



DEPARTMENT OF
ECOLOGY
State of Washington

Recycling Development Center Advisory Board Meeting

September 14, 2022 | 9am – 12pm (Pacific time)

Agenda

9:00 am Welcome & review meeting goals

9:15 am Board and Agency Updates

9:30 am Legislative Report Discussion

9:55 am Break

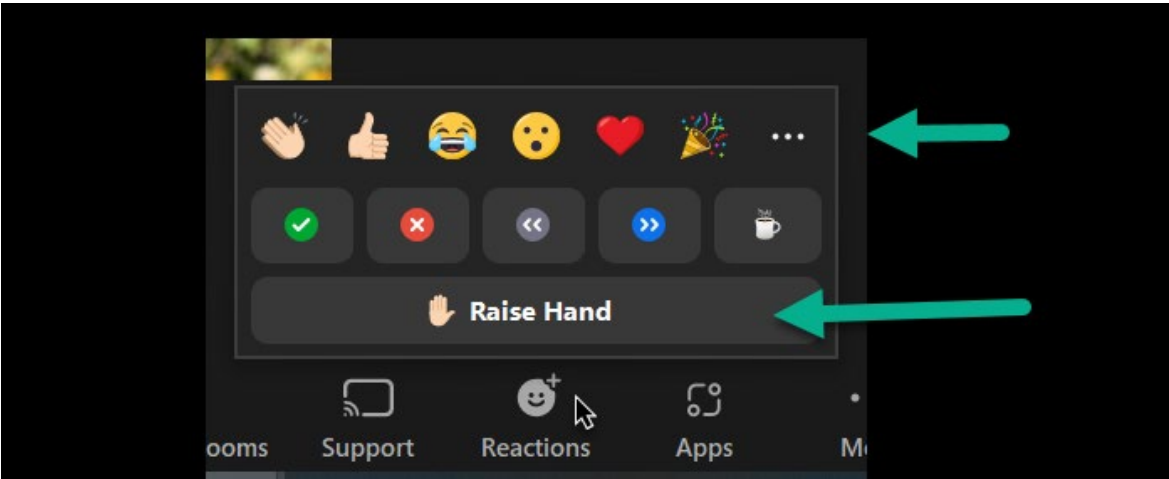
10:05 am Center Grants – A Year in the Life

11:05 am Wrap-up



Participating in this meeting:

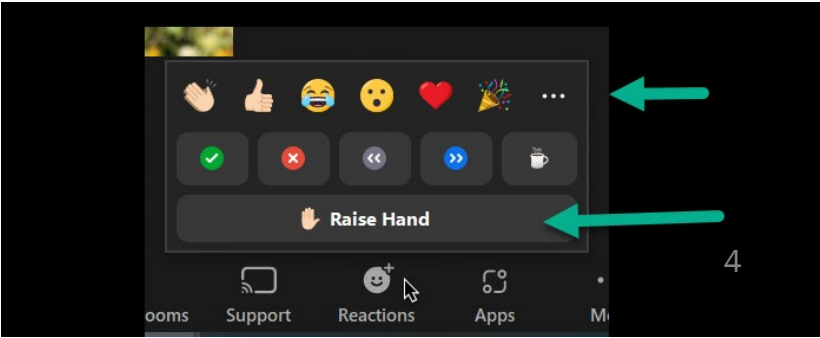
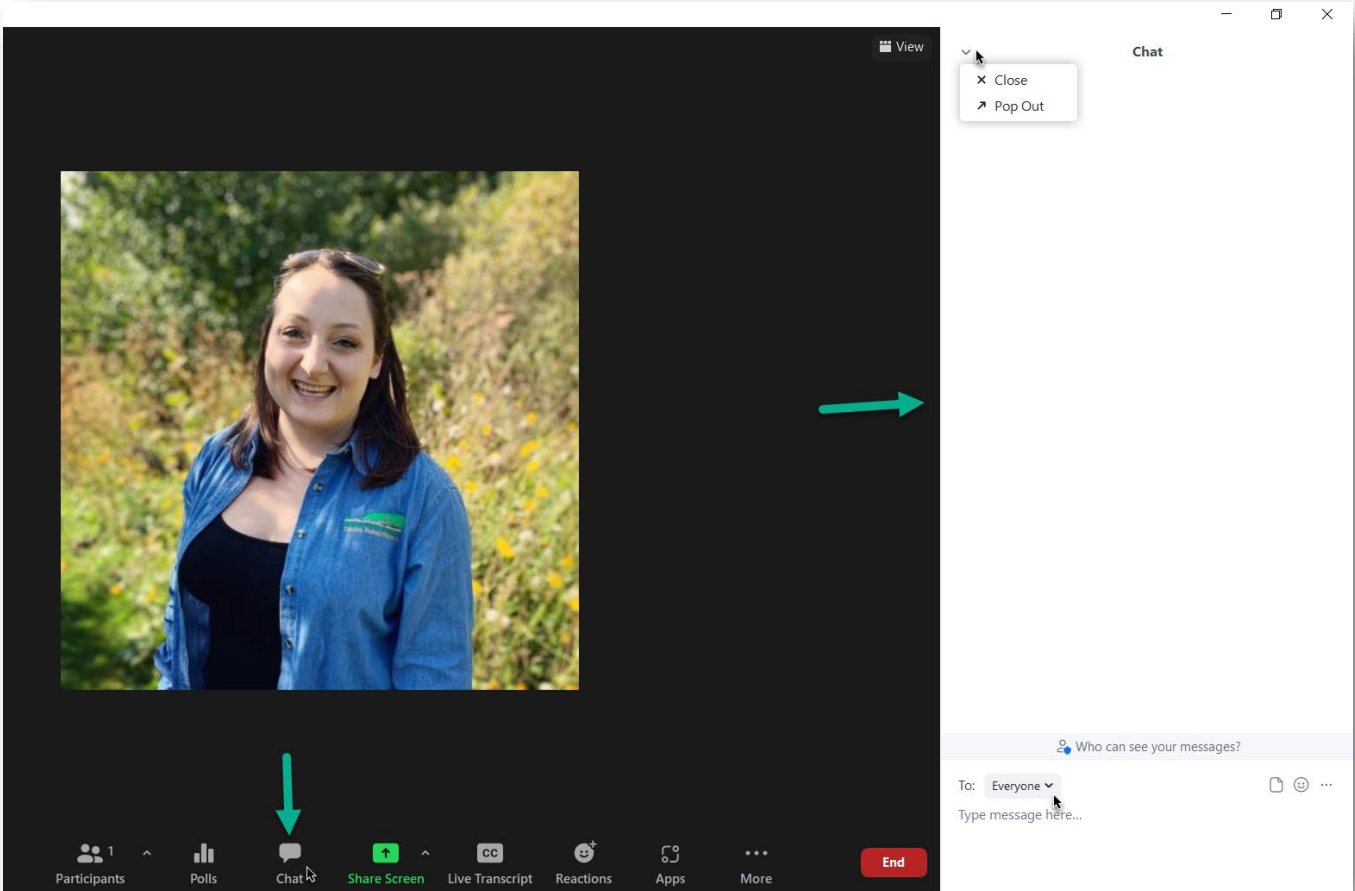
Board members and presenters may unmute themselves.



