

ZERO WASTE ACTION PLAN

Final Draft - Summer 2022



If you're not for Zero Waste...



How much waste are you for?

ACKNOWLEDGEMENTS

Acknowledgements

Special thanks to the residents and business representatives, who participated in the interviews, focus groups, and workshops. These contributions ensured that the solutions identified in the plan were truly community-based.

The planning process was guided by the Broomfield Advisory Committee on Environmental Sustainability (ACES) and its Zero Waste Committee, which met monthly to review the project deliverables and plan the outreach process.

The project team was led by Andrew Valdez and Camille Pollan of the Department of Strategic Initiatives with support from Broomfield staff from Environmental Services, Communications, and Economic Vitality.

Zero Waste Associates provided consultation and stakeholder outreach.

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Zero Waste is Part of the Climate Solution

In February 2020, the City Council set the City and County of Broomfield on a path toward Zero Waste with the passage of [Resolution 2020-65](#): “Adopting Zero Waste as a Guiding Principle and Supporting the Creation of a Zero Waste Plan.”

The resolution establishes Zero Waste as a priority for the City & County and identifies waste diversion goals of 50% diversion by 2025 and Zero Waste by 2035.

Implementing the Zero Waste initiatives identified in this Action Plan will increase Broomfield’s diversion rate from 22% to approximately 75%. This will bring Broomfield among the leading Zero Waste cities in the country.

Zero Waste strategies are some of the fastest, easiest and least expensive ways for a community to reduce its greenhouse gas emissions. Reducing waste, diverting materials from landfills can also create jobs, reduce impacts to habitat, preserve natural resources and improve community health.

The Zero Waste initiatives are estimated to reduce greenhouse gas emissions by approximately 38,000 metric tons of carbon dioxide (MTCO₂e) equivalent per year.

38,000 MTCO₂e is equivalent to:



Source: U.S. EPA Greenhouse Gas Equivalencies Calculator

Fourteen Zero Waste initiatives were identified for evaluation and vetted during the stakeholder process.

Policies

1. Community Recycling & Composting Ordinance
2. Product Policies
3. Lead Colorado on Reusables
4. Clean Community Fee
5. Construction, Deconstruction, & Demolition Diversion

Programs

6. Lead by Example
7. Outreach and Education
8. Technical Assistance
9. Universal Collection - Districting/Single Hauler
10. Service Provider Incentives
11. Food Waste Prevention Campaign
12. Business Recognition Program

Infrastructure

13. Building Materials Reuse Center
14. Center for Hard to Recycle Materials

How the pieces fit together



All of us Together can Make Zero

Pursuing Zero Waste requires all sectors of the community to work together to reduce waste, and increase reuse, recycling, and composting. Throughout the planning process, Broomfield engaged residents and businesses through: stakeholder interviews, focus groups, online surveys, and community workshops and received guidance from Broomfield’s Advisory Committee on Environmental Sustainability. Public support (from a 30-day comment period, 157 responses) for the below policies is indicated below on each.

The initiatives were evaluated for diversion tons and greenhouse gas emissions reduction potential. The following priority initiatives emerged from the evaluation and outreach process and most were among those with the highest diversion and greenhouse gas reduction potential.

- **City Contract for Preferred Hauler (56.7% Support)**
Changes from multiple licensed haulers to a single hauler or district approach to increase efficiency, reduce road impacts and traffic, and expand services, including Pay-As-You-Throw rates and universal recycling and composting in rolling carts.
- **Community Recycling & Composting Ordinance (61.1% Support)**
Requires residents and businesses to separate materials for collection and requires haulers to provide collection services for recycling, compost, and trash.
- **Construction, Deconstruction, & Demolition Diversion (62.4% Support)**
Provides requirements, programs, and incentives to increase deconstruction, building materials reuse, and diversion of recyclable and compostable construction & demolition debris.
- **Outreach and Education (63.7% Support)**
Provides the “social infrastructure” to support community understanding, compliance, and adoption of new Zero Waste behaviors directly related to “physical infrastructure” provided through new collection programs and requirements.
- **Technical Assistance (57.3% Support)**
Builds on the outreach and education initiative to provide on-site assessments, educational material, and in-person presentations to businesses and institutions and at multifamily complexes.
- **Lead by Example (67.5% Support)**
Demonstrates civic leadership in Zero Waste where all municipal facilities and operations (e.g. offices, parks and Public Works) implement Zero Waste initiatives such as reuse, recycling, and composting.

Over the 10-year planning period, full implementation of all of the initiatives in the Zero Waste Action Plan will increase Broomfield's diversion rate from 22% to 75%. The priority initiatives - developing a community recycling and composting ordinance and creating a city contract for a preferred hauler - will increase Broomfield's diversion rate to nearly 46%, practically doubling the diversion rate from where it is now. Implementing the full range of initiatives, including policies, programs and infrastructure projects, identified in the Plan will further increase Broomfield's diversion rate from 46% to nearly 75%. The remaining 25% of the waste generated in Broomfield consists of hard to divert items that have no market for reuse, recycling or composting. These include things like diapers, cigarette butts, pet waste, painted wood, and composite materials (things stuck to other things).

The Zero Waste strategies will be monitored annually to reflect actual performance and to identify additional policies, programs and infrastructure that will enable Broomfield to achieve its 2035 goal of Zero Waste.

The timeline shows the planned implementation schedule and the resources that will be needed to implement these initiatives.

These policies, programs and infrastructure projects are designed to be implemented equitably across the community, so that all Broomfield residents and businesses can realize the benefits of the new initiatives.

Broomfield will employ targeted outreach strategies to educate families and business owners who have not historically had access to recycling and composting services.

Landfills, hazardous waste sites, and other industrial facilities are most often located in communities of color and low-income communities. Reducing waste and increasing diversion from landfills will reduce the burdens on these communities.

By enacting these initiatives, Broomfield will become a leader in Zero Waste and create a path to sustainability for the whole Broomfield community.

Estimated Costs by Zero Waste Initiative (in \$1,000s)

Zero Waste Initiatives	One-Time Costs	Short Term (1-3 years)	Medium Term (4-7 years)	Long Term (8-10 years)	10-Year Total
Policies					
1. Community Recycling & Composting Ordinance	\$50	\$150	\$200	\$150	\$550
2. Product Policies	\$50	\$0	\$200	\$150	\$400
3. Lead Colorado on Reusables	\$50	\$0	\$0	\$150	\$200
4. Clean Community Fee	\$50	\$0	\$0	\$25	\$75
5. Construction, Deconstruction, & Demolition	\$50	\$0	\$200	\$150	\$400
Programs					
6. Lead by Example	\$10	\$0	\$140	\$105	\$255
7. Outreach and Education	\$25	\$150	\$200	\$150	\$525
8. Technical Assistance	\$10	\$0	\$240	\$180	\$430
9. Universal Collection - Single Hauler/Districting	\$100	\$300	\$400	\$300	\$1,100
10. Service Provider Incentives	\$0	\$0	\$0	\$0	\$0
11. Food Waste Prevention Campaign	\$20	\$0	\$200	\$150	\$370
12. Business Recognition Program	\$10	\$10	\$40	\$30	\$90
Infrastructure					
13. Building Materials Reuse Center	\$10	\$0	\$0	\$150	\$160
14. Center for Hard to Recycle Materials	\$75	\$0	\$100	\$75	\$250
Total Costs	\$510	\$610	\$1,920	\$1,765	\$4,805

See page 16 for a further breakdown of diversion and costs.



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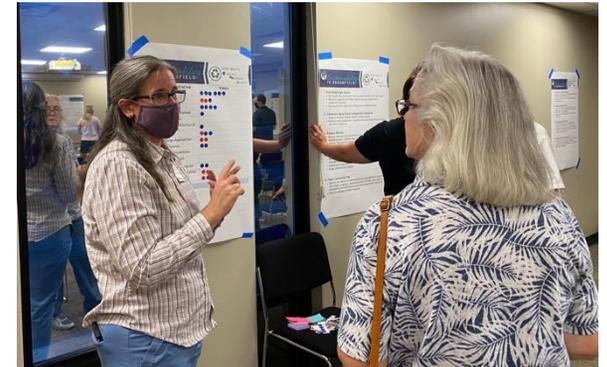
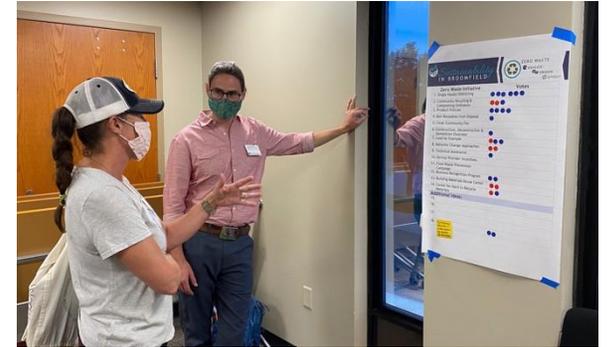
The resolution establishes Zero Waste as a priority for the City & County and identifies waste diversion goals of 50% diversion by 2025 and Zero Waste by 2035.

In the spring and summer of 2021, the City & County undertook an extensive stakeholder engagement process, in concert with the development of the Greenhouse Gas Emissions Reduction Plan.

Through meetings with local service providers, businesses interviews, and focus groups, the City & County identified the barriers and opportunities for Zero Waste in Broomfield.

The City & County also conducted communitywide survey and a series of public workshops (online and in person) to identify the policies, programs and infrastructure needed to address Zero Waste in Broomfield.

This planning effort was guided by the Advisory Committee on Environmental Sustainability (ACES), spearheaded by the Department of Strategic Initiatives, and funded through a grant from the Colorado Department of Public Health & Environment.



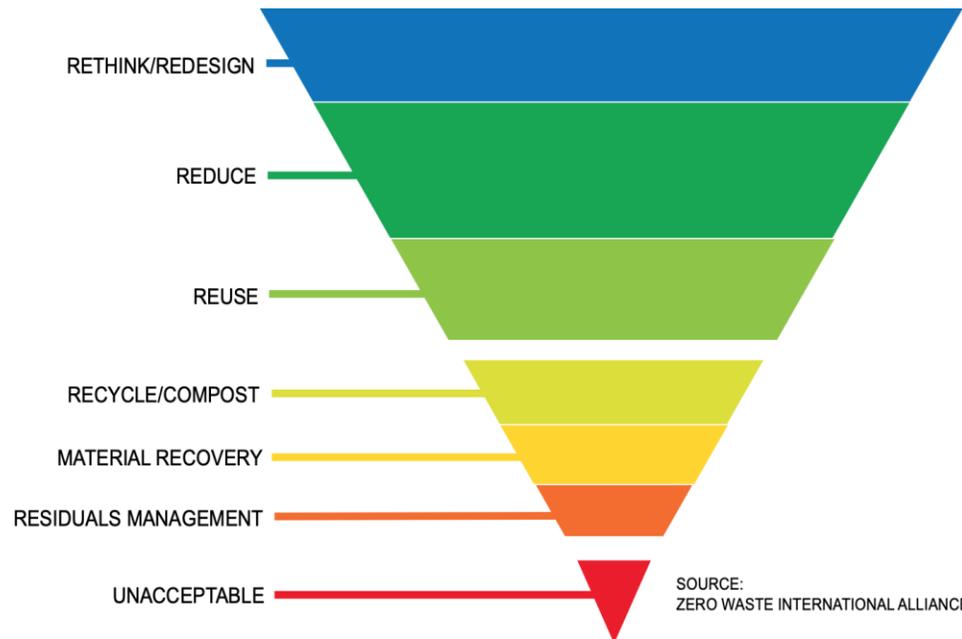
What is Zero Waste?

Zero Waste is a systems approach to eliminating wasteful practices, setting up reuse, recycling, and composting systems to maximize the highest and best use of resources that can then be reinvested in the local economy to create more income, wealth, and jobs for residents.

Zero Waste is all about successfully implementing Reduce, Reuse, Recycle, focusing first on Reduce and Reuse, then Recycling, Composting, and Redesigning the rest. Zero Waste will also reinvest quality, affordable resources into the community, such as surplus food, furniture, clothes and used building materials, helping many residents and businesses of Broomfield benefit by a better use of those products.

Zero Waste is an aspirational goal. What is most important is the journey. Once a Zero Waste goal is adopted, implementing that goal is all about exploring why materials, products or packaging are discarded in the first place, and what can be done to set up new systems that can eliminate those wasteful practices or reuse, recycle, or compost those resources. If the hierarchy of Reduce, Reuse, and Recycle is implemented, Broomfield will achieve its Zero Waste goal, or get close to achieving it.

Zero Waste Hierarchy of Highest and Best Use



Zero Waste International Alliance collaborated with Zero Waste organizations and communities around the world to develop the peer-reviewed, internationally-accepted [definition of Zero Waste](#).

“The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning, and with no discharges to land, water, or air that threaten the environment or human health.”

Cradle to Cradle: The Circular Economy

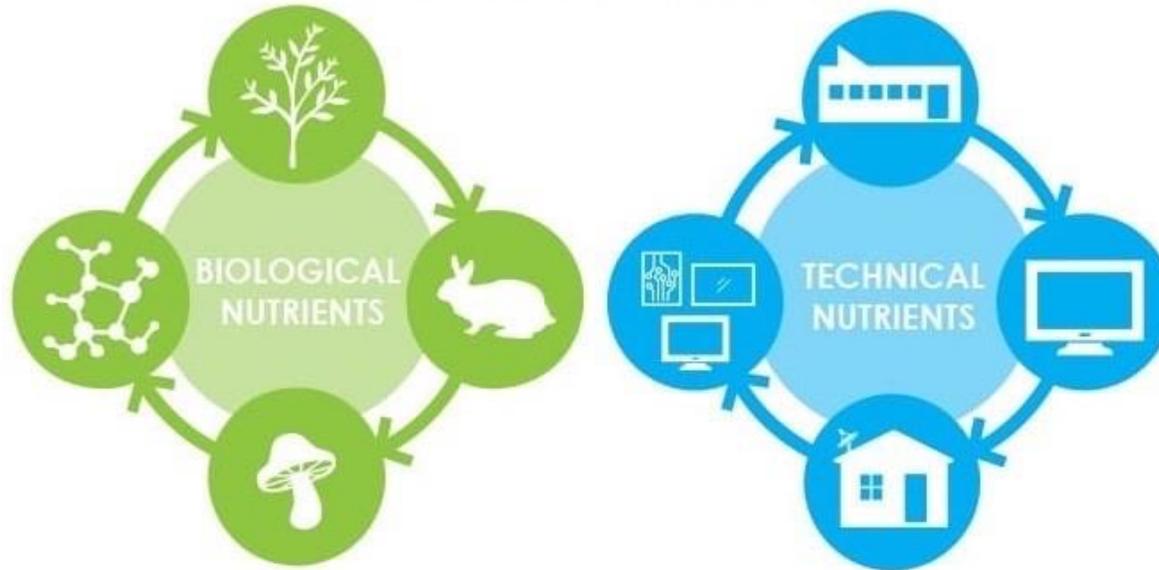


Diagram @MBDC. Used with permission.

In their 2002 book *Cradle to Cradle: Remaking the Way We Make Things*, architect William McDonough and chemist Michael Braungart presented an integration of design and science to explain how circular economies can eliminate the concept of waste.

In nature, everything is a resource for something else. The “waste” of one system becomes food for another. In a circular economy, everything can be designed to be disassembled and safely returned to the soil as “biological nutrients,” or re-utilized as high quality materials for new products as “technical nutrients” without contamination.

Moving from Linear to Circular

Zero Waste initiatives are designed to move the community from a linear system to a circular system.

A linear economy, where resources are extracted, products and packaging are made and used and then discarded in landfills and incinerators, is expressed as:

Take → Make → Waste

Products and packaging may be made for a single use, with little regard for recyclability, reuse or repair.

A circular economy is based on the principles of designing-out waste and pollution, keeping products and materials in use, and regenerating natural systems.

Community Zero Waste programs are one of the best opportunities to encourage the development of a local circular economy. Zero Waste policies, programs and infrastructure are some of the quickest and most effective tools that communities can use to develop a local circular economy.

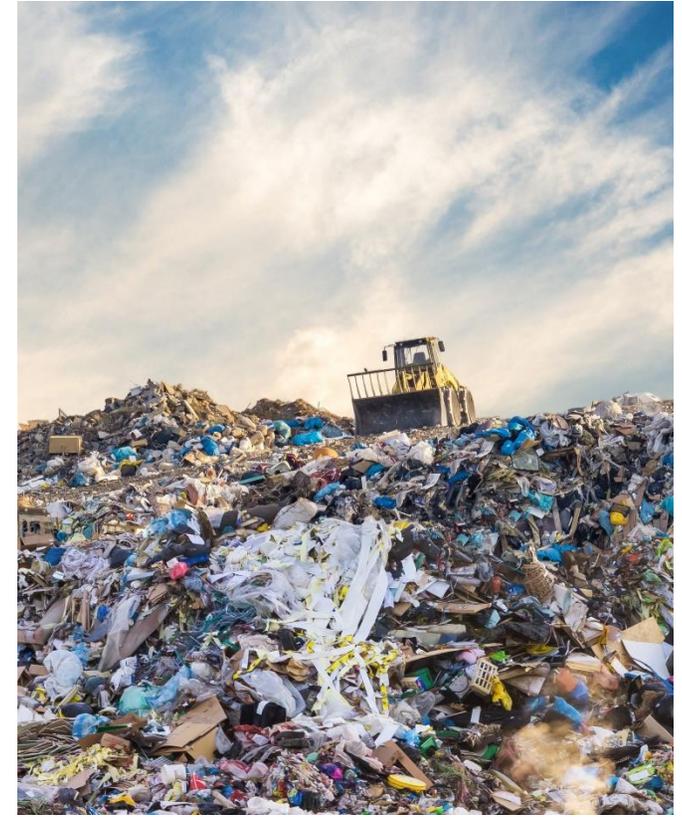
Impacts of Waste

Climate change has disproportionate impacts on marginalized communities. More affluent communities generate more emissions and trash than poorer communities.

Landfills create methane a potent greenhouse gas 25-75 times more impactful than carbon dioxide.

Plastic pollution is generated at the point of generation (where extraction and production impacts frontline communities), plastic pollutes our streams, rivers and oceans when it is discarded irresponsibly, and many single-use plastics are hard to recycle.

Broomfield is committed to pursuing Zero Waste to reduce these burdens, and increase the benefits of living in a sustainable community with community-based solutions to ensure that everyone (residents, businesses, visitors) can be a part of the solution.



Toxic emissions from industrial facilities and power plants impose an unequal pollution burden on socially and economically disadvantaged communities, including communities of color and lower-income, underserved, and rural communities.

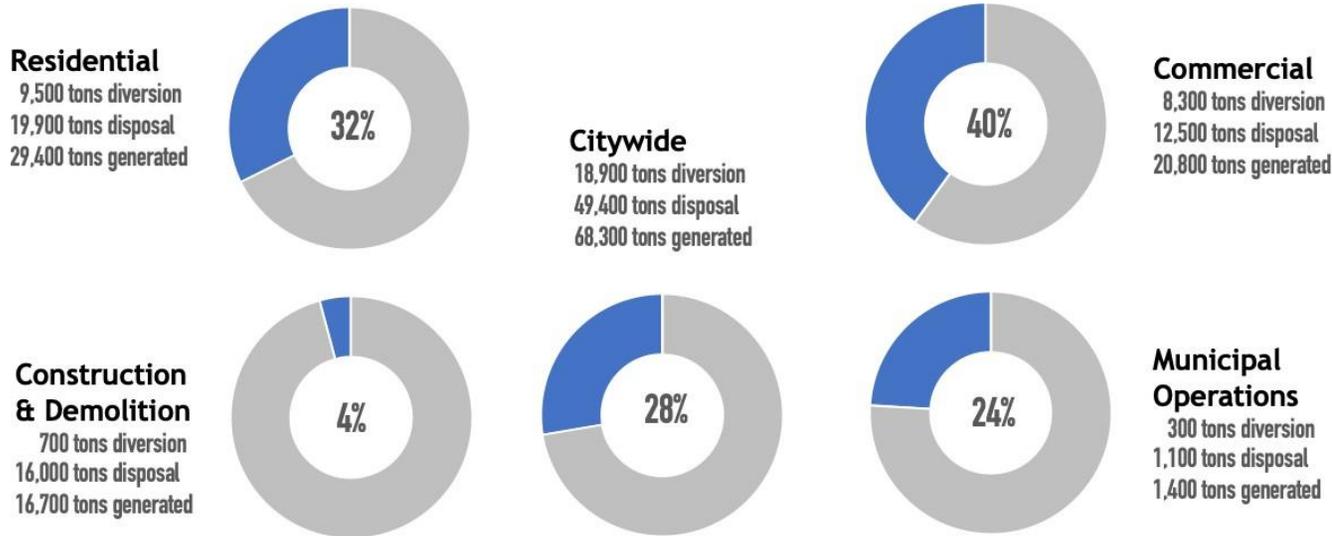
— *Foodandwaterwatch.org*

Recycling rates are typically expressed in the percentage of diversion from landfills using the following formula:

$$\text{Generation} = \text{Total Diversion} + \text{Total Disposal}$$

$$\text{Diversion rate} = \frac{\text{Total Diversion Tons}}{\text{Total Generation Tons}}$$

In 2020, the citywide diversion rate was 28%. This baseline estimate includes all sectors: Residential, Commercial, Construction & Demolition (C&D) and Municipal Operations.



Sources: ReTrac Hauler Data, Recycling Center, Yard Trimmings Drop-Off

Broomfield 2020 Diversion and Disposal, shows that reuse, recycling and composting accounted for 28% of generation in Broomfield. These data were reported through ReTRAC and from the Broomfield Recycling Center, Yard Trimmings Drop-Off Center, and Spring Cleanup event. Landfilled material accounted for 72% of generation in Broomfield.

Broomfield currently has an open market system where residents and businesses subscribe to a hauler of their choice that is licensed to operate in Broomfield.

Home Owners Associations and property managers for multitenant or multifamily buildings also contact for services with licensed haulers.

The pricing and services offered by the various haulers differ and while there are diversion services available in Broomfield, there are none that are mandatory.

Currently, Broomfield has 33 licensed haulers who report tonnage through ReTRAC. The majority of these are roll-off haulers servicing the construction and demolition (C&D) sites.

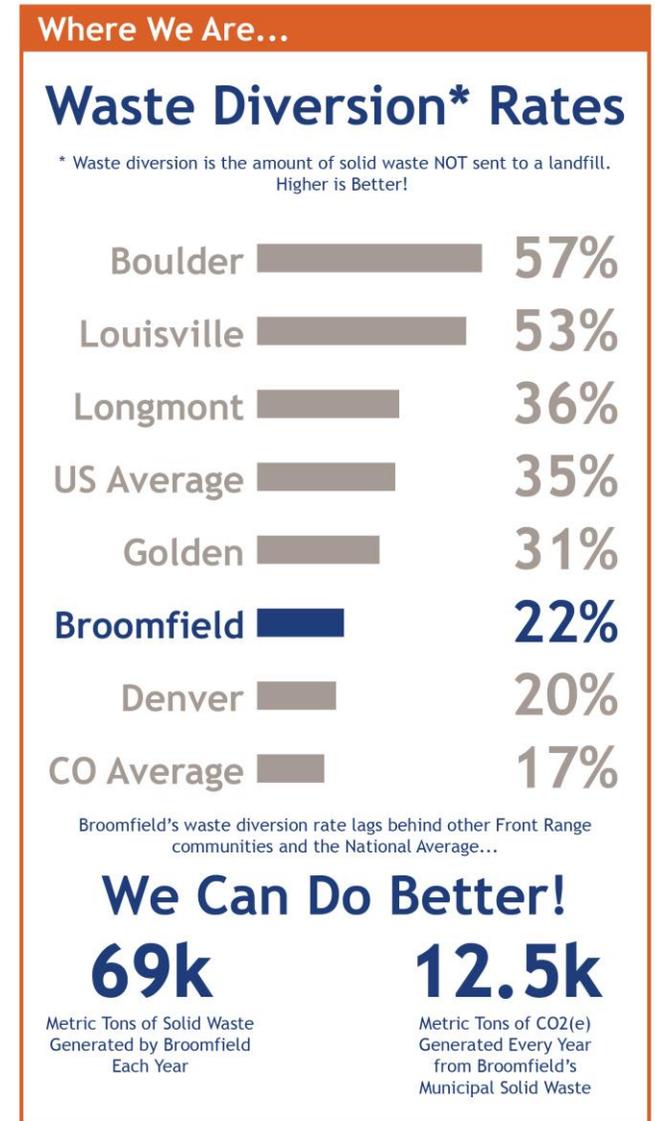
Five private hauling companies provide the bulk of the services to residents and businesses.

- GFL Environmental
- Republic Services
- Waste Connections
- Waste Management
- Western Disposal Services

How Broomfield Measures Up

Broomfield is lagging behind peer communities. In 2020, the City and County began to track tonnage diverted and disposed by its licensed haulers. This data, along with tonnage information from the Broomfield Recycling Center and Yard Trimmings Drop-off Center, was used to calculate Broomfield’s 2021 diversion rate of 22%.

The state of Colorado had a municipal diversion rate of 15.9% in 2019 (most recent data available) and Colorado has a goal of 28% diversion rate by 2021.



Sources: State of Recycling & Composting in Colorado, ReTrac Data, Eco-Cycle, CoPIRG 2021

Local and Regional Zero Waste Infrastructure

Colorado’s Front Range is home to many communities with Zero Waste goals, policies, and programs. As a hotspot of Zero Waste planning in Colorado, this region hosts a robust array of infrastructure that supports the diversion efforts of the Front Range communities. Broomfield operates municipal programs for recycling drop-off, tree limb drop-off, household hazardous waste collection events, and community clean ups.

During the Zero Waste planning process, a gap analysis was conducted to determine the availability of diversion opportunities, or markets, for discarded materials. Local and regional reuse, recycling, and compost markets exist for nearly all material types currently landfilled by Broomfield residents and businesses.

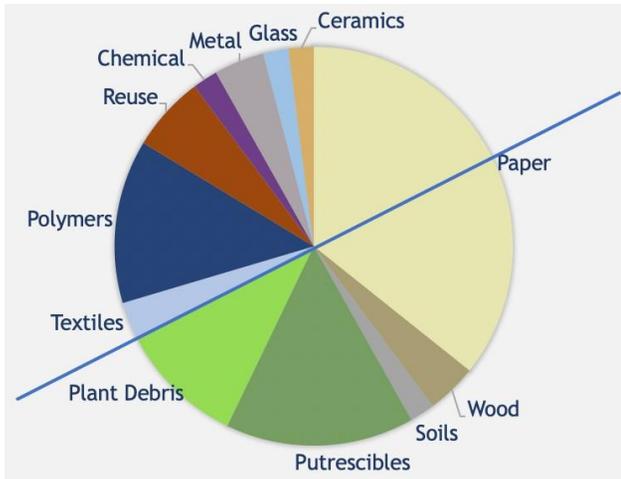
Arc Thrift, Goodwill, Joyful Thrift	Reusable household goods
Broomfield FISH	Edible food
Broomfield Forestry Department	Tree limbs, leaves, holiday trees, pumpkins
Broomfield Recycling Center	Commingled recycling, office paper, newspaper, cardboard, textiles, shoes, books
Boulder County Hazardous Material Management Facility	Batteries, compact fluorescent bulbs, household chemicals, automotive fluids, paints
Eco-Cycle Center for Hard to Recycle Materials	Electronics, polystyrene foam, plastic bags, cooking oil, food scraps, rigid plastics, toner cartridges
Resource Central, Habitat for Humanity ReStore	Building materials, appliances
Western Disposal Transfer Station	Food scraps, yard trimmings



Broomfield Recycling Center



Broomfield Tree Limb Drop-off



12 Market Categories of Discarded Materials
Note that 50% can be composted

Discarded materials can be categorized into 12 market categories, materials that can be sold as commodities or converted into usable products.

When these valuable resources are kept local and managed according to their highest and best use, jobs are created through reuse, recycling, and composting.

The Value of Discarded Materials

Discarded materials have value. Each year Broomfield residents and businesses are sending reusable, recyclable, and compostable resources to the landfill with an estimated value of more than \$3 million.

Broomfield Market Commodity Estimate (2020)

Market Categories	%	Tons	Average \$/Ton	Estimated Value of Landfilled Materials
Reusable Goods	6%	2,723	\$400	\$1,089,000
Paper	14%	6,855	\$30	\$205,600
Glass	2%	972	\$3	\$3,000
Metals	3%	1,215	\$145	\$177,000
Plastics/Polymers	9%	4,376	\$285	\$1,247,000
Rubber	0%	34	\$0	\$0
Textiles	2%	1,070	\$10	\$11,000
Wood	5%	2,285	\$30	\$69,000
Yard Trimmings	10%	4,667	\$30	\$140,000
Food Scraps/Putrescible	21%	10,356	\$30	\$311,000
Soils	5%	2,528	\$1	\$4,000
Ceramics	9%	4,133	\$8	\$33,000
Chemicals	0%	97	\$0	\$0
Other/No Market	15%	7,307	\$0	\$0
Total	100%	48,619		\$3,289,000

Source: Broomfield ReTRAC Data. Waste Composition from 3 sources: Waste Audit - City and County of Broomfield (2019), 2019 Boulder County Waste Composition Study, & Fort Collins Waste Composition Study 2016. Market values from Richard Anthony Associates, Resource Recycling, and other local sources.

Stakeholder Engagement

In spring and summer 2021, Broomfield conducted an extensive outreach project to engage the community in the Zero Waste Action Plan and Greenhouse Gas Emissions Reduction Plan.

Stakeholder Interviews

The outreach team conducted 34 stakeholder interviews, including 9 large businesses, 3 school districts, 12 haulers, 10 local reuse and recycling establishments.

Phone interviews were conducted with local haulers and roll-off providers as well as local and regional reuse, recycling, and composting operations to assess capacity for increased diversion of materials from Broomfield.

Online interviews were also conducted with sustainability managers at Broomfield-based large businesses and institutions to assess existing Zero Waste programs and understand what support they needed to adopt new ones.

We learned that there are many leadership institutions within Broomfield who would like to partner with the City and County on its sustainability goals. Others were eager to learn about new regulations and future opportunities.

Several referred to requirements that they comply with in other communities (“we compost in Boulder because they make us”). They encouraged Broomfield to create a level playing field, provide more services and information, and allow flexibility in implementation.

Broomfield Departments

Development of the Zero Waste Action Plan is a project of the Department of Strategic Initiatives. However, implementation of the plan will involve many (or most) of the other departments within Broomfield. To ensure that the Zero Waste initiatives were appropriate for implementation within Broomfield, a robust engagement process was undertaken with several departments, including: Environmental Services, Economic Vitality, Housing, Diversity / Equity / Access / Inclusion, Workforce Development, Legal, and Communications. Representatives from these departments provided their expertise and institutional knowledge and made valuable contributions to the program development process.



Vail Resorts announced bold waste goals in 2017: zero waste to landfill by 2030, with 50% diversion by the end of 2020 for the 16 resorts in our FY 2017 footprint. We’re extremely proud to share that at the end of March 2020 we officially reached 50% waste diversion—nine months ahead of our deadline—by reducing landfill waste while increasing composting and recycling.

Vail Resorts

It’s great that Broomfield is focusing on sustainability. Macerich (Parent of Flatiron Crossing) has been focusing on sustainability overall for the last 10 years. We would like to partner with Broomfield to help meet these goals.

Flatiron Crossing

WHERE ARE WE GOING?

Diverse Voices

Broomfield sought to include a diverse number of voice through the planning process and reached out to Broomfield residents through focus groups and online surveys.

Focus Groups

The City and County conducted focus groups targeting homeowners, renters and small businesses to discuss the barriers and opportunities on the path to Zero Waste. We learned that residents are eager for more municipal involvement in regulating the collection services either with requiring haulers to provide more services or by contracting for citywide collection. There was interest in regional alignment of waste reduction rules and consistency of recyclable materials from community to community, business to residential.

Online Survey

Broomfield conducted an online survey to gauge residents' attitudes on climate, greenhouse gas emissions reduction and Zero Waste initiatives. Respondents were all eager recyclers and some had contracted for composting from a service provider. Several respondents were interested in having compost collection services.

Supporting compost collection services

"We need composting collection. We are not great home composters, and we would be able to compost a lot that currently ends up in our trash that can be composted at a commercial compost facility." - Survey Respondent

"We make a lot of kitchen/garden waste that can be composted. I only have a small space for doing this and would LOVE it if the city had a compost material pick up service." - Survey Respondent

"Need a convenient, affordable way to manage organics, e.g. leaves & grass." - Focus Group Member

"Composting and community gardens are important. We need a better connection to the land and growing food" - Focus group member

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Supporting the concept of a single hauler contract instead of having multiple haulers

"it's crazy to see so many trash trucks on the road in the neighborhoods"
- Focus Group Member

"Broomfield needs to rethink this - we have never lived in a city that has multiple trash and recycling service providers. It's a waste of resources - fuel to run the trucks, the number of trucks on inefficient routes. Consolidate it or bid out geographic areas to those who will provide the best service at the lowest cost. Consumers don't need a choice. And for heaven's sake, start a citywide compost program!"
- Survey Respondent



The City of Lafayette is proving three-stream (recycling, compost, trash) collection through a contract with a single hauler. The City provides Pay-As-You-Throw rates to provide an incentive to residents to recycle and compost.

<https://lafayette-listens.com/payasyouthrow>

Community Workshops

In addition to an online survey and online focus groups, Broomfield held two online workshops and two in-person workshops to engage Broomfield’s broader residential and business community.

During the online workshops, residents gave feedback on four primary Zero Waste strategies: single hauler (where Broomfield would contract with one hauler for citywide services), community recycling & composting ordinance (where haulers would be required to provide services), construction & demolition recycling requirements, and outreach and education. Residents discussed and were supportive of moving to a pay-as-you-throw system (where customers have tiered rates and those with more trash pay more). They also supported consistent rules and minimum standards for recycling.

The in-person workshops allowed residents to give more feedback. After a presentation given by the Broomfield’s sustainability manager, participants visited different stations where they could review and discuss several Zero Waste strategies considered for implementation in Broomfield. They then indicated their top four priority strategies using dot voting (placing stickers to indicate preferences).

The top four initiatives were:

- Universal Collection - Single Hauler/Districting
- Community Recycling & Composting Ordinance
- Center for Hard to Recycle Materials
- Construction, Deconstruction, & Demolition Diversion

Meetings were also held with Homeowner Associations (HOAs). The prevailing takeaway from these varied engagements was broad support across Broomfield for the recommendations presented in this plan. As one resident stated, “Why aren’t we doing this already?”

The input provided by Broomfield stakeholders was used to refine the Zero Waste strategies included in the Zero Waste Action Plan.

A summary of stakeholder engagement, which details engagement activities as well as the results from the online survey, focus groups, workshops, and outreach to representatives from collection and processing service providers, is listed in Appendix A.



Policies, Programs and Infrastructure

Fourteen Zero Waste initiatives were identified for evaluation. These were further vetted during the stakeholder process and additional clarifications were included.

These initiatives, taken together, represent the best path towards achieving Broomfield's Zero Waste goals. City Council approval of the plan is not a commitment to the spending. Funding implementation will be considered as part of the annual budget process. The programs and policies will be developed and adopted incrementally beginning in 2022. Each department of the City and County will continue to be engaged throughout the implementation phase.

Full descriptions and analyses of each of the initiatives are included in a companion Impact Analyses document published along with this plan.

For each initiative, the following impacts have been identified and estimated:

- Potential landfill diversion tons - annual
- Greenhouse gas (GHG) emissions reduction potential in metric tons of carbon dioxide equivalent (MTCO₂e) - annual
- Staffing based on full-time equivalent (FTE) levels of existing staff - one time or ongoing effort
- Costs for infrastructure, expenses or contractor support

Zero Waste Initiatives	Projected Annual Diversion	Projected Annual GHG Reduction	Estimated Costs FTE = Full Time Equivalent		Other Costs	
	(Tons)	(MTCO ₂ e)	FTE	Staff Costs	One-Time Costs	Annual Costs
Policies						
1. Community Recycling & Composting Ordinance	7,080	(8,582)	0.5	\$50K	\$50K*	
2. Product Policies	219	(435)	0.5	\$50K	\$50K*	
3. Lead Colorado on Reusables	941	(2,969)	0.5	\$50K	\$50K*	
4. Clean Community Fee	1,672	(2,062)	0.25*	\$25K*	\$50K*	
5. Construction, Deconstruction, & Demolition	7,901	(3,079)	0.5	\$50K	\$50K*	
Programs						
6. Lead by Example	868	(1,169)	0.25	\$25K	\$10K*	\$10K
7. Outreach and Education	4,955	(6,012)	0.25	\$25K	\$25K*	\$25K
8. Technical Assistance	3,029	(2,530)	0.1	\$10K	\$10K*	\$50K
9. Universal Collection - Single Hauler/Districting	4,782	(5,652)	1	\$100K	\$100K*	
10. Service Provider Incentives	1,022	(591)	0	0	0	
11. Food Waste Prevention Campaign	745	(3,100)	0.25	\$25K	\$20K*	\$25K
12. Business Recognition Program	662	(901)	0.1	\$10K	\$10K*	
Infrastructure						
13. Building Materials Reuse Center	510	(598)	0.25	\$25K	\$10K*	\$25K
14. Center for Hard to Recycle Materials	731	(677)	0.25	\$25K	\$75K*	
One-time staff support or one-time costs			0.25	\$25K*	\$510K*	
On-going staff support and on-going costs			4.45	\$445K		\$135K
Total annual diversion and GHG reduction		35,117	(38,358)	Total costs over 10 years (one-time and annual cumulative)		\$4.805M

Reducing greenhouse gas emissions through Zero Waste initiatives will make a meaningful contribution to Broomfield's goal of reducing its 1.2 million metric tons of carbon dioxide equivalent by 2050.

Centering Equity

As Broomfield moves forward to implement the initiatives described in the Zero Waste Action Plan, the City and County will consider the **Equity Assessment Questions** developed through the Colorado Communities for Climate Action Equity Working Group.

1. Who is impacted by this action negatively and positively?
2. How can we ensure that underserved populations benefit from this action and are unburdened by this action?
3. How can we use this action to meet the authentic and culturally appropriate needs of underserved populations and build their capacity?
4. How can we engage and empower underserved populations in the planning and implementation of this action?
5. How does this action foster relationship-building and trust with community partners?

Through the implementation of the Zero Waste Action Plan, the City and County will strive to ensure that all residents, regardless of income or living situation, have access to programs and services identified in the plan, and that any potential increased costs will not fall disproportionately on underserved populations.

Broomfield will employ targeted outreach strategies to educate families and business owners who have not historically had access to recycling and composting services.

Landfills, hazardous waste sites, and other industrial facilities are most often located in communities of color and low-income communities. Reducing waste and increasing diversion from landfills will reduce the burdens on these communities.

Zero Waste embodies the values of environmental protection and social justice. By implementing Zero Waste strategies, Broomfield will help to bring about the systemic changes that will be needed to ensure a healthy and vibrant future for all.

Equity is both a **lens** to view decisions and the **outcome** we seek to achieve.

It is an inclusive approach to transform **systems** and **structures** toward access, justice, self-determination, redistribution, and the sharing of power and resources.

Equity occurs when outcomes are **independent** of one's identity.



Policies

1. Community Recycling & Composting Ordinance

A Community Recycling & Composting Ordinance provides clear direction to both haulers and generators about what is expected in Broomfield. This would build on the existing hauler license requirements that were recently updated to include a reporting requirement. Policy and ordinance options for Single-Family Residences would require source separation, universal provision of service (Recycling, Compost, Trash), and Pay-As-You-Throw incentives. For Multi-Family Residences and Industrial, Commercial, & Institutional locations, the ordinance would require source separation and universal provision of service (Recycling, Compost, Trash). This would be implemented in phases.

	Summary of Impacts
Diversion Potential	7,080 tons
GHG Reduction	(8,582) MTCO2e
Staff Levels	0.5 FTE to help develop the Ordinance, implement it, and to properly enforce the provisions of the adopted Ordinance.
Costs	\$50,000 one-time fee for a consultant to draft an ordinance and manage stakeholder engagement process
Cost/benefit analysis (ROI)	\$14 per ton diverted & \$12 per MTCO2e reduced



During the 2018 - 2019 school year, Coyote Ridge Elementary School began collecting food scraps for composting as one aspect of the Adams 12 Five Star School District's Sustainability Management Plan. They already had recycling services in this school. During this time the students learned to source separate their food scraps from the landfill trash at the end of lunch. This additional source separation of food scraps increased their diversion rate from 14% to 26%. The school has maintained their 26% Diversion Rate through the 2020 - 2021 school year.

ZERO WASTE ACTION PLAN

2. Product Policies

To reduce landfill waste related to consumption and increase the use of sustainable alternatives, Broomfield can ban or require businesses to take back products and associated packaging that are toxic in their manufacture, use, or disposal that are not currently reusable, recyclable, or compostable locally.

In July 2021, the State of Colorado adopted HB21-1162 into law, which bans single-use plastic bags at most stores and expanded polystyrene foam (EPS) takeout containers at most restaurants beginning January 1, 2024. Affected retailers will need to start charging a 10-cent bag fee for both paper and plastic bags starting January 1, 2023 ([source](#)).



WHERE ARE WE GOING?

	Summary of Impacts
Diversion Potential	219 tons
GHG Reduction	(435) MTCO _{2e}
Staff Levels	0.5 FTE to develop Product Policies, implement them, and to properly enforce the provisions of the adopted Policies.
Costs	\$50,000 one time cost for consultant to draft Ordinance, manage stakeholder engagement process, and help with implementation
Cost/benefit analysis (ROI)	\$457 per ton diverted & \$230 per MTCO _{2e} reduced

Product Policies include:

- Bans of materials that are difficult to reuse, recycle, or compost including: plastic foam ice chests, egg cartons, foodware, and packaging materials.
- [#SkipTheStuff](#) ordinance to direct restaurants to provide accessories only on request (e.g. straws, utensils, napkins, condiment packets) for takeout or delivery.
- Enacting a fee on the sale of certain disposable items, such as disposable plastic and paper shopping bags, to incentivize customer reuse.
- Enacting a deposit or fee at the point of sale on difficult to recycle items, e.g. small propane cylinders, to fund the infrastructure to take back the containers either at points of sale or the CHaRM.
- A voluntary take-back program that would encourage businesses to voluntarily take back products and associated packaging that they sell.
- A mandatory take-back policy would require businesses that sell hard-to-recycle items to take those items back for proper reuse, recycling, or disposal. This approach is often called Extender Producer Responsibility (EPR).
- Requiring restaurants to provide only reusable foodware for on-site dining.
- Developing a pilot program to demonstrate reusable takeout foodware services

3. Lead Colorado on Reusables

	Summary of Impacts
Diversion Potential	941 tons
GHG Reduction	(2,969) MTCO ₂ e
Staff Levels	0.5 FTE to develop a draft ordinance that phases out reusable materials as defined in the ordinance. This 0.5 FTE will also work to implement this policy and to properly enforce the provisions of the adopted policy.
Costs	\$50,000 one time cost for consultant to draft Ordinance and manage stakeholder engagement process and help with implementation
Cost/benefit analysis (ROI)	\$106 per ton diverted & \$34 per MTCO ₂ e reduce



Lead Colorado on Reusables is an initiative that would phase out reusable materials, or durable goods, from the landfill and this initiative is recommended for Broomfield as part of their Zero Waste plan. Reuse is high in the Zero Waste Hierarchy of Highest and Best Use (Figure 2) and keeping durable goods in the local reuse economy should be considered as part of any comprehensive Zero Waste plan. Reusable materials can include edible food, durable goods, building materials, clothing and textiles, and household items.

This initiative, Lead Colorado on Reusables includes drafting an ordinance that will ultimately not allow reusable material or durable goods to enter the landfill stream. This is a novel ordinance that will need to include a definition of reusable materials, need stakeholder engagement, and have corresponding outreach and education (initiative 7).

Lead Colorado on Reusables ordinance will specify which materials will not be able to enter the landfill stream. The contents of the ordinance can be adopted all at once or over time as clear alternatives that residents and businesses can use to keep those items in the local reuse economy are identified. Initiative 13, Building Material Reuse Center, will work in coordination with this Zero Waste initiative as a facility identified to take reusable items.

4. Clean Community Fee

	Summary of Impacts
Diversion Potential	1,672 tons
GHG Reduction	(2,062) MTCO ₂ e
Staff Levels	0.25 one time FTE to help develop the Clean Community Fee ballot measure and implement it.
Costs	\$25,000 one time cost for consultant to draft local ballot measure and manage stakeholder engagement process. Additional \$25,000 one time cost for education on fee ballot measure.
Cost/benefit analysis (ROI)	\$45 per ton diverted & \$36 per MTCO ₂ e reduced

The expansion of Zero Waste efforts in Broomfield will require funding to support the increase in environmental programs, diversion services, programs, and infrastructure.

A Clean Community Fee can be a monthly fee linked to landfill collection service to help fund expanded diversion efforts including reuse & recycling grants (for collection, processing, and market development). This action would be similar to the City of Boulder Trash Tax, an occupation tax on trash haulers serving customers within the city limits and helps fund waste reduction efforts in Boulder.

The Clean Community Fee can be designed to fund Broomfield’s other environmental programs in energy and transportation.

Coordination at the State Department of Revenue is required, as well as a local ballot measure.



All residents in the City of Austin, Texas, including single-family homes and apartment and condo dwellers, pay a monthly \$4.70 Clean Community Fee (for services that keep Austin clean and enhance the livability of its neighborhoods and the downtown area. The Clean Community Fee funds the following:

- Street sweeping
- Litter Abatement
- Recycle & Reuse Drop-off Center
- Business outreach
- Austin Reuse Centers
- Zero waste program development
- Clean Austin
- Dead animal collection
- Boulevard sweeping

5. Construction, Deconstruction, & Demolition Diversion

	Summary of Impacts
Diversion Potential	7,901 tons
GHG Reduction	(3,079) MTCO ₂ e
Staff Levels	0.50 FTE to help develop the Ordinance, implement it and other provisions of this initiative, and to properly enforce the provisions of the Ordinance.
Costs	\$50,000 one time cost for consultant to draft Ordinance and manage stakeholder engagement process. Note: unredeemed deposits can pay for these costs
Cost/benefit analysis (ROI)	\$13 per ton diverted & \$32 per MTCO ₂ e reduced

Spotlight: The City of Fort Collins

In 2019, the City of Fort Collins updated roof covering and re-roofing requirements to prevent waste generation due to hail damage from severe storms. The update requires that asphalt shingles, on both new construction and re-roofing projects, must be Class 4 impact resistant that meet UL 2218 test. Additionally, all roofing permits, regardless of roofing material used, must include a Construction Waste Management Plan.

ReTRAC data and conversations with six roll-off service providers working in Broomfield suggests that 24 percent of landfilled materials generated in Broomfield are C&D debris (15,886 tons). This initiative would adopt requirements, programs, and incentives to increase deconstruction, building materials reuse, and diversion of recyclable and compostable C&D debris, including:

- Minimum requirements for C&D debris diversion (e.g., 75 percent), offering contractors the option to source-separate the materials for reuse, recycling, and composting on-site or to send a mixed load to a certified C&D sorting facility.
- Require a waste management plan or sustainable deconstruction plan be submitted with permit applications for construction and demolition projects (and do not issue occupancy permits to projects without plans and reports of actual results).
- Charge a deposit for permitted projects, refundable upon permittee demonstrating that the minimum threshold of C&D debris diversion has been met.
- Give preferential treatment in expediting reviews and/or permit credits for projects that meet existing Broomfield Green Building/Sustainable Building Product policies or that earn LEED or Green Globe certification.
- Require deconstruction rather than demolition of buildings that meet certain criteria.
- Develop community infrastructure for C&D debris diversion including an inert materials recycling facility for rocks, brick and block, asphalt, and concrete as was done in Fort Collins.
- Adopt roofing requirements to reduce waste associated with impacts of hail damage to asphalt shingles, similar to those in the City of Fort Collins.
- Expand Broomfield's Forestry Department acceptable materials list to include clean wood from C&D projects.
- Establish a public or private reuse center for sale of salvaged building materials and used household items.
- *If Broomfield opts to contract for residential collection service:* Require contracted hauler(s) to provide periodic collection of small quantity clean source-separated C&D debris from residences for diversion to reuse, recycling, or composting as part of bundled rates for all services.

ZERO WASTE ACTION PLAN

Programs

6. Lead by Example



waste **ZERO** PROJECT

Broomfield.org/WasteZero

WHERE ARE WE GOING?

	Summary of Impacts
Diversion Potential	868 tons
GHG Reduction	(1,169) MTCO ₂ e
Staff Levels	0.25 FTE to help develop EPP policy, implement it, and to properly enforce the provisions of the policy. Also to lead Green Team, adoption of Zero Waste Events Ordinance and to arrange for purchase of containers
Costs	\$10,000 one time cost for containers for Broomfield municipal facilities. Additional cost of \$10,000 per year for training and signage materials.
Cost/benefit analysis (ROI)	\$52 per ton diverted & \$30 per MTCO ₂ e reduced

The Lead by Example initiative involves the Broomfield municipal facilities and operation (e.g. offices, parks and Public Works) implementing Zero Waste initiatives such as reuse, recycling, and composting. By implementing reuse, recycling, and composting programs in municipal facilities and operations, Broomfield will lead by example toward Zero Waste. This will generate more support from both residents and businesses for new Zero Waste policies and programs. Seventeen municipal properties (70%) have recycling collection service in place while only 2 properties (8%) have organics collection service. Specific actions to be taken include:

- Source separation of discards by staff, pairing of recycling and trash for all public receptacles (and composting containers where food is served), with employee training and engagement.
- Adopt and implement environmentally preferable procurement (EPP) policy that provides incentives for recovered products to be reused, made of recycled content or compost products, and to be reusable, recyclable or compostable at the end of their useful life.
- Implement reuse, recycling, and composting programs in events (e.g., with adoption of a Zero Waste Events Ordinance).
- Establish an interdepartmental Green Team to help implement and promote reuse, recycling, and composting programs in Broomfield municipal buildings and operations.

7. Outreach and Education

	Summary of Impacts
Diversion Potential	4,955 tons
GHG Reduction	(6,012) MTCO ₂ e
Staff Levels	0.25 FTE to develop an Outreach and Education Marketing Plan and to assist in implementing it.
Costs	\$25,000 one time cost for consultant to develop the Outreach and Education Plan. Additional \$25,000 per year ongoing cost for implementation of the consultant recommendations
Cost/benefit analysis (ROI)	\$15 per ton diverted & \$12 per MTCO ₂ e reduced



The Outreach and Education initiative is programming, information campaigns, and awareness building directly related to the new Zero Waste initiatives that Broomfield enacts. This information and awareness based outreach and education will be crucial to the community understanding, complying, and adopting new Zero Waste behaviors directly related to Zero Waste policies and programs. One option for Broomfield is to use a specific type of educational campaign called Community Based Social Marketing (CBSM). CBSM includes:

- Identifying a behavior to change
- Identifying the barriers to a behavior
- Developing and piloting a program to overcome these barriers
- Implementing the program across a community
- Evaluating the effectiveness of the program

Outreach and Education in Broomfield will be directed at all sectors: residential, institutional, commercial, industrial, self-haul, and construction and demolition and will touch on all aspects of the Zero Waste Action Plan. This will allow all sectors of the community to know what changes to expect and how they play a role in Broomfield achieving Zero Waste. Zero Waste policies and programs will be accepted and integrated better when there is outreach and education to ensure a more successful rollout of Zero Waste initiatives.

Broomfield can create an initial education video that explains Zero Waste and refers viewers to an informative website laying out the Zero Waste Action Plan, ordinances, timeline, and goals. The video and website can also contain a pledge that residents and businesses can sign. Additional outreach and educational materials and strategies will be phased in as more Zero Waste initiatives take place (including an App for item look up as Eco-Cycle has provided).

Outreach and education will be an ongoing program as there will always be something the community is working on and to reinforce the culture change that results from the initiatives and marketing.

ZERO WASTE ACTION PLAN

8. Technical Assistance



In Oakland, California, multi-family properties (5+ units) are required to have recycling and composting collection service for their residents.

To help create a successful food scraps collection program at multifamily building, the City offers onsite technical assistance and door-to-door outreach to tenants and distributes kitchen pails for food scrap collection.

WHERE ARE WE GOING?

	Summary of Impacts
Diversion Potential	3,029 tons
GHG Reduction:	(2,530) MTCO ₂ e
Staff Levels	0.1 FTE ongoing to help develop technical assistance educational materials, presentations and on-site assessments, if staff have limited background in Zero Waste. If staff are knowledgeable in Zero Waste, there could be more staff time and less consultant time.
Costs:	\$10,000 one time cost for a consultant to help develop and \$50,000 per year ongoing to implement a technical assistance program. This cost could be lower if staff are knowledgeable in Zero Waste and can implement the technical assistance program.
Cost/benefit analysis (ROI)	\$23 per ton diverted & \$28 per MTCO ₂ e reduced

Technical Assistance is an initiative that outlines direct Zero Waste assistance to sectors of the community where there is a need. This need could result from multi-family unit residents being required to source separate their food scraps.

The multi-family property owner and the residents might need technical assistance to comply with this new Zero Waste initiative. Technical assistance will be directed towards multi-family building owners and residents, commercial, institutions, industrial, and construction, deconstruction, and demolition sectors in Broomfield.

Technical assistance can build off of the successful outreach and education around Broomfield’s various recycling, hazardous waste, and debris collection programs that have been in place for years.

Components will include:

- On-site assessments to provide the necessary information and skills to implement the new Zero Waste initiatives and may include waste assessments, review of procurement practices, and/or technical assistance related to better reuse, recycling, and composting.
- Educational materials will be created to assist with Outreach and Education and the implementation of specific Zero Waste initiatives.
- In-person presentations will focus on how to initiate the new Zero Waste initiatives.

9. Universal Collection by Districting or Single Hauler

	Summary of Impacts
Diversion Potential	4,782 tons
GHG Reduction	(5,652) MTCO ₂ e
Staff Levels	1 FTE to help develop a RFP, implement it, and to properly enforce the provisions of the executed contract
Costs	\$100,000 one time cost for consultant help to draft Request for Proposal and Agreement and manage the procurement process
Cost/benefit analysis (ROI)	\$42 per ton diverted and \$35 per MTCO ₂ e reduced



To increase waste diversion from landfilling, Broomfield will change its approach to regulating the licensed haulers and require them to provide “universal” recycling and composting services to all residential and commercial generators, and corresponding requirements for generators to participate in such programs.

A single hauler contract provides a simpler system than the current licensing system for Broomfield to manage. This would build on the experience of neighboring cities that changed from an open market system like Broomfield currently has to a single hauler system. Alternatively, Broomfield could divide the area into multiple districts and either negotiate which of the existing haulers are assigned to which district, or competitively solicit a single hauler contract for each district. If negotiated, this could maintain the relative amount of business each hauler is currently servicing in Broomfield.

Both approaches would also be more efficient than the current system, decrease impacts on roads in Broomfield and eliminate air emissions from multiple haulers’ collection vehicles operating in the same areas throughout the community. For either approach, Broomfield would seek proposers to serve its residential customers and provide recycling, compost, and trash collection and provide recyclables and organics processing. The contract would include detailed terms regarding the types of services to be provided, incentives to ensure those services are performed well, and customer service, education, and reporting requirements. Rolling carts would be provided by the contractor for all services, with different sizes available.

Pay-As-You-Throw rates would be required for single family residences, with recycling and composting services bundled with the payment of fees for trash carts. Residents would have the option to opt out of the contract services, under Colorado state law, but would be required to hire a private hauler providing the same or higher service level.

10. Service Provider Incentives



	Summary of Impacts
Diversion Potential	1,022 tons
GHG Reduction:	(590) MTCO ₂ e
Staff Levels	This is part of the scope of work for initiative 1 - Universal Collection by Districting or Single Hauler
Costs:	This is part of the scope of work for initiative 1 - Universal Collection by Districting or Single Hauler
Cost/benefit analysis (ROI)	The cost for this initiative is bundled in initiative 1 - Universal Collection by Districting or Single Hauler, therefore there is no direct cost/benefit analysis.

To increase waste diversion from landfilling, Broomfield can include incentives in contracts with service providers under a single hauler or district system. Incentives can be designed to maximize waste diversion, ensure quality services, detail expectations for outreach and education, and provide detailed reporting for maximum transparency. Example service provider incentives include:

- Compensation incentives for meeting or exceeding diversion targets
- Performance incentives and disincentives
- Contract extensions

Compensation incentives can be structured in different ways, including:

- Greater payment for more materials recycled
- Greater payments for less materials landfilled
- Not paying for disposal above target amounts
- For providing Waste Reduction services (e.g. hiring waste reduction coordinator, doing waste audits, and providing technical assistance)

Performance Incentives and Disincentives can be structured to provide:

- More money if they exceed targets for quality performance of services, reporting, and/or diversion
- Fines or penalties if they exceed targets for quality performance, such as number of complaints, missed pickups, not reporting on time

Service provider incentives costs will be included in initiatives 1 Universal Collection by Districting or Single Hauler.

11. Food Waste Prevention Campaign

	Summary of Impacts
Diversion Potential	745 tons
GHG Reduction	(3,100) MTCO ₂ e
Staff Levels	0.25 FTE ongoing to help develop webpage, educational materials and schools program.
Costs	\$20,000 one time cost for a consultant to help develop the Food Waste Prevention Plan and \$25,000 per year ongoing to implement the program.
Cost/benefit analysis (ROI)	\$94 per ton diverted & \$23 per MTCO ₂ e reduced



A Food Waste Prevention Campaign targets reducing wasted food across sectors through a comprehensive approach by educating the community about the important components of preventing wasted food. The [U.S. EPA Food Recovery Hierarchy](#) can be used as a guide for this Food Waste Prevention Campaign.

According to the [USDA](#), 30-40% of the food in the United States is wasted. At the same time there are many Americans who are food insecure ([USDA](#) estimates that 10% of Americans faced food insecurity in 2019). A Food Waste Prevention Campaign seeks to bridge this by connecting wasted food to those in the community who need food.

Components of the Food Waste Prevention Campaign include a webpage that is devoted to educational material with fact sheets, videos, and content on why it's important to prevent wasting food. Since the audience for this Food Waste prevention Campaign is across sectors, there will be separate pages dedicated to residents, businesses, and institutions.

- For **residents** there will be a list of resources that residents can use such as [savethefood.com](#), [stilltasty.com](#) and [zerowastechef.com](#). The EPA site [Reducing Wasted Food at Home](#) can be included on this webpage as well.
- For **businesses**, there will be education on food waste prevention specifically targeting businesses. [Broomfield Fish](#) has programs in place to rescue edible food from restaurants and match that food up with those in need in the community. Broomfield Fish does not get to all the edible food and can expand with Broomfield's help. Businesses in Broomfield can also be encouraged to join the [EPA Food Recovery Challenge](#).
- For **K-12 schools**, a program can be created similar to the Green Stars Schools program that Eco-Cycle created or Broomfield can partner with Eco-Cycle to expand that school program to the schools in Broomfield.

ZERO WASTE ACTION PLAN

12. Business Recognition Program



WHERE ARE WE GOING?

	Summary of Impacts
Diversion Potential	662 tons
GHG Reduction	(901) MTCO2e
Staff Levels	0.1 FTE to lead development of the program.
Costs	\$10,000 one time cost for a consultant to develop a Business Recognition Program or to contract with PACE for similar services.
Cost/benefit analysis (ROI)	\$30 per ton diverted & \$22 per MTCO2e reduced

Green Business Recognition programs have been implemented across Colorado including the statewide [Green Biz Tracker Program](#) as well as in municipalities such as [Denver](#), [Golden](#), [Lafayette](#), [Longmont](#), and [Louisville](#). Existing programs recognize businesses for waste reduction, energy and water conservation, alternative transportation, social responsibility, and economic vitality. A recognition program and “green directory” to highlight and promote businesses that are exemplars and supporters of Broomfield’s sustainability and Zero Waste vision can include energy, transportation, and Zero Waste as well as water conservation and local food and agriculture as identified in [Broomfield’s Draft Sustainability Vision](#). Ideally, this program would be linked to initiative 9. Technical Assistance.

The program can also highlight regional businesses that have already achieved Zero Waste, such as [New Belgium Brewery](#), Anheuser Busch and Hewlett-Packard in Fort Collins, to demonstrate that Zero Waste is possible in this region. Additionally, the program can bring awareness to Broomfield’s business community of the Zero Waste facility certification available through the US Green Building Council [TRUE Zero Waste certification program](#), which enables facilities to define, pursue, and achieve their Zero Waste goals while cutting their carbon footprint and supporting public health.

This can be done in partnership with the [Boulder County PACE \(Partners for a Clean Environment\)](#) and supported by creating a searchable local or regional directory of businesses that offer green products or services that expands [Broomfield’s WasteZero webpage](#) to include a searchable local or regional directory specific to material, sector, and/or industry of how and where to reuse, recycle, compost or take back used consumer products and packaging. It can also integrate or link to a directory from [Broomfield’s Licensed Haulers webpage](#). Alternatively, in advance or in lieu of creating a Broomfield-specific program, the City and County of Broomfield can help promote the CDPHE [Green Biz Tracker Program](#) to Broomfield businesses.

Infrastructure

13. Building Materials Reuse Center

	Summary of Impacts
Diversion Potential	510 tons
GHG Reduction	(598) MTCO ₂ e
Staff Levels	0.25 FTE to lead development of the program.
Costs	\$10,000 one time cost for a consultant to help develop the program. \$25,000 per year ongoing cost to contract for these services.
Cost/benefit analysis (ROI)	\$118 per ton diverted & \$100 per MTCO ₂ e reduced



A key opportunity within Broomfield is to develop or contract for one or more building materials reuse centers for sale of salvaged building materials and used household items. Additional jobs can be created from supporting the Habitat for Humanity ReStore and/or one or more additional existing building materials reuse centers, such as those that specialize in particular items, like [Front Range Timber](#), also located in Broomfield, that sells raw reclaimed wood rescued from aging barns across the USA).

Broomfield can provide leadership for used building materials by:

- Expanding the Broomfield Recycling Center to include the collection of used building materials on behalf of one or more of the existing operations.
- Contracting with one or more local building materials reuse entities to add collection services within the community boundaries and/or to provide expanded services or capacity to process more materials collected from Broomfield.
- Assessing municipally-owned properties to determine if there's a suitable site for a building materials reuse center that Broomfield can make available to one or more operators.
- Establishing a grant or loan program to support the development of a building materials reuse center.

14. Center for Hard to Recycle Materials



	Summary of Impacts
Diversion Potential	731 tons
GHG Reduction	(677) MTCO ₂ e
Staff Levels	0.25 FTE to help develop a CHaRM, implement it, and to properly enforce the provisions of the executed Contract.
Costs	\$75,000 one time cost for site improvements of the Broomfield Recycling Center for a few materials. Or a service contract for \$20,000 a year for a nonprofit or social enterprise to develop and manage in cooperation with new state EPR take back requirements for some of the materials (working with Producer Responsibility Organizations PROs to help fund these initiatives)
Cost/benefit analysis (ROI)	\$138 per ton diverted & \$147 per MTCO ₂ e reduced

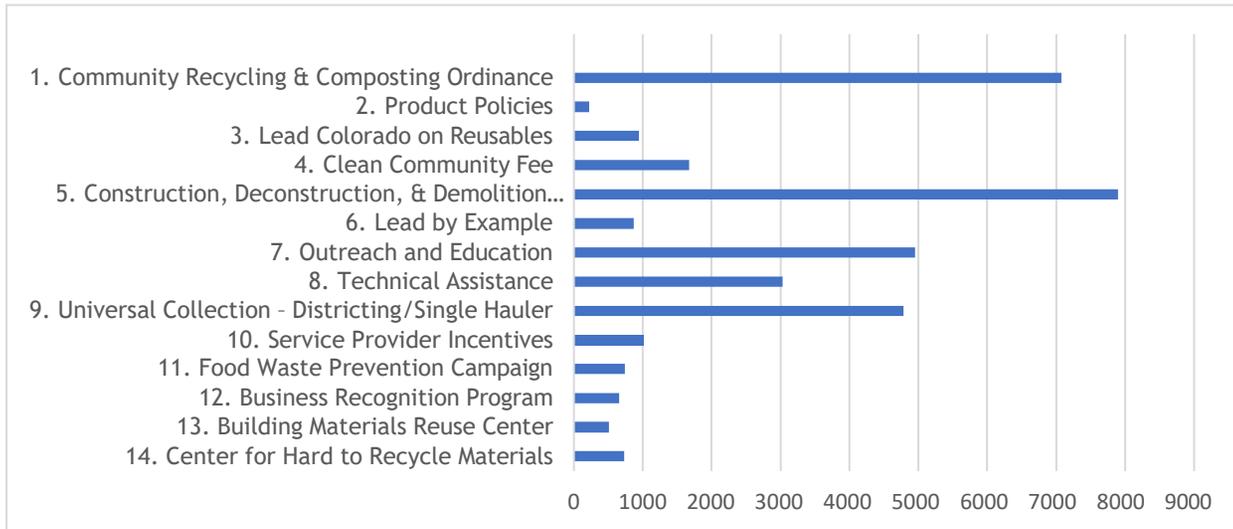
Center for Hard to Recycle Materials (CHaRM) facilities are a place where residents can bring items that are generally not accepted in curbside recycling programs. Generally accepted at CHaRM facilities are household appliances, metals, books, textiles, electronics, mattresses, hard to recycle plastics, ceramics, concrete and more. These items are generally landfilled if there is not a convenient and efficient system in the community to divert them from the landfill. A CHaRM facility collects these hard to recycle items, deconstructs them if needed, processes some items like electronics, and then gets the items or materials to end markets that will reuse or recycle the materials. This diversion, processing, deconstruction, reuse, and recycling all creates jobs.

The first Center for Hard to Recycle Materials (CHaRM) facility opened in 2001 in Boulder to divert and recycle non-traditional items from the community. In 2019, 1,500 out of 55,500 transactions at the Eco-Cycle CHaRM facility were from Broomfield residents. Broomfield can create a CHaRM at the Broomfield Recycling Center as a drop off location, similar to the ones in Boulder and Longmont with a fee per car and possibly a fee for specific items. This can replace the [twice a year electronics drop off events](#) and instead offer a year round facility for diverting many everyday but hard-to-recycle items from the landfill. Having a location at the Broomfield Recycling Center would make this system more accessible to Broomfield residents. It can be phased in where only a few items are accepted at first, then expanded to offer services for [many everyday items similar to what is accepted at Eco-Cycle CHaRM facility](#). Once this Broomfield CHaRM facility is established, Broomfield can add a collection system for commercial or institutional entities and residents who are unable to drop them off themselves similar to the Boulder [CHaRM on the Road Program](#).

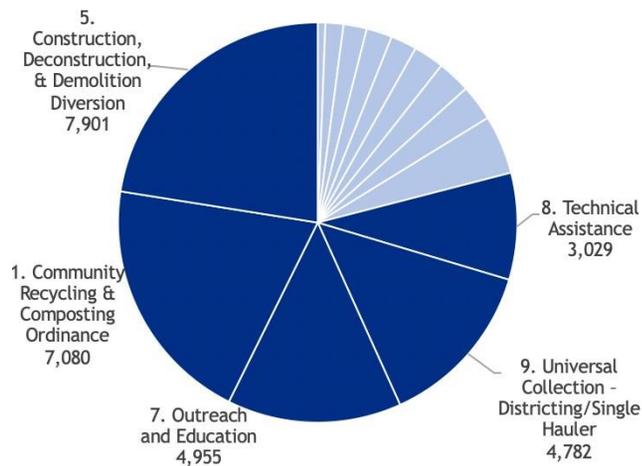
Broomfield may opt to have a social enterprise or nonprofit run a CHaRM facility instead of running as a municipal operation. [SustainAbility](#) is a recycling and composting social enterprise that works out of Arvada, CO that employs hard to employ people of all abilities that may want to expand. They also have a CHaRM facility that accepts many hard to recycle materials. (See companion Impact Analyses document)

Diversion Estimates and Greenhouse Gas Emissions Reduction Potential

Diversion Potential of Zero Waste Initiatives (Tons)



Top Five Zero Waste Initiatives Based on Diversion Tons



Implementing the Zero Waste initiatives identified in this Action Plan will help Broomfield achieve its 50% interim goal and set the community on the path toward Zero Waste.

Using conservative estimates for capture rates by material type, Zero Waste initiatives would result in an additional 35,000 tons per year diverted from landfill and increase Broomfield's diversion rate from 28% to approximately 80%. This will bring Broomfield among the leading Zero Waste cities in the country.

Approximately 15% of discarded materials in Broomfield consist of items that have no market for reuse, recycling or composting. These includes things like diapers, cigarette butts, pet waste, painted wood, and composite materials (things stuck to other things).

The Zero Waste strategies will be monitored annually to reflect actual performance and to identify additional policies, programs and infrastructure that will enable Broomfield to achieve its 2035 goal of Zero Waste (or darn close).

ZERO WASTE ACTION PLAN

Waste prevention, recycling and composting activities also reduce greenhouse gas emissions.

Zero Waste strategies are some of the fastest, easiest and least expensive ways for a community to reduce its greenhouse gas emissions. Reducing waste, diverting materials from landfills can also create jobs (as much as 50-100 new full time jobs in support of Broomfield’s diversion efforts), reduce impacts to habitat, preserve natural resources and improve community health.

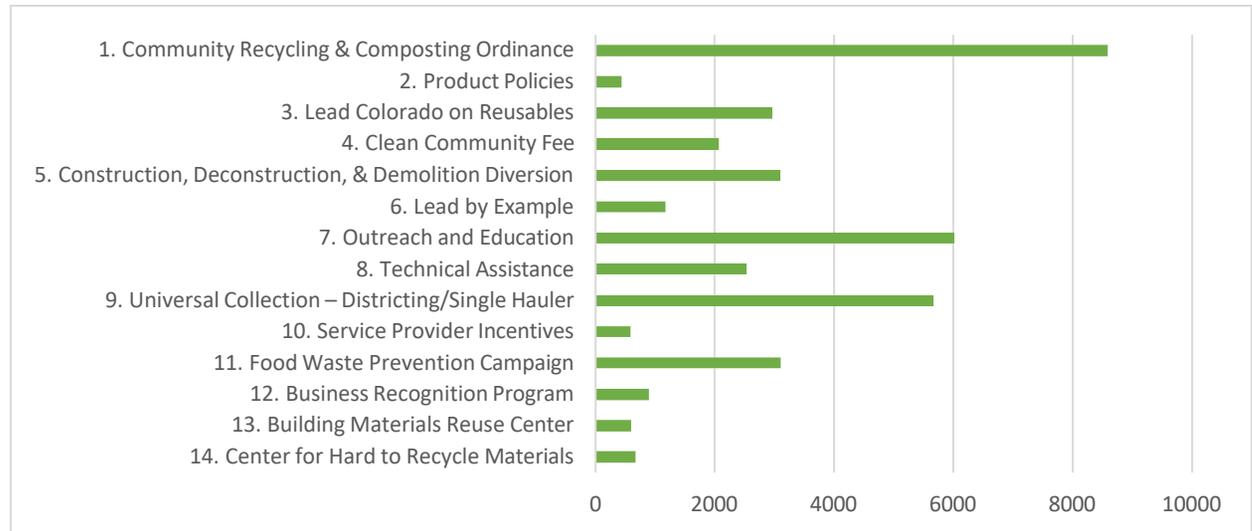
Using the [U.S. EPA Waste Reduction Model \(WARM\)](#), the Zero Waste initiatives are estimated to reduce greenhouse gas emissions by approximately 38,000 metric tons of carbon dioxide equivalent, which is equivalent to the amount of electricity used by 25 percent of Broomfield households in one year.

The assumptions and calculations are included in Appendix B Methodology.

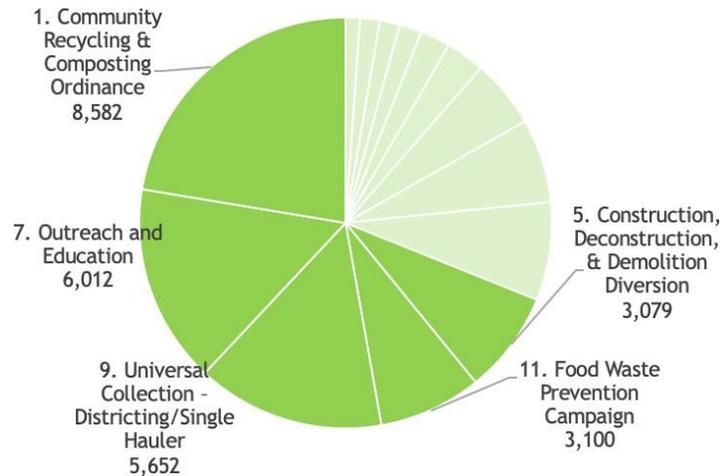
Appendix C includes the timelines that show the planned implementation schedule, diversion tons and greenhouse gas emissions potential, and the resources that will be needed to implement these initiatives.

WHERE ARE WE GOING?

Greenhouse Gas Emissions Reduction Potential of Zero Waste Initiatives (MTCO₂e)



Top Five Zero Waste Initiatives Based on MTCO₂e



APPENDICES



Appendix A Stakeholder Engagement

The following is the list of stakeholders contacted during the Broomfield Zero Waste planning process to solicit input on the development of the plan.

Engagement Activities

Local and Regional Reuse, Recycling, & Composting

Infrastructure:

Broomfield Fish
 Habitat for Humanity ReStore
 Arc Thrift Store
 Goodwill
 Re-volve
 Eco-Cycle CHaRM
 ReSource Central
 Broomfield Recycling Center - Dave Jackson
 Boulder County Recycling Center
 A-1 Organics

Residential & Commercial Haulers:

GFL Environmental (formerly Alpine Waste & Recycling)
 Next Use Recycling & Composting
 Republic Services
 Western Disposal
 Waste Management
 Waste Connections*
 *Attempted contact; no contact made

Roll-Off Service Providers:

5280 Waste Solutions
 Benson's Roll Off
 Bin There Dump That
 Blue Bear Waste Services
 Elite Hauling, Inc.
 McDonald Farms, Inc.
 Sam's Hauling*
 Total Disposal
 *Attempted contact; no contact made

Large Businesses:

Oracle
 Vail Resorts
 SCL Health / Good Samaritan Medical Center
 Hunter Douglas
 Ball
 Flatirons Crossing
 Lumen
 UC Health/Broomfield Hospital
 Crocs

School Districts:

Adams 12 Five Star School District
 Boulder Valley School District
 Jefferson County School District

Focus Groups:

- (3) Focus groups held via Zoom
- Homeowners - June 22, 2021
 - Small Business - June 23, 2021
 - Renters - June 30, 2021

Workshops:

- (2) Virtual workshops held via Zoom - July 14 and 22, 2021
 (2) In-person workshops held at 6 Garden Center - August 25 and 26, 2021

Collection & Processing Engagement Summary

Residential and Commercial Haulers

Five companies provide municipal solid waste (MSW) collection services for residential and commercial customers in the City and County of Broomfield. Conversations occurred with four of Broomfield's residential and commercial haulers.

Of the haulers engaged, all were very supportive of mandatory and recycling and composting requirements for residents and businesses. Three haulers voiced support for an exclusive municipal single-hauler contract citing route efficiency as a key benefit. Two haulers voiced support for a district approach to accommodate multiple haulers with efficient routes as opposed to a single hauler for the entire community. One hauler was opposed to a single-hauler approach. All haulers currently offer recycling collection services to customers. Two haulers offer limited organics collection services.

Roll-Off Service Providers

Representatives of seven roll-off companies who collectively represent 78 percent of the total landfill disposal reported by roll-off providers in 2020 were engaged. Of the roll-off providers engaged, all confirmed that 100 percent of landfilled materials they collected within Broomfield were from construction and demolition job sites. While all offer concrete recycling and most offer additional source-separated materials recycling and organics collection services, very little diversion was reported (9 percent) because diversion services were rarely requested.

Desire for market development for clean drywall and mattresses was noted. Attitudes toward C&D diversion requirements were mixed. While the tone was generally supportive, some concerns providers mentioned included:

who will manage job-site contamination, the increase in cost to them and their clients, and lack of access to convenient, affordable facilities, e.g. a mixed C&D sorting facility. As one representative stated, "Without the push nothing is going to happen, but pushing without markets puts us in a tough spot." Representatives identified ways Broomfield could support C&D diversion, including: subsidizing the cost of diversion ala Boulder or otherwise making it cost effective, providing education to address contamination, and monitoring and enforcement of any adopted regulations.

Recycling & Organics Processing Capacity

Processing capacity exists for expansion of both recycling and organics collection in Broomfield. One composting facility is operated by a hauler. However, it is open to accepting organics collected by other haulers. Regarding organics, it is important to ensure that the features of any new organics collection program are compatible with the compost facilities in the region. One facility accepts as feedstock only materials accepted by the Compost Manufacturers Alliance.

C&D Facilities

Access to facilities was noted as a barrier to increased recycling of C&D debris. Composting facilities and aggregate recycling facilities, e.g. concrete, brick, block, asphalt, are the most common, yet cost and convenience remains a concern for roll-off providers. While several aggregate recycling facilities exist regionally, the closest facilities are 14 miles from Broomfield with one co-located at the Republic Services Foothills Landfill.

Reuse Facilities

Broomfield Fish rescues edible food from all grocery stores in Broomfield and from Safeway in Superior and Sprouts and

Whole Food. They have a great relationship with these grocery stores who help them capture the edible food. They get the edible food to those in need. They also give inedible food to pig farmers and chicken farmers. They do compost food scraps but are limited by volunteer capacity to compost. They do collect from 11 restaurants (pre-COVID) and are also limited by volunteers to pick up the edible food.

Arc Thrift Store, Goodwill, Habitat for Humanity ReStore are all thrift stores in Broomfield that accept donations and then resell to the community. Arc and Habitat for Humanity ReStore both said that they sell everyday household items and are not at capacity and rarely turn away donations. The only items the Arc Thrift Store does not accept are light fixtures. Arc Thrift Store and Habitat for Humanity ReStore said that they do landfill some items that don't sell but it's a small percentage and they try not to. Goodwill keeps a semi-truck at their location and they fill that with items that don't sell. When the semi-truck is full, it goes to the landfill. They also get so much more clothes than they can even process and attempt to sell. Goodwill's unsold or excess clothing goes to a goodwill warehouse in Commerce City, CO where they sell it by the pound to resellers, ship to 3rd world countries, or sell/send to Mexico.

Boulder County Resource Central And CHaRM
Resource Central is a 501c3, nonprofit co-located by CHaRM in Boulder, CO but is only 10 minutes away from Broomfield. They have 15 employees, fair wage and are a social enterprise. They have a showroom, warehouse, and outside yard. Broomfield residents do donate and shop there but they do not keep track of how many or how frequently. They offer a free pick up service even for Broomfield residents with an itemized receipt. They aren't at capacity although sometimes they have to turn away huge offers of donations like an entire office clean out.

When considering ordinances related to deconstruction, Brandon, Resource Central Reuse Director, recommends looking at Boulder's deconstruction ordinance that required 65% by weight to be reused or recycled. This will help divert usable material from the landfill from deconstruction projects.

Center for Hard to Recycle Materials (CHaRM) is located by Resource Central in Boulder, CO and is a mostly outdoor facility with a 6000 square foot warehouse where half is devoted to e-waste processing. CHaRM finds recycling outlets for typically hard to recycle items that traditionally aren't accepted curbside like, electronics, ceramics, hard to recycle plastic, plate glass, mattresses, concrete, yoga mats, and scrap metal. CHaRM is financially subsidized by three partners: the city of Boulder, Eco-Cycle and dedicated recyclers. CHaRM is funded in part by the city of Boulder trash tax dollars. There is a \$3 facility fee for every vehicle entering the CHaRM to recycle hard-to-recycle materials. Recycling fees that apply to specific materials like electronics, bike tires and porcelain. CHaRM is not at capacity and will continue to find outlets for hard to recycle items. Their data showed that in 2019 1500 transactions came from Broomfield residents out of 55,000+ transactions.

Online Surveys

The City and County circulated the online survey through its website, electronic newsletters and advertisements in the Broomfield Voice. The survey was open between April and September 2021. Results from the survey are highlighted below.

100% of the respondents were homeowners
 100% recycled at home
 58% compost
 92% shop at thrifts stores
 67% were happy with their collection provider

Are you happy with your collection service provider? Why or why not?

Yes, except I'd like options for cart size and compost service.

Western is okay. I wish they picked up a wider variety of plastics. It would be AMAZING if I could curbside recycle things like batteries, lightbulbs, etc.

All trash and recycle collection services start out at a reasonable rate, then continue to raise the rates until we are forced to cancel and start up with another provider.

Yes, but it is expensive

In our little Eagle Trace neighborhood, we have 2 or 3 different companies picking up our trash during the week. I have no complaints except to say 3 large trucks driving on the road is 3 x wear and tear, and fuel when perhaps one company could do it with one pass on the road. It seems this way of doing it is less environmentally friendly and costs more in the long run. I recognize people want choice and companies should need to compete for the service to keep quality high. I just wonder if there's a fair way to divvy the service up to reduce unnecessary consumption of resources.

Yes (Western). However, we are frustrated by the number of collection trucks that come down our street (several a day). We would give up our service provide to have a single community-wide service if it included recycling. Compost too would be amazing.

Broomfield needs to rethink this - we have never lived in a city that has multiple trash and recycling service providers. It's a waste of resources - fuel to run the trucks, the number of trucks on inefficient routes. Consolidate it or bid out geographic areas to those who will provide the best service at the lowest cost. Consumers don't need a choice. And for heaven's sake, start a city-wide compost program!



Compost collection service was identified by several survey respondents.

What would help you to reduce/reuse/recycle/compost more?

More awareness of options

Compost service

Part of city plan rather than it only being available privately

We make a lot of kitchen/garden waste that can be composted. I only have a small space for doing this and would LOVE it if the city had a compost material pick up service.

I am trying to get into the habit of carrying a container to restaurants to use as a takeout box instead of always taking home a new one. EVERY time we eat out, we take some of our plate home.

Convenience. 'Right to Repair' is also very important, though difficult to tackle at this level.

A program that provides education, instructions, maybe provides the proper containