban Agriculture - City of Lawrence, Kansas \(lawrenceks.org\)](http://lawrenceks.org/urban-ag-cheat-sheet)

¹⁹ [urban-ag-cheat-sheet.pdf \(lawrenceks.org\)](http://lawrenceks.org/urban-ag-cheat-sheet.pdf)

²⁰ <https://www.roundup.com/en-us>

²¹ [United States Environmental Protection Agency \(US EPA\) Food Recovery Hierarchy](http://www.epa.gov/food-recovery-hierarchy)

APPENDIX: COLLABORATOR INFORMATION

Collaborator	Interviewee	Contact Email
Alaska Food Policy Council	Danny Consenstein	consenstein@gmail.com
Anchor Gardens	Cindee Karns	anchorgardensANC@gmail.com
Bean's Café	Scott Lingle	slingle@beanscafe.org
Catholic Social Services – St. Francis House Food Pantry	Claire Lubke	clubke@cssalaska.org
Food Bank of Alaska	Cara Durr / Mike Reusser	cdurr@foodbankofalaska.org / mreusser@foodbankofalaska.org
Yarducopia	Nicholas Riordan	riordannk@gmail.com

APPENDIX B

TASK 2 TECHNICAL MEMO – DEVELOP PROGRAM ELEMENTS

To: Shaina Kilcoyne, Kelli Toth, Mike Rhodes
Solid Waste Services, Municipality of Anchorage

CC: Debra Darby, Wilbert Yang, Randy Eblacker

From: Belinda Li, Tamara Shulman

Date: August 10, 2022 (Revised August 21, 2022)

Subject: Food Waste Reduction Program Study
Task 2: Develop Program Elements

INTRODUCTION

The objective of Task 2 is to review up to four local food-related educational programs from other jurisdictions to identify program elements that could be implemented in the Municipality of Anchorage. Case Studies were selected to cover a range of program types, scale, and geography.

The first Case Study is the City of Los Angeles' Curb Your Food Waste LA pilot. This program included resident outreach and education on food waste reduction, home composting, and food scraps recycling. For this Case Study, the food waste reduction elements are the focal point. The pilot also included multiple methods of data collection to track progress, which are also discussed as useful lessons learned for program evaluation.

The second Case Study is a review of the food recovery partnerships in Douglas County, Kansas. The region has a robust set of policies and programs that support an equitable food system that eliminates food waste across the supply chain and optimizes food rescue and recovery.

The third Case Study focuses on a business to consumer online food sharing application Too Good to Go. Customers use an app to purchase Surprise bags from consumer facing food retailers at a great price. Founded in 2016 in Denmark, Too Good To Go has connected more than 61.3 million customers to support 163,252 businesses to sell 153 Million Surprise Bags (e.g. meals) across 17 countries including the United States.

The fourth Case Study showcases community greenhouses in northern environments. Based on findings from Task 1, there appears to be interest in increasing local food production, but one limitation is the short growing season in Anchorage. Community greenhouses have been implemented in polar regions, including Alaska. Greenhouse designs can range from simple Gothic Arch kits to renovating existing buildings and be heated with biomass or unheated. There are many different models for community greenhouses as they can be run by community organizations or schools or operate seasonally or year-round. Beyond growing food, these greenhouses also serve as spaces for education and socializing and are considered a community asset.

CASE STUDY 1: CITY OF LOS ANGELES - CURB YOUR FOOD WASTE LA

The City of Los Angeles Bureau of Sanitation and Environment (LASAN) ran a Residential Food Waste Prevention and Food Scrap Recycling Pilot Program called Curb Your Food Waste LA (CYFWLA) to promote food waste reduction, encourage residents to recycle remaining food scraps in their green bin, and encourage continued use of home composting. The aim of the pilot program was to inform a broad-scale city-wide program. Evaluation of the program included engagement tracking, surveys, visual inspections, and waste characterization.

Program Drivers

The City of Los Angeles has a Sustainable City pLAn¹ which includes various waste reduction and diversion targets such as reducing per capita municipal solid waste (MSW) generation by 15% by 2030, eliminating organic waste disposal in landfills by 2028, and 90% diversion from landfill by 2025. Food waste remains one of the largest components of landfilled waste, and California legislation Assembly Bill (AB) 341, AB 1826, and Senate Bill (SB) 1383 have called for a reduction of food waste ending up in landfills. SB 1383 came into force in 2016 and established targets to achieve a 50% reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020, and a 75% reduction by 2025. To work towards the Sustainable City pLAn goals and meet the requirements for SB 1383, it was necessary for the City of Los Angeles to roll out a broad-scale residential curbside food scraps collection program.

Local Context

The City of Los Angeles is the most populous city in California and the second most populous city in the United States, after New York City. The City covers about 470 square miles with a population of approximately four million according to the 2017 ACS 5-Year Population Estimate.

Los Angeles has a very diverse population that includes many cultural backgrounds as well as a high degree of income inequality and segregation. For example, many of the selected routes for the program had more than 30% Spanish speakers. Neighborhoods also differ greatly, from densely populated areas dominantly occupied by lower-income residents and racialized communities to affluent areas with large properties that are mostly occupied by White residents. Therefore, bridging cultural differences and environmental justice were important factors for the program to be successful.

Approximately 775,000 homes (562,000 single-family detached dwellings and 213,000 housing units in duplex to four-unit buildings) receive curbside municipal solid waste collection services from LASAN for refuse (black bin), recycling (blue bin and green bin), and bulky item pickup. Only yard and garden trimmings are currently accepted in the green bin. Food scraps are typically disposed in the black bin. Residents who wish to divert food scraps compost at home or use food scraps drop-off spots.

Program Objectives

The objectives of CYFWLA were:

- Engage residents in food waste prevention education, practices, and benefits (i.e., shop smart, waste less, recycle the rest);
- Engage residents in food scrap recycling (FSR) through use of their green bin;
- Reinforce the importance of home composting to keep some organic materials onsite and replenish the soil (e.g., if you are a home composter, keep composting);
- Determine the level and quality of participation in the Pilot Program using surveys, curbside 'lid lift' inspections, waste composition studies at point of generation, and tonnage measurement for black bins (trash) and green bin (yard debris, food scraps); and
- Gather information on Pilot Program-related environmental, economic, and operational impacts to inform a city-wide program.

¹ L.A.'s Green New Deal: Sustainable City pLAn, (2019), https://plan.lamayor.org/sites/default/files/pLAn_2019_final.pdf

Program Design and Implementation

Approximately 18,000 households in 15 City Council Districts distributed over 25 waste collection routes were selected for the pilot program. These routes were selected by LASAN such that each Council District had at least one route and that the routes represented different demographic groups.

The program utilized three core messages of reduce, reuse, recycle based on the US Environmental Protection Agency (US EPA) Food Recovery Hierarchy. The key messages were:

- to prevent food from being wasted;
- use the green bin to recycle food scraps; and
- and home compost more effectively.