*Note: we are **not** recording this meeting, meeting notes will be posted on the Advisory Board website.*

Participating in this meeting:

Participants may use reactions throughout.
For questions, please raise your hand or type them in the chat box.



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Center updates

Board member roundtable

Ecology update

Commerce update



Please welcome new board members....

- Sam Dart, Grant County
- Natalie Caulkins, Republic Services



Board roundtable:

Natalie Caulkins



Sam Dart



Corinne Drennan



Karl Englund



Kyla Fisher



Nina Goodrich



Allen Langdon



Kris Major



Scott Morgan



Chris Piercy



Mike Range



Tim Shestek



Jay Simmons



Heather Trim



Agency Updates

Kara Steward



Rob Duff



NextCycle Washington

There are two ways to participate in NextCycle Washington:



Circular Accelerator

The 2022 application period is now closed.
Stay tuned for 2023 Circular Accelerator details

Competitive challenges designed to support promising circular businesses and projects



Renew Seed Grants

Launching
September 21, 2022

A great starting point for funding new innovative businesses and projects

NextCycle Washington is an initiative of:



Startup funding for NextCycle Washington is provided by King County's Solid Waste Division. Other funding partners will be confirmed soon. Re+ grant funding is provided for King County based organizations.

NextCycle Washington is powered by:



NextCycle Upstream Accelerator

Organization	Project focus
Plover	Upcycling textile product lines using pre-consumer textile materials
Refugee Artisan Initiative	Upcycling textiles by refugee and immigrant women using post-consumer materials, like fire hoses
Geer Garage	Online peer-to-peer outdoor gear rentals
DeliverZero	Reusable takeout container app that integrates with online delivery platforms
Okapi Reusables	Reusable cup network serving cafes and coffee shops
South King Tool Library	Develop replicable tool library sharing platform model
Just Right Bite	Develop and market pet food using insect-based inputs
Community Gearbox	App based sharing platform for outdoor gear and other products

NextCycle Downstream Accelerator

Organization	Project focus
Duwamish Valley Sustainability Association	Community scale anaerobic digestion of food waste to produce biofuel and liquid fertilizer
Regenerated Textiles	Develop pilot for demonstration of advanced textile recycling module in shipping container to produce recycled fibers
Birch Biosciences	Plan pilot for demonstration of plastic depolymerization using engineered enzymes to produce food grade recycled PET
Glass Packaging Institute	Develop glass aggregation and color sorting facility in central and eastern Washington to overcome economic barriers
Glacier	Expand market case for low-cost small footprint robotics and A-I for material recovery facilities
Ground2Ground Glass	Expand glass recycling to sand operation in the Walla Walla valley
Book Hill Group	Manufacturing household accessories using recycled content.
Restaurant 2 Garden	Expand pilot community-scale restaurant food waste composting in Chinatown-International District.

NextCycle Grants

Renew Seed Grant Applications Open on Sept 21.

