



Use Food Well Washington Plan

A roadmap to a more resilient food system

Draft Copy

Solid Waste Management Program

Washington State Department of Ecology

Headquarters

Olympia, Washington

October 2021, Publication 20-07-001



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Department of Ecology's Regional Offices

Map of Counties Served



Southwest Region 360-407-6300	Northwest Region 425-649-7000	Central Region 509-575-2490	Eastern Region 509-329-3400
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Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	15700 Dayton Ave. N., Shoreline, WA 98133	425-649-7000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 46700 Olympia, WA 98504	360-407-6000

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DEPARTMENT OF
ECOLOGY
State of Washington

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Acronyms

AD – Anaerobic digester

BSFL – Black soldier fly larvae

COMM – Washington State Department of Commerce

DOH – Washington State Department of Health

EPA – Environmental Protection Agency

ECY – Washington State Department of Ecology

FLW – Food Loss and Waste

FDA – (US) Food and Drug Administration

FTE – Full-time equivalent

GHG – greenhouse gas(es)

HRO – Hunger Relief Organization

JHD/LHJ - Jurisdictional Health Department/
Local Health Jurisdiction

K-12 – Common designation for US schools –
grades kindergarten (K) through grade 12.

LSWFA – Local Solid Waste Financial Assistance

NRCS – Natural Resource Conservation Service

NRDC – National Resource Defense Fund

OSPI – Office of the Superintendent of Public
Instruction

PCC – Pacific Coast Collaborative

PPG – Public Participation Grants

PAYT – Pay-As-You-Throw

ReFED – Rethink Food Waste through
Economics and Data

RNG – Renewable Natural Gas

RIN – Renewable Identification Number

RCW – Revised Code of Washington

UFWW Plan – Use Food Well Washington Plan

UN – United Nations

USDA – United State Department of Agriculture

UN SDG – United Nations Sustainable
Development Goals

UN FAO – Food and Agriculture Organization of
the United Nations

WSDA – Washington State Department of
Agriculture

WCS – Waste Characterization Study

WRAP – Waste and Resources Action
Programme

WRRF – Water Resource Recovery Facility

WRI – World Resources Institute

WRRED – Waste Reduction Recycling and
Education Grants

WWF – World Wildlife Fund

Executive Summary

The **Use Food Well WA Plan** has real environmental, social, and economic benefits:



Environmental Benefits

The *UFWW Plan* has the potential to annually reduce food waste generated in Washington by **1.1 million tons**.

This also reduces greenhouse gas emissions by over **900 thousand metric tons**, the equivalent to the energy needed to power over **108 thousand homes annually**.



Social Benefits

The *UFWW Plan* has the potential to reduce **edible food waste by at least 295 thousand tons per year**. This is critical when over **2 million Washingtonians** have experienced food insecurity in the last year.



Economic Benefits

Full implementation of all the recommendations would **create \$4** in benefits **for every \$1 spent**, and potentially garner net benefits of over **\$1 billion annually**.

The *Use Food Well Washington Plan (UFWW Plan)* outlines a pathway to a more resilient food system through food waste reduction.

Our calculations show **Washington generates more than one million tons of food waste annually**, with a large portion (about 35 percent) being edible food going into landfills. Food waste is one of the greatest challenges of our time, with significant environmental, social, and economic impacts. Thankfully, our research also shows the potential benefits to addressing food waste in Washington are just as enormous (Fig. 1).

To address food waste and wasted food in Washington, the 2019 Washington State legislature passed ESHB 1114, now codified as RCW [70A.205.715 RCW](#).

The law established a statewide food waste reduction goal, relative to 2015 levels, including a focus on reducing the amount of edible food wasted. Ecology is required to establish baseline data to annually track progress towards the statewide food waste reduction goals.

We developed the 2015 baseline data (p. 14), and further defined the edible food waste reduction goal, resulting in the following statewide food waste reduction goals:

Goal 1: Reduce overall food waste by 50 percent by 2030.

Goal 2: Reduce edible food waste by at least 50 percent by 2030.

Our agency was also tasked to develop and implement a food waste reduction plan that focuses on three key strategies:

- 1. Prevention:** Prevent and reduce the amount of food waste.
- 2. Rescue:** Rescue edible food that would otherwise be wasted and ensure the food reaches those who need it.
- 3. Recovery:** Support productive uses of inedible food materials, including animal feed, nutrient recovery, and off-site or on-site management systems including composting, vermicomposting, anaerobic digestion, and other biological systems.

Figure 1. The environmental, social, and economic benefits of the *UFWW Plan*

Our research found it is possible to achieve the 2030 food waste reduction goals through comprehensive implementation of the *UFWW Plan*. This is done by reducing burdens and barriers within the food sector, making investments in critical infrastructure, and by prioritizing public-private partnerships.

A **total of 30 recommendations** (Fig. 2) were identified through a collaborative engagement process that took place from the fall of 2019 thru 2021. To draft the plan, Ecology consulted with the Washington State departments of Agriculture (WSDA), Health (DOH), and Commerce (COM), the Office of Superintendent of Public Instruction (OSPI), and over 150 subject matter experts to identify ways to reduce food waste in Washington. Ecology also conducted research and literature reviews to develop and support the recommendations in the plan. Estimated costs, benefits, and food waste diversion potentials were based on a comprehensive, statewide roll-out over three phases across all sectors in the food system.

While each recommendation could be implemented on its own, a piecemeal approach could result in higher costs and reduced effectiveness, and Washington not reaching its food waste reduction goals. It is crucial to an effective, enduring food waste reduction program that it complements infrastructural and project-based investments with broader investment in research, education, assistance, coordination, and expertise.

When implemented together, **the recommendations in this plan could prevent, rescue, and recover over one million tons of food waste** each year from landfill disposal. A significant portion of this reduction (up to 295 thousand tons per year) would be edible food diverted to hunger relief or new markets.

Working individually and together, the 30 recommendations potentially garner net benefits of over \$1 billion annually from elements such as reduced disposal costs, development of new markets and waste uses, and avoided purchases of additional food.

The *Use Food Well Washington Plan* is a first step on the path towards a more resilient food system in Washington State. Through this work, we have the collective obligation to reduce food waste and create a stronger food system. **We have the obligation to use food well.**



Figure 2. The UFWW Plan process



Use Food Well Washington Plan

“Looking down the road, there is pressure to get it right.”

-Aaron Czyzewski, Food Lifeline

Food has intrinsic value. It nourishes us and is a cornerstone of all cultures. Despite this importance, food waste is the single largest component (17 percent) of Washington’s solid waste stream (1). Washington is also experiencing unprecedented food insecurity, with over 2 million Washingtonians identified as food insecure over the last year (2).

Generating food waste at a time of increasing food insecurity is unacceptable. Also unacceptable are the wasted time, resources, and energy used to move food through Washington’s food system. Washington must do better.

The difficulties Washington faces in responding and adapting to these challenges are rooted in longstanding vulnerabilities. The COVID-19 pandemic exposed existing weaknesses in Washington’s food system, and amplified the need to strengthen the resiliency of our local food systems. This is especially critical for those who are overburdened and in communities that currently lack access to healthy and affordable foods.

This plan includes 30 actionable recommendations, across all sectors of the food system, to address these vulnerabilities by preventing, rescuing, and recovering food waste and wasted food. These recommendations have the potential to meet Washington’s 2030 food waste reduction targets, and beyond, creating a more resilient and vibrant food system.

There is an ethical obligation to respect food, the people who grow it, and the earth that gives it to us. **We all have an obligation to use food well.**

What is food waste?

This plan uses definitions from RCW [70A.205.715](#) to define food waste and wasted food:

Food Waste means waste from fruits, vegetables, meats, dairy products, fish, shellfish, nuts, seeds, grains, and similar materials that results from the storage, preparation, cooking, handling, selling, or serving of food for human consumption. Food waste includes excess, spoiled, or unusable food and includes inedible parts commonly associated with food preparation such as pits, shells, bones, and peels. "Food waste" does not include dead animals not intended for human consumption or animal excrement.

Wasted Food is the edible portion of food waste.

Why is food waste reduction important?

When food is wasted, so are the resources and labor used to grow, harvest, process, transport, and manage the food from farm to table.

A greater understanding of these impacts have catalyzed a global effort to reduce food waste (Fig. 4). The Food and Agricultural Organization (FAO) of the United Nations found one third (approximately 1.3 billion tons) of all food produced for human consumption is wasted (3). In the U.S., 35 percent of the 229 million tons of food available went unsold or uneaten in 2019. That's nearly \$130 billion worth of meals' unsold or uneaten each year, at a cost of almost 2 percent of U.S. GDP (4).

Food insecurity increased over the last year, both nationally and in Washington State. Rescuing edible food for human consumption is a viable pathway to help meet this growing need, while also reducing wasted food in landfills. Reducing food waste increases system resiliency, which is critical when food systems are challenged during crises.



Figure 3. National Guard delivers potatoes at the Tacoma Dome in May 2020 (Drew Perine/The News Tribune)



Use Food Well Stories: Washington-grown potatoes

A successful example of a food redistribution partnership in response to disruptions caused by the pandemic can be seen through efforts to save Washington-grown potatoes.

According to the Washington State Potato Commission, 90 percent of all potatoes grown in the state are sold to institutions, restaurants, and other food service providers. With many restaurants closed due to COVID-19 restrictions, potato farmers had storage sheds full of whole potatoes that would no longer be processed into French fries, tater tots, and other restaurant products due to decreased demand.

With significant volunteer help (Fig. 3) and coordination by the Washington State Potato Commission, Washington farmers gave away more than 200 thousand pounds of potatoes in May, 2020. The mission was to get one million pounds of potatoes into the hands of people in need during the pandemic (5).

The pandemic underscored the need for collaboration and partnerships across the food chain, particularly between farmers, food businesses, and hunger relief organizations. The need for improved mapping of how food flows, emergency food distribution planning, education, infrastructure, transportation, and funding were amplified during the pandemic response.

How is Washington addressing food waste?

The *Use Food Well Washington Plan* is the result of ESHB 1114, now codified as [70A.205.715 RCW](#). Passed during the 2019 legislative session, this law established a statewide food waste reduction goal, relative to 2015 levels, and required a subset of the goal to focus on reducing the amount of edible food wasted. Ecology is required to establish baseline data and annually track progress towards the statewide food waste reduction goals.

Ecology developed the 2015 baseline (p.11) and further defined the edible food waste reduction goal, resulting in the following statewide food waste reduction goals:

Goal 1: Reduce food waste generated by 50 percent by 2030.

Goal 2: Reduce at least half of edible food waste by 2030.

The law requires Ecology to determine baseline data and annually track progress towards these statewide goals. Ecology is also tasked to develop and implement a food waste reduction plan that focuses on three key food waste reduction strategies:

1. **Prevention:** Prevent and reduce the amount of food that is wasted.
2. **Rescue:** Rescue edible food that would otherwise be wasted and ensure the food reaches those who need it.
3. **Recovery:** Support productive uses of inedible food materials, including using it for animal feed, energy production through anaerobic digestion, and for off-site or on-site management systems including composting, vermicomposting, or other biological systems.

To draft the plan, Ecology consulted with the Washington State Department of Agriculture (WSDA), Department of Health, (DOH), Office of Superintendent Public Instruction (OSPI), Commerce (COM), and over 150 subject matter experts (SMEs) to identify ways to reduce food waste in Washington.

Ecology also conducted research and literature reviews to support the recommendations in the plan. As required by the law, Commerce issued an [evaluation on Washington State food waste management](#). This research was utilized throughout the planning process and to better understand Washington's food system.

The following section details the food waste reduction goals and how we will measure progress towards the targets.

Washington is aligned with global, national, and regional goals to reduce food waste by 50 percent by 2030:



Figure 4. Goals to reduce food waste by 50 percent by 2030

Food Waste Goals and Measurement

As codified in [70A.205.715 RCW](#), Ecology is required to identify Washington’s baseline food waste data. Ecology is also responsible for tracking annual metrics to measure progress towards the statewide food waste reduction goals.

Washington’s food waste reduction goals are (Fig. 5 and 6):

Goal 1: Reduce food waste generated by 50 percent by 2030.

Goal 2: Reduce at least half of edible food waste by 2030.



Goal 1

Reduce food waste generated by 50 percent by 2030.



Figure 5. Goal 1 infographic

Our calculations show **Washington generates approximately 1.2 million tons of food waste annually** (Fig. 5), with over **390 thousand tons being edible food waste** (Fig. 6). The residential sector generates 37 percent, and the commercial sector generates 60 percent of food waste annually (Fig. 7).

In order to achieve the 2030 food waste reduction goals, **Washington will need to reduce food waste generated by at least 579 thousand tons, with at least 390 thousand tons being edible food waste.**

How was the baseline data calculated?

Several sources of data were used to determine the amount of food waste generated in a given year, and whether that food waste was disposed or recovered in Washington.

Ecology took the percentages of materials from the 2015-2016 Waste Characterization Study and applied those percentages to the 2015 actually reported disposed numbers to get the food waste disposed in 2015.

A general overview of sources is provided here, and Appendix A includes the best available data.

Municipal solid waste disposal data: Ecology has collected data on the amounts of disposed municipal solid waste (MSW) going to permitted landfills and incinerators since the late 1980s. These facilities are required to annually report the tons of mixed MSW received and disposed by their facility under [Chapter 173-304 Washington Administrative Code \(WAC\)](#). Ecology receives, compiles, and distributes these data to local governments and the public in annual reports (6).

Waste characterization data: To estimate the amount of food in the disposed waste stream, Ecology uses periodic sampling studies, or waste characterization studies. Ecology is required by [RCW 70A.205](#), to conduct periodic characterization of the state’s MSW. This obligation includes determining solid waste disposal rates for each waste category, and keeping the dataset current

Food waste recovery data: Food waste recovery data is tracked in annual reports received by Ecology from compost facilities, anaerobic digesters, land application sites, and other facilities that recover food from the solid waste stream for beneficial uses. Most of these facilities are permitted or conditionally exempt from solid waste handling standards ([Chapter 173-350 WAC](#)), and thus are required to report quantities and types of waste in their annual report. Other facilities report through an annual voluntary recycling survey, conducted by Ecology (7).

Goal 2
Reduce at least half of edible food waste by 2030.

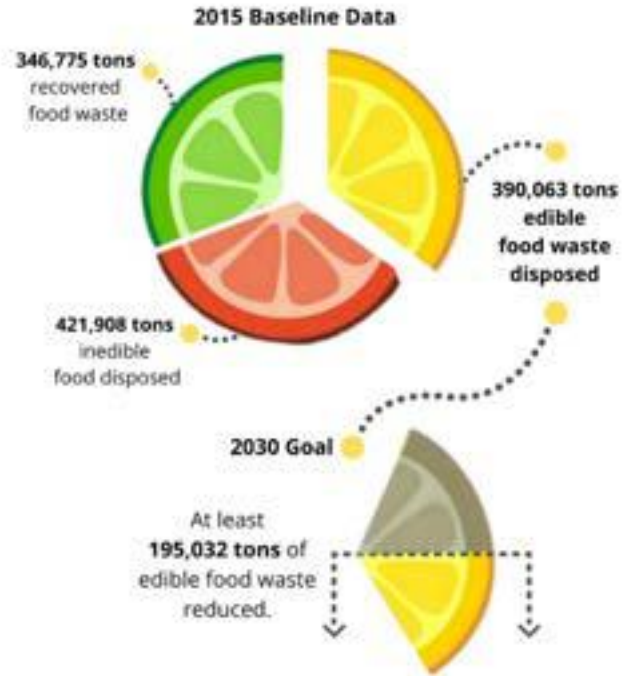
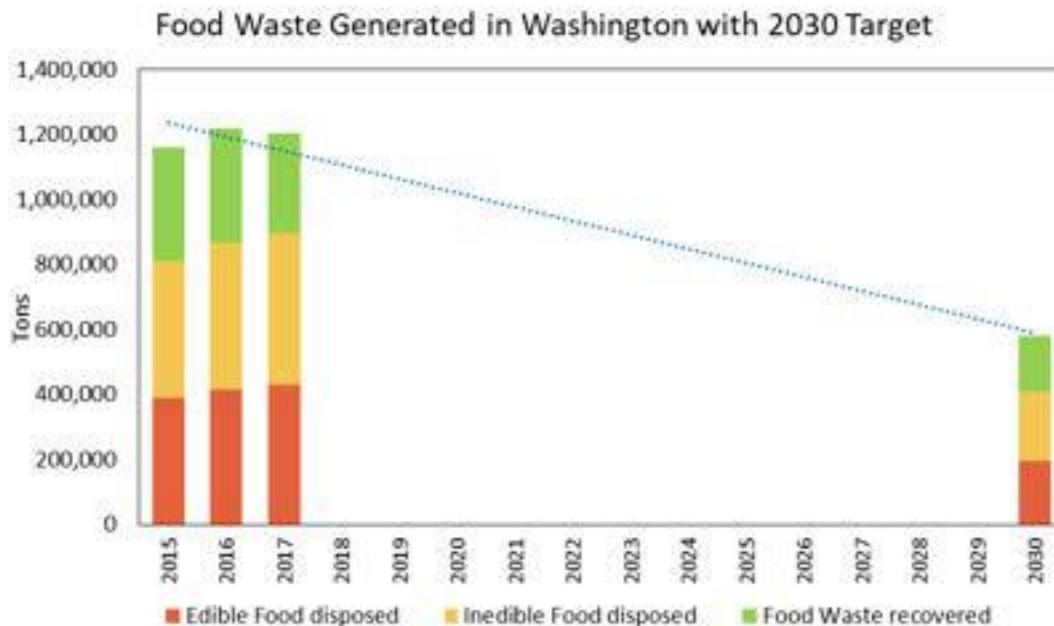


Figure 6. Goal 2 infographic

Table 1. Food waste generated in WA with 2030 target



How can progress towards food waste reduction goals be monitored?

Calculations can be consistently replicated annually as data becomes available and tracked on Ecology’s website and in report updates. Table 1 shows the goal progress with the 2016 and 2017 data.

As more data become available throughout the progress of this plan, Ecology will utilize the best available data to track progress towards the statewide food waste reduction goals. Any plan reporting or updates will include up-to-date methodology and data sourcing to best illustrate the progress through data.

For the most current information and plan tracking, please visit Ecology’s food waste reduction webpage:

<https://ecology.wa.gov/Waste-Toxics/Reducing-recycling-waste/Organic-materials/Food-waste-prevention/Food-waste-plan>

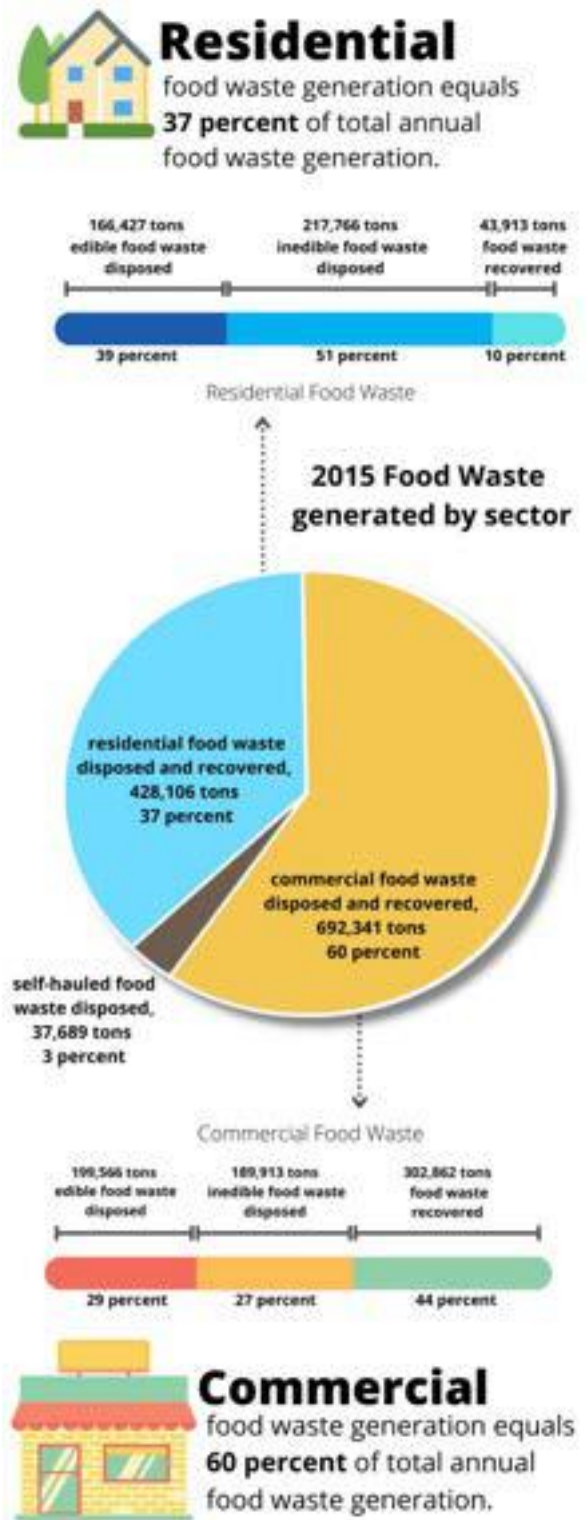


Figure 7. Residential and commercial infographic

Strategies

Washington’s food waste reduction goals are required to be met through three strategies, as codified in [70A.205.715 RCW](#): prevention, rescue, and recovery. Each recommendation includes strategy icons (Fig. 8) to illustrate how these strategies apply and work within the plan.