Pilot Program branding involved developing a recognizable project image, crafting memorable tag lines that resonate with and motivate program participants, and creating public education materials and messages that are simple to understand and motivate new behaviors. A Pilot Program title, “Curb Your Food Waste LA” was agreed upon given its double meaning for reducing food waste and placing your food waste – in your green bin – to the curb for collection and recycling (see Figure 1). The three core messages were then adapted into a tag line, “shop smart, waste less, recycle the rest”.



Figure 1: Curb Your Food Waste LA Title and Tagline

Public education materials included an introductory letter, information booklet, branded kitchen pail, three quarterly newsletters, and a dedicated web page on the OrganicsLA.org website. See Appendix A for examples of these materials.

The introductory letter was sent at the beginning of the program to notify residents that their neighborhood was selected to be in a pilot program and was signed by the LASAN Director & General Manager.

The information booklet was distributed as part of the door-to-door direct engagement and included a program overview plus how-to participate sections on each program theme. Food waste reduction content included facts about the negative impacts of food waste (e.g., money wasted, greenhouse gas emissions), meal planning to prevent over purchasing, food storage to make food last longer, cooking creatively to use up ingredients, and clarifying the meaning of best before dates. The booklet was printed on one side in English and the other side in Spanish. Accompanying the information booklet was a kitchen pail with a ‘how to’ decal for residents to collect food scraps to transfer into their green bins.

Newsletters were sent by mail to each home in pilot program routes in the winter 2019, summer 2019, and spring 2020. Each newsletter included helpful tips and updates for optimized participation. Tips for food waste reduction included meal planning, fridge storage, and recipes to use leftover ingredients at home. Facts and figures reflected

program progress to date based on quarterly measurement events so residents could gauge their progress through this feedback mechanism.

The dedicated web page was intended to serve as a source of additional information for residents participating in pilot programs such as helpful tips for preventing food waste and educational videos. Most materials were available in both English and Spanish.

Approximately 75 staff conducted door-to-door outreach over approximately three weeks. Outreach teams were organized into teams of four to six members with a supervisor. Outreach staff approached each home up to three times to deliver a branded kitchen pail and brochure with information about the program. Shifts for outreach were scheduled on weekday afternoons and evenings, as well as midday on weekends. A data collection application using the platform Fulcrum was developed to track progress on outreach and pail distribution. This application was also used to record survey responses.

Community events were a valuable way to bring residents together in a more intimate setting to reinforce desired behavior changes, build community, and create a sense of commonality towards a joint goal. A total of 28 community events were organized across the 15 Council Districts. Community events took place at parks, libraries, and other community sites between April and mid-September 2019. Events took place in an interactive workshop format (approximately 1.5-hour session) or a walk-through format (booth or table at a public location). Invitation postcards were mailed to each home in pilot routes for the events in their Council District. To encourage participation, giveaways and raffle prizes were provided at community events as fun incentives. These items also acted as prompts to continue to foster behavior change (e.g., chip clips and insulated grocery bags to keep food fresh, wooden spatulas to clean out food scraps pail).

Food waste reduction engagement included activities on food storage, shopping, and using up ingredients. One activity was 'What Food Goes Where?' showing an empty fridge and freezer with individual items to be placed in the appropriate location (see Figure 2). Another "Efficient Food Shopping" activity set the participant up with several pre-shopping steps to list in priority order such as: plan your meals ahead of time; shop at home first; and make a list.



Figure 2: Food Waste Reduction Activity Examples (Top: Question templates; Bottom: Answers)

To track progress, a combination of visual inspections, waste characterization, and survey methods were used. Visual inspections were spot checks of black and green bins on randomly selected sections of pilot routes to look for signs of participation, such as food scraps in the green bin. Visual inspections also provided an opportunity to gauge contamination. Green bins with high amounts of contamination (greater than 25% by volume based on a visual estimate) were marked with contamination tags to remind residents which items do not belong in the green bin. Waste characterization involved collecting and sorting samples from green bins and black bins into material categories to estimate the diversion rates before and during the program. Visual inspections and waste characterizations were conducted in tandem, with the first event before door-to-door outreach began to establish a pre-pilot baseline (April 2019). Subsequent events took place in August 2019, January 2020, and July 2020. Surveys were conducted with randomly selected residents to measure residents' attitudes and behaviors and provide program feedback. The first survey was conducted during door-to-door outreach in May 2019. Subsequent surveys were conducted in August 2019 and January 2020. The last survey in July 2020 was not conducted due to the COVID-19 pandemic.

Program Implementation Reflections

This section covers reflections from the Tetra Tech team that implemented this project. The lessons learned from these reflections can be useful for gaining insights on how these types of programs run. Quantitative results from this pilot are not currently publicly available.

Door-to-Door Outreach - Managing a large staff team in neighborhoods that had diverse characteristics was a large logistical challenge. The field team was able to make direct contact with most households and speak to a resident about the program. The majority of interactions were friendly, and feedback was generally positive. Some

of the easier routes had homes that were easily accessible (e.g., no locked gates, unleashed dogs, or unmarked secondary suites), a high percentage of people willing to answer the door and were supportive of the program. Teams covering the easier routes tended to reach more homes per hour and morale was also higher. However, there were some challenges with residents lacking interest or not wishing to interact. Teams in more challenging routes tended to need more time for troubleshooting and the frustration of not being to reach residents (or have unfriendly residents) can reduce morale. Sometimes, teams would be much faster or much slower than estimated in the schedule, leaving staff looking for more work to do or being overwhelmed with too much. Using a cloud-based application for data entry and real-time tracking helped with overcoming the scheduling challenge, since teams that finished early could move to routes to assist teams that were progressing more slowly. Moving teams between different neighborhoods also helped so staff experienced a mix of easier and challenging routes.

Key Messages - During interactions with residents, the field team noted some challenges with requesting three different but interrelated behaviors from residents in the same program materials. This made for an outreach script that as a bit longer, of which a resident may start losing focus or interest. However, with practice, field team members were able to succinctly communicate the messages in a quick 'elevator pitch' and tailor the interaction with the resident based on what appealed to them.

Information Booklet - The field team found it useful to have a bilingual (English/Spanish) booklet because they only needed to carry one type of collateral material. However, this book was quite thick and was sometimes cumbersome to go through with a resident. An alternative approach is to have a smaller series of handouts or a fold down style brochure with downloadable pdf options in multiple languages. These handouts could be used in the kitchen more easily (e.g., put up on a fridge with a magnet) and printed (and duplicated) more simply for easier access and distribution over time.

Community Events - The most successful community event with a large turn-out was a neighborhood block club, where the workshop took place during one of their regularly scheduled meetings. Attendance was lower for one-off events. Collaborating with and co-hosting events with existing organizations when they have meetings that are already scheduled can increase engagement and participation.

Measurement - It was challenging to directly measure food waste reduction because visual inspections and waste characterization measured food scraps going into the green bin. While anecdotally there appeared to be more food scraps in the green bin, it was challenging to demonstrate this with statistical rigor. Gauging shifts in reducing food waste generally requires more samples due to the variation in residential waste composition or more involved measurement methods (e.g., kitchen diaries) that are time and resource intensive to implement. Therefore, residents' surveys were the primary method to measure attitudes and behavior. Residents seemed to be adopting more food waste reduction actions at home. However, these are self-reported attitudes and behavior so some positive response bias needs to be taken into consideration when interpreting the results.