37 Grants Available
Up to \$10,000



nextcyclewashington.com/renew-seed-grant

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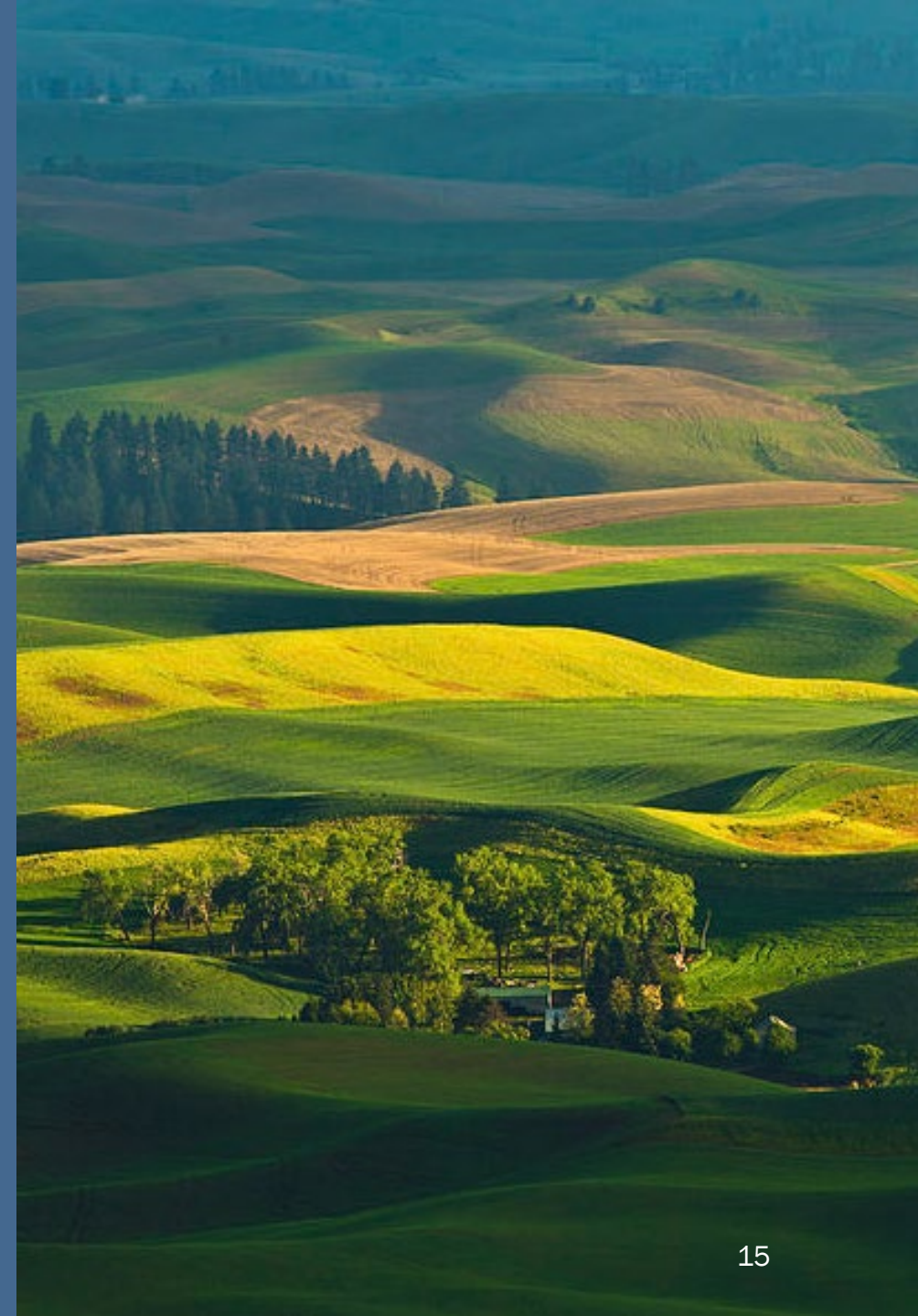




Legislative Report

Overview – Kara Steward

Board Recommendations – Scott Morgan



Report to the Legislature - 2022

Contents

- Executive Summary
- Operations and Logistics
- Accomplishments 2021-22
- Work Plan 2023-24
- Challenges, Goals, Metrics
- Solid Waste Data Supplement

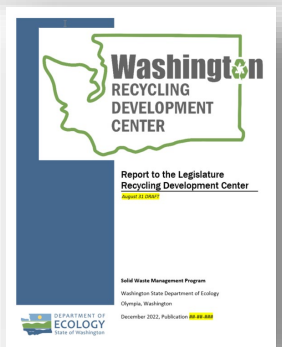
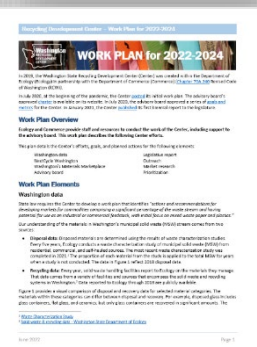
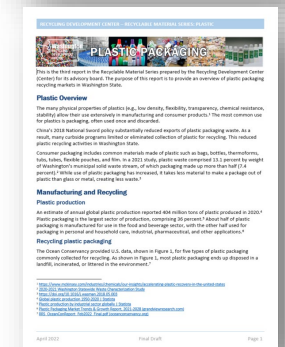
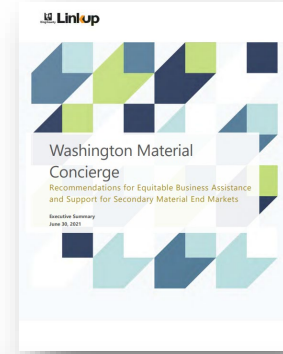
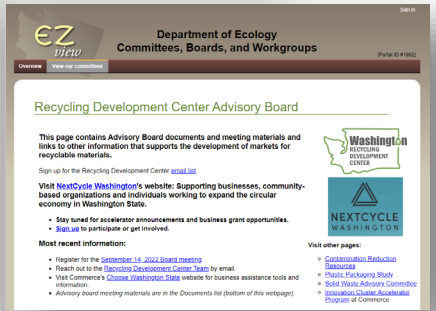
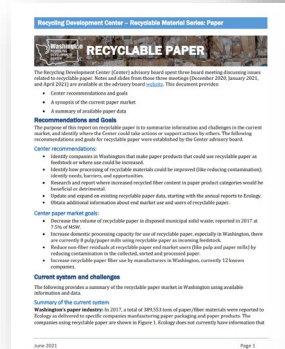


**Total state funds
\$2,624,551**

Accomplishments 2021-2022

Agency Support and Research
\$1,210,114

NextCycle Washington
\$710,000*



Supporting businesses, community-based organizations and individuals working to expand the circular economy in Washington State.

Interested in applying for a NextCycle Washington governance role? We are currently seeking Applicant Mentors and Renew Seed Grant Governance members. Learn more and apply below.

OPEN GOVERNANCE ROLES

*NextCycle funds committed in 2022, to be spent in 2023

Accomplishments 2021-2022

Recycling Studies
\$324,437

Pilot Projects
\$150,000

Plastics Recycling Market Development for Washington State and the Northwest Region



Karl Englund, Hui Li, Kristin Brandt, Dane Camenzind, Sarah Dossey and Jonathan Hoff
Composite Materials and Engineering Center
June 30, 2021

WASHINGTON STATE UNIVERSITY

Prepared for WA State Department of Commerce and WA State Department of Ecology
For inquiries, contact Karl Englund: englund@wsu.edu

Linup

Recycling Infrastructure in Washington State
Material Recovery Facilities and Paper and Plastic Recyclers

June 30, 2021

CITY OF LEAVENWORTH

Food Waste Collection & Hauling Feasibility Study

JUNE 2021

PREPARED BY:
WASTE LOOP

AUTHORS: ARIANNA JONES & HELENE TAMBET

Pyrolysis System Feasibility Study for the Port of Port Townsend

REDCORP/BCORP
June 30, 2021


PRESENTED TO:
The Port of Port Townsend
Executive Director
Port Townsend, Washington

PREPARED BY:
Terry Tech, Inc.
and
Ampere Group
June 2021
Port Townsend, WA

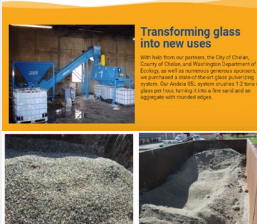
Reviewed by:
Mark Hines
VP of Strategy

Restriction on Disposition, Use of Data, and Limitations
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Glass is easily recycled and repurposed



Transforming glass into new uses




LOPEZ SOLID WASTE DISPOSAL DISTRICT

The ReMakery




FINAL Secondary Recycling Market Feasibility Study and Preliminary Action Plan



HDR
JUNE 2021

Kittitas County Solid Waste Division


Solar Photovoltaic Module Retirement in the State of Washington



Preliminary Analysis and Recommendations For Further Study

Energy Program
WASHINGTON COUNTY

Market Development for Clean Wood Waste
Jefferson County Department of Public Works
June 30, 2021



Prepared by:
Al Caron, Solid Waste Manager

Reviewed by:
Mark Henders, Public Works Director

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EARTH WISE ARCHITECTURAL SALVAGE



BANKOFA LUMBER wood with a future

Seattle Public Utilities

RE-USE Consulting



RAINIER WOOD RECYCLERS

Accomplishments 2021-2022

Economic and Equity Analysis
\$130,000



Business Resources
\$100,000



washington
materials
marketplace



Funding fiscal years 2021-2022

Center activity	Funds used for	Amount	Percent
Ecology staff	3 staff	\$ 744,362	28 %
Commerce staff	2 staff	\$ 465,752	18 %
NextCycle Washington	Online platform	\$ 440,000*	17 %
NextCycle grants	27 grants	\$ 270,000*	10 %
Recycling studies	7 projects	\$ 324,437	12 %
Pilot projects	3 projects	\$ 150,000	6 %
Economic research	1 contract	\$ 130,000	5 %
Business resources	2 projects	\$ 100,000	4 %
Total funds		\$ 2,624,551	100 %

*NextCycle funds committed in 2022, to be spent in 2023

Center Goals and Metrics

Recycling Development Center Goals	NextCycle	Studies/ Research	Pilot projects	Business resources
Develop local and regional markets and processing for Washington's recyclable products and materials to be transformed or remanufactured into usable or marketable products for use other than landfill disposal or incineration.	◐	○	◐	◐
Support equitable economic growth by analyzing, attracting, and supporting existing and new Washington-based businesses that enable reuse of products, packaging, and other materials before they enter the waste stream, process recyclable waste materials into valuable commodities and products, use recycled content, and create local jobs, while ensuring that a social justice lens is applied throughout.	●	◐	●	◐
Assess innovative technologies, such as new Material Recovery Facility (MRF) technologies, sorting processes, or new ways of addressing mixed plastics, and promote those that meet established criteria.	◐	●	●	○
Collaborate with manufacturers and producers of packaging and other potentially reusable or recyclable materials to increase the ability of their packaging and products to be reduced, reused, or recycled.	◐	◐	●	●
Evaluate, analyze, and recommend state policies that positively affect markets for recyclable materials.	○	●	○	○
Collect recycled materials end use data from material recovery facility operators; public and private sector recycling and solid waste industries; manufacturers and retailers.	○	●	○	○
Work in partnership with product and packaging producers and other regional partners on a pilot project that demonstrates a pathway for a specific material, showing all stages of the supply chain using a circular economy model.	●	◐	○	●

Goals Progress
○ - minimal
◐ - moderate
● - good

Recycling Development Center Metrics	NextCycle	Studies/ Research	Pilot projects	Business resources
Increased business use of recycled plastic or paper material – Work with 10 new or existing businesses in WA to manufacture products using plastic or paper recyclable materials, in five years.	◐	◐	○	◐
Increased business use of other recyclable material and reusable products – Work with 10 new or existing businesses in WA to increase use of reusable or recyclable materials, in five years.	◐	○	◐	◐
Increased reusability/recyclability of manufactured products – Work with 15 manufacturers (or their associations) to make their products reusable or recyclable (design changes), in five years.	◐	○	○	◐
Increased purchasing of products with recycled content – Work with 10 manufacturers, government agencies, or institutions to implement purchasing preferences for products with recycled content, in five years.	◐	○	○	◐
Recommended policy changes – Support of policies to improve recycling – examples: product stewardship for specific products, bottle deposit program, improved labeling for recyclability, in five years.	○	●	○	○
Completed a pilot project or initiative with packaging or other product producers, within five years that demonstrates that creating sustainable markets is possible or has fostered, enhanced, built markets for mixed waste papers or plastics or has created a template for how to create more sustainable markets for this material.	◐	○	◐	◐
Collaborated with other recycling development centers, regional partners, and other stakeholders so that our successes are amplified rather than be duplicative or competitive.	◐	○	○	○
Increase total amount of material recycled locally/regionally (relative to the percentage exported) – Percentage of recyclable materials that are primary/secondary processed and recycled into new transformed or remanufactured into usable or marketable products within the state or region increases by 75 percent, in five years.	◐	○	◐	○
Injected economic growth and innovative technologies into Washington and the region's recycling and processing capacity by increasing capital investment (by 50 percent) and job creation rate (by 50 percent), in five years.	◐	○	○	○
Reduced the amount of recyclable material going to the landfill by at least 50 percent in five years, relative to 2015, as measured by the State Waste Characterization reports, including reductions created both by increased recycling and decreased waste generation strategies (e.g., reusable packaging).	◐	○	◐	○
Reduce pulp and paper mill residuals by 50 percent, in five years.	○	○	○	○

2023-24 Work Plan



Advisory board and facility tours



Support NextCycle Washington



Support the Materials Marketplace



Research and data analysis

2023-24 Work Plan



Board Recommendations

Charter

- The Board's advice to Ecology does not require members to reach consensus. All viewpoints will be considered as the work plan for the Center is developed and the results of that work is completed. Recommended actions, along with any areas of disagreement, will be presented in any reports and shared with appropriate stakeholders for further implementation.

Process

- Board members are asked to provide critical comment on the recommended actions to highlight strengths, pitfalls/weaknesses, critical stakeholders, and/or other policy concerns associated with the broadly defined recommendations.

Board Recommendations

System gaps:

- Consumer participation in recycling and product sorting are sub-par.
- Waste collection centers receive mixed and poorly sorted material streams.
- End-user markets remain marginal and/or emergent.

Board Recommendations:

- Beverage deposit return system or 'bottle bill' to increase consumer participation in recycling and provide cleaner incoming material streams that improve material recovery facility (MRF) throughput capacity.
- Extended producer responsibility (EPR) program to recover recyclable and compostable materials from the waste stream and lay foundations for a more robust end-user markets.
- Center fiscal support for staff, research, market development, pilot projects, and NextCycle Washington.

Let's take 10 minute break



Agenda

- | | |
|----------|------------------------------------|
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Grant project updates

Ariahna Jones and Carl Florea – City of Leavenworth

Andrew Nichols – Lopez ReMakery

Julie McCoy – 911 Glass Rescue





Grant Project Update

Ariahna Jones and Carl Florea – City of Leavenworth



City of Leavenworth

Food waste collection & hauling feasibility study

Prepared by Waste Loop

September, 2022



Outline

- Background
 - Assessment of current City waste management operations
 - Waste characterization study
 - Best practices overview for comparable size operations
 - Path Forward
-

Background

- October 2018, Impact Bioenergy (Anaerobic Digestion) invited to present to Leavenworth City Council upon community request.
- Community gatherings around sustainability through waste diversion started the winter of 2018 and Waste Loop was founded the spring of 2019.
- November 2019, the City of Leavenworth contracted with consultant for an assessment of the commercial waste stream in the City.
- February 2021, City of Leavenworth awarded the DOE Recycling Development Center Grant for Research & development of the organic waste management market in Leavenworth, WA.



Current Operations

- Close to 2 million visitors a year
- City operates downtown solid waste & cardboard collection & hauling.
- 159 commercial accounts picked up 1-6x a week plus general downtown sidewalk collection.
- In 2021, average of 204 tons & \$19,411 in tipping fees per month (\$232,934 a year)



City-wide waste audits

- Objective
 - Estimate the share of organic waste within commercial waste stream
 - Assess other diversion potential for City's waste
- Methodology
 - Modified random sampling
 - Stratification by business types
- Logistics
 - May 24 & June 7, 2021 (Mondays)
 - 10+ volunteers

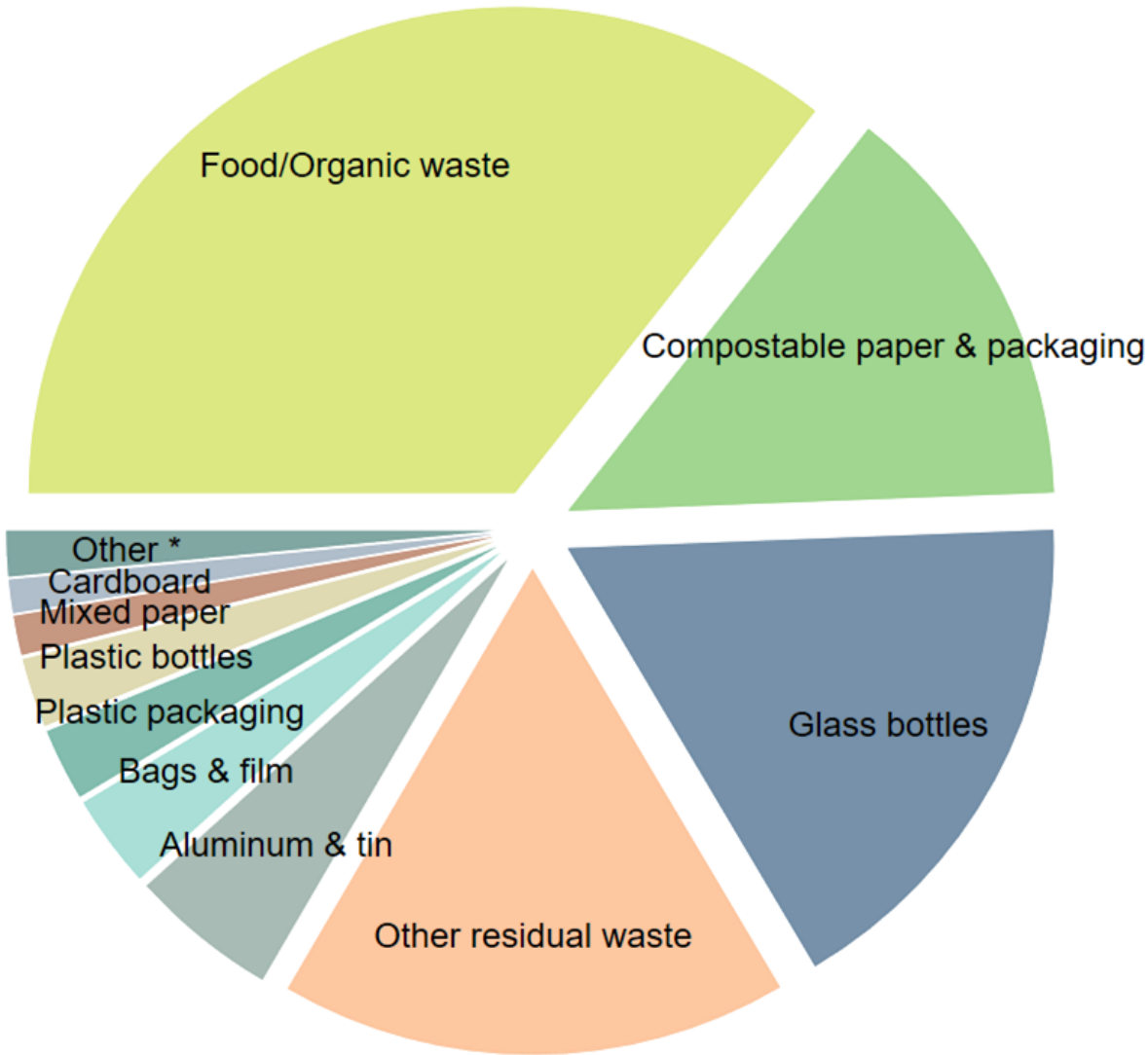


Results

Weight of all waste surveyed = 2386.1 lbs.