Figure 8. Food waste reduction strategies

Food rescue is an essential strategy to using food well. Now more than ever, hunger relief organizations (HROs) need access to nutritious edible food, resources, transportation, cold storage, and facilities. HROs across the state are at capacity, despite the increasing need for nutritious foods. Food rescue is a critical component of this plan, and is centered on dignity, increasing access to infrastructure, and networks within Washington.

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

After every effort is made to prevent food waste and rescue edible food, recovery strategies focus on closing the nutrient and energy loop of food waste. In order for Washington to meet its food waste reduction goals, significant investments in recovery infrastructure and pathways will be needed.

This plan focuses on building on Washington’s composting and anaerobic digestion capacity, and the diversification of the food waste management systems. End market development for composting and AD outputs will rely on low contamination rates and the ability to obtain quality feedstock. More research is needed on how to best use and optimize inedible food waste, especially post-consumer food waste, for recovery and animal consumption.

Recommendations Summary



Figure 9. UFWW Plan Infographic

Our research and planning show **it is possible to achieve the 2030 food waste reduction goals with the full implementation of the UFWW Plan** (Fig. 9). This is done by reducing barriers, investing in infrastructure, and by prioritizing public-private partnerships.

We also found additional environmental, economic, and social benefits can be realized through comprehensive implementation, including a **net financial benefit of over \$1 billion annually**.

These results and benefits are only realized through comprehensive plan implementation. Our research demonstrated a piecemeal approach could result in higher costs, reduced effectiveness, and Washington not reaching its food waste reduction goals.

Simply put, every area of the food system will need to successfully reduce food waste in order to sustain a lasting effort (Appendix B indexes recommendations by sector). Our economic analysis (Appendix C) found that there is no one single solution to food waste reduction, but instead an intricate network of recommendations across the food system that, when implemented together, have the capacity to meet our statewide targets by 2030.

Similarly, State agencies have a critical role in leading Washington's food waste reduction efforts, with Ecology, WSDA, DOH, Commerce, and OSPI providing valuable input and expertise. Appendix D indexes the recommendations by agency lead(s).

Continued collaboration between state-agencies and subject matter experts will be necessary to achieve the statewide goals. Once achieved, the work should not stop at the 2030 goals. It is vital to keep moving forward to close the loop on this important nutrient and life cycle. Food is too valuable to waste, and it is our obligation to use food well.

Recommendation Impacts

Our research found, the recommendations in this plan could divert over **1 million tons of food waste each year** (Fig. 10). A significant portion of this reduction (up to 295 thousand tons per year) would be edible food diverted to hunger relief, K-12 nutrition, or new markets. Feeding America uses a calculation of 1.2 pounds of food per meal, so the rescue of 295 thousand tons per year equals over **492 million meals** (8). This is a critical social value as over 2 million Washingtonians experience unprecedented food insecurity.

The recommendations in this plan also have real environmental and economic impacts. When implemented in full, the recommendations in this plan have the potential to annually **reduce greenhouse gas emissions** by over **900 thousand metric tons**, the equivalent to the energy needed to power over 108 thousand homes annually.

The benefits of this GHG reduction can also be illustrated through the social cost of carbon. Social cost of carbon rises over time, and the equation calculates the avoided expenses and costs of rising GHG emissions in the atmosphere.

The 2030 Social Cost of Carbon is \$89.48/ton. The combined diversion of **the plan could reduce the economic impacts of climate change by over \$83 million each year beginning in 2030.**

In addition to the significant avoided costs, there are economic benefits to food waste reduction. We estimated this set of 30 recommendations could result in **annual net benefits of over \$1 billion**, if comprehensively implemented. This means for every \$1 spent in implementing recommendations, \$4 in benefits are created in Washington, mostly realized by the private sector (Table 2).

Our research found, while the benefits and costs are impressive, the key to success is comprehensive implementation of the plan. With a piecemeal approach to food waste reduction, Washington risks not achieving the 2030 food waste reduction targets. There are simply too many barriers to reducing food waste (Appx. E)

With that said, there are recommendations that clearly need to occur ahead of others to maximize impacts and benefits. We support a phased implementation approach to best optimize the benefits and outcomes of this plan.

A phased and thoughtful approach to food waste reduction will help navigate existing and unforeseen barriers to food waste reduction. Appendix F indexes the recommendations by phases, and the following section goes into the implementation process in greater detail.



Environmental Benefits

The *UFWW Plan* has the potential to annually reduce food waste generated in Washington by **1.1 million tons**.

This also reduces greenhouse gas emissions by over **900 thousand metric tons**, the equivalent to the energy needed to power over **108 thousand homes annually**.



Social Benefits

The *UFWW Plan* has the potential to reduce **edible food waste by at least 295 thousand tons per year**. This is critical when over **2 million Washingtonians** have experienced food insecurity in the last year.



Economic Benefits

Full implementation of all the recommendations would **create \$4 in benefits for every \$1 spent**, and potentially garner net benefits of over **\$1 billion annually**.

Figure 10. Benefits of the UFWW Plan

Phase 1 – Foundations phase of plan implementation. Includes recommendations that are needed to set up the framework, funding, or support for additional recommendations.

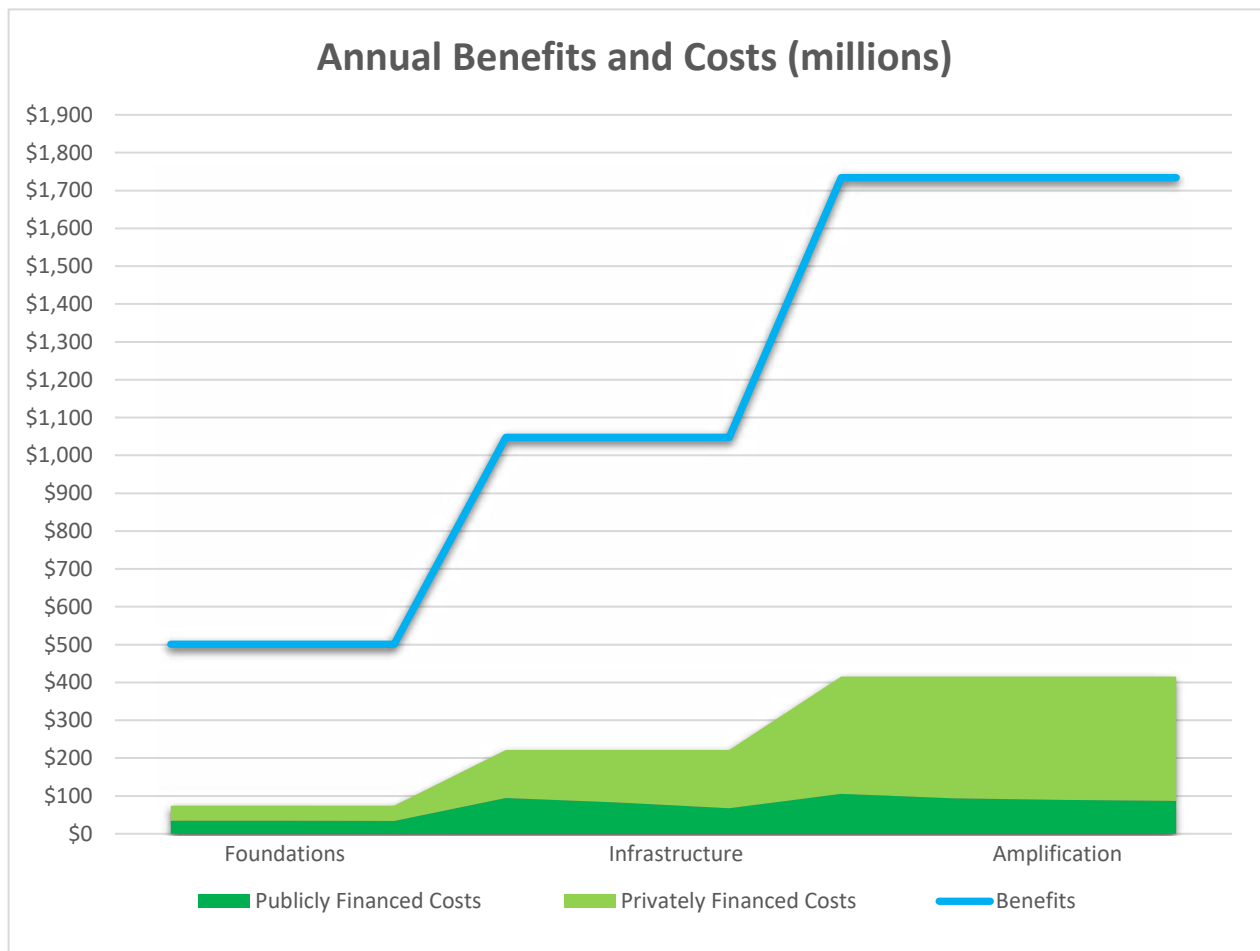
Phase 2 - Infrastructure phase. Expanding off of efforts in the foundations phase, and laying the groundwork for the amplification phase.

Phase 3 - Amplification phase. Builds out the food waste reduction work across the state and food system to realize Washington’s food waste reduction goals.

We assumed approximately three years for each phase. Phase 1 prioritizes financing, networking, and foundational recommendations. More infrastructure and work is developed in Phase 2. This supports the larger amplification of food waste reduction across the state in Phase 3.

Table 2 and 3 illustrate the amplification of this investment and food waste diversion potential over time. Phase 1 will require an average annual investment of \$74 million dollars. This would drive about \$501 million in net benefits and has the potential to divert over 200 thousand tons of food waste from the landfill, with over half of that being rescued edible food.

Table 2. Annual benefits and costs of UFWW Plan



Focusing in on Phase 1

In order for Washington to achieve its food waste reduction goals, agencies and subject matter experts will need to continue to collaborate and develop solutions. This can be best facilitated out of the Center for Sustainable Food Management. Use Food Well Washington Grants will also need to be developed to catalyze funding across the food system.

In addition to financial investments, Phase 1 requires advocating for smart policies at the federal level, developing infrastructure and technology to track and reduce food waste, and building networks across the food system through the Center for Sustainable Food Management.

Phase 1 implementation is rounded out with making critical investments in the hunger relief sector, along with developing food waste reduction campaigns for the commercial and residential sectors. Contamination reduction will also need to be prioritized to help ensure a clean stream of food residuals to recovery options like composting and anaerobic digestion.

There are enormous economic, social, and environmental benefits to food waste reduction. Food waste reduction in Washington means decreased carbon emissions, increased access to quality and affordable nutrition, and a more sustainable and vibrant local economy. Developing a culture around using food well at home and within our communities is going to take focus and ongoing work, but the fruits of the labor are ripe with a resilient food system.

Table 3. Cumulative annual costs and annual net benefits (millions of \$), and cumulative annual diversion potential (tons) through planning phases

Phase	Cumulative Annual Costs (millions of \$)	Cumulative Annual Gross Benefits (millions of \$)	Cumulative Annual Net Benefits (millions of \$)	Cumulative Annual Diversion Potential (tons)	Cumulative Annual Edible Diversion Potential (tons)
Phase 1	\$74	\$575	\$501	203,328	131,349
Phase 2	\$222	\$1,269	\$1,047	476,521	269,976
Phase 3	\$415	\$2,149	\$1,734	1,474,264	295,381

Recommendation Guide

The recommendations are listed numerically for organizational purposes and must be implemented comprehensively in order to sustain measurable food waste reduction.

Recommendations include strategy icons (p. 17) and food sector icons (Fig. 11) to illustrate how the three food waste reduction strategies and food sectors apply to each recommendation. Appendix C indexes the recommendations by sector as well.

For planning purposes, sectors are divided up into 11 categories, including:

- Farmers and ranchers
- Transportation, storage, and logistics
- Schools and institutions
- Retail food businesses
- Hunger relief organizations
- Food service and hospitality
- Community and residential
- Food manufacturers and processors
- Composters and anaerobic digesters
- Local government (includes local health jurisdictions, counties, and cities)
- Washington Legislature (dedicated funding, legislation, or joint memorial)

This plan also features ten, “Use Food Well Stories,” to highlight a few examples of the impressive and innovative food waste reduction work already underway in Washington.

Appendix C includes a table including estimates on each recommendations total cost, benefits, and diversion potential.

Current information on progress towards the 2030 goals and plan updates can be found on our webpage at:

<https://ecology.wa.gov/Waste-Toxics/Reducing-recycling-waste/Organic-materials/Food-waste-prevention/Food-waste-plan>

Food sector icons



Figure 11. Food sector icons

Recommendation and Strategy Index



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1. Support national date labeling standard

Recommendation

The Washington State Legislature passes a joint memorial to support federal legislation to:

- **Standardize date labels:** Require standard labels be used by food manufacturers.
- **Differentiate between quality and food safety labels:** The suggested standard is to use “best if used by” or “best if used or frozen by” as a food quality date label and “use by” or “use or freeze by” as a food safety date label.
- **Provide consumer education:** Require retailers to provide consumer education about how to understand labels.

Overview

Consumer confusion regarding food date labels is well documented and accounts for approximately 20 percent of consumer waste (9). The 2016 report from ReFED identified standardized date labels as the most impactful way to prevent food waste (10).

There is no comprehensive national regulation with the direct mandate to regulate food date labeling for safety and perishability. The food safety labels vary widely depending by state and manufacturer preference.

Date labeling requirements would best serve Washington at the federal level. While state and voluntary efforts are celebrated as a step forward, like [California’s AB-954](#), regulating date labeling at the state level is difficult and cumbersome (11). Modifications to federal law instead of state law will increase consistency for food manufacturers that sell products in multiple states and reduce confusion amongst consumers and businesses.

When implemented in full, this recommendation can annually reduce about 13 thousand tons of food waste, while generating an annual financial net benefit of over \$53 million dollars. Our research also showed this recommendation has a high benefits to cost ratio, low cost per ton, and has the potential to rescue a significant amount of edible food.

This plan recommends that Washington support federal legislation to standardize consumer facing labels, such as the [Food Recovery Act of 2020, H.R. 5841](#), proposed in 2020, which includes all three components of this recommendation.



Standardize date label language

It is [often unclear to the consumer](#) what the date label really means on food packaging. One study showed, when asked to define ‘best before’ dates unprompted, 65 percent correctly included a reference to product quality, although 27 percent of participants incorrectly stated product safety (9). For this reason, standardized language using “best if used by” or “best if used or frozen by” as a food quality date label and “use by” or “use or freeze by” as a food safety date label has been proposed in federal legislation.

Differentiate between quality and food safety labels

Many consumers use food date labels to make decisions about discarding food and incorrectly assume that the date label is an indicator of food safety. In Washington State, it is not against the law to sell or donate food past the label date. However, consumers are often confused about what the date labels mean. By requiring different standard labels be used to indicate food quality versus food safety, it will be easier for consumers to make informed decisions about donating or discarding food past the label date.

Provide consumer education

Consumer education is needed to increase understanding of food date labels (12). Surveys have identified younger consumers are more likely to perceive date labels to be indicators of food safety and discard foods past the label date. Education is needed for consumers to understand *when* they should discard food instead of relying on the date label. Once a national standard for date labeling is enacted, support for a nationwide and statewide education campaign is recommended to help inform businesses and consumers of the changes. Organizations like WRAP in the UK have [measurably reduced food waste](#) with clear education and labeling that includes food storage and safety instructions (13).



2. Strengthen the Bill Emerson Good Samaritan Food Donation Act

Recommendation

The Washington State Legislature passes a joint memorial to support federal legislation that strengthens the Bill Emerson Good Samaritan Act to:

- **Allow the sale of food at a discounted price:** Broaden language to protect nonprofit organizations that sell food at a discounted price and the donors that donate to these nonprofits.
- **Encourage direct donations from restaurants:** Modify language to include donations made by food businesses and retailers directly to individuals.
- **Emphasize food safety:** Change the definition of apparently wholesome food to replace “quality and labeling standards” with “safety and safety-related labeling” to clarify that donated food must meet all federal, state, and local food safety requirements.

Overview

The [Bill Emerson Good Samaritan Food Donation Act](#) provides liability protection for individuals that donate apparently wholesome food to nonprofit organizations for ultimate distribution to the hungry. Washington State has its own version of this law, called the [Good Samaritan Food Donation Act \(RCW 69.80.031\)](#) that also provides liability protection for individuals who donate food to hunger relief organizations.

Despite these laws, many businesses, including 50 percent of food manufacturers, 25 percent of retailers/wholesalers, and 39 percent of restaurants, cite liability concerns as a barrier to donating food (14). Additionally, in both the federal and state versions, liability protection does not extend to businesses that provide direct donations to hungry people, or those that sell meals to the hungry at a reduced cost (15).

To increase consistency of food donation liability, this recommendation focuses on modifications to federal law instead of state law. When implemented, this recommendation can annually divert an estimated 16 thousand tons of food waste from the landfill, while generating an annual net financial benefit of approximately \$20 million dollars. Our research also found this recommendation has a high benefits to cost ratio, and ability to rescue a significant amount of edible food.





The Food Recovery Act of 2020, [H.R. 5841](#), includes all three recommended improvements to the Bill Emerson Good Samaritan Food Donation Act:

- **Allow liability protection for the sale of food at a discounted price**

An innovative approach to tackling food insecurity and waste generation is the advent of nonprofit grocery stores that sell surplus food at low cost to food insecure individuals. These organizations may meet a need in the community by providing food at a reduced cost for hungry individuals not willing or able to qualify for government assistance or visit a food pantry.

Broadening the law to expand liability protections to include these nonprofit organizations may result in more donations. Additionally, the ability to sell surplus food at low cost allows for the use of profits to buy things such as more storage space or refrigerated vehicles.

- **Encourage direct donations from restaurants**

Extending liability protection to food establishments that provide direct donation to the hungry shortens the supply chain and may allow for timelier donation of perishable food. This modification will increase efficiency and reduce costs, encouraging more food establishments to provide direct donations. These facilities are already required to follow food safety standards in the Washington State Retail Food Code ([Chapter 246-215 WAC](#)), which ensures these direct donations are safe.

- **Emphasize food safety**

There is some ambiguity regarding what qualifies as “apparently wholesome food” because both state and federal law uses the term “quality” and not “safety” in the definition. “Quality” is not defined and can refer to a variety of things such as flavor, safety, appearance, freshness, “best by” date, etc. Similarly, many labeling standards correspond with quality and not safety requirements. This recommendation supports clarifying what “apparently wholesome food” means under the law and further encourages food donations that are safe but may not meet all quality and labeling standards.



3. Increase markets for lower-grade produce

Recommendation

Increase market demand for lower-grade produce by:

- Changing customer perception of produce by incorporating gardening into elementary school curriculum.
- Including stipulations in state purchasing contracts to require a certain percentage of produce purchased to be lower-grade.
- Supporting federal legislation to review the Code of Federal Regulation, [Title 7, Part 51 grading standards](#) to identify best practices and programs that increase demand for lower-grade produce.

Overview

This recommendation focuses on actions in lower, medium, and higher-level scope to create a cultural and economic shift towards increasing markets for lower-grade produce.

Lower-grade produce includes fruits and vegetables that do not meet grading specifications but are otherwise edible and nutritious. Specifications including standards for produce color, size, and quality and are particularly important for trade.

A major challenge is that most consumers have an aversion to lower-grade produce (16) and are not willing to pay the same cost for produce perceived to be lower quality or undesirable. Through education in elementary schools, an educational and cultural shift can be made in the value of lower grade produce. Similarly, creating programs and levers to increase markets for lower grade produce at the state and federal level can help catalyze this cultural and economic shift.

When implemented, this recommendation increases system resiliency while reducing food waste. This recommendation has an estimated annual food waste diversion potential of 10 thousand tons, while generating an annual net financial benefit of approximately \$19 million dollars. Our research also showed this recommendation has the potential to develop new businesses and rescue a significant amount of edible food.

This recommendation supports beginning with the following key actions to increase markets for lower-grade produce:



Incorporate gardening into elementary school curriculum

Researchers suggest incorporating gardening activities into elementary school science curriculum can improve perceptions of lower-grade produce and affect purchasing decisions when these children become adults (17). Gardening exposes students to the natural variation and aesthetic value of fruits and vegetables, giving them personal experience and a more realistic understanding of produce variability.

Include stipulations in state purchasing contracts

Another way to expand the market for lower-grade produce in Washington State is by requiring a certain percentage of produce purchased at state facilities and institutions be lower-grade.

This recommendation encourages the Washington State Legislature to explore updating Chapter 39.26 RCW to include stipulations in purchasing contracts to support the purchase of cosmetically lower-grade produce. Prioritizing locally sourced lower-grade produce will help create lower-grade produce markets for Washington farmers.

Support federal legislation to research and develop best practices and programs that increase demand for lower-grade produce

The Washington State Legislature can pass a joint memorial to support federal legislation to research and develop best practices and programs to nationally integrate the sale of lower-grade produce for retail sale, use in food service, restaurants, institutions, and within households.

Many food businesses are unaware of the cost-savings affiliated with the sale of lower-grade produce. Our federal partners have the unique opportunity to strategically map and identify ways that can help increase the total harvested value for the farmer, while decreasing the amount of food left on the field.

Finally, this recommendation encourages the Washington State Legislature to consider how stronger connections can be made between farmers and HROs to increase markets for lower-grade produce. Incentives and levers can be designed along with the above actions to increase food rescue and decrease on- the- farm loss.



4. Improve federal tax incentives

Recommendation

The Washington State Legislature passes a joint memorial to support federal legislation to:

- Expand the federal tax deduction for food donation to include non-profit sales and transport.
- Offer an alternative tax credit for food donation by farmers.
- Develop valuable end markets through tax incentives.



Overview

This recommendation supports expanding the existing federal tax deduction and developing an alternative tax credit for food donation by farmers. These measures can increase the amount of edible food donation overall, while reducing food donation barriers for farmers.

When implemented fully, this recommendation has the estimated potential to annually divert 10 thousand tons of food waste from the landfill. This is the only recommendation in the plan with a negative annual net financial benefit, totaling to -\$7 million dollars. Our research also showed this recommendation has the potential to rescue a significant amount of edible food.

Expanding the federal tax deduction for food donation to include non-profit sales and transport.

The federal government already recognizes the value of tax deduction incentives, and existing incentive programs have proven to be effective in rescuing food from the retail sector. For example, when incentives were temporarily expanded to cover more businesses in 2005, food donations across the country rose by 137 percent in 2006 (10).

Under current law, the federal enhanced tax deduction for food donations can only be claimed when food is donated to a non-profit that does not charge the end recipient for the food. Expanding the federal tax deduction can incentivize donations to more recipients, including social supermarkets that sell donated food at an extremely discounted price or food recovery organization that charge \$1 to recipients to help offset the costs of home delivery.

Adding transport services for donated food as a separate cost eligible for enhanced deduction will also help overcome one of the most expensive barriers for businesses to donate excess food to those in need.

Offer an alternative tax credit for food donation by farmers

Nationally, farmers produced approximately 10.1 million tons of on-farm waste (9). Some of this waste is a result of unharvested or partially harvested crops. These unharvested crops are well suited for added-value food processing or donation to hunger relief organizations.

The existing federal enhanced tax deduction for food donations is not well-suited to farmers and often is not claimed by them, as many farmers operate at low profit margins and do not make enough income to claim a tax deduction. Further, the calculation of the value of the deduction is very onerous for farmers.

Congress could provide an alternative tax credit for farmers instead of the existing enhanced deduction. This would incentivize farmers to donate their surplus food and offset some of the costs of donation, including labor. Washington can also enact state-level tax credits for food donation.

This plan also supports the recommendations made by the [Natural Resource Defense Council and the Harvard Law School Food Law and Policy Clinic's](#) to improve federal tax incentives:

- Federal tax incentives should be expanded to include an alternative tax credit that can be used by low-margin businesses, like many farms, in lieu of the enhanced deduction.
- Federal tax incentives should be strengthened by adding a deduction or credit specifically to cover the cost of transporting donated food.
- Congress should foster the development of innovative, sustainable food recovery models by repealing the “no-charge” provision that does not allow the enhanced deduction to be claimed if donated food is “transferred by the donee in exchange for money, other property, or services.”
- Congress should amend the enhanced deduction to only require compliance with safety standards and safety-related labeling Food, Drug, and Cosmetic Act requirements (18).

Develop valuable end markets through tax incentives

To help offset the costs and barriers associated with food waste management and reduction, tax incentives should be developed to increase valuable end markets. In order to beneficially use food waste through end market development, industries require consistent feed stock, and consistent food waste streams to maintain efficiencies, sales prices, and production. Tax incentives can help reduce barriers to supporting this market development.



5. Continue support for the Pacific Coast Collaborative (PCC)

Recommendation

Continue Washington State’s support for the PCC.

Overview

Formed in 2008, the PCC established ambitious goals for reducing greenhouse gas emissions (GHGs) by at least 80 percent by the year 2050, and a major focus of that effort is food waste reduction.

The [PCC Food Waste Reduction Project](#) began in June 2016, when the PCC entered into the Pacific North American Climate Leadership Agreement (PNACLA) – which spurred the creation of the Pacific Coast Food Waste Commitment. Washington signed onto this work in 2019, along with declaring statewide food waste reduction goals.

The PCC includes jurisdictional partners from state, county, and local governments (Fig. 13), along with resource partners (Fig. 12) including WRAP, ReFED, WWF, and Cascadia Policy Solutions. This work drives impact through collaboration to achieve measurable food waste reduction, while sharing knowledge and best practices. This public-private partnership is a major component on how experts can provide technical assistance to food businesses and manufacturers.

Supporting the PCC directly support’s Washington’s food waste reduction goals. This recommendation acts as a lever for other recommendations. When fully implemented, this recommendation has the potential to generate an annual net financial benefit of approximately \$568 thousand in cost-savings from an investment of \$100 thousand dollars. This cost-savings is enough to buy over 400 thousand meals at wholesale prices.

Through this effort, jurisdictions work directly with resource partners to provide technical assistance to food businesses. The initial focus of this regional food waste reduction work is grocery retail, with the intention to amplify across the food system to achieve regional food waste reduction goals.



Figure 12. PCC resource partners



The PCC uses the “**Target-Measure-Act**” framework established by the World Resources Institute for the global Champions 12.3 initiative to structure its food waste reduction activities:

- **Target:** Setting ambitious food waste reduction targets that are aligned with Sustainable Development Goal 12.3;
- **Measure:** Implementing streamlined methodology for measurement – including anonymized reporting and individual dashboards – to help businesses across the food supply chain reduce waste and better identify areas to target for action; and
- **Act:** Driving industry progress through sharing best practices, leading demonstration projects, and providing technical assistance related to policy, financing, businesses solutions, and education.

The PCC’s West Coast Voluntary Agreement (VA) to Reduce Wasted Food was launched in 2020 to support the food industry in achieving its reduction goals – by targeting, measuring, and acting on its food waste.

The West Coast VA is based on a commitment from all participating businesses to:

- Support and play a part in achieving the West Coast’s regional goal of reducing and preventing wasted food by 50 percent by 2030;
- Annually measure and report food waste reduction data to ReFED for ongoing analysis;
- Take action to reduce food waste, with an emphasis on prevention-related solutions;
- Share existing food waste reduction plans or create and implement new ones;
- Collaborate with other private and public partners participating in the PCC Food Waste Reduction Project, with the option to participate in working groups.

Figure 13. PCC jurisdictional partners



6. Create the Washington Center for Sustainable Food Management

Recommendation

Create the Washington Center for Sustainable Food Management to help coordinate statewide food waste reduction.

Overview

This recommendation is a major component of how Washington’s food waste reduction work is coordinated beyond the planning phase. The majority of the recommendations in the plan require a coordinated effort across the food sector and state agencies to see impacts. Many of the recommendations in the plan require strategic implementation, compounding efforts, and ongoing monitoring to be successful.

This recommendation supports developing a one-stop-shop, the Washington Center for Sustainable Food Management, to help coordinate work and meet the state’s goals. When fully implemented, this recommendation helps support the majority of the recommendations in the plan, while streamlining investments and effort on food waste reduction work.

While it is difficult to calculate the exact food waste diversion potential of this recommendation, this recommendation is clearly a catalyst and amplifier for other recommendations. We estimated this recommendation has an annual net financial benefit of \$4 million in efficiency cost-savings from an investment of \$1 million. This cost-savings is enough to buy over 3 million meals at wholesale prices.

Without this recommendation, Washington risks not effectively reducing food waste and meeting its food waste reduction targets. Within our current system, businesses, organizations, and volunteer groups become interested in reducing food waste, but are faced with a need to contact multiple agencies and organizations to obtain information or assistance. Whether they are trying to prevent food waste, donate food safely, or recover food waste for productive purposes, efforts to get information can be cumbersome and discouraging.

This Center should be housed in the Department of Ecology, as Ecology is responsible for determining the annual food waste data, is the state lead on food waste reduction efforts, and currently participates as the state’s liaison for the PCC’s regional food-waste prevention work.



A more networked and streamlined food waste reduction system would support the critical moments where food needs to be redirected efficiently and safely. This is especially true when large supply chains are disrupted. Instead of throwing away edible food because of communication or logistical delays, organizations and households can contact the center to be connected with local hunger relief organizations (HRO) and receive timely information on proper food safety standards.

The Center can also support voluntary working groups, similar to the work structure of the Pacific Coast Collaborative, to help support food waste reduction efforts. The Center can coordinate dedicated food waste reduction grant funding, mapping of the food system, and facilitate partnerships across the food system. The Center can also consolidate emerging data and research on the best strategies for food waste reduction.



The Washington Center for Sustainable Food Management may:

- Coordinate the implementation of the Use Food Well Washington Plan
- Draft plan updates and measure progress towards actions, strategies, and the statewide reduction goals.
- Maintain website with current food waste reduction information and guidance.
- Provide staff support to the Pacific Coast Collaborative food waste reduction work.
- Stay connected to the Food Policy Forum’s work on food system resiliency.
- Facilitate and coordinate public-private and non-profit partnerships focused on food waste reduction through voluntary working groups.
- Collaborate with federal, state, and local partners on solutions to food waste.
- Develop and maintain mapping of the food system of Washington.
- Research and develop emerging organics and food waste reduction markets.
- Coordinate and implement the statewide food waste prevention and organics contamination reduction campaigns.
- Distribute and monitor grants dedicated to food waste prevention, rescue, and recovery.



7. Connect Use Food Well Washington Plan to the Food Policy Forum

Recommendation

Build connections between the Use Food Well Washington Plan and the Food Policy Forum's food system resiliency planning.

Overview

Washington's food system is complex and multifaceted, and so is the effort to reduce food waste and rescue edible food. Ensuring reduction in duplicate efforts, and to support existing work, this recommendation focuses on connecting *UFWW Plan* to the Food Policy Forum. Similar to Recommendation #6, it is difficult to calculate the exact diversion potential of this recommendation, but it is important to highlight connected planning and implementation efforts.

When implemented in full, this recommendation has an estimated annual net financial benefit of \$56 thousand dollars in efficiency cost-savings for other recommendations, from an investment of \$67 thousand. This cost-savings is enough to buy over 41 thousand meals at wholesale prices.

The Food Policy Forum has identified actions similar to the recommendations in the *UFWW Plan* in their most recent [2020 updated actions report](#). Connecting this work with the networking and stakeholder engagement to the Use Food Well Washington Plan will help support information sharing across critical focus areas. For example, some of the funding requests in this plan support the ongoing work of Farm to School and Regional Markets development out of WSDA and OSPI.

Food Policy Forum Goals

- Increase direct marketing sales and consumption of Washington-grown foods;
- Expand and promote programs that bring healthy and nutritious Washington-grown foods to Washington residents;
- Examine ways to encourage retention of an adequate number of farmers for small scale farms, meet the educational needs for the next generation of farmers, and provide for the continued economic viability of local food production, processing, and distribution in the state; and
- Reduce food insecurity and hunger in the state; and
- Identify ways to improve coordination and communication among local food policy entities and communication between the local food policy entities and state agencies.



8. Research levers and develop partnerships to prevent food from entering landfills

Recommendation

Research and develop strategies through partnerships to prevent food from entering landfills.

Overview

A major barrier to food waste reduction in Washington is the lack of levers to prevent food from entering landfills. This creates an inaccurate valuation of food, and has real environmental, social, and economic impacts. One of the most effective levers to incentivize food waste reduction is to implement policy mechanisms to divert organic waste from landfills.

This recommendation supports Ecology facilitating voluntary working groups to develop partnerships and identify solutions to prevent food from entering landfills. This recommendation also supports enacting a landfill ban on food waste and wasted food by 2028 if the state is not on target to reach the 2030 food waste reduction goals. Ultimately, Washington would need comprehensive plan implementation and successful public private partnerships to prevent a statewide ban on food waste and wasted food from going into effect.

We calculated when fully implemented, this recommendation has the estimated annual food waste diversion potential of 74 thousand tons, and an annual net financial benefit of \$3 million dollars. Our research showed this recommendation has a high diversion rate compared to other recommendations, and low cost per ton of food waste and waste food diverted.

While levers to prevent food from entering landfills are developed, so should incentives to increase diversion upstream, including rescue and recovery infrastructure highlighted in this plan. The commercial and processing sectors need incentives and financing to overcome the initial hurdles of managing food and food waste.

Infrastructure capable of managing this food waste will be needed in order to effectively implement any type of rule or program that diverts inedible food from landfill disposal in Washington. Connecting infrastructure investment with policy mechanisms to divert organic waste has shown success in other states and jurisdictions. At least eight states and numerous cities have already adopted policies to do so (19).



Examples of levers and mechanisms include:

- **Ban organic waste in landfills** – Connecticut, Vermont, Massachusetts, New York, Rhode Island, and California all have versions of bans in effect today with additional resources set aside to help local governments and businesses adapt (20). California, for example, funds the adaptation costs, but allows local jurisdictions to develop the specific organic recycling program, outreach, and enforcement.
- **Mandate food scrap recycling** – This model may prove more effective for city governments, given that landfills are not always managed by or within the cities they serve (21). Seattle, Austin, New York City, and San Francisco are all examples where this model is in place today.
- **Implement Pay-As-You-Throw (PAYT) Pricing** – Under this market-based model, recycling and composting organic waste is priced much lower or at no-cost versus landfilling it. Any organics sent to landfills is then charged per waste amount via a metering model as most other utilities use today (21). This corrects the market failure that incentivizes landfilling organic waste today, without the potential political resistance that often comes with a government mandate or ban.
- **Levy a Landfill Tax** – A similar variation of PAYT that at least twenty states have implemented is a landfill tax, which is added to the existing tipping fee that each municipal waste facility charges per unit of trash (10). A landfill tax helps to ensure that, even if a tipping fee is inexpensive on its own, the overall cost to landfill remains higher than recycling and composting alternatives. Part of the funding from this tax revenue could be used to fund FLW source reduction and prevention activities. Careful consideration should be made for large and already well-developed programs so they are not penalized.



An example of successful levers: The City of Seattle has used mandates as a lever to divert organics from landfill disposal since the late 80s, and more recently prohibited food waste from garbage in 2015.

Municipal code 21.36.082 states that commercial clients are prohibited from placing food in garbage containers. Commercial clients are further required to manage food waste generated on-site through on-site management, subscription to a composting service, or self-haul food waste to a processor. Penalty fees can be assessed for violations of this code. Residential customers (single-family, multi-family, and mixed-use buildings) are also prohibited from placing of food waste in garbage containers. Penalty fees can be assessed if violations occur.

According to the [City of Seattle website](#), “Before the ordinance, Seattle sent approximately 100 thousand tons of food waste 300 miles to a landfill in eastern Oregon each year. This resulted in higher costs and greenhouse gas emissions. Today, Seattle sends more than 125 thousand tons of food and yard waste to composting processors.”



9. Increase state grant funding for food waste reduction

Recommendation

Increase funding for state-level food waste reduction through new and existing state-level grants.

Overview

Increasing state grant funding for food waste reduction has the potential to boost the efficacy of other recommendations, and helps fund and support the majority of the recommendations in the plan. This recommendation can also help collect necessary food waste data to help target food waste reduction opportunities (See Rec. #15 and #16 for more information).

Nationally, ReFED estimates that an aggregate \$18 billion of new financing is needed to achieve a 20 percent waste reduction – or roughly \$2 billion per year averaged over the next decade. The ReFED report estimates that a one-time investment of \$18 billion will yield roughly \$100 billion in economic benefits for society nationally, including an estimated \$20 billion in total business profit opportunity over the same period (10).

Our research demonstrated similar outcomes for Washington (\$5 in benefits for each \$1 invested), and state-level grants were identified as sustainable funding mechanisms that can help reduce initial cost barriers. When implemented fully, increasing state grants for food waste reduction has an estimated annual food waste diversion potential of nearly 1 million tons, and an annual net financial benefit of approximately \$1 billion dollars.

This recommendation supports increasing state grant funding through developing new funding mechanisms like “The Use Food Well Washington Grants,” and through utilizing existing funding mechanisms. Appendix G inventories existing and historic state-level grants.

Pairing state and federal support (e.g. various USDA programs) is a tried and true approach to maximizing investments, and when used together, can be great catalysts for food waste reduction infrastructure development and innovation. More information on federal level funding opportunities can be found on the [U.S. EPA](#), [USDA](#), and [NRCS](#) websites.





Use Food Well Washington Grants

New food waste reduction funding mechanism

The most efficient way to increase state-level funding for food waste reduction is to develop a grant specifically focused on food waste prevention, rescue, and recovery. This grant can provide funds to support the development of critical food waste reduction infrastructure, while simultaneously requiring data reporting to better understand food flows in Washington.

This recommendation supports developing the UFWW Grant system, and prioritizing reducing the burden on the hunger relief sector through strategic investments. Similarly, supporting commercial food waste reduction, specifically the grocery retail sector, could be a successful initial focus point of the grant system. By requiring data collection and demonstrated landfill diversion, important data on Washington's food flows and food waste reduction best practices can be collected through the grant system.

The Use Food Well Washington Grant (UFWWG) will be designed to help bridge the gap between existing funding mechanisms and what is needed to build a more resilient food system. This new grant system can be administered out of the Center for Sustainable Food Management, or Ecology's Solid Waste Management program. The grant system can be funded by MTCA and/or WRRLCA, or other appropriate funding mechanisms.

This grant system will support public-private partnerships, data collection whenever available, and have the ability to be combined with federal food waste prevention funds for maximum community impact. Local governments, businesses, hunger relief organizations, and non-profits can apply for funds that cover:

- Food waste prevention projects that prevent food waste from being generated and becoming waste normally destined for landfills.
- Food rescue projects that result in rescued food being distributed to people, that would otherwise be destined for landfills.
 - Any food waste residuals from the food rescue project must be composted or sent to a digester within the project service area (if applicable).
- Food waste recovery projects that recover food that would otherwise be discarded in the landfill and not applied to a higher beneficial use.



Use Food Well Stories: Sustainable Connections

Doing traditional waste audits at food producing businesses, staff at Sustainable Connections saw too much edible food being thrown away. Most of the businesses, including restaurants, schools, and caterers were not connected to hunger relief organizations. Staff saw an unmet need, received a grant from the Department of Ecology and in 2017 the Food Recovery Program (FRP) was created.

The FRP helps businesses redirect food to support community hunger relief organizations, which reduces disposal costs for the businesses and reduces the environmental impacts of disposed food. Managers work hard to understand the needs of different hunger relief organizations so each get the food they want and can use rather than indiscriminate distribution that can result in the food going to waste.

The pandemic produced new challenges and opportunities. The organization helped shift the supply chain to get bulk foods to new destinations and volunteers gleaned food the food banks did not have the capacity to collect (Fig. 14). The repackaging and distribution of bulk prepared food is an area that needs support. As the program grows, grants and donations will help buy new food handling equipment and data management programs to better track food flows.

Sustainable Connections surplus food recovered:

2019: 59,000 pounds

2020: 255,000 pounds;
212,415 meals served

2021: Over 100,000 pounds
as of July, 2021.



Figure 14. Sustainable Connections volunteer rescuing edible food rain or shine



10. Infrastructure investments in Washington schools

Recommendation

Increase funding and support for food waste prevention infrastructure in Washington schools.



Overview

This recommendation supports increasing funding to invest in the infrastructure needs of Washington K-12 schools. Washington schools have demonstrated a need of over \$2.5 million worth of funding to expand staffing and invest in equipment to increase food waste prevention efforts (Appendix H). Our calculations show that with an investment of \$2.5 million, Washington's K-12 schools can demonstrate a net benefit of almost \$3.5 million by avoiding costs like garbage hauling, while reducing food waste.

Across the state, infrastructure investment is necessary to support more locally sourced and nutritious food, and for schools to make more sustainable choices overall. For example, many kitchens lack the space to prepare and cook fresh foods or wash durable service ware. Schools across the state want to develop environmental curriculum and need funding for school gardening equipment and supplies. Similarly, schools that want to better understand their waste stream need to purchase waste audit equipment and materials.