Relevant Program Elements

The food waste reduction campaign elements of the CYFWLA program could be implemented in a local campaign in the Municipality of Anchorage. Educational materials for CYFWLA were derived from national campaigns such as Save the Food² and Love Food Hate Waste³, then adapted for the local context in Los Angeles as well as by season. A similar approach can be taken to tailor messages for residents in Anchorage. For example, fridge storage tips, ways to keep food fresh for longer, and food preservation may be emphasized due to the high price of fresh fruits and vegetables that may be close to spoilage when they are sold in grocery stores. These materials can be disseminated through print and online media. Note that CYFWLA did not employ social media because the pilot

² savethefood.com

³ lovefoodhatewaste.com

program was only available to select routes. However, a city-wide campaign will be able to use social media channels to increase engagement.

While door-to-door outreach is a great way to engage residents that may not voluntarily attend community events, it takes a lot of resources and coordination. However, targeted door-to-door outreach has been used in other jurisdictions to engage segments of the population that are harder to reach. Engagement via existing community groups can be more effective to reach residents where they are already doing an activity that they are familiar with. The content of community events can also be adapted for these different community groups so it is more relatable to increase interest. For example, the foods shown during workshops or cooking tips can be selected based on what would be typically eaten within that group.

Tracking progress is an important part of a program. For educational campaigns it can be challenging to collect enough data to show measurable change, especially for food waste reduction. Quantitative measures such as waste characterization studies and kitchen diaries require a lot of resources and still may not generate statistically significant results due to the high degree of variability in solid waste. Qualitative measures such as surveys require fewer resources, but due to their self-reported nature, may over-estimate changes in behavior due to positive response bias. Nonetheless, surveys are a useful tool for program evaluation because some metrics can be generated within a reasonable budget.

CASE STUDY 2: DOUGLAS COUNTY - FOOD RECOVERY PARTNERSHIP

Wasted food rescue and recovery is defined as actions to recover safe and nutritious food first for human consumption and second for animal feed through receiving, storing, or processing food—with or without payment—that would otherwise be discarded or wasted.⁴ Seeking ways to effectively recover food through gleaning and other donation efforts requires effective communication, policy drivers, and partnerships along effective storage, transportation, distribution, value-added processing where relevant, and liability protection. Douglas County in Kansas offers an example of food rescue and recovery being done through effective partnerships.

Local Context

Douglas County and City of Lawrence, Kansas

Located between Topeka and Kansas City, Douglas County has a population of approximately 120,290 according to the 2019 American Community Survey (ACS) five-year population estimate. It is the fifth-most populous county in Kansas, with Lawrence being the largest city with a population of close to 95,000 and is home to University of Kansas (28,000 students) and Haskell Indian Nations University (150 students), the only inter-tribal university for Native Americans in the US. The County has a total area of 475 square miles with its northern boundary defined by the Kansas River.



Figure 3: Douglas County, Kansas
(Source: Google Maps)

⁴ <http://www.cec.org/publications/characterization-and-management-of-food-loss-and-waste-in-north-america/>

Program Drivers

Douglas County has a longstanding agricultural community producing mostly commodity crops but also supporting animal grazing and some specialty crop production. Lawrence is home to a diverse range of urban agriculture projects focusing on vegetables, fruit production, and chicken-raising for eggs. There are over 90 vendors at the downtown Lawrence farmers market and 10 to 40 vendors at five additional farmers markets across the county. Local restaurants and a well-established cooperative grocery store are committed to selling local foods to customers.

Gaps in the Food System

Despite these opportunities there are many challenges to optimizing food production. Productive arable land has been developed or is under significant development pressure with land values escalating. There are limited food processing businesses, distribution channels, packing warehouses, and aggregation facilities within the region for local smaller growers. These infrastructure gaps make it challenging for larger buyers to access items from smaller producers.

Even with the food production in the region, the county has 16.5% food insecurity across the population with 18% of children being food insecure and 51% being eligible for children's nutritional programs.⁵ Fifty three percent of the population is below Supplemental Nutritional Assistance Program (SNAP) thresholds, although the participation rates are very low with only about 27% of eligible people applying for and receiving SNAP benefits. Food insecurity challenges are fueled by limited access to food retail, healthy foods, and affordable local foods. Widening the urban and rural divide, healthy and local foods are more readily available in urban centers and owning or having access to a car is generally needed for grocery shopping.^{6,7}

Food Systems Policies and Programs

To overcome challenges and seek opportunities to strengthen food systems and access to healthy food, Douglas County and the City of Lawrence governments have developed several policies, programs, and projects over time using a unique collaboration model. As part of a long-term commitment to food systems planning, they have collaborated with each other and community groups to set the policy framework, conduct studies, create governance models, and establish funding and resources for staffing. Below is a chronological overview of these efforts.^{8,9}

Horizon 2020 Plan, 2009.¹⁰ County and city governments convened a steering committee and adopted an environmental chapter to a joint comprehensive plan which included food system components and an emphasis on local food.

Food Policy Council, 2010. A joint city/county food policy council composed of 23 local stakeholders who meet monthly to identify benefits, challenges, and opportunities for a successful, sustainable local food system in Douglas County. The 14 County-appointed seats include education, agriculture producers, retail, nonprofit organizations, health, Native American, youth, and senior representation while the nine City-appointed seats include similar representation from the city level including farmers market, food bank, and

⁵ <http://map.feedingamerica.org/county/2016/overall/kansas>

⁶ <https://iwrc.uni.edu/sites/default/files/Ladd.pdf>

⁷ <http://growingfoodconnections.org/comminnovat/healthy-food-system-in-the-heartland-intergovernmental-cooperation-in-the-city-of-lawrence-and-douglas-county-kansas-advances-food-policy/>

⁸ Ibid

⁹ <https://planning.org/blog/blogpost/9107456/>

¹⁰ <https://lawrenceks.org/pds/comp-plan/>

business community representatives.¹¹ The Council has been instrumental to convening core stakeholders, leveraging partnerships, and overseeing the development of annual reports, outreach materials, reports connected to Kansas University courses, and dedicated studies to assess the food system, determine food hub feasibility, determine urban agriculture policy, review ethnic retail foods, determine farmers markets key lessons and more.¹² Reducing wasted food through the Food Recovery Partnership is one of the Council's current priorities (see Food Recovery Initiatives below).

The Council's funding has evolved from \$7,000 through a county commission resolution that helped to fund conference attendance by members to a \$1.3 million Health Department grant which funded four positions including a Food Systems Coordinator position. The Council has also received USDA funding through a Rural Development grant (\$58,000), and a Kansas Health Foundation grant to fund a Food Hub Feasibility Study (\$10,000). Currently the city and county jointly fund a Sustainability Coordinator and support seeking grant funding for an ongoing Food Systems Coordinator position.¹³

Indigenous Food Day Proclamation, 2011. A proclamation was passed to designate a specific day in October as Indigenous Food Day. The proclamation highlights the socio-cultural importance of food, acknowledges the contributions of local farms and food producers to physical and economic health of the community, and recognizes the heritage and food traditions of the region's Indigenous populations.¹⁴

Common Ground Community Gardens, 2012.