15 Waste Categories

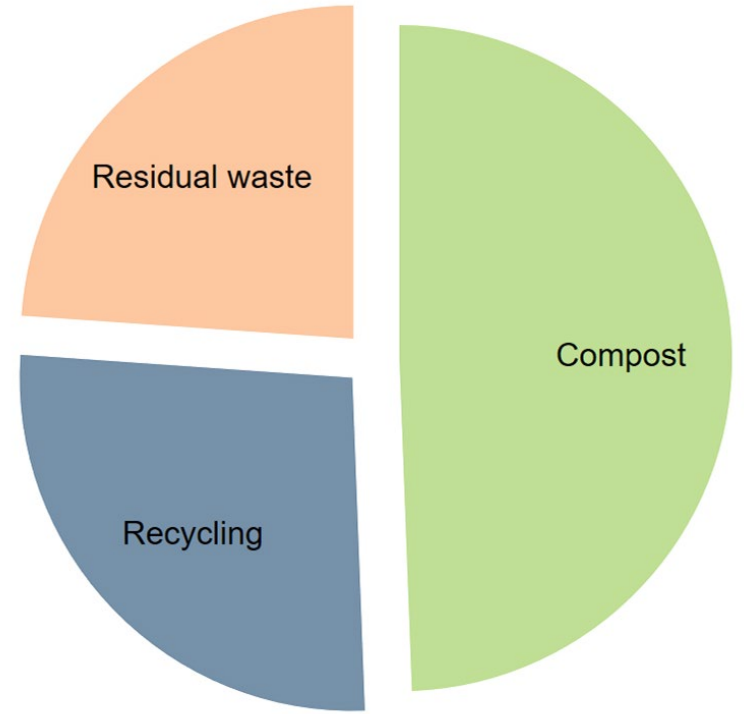
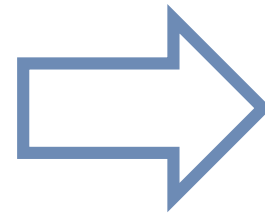
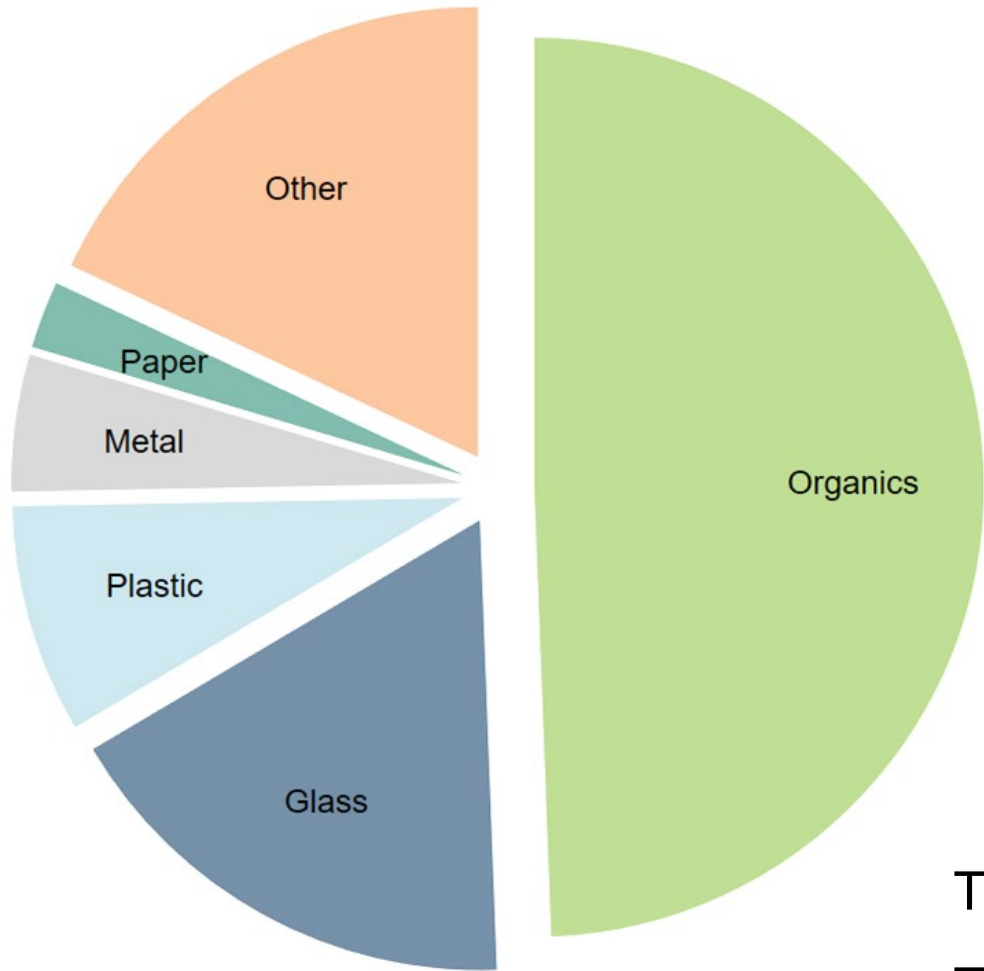
Averaged over the two audit days



* Other here includes all categories that represented <1% of the total weight: electronics (0.6%), tetra packs (0.4%), styrofoam (0.4%), batteries (0.1%)

Diversion potential

All categories	Recyclable in Leavenworth	Recyclable hypothetically
Plastic Bottles	X	X
Other Plastic Packaging		X
Bags & Film		X
Styrofoam		X
Cardboard	X	X
Mixed Paper	X	X
Aluminum & Tin	X	X
Scrap Metal		X
Glass Bottles	X	X
Food/Organic Waste		
Compostable Paper & Packaging		
Batteries		X
Tetra packs		X
Electronics		X
Other Residual Waste		
Total compostables	49.4%	49.4%
Total recyclables	26.7%	33.7%
Total diversion potential	76.1%	83.1%



Total Compostable : 49.4%

Total Recyclable: 26.7%

Total Diversion Potential: 76.1%

Restaurant audits

- **Goal:** assess the share of compostable waste in food service businesses specifically
- 4 restaurants >> 1 day's worth of waste from each
- On average, **83.7% of all waste** was compostable
- Businesses' sales data was used to compare the audit day to annual sales volume:
 - The largest of the businesses could have diverted 34,510 lbs. of waste in 2019 if composting had been an option
 - Collectively, the businesses could have diverted over **69,500 lbs. of waste in 2019 alone** if composting had been an option.



Results

		München Haus	Yodelin Broth Company	Whistle-punk Ice Cream	Icicle Brewing	AVERAGE
WASTE BY WEIGHT	Total weight (lbs.)	172.2	231.1	35.2	24.8	
	% compost	79.8%	97.0%	81.3%	76.6%	83.7%
	% trash	20.2%	3.0%	18.7%	23.4%	16.3%
WASTE BY VOLUME	Total volume (gal)	230	120	30	36	
	% compost	60.0%	75.0%	50.0%	66.7%	62.9%
	% trash	40.0%	25.0%	50.0%	33.3%	37.1%
2019 PROJECTIONS	Total weight (lbs.)	43,251	31,514	N/A	5,893	
	Compost weight (lbs.)	34,510	30,559	N/A	4,515	
	Trash weight (lbs.)	8,741	955	N/A	1,378	
2019 PROJECTIONS	Total volume (gal)	57,768	16,364	N/A	8,555	
	Compost volume (gal)	34,661	12,273	N/A	5,703	
	Trash volume (gal)	23,107	4,091	N/A	2,852	

Insights

- In ideal conditions, 45+% City's commercial waste could be diverted as compost
 - Up to \$100,000 could be saved/re-channel towards compost from reduced tipping fees
 - In reality, a smaller percentage due to practical reasons, awareness/cooperation of staff, visitors, etc.
- Finding alternatives to small things matters
 - E.g., 8 lbs. of rubber gloves
 - Condiment containers
- Strategic targeting of compostables
 - E.g., coffee in hotels
- Many restaurants interested in sustainability practices



Research on Comparable Operations & Market

- Organic waste collection & hauling
 - Exception in the market due to the importance of source separation & contamination reduction
- Circular economy opportunity
 - Partnerships between facility, hauler, municipality, local nonprofits, agriculture & local restaurants
- Market for compostable products & 'towards zero waste' is increasing.
 - Major distributors such as Sysco now carry compostable packaging & labeling/ certification increasing
 - Eco-tourism request for 'towards zero waste' services & events



What's happening now & first steps

Operations

- Winton MFG: Aerated Static Pile Commercial Composting Facility
 - Starting to accept food waste now, collection operations starting late September
- Launching a pilot program to collect & haul food waste
 - Businesses joining on voluntary basis
 - Drop-off sites for residential compost
 - Winton serving as primary hauler
 - Through DOE Grant the City & Waste Loop purchased a collection & hauling trailer to utilize as needed



What's happening now & first steps cont.

Education & Outreach

- Working with the Cascade School District
 - School & Classroom waste audits
 - Support of Sustainability Club initiatives
 - Composting curriculum development & integration
- Community Outreach
 - Community Events & Workshops
- Business Outreach
 - Sustainable business program development
 - Waste audits & analytics
 - Staff training



Next steps

Aligning waste management plans & goals

- The 2017 Chelan County Solid Waste Management Plan (SWMP) includes recommendations to reduce waste through organics management and diversion
 - Maintain and encourage public education/information programs.
 - Encourage convenient and cost-effective opportunities for all households, institutions and businesses to divert organics.
 - Promote private sector involvement.
- WA Food Waste Reduction Act / Department of Ecology's Use Food Well WA Plan
 - Reduce food waste by 50% by 2030
 - Reduce at least half of edible food waste by 2030
- HB 1799 Reducing Organic Material to landfill
 - 75% reduction by 2030 (relative to 2015)
 - Increase the demand for compost



Next steps cont.

Adaptive Management & Growth

- Continue to add businesses to composting program.
 - Adapt routes & collection strategies as needed
- Continue to assess and document wildlife conflict with waste
- Add additional community compost drop-off points as needed
- Assess yard waste collection efforts by City and consider combining yard & food waste for residents
- Serve as an example for other cities in Eastern Washington



Questions?





Grant Project Update

Andrew Nichols – Lopez ReMakery

Check out their work at -

<https://www.youtube.com/watch?v=vVA9AmJuyBc>





Grant Project Update

Julie McCoy – 911 Glass Rescue



Rotary
Lake Chelan



911 Glass Rescue

A Glass Repurposing Project



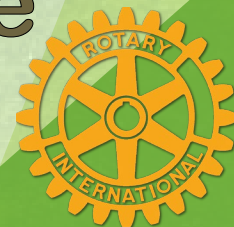
Brought to you by the Preserve Planet
Earth Committee of LCRC



2021 RCLC Signature Project

Glass Repurposing for the Community. Why?

- ❖ Community Outcry over Loss of Recycling of Glass
- ❖ Wine Country: “All those wine bottles. . . .”



Glass Lifecycle Facts

- ❖ Used container glass is 100 % and endlessly recyclable: No end of life!
- ❖ 9 to 11 million tons of glass is disposed of annually in the U.S.
- ❖ The vast majority goes to the landfill
- ❖ Glass takes 1 to 2 million years to decompose



Glass Recycling v. Repurposing

- ▶ True recycling means transporting used glass to Seattle area
- ▶ Not economically viable solution because of costs
- ▶ Repurposing glass into new products offers local end uses (A Local Solution to a Local Problem!)



**Andela Products Glass
Pulverizing System
Capable of 1-2 TPH
GP-05L Price: \$120,000**





**Glass Sand
Product**

Glass Gravel Product



Start-up Funding Sources

- ❖ City of Chelan (\$50K)
- ❖ Washington Dept. of Ecology
(Through Chelan County (\$50K))
- ❖ Sponsorships & Donations
(\$82K)



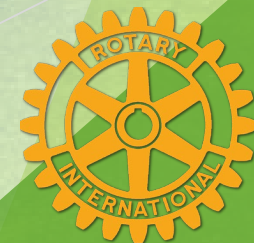


Paulie the Pulverizer En Route from New York to Washington, June 2021

Courtesy our “Friendly” Truck Driver

911 Glass Rescue Business Model

- ❖ Drop-Off Fee (.02 per pound/.04 per pound)
- ❖ Sales of Product at \$5.00 a Bucket
- ❖ Bulk Sales at \$100 per cubic yard



Operation Logistics:

- Recycle Center
- Saturdays Only
- No Drop-Off
- All volunteer Staffing



Operation Statistics to Date

- ▶ Glass Processed 307,371 pounds
- ▶ Drop-off Fees \$4,500
- ▶ Additional Donations \$6,000
- ▶ Product Sales Revenue \$2,500

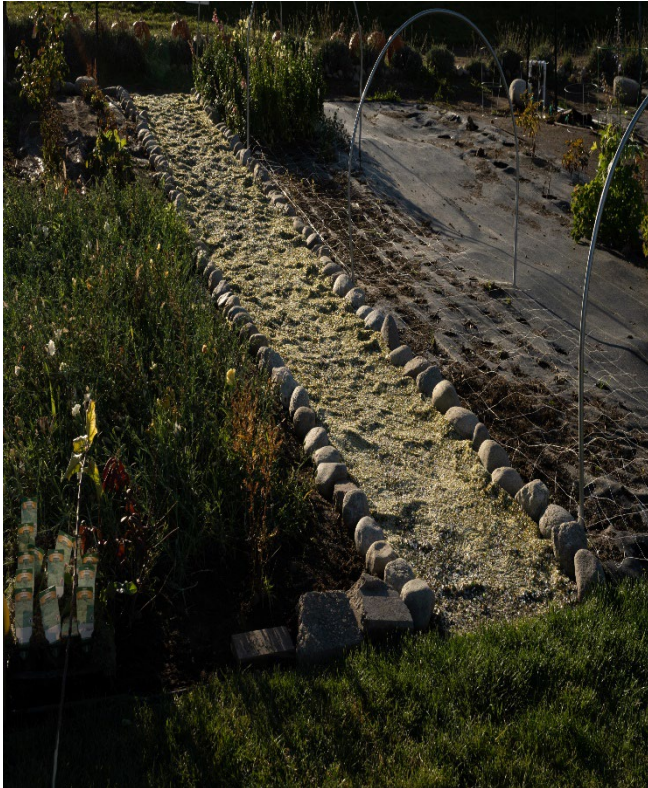
Notable Achievements in Year One

- ▶ Cemented Valuable Community Partnerships
- ▶ Staffed every Saturday except 2 “snow days”
- ▶ Met all projections in Pro Forma
- ▶ Established a financially viable model
- ▶ Created Operating Reserve of \$25,000
- ▶ Donated \$2,500 to Rotary Youth Scholarships (from Operations only)
- ▶ Attracted Gates Foundation Grant (unsolicited) for \$5,000

Regional and National Interest In Project

- ▶ Visiting Dignitaries from Wenatchee, East Wenatchee, Brewster, Pateros, Ellensburg
- ▶ Wenatchee Valley College Collaboration
- ▶ Solid Waste Consultant to Walla Walla and City of Chelan
- ▶ Inquiries from Orcas Island, Hawaii, South Carolina, and many others around the country
- ▶ Idaho plastics project

Glass Product Uses



Glass Product Uses



Glass Product Uses



Larger Projects on Horizon

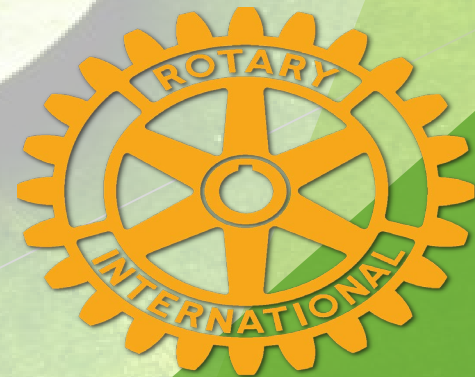
- ▶ Large construction project in Manson
- ▶ Pollinator Gardens (Rotary Project 2022-2023)
- ▶ City Beaches
- ▶ Wenatchee Rescue Mission
- ▶ Fill for new Runway Chelan Airport
- ▶ Peterson's Waterfront
- ▶ Sunset Bar & Grill, Manson

QUESTIONS?

Julie@911glassrescue.org

www.911glassrescue.org

Phone: 509-402-1138



Agenda

- | | |
|----------|------------------------------------|
| 9:00 am | Welcome & review meeting goals |
| 9:15 am | Board and Agency Updates |
| 9:30 am | Legislative Report Discussion |
| 9:55 am | Break |
| 10:05 am | Center Grants – A Year in the Life |
| 11:05 am | Wrap-up |





Meeting wrap-up



Wrap up

Next meeting:

- Wednesday, December 14, 2022
- Location: Tacoma (tentative)
- Tour: to be determined

Tasks from today:

- Notes and slides from today will be posted to the EZ page next week.
- Board comments on the draft report to the legislature – **DUE by September 30.**



See you at the December 14 board meeting!