Some of the more common requests from K-12 schools include:

- Food processing equipment
- Dishwasher, refrigerator, oven, range, coolers, and milk dispensers
- Electrical work for food waste prevention equipment
- School gardening equipment

Investing in food programs in schools supports increased planning for food prep and storage space and equipment, which can lead to greater partnerships with local farmers and growers. Supporting waste audit stations to monitor food waste and adding space to handle edible food for donation furthers school goals to reduce food waste. Coupling this investment with increased sustainability staffing can result in more local partnerships and a better understanding of a school's food waste.

For example, Clark County Green Schools measured saving 548 gallons of milk from being wasted across four different school districts by providing milk dispensers and washable cups. This work replaced milk cartons and demonstrated a significant reduction in milk and carton waste.



Use Food Well Stories: Clark County Green Schools

In the [Pilot for Clark County](#) schools, changing from carton milk to dispensers with washable cups, showed the following results:

- All 5 schools showed a reduction in milk waste ranging from 1.15 to 7.25 gallons per day, with an average reduction of about 70% per day.
- Using this data and assuming 180 days in a school year, these schools each prevented an average of 548 gallons of milk from being wasted each year!

Milk dispensers are a two-for-one solution for food AND packaging waste reduction. When giving students the option to dispense how much they will drink and giving a more positive milk drinking experience with a cup instead of a carton, less is wasted.

Despite the initial cost of installation (Each milk dispenser set up costs between \$4,500 - \$9,000 depending on the number of students), many school districts that have switched to milk dispensers have saved thousands of dollars and created a lighter and cleaner waste stream (no soggy half-filled milk cartons) for custodians to manage.

The success of this pilot can be found by the partnerships and willingness to try new systems.

For example, Clark County Green Schools received a \$40 thousand dollar grant from Ecology to cover the cost of the dispensers, glasses, dishwashing racks and other equipment needed. They also worked with school officials on education, planning and implementation of the pilot, while developing partnerships with the Washington Dairy Council to help support and promote the program (Fig. 15).

START STRONG
with Local Milk

Increase your ADP and reduce waste.
Promote milk dispensers in your school with a turnkey marketing program from the Washington State Dairy Council!

The program offers:

- Posters & digital assets
- Tips tool kit
- Kick-off events
- Milk dispenser signage

Questions?
Bri Kappel, RDN
425.245.2526
brianne@wadairy.org

FUEL UP
with a cup

Find out more at
saasmarf.org/pages/start-strong

Dairy Council

Figure 15. WA Dairy Council start strong campaign (Clark County Green Schools)



11. Require food waste prevention, rescue, and recovery education in Washington schools

Recommendation

Require food waste reduction education in K-12 schools statewide, and include the necessary investment in staffing at the state, county, and local level to support education efforts.

Overview

Food waste reduction education and curriculum are critical to achieving long-term food waste reduction. Students take lessons home from the classroom, or innovate on the pressing challenges of our time. A recent study found students who participated in gardening, nutrition, and cooking classes ate, on average, a half serving more vegetables per day than they did before the program (22).

This recommendation supports requiring food waste reduction education in K-12, which would require the establishment of a minimum one full-time equivalent (FTE) standard position for each county dedicated to food waste reduction and education efforts in K-12 schools. Examples of this education include:

- School gardening and composting programs.
- Conducting school waste audits and monitoring food waste data (Fig. 16).
- Classroom, Green Team, and school-wide education on the values of preventing, rescuing, and recovering food waste, like [Green Team Activities on Food Systems and Food Waste Reduction](#), the King County Food for Thought workshop described [here](#), and [WWF's Food Waste Warriors](#).
- Increasing access to school pantries and perishable foods to food insecure students.
- Support development of student “green clubs” to help educators with food waste reduction program development; pay club advisors a stipend to increase engagement and longevity of the program.
- Participating in the “[Smarter Lunchrooms](#)” initiative and develop nutritional curriculum for students.
- Increasing partnerships with farmers, modeling off of the successes of [Oregon's Farm to School program](#).



Our research shows that when implemented fully, this recommendation has an annual net financial benefit of over \$500 thousand dollars, and an annual food waste diversion of approximately 3 thousand tons.

While most schools will be able to see cost savings through food waste reduction work, due to differences with collection and hauling of waste it is hard to say if all projects will be so cost effective. The [World Wildlife Fund](#) reviewed multiple schools across the nation and estimated that “if all the schools in the National School Lunch Program reduced their waste by an average of 3 percent, they could save an estimated \$52 million each year.” [Another report](#) describes how the USDA’s National School Lunch Program “wastes about \$5 million worth of edible food every school day.”

Integrating food waste reduction education into Washington’s educational fabric

Schools with existing county-level support for food waste reduction have seen significant reduction in solid waste disposal costs and reduction in food costs. A [2016 estimate](#) shows that Olympia’s schools equipped with dispensers eliminated 350-400,000 empty cartons from their waste stream, preventing about 9,000 gallons of milk from being poured out. This effort reduced schools’ annual waste collection costs anywhere from \$750 to just under \$2,000.

Dedicated support and resources are needed to integrate food waste reduction education into the educational and operational fabric of school districts across the state. This support should consist of both uniform and tailored elements to reflect differences in school districts across the state and allow for flexible and cost-effective implementation of school composting.

Uniform elements would include:

- Development and provision of K-12 curriculum consistent with WSDA best practice that elevates OSPI Environmental & Sustainability Education (ESE) standards (23).
- Adequate FTE program coordination based on district populations, achieved in partnership with school districts, local government, private or non-profit staff.

Tailored elements would include:

- Equipment support. Develop waste-sorting and composting equipment protocols for districts with access to municipal composting programs and those without (24). Provide funding for equipment necessary to implement programs.
- Encourage public/private partnerships where feasible to leverage coordination support for cost effective implementation. For example, utilize local government, school district, private or non-profit staff as lead coordinator.

Metrics and evaluation criteria should include both environmental and educational markers:

- Diverted tons per student per school
- Carbon reduction calculation, such as those calculated by the [EarthGen](#) Calculator.
- # of students per participating school

Tiered staffing system

Counties currently supporting such staffing positions have seen measurable positive changes in solid waste reduction, including food waste reduction, in the schools they work with. The students within these schools supported by these county-level personnel receive extensive opportunities to participate in food waste reduction efforts in the school.

The first tier of this staffing system would be increased staffing at OSPI to:

- Lead state-level oversight of food waste reduction efforts in K-12 education,
- Help inform future legislation and funding needs for food waste management practices in schools, and
- Enforce existing legislation for extended seated lunch times and recess before lunch.

The FTE minimum would be established based on county population with the minimum FTE per county set at 1 FTE. These personnel would provide supports to K-12 schools in a number of ways, including, but not limited to all of the listed activities in this recommendation. County public works departments or regional Educational Service Districts could possibly house this position.

Dedicated funding is crucial to ensure equitable and effective implementation of food waste reduction education across the state. Potential funding mechanisms could include increased support of new funding mechanisms, Ecology's Local Solid Waste Financial Assistance to fund local program coordination, or OSPI's Healthy Kids-Healthy Schools program to provide needed equipment.



Figure 16. Students and staff perform waste audits through EarthGen's School Food Share Program (EarthGen)



12. Increase funding for local health jurisdictions

Recommendation

Increase public health funding to LHJs to²:

- Provide inspections and technical assistance to HROs.
- Promote proper food donation with food businesses, schools, and institutions.
- Support consistent application of food safety regulations regarding HROs and food donation.

Overview

The Centers for Disease Control (CDC) estimates that approximately 960,000 Washingtonians fall ill with a foodborne illness each year. The majority of these illnesses go unreported and the associated costs can be significant.

While there have been no reports of foodborne disease outbreaks in Washington associated with HROs, there have been outbreaks in other states. In 2012, over 60 people fell ill after eating at the Denver Rescue Mission. As we see the increasing need for more resiliency and connectivity within our hunger relief networks, there is an equal need to ensure food safety.

This recommendation supports increasing public health funding to help provide technical assistance and food waste reduction education to HROs and food businesses, schools, and institutions.

When fully implemented, this recommendation has an estimated annual food waste diversion potential of 104 thousand tons, and generates an annual net financial benefit of approximately \$415 million dollars. Through simultaneous investment in staffing and inter-agency coordination, this recommendation has the potential to catalyze Washington's food waste reduction efforts. Our research also showed this recommendation has a high benefit to cost ratio, high diversion potential, including the ability to rescue a significant amount of edible food from going to the landfill.



² If funding cannot be improved for LHJs to conduct this work, it is recommended that regulatory authority be transferred to a state agency (like DOH or WSDA) and funding be provided to those agencies to provide inspection and technical assistance to HROs. This would require an update to RCW 69.80 to grant state agency regulatory authority of HROs.

Regulation of Hunger Relief Organizations (HROs)

The lack of HRO permit fees presents a unique challenge for LHJ food safety programs, which are often already understaffed. In Washington, HROs are considered food establishments in the Washington State Retail Food Code [WAC 246-215](#) and are regulated by LHJs. According to [WAC 246-215-09400\(2\)](#), HROs are not required to pay permit fees or obtain a food establishment permit. Instead, HROs (called Donated Food Distributing Organizations in [WAC 246-215-0115](#)) are required to submit an annual report to their LHJ describing their food handling activities.

Local Health Jurisdiction (LHJ) Funding Shortfalls

Since the adoption of WAC 246-215 in 2005, HROs have not been required to pay permit fees or obtain a food establishment permit. As a result, most LHJs do not collect fees to support HRO inspection or technical assistance activities. In 2005, the rule change transferred the cost burden to the LHJ and over the years fewer and fewer LHJs have been able to support unfunded inspection activities of HROs or promotion of safe food donation in their communities.

Limited LHJ inspection and technical support

LHJs regulate food establishments, including HROs, to evaluate safe food handling practices. Increased communication, frequent inspections, and technical assistance from LHJs can increase food safety at HROs. Due to lack of funding and resources in LHJs across the state, LHJs often struggle to adequately monitor and regulate HRO's. For example, some HROs are unaware that food safety regulations apply to them and are not used to working with their LHJ to provide technical assistance when questions arise.

Many LHJs do not have the resources to identify all the HRO within their community and instead rely on HROs submitting an annual report. This can result in a lack of food safety oversight at HROs that do not submit annual reports.

If LHJs had additional funding they may be able to identify and communicate with HROs that are unaware of regulatory requirements. For HROs, without this oversight, there is little assurance of food safety among potential corporate donors as well as some members of the public who would otherwise need the services of an HRO. Several retailers mentioned anecdotally during the planning process that they have concerns donating food to HROs that are uninspected and unpermitted.

LHJ outreach to food businesses on important donation regulations like the Good Samaritan Act can greatly assist in food rescue efforts. There are misconceptions on what foods can be donated in addition to how to safely donate food. According to a 2016 study by the Food Waste Reduction Alliance, approximately 50 percent of manufacturers, 25 percent of retail/wholesalers and 39 percent of restaurants identified liability as a barrier to donation (14).

Currently, this type of outreach is rarely done by LHJs when interacting with food businesses. In addition, by identifying and mapping all of the HROs in the state, a better communication network can be realized within the food system. This will enable LHJ food safety professionals to provide technical assistance to food businesses about safe food donation and encourage them to donate to local hunger relief organizations within their community.



13. Statewide Food Waste Reduction Campaigns

Recommendation

Develop statewide food waste reduction campaigns focused on Washington’s residential and commercial sectors.

Overview

Simply put, a major barrier to using food well is education and understanding how to use food well. Nationally, food waste education campaigns have a diversion potential of 548 thousand tons, with an economic value of \$2.65 billion dollars (10). Appendix I includes a list of food waste reduction campaigns.

Our research showed this recommendation has a high benefits to cost ratio. When fully implemented, this recommendation has the potential to annually divert approximately 31 thousand tons of food waste, while generating an annual net financial benefit of \$137 million dollars.

Both the public and private sectors of Washington need more support with food waste reduction education and technical assistance. To begin this effort, this recommendation focuses on developing two statewide food waste reduction campaigns for the residential and commercial sectors. The campaigns would be developed and administered out of Ecology, and ideally, out of the Center for Sustainable Food Management.

Residential food waste reduction campaign

Ecology, in collaboration with other state agencies, can develop a food waste prevention campaign focused on the residential sector. This campaign should have key components focused on all three of the plan’s strategies: prevention, rescue, and recovery.

Studies have indicated that while consumers understand the importance of food waste reduction, they do not recognize their own role in solving the problem (25). In addition to promoting more responsible behavior, a food waste reduction campaign can also promote a greater cultural shift towards more sustainable behaviors.



This campaign can include online modules, customizable toolkits, and guidance on the following key subject areas:

- Focus on safe food donation and edible food rescue
- Making better use of leftovers
- Meal planning and Smart Shopping
- Metrics gathering software and food waste reduction challenges
- Diversified food waste management systems like composting and vermicomposting (See Rec. #30)

Commercial Campaign

Similar to the Residential Campaign, Ecology can lead and facilitate a commercial campaign focused on food waste reduction. This campaign, in coordination with other state agencies, should have key components across the plan's strategies of prevention, rescue, and recovery.

Within food businesses and HROs, there can be high turnover in staff/volunteers and numerous competing priorities. To help facilitate food rescue and food waste prevention education, Ecology, with the help of partnering agencies, can develop the following materials in support of a commercial food waste prevention and rescue campaign:

Increasing the quality of edible food donated to HROs should be a priority of the campaign, along with ensuring HROs and food businesses have clear guidance on food donation and rescue laws.

This campaign can include online modules, customizable toolkits, and guidance on the following key subject areas:

- Guidance for food businesses on the best practices of food donation
- Donor education and training
- Research and report how to effectively reduce barriers to donating quality edible food to HROs.
- Education on how to maximize existing resources and networks to leverage otherwise difficult to get resources like transportation, cold chain management, and labor.
- Develop guidance and share research on feeding non-meat food waste to animals (See 'Areas of future research' section for more details)



14. Support local government food waste reduction efforts

Recommendation

Support local government food waste reduction work by:

- Stabilizing and increasing state-level funding for local government food waste reduction and on-site recovery education.
- Developing standardized language and communication materials, and provide state-level food waste reduction technical assistance.

Overview

Local governments are the powerhouses behind much of the food waste reduction and on-site food management education in Washington State. In addition to supporting many of our communities' essential services, local governments are often found at the helm of community food waste reduction and on-site management education.

There is not a "one-size-fits-all" solution to food waste reduction and on-site management, and challenges can vary widely across the state. Local governments are best suited to coordinate and target opportunities within their own communities, and many are already working on food waste prevention, rescue, and on-site recovery programs.

There are many benefits to this recommendation, including tailoring the food waste reduction to work to local communities. When fully implemented, this recommendation has an estimated annual food waste diversion potential of 100 thousand tons, while generating an annual net financial benefit of approximately \$67 million dollars. Our research also showed this recommendation has the potential to rescue a significant amount of edible food.

This recommendation focuses on two critical ways to support local governments:

- Stabilize and increase state-level funding for local government food waste reduction work.
- Develop standardized language and communication materials on food waste prevention, rescue, and recovery for local government use.

To support the development of this recommendation, and to learn more from local governments, we conducted a local government survey in December 2020. Results and best practices from this survey can be found in Appendix J.



The survey revealed that the biggest limiting factor to supporting existing and new programs is funding and staffing to support the work. Food waste reduction is time intensive work and requires adequate resourcing and funding to be successful. Similarly, infrastructure investments are needed to prevent, rescue, and recover food waste.

Local governments in both rural and urban communities have expressed interest in small-scale anaerobic digesters and increased access to organics collection services. More cold storage and transportation infrastructure is also needed statewide to help support food rescue efforts.

Increased funding to local governments could come from existing or new food waste reduction grant programs, or through leveraging federal funding. There is also a need for more standardized information and clear messages on food waste prevention, rescue, and recovery. Ecology can develop and maintain a website that includes details, guidance, and toolkits to help communicate about food waste reduction. Communication on share table best practices, milk dispenser implementation guidance, and other food waste reduction strategies could be supported through this work as well.



Use Food Well Stories: Lewis County workshops

Melanie Case, Recycling Coordinator for Lewis County developed and produced the “Take a bite out of waste” food waste prevention workshops to educate Lewis County residents on food waste issues and to share tips on how to reduce the amount of food they waste.

The workshops included food waste statistics, reasons behind food waste, ideas on how to reduce food waste, and a “walk the talk” session by members of the County’s Master Recycler Composter group. They shared their personal tips to store, prepare, preserve, and use up food so it doesn’t get wasted. Melanie said that while “the statistics on food are interesting, people really just want tips on how they can reduce food waste.” Workshops information was also shared at school presentations and community events.

Costs to produce the workshops included staff time and printing costs for educational information, but participation by the many volunteers helped keep costs to a minimum. Establishing a stable food waste prevention grant program, and a statewide food waste reduction campaign will help all counties in their outreach efforts related to food waste.



Figure 17. Lewis County school food waste audit for reduction awareness outreach. Source: Lewis County



15. Food waste tracking and analytics

Recommendation

Support waste tracking analytics to better understand food flows in Washington, including:

- Standardize food waste tracking and analytics statewide, modeling after methods developed by the [ReFED Insights Engine](#) and [WRAP](#).
- Incentivize food flows and food waste data tracking.
- Increase voluntary food waste tracking and analytic efforts.
- Connect food waste tracking and analytics to funding mechanisms and incentives.
- Provide technical assistance to help share information across sectors.

Overview

The adage, “What gets measured, gets managed,” can be easily applied to food and food waste. The more we know about food flows, the better we can target and manage them.

The existing data on food waste in Washington is incomplete, and as a result there is much to be learned from Washington’s food waste flows, or how food moves within the food system. State level data currently includes waste characterization studies and regulated components of the food system, but much is unknown about how food waste happens in Washington. Even when the data is available, pounds of rescued food do not tell the full story of how much of the food could not be redistributed for human consumption. We must track food flows higher than disposal to meet Washington’s food waste reduction goals.

This recommendation supports increasing statewide waste tracking and analytics effort through Ecology’s Center for Sustainable Food Management (Rec. #6). Through the Center and the PCC’s work (Rec. #5), this network can help produce results through regionally planned and locally focused food waste reduction efforts using the Target > Measure > Act framework, as highlighted on page 29.

When fully implemented, this recommendation has the potential to divert about 20 thousand tons of food waste annually, while generating \$76 million dollars in annual net financial benefits. Our research also showed this recommendation has the potential to catalyze business development.



Use Food Well Stories: Swedish First Hill and Leanpath partnership

Swedish (Fig. 18) is the largest non-profit healthcare provider in the Puget Sound. The campus typically serves about 1,800 customers a day in patient services, 600 meals a day retail and hosts about 10 catered events. Corporate Executive Chef Zachary Schwab has overseen food waste reduction using Leanpath since 2007, resulting in deep cuts in food waste.

Schwab remembers seeing the food waste data for the first time, 13 years ago. “What surprised me was the amount of food waste overall, but what stood out was the amount of protein waste,” he said, “You are not in the kitchen all the time, and food waste adds up throughout the day. A little here and a little there. Then you see the Leanpath data and it’s, ‘Wow, we overproduced \$100 worth of that protein today.’”

The data gathering technology included built-in food waste photography. “The photos were surprising too,” says Schwab. “You see eight loaves of banana bread that had too much lemon agent in them and couldn’t be used. That’s hard to see.”

Through this partnership, Swedish First Hill has been able to **sustain 53 percent food waste reduced by value and 40 percent reduction by weight.**

Some of the most effective food waste reduction strategies came from staff after meetings to collectively review the food waste data. For example, the data showed a high level of food waste due to overproduction. Oftentimes cooks were following production sheets correctly, but the expected number of covers didn’t show up. “Maybe it was sunny outside,” says Schwab.

The solution—was to engineer the menu for second-day use, and use overproduction in the doctor’s dining room.

“For example, instead of baking off all the chicken quarters for dinner, you bake off half of it. If we don’t get the covers we want, we know the next day we can serve it at the doctor’s dining room and it will be fresh. Now, we with our menu development, we always ask, ‘If I make this today, will it still be good quality tomorrow?’”

The same mindfulness has been applied at Swedish during the coronavirus pandemic. “We’re really on top of it these days,” says Schwab. “Food costs are so expensive, all the hospitals around the country are financially strained right now.”



Figure 18. Swedish First Hill medical facility in Seattle (LeanPath)



16. Mapping food system flows

Recommendation

Map Washington's food system to:

- Identify food flows, where waste occurs and opportunities to prevent food waste.
- Find resources that could be shared for greater efficiencies and resilience (such as cold storage, processing, and transportation).
- Connect potential partners, especially HROs, and facilitate sharing challenges and opportunities within the food system.

Overview

More needs to be done to identify key partners in the food system, and to connect them with one another to reduce food waste, especially for HROs. The mapping of Washington's food system would support many of the recommendations in the plan and is a key component of each of the prevention, rescue, and recovery strategies.

This recommendation supports developing a statewide map of the food system.

Mapping the Washington food system could be conducted by Ecology, and ideally by the Washington Center for Sustainable Food Management. This map could build off existing mapping effort to tailor a map that best serves Washington. The United States Environmental Protection Agency (EPA) maintains the [Excess Food Map](#), and another great example is the [Eat Local First Farm Finder](#).