The City of Lawrence established a community garden program to lease vacant city-owned property to gardeners and farmers. The program includes an incubator farm, a teaching farm, several community gardens, and a free you-pick orchard. Based on their latest annual report (2018), the program supports nine gardens that span 116 plots and four cooperative areas, had 272 volunteers, sponsored 35 events including a tour, donated 1539 pounds of produce, and awarded four mini-grants totaling \$1835 for new tools, plants and infrastructure.¹⁵ The program benefits from a wide range of community partners including the local universities, city and county departments, youth organizations, and food security groups including Just Food. In 2017 they received \$50,000 from the County Conservation District to enhance local urban agriculture. They continue to seek ways to expand to new garden sites.



Figure 4: The Garden Incubator, a Common Ground site within a city park welcomes gardeners of all ages
(Source: Common Ground)

Double Up Food Bucks: SNAP Market Match Program, 2014. The Food Policy Council secured \$25,000 from a city/county partnership plus a community leader coalition, Livewell Lawrence, to create a dollar-for-dollar SNAP matching program at regional farmers markets. For every dollar spent, it is matched with another \$1 so participants can buy up to \$25 more in vegetables and fruits.¹⁶ The program is continuing to grow with

¹¹ <https://www.douglascountyks.org/fpc/who-we-are>

¹² <https://www.douglascountyks.org/fpc/reports>

¹³ https://assets.jhsph.edu/clf/mod_clfResource/doc/FundingFPCsStoriesfromtheField_6-12-15.pdf

¹⁴ <https://indiancountrytoday.com/archive/indigenous-food-day-in-kansas>

¹⁵ <https://lawrenceks.org/wp-content/uploads/2019/02/Common-Ground-2018-Annual-Report.pdf>

¹⁶ <https://www.douglascountyks.org/depts/sustainability/doubleup>

USDA funding to rebrand and expand the program with regional partners to reach the 18 regional farmers markets in eastern Kansas under Douglas County oversight.

Food System Plan, 2017. This plan was created as part of the process to update the Lawrence-Douglas County Comprehensive Plan and sets a framework for the next 10 years to guide policy changes by our local governments, to shape the work of the Douglas County Food Policy Council (DCFPC), and to inspire community actions and partnerships.¹⁷ During an extensive consultation process, five criteria were used to determine the plan's priorities; need, community interest, impact, feasibility and funding, and influence. The plan has five primary goals each followed by several objectives: 1. Agricultural and food workers thrive locally; 2. Prioritize natural resources and soil health; 3. Ensure food access, health and eliminate food deserts; 4. Foster an equitable food system; and 5. Eliminate waste in our local food system.

Urban Agriculture Laws, 2022 updated. Building on a 2012 Lawrence Chicken Ordinance to permit backyard hens for egg production, the City of Lawrence passed updated urban agriculture laws to permit limited numbers of goats and sheep, bees, other animals including crustaceans, insects and fish, and crops. Parameters were also set for agricultural sales of unprocessed goods and urban farms, which require a permit once beyond a certain size.¹⁸ An Urban Ag 101 booklet and a one-page policy summary brochure provide more specifics to support residents to produce local, healthy food at home and create opportunities to pursue commercial production.¹⁹

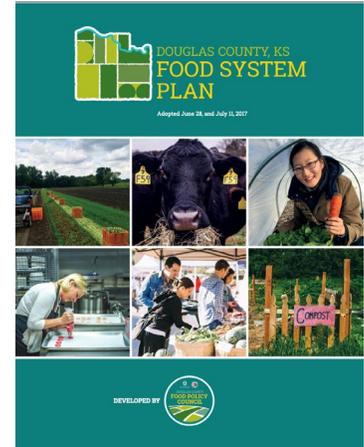


Figure 5: Douglas County Food System Plan, 2017
(Source: Douglas County)

Food Recovery Initiatives

The 2017 Food Systems Plan emphasizes food recovery initiatives as part of goal 5 related to eliminating waste in our local food system. Douglas County has initiatives underway for on-farm gleaning, school food waste reduction and rescue, and use of incubator kitchens to support smaller-scale secondary food processing.

It is of note that liability protection when donating food is an important barrier to overcome. The USDA's Good Samaritan Act provides liability protection for good faith donations, as does the Kansas Food Donation Law.²⁰ The Kansas Health Foundation has a Food Donation Liability Guide for Donors and Distributors that explains both laws and how they intersect.²¹

On-Farm Gleaning

When COVID-19 pandemic restrictions were in place, food provision agencies saw an increase in visits to their pantries and facilities. Often the requested items were fresh foods including produce. To respond to this increased need and stay aligned with policy goals (goal 5 reduce food waste), Douglas County started an on-farm gleaning program to recover edible, unsold produce for distribution to those in need.²²

¹⁷ <https://www.douglascountyks.org/sites/default/files/media/groups/fpc/pdf/douglas-county-food-system-plan-2017-low-res.pdf>

¹⁸ <https://www2.ljworld.com/news/2016/apr/27/city-commission-approves-urban-agriculture-lawrenc/>

¹⁹ <https://lawrenceks.org/urban-ag/>

²⁰ <https://www.usda.gov/media/blog/2020/08/13/good-samaritan-act-provides-liability-protection-food-donations>

²¹ <https://www.publichealthlawcenter.org/sites/default/files/resources/phlc-fs-kansas-Food-Donation-web-2016.pdf>

²² <https://www.douglascountyks.org/depts/sustainability/food-recovery-partnership>



Figure 6: Gleaning Example
 (Source: Douglas County Food Policy)

Several key groups are collaborating to optimize on-farm gleaning including After the Harvest²³, an established Kansas City group, a locally formed group called Community Organized Gleaners, and Douglas County Sustainability who is working with several organizations including Just Food, Lawrence Community Shelter, Sunrise Project, and KU Center for Environmental Policy. They have successfully recruited volunteers and recovered thousands of pounds of food to local food pantries over two growing periods, July to October 2020 and May to December 2021. This is one of thirteen related initiatives funded by the USDA through a two-year Community Compost and Food Waste Reduction Grant.²⁴

School Programs

In 2018, a Lawrence-Douglas County Health Department grant funded a food recovery initiative to identify what food was being wasted, its corresponding environmental impact, and what could be done to avoid food wastage. The project drivers included the fact that 18% of Kansas children are food insecure, food waste comprises 17% of trash going to landfill and emits greenhouse gases, and climate impacts to crop production are pushing costs up to further risk food insecurity. The project goals were to reduce pre-consumer food waste and divert excess food to hungry populations.

A system review identified challenges ranging from storage issues to overproduction given lack of records around field trips and absences. Some staff had questions about what they could donate and how; there were logistical challenges re some food donation given not wanting to spare metal trays that held items such as extra lasagna. In another school setting, they were not sure if salsa, which is a chronically underutilized item, could be donated. Other feedback included a mention that too many choices for younger students could be challenging and results in food wasted.

Recommendations included better tracking to determine quantities, supporting students on selecting the appropriate portion sizes (e.g., add 'fair share' size signs or examples for items such as grapes), staff training on what can be donated and how to package it, implementing Share Tables for unopened items, and seeking creative ways to manage overproduction. For example, stale bread can be made into croutons or breading, fruit can be used as dessert toppings or in smoothies, vegetables can be incorporated into pizza toppings or used in soups. Implementing composting at schools was also recommended to reduce GHG emissions from food waste as well as to serve as an educational tool.

Shared-Use Kitchens

To address the need to have places for smaller scale secondary processing, shared-use kitchens (also known as incubator kitchens or culinary commons) are being developed for use by food entrepreneurs to develop and process their products. For example, the Glacial Hills Food Center is rented to entrepreneurs for \$15 per

²³ <https://aftertheharvestkc.org>

²⁴ <https://lawrencekstimes.com/2021/04/08/douglas-county-using-gleaning/>

hour, so they have access to a fully operational commercial kitchen with a large capacity for cooking, canning, baking, and freezing many types of food products. USDA standards and Kansas Department of Agriculture (KDA) standards are in place.²⁵

The KDA also published two guides in 2021 to help small food-business start-ups, in particular to help overcome potential food safety issues: Incubator Kitchen Resource Guide, 2022²⁶ and the Incubator Kitchen Listing with 15 kitchens available across the state.²⁷ Often training and advisement is also available through these kitchens.

Relevant Program Elements

There are several food system and food rescue/recovery program elements from Douglas County that are potentially adaptable for the City of Anchorage. The collaborative model between city, county, and other key community organizations can offer additional specifics that the City could use to build on its current model. Governance guided by a strong representative Food Policy Council combined with staff resources, funded in part by grants, can provide consistent ongoing support for securing resources and keeping momentum for initiatives. A strong policy framework (e.g., Food Systems Report 2017) can offer goals and objectives that emphasize avoiding food waste and creating equitable food systems. Programs funded by a mix of local sustainability and health sources combined with federal (e.g., USDA) grants can be an effective way to leverage resources over time. The multi-sector approach to ensure surplus food is managed across the supply chain – from on-farm gleanings through shared-use kitchens for smaller scale food processing to school programs – can be an effective way to avoid wasting edible food.

Case Study 3: Food Sharing App: Too Good To Go

Food Sharing Apps Defined

Using online food sharing platforms to match generators of surplus foods to buyers continue to emerge to fill a variety of niches within food rescue efforts. Food sharing can be an effective way to manage quick turnaround for smaller food quantities. Many online food sharing platform solutions are available in a single metropolitan area where they can match generators to buyers in an efficient and cost-effective way. They increase the viability of recovering smaller amounts of food by handling time sensitivities and optimizing transportation routes. Technology providers usually charge a commission for each transaction.²⁸

This Case Study focuses on a business to consumer online food sharing application, Too Good To Go. Their app lets customers buy and collect Surprise Bags of food at a great price – directly from businesses. This generates a win-win-win solution that allows businesses to make money from food that would otherwise be wasted, consumers can access food at affordable prices to reduce food waste, and all parties have a positive impact on the environment. The app is mostly for consumer facing businesses such as restaurants, bakeries, supermarkets, hotels, and canteens. Customers know the general food type but do not know the exact items to be found in the Surprise Bag.²⁹

²⁵ <https://www.ksre.k-state.edu/news/stories/2022/04/first-friday-community-kitchens.html>

²⁶ <https://agriculture.ks.gov/divisions-programs/food-safety-lodging/incubator-kitchen-resource-guide>

²⁷ https://agriculture.ks.gov/docs/default-source/fsl--handouts/incubator-kitchen--vertical2017.pdf?sfvrsn=7183bcc1_64

²⁸ <http://www.cec.org/publications/characterization-and-management-of-food-loss-and-waste-in-north-america-2/>

²⁹ https://zerowasteurope.eu/wp-content/uploads/2020/01/zero_waste_europe_CS7_CP_TooGoodToGo_en.pdf

About the Company

Too Good To Go (<https://toogoodtogo.com/en-us/>) is a social impact company leading the food waste revolution to create a greener planet. Their app connects consumers to surplus food from local restaurants and grocery stores, such as pastries, fresh produce, sushi and more, which would otherwise be thrown away to make room for the next batch of goods. Founded in 2016 in Denmark, Too Good To Go has connected more than 61.3 million customers to support 163,252 businesses to sell 153 Million Surprise Bags (e.g. meals) across 17 countries. In the past year, the app has expanded to the United States and is currently used in several cities such as New York, Chicago, Seattle, San Francisco, and Austin. On average, each meal rescued is equivalent to the carbon footprint from charging your smartphone 422 times. They recognize that over one third of food produced globally is wasted³⁰ and reducing food waste is one of the most important things we can do to reserve global warming.³¹



Figure 7: Food Waste Education Graphic (Source: Too Good To Go)

The company's overall vision is "a planet with no food waste". Their mission is to inspire and empower everyone to take action against food waste. Their intent is to overcome the challenge that, "every day, delicious, fresh food goes to waste at cafes, restaurants, hotel, shops, and manufacturers – just because it hasn't been sold in time. Their ambition is to contribute in every way that they can to building the global food waste movement and generate positive change in society."³²

The company generates revenue from two main streams; the business partners pay a yearly subscription for the service and a small commission fee for each meal sold.³³ In four funding rounds they have generated \$45.7 Million from investors.³⁴

Company Impact

To actively empower and inspire everyone to fight food waste together to build a movement against food waste, Too Good to Go uses a four-pillar approach with actions and targets for each. Their 2021 Impact Report provides an overview of how each pillar is supporting their mission.³⁵

Households. It specifically targets households, as almost half the food wasted in Europe happens at this stage. The pillar provides educational messages with tips and tricks that can reduce food waste daily by better buying, storing and cooking. The overall goal is also for citizens to regain an understanding of the value of food, and to make the issue more visible. Most recently, they have included a date labelling project in Europe that features a clear pictogram with the message 'Don't throw away products immediately after expiration of

³⁰ <https://news.un.org/en/story/2013/09/448652>

³¹ <https://toogoodtogo.com/en-us/>

³² <https://toogoodtogo.com/en-us/movement>

³³ https://zerowasteurope.eu/wp-content/uploads/2020/01/zero_waste_europe_CS7_CP_TooGoodToGo_en.pdf

³⁴ https://www.crunchbase.com/organization/too-good-to-go/company_financials

³⁵ <https://toogoodtogo.com/en-us/download/ImpactReport21>

the best before date, but look, smell and taste first to check the quality.’ They also have a Remix Recipe Cookbook to help customers come up with creative ways to use ingredients.

Businesses. It targets businesses, with the aim of going beyond just retail and food services to address food waste and losses happening further upstream in the food value chain. It contains plans to improve the sustainability agendas of the thousands of businesses partners the company engages directly.

Schools. The 3rd pillar focuses on schools, targeting younger generations with the creation of educational toolkits that contain exercises and guides for teachers.

Public Affairs. The company engages with policy-makers to make sure the right regulatory framework is adopted to reduce food waste and enable change to make food systems more sustainable.

Beyond the app, Too Good To Go has launched initiatives to change date labeling on food, produced free educational resources for schools, and inspired households to change food waste behaviors.

How the App Works

After downloading the app, users have access to a range of meals, snacks, and groceries available nearby. They can either view what’s close by or search for specific meals with different options, such as collection time, location or type of food, for instance vegan or vegetarian. Once they select their option, users receive a receipt which needs to be presented to the shop to receive the Surprise Bag. Typically, consumers are able to buy food that’s worth three times the amount they paid.

Once Too Good To Go is in the region, there are two ways for businesses to become part of the system. One option is that businesses inquiry directly to join. Too Good To Go has a team dedicated to market analysis, identifying stores which would most benefit from joining the platform and helping those stores to better optimize and avoid potential food waste. For those businesses, the motivations behind joining the platform are different, ranging from the environmental impacts of food waste to optimizing the general functioning costs or corporate social responsibility guidelines.

Regarding other types of waste, such as the packaging used to contain the food, the company encourages its partners to allow consumers to bring their own containers as much as possible. On the mobile application, consumers can easily access information, store by store, as to whether this is an option. At times, particularly for grocery stores, items are pre-packaged and it is not an option.

All businesses joining the platform are in direct communication with Too Good To Go staff and benefit from an onboarding session with the company’s team. To maintain the quality of food and experience on the app, Too Good To Go also works with partners who have received below-expectation user reviews to improve the experience for both parties.

Additionally, the app keeps evolving and adding more functionalities, such as the vegetarian option or the possibility to bookmark your favorite stores.³⁶

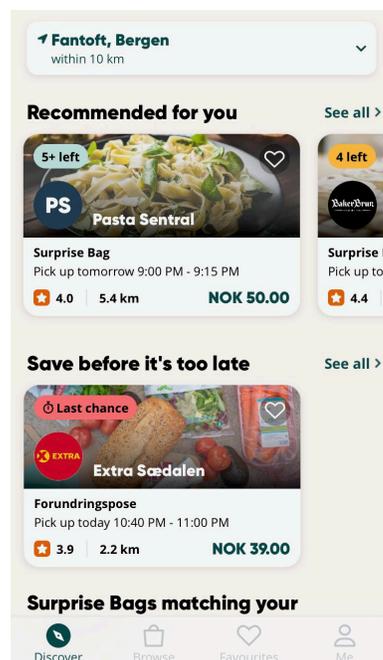


Figure 8: App User Interface
(Source: Too Good To Go)

³⁶ https://zerowasteurope.eu/wp-content/uploads/2020/01/zero_waste_europe_CS7_CP_TooGoodToGo_en.pdf

Program Critique

There are challenges with online food sharing platforms, including Too Good to Go. One is that instead of selling that food, albeit for a few dollars, the food places can instead donate it. For smaller amounts that can be easier in concept than reality though. Second, it is ideal for retailers to minimize their food surplus to minimize waste in the first place. Having a lower revenue option for managing that surplus is helpful as a stop gap for smaller amounts but shouldn't be overly relied upon. Third, there are those in lower socio-economic brackets that may not have smart phones or the know how to access the lower cost food and less goes to food pantries and other charities.³⁷

Relevant Program Elements

It could be beneficial for the City to work with Too Good to Go or another online food sharing platform to make a business to consumer food sharing app an option for Anchorage businesses and residents. It provides a practical, low-cost way for consumer facing food businesses to avoid food waste while providing residents with the opportunity to access affordable food.

Case Study 4: Community Greenhouses

Most fruits and vegetables in Alaska are imported. Due to the long transport distances, fresh produce is expensive and often of lower quality (i.e., close to spoiling) by the time it is sold in stores. The high cost of fruits and vegetables is a contributor to food insecurity in northern regions, especially for low-income households that have limited food budgets and may choose cheaper, but also less nutritional processed foods. While some fruits and vegetables can be grown in Alaska, the growing season is very short. Community greenhouses have been established in northern regions to extend the growing season, increase the availability of fresh produce, improve food security, and provide opportunities for education and socializing.

To encourage development of greenhouses for local food production and use of biomass resources in Alaska for heating, the Alaska Energy Authority and USDA Forest Service published *Biomass-Heated Greenhouses: A Handbook for Alaskan Schools and Community Organizations*. This handbook is aimed at schools and community organizations in Alaska that want to start a biomass-heated greenhouse. Greenhouses in Alaska need to be heated to be able to grow food during the colder months, otherwise they cannot be used in the winter. Alaska is abundant in biomass resources, which is any fuel that comes from woody plants (e.g., cordwood logs, timber mill sawdust). Biomass heating for greenhouses therefore has a lot of potential and can support year-round local food production. In addition, local food growing and heating with local biomass creates sustainable economic opportunities within communities, especially those with high unemployment rates. From an environmental standpoint, biomass is considered a carbon-neutral fuel and eating local food reduces greenhouse gas emissions from long-distance transportation and large-scale industrial agriculture. From a social standpoint, biomass-heated greenhouses can be used as a living laboratory for students to learn by doing in a variety of subjects including science, agriculture, business, and forestry. Community members can also benefit by developing food skills. The steps involved in planning, constructing, and implementing a biomass-heated greenhouse are described in this handbook. Examples and tips from greenhouse practitioners are included to offer useful insights for someone who is getting started.

In the following sections, three examples of northern community greenhouses are highlighted to showcase different ways they could be organized. The first example is one of the oldest northern community greenhouses, located in Inuvik, Northwest Territories, Canada. The second and third examples are the Southeast Island School District and Alaska Gateway School District, which run greenhouses at their schools.

³⁷ <https://www.makeuseof.com/too-good-to-go-app/>

Inuvik Community Greenhouse

The idea for the Inuvik Community Greenhouse started in 1998 when the old hockey arena was planned for demolition³⁸. Local community members came together to transform this arena into a greenhouse. At the start, community members volunteered and paid a small fee for a plot. This has since grown to a greenhouse with 170 garden beds for members, as well as dedicated community plots for elders, group homes, children's groups, and local food banks.