With the increase need for shared commercial kitchens, cold chain supply, food supply redirection, and identifying local hunger relief organizations, the Washington map can be a hub that helps connect food with those who need it and can use it well, while facilitating connections to further reduce food waste.

While it is difficult to determine the total food waste diversion potential of this recommendation, mapping has a clear financial benefit of \$1.8 million dollars annually in reduced information and networking costs in other recommendations. Our research also showed this recommendation has a high benefits to cost ratio, and the ability to catalyze other recommendations.





17. Improve donation transportation

Recommendation

Improve donation transportation by:

- Developing partnerships between food businesses, logistic companies, and hunger relief organizations.
- Increasing food rescue through efficient transportation and incentives.
- Increase funding for transportation investments.

Overview

The greatest need of Washington, and especially for HROs, is increasing the ability to transport, store, and process nutritious edible food. ReFED estimated that nearly 80 percent of food waste generated nationally comes from perishable foods (9). Meanwhile, hunger relief organizations (HROs) experience unprecedented need for quality nutrient-dense foods such as dairy, meats, fruits and vegetables (26).

Across the state, HROs have demonstrated over \$10 million in needs for transportation, cold chain management, and storage infrastructure through legislative requests. Pooling transportation resources within local food networks like the South King County Food Coalition may be a valuable option to get the highest return on investment.

This recommendation supports improving donation transportation by developing more cross-sector partnerships within the food system, increasing transportation efficiencies, and dedicating funding for transportation investments. When fully implemented, this recommendation has the annual food waste diversion potential of 48 thousand tons, while generating an annual net financial benefit of \$184 million dollars. Our research also showed this recommendation has the potential to rescue a significant amount of edible food, while supporting business development.

Partnerships and connections

Many recommendations in this plan work together to increase partnerships and connections, and this type of partnership facilitation would be stewarded through the Center for Sustainable Food Management. Roundtables and connections would benefit networking cross-sector groups in the food business, transportation, cold chain storage managers, and the hunger relief sectors. Partnerships can also be facilitated between organizations and academic institutions like the UW Urban Freight Lab.



Increase food rescue through efficient transportation

The need for efficiency with food donation, coupled with the natural uncertainties of food rescue create deep supply chain challenges within the food system.

Perishables need to be distributed quickly and efficiently to maintain freshness and food safety. Costs to transport donated food are typically covered by HROs, many of which are operating with small budgets and increasing demand. Many of the smaller HROs in Washington rely on volunteer help to transport and process donated food. The COVID-19 pandemic has directly disrupted volunteer supply, as much of the HRO volunteer base can be considered vulnerable populations and may take extra precautions.

As transportation funding is made available through the state, metrics and collection data can be requested through the grant funding mechanisms. The more available data on the food system, the better we are able to assess where food waste prevention, rescue, or recovery opportunities exist.

Use Food Well Stories: Thurston County Food Bank

In response to the COVID-19 pandemic, Thurston County Food Bank (TCFB) was able to pivot from usual distribution models in order to serve the community as safely as possible. One model developed was the Community Point of Distribution (CPODs) (Fig. 19).

Throughout 2020, TCFB had CPODs at five locations, and served over 8 thousand households. TCFB was able to maintain their existing food rescue community partnerships while successfully making the pivot to the new system. TCFB Executive Director Robert Coit said, “The rules do not go away when things go wrong. Best practices carry forward into modified operations during a Pandemic. But without the right tools you are faced with tough decisions and often lower service levels.”

Their success can be found in long-term planning and support. TCFB has benefited from the state-level funding many HROs across the state require to build capacity. These investments are critical to giving HROs the capability to adapt and serve their community. Coit shared, “our ability to respond last year was directly related to the capacity we built within our system. Now we are motivated to expand capacity even further.”



Figure 19. Thurston County Food Bank CPODs in action (TCFB)



18. Build more farm to school partnerships

Recommendation

Build more farm to school partnerships in Washington through increased funding and staffing.



Overview

Farm to school programs connect communities to our state’s farmers, ranchers, and fishers through local food purchasing for child nutrition programs, school gardens, and hands-on agricultural education. Farm to School programs also boosts rural economies and improves children’s health.

According to the [USDA’s Farm to School 2015 Census Data](#), 49 percent of school districts in Washington State participate in Farm to School activities in some way. This includes 91 school districts who bought ingredients directly from Washington farmers between 2013-2018, spending over \$17 million on local food in 2013-2014.

Since 2008, farm to school programing has been coordinated between the Washington State Department of Agriculture (WSDA) and the Washington Office of Superintendent of Public Instruction (OSPI) to build farm to school partnerships across the state. In 2018, the [Washington State Farm to School Network](#) was also formed to support and grow this work. To help connect more schools to farms, this recommendation encourages mirroring the successes and structure of the [Oregon Farm to School Grant program](#) farmers, producers, and local food suppliers.

When fully implemented, this recommendation has the potential to reduce about 5 thousand tons of food waste, while generating an annual net financial benefit of \$5 million dollars. This recommendation supports the ongoing efforts by WSDA and OSPI to build Washington’s Farm to School program. Similarly, this recommendation supports increasing funds for Farm to School activities like gardening and agricultural education in Washington schools.

To reduce burden on educators and staff, investment can also be made in community-based organizations. These partnerships between local organizations and schools can help sustain food waste reduction education efforts while improving student understanding of the food system. Having experts from the community partner with schools also helps reduce the education burden on teachers and staff. Once successfully implemented, this model and effort can be further used to connect local farms to more Washingtonians.



19. Develop an emergency food distribution plan for Washington schools

Recommendation

OSPI will develop best practices and statewide guidance for the K-12 system to distribute school meals to students, when an emergency prevents students from in-person attendance.

Overview

The OSPI 2019 meal participation report shows that schools provided approximately 200 million meals during the school year (includes breakfast, lunch, some snack programs) to students across the state. Of that number, the report indicates the 73 million were provided at no cost to students who did not have the financial support to purchase the food (27).

When COVID-19 led school districts across the state to close in March of 2020, concerns grew about how to get school food to all students, with particular concern for the students who depend on school meals to survive. Fortunately, many school districts in the state, staffed with faculty, teachers, and volunteer assistance, were able to continue to get meals to those in need (28); (29); (30).

This recommendation supports reviewing actions taken by school districts across the state in response to school closures and determining which approaches can be replicated and standardized across all school districts. The successful approaches would be detailed in an emergency food distribution guidance plan.

When fully implemented, this recommendation has the potential to annually reduce 5 thousand tons of food waste, while generating an annual net financial benefit of \$25 million dollars.

The proposed guidance document will:

- Improve the resiliency and confidence in our food and education system,
- Identify ways to coordinate state and federal food distribution programs,
- Prevent food waste,
- Ensure that vital nutrition is getting to the students, and
- Support staff providing direct education and services to students.





20. 20-minute seated lunch minimum in Washington schools

Recommendation

Require statewide policy for 20-minute seated lunch minimum in Washington schools.



Overview

According to a study conducted by the Office of the Washington State Auditor on school lunch durations, most elementary-age students have less than 20 minutes of seated time to eat in Washington schools (31). Seated time is the amount of time students have to eat their lunch after going through the lunch line and sitting down to eat, which is different than the total amount of time scheduled for lunch.

The benefits of a seated 20-minute lunch minimum include:

- **Less edible food left behind by students** – More food eaten correlates with less wasted food and a longer lunch will promote the consumption of more food by students.
- **More nutrition for students** - Healthy mealtime experiences are essential for schoolchildren in developing good eating habits that will last through adulthood.
- **Better overall behavior and learning ability** – With increased nutrition, studies have shown students are more likely to focus in the classroom and do better on tests.

When fully implemented, this recommendation has the potential to annually divert about 3 thousand tons of food waste, while generating an annual net financial benefit of approximately \$159 thousand dollars.

During the 2019-2020 school year, OSPI began a seated lunch time pilot with 6 schools in Washington state to start establishing best practices for the initiation of a 20-minute seated lunch time. OSPI determined a few barriers exist to initiating a 20-minutes seated lunchtime. This requirement should account for the following barriers:

- Increased staffing needs for extended overall lunch periods,
- Financial barriers to adjusting the school schedule to accommodate extended lunch periods, and
- A need for increased lunchroom staff and support.



21. Recess before lunch in Washington schools

Recommendation

Support statewide policy requirement for recess before lunch in Washington schools.



Overview

This recommendation supports a statewide policy requiring recess before lunch in K-12 schools. When fully implemented, this recommendation has the potential to annually divert over 2,000 tons of food waste from the landfill, while generating an annual net financial benefit of approximately \$121 thousand dollars. Our research also shows this recommendation has a low cost per ton of food waste diverted, and the ability to rescue a significant amount of edible food.

Recess before lunch has proven to effectively reduce food waste and positively affect student eating habit (32). Studies have shown students consume 67 percent more food, including fruits and vegetables, when recess is scheduled before lunch, compared to students with recess after lunch (32). When recess is scheduled affects children's nutritional well-being and can directly impact their attentiveness and ability to learn in the classroom

More than half of the Washington schools audited in the report conducted by the State Auditor's Office did not offer recess before lunch (31).

To successfully implement recess before lunch statewide, OSPI could mandate initiating recess before lunch through their rule making process. Effort to begin this transition through pilot programs is already underway. During the 2019-2020 school year, OSPI began a seated lunch time and recess before lunch pilot with 6 schools to start establishing best practices for the initiation of recess before lunch. This pilot will continue in the future as schooling returns to the classroom.

In addition to the lunchtime requirement, the OSPI policy should provide technical assistance and manage for the concerns and barriers to implementing recess before lunch. Some barriers include concerns about access to handwashing opportunities between recess and lunch, and adjustments needed to academic schedules.



22. Increase access to cold chain management

Recommendation

Increase access and funding for cold chain management across the food supply chain, especially for hunger relief organizations.



Overview

Cold chain management is the temperature-controlled supply chain from harvest to consumption. Cold chain management processes are focused on managing the temperature of perishable products in order to maintain quality and safety from the point of origin through the distribution chain to the final customer.

This recommendation supports increasing access to existing cold chain management, in addition to increasing statewide investments in cold chain infrastructure, especially in the hunger relief sector.

When fully implemented, this recommendation has the potential to annually divert 22 thousand tons of food waste from the landfill, while generating an annual net financial benefit of approximately \$70 million dollars. Our research also showed this recommendation has the ability to rescue a significant amount of edible food, while promoting business development.

Experts within the Washington hunger relief community indicate access to cold chain infrastructure to being a one of the main limiting factors in the amount of nutritious food they can provide their communities. Improving distribution efficiencies and storage capacity in donated food distribution network would also allow for more food to be introduced to hunger relief efforts, leading to less food waste to landfills.

Maximizing existing cold chain infrastructure through innovative partnerships and networking can help minimize environmental impacts while increasing the quality of food donated to hunger relief organizations. Developing a better understanding of existing infrastructure and potential partnerships can benefit the entire supply chain, especially in times of crisis.

This recommendation can best be supported by the following actions:

- Develop a better understanding of existing cold chain infrastructure in Washington through research and mapping.
- Facilitate partnerships of existing cold chain storage capacity through the Center for Sustainable Food Management, connecting all sectors of the food supply system.
- Increase funding to hunger relief organizations through statewide grants, so they can purchase more cold chain trucks, storage facilities and equipment (Fig. 20).

Actions and solutions should prioritize the following outcomes:

- Increasing food safety and the quality of food donated to hunger relief organizations.
- Increasing food rescue by prioritizing access to cold chain management for hunger relief organizations, especially in times of crisis.
- Energy efficiency through heat reclamation, renewable energy supply, retrofitted cold storage units, and maximizing existing infrastructure first.
- Increasing community resilience through shared cold storage facility hubs for HROs, businesses, and food distributors.
- Innovate and increase access to mobile cold storage units and depackaging machinery to increase food waste prevention and food rescue.



Figure 20. Food Lifeline cold storage trucks ready to be dispatched for hunger relief. Source: Food Lifeline



23. Support value-added food processing and manufacturing

Recommendation

Support value-added food processors and manufacturers by:

- Increasing incentives for sector development in rural and urban areas.
- Promoting innovations in de-packaging and re-packaging technology.
- Increase understanding of regulations and best practices for value-added food processing and manufacturing.

Overview

Value-added food processing is the process of taking a raw commodity and changing its form to produce a high-quality end product. In Washington, this can look like a farmer making salsa out of some of their tomato crop, or a company purchasing food residuals from a manufacturing process and then upcycling them into baking and smoothie ingredients.

Value-added food processing has the potential to have a large roll in food waste reduction work across the state. When fully implemented, this recommendation has the potential to annually divert 28 thousand tons of food waste from the landfill, while generating annual net benefits of approximately \$40 million dollars. To catalyze this work, this recommendation supports the following actions:

Increase incentives for sector development in rural and urban areas

Both farmers and small businesses indicate their need for more infrastructure support. Machines, costs to process the food or residuals, trucks to transport the feedstocks, and materials can become a barrier (33).

Access to quality ingredients and networks is another barrier for this sector. Increasing network strength through the Center for Sustainable Food Management is a viable solution to support the emerging field. Grants through the Department of Commerce could support this initial infrastructure development, and data could be captured through the reporting process.

Promote innovations in de-packaging technology

The state does not currently have adequate infrastructure to depackaging or repackage food and food waste. This often pushes the value-added food processor to have to buy their own equipment, which can be difficult to obtain and is often expensive.



Since there is no one-size-fits-all, successes in depackaging are largely dependent on each feedstock. More could be understood on the Washington food system to help support innovation in depackaging technology. Through supporting value-added food processors, we can work to divert more edible and inedible food from the landfill that would otherwise be considered contaminated. Contamination is an area of concern with depackaging technology, and careful effort should be made to decrease plastics and micro plastics from the food and organic material streams. Decreasing contamination, while increasing depackaging infrastructure, food and food waste can be used more beneficially throughout the food system.

Develop a voluntary working group through the Center for Sustainable Food Managements to support value-added food processing and manufacturing

Another large barrier for this sector is how new and innovative the work is. More could be done to help facilitate information and guidance to both farms and food businesses in this sector. One solution could be to facilitate voluntary working groups through the Center for Sustainable Food Management to increase connectivity. Voluntary working groups could help build an understanding of food flows, networks, and help value-added food processors and manufacturers learn quickly and reduce more food waste in this emerging field.

Use Food Well Stories: Addie's Alternative LLC

When a request came in asking if Addie's Alternatives LCC could haul packaged food to the landfill, owner Luke Dynes saw a problem that needed a solution: removing the packaging so the food could be made into animal feed instead. Luke quickly realized the largest barrier to redirecting this food waste was access to depackaging technology. Through trial and error, Luke built equipment that would not require "hand depackaging," but instead would be a mechanical.

With locations across the Pacific Northwest, Addie's has since expanded to work with food manufactures and businesses to direct inedible food towards added value food processing and animal feed when possible (Fig. 21). From bread companies, potato chip manufacturers, to lower grade carrots, Luke has a connection that can beneficially use food residuals.

For example, in just April 2021, Addie's sent 3,697,200 pounds of feed to the cattle feeders and dairies, instead of much of the material going to the landfill for disposal. Building on these innovations and networks across the state will ensure Washington meets its food waste reduction goals, using food well along the way.



Figure 21. Luke standing next to depackaged food residuals ready for animal feed. (Addie's Alternatives LLC)



24. Community food hubs

Recommendation

Increase the number of community food hubs across the state to help rescue and recover edible food.



Overview

Across the food system in Washington, businesses and organizations request more community food hub support. A community food hub can be considered a network and shared community space to process, add-value, repackage, depackage, or otherwise prepare food for human consumption. Figures 22 and 23 illustrate a few examples of community food hubs at work in Washington.

Farmers can use the space to prepare or add-value to produce, and hunger relief organizations can use the space to repackage donated edible food. Community food hubs may facilitate education like canning courses or composting guidance and can locate food waste management systems on-site for easy pick-up.

This recommendation could mean investments in existing or new infrastructure. When fully implemented, this recommendation has the annual food waste diversion potential of 25 thousand tons, and has the potential to generate an annual net financial benefit of \$57 million dollars. Our research also shows this recommendation has the potential to rescue a significant amount of edible food, while supporting business development.

This recommendation supports increasing the number of community food hubs across the state by:

- Facilitate connections between state agencies and existing networks like Regional Agricultural Development Partnerships or the Northwest Agriculture Business Center and local hunger relief networks.
- Coordinate efforts to [identify optimized locations](#) for community food hubs across the state.
- Create funding specific to supporting the development of community food hubs.
- Co-locate depackaging and repackaging machines and infrastructure at community food hubs.
- Co-locating food waste management systems at community food hubs.

Helping farmers

In recent decades, fruit and vegetable processing has shifted from small dispersed processing to large-scale centralized processing. This shift has made it increasingly difficult for smaller farms or specialty crop growers to have their crops processed for market (34). Many rural economies in Washington are dependent on agriculture as a core industry, so smaller-scale processing, distribution, and logistical services for small to mid-sized food producers reduces food waste while increasing rural economic activity, makes local purchasing possible, and supports small farm viability (35).

Hunger relief support

Similarly, hunger relief organizations could use the facility and network support of community food hubs. With increased food insecurity, HROs across the state require more access to nutritious food. Connecting HROs directly with local farmers through community food hubs is an emerging opportunity that could be facilitated through this recommendation.

HROs can also benefit from the processing space community food hubs provide. Often times food is donated in commercially sized packaging and need to be repackaged into smaller quantities for consumers. Community food hubs provide the space to process larger donations, increasing the amount of edible food rescued for hunger relief.



Figure 22. Tomatoes grown at Bee Organic Farm in Elma, WA. The SW WA Food Hub offers an easy platform for rural consumers to be able to purchase produce and meats in areas that are typically USDA defined “food deserts” (SW WA Food Hub)



Figure 23. Puget Sound Food Hub makes a delivery to Dandelion Organics. The mission of the PSFHC is to support and champion local, family scale farms by providing a direct connection with buyers in our region seeking high quality, locally produced food. (PSFH)



25. Statewide food waste contamination reduction campaign

Recommendation

Develop and promote a food waste contamination reduction campaign.

Overview

Contamination is a major barrier in effectively managing food waste in Washington. Local governments, facilities, food businesses, and hunger relief organizations all indicate food waste contamination as a major hurdle in beneficially using food and food waste.

As Washington pivots to more food waste diverted from landfills, it will be important to effectively navigate the unintended consequence of increased food waste contamination. A standardized message and more resources on how to navigate food waste contamination can help increase the quality of food scraps composted or converted into energy.

This recommendation supports the development and promotion of a food waste contamination reduction campaign focused on the residential and commercial sectors. The campaign can be developed by staff at Ecology, and ideally implemented through the work of the Center for Sustainable Food Management. When fully implemented, this recommendation has the potential to annually divert over 15 thousand tons of food waste from the landfill, while generating an annual net financial benefit of approximately \$376 thousand dollars.

The food waste contamination reduction campaign can include the following:

- A general statewide contamination reduction messaging strategy to promote clean stream of organics and food waste.
- Toolkits for local governments to educate on best practices in commercial and residential sectors.
- Online resources educating on the food system and managing food residuals.
- Focus groups to identify barriers to contamination reduction in households and businesses.
- Survey of compost facilities to identify predominant contaminants and potential solutions.



What is Anaerobic Digestion?

Anaerobic digestion (AD) is an important part of our food waste management portfolio. AD is the process where bacteria break down organic matter in the absence of oxygen. This organic matter can include animal manure, wastewater biosolids, and food wastes. In waste management systems, AD takes place either in a sealed environment or the cell of a landfill. Complex microbial communities digest the waste and produce digestate and biogas (36).

Digestate is the residual material left after digestion. It is composed of liquid and solid portions. These are often separated and handled independently, as each have value that can be realized with varying degrees of post processing. With appropriate treatment, both the solid and liquid portions of digestate can be used in many beneficial applications, including animal bedding (solids), nutrient-rich fertilizers (liquids and solids), precursor chemicals for bio-based products (e.g., bioplastics), organic-rich compost (solids), and/or simply as a soil amendment (solids). Digestate products can be a source of revenue or cost savings and are often pursued to increase the financial and net-environmental benefit of an AD/biogas project (36).

Biogas is composed of primarily of methane (generally 40 to 75 percent depending upon source). Raw biogas can be used to provide heat, generate electricity, and power cooling systems, among other uses. Biogas purified to meet the same standards as fossil natural gas (around 97 percent methane) is known as biomethane, or more commonly renewable natural gas (RNG). RNG can be injected into the natural gas distribution system and used in the same manner as fossil natural gas, including transportation fuel, heating and power generation, or in various industrial applications, including advanced biochemicals and bioproducts. Unfortunately, under the federal Renewable Fuel Standard, the value of compliance credits generated when RNG is used as a transportation fuel is much higher when produced from manure and agricultural residues, or in landfills or WWRFs, than it is when food waste is added to a digester, creating a disincentive to co-digest food when the RNG is being marketed into the natural gas pipeline grid.

Washington currently has three large biogas projects already producing enough RNG to offset 1.3 percent of current fossil natural gas consumption. At present, most of the RNG is being sold into the California market due to the significant value available under that state's low-carbon fuel standard (37). Hundreds of additional locations where RNG could be produced in proximity to the natural gas pipeline grid have been identified. However, significant investments are needed to generate and condition the biogas to RNG quality standards, and then inject it into the natural gas pipeline grid (37).

It is an exciting time for AD in Washington. Efforts to expand the use of AD are now more viable than ever at the small and large scale. A requirement that natural gas utilities offer RNG to their retail customers ([E3SHB 1257](#) in 2019) and passage of a state clean fuel standard ([E3SHB 1091](#) in 2021) show that Washington is ready to support the expansion of AD infrastructure needed to produce and use RNG. Recommendations #26 through #28 go into further detail on how AD can be expanded in Washington.



26. Anaerobic digesters at Water Resource Reclamation Facilities (WRRFs) and on farms

Recommendation

Increase the use of anaerobic digesters at Water Resource Reclamation Facilities (WRRFs) and on farms.

Overview

Just as it is important to beneficially manage food up the hierarchy of prevention, rescue, and recovery, digesters have a significant role to play within the recovery strategies in this plan. In order to effectively manage and recover inedible food waste, investments in anaerobic digestion (AD) infrastructure at Water Resource Reclamation Facilities (WRRFs) and on farms will be needed. When fully implemented, this recommendation has the potential to annually divert 452,000 tons of food waste, while generating an annual net financial benefit of approximately \$7.3 million.

Specifically, this recommendation supports the following actions:

- Develop a grant and/or loan program to catalyze expansion of infrastructure to support AD and RNG development. This can be done by maintaining and expanding the Dairy Digester grant program through Commerce, and the capital facility grants for WRRFs handled both by Ecology and Commerce.
- Provide grants and/or loans to implement nutrient recovery, and purchase depackaging equipment to reduce contamination.
- Expand tax incentives to facilitate interconnection with electrical and natural gas pipeline grids.
- Support a Renewable Portfolio Standard (RPS) for natural gas to reduce carbon emissions and increase demand for RNG.

AD at WRRFs

WRRFs use a variety of treatment methods to produce biosolids and treated water for discharge to the environment. Digesters needed to produce and capture biogas are most often used at larger WRRFs to further treat biosolids. Of the nearly 300 WRRFs, or wastewater treatment plants, in Washington, at least 65 operate with digesters. Eleven of these already use digesters and generate enough biogas, and are close enough to the natural gas pipeline grid, to consider incorporating the gas conditioning equipment needed to produce and market RNG. Another four would likely generate enough biogas if they integrated digesters into their operations (37).

The Tacoma Central Treatment Plant and the King County South Treatment Plan highlight the benefits of adding food to WRRFs. The Tacoma plant was built to accept food waste from local food processors through wastewater pipes. The system already gets some food waste through the wastewater pipes, but it has the capacity to accept more food waste from more sources.

The King County facility accepts food through pipes and via truck delivery. King County conducted a study to determine the feasibility of expanding the South Treatment Plant to accept more food residuals. Both plants generate heat and power for use on-site, and King County sells excess RNG into the natural gas pipeline grid. Both systems also create a well-regarded soil amendment from the digestate.

Improving the ability of WRRFs to consume more inedible food waste and condition raw biogas to RNG quality standards will likely require state and federal financial support (37).

AD on farms

In Washington there are roughly 350 dairy farms, 10 beef and poultry farms, a few rendering facilities, and a couple dozen egg producers of adequate size to consider hosting a digester or contributing feedstock to nearby digesters (37).

Of these 350 dairy farms, nine currently use anaerobic digestion to manage manure, produce energy, and recover fiber and nutrients. Roughly half currently accept pre-consumer food waste from food processors in order to boost energy recovery (no post-consumer food is accepted at dairy digesters). These digesters accept pre-consumer food waste mostly from food processors, but food waste from grocery stores and food recovery facilities is also possible. A depackaging system has already been installed at one of the dairies. Providing support for the expansion of AD on farms enhances economic stability for the farmer through tip fees, fiber and nutrient sales, and generation of heat and power for use onsite and for sale.

Other potential sources of residuals include upland fish hatcheries, tree fruit packers, and vineyards. However, tapping these high-quality, high-volume sources can be challenging given their seasonal nature. Commercial animal feed and pet food manufacturers could also be good sources, but no data is currently available regarding their waste generation. Many organic residuals already have existing uses or markets. The extent to which they might contribute to RNG production will depend largely on the market value for RNG and the resulting competitive value of desirable feedstocks.



Use Food Well Stories: Vander Haak and Edaleen Farms

Vander Haak (Fig. 24) and Edaleen are two Western Washington dairies using anaerobic digestion (AD) for production of renewable electricity from dairy manure and pre-consumer food processing waste. Adding AD to dairy farms is a great way to reduce the impacts of raw cow manure on the environment while generating electricity or producing renewable natural gas (RNG).

Smaller dairies (typically under 2,500 cows), many of which are located in Whatcom and Snohomish counties, have less manure to manage so often choose to incorporate pre-consumer food processing waste into the digesters to boost biogas production. Food waste tipping fees and energy sales add important income to the dairy's bottom line and if generated electricity is used by the dairy, reduced energy costs also help improve the dairy's profitability.

Within both farms, current efforts to improve overall AD profitability include increasing the volume of biogas generated from co-digested manure and food waste, exploring new energy markets, and installing nutrient recovery and depackaging equipment. Networks of depackaging equipment to separate pre-consumer spoiled food from its packaging help create a clean food waste stream for digesters (this is good for composters, too!). State grants, continued innovation, and partnerships help drive success with AD at dairy farms.

“Adding food processing residuals and other pre-consumer food wastes to AD on dairy farms can more than triple the farm revenues through increased tip fees and RNG generation. AD on dairy farms also generates a range of environmental and economic benefits for the surrounding community.” – Craig Frear



Figure 24. AD on dairy farms (Craig Frear, Regenisis)



27. Anaerobic digesters at compost facilities

Recommendation

Increase opportunities for high-solids anaerobic digesters at commercial compost facilities.

Overview

A form of anaerobic digestion, known as dry or high-solids anaerobic digestion (HSAD), can handle large quantities of post-consumer food waste. HSAD allows organic material that is often the most putrid portion of municipal solid waste (MSW) to off-gas in an enclosed space, capturing methane and other fugitive GHG emissions. HSAD can also help landfills save space and reduce generation of leachate and fugitive emissions. These attributes make HSAD a natural complement to composting operations.

This recommendation supports increasing opportunities for HSAD in Washington. When implemented fully, this recommendation has the potential to annually divert 169 thousand tons of food waste from the landfill, while generating an annual net financial benefit of approximately \$291,000.

HSAD systems have been in use in Europe for many years and currently can be found in the US in California, Wisconsin, Ohio, Maine, Massachusetts and New York. HSAD developers have explored opportunities in Washington for many years, especially in the central Puget Sound region.

The high cost of development and construction combined with variable feed stock availability, quality, and prices has hindered efforts to install HSAD at compost facilities. Research and market support is needed to reduce barriers for this development. This research could be conducted by the Center for Sustainable Food Management along with mapping of the state's food flows. In addition to this research, this recommendation supports the following actions:

- Provide state grant funding, similar to the program for dairy digesters, to support HSAD installation at compost facilities.
- Support a grant program to off-set the cost of depackaging equipment and develop regional depackaging hub-and-spoke infrastructure.





28. Increase use of small-scale anaerobic digesters

Recommendation

Increase the use of small-scale AD food waste management systems through funding and continued research and innovation.

Overview

Small-scale anaerobic digestion (AD) is gaining traction in Washington. This recommendation supports building on the existing momentum. Capital costs are the largest barrier to small-scale AD expansion, so this recommendation focuses on increasing funding where feasible.

There is a clear opportunity for institutional, industrial, and commercial stakeholders across island, rural, and urban communities to locally manage their food residuals through small-scale AD. Small-scale AD has demonstrated cost savings and environmental benefits, including the production of valuable digestate, bioenergy, and educational opportunities. Digester units the size of shipping containers are already in use in the Seattle area, and local governments across the state have indicated interest in supporting small-scale AD development in their communities.

When fully implemented, increasing the use of small-scale AD in Washington has the annual diversion potential of 4 thousand tons, with a potential annual net financial loss of \$3 million while initial capital costs are paid off. Afterward, this recommendation would continue to divert food waste, while breaking even or selling nutrients for a net benefit.

This recommendation supports the following key actions to increase small-scale AD development in Washington:

- Increase state-level funding, incentives, and programs for pilot and start up small-scale AD projects. Work to compound state-level funding with available federal funding.
- Support local government programs that provide technical assistance and funding for small-scale AD development.
- Continue to support research, innovation, and deployment of small-scale AD systems to provide viable food waste management options for small generators, rural residents, farms, schools and businesses, and island communities. Examples include ongoing work by WSU's Center for Sustainable Agriculture and Natural Resources and Gonzaga University.



- Provide pilot project funding and support for programs beneficially using digestate to boost soil health, food production, reforestation and carbon sequestration initiatives. For example, similar to rainwater projects, facilitate a digestate [fertigation](#) system rebate program for small farms, in collaboration with the [King County Local Food Initiative](#), [CompostWise](#) and other complementary program.
- Provide pilot project funding and support for farm-to-school-to-farm projects integrating STEM and climate curriculum.



Use Food Well Stories: University District Food Bank

Food Banks currently spend precious cash reserves on inedible food waste removal. Small-scale anaerobic digesters can convert inedible food waste into energy and liquid fertilizer and save the food bank money on disposal costs. The University District Food Bank in Seattle (Fig. 25) is looking forward to taking advantage of all of these perks by installing a small-scale digester from Impact Bioenergy at the Food Bank’s roof-top garden.

The purpose of this project is to foster a circular economy where food waste becomes a resource for fueling food bank vehicles and growing more food onsite or within the local community. UDFB pays to truck approximately 300,000 pounds of inedible food “waste” to a local composter. By converting this feedstock on-site into renewable resources—bioenergy and biofertilizer—UDFB can grow more fresh food on their rooftop farm, feed even more hungry people, and run their trucks on biogas. This system also reduces the GHG impact of trucking the material to an off-site composter.

The valuable organic biofertilizer can be used on their rooftop vertical farm. It can also be beneficially used by P-Patch Community Gardens and support local urban food production. More support through funding, rebate programs, and partnerships is needed to increase small-scale AD across Washington.



Figure 25. UDFB rooftop gardens (UDFB)



29. Improve regulatory certainty for compost facility operations

Recommendation

Improve regulatory certainty for compost facility owners.



Overview

Composting is currently the primary conversion option in Washington for residential and commercially collected food waste. The process converts food waste (and other organics) into valuable soil amendments.

Local governments have primary regulatory authority over permitted compost facility operations and closure. Due to the presence of the invasive apple maggot pest, WSDA recently began to provide additional regulatory review for some compost facilities and for the movement of collected organics to or through pest-free areas of the state. Additional oversight on compost facilities includes state and regional air quality agencies.

This mix of agency involvement in permit review and oversight of compost facilities, coupled with the lack of clear regulatory requirements has resulted in time delays and miscommunications between composters and regulating agencies. This has made planning for new facilities or expansion of existing facilities difficult to manage.

This recommendation supports improving regulatory certainty for compost facility owners. Composters find differing regulatory interpretations in different parts of the state and find these interpretations are not clearly defined or well understood. Clear regulatory requirements and improved review coordination are needed in all regions of the state to reduce barriers to siting or expanding compost facilities. Having clear and coordinated requirements will facilitate and support the continued use of commercial composting as an important food waste management option.

With full implementation, this recommendation has the potential to annually divert approximately 54 thousand tons of food waste from the landfill, while generating an annual net financial benefit of about \$129 thousand dollars.



30. Diversify food waste management systems

Recommendation

Increase the development of diversified and innovative food waste management systems.

Overview

Residual food waste can be managed through a variety of food waste management systems. Many of these operations function as closed loop systems that take in local food waste, and produce soil enhancing products that can be used locally to grow more food. Others use insects to convert inedible food into a value protein-packed product used for animal or human consumption.

By increasing the development of these systems, Washington can divert over 3 thousand tons of food waste from the landfill annually, and receive an annual benefit of approximately \$76 thousand dollars. This recommendation focuses on small-scale on-site composting and vermicomposting systems to start.

These systems can be installed in the backyards of rural and urban homes as well as spaces in or near businesses to manage food waste. The following actions are supported to increase the use of backyard/on-site composting, vermicomposting, community composting, and insect conversion of food waste to beneficial products:

- Increase awareness and education for a varied and sustainable food waste management system.
- Support local government programs that provide bins, technical assistance, and grants to residents and businesses that are interested in implementing these systems.
- Create a grant program specific to food waste management and for studies to evaluate diversion impacts (Use Food Well Washington Grants)
- Support cooperative partnerships, pilot projects, and research for established and emerging technologies.



Continue to support backyard composting and vermicomposting outreach

“Backyard composting” is the traditional term used to describe the process of converting organics generated on-site using a small compost pile or in a container. Based on a 2008 study from Vancouver, BC, BioCycle magazine reported that backyard composting programs in the region annually diverted between 551 – 915 pounds of organics from the waste stream (38).

Small-scale “vermicomposting,” is the process of converting food scraps into a high-quality soil amendment which, in this context, uses red-wiggler worms in a container. While no definitive information exists on the number of at-home vermicomposting systems in operation in Washington state, researchers from Purdue University assert that 64% of the compostable waste generated at their test site was diverted from disposal through vermicomposting (39).

Community Composting

The term “community composting” is used here to identify composting programs done on a slightly larger scale that include centralized sites in neighborhoods, community gardens, schools, and civic organizations. According to the Institute for Local Self-Reliance, composting at the community level provides many benefits, such as improved social interaction, an increase in the quality and quantity of local gardens, greener neighborhoods, and a reduction in urban food deserts (40). Community composting improves local communities and the environment while it helps to improve local soil.

Insects

Another system for beneficially managing food waste involves using insects to convert food waste and moldy grain into an animal feed amendment. Mealworms and black soldier fly larvae are two examples of how insects can help convert food and crop waste into a value-added end product. The larvae are the desired end product so are harvested before they pupate, then are baked or dried and used ‘as is’ for bird or fish feed (41), or processed into a high-quality protein cake or powder and added to animal feed, replacing fish protein. Additionally, the excrement, or “frass” produced by both types of larvae can be used as an addition to liquid or solid fertilizers to boost performance.

Black Soldier Fly Larvae (BSFL)

The black soldier fly is a benign beneficial insect that produces larvae which will eat all types of food waste, wet or dry. They can even eat food that contains packaging waste, consuming all the food while leaving the packaging intact. While the BSFL can eat post-consumer food waste, current focus is on using the BSFL to eat pre-consumer food waste and food processing waste. More BSFL post-consumer food waste studies are needed to resolve safety questions. While the BSF system is currently considered low-tech and can be labor intensive, companies such as Enterra in Canada are working to develop systems that make the process more efficient and less labor intensive (42).

Darkling Beetle Mealworms

The mealworm is the larval stage of the darkling beetle. Mealworms consume dry food waste such as grains that have been contaminated by molds (mycotoxins), making the grain toxic for humans and animals. While this is a narrowly focused food waste stream, Washington produces a large amount of grains that, if contaminated by molds, will need safe and beneficial conversion to high-quality animal feed. This system can turn a loss into a gain for grain producers.

Use Food Well Stories: Beta Hatch

Beta Hatch (Fig. 27), located in Cashmere, WA, is set on industrializing insect agriculture within a regenerative food system. The start up's insect-rearing technology converts mealworms and their waste into high-value proteins, oils, and nutrients for agriculture.

Beta Hatch is currently building North America's largest mealworm production facility for animal feed, scheduled to be operational in November 2022. Mealworms have a complete amino acid profile and research shows they are a nutritious feed ingredient for a wide variety of animals. Frass, or insect manure, is a natural co-product that can be applied directly to fields to improve soil health, creating a zero-waste food production system.

Cost is a significant hurdle in insect production and economies of scale are needed to reach price parity with fishmeal and other key protein sources. Research showing the health benefits of insect protein versus other protein sources in various species helps to command a premium

price over other ingredients, but on-going investment is needed to fund research and to help companies like Beta Hatch over the scaling hurdles.

"Insects can be farmed vertically, indoors, at large scale. They have a complete amino acid profile and a rapidly-growing body of research shows they are a nutritious feed ingredient for a wide variety of animals." – Aimee Rudolph, Beta Hatch



Figure 26. Beta Hatch staff inspect and research mealworms to process food waste and create added-value products (Beta Hatch)

Areas of Future Research

Outside of the 30 actionable recommendations, many areas of future research were identified throughout the development of the *UFWW Plan*. The following is a summary of important areas of future research within Washington's food system:

Sector research

In general, more could be understood regarding Washington's food flows and food system, and how to best remove food waste reduction barriers to all sectors of the food system. A few ongoing and emerging areas of future research are:

- **Anaerobic Digestion** – Effort is ongoing to research how to increase the value of RNG in Washington. This would increase incentives to convert food residuals into energy. Current rates and pricing appear to be a barrier to increased anaerobic digester use for using food waste as part of the state's energy generation programs. Investing in a renewable energy standard and more research on how to increase value of RNG would greatly support the state's food waste reduction efforts.
- **Chemical extracts from food waste** – Many studies are being done in Washington and around the world on extracting value-added chemicals, scents, and medical products from food waste. Support for these studies is important since they focus on turning food waste into a valuable resource.
- **Food businesses and consumers** – Both food businesses and consumers are major generators of food waste. More studies are needed to understand why food waste occurs from these groups, and what best practices can be promoted to change behavior.
- **Feeding food waste to animals** – More research is needed to better understand the issues associated with feeding food waste to animals and how feasible it is to feed non-meat food waste to animals in Washington. Food waste collected on a route (as opposed sent directly from a food processor) has too much nutritional variability to be fed directly to animals or even to be used as an ingredient in manufactured feed. Each load of food waste destined for a secondary market as animal feed would be different, so farmers would need to analyze and adjust to each ration. Safety is also a concern: recipients want assurance there are no pathogens, chemicals, or physical contaminants like glass or metal in the food waste they accept. Consistency and regularity of feedstock are also a large concern for producers. Washington has few commercial swine operations, generally the considered the best system to take food waste. As omnivores, swine are best suited for rations that vary, but most food waste mixes will not have enough protein to grow or maintain swine. Ruminants are poorly suited to such varying rations; they need high fiber diets for best health.

Food packaging research

Trade-offs and complexities exist in the relationships between food packaging, food safety, food preservation, and the environmental impacts of the packaging. Specifically, more could be understood in the following focus areas:

- **Food preservation** – Preserving food should be the priority from a life cycle analysis perspective. More could be understood on how to optimize packaging to increase preserving food while reducing contamination and environmental impacts.
- **Compostable packaging** – Compostable packaging is an understudied emerging issue. Innovations can be made to make compostable packaging more compatible with existing facility operations. More could be understood on how to develop truly compostable packaging that increases the shelf life of food. Some facilities do not accept compostable packaging and consider it a contaminant of their organics and food waste management systems. Research should be conducted to better understand the challenges and barriers that currently exist for compostable packaging.
- **Contamination reduction** – The contamination of organics and food waste is a major ongoing issue in Washington and will only increase in concern as more food waste is diverted from landfills. More could be understood on how to best reduce contamination of organics and food waste residuals.
- **Depackaging technology and processes** – Innovation and research is needed on how to best use depackaging infrastructure to increase value to food waste. Contamination can be an issue with some depackaging machinery, which can decrease the value of the feedstock. More could be understood on depackaging needs and processes in Washington.

PFAS in compost research

Per- and polyfluoroalkyl substances (PFAS) are a group of synthetic chemicals that have been in use since the 1940s. There is evidence that continued exposure above specific levels to certain PFAS may lead to adverse health effects (43). PFAS are found in a wide array of consumer and industrial products including food packaging and industrial fire retardant materials. Due to their widespread use and persistence in the environment, most people in the United States have been exposed to PFAS.

Currently, there is no national or state PFAS threshold for soils or compost. The general consensus is that inclusion of food scraps, food packaging and biosolids in composting operations will introduce some amount of PFAS, but testing has shown the levels to be low (44). Recognizing the impact that PFAS in food packaging is having on human and environmental health, in 2018 the Washington State legislature passed a bill that prohibits the use of PFAS in paper food packaging. Ecology's Hazardous and Toxics Reduction Program created a [focus sheet](#) to describe the impacts of that legislation. In addition to continuing the ongoing work and research on PFAS, more could be understood on the impacts of PFAS and how to best manage for the impacts of these chemicals.

Blockchain technology

The blockchain in food supply chains and agriculture is estimated to be worth \$60.8 million in 2018, projecting to reach \$429.7 million by 2030 (45). Blockchain is an emerging digital technology allowing financial transactions among distributed parties, without the need for intermediaries, such as banks or brokers. Since 2014, blockchain has been used increasingly across industries and sectors, including for tracking and distributing goods through a supply chain (46).

In 2019, Washington State Governor Jay Inslee signed SB 5638-an act “recognizing the validity of distributed ledger technology” into law. This Act encourages the development of blockchain, and recognizes its use in commerce and digital signatures.

More could be understood on how Washington can use blockchain to increase market share for farmers, decrease costs and food waste across the food supply chain, and how the technology can be used to monitor for food safety (47).

In addition to research, state-level policies will be needed to help support investment in this technology. Similarly, advocacy at the federal level will be needed to create the optimal environment to support blockchain use across the food supply chain.

GLOSSARY

A

Anaerobic Digester (AD) - means a vessel that processes organic material into biogas and digestate through microbial decomposition under anaerobic (low oxygen) conditions. ([WAC 173-350-100](#))

B

Bill Emerson / Good Samaritan Food Donation Act – Federal act passed in 1996 that protects those who donate edible food in good faith from any liability.

Black Soldier Fly Larvae (BSFL) – The black soldier fly is a harmless insect very good at consuming food waste and making larvae that function as an excellent protein source for animal feed.

C

Cold Chain Management– Interconnected cold storage system designed to keep food cold (reducing spoilage) from farm through the handling system to final purchase.

Compost Contamination – Any “chemical, physical, biological, or radiological substance that does not occur naturally in the environment or that occurs at concentrations greater than natural background levels” found in raw collected organics and finished compost.

Compostable (Plastic) Packaging – A [compostable plastic](#) is biodegradable in a composting environment, yielding H₂O, CO₂, biomass, and inorganic compounds. The biodegradation during composting should be at a rate similar to other known compostable materials, and should not leave visual or toxic residue. In order for a plastic to be labeled compostable, it must meet scientific standards, such as the ASTM specification D6400-12. ([Ecology](#) Focus sheet)

Composting - means the biological degradation and transformation of organic solid waste under controlled conditions designed to promote aerobic decomposition. Natural decay of organic solid waste under uncontrolled conditions is not composting. ([WAC 173-350-100](#))

Contaminant - means any chemical, physical, biological, or radiological substance that does not occur naturally in the environment or that occurs at concentrations greater than natural background levels. ([WAC 173-350-100](#))

Core team – Staff from WA agencies (Ecology, Department of Agriculture, Office of Superintendent of Public Instruction, Department of Health, and Commerce) designated to work on the food waste prevention plan.

Cross-Sector Advisory Group (CSAG) – invited representatives of each subject matter expert group who served as liaisons between the stakeholders and the Core Team.

D

Depackaging – The process, either manual or mechanical, of removing the packaging [around food]. Packaging is separated from food so the food can be managed beneficially: if edible, distributed to HRO's or value-added processors, if inedible, distributed to animal feed producers, composters, or anaerobic digesters.

E

Edible food – Food that can be eaten by humans.

Energy recovery - means a process operating under federal and state environmental laws and regulations for converting solid waste into usable energy and for reducing the volume of solid waste. The recovery of energy may include mass burning or refuse-derived fuel incineration, or other means of using the heat of combustion of solid waste that involves high temperature (above twelve hundred degrees Fahrenheit). ([WAC 173-350-100](#))

Environmentally Responsible Packaging (ERP) - packaging made from recyclable or compostable materials that can in turn be recycled or composted. Packaging that produces little-to-no waste.

EPA Food Waste Hierarchy – The Federal tiered system that promotes food waste prevention, in a tiered diagram, with source reduction at the top, then feeding people, feeding animals, feeding industrial conversion efforts, landfilling, incineration.

F

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

Food Hub - A “centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products.” ([USDA](#))

Food insecurity - the limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.

Food Loss and Waste (FLW) – Food loss: refers to food that gets spilled or spoiled before it reaches its final product or retail stage; Food waste refers to edible food left or discarded.

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

Food Waste - means waste from fruits, vegetables, meats, dairy products, fish, shellfish, nuts, seeds, grains, and similar materials that results from the storage, preparation, cooking, handling, selling, or serving of food for human consumption. “Food waste” includes, but is not limited to, excess, spoiled, or unusable food and includes inedible parts commonly associated

with food preparation such as pits, shells, bones, and peels. "Food waste" does not include dead animals not intended for human consumption or animal excrement. ([RCW 70A.205.715](#))

Food Waste Analytics – Using information gathered through food waste data tracking to identify where and how to best reduce food waste generation.

Food Waste Baseline – The year identified as the starting point for comparing food waste generation rates to rates calculated in the years following the baseline year.

Food Waste Reduction Act - ESHB 1114 – ([RCW 70A.205.715](#))

G

Greenhouse gas(es) (ghg) - such as methane (CH₄), carbon dioxide (CO₂), Nitrous Oxide (N₂O), Water (H₂O), and Ozone (O₃) that absorb and emit infrared radiation which in turn warms the planet.

H

Hunger Relief Organization (HRO)– Organizations that work to capture edible food from grocery stores, restaurants, and individual donors for distribution to those in need.

J

Jurisdictional Health Department (JHD)/ Local Health Jurisdictions (LHJ) means city, county, city-county or district public health department.

K

K-12 – Common designation for US schools – grades kindergarten (K) thru senior class in high school (12).

L

Local Health Jurisdictions (LHJ) / Jurisdictional Health Department (JHD) means city, county, city-county or district public health department.

Local Solid Waste Financial Assistance (LSWFA) – grant program managed by the WA Department of Ecology

M

N

Nutrient recovery – the process of managing food residuals in order to recover the beneficial chemicals (like nitrogen and phosphorus) embodied in food and manure.

Nutritionally adequate – Nutrition available in food consumed is adequate to provide the nutrients needed to maintain health.

O

Off-site waste management – removing waste from the point of generation for disposal or conversion to beneficial end products such as compost, energy, and nutrients.

On-site waste management – keeping waste at the point of generation in order to convert the waste into beneficial end products such as compost, energy, and nutrients – typically for use on-site.

P

Pacific Coast Collaborative (PCC) – A collaboration between California, Oregon, Washington, British Columbia and select local governments within those jurisdictions that promotes efforts to accelerate the transformation of energy systems, buildings, transportation, and food waste management within the region.

Pay-As-You-Throw (PAYT) – an accounting system for waste disposal through which people pay a graduated disposal rate based on the amount of waste they put out for collection (size of collection cart or number of bags).

Prevention – Refers to avoiding the wasting of food in the first place and represents the greatest potential for cost savings and environmental benefits for business, governments, and consumers. ([RCW 70A.205.715](#))

Public Participation Grants (PPG) – a grant program managed by the WA Department of Ecology.

Q

R

Recovery - refers to processing inedible food waste to extract value from it, through composting, anaerobic digestion, or for use as animal feedstock. ([RCW 70A.205.715](#))

ReFED – Rethink food waste through economics and data – national group working to reduce food waste using information and partnerships

Renewable Identification Number (RIN) - a serial number assigned to a batch of [biofuel](#) for the purpose of tracking its production, use, and trading as required by the [United States Environmental Protection Agency's Renewable Fuel Standard \(RFS\)](#) implemented according to the [Energy Policy Act of 2005](#) and the [Energy Independence and Security Act of 2007](#). Wikipedia

Renewable Natural Gas (RNG) - a term used to describe biogas that has been upgraded for use in place of fossil natural gas. The biogas used to produce RNG comes from a variety of sources, including municipal solid waste landfills, digesters at water resource recovery facilities (wastewater treatment plants), livestock farms, food production facilities and organic waste management operations (48).

Rescue - refers to the redistribution of surplus edible food to other users. ([RCW 70A.205.715](#))

S

Shelf-life – The estimated time a food product will remain safe for human consumption.

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

Sustainable Food System - A [sustainable food system](#) includes food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generation is not compromised. This means that it is profitable throughout, ensuring economic stability, it has broad-based benefits for society, securing social sustainability, and that it has a positive or neutral impact on the natural resource environment, safeguarding the sustainability of the environment.

T

U

United Nations Sustainable Development Goals (UN SDG) – Also known as the Global Goals, were adopted by all United Nations Member States in 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030 (49).

V

Value-Added Food Processing Hub - small scale, minimally processed, community-oriented food processing cooperatives to process select crops, primarily from small and mid-sized farms, or to re-package large quantities of food into smaller packages for individual or small group use.

Vermicomposting - means the controlled and managed process by which live worms convert organic residues into dark, fertile, granular excrement. ([WAC 173-350-100](#))

W

Washington State Organics Management Hierarchy – The Washington State strategy for managing organics in an order that represents best available options in Washington State.

Waste Characterization Study (WCS) – Process through which select loads of waste being delivered to pre-determined disposal sites are examined and sorted into various categories in order to identify the separate types of waste being disposed. The information from these sorts is then extrapolated to provide a snapshot of total wastes disposed.

Waste Reduction Recycling and Education Grants (WRRED) – Grant program administered by the Department of Ecology, geared specifically toward schools.

Wasted Food - means the edible portion of food waste. ([RCW 70A.205.715](#))

Water Resource Recovery Facility (WRRF) – updated term that replaces “wastewater treatment facility” that more clearly identifies the water recovery aspect of the sewage treatment system.

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Appendix A. Annual food waste data

Table 4. WA Annual food waste data

	2015 tons	2016 tons	2017 tons
Edible food disposed, all sectors	390,063	415,807	430,468
Edible food disposed, residential sector	166,427	177,411	183,666
Edible food disposed, commercial sector	199,566	212,737	220,238
Edible food disposed, self-hauled sector	23,790	25,361	26,255
Inedible food disposed, all sectors	421,908	449,754	465,611
Inedible food disposed, residential sector	217,766	232,138	240,323
Inedible food disposed, commercial sector	189,913	202,448	209,585
Inedible food disposed, self-hauled sector	13,898	14,816	15,338
Recovered food waste, all sectors	346,775	353,268	306,292
Recovered food waste, residential sector	43,913	69,575	49,324
Recovered food waste, commercial sector	302,862	283,693	256,968
Food waste generated total, all sectors	1,158,746	1,218,829	1,202,371

Appendix B. Recommendation index by sector

Table 5. Recommendation index by sector

Recommendation	Farmers and Ranchers	Transportation, storage, and logistics	Retail food businesses	Schools and institutions	HROs	Food service and hospitality	Community and residential	Food manufactures and processors	Composters and anaerobic digesters	Local governments	Washington State Legislature
1		X	X		X	X	X	X		X	X
2	X	X	X	X	X	X	X	X		X	X
3	X	X	X	X	X	X	X	X			X
4	X	X	X		X	X	X	X			X
5		X	X		X	X		X		X	X
6	X	X	X	X	X	X	X	X	X	X	X
7	X	X	X	X	X	X	X	X		X	X
8	X	X	X	X	X	X	X	X	X	X	X
9	X	X	X	X	X	X	X	X	X	X	X
10	X	X		X	X						X
11	X			X	X		X		X		X
12			X	X	X	X	X		X	X	X
13	X	X	X	X	X	X	X	X	X	X	X
14	X	X	X	X	X	X	X	X	X	X	X
15	X	X	X	X	X	X	X	X	X	X	X
16	X	X	X	X	X	X	X	X	X	X	X
17	X	X	X		X	X	X			X	X
18	X			X	X					X	X
19	X			X	X					X	X
20			X	X							X
21			X	X							X

22	X	X	X	X	X	X	X				X
23	X	X					X			X	X
24	X	X			X		X	X	X	X	X
25	X	X	X	X	X	X	X	X	X	X	X
26	X	X					X		X	X	X
27	X	X					X		X	X	X
28	X	X	X	X	X	X	X	X	X	X	X
29	X	X					X		X	X	X
30	X	X	X	X	X	X	X	X	X	X	X

Appendix C. Economic Analysis

Overview of Approach

We approached estimating the costs, benefits, and potential diversion resulting from the 30 recommendations with a set of goals in mind:

- Comparable estimates: Using consistent underlying assumptions, timeframe, and unit values.
- Versatile results: Estimates that can be considered individually, combined with others, or differently distributed over time.
- Interrelated impacts: Reflecting ways recommendations may facilitate, reduce costs of, or increase benefits from other recommendations.
- Avoiding double-counting: Ensuring we were not reflecting any set of impacts more than once in presenting totals.
- Ordered, flexible timing: Overall implementation in phases following logical and needs-based deployment. Beginning with building foundations necessary for structures and staffing, followed by larger infrastructural investments, and completed with improvements that amplify the efficiency, scope, or size of diversion.

Precision and uncertainty

The degree and precision of our quantified estimates necessarily rely on the specificity and scope of each recommendation. Estimates presented should be considered “high-level” in that they are inherently based on assumptions regarding implementation and scope, including:

- Statewide versus geographically variable deployment of administrative recommendations (e.g., K-12 related recommendations, LHJs).
- The number, locations, and attributes of potential large capital investments (e.g., ADs, hubs, transportation).
- Degree of uptake of voluntary programs and improved regulatory structures (e.g., composter expansion, food donation).

The degree to which assumptions such as the list above impacted estimates varies by recommendation, or is applicable to specific illustrative scenarios that may not reflect all of the options a recommendation suggests. This appendix summarizes the estimation methodology for each recommendation, including assumptions, where central estimates (e.g., median or average) were selected, and notes on sources of uncertainty.

Cost scope

Annual costs were based on the cost of implementation, as well as initial development, capital investment, staffing, or other startup costs. Capital costs were annualized over ten years using a 4% discount rate, to maintain consistency across independent calculations, cited references, and combined approaches.

Benefit scope

Benefits were based on reduced or avoided costs, as well as improved efficiencies (reduced costs of other recommendations). Because the benefits of some recommendations are based on facilitation of other recommendations, we had to exclude some interrelationships to avoid circular logic or double-counting of benefits. This means comprehensive implementation of the recommendations could result in higher net benefits than we could estimate. These market development, informational, and networking efficiencies would likely improve over time until they level off at ongoing understanding of new developments in WA's food system.

Sources and application

Across the 30 recommendations discussed in this Appendix, we cite nearly 60 cumulative sources, many of which are used across multiple recommendations to develop consistent, comparable estimates.

- Estimates for some recommendations were independently fully developed based on WA-specific data, research, and assumptions.
- In some cases, we were able to scale estimates from the literature to apply a cost or benefit per ton diverted.
- In some cases, we extrapolated tons of food waste diverted from the implementation costs of similar programs.
- Where a WA-specific estimate was available from the 2020 ReFED Insight Engine and data available at the state and sector levels, we either directly applied estimates, or adjusted them to better reflect the scope or direction of recommendations in this plan.
 - o To ensure ReFED estimates were applicable (or not; to what degree), we studied the documentation of underlying methodologies and assumptions, not limited to affected sectors or subsectors and unit values for costs and benefits.
 - o Where estimates could be augmented with additional or new data relevant specifically to WA, we included that data in calculations.
 - o To allow for some variable assumptions, we included new range endpoint estimates, and reported a representative point estimate for that range.

Special cases: financing recommendations

Two recommendations address the financing of the other recommendations (either directly or through local governments). For these recommendations, we summed the impacts for individual related recommendations, as well as including costs of independent implementation of the funding and distribution program. The total impacts summarized below are the total of these two funding mechanisms, reflecting the total impacts of all the other recommendations.

Estimated impacts by recommendation

Most impacts reported here are relatively scalable by tons of food waste, as capital costs are annualized, and most unit costs or benefits are annual. Estimated impacts for recommendations with uncertain development and repayment timelines, highly variable site-specific attributes, or significant capital investment may be less scalable.

Table 6. Recommendation summary table

Recommendation Number	Title	Annual Cost (millions)	Annual Gross Benefit (millions)	Annual Net Benefit (millions)	Annual Diversion Potential (thousands)
1	Support national date labeling standard	\$0.2	\$53.2	\$53.0	13
2	Strengthen Good Samaritan Law	\$1.5	\$21.6	\$20.1	16
3	Increase markets for lower-grade produce	\$6.7	\$25.9	\$19.3	10
4	Improve federal tax incentives	\$19.9	\$12.5	-\$7.4	10
5	Continue support for the Pacific Coast Collaborative	\$0.1	\$0.7	\$0.6	n/a
6	Create the Washington Center for Sustainable Food Management	\$1.0	\$5.5	\$4.5	n/a
7	Connect UFWW planning to Food Policy Forum	\$0.1	\$0.1	\$0.1	n/a
8	Develop incentives to prevent food from entering the landfill	\$1.6	\$4.8	\$3.2	74
9*	Sustainable state grant funding for food waste prevention, rescue, and recovery	\$217.9	\$1,256.8	\$1,038.9	967
10	Infrastructure investment in K-12 schools	\$1.2	\$3.1	\$1.9	7
11	Require food waste prevention, rescue, and recovery education in K-12 schools	\$6.1	\$6.6	\$0.5	3
12	Increase funding for local health jurisdictions	\$47.8	\$462.7	\$414.9	104
13	Statewide food waste prevention campaign	\$2.3	\$139.0	\$136.7	31
14*	Support local government food waste reduction efforts	\$43.7	\$107.6	\$63.9	100
15	Food waste tracking and analytics	\$21.7	\$97.5	\$75.8	20
16	Mapping food system flows	\$0.1	\$1.8	\$1.8	n/a
17	Improve donation transportation	\$31.3	\$215.1	\$183.8	48
18	Fund farm to school program efforts	\$5.3	\$10.5	\$5.1	5

19	Develop an emergency school food distribution plan for K-12 system	\$2.8	\$27.6	\$24.8	5
20	20-minute seated lunch minimum in K-12 schools	\$0.02	\$0.2	\$0.2	3
21	Recess before lunch in K-12 schools	\$0.02	\$0.1	\$0.1	2
22	Increase access to cold chain management	\$30.1	\$99.7	\$69.6	22
23	Value-added food processing and depackaging	\$28.3	\$68.4	\$40.1	28
24	Value-added food processing hubs (COMMUNITY FOOD HUBS)	\$7.4	\$64.6	\$57.2	25
25	Develop and promote an organics contamination reduction campaign	\$2.3	\$2.7	\$0.4	16
26	Anaerobic digesters (Ads) at WRRFs and on Farms	\$25.4	\$32.1	\$6.7	393
27	Anaerobic digesters (Ads) at Compost Facilities	\$1.1	\$1.4	\$0.3	169
28	Increase use of small-scale anaerobic digestion (AD)	\$4.3	\$1.2	-\$3.0	4
29	Improve regulatory certainty for compost facility operations	\$5.3	\$5.4	\$0.1	54
30	Diversify food waste management systems	\$0.3	\$0.3	\$0.1	3
	TOTAL (excluding corresponding financing recommendations marked with a *)	\$261.6	\$1,364.4	\$1,102.8	1,067

Appendix D. Recommendation index by agency lead

Table 7. Recommendation index by agency lead

Recommendation	Ecology	Commerce	WSDA	DOH	OSPI
1*	X			X	
2*	X			X	
3*	X	X	X		X
4*	X				
5	X	X			
6	X				
7	X		X		
8	X				
9	X	X	X		X
10					X
11					X
12				X	
13	X		X		
14	X				
15	X				
16	X				
17	X	X	X		
18			X		X
19					X
20					X
21					X
22	X	X	X		
23	X		X		
24	X		X		
25	X				
26	X	X	X		
27	X	X			
28	X	X			
29	X				
30	X	X	X		

*denotes a federal component to the recommendation

Appendix E. Barriers to food waste reduction

Addressing the food waste challenge is just as complicated as the issue itself. Through the research and planning to support this plan, the following barriers were identified as challenges to reducing food waste in Washington.

Truly understanding the value of food - When food is thrown away, so are the valuable resources used to grow, transport, and distribute the food. A greater effort is needed to help consumers and businesses truly value food, and a cultural shift is needed to use food well in Washington. Through education and behavior change campaigns, technical assistance, and support this cultural shift can be realized.

Access to financing - It is often difficult to see the long-term benefits of investing in food waste reduction strategies. Solutions have varying returns based on their level of complexity, which can result in a lack of direct return on investment. This, plus already tight profit margins, disincentives businesses and consumers from investing in food waste reduction. Similarly, many food waste reduction projects have high upfront costs that can discourage investment, despite having long-term economic benefits.

Hunger relief and food rescue support needed - The single greatest need for hunger relief organizations (HROs) is to increase the state's distribution capacity. Increasing access to cold chain facilities, transportation mapping, and increased storage capacity would transform this dramatically. Many consumer-facing businesses lack sufficient facilities to store food for donation. Food banks, pantries, soup kitchens and other community organizations may also not have sufficient infrastructure or labor capacity to accept large donation volumes.

Available state funding for local hunger relief agency is provided through the Emergency Food Assistance Program (EFAP) managed by WSDA. Through this program WSDA distributes funding to county-level lead contractors that make funding allocation decisions for their county. There is no special categorization for regional distribution hubs or state strategy for systems-level improvements. This means that all hunger relief agencies in a county compete for a share of local funding, although they may have different roles in the statewide network.

The current situation is not conducive for systems-level investment strategies, such as dedicated funding for redistribution hub infrastructure which can provide efficiencies to the system as a whole. Existing state-level financing mechanisms can support this effort, and Ecology can develop a new grant specific to food waste prevention, rescue, and recovery to address these challenges.

Gaps in the food system - There is not much data on how food flows through the food system. This creates uncertainty about where food waste occurs in the food system and how much is being wasted. Similarly, the cost of food waste is often invisible, and it is difficult to manage when it's not being measured. This results in food not being accurately valued.

Regulatory uncertainty - Regulation uncertainty can also hinder food waste reduction. Health regulations vary by city and state, arising from "home rule" authority in some localities and

offering interpretations of the FDA Food Code, which only loosely defines basic requirement for food safety. This hampers food businesses from developing uniform food donation policies across their organizations. Regulatory uncertainty can also exist within the recovery sector.

Reducing regulatory uncertainty would also encourage more rapid or greater expansion of composting capacity, helping reduce costs or delays in implementing other recommendations that would send food waste to compost instead of landfill. With increased capacity for *at least* 54 thousand more tons of food waste annually, through expansion of small to medium compost facilities under clear and consistent regulation, the state would face less pressure on existing facilities to handle increased volume or increasing costs by hauling food waste longer distances.

End market development and contamination reduction - The hassle of removing food from its packaging significantly reduces food recycling rates among business and residential customers. Common contaminations include plastics, takeout containers, or food packaging that appears compostable but is not. The problem continues at the recovery facility. Compost or anaerobic digestion facilities that receive highly contaminated feedstock must spend more costs on pre- and post-processing, which may hurt profitability. Washington's food waste reduction strategies must include contamination reduction components in order to be truly successful.

Composting facilities must establish a price for their finished product based on their business model, a price which may be higher than competing soil amendments, but which support financial viability over time. These prices are impacted by customer demand as well as input availability and supply. Facilitating initial market expansions by funding capital projects, pilots, research, and technical support, could reduce barriers to entry for new or expanded composter capacity or locations. Education and public information campaigns could serve to not only increase the quantity of compost inputs, but also improve their quality and improve public understanding and demand for local sustainable products. Coordinated support for improvements on both the supply and demand side of the compost market, with regard for quality and education, could expand local markets while reducing price variability and potentially increasing market share for compost through improved geographic coverage and reduced transportation costs.

However, for anaerobic digestion projects, the sharp ups and downs of natural gas market prices make it challenging to finance projects that require stable, long-term cash flows. Compost markets are smaller and constrained by having to compete with chemical fertilizer prices, transportation costs, and the cost to spread the compost. Therefore, market demand for compost must keep pace with the millions of new tons of compost generated, or else a market imbalance will negatively impact compost prices and system economic.

Simply put, we cannot compost or AD our way towards meeting Washington's food waste reduction goals, but they are important parts of the diversion portfolio.

Appendix F. Recommendations by Phase

Table 8. Recommendations by phase

Recommendation	Phase 1	Phase 2	Phase 3
1*		X	
2*		X	
3*		X	
4*		X	
5	X		
6	X		
7	X		
8	X		
9	X		
10	X		
11		X	
12	X		
13		X	
14		X	
15		X	
16		X	
17		X	
18		X	
19		X	
20		X	
21		X	
22		X	
23			X
24		X	
25	X		
26			X
27			X
28		X	
29		X	
30		X	

Appendix G. Existing state-level funding mechanisms

In support of the plan, the following funding mechanisms and grants were identified throughout the planning process. These mechanisms could be utilized along with developing new funding mechanisms to help catalyze investments. Federal and additional funding sources can also be considered when identifying funding for food waste reduction efforts.

Table 9. List of existing state-level funding mechanisms

Grant	Focus
Clean Energy Fund Commerce	Established in 2013. The program funds development, demonstration, and deployment of clean energy technology. This includes using anaerobic digestions to convert food waste into renewable natural gas (RNG), energy and value-add coproducts.
Local Solid Waste Financial Assistance Grants (LSWFA) Ecology	Provides funding to local governments for solid and hazardous waste planning and implementation, as well as enforcement of solid waste rules and regulations
Waste reduction recycling and education (WRRED) Ecology	This grant program is a competitive grant for qualified local governments and non-profit organizations to help with local or statewide litter control, waste reduction, recycling, and composting education programs.
Public Participation Grants (PPGs) Ecology	Provides funding to individuals and not-for-profit public interest organizations to increase public understanding and involvement in cleaning up contaminated sites and improving recycling and waste management.
Healthy Kids Healthy Schools OSPI	Primarily focused on supporting physical activity enhancement, but may be used to procure food waste prevention equipment.

Department of Commerce

Clean Energy Fund (CEF)

[Clean Energy Fund](#) (CEF) was established in 2013 within the Energy Division at the Department of Commerce to provide grant funds to support the development and deployment of clean energy technologies. Now in its fourth round of biennial funding, CEF has been tapped twice to advance innovative approaches to the value-added disposition of food waste. The CEF can be expanded to support much of the infrastructure development in this plan.

This recommendation supports utilizing the CEF grants to focus investments in both energy (heat and power) and nutrient recovery. This focus would be similar to previously granted funds towards food waste reduction. For example, in 2017, Impact Bioenergy received a \$550,000 grant under the Research, Development and Deployment (RD&D) portion of CEF to install a

community-scale anaerobic digester on Vashon Island. Similarly, in 2019, FPE Renewables received a \$300,000 grant under a newly created Dairy Digester Enhancement component of CEF to install a de-packaging system for food residuals. The resulting slurry will be used in their on-site digester and be delivered to other farm-based digesters in the region.

Ecology

Local Solid Waste Financial Assistance (LSWFA)

The Washington Legislature authorized a financial assistance program under the Model Toxics Control Act, [70.105D](#) RCW to support local solid and hazardous waste planning and implementation, and to enforce rules and regulations governing solid waste handling. Ecology administers [Local Solid Waste Financial Assistance \(LSWFA\)](#) through chapter 173-312 Washington Administrative Code (WAC).

Financial assistance to local governments is based on the amount allocated for LSWFA by the legislature each biennium. In 2019-21, \$10 million was allocated to administer LSWFA. This amount represents a 64 percent reduction from the full funding amount of \$28 million.

Ecology disburses funds through an application process. Each jurisdiction is able to receive up to the formula-based amount available for that jurisdiction. Recipients of LSWFA are required to contribute 25 percent of project-eligible costs as cash expenditures and/or in-kind local match.

LSWFA supports local government implementation of eligible projects identified in their local solid and hazardous waste management plans, and local enforcement of solid waste handling laws and rules. Projects must be able to produce a measurable outcome. An example of a successful project through LSWFA grants can be seen in the work Thurston County Solid Waste accomplished assisting the Thurston County Food Bank build capacity.

Public Participant Grants (PPGs)

[Public Participation Grants \(PPGs\)](#) are grants to nonprofit organizations providing public education and outreach on contaminated sites and waste management issues. The competitive grant program provides up to \$60,000 per year for the two-year biennium. There is no matching funds requirement.

The Model Toxics Control Act requires that one percent of the revenue from the Hazardous Substance Tax be appropriated to the PPG program. The program received \$2.4 million in the current biennium for grants. The Hazardous Substance Tax was restructured during the 2019 legislative session and is anticipated to collect more revenue. It's anticipated this will increase the appropriation into the PPG program in the upcoming biennia.

The PPG program rule prioritizes contaminated site projects and projects with an environmental justice emphasis. Waste management projects that educate on waste reduction are also prioritized. Food waste reduction and redistribution are considered waste reduction projects.

Waste Reduction Recycling & Education (WRRED) grants

The [Waste Reduction Recycling & Education \(WRRED\)](#) grants program is a relatively new program that received an allocation of \$250,000 in the 2020-2021 grant cycle. This grant provides up to \$60,000 for each grant to qualified local governments and non-profit organizations for local or statewide education programs designed to help the public with litter control, waste reduction, recycling, and composting. A match of 25 percent of state funding is required.

The grant projects focus on the products taxed under chapter [82.19 RCW](#), Waste Reduction, Recycling, and Litter Control Account. The funding for this program can vary significantly from biennium to biennium but has historically funded from ten to twenty grants each cycle.

Office of Super Intendent of Public Instruction

Healthy Kids Healthy Schools Grant

During the 2019-2021 grant cycle, the legislature appropriated \$3.25 million to the OSPI capital budget to support the Healthiest Next Generation Initiative (launched in 2014), however over \$8.1 million was requested in grant applications received by OSPI. The large gap between allocated funds and funding requests underscores the need for additional grant funds.

Funds were available in two categories: physical education/physical activity and **nutrition**. Grants may be used to purchase new equipment, repair existing equipment, design, construct, or refurbish facility space and infrastructure.

Additional funds are needed to purchase the equipment necessary to carry out food waste reduction projects. Some examples of equipment needed by schools for food waste prevention, rescue, and recovery education include, but are not limited to:

- Updated kitchen equipment to support schools' capacity to do more scratch cooking. This leads to the production of meals that are more nutritious, use less food packaging, and potentially, meals that incorporate more locally sourced foods.
- Bins, crates, and ice packs to support school cafeteria edible food sharing.
- Milk dispensers, and, if needed, dishwashing equipment and reusable cups to eliminate single-use milk cartons.
- School gardening and onsite composting equipment, which support students' education about where their food comes from and ways to use food waste as a sustainable food production resource.

More funding to purchase equipment that supports food waste prevention, rescue, and recovery will lead to measurable food waste reduction in schools through improved storage, sharing, and waste tracking. Furthermore, when school food waste prevention, rescue, and recovery projects educate and engage students in learning, then students bring those lessons home to their families and communities.

Appendix H. Healthy Kids Grants Worksheet

Table 10. 2019-2021 Healthy Kids Healthy Schools Grant program funding requests

District Name	Nutrition	Nutrition Project Description	Physical Ed (PE)	PE Project Description	District Total
Brinnon			\$45,954	1/4 walking path around play yard	\$45,954
Centerville	\$20,100	dishwasher, refrigerator, oven, range			\$20,100
Coupeville	\$82,345	food processing equipment			\$82,345
Freeman	\$17,960	warehouse freezer			\$17,960
Grapeview	\$3,903	water bottle filling stations			\$3,903
Harrington	\$13,432	salad bar equipment			\$13,432
Hood Canal	\$60,151	water bottle filling stations, cafeteria equipment			\$60,151
Index			\$61,000	rubberized playground surface	\$61,000
Keller	\$198,487	hood exhaust fan, walk-in cooling system			\$198,487
Kiona-Benton	\$60,501	walk-in cooler, dishwasher			\$60,501
Kittitas	\$62,478	refrigerator, freezer, food warmer equipment			\$62,478
Klickitat	\$200,000	range, refrigerator, freezer, sink, dishwasher			\$200,000
Lake Quinalt			\$193,222	gym floor, weight room and playground equipment	\$193,222
Mabton	\$5,300	water bottle filling stations	\$5,000	weight room equipment	\$10,300
Mary Walker	\$4,000	kitchen electrical	\$68,681	covered play area, basketball court upgrades	\$72,681
Mill A	\$17,000	refrigerator, dishwasher			\$17,000
Napavine			\$199,980	covered play area, climbing wall, court upgrades	\$199,980
Nooksack Valley	\$61,466	oven, cooler, dishwasher, cold bar			\$61,466
North Beach	\$44,000	water bottle filling stations			\$44,000
Okanogan			\$200,000	playground equipment, ADA ground cover	\$200,000
Quillayute Valley			\$200,000	playground equipment, playground surfacing	\$200,000
South Kitsap			\$123,582	playground equipment, playground surfacing	\$123,582
Sprague	\$9,479	water bottle filling stations			\$9,479
Summit Valley	\$5,000	sink	\$190,000	covered play area, playground equipment, disc golf course	\$195,000
Taholah	\$30,000	walk-in cooler and refrigerator			\$30,000
Thorp	\$58,500	oven, dishwasher, cold bar, hood exhaust fan			\$58,500
Tonasket			\$99,000	playground equipment, playground surfacing	\$99,000
Touchet	\$120,272	dishwasher, greenhouse replacement			\$120,272
Union Gap	\$69,000	oven, dishwasher, mixer	\$30,091	playground surfacing, volleyball net	\$99,091
Wahkiakum	\$43,300	freezer, range, dishwasher, sinks, ice machine			\$43,300
Yakima			\$146,816	ADA playground equipment	\$146,816

Appendix I. Example food waste reduction campaigns

Examples of food waste prevention campaigns:

- [Food Recovery Challenge](#) - US EPA (50) – The Food Recovery Challenge challenges universities, business, and other community organizations to make their food management systems more sustainable.
- [Love Food Hate Waste](#) – WRAP, UK (51) – The Love Food Hate Waste campaign provides information on the environmental and socio-economic impact of food waste. Their website offers tips, recipes, and tools to help individuals and families reduce food waste and save money.
- [Love Food Hate Waste](#) – Canadian version of the UK program (52)
- [Save the Food](#) – NRDC (53) – Save the Food is a national public service ad launched by the Natural Resource Defense Council (NRDC) and the Ad Council to raise public awareness about the environmental and socio-economic impacts of food waste.
- [Wasted Food Wasted Money](#) – Oregon DEQ (54) - campaign to assist local governments in running effective waste prevention campaigns, in addition to provide technical assistance to local food businesses.
- [Think.Eat.Save](#) – UNEP (55) – The Think.Eat.Save campaign seeks to provide a global vision for reducing food waste. The campaign hopes to increase public awareness and create greater understanding about the total impact of food waste.
- [I Love Leftovers](#) – Sustainability Victoria (56) – In support of the Love Food Hate Waste campaign, this Australian program encourages people to get creative with leftovers. The campaign’s website includes useful resources, like tips on how to prepare food and store food once it has been cooked.
- [I Value Food](#) – Sustainable America (57) – The I Value Food campaign aims to raise awareness about food waste in the United States. The campaign’s website offers tools and tips on how to help end food waste.
- [Zero Hunger Challenge](#) – United Nations (58) – With the goal of eliminating all forms of malnutrition and to build a more sustainable food system, this international initiative focuses on ending hunger and living more sustainably.

Appendix J. Local government survey summary report

To help inform this plan, a local government survey was drafted in December 2020. The survey was distributed through Ecology’s existing subject matter expert networks from January 12-25. A total of 54 responses were received from 15 city governments, 23 county level agencies, and 8 organizations. Some agencies and organizations had multiple respondents. This list includes the feedback from the survey respondents.

Getting Started

- **Understand there is not a “one-size-fits-all” solution for reducing food waste.** Many local governments responded with the feedback that food waste reduction is complex, time consuming, and often trial and error work.
- **Develop baseline data to inform progress towards goals.** What gets measured, gets managed. Some local governments reported ongoing work with determining baseline data for their communities. Food waste baseline data can come from waste characterization studies, technical assistance, and research done in the community.
- **Start food waste prevention, rescue, and recovery work with schools and institutions.** Local governments are finding success in pilot programs and partnerships with schools and institutions. Across the focus areas of food waste prevention, rescue, and recovery, local governments are identifying a “low hanging fruit” to beginning food waste reduction efforts through this focus.

Regulations and strategic planning

- **Linking food waste reduction strategies to existing priorities of the local government:** Local governments have found success in linking food waste prevention, rescue, and recovery work to existing local government priorities.
 - For example, King County has developed a new program, called CompostWise, which supports the use of compost and other recycled content soil amendments and develops markets for these products in the region. As a part of the county’s zero waste of resources by 2030 goal and plan, the Solid Waste Division (SWD) is pursuing additional opportunities to increase diversion through AD and organics processing. Another initiative the county is pursuing is the link of food waste recovery to climate objectives, including developing financial incentives such as soil carbon sequestration markets
 - To meet similar climate goals, the University District Food Bank in Seattle received a grant to establish an onsite system to turn food waste into digestate to use on their rooftop garden.
- **Develop regulations and incentives that make sense for your local community:**
 - Some local governments have found success in developing regulations and incentives that work for their communities. These strategies include:
 - *Tie funding incentives to real-time food loss and waste measurement and infrastructure planning* – some county and city level grants require waste tracking and analytics with the grant funds. This method can help collect food waste data that is otherwise difficult to obtain since it is not regulated or required. For example:

- [King County Commercial food waste grants](#)
- [Seattle Public Utility Waste-Free Communities Matching Grants](#)
- [City of Tacoma Sustainability Small Grants](#)
- *Ban organic waste from landfills* – One option to encourage food waste reduction is to implement a food waste disposal ban, such as the one Seattle implemented in 2015.
- *Mandate food scrap recycling* – Another way to promote food waste recovery is to mandate that food scraps must be collected for composting and energy recovery.
- *Reduced cost organics curbside collection* – Under this market-based model, recycling and composting organic waste is priced much lower or at no-cost versus landfilling it. In some jurisdictions, residential customers do not have to pay for curb side organics collection. Others can opt in for a reduced rate.
- *Incentives for haulers, food businesses, and residents to recover, rescue, and prevent food waste* – Many local governments are curious to explore how to further incentivize food waste reduction participation throughout their communities. Developing innovative incentives that drive food waste reduction is a key consideration amongst Washington local governments.
- **Develop incentives to monitor and collect food waste** – Local governments expressed an interest in learning how to develop incentives to reduce food waste and methods to collect and monitor food waste and food waste data.
- **Continue to work with state agencies to clarify and shape state and federal food rescue rules.**
 - Multiple respondents indicated regulatory confusion, particularly within the scope of food rescue. More support on consistent rule interpretation and state-level coordination will help local governments prevent food waste and rescue more food. Some businesses have been hesitant to donate food, due to concerns about liability issues.
 - *Too many differences between communities* – Within the need for regulatory clarity, a few local governments reported residents are confused between jurisdictions on what they can and cannot do with edible and inedible food products.
 - *Share tables* – Another area of confusion was share table guidance for K-12 schools, since local health jurisdiction rules and interpretations can vary.
 - *Food donation guidance* – Local governments reported businesses are hesitant to donate edible food because of regulatory confusion. Other examples of emerging food donation issues are food donation projects like the “food is free” work in Tacoma, where more coordination is needed between local health jurisdictions and the state to determine guidelines and best practices.

Networking and connecting the dots

- **Build opportunities to connect, strengthen, and network the local food system:**
 - Due to the nature of the food supply chain, many public agencies have interests in the food system and these interests can lead to duplications in effort or to competing priorities, reducing the effectiveness of the work. It is often difficult to coordinate efforts and financial resources across agencies and jurisdictions.
 - Many respondents identified developing partnerships with governments, private organizations, and non-profits. Suggestions included forming/participating in partnerships, purchasing cooperatives, cities working together on diversion efforts, counties working

- together on regional solutions, leveraging already existing programs like EPA's Food too Good to Waste and Food Recovery Challenge, support Master Gardener programs, gleaning efforts. These partnerships also include accessing grants and other funding support from alternative sources. These can be micro or mini grants from local private sector or non-profit organizations.
- Suggestions were made for the state to provide food waste reduction specific grant funding to reduce competition between food waste reduction efforts and other recycling programs.

Prevention, Rescue, and Recovery Best Practices

- **Make food waste prevention a priority within food waste reduction work.**
 - Many local governments already have food waste recovery programs, however of the local governments who responded only half had food waste prevention programs in place.
- **Build networks to increase edible food donation:**
 - Food rescue is a strategy to reduce food waste from businesses by diverting edible food to programs that can distribute this food into the community. The respondents indicate increasing edible food donation is a want for their local government, but with limited time and resources it is difficult to prioritize.
 - The responses indicate more needs to be done with establishing networks and mapping hunger relief organizations, and connect those with edible food to those who distribute the food to those who need it. Food rescue appears to be equally a focus commercially and residentially when food rescue programs exist.
- **Increase focus on diversifying recovery options while promoting contamination reduction**
 - Many local governments across the state want to diversify their food waste management systems. Rural and urban respondents indicated the desire to develop more small-scale anaerobic digesters for on-site processing of food waste residuals. Large scale AD systems are often too expensive and require high waste density to operate, making smaller scale systems more appealing to manage waste on-site.
 - Through partnering with master gardeners and community organizations, local governments are providing education on small-scale recovery options like backyard composting, vermicomposting, and food waste prevention strategies.
 - Similarly, local governments are finding success offering curbside organics hauling with more information on contamination reduction. Local government respondents indicated contamination reduction outreach needs to occur continuously to ensure a clean stream.
 - A few respondents mentioned an interest in year-round organics hauling or described pilot projects they'd completed or were interested in initiating, but all noted lack of funding to implement or maintain an organics collection program.
 - Some local government respondents noted success with providing free organics collection to commercial and multi-family customers and drop box collection programs.