Greenhouse Design

The arena was used as the base structure of the greenhouse. The tin roof of the arena was replaced with translucent polycarbonate glazing with a ridge vent along the length of the roof.³⁹ The garden plot area is built over gravel to prevent cold transfer from permafrost below and each plot is insulated. The building has two floors. The main floor contains the community and family garden plots. The second floor has a commercial greenhouse operation. The greenhouse is primarily heated by sunlight since the sun shines close to 24 hours per day in the summer, which keeps the inside of the greenhouse 10 degrees Celsius (18 degrees Fahrenheit) warmer than outside temperatures. Additional heat is used in the early growing season. There is also a composting facility on site that collects organic material from the greenhouse and community. The compost is then used by the greenhouse as an organic, nutrient rich soil amendment that also saves cost of flying in soil and compost.⁴⁰



Figure 9: Inside the Inuvik Community Greenhouse (Source: Inuvik Community Greenhouse)

³⁸ <https://inuvikgreenhouse.com>

³⁹ <https://sustainableheritagecasestudies.ca/2019/12/24/fostering-community-healing-from-arena-to-greenhouse/>

⁴⁰ <https://fieldlawcommunityfund.com/ideas/inuvik-community-greenhouse-compost-program-funding-applications/>

Growing System

The greenhouse operates from May to October, taking advantage of 56 days of 24-hour daylight in the summer. On the main floor, a variety of vegetables, fruits, and flowers are grown in box plots filled with soil. There are also chickens that live in the greenhouse and provide support with clearing plots, fertilizing the soil (with manure), and lay eggs that are sold. On the second floor, hydroponic vegetables are grown for sale. As of 2021, a solar-powered hydroponics container was added to the facility to grow greens and herbs year-round for sale.⁴¹

Management and Funding

The Inuvik Community Greenhouse is run by the Community Garden Society of Inuvik (CGSI), which raised funds and petitioned against the demolition of the hockey arena so it could be converted to a greenhouse. The CGSI originally started as a group of volunteer residents of Inuvik. Now they have a board of directors and two staff members.

Operational costs are covered through a combination of grants, donations, membership/plot fees, and vegetable sales. Funding has been a challenge because there isn't an ongoing, steady source of funding for operational costs.

The membership model includes a membership fee and plot fee. There is a \$25 membership fee per family (includes 2 adults and 2 children in the same household) to get early access the annual Plant Sale, have priority access to the Veggie Box subscriptions, workshops, and events, as well as a vote at the Annual General Meeting. Those who wish to garden in the greenhouse pay an additional fee of \$30 for a small plot for \$60 for a large plot per year. Those with plots are also required to volunteer for 5 hours per year. Besides regular vegetable market sales, there is a veggie box program for \$40 per week, as well as a discounted \$6 veggie box of leftovers that are not sold during weekly markets.

Education

Multiple educational opportunities are offered through the greenhouse. Members can opt for an individualized plot planning meeting with the garden coordinator. Workshops are hosted bi-weekly on topics such as terrarium gardens, tomato pruning, growing sprouts and micro-greens, harvesting, painting, and yoga. Students can get involved through a summer student work program. To support the large Indigenous population in Inuvik, workshops are offered to Indigenous groups on alternative ways for food production with an aim of supplementing traditional food sources so traditional and alternative food practices can be done together. The greenhouse also has a partnership with Aurora College Research Institute for a pilot project called "The NWT Native Seed Development Project: Moving Towards Local Seeds for Local Remediation" to collect, test, and develop technology to propagate native plant species that would be suitable for use in reclamation and revegetation in the Northwest Territories.

Southeast Island School District

The Southeast Island School District has four bioenergy-heated greenhouses in schools located in Thorne Bay, Kasaan, Naukati Bay, and Coffman Cove. Started between 2014 and 2016, these greenhouses were originally implemented to provide fresh produce for the school lunch program. Previously, students were eating reheated canned vegetables. Now, they have salad bars and fresh greens.

Greenhouse Design

Three of the schools (Kasaan, Naukati Bay, Thorne Bay) have a Gothic Arch greenhouse, which comes as a kit that can be assembled on site. The construction consists of a wooden frame and double polycarbonate panels on a cement foundation. The greenhouses range from 792 to 864 square feet in area. [something about it being simple]

⁴¹ <https://www.nnsi.com/inuvikdrum/inuvik-community-greenhouse-hydroponics-unit-arrives/>

In Coffman Cove, they have a much larger greenhouse (7,000 square feet), built with a steel frame on a cement foundation. A mix of tempered glass and double polycarbonate panels were used for the glazing.

All the greenhouses use a cordwood boiler as the heating system. This system provides heat to both the school and the greenhouse, as well as heating for the water that goes into aquaponics system.

Growing System

All the greenhouses use an aquaponics system to grow produce because soil is limited in Southeast Alaska. In an aquaponics system, plants grow in a nutrient solution instead of soil and the nutrients are provided by fish. The plants and fish exist in a symbiotic relationship; the fish provide ammonia and carbon dioxide to the plants and the plants provide oxygen and nitrate to the fish. Note that in Alaska, fish used for aquaponic systems cannot be eaten by humans, so ornamental species like goldfish are typically used.

Three of the schools (Kasaan, Coffman Cove, Thorne Bay) also have raised beds outside of the greenhouse which need to be replenished with nutrients from sources such as seaweed due to the heavy rain.



Figure 10: Floating rafts in the Coffman Cove greenhouse
(Source: Alaska Master Gardener Blog)



Figure 11: Student in a Gothic Arch greenhouse
(Source: Alaska Master Gardener Blog)

Lettuce is the main crop grown in all the greenhouses, which is sold to the school cafeterias for their salad bars as well as to the school's district cafe and local grocery stores. Other vegetables are rotated seasonally and based on the choices of the teachers, students, and school curriculum. These vegetables have included greens (e.g., kale, basil, chard) and root vegetables (e.g., carrots, turnips, radishes).

Management and Funding

Management of the greenhouses is shared between district staff and school staff. One project manager oversees the biomass boilers in the school district. District employees with greenhouses meet once per month to share successes, troubleshoot challenges, and plan future changes. At each school, one the principals oversee greenhouse operations and one teacher acts as the on-site greenhouse manager. Student employees manage the

day-to-day operations of the biomass boilers at Naukati Bay, Coffman Cove, and Thorne Bay. In Kasaan, teachers (with help from students) manage the day-to-day operations of the biomass boilers. The boilers also provide heat to the teacher housing, so the teachers receive a discount on their home heating in return for managing the system.

Capital funding for the greenhouses came from grants, legislative funds, and in-kind donations from the district. Ongoing operational funding is covered by profits from vegetable sales, grants (e.g., Alaska Nutritional Foods grants, small foundations grants) and district funds. The district also received a national Farm to School grant to expand the program⁴².

Education

Teachers have worked to integrate activities in the greenhouses with different subjects in the school curriculum. For example, students learn about the science of photosynthesis and practice geometry in measuring garden beds or figuring out how much soil is needed to fill them. For high school students, there is a natural resource management elective⁴³ that teaches students about greenhouse management and production. The students also run a business called “Island Fresh: Student Enterprises” which helps them develop business skills⁴⁴.

Alaska Gateway School District

The Alaska Gateway School District has a biomass-heated greenhouse at Tok School, constructed in 2012. This greenhouse provides fresh vegetables to seven schools in the district. This year, there will be approximately 350 students. The primary use of vegetables in the schools are for salads, however they also supply to the fresh fruit and veggie snack program when there is a surplus. In the summer, the greenhouse supplies food to the summer camp.

Greenhouse Design

The greenhouse has a high tunnel design. It is equipped with ventilation fans and LED lighting. The greenhouse is on a hydronic heating system with unit heaters supplying approximately 1 million BTU of heat. The heating season runs from mid to late-September to April. Due to the cold temperatures in the winter and lack of back-up power supply to the greenhouse, it is very susceptible to freezing when there are power cuts. If the system loses power for more than about 30 minutes, then the temperatures will likely hit the freezing mark and damage the crops. Another challenge in maintaining the system is that the fan motors need frequent repairs and replacement.

The greenhouse has a composting area with two 7'x7'x4' bins on a heated pad. Prunings and vegetable kitchen scraps are composted on site, supplemented with shredded paper and cardboard from the school. The composting process is very slow since they do not have a big agricultural base in Tok and cannot get feedstock such as manure to catalyze the system. The compost is used to build up the soil in the greenhouse using the 'lasagna method' of layering cardboard, greens, and compost. One potential source of additional organics for composting is local businesses, but they do not have the labor available to collect these materials.

Growing System

There are 17 beds in the greenhouse that grow a variety of vegetables. These include cherry tomatoes, tomatoes, zucchini, broccoli, onions, kale, peppers, celery, carrots, green beans, cucumbers, snap peas, radishes, cabbage, crookneck squash. Lettuce and Swiss chard are grown hydroponically. From 2021-2022, they produced 3,581 lbs of vegetables, with cherry tomatoes (1,016 lbs), lettuce (648 lbs), and cucumbers (539 lbs) being the most popular

⁴² <https://health.alaska.gov/dph/PlayEveryDay/blog/Lists/Posts/Post.aspx?ID=431>

⁴³ <https://sites.google.com/a/sisd.org/curriculum/electives/natural-resource-management>

⁴⁴ <https://alaskamastergardener.community.uaf.edu/2017/10/24/we-grew-it-sustainable-agriculture-in-the-southeast-island-school-district/>

items. The main growing season for vegetables grown in the garden beds is from mid-February to mid-November. Lettuce is grown year-round. Starts (e.g., tomato and pepper) are planted in December.

One of the challenges with growing in a greenhouse is that the vegetables that kids like to eat (e.g., cherry tomatoes) are not cool weather crops that grow well in Alaskan conditions. Although the greenhouse runs year-round, the LED lighting is not as good as natural light for plants to grow. They attempted to grow cool weather crops this past winter and they were not very successful. In the spring, pests are a concern. They try to avoid using synthetic pesticides and keep the growing organic. Therefore, they try to employ natural pest management techniques. Due to low temperatures, they cannot get shipments of beneficial insects until June, so during the spring the pests are a major problem.

Management and Funding

The greenhouse has one Greenhouse Manager that is responsible for its operations. A Biomass Manager is responsible for the heating system. Capital funding for the greenhouse came from the district's general funds. The biomass boiler was funded by the Alaska State Renewable Energy Fund. Ongoing operational funding is covered from general funds from the district, as the greenhouse is viewed as an educational resource. The greenhouse bills the school cafeteria for the vegetables and sells excess vegetables to the public in the summer when school is in session. The profits from vegetable sales are in the range of thousands of dollars per year.

Education

Students and community groups occasionally visit the greenhouse to learn about how food is grown. In 2016-2017, Tok School ran a greenhouse management class. As part of this class, students worked in the greenhouse four days per week to learn about plant management.

Relevant Program Elements

The Municipality of Anchorage could support implementation of community greenhouses through community organizations or schools. There is already great demand for community garden plots in Anchorage, with a long waiting list for residents to get a plot. There would likely be a lot of interest from residents in participating in community greenhouses and this can alleviate some of the demand for outdoor community gardens. There are existing organizations such as Yarducopia and Anchor Gardens that are already promoting food gardening and building gardens within the municipality. Both organizations, as well as Catholic Social Services indicated interest in developing community greenhouses, if funding and resources were available. Besides funding and resources to develop community greenhouses, education of gardeners is also important since the conditions within a greenhouse are different than outdoors, such as managing pests, humidity, and temperature. Security of greenhouses also needs to be considered to mitigate theft and prevent unintended occupancy (e.g., by people who are unhoused sleeping in the greenhouses).

There is potential for the Anchorage School District to expand their greenhouse program. Currently, there are three school greenhouses that are mostly used by students (Goldenview Middle School, Airport Heights Elementary, and King Tech High School). These facilities do not appear to be used as much outside of the school year so there is potential to develop community partnerships to make use of these greenhouses during the summer when school is not in session. However, one potential challenge is the Anchorage School District may be hesitant to allow the public to use their facilities.

Support from the Municipality of Anchorage could be in the form of providing funding, access to unused vacant land, utility hook-ups, or other in-kind resources. Another avenue of support could be to encourage businesses to implement greenhouses such as Denali Brewing, which grows food for its restaurant⁴⁵. Some policy changes may

⁴⁵ https://storymaps.arcgis.com/stories/4144b73f1a2b47e98078a26ac0d98e49?utm_medium=email&utm_source=govdelivery

be needed to allow larger greenhouse development, since large greenhouses (beyond 8'x12') are currently not permitted in Anchorage.

If community greenhouses are established in Anchorage, besides offering locally-grown produce to residents, there is also an opportunity to co-locate a composting facility like what was done in Inuvik or an aquaponics system like Southeast Island School District to promote closed-loop food systems.

Summary

This review of local food-related educational programs identified a broad range of program elements that could be adapted for the City of Anchorage. They can be grouped into the following themes.

- **Food System Resilience.** Gardening and farming efforts require land access, educational programs, harvesting capacity (including on-farm gleaning), and appropriate storage and distribution systems. When residents are engaged in growing food, there is an inherent value added to the items harvested; this can be harnessed to leverage waste reduction efforts. Case Studies 2 and 4 had a strong food systems component driven to move towards equitable food systems. Douglas County's efforts were informed by a Food Policy Council while the northern greenhouse food production initiatives had their own drivers and resources to support food growing efforts.
- **Food Waste Prevention.** Preventing food waste from happening in the first place was shown to be the best way to reduce food costs, maintain the lowest carbon footprint, and support an equitable and accessible-to-all food system. Efforts can be made to strengthen the food supply chain by optimizing farm harvest as shown in Case Study 2 through on-farm gleaning, reduce transportation distances and storage needs by supporting local food growing and selling (Case Studies 2 and 4), and educate residents at large on ways to prevent food waste as shown in the LA Case Study 1 are specific ways to prevent food waste.
- **Food Rescue and Recovery.** Seeking ways to manage edible food surplus for people and then animals is another important aspect for avoiding wasted food. In Douglas County Case Study 2, strong partnerships between government and community groups helps to optimize food rescue to food insecure individuals and families. Case Study 3 showcases how online food sharing apps, in particular Too Good To Go, can support business to consumer connections for selling smaller quantities of food surplus from food retailers at discount prices.
- **Organics Management.** For inedible food scraps and wasted food, using an integrated organics management approach can be quite beneficial. The LA Case Study 1 showcases this by having multiple messages; prevent food waste, keep home composting to generate soil amendment without the extra transportation efforts, and recycle remaining food scraps using the green bin (that goes to an organics processor). Case Studies 2 and 4 both emphasized the importance of composting to support soil building for food production as well as avoiding having food to go landfill as waste to generate greenhouse gases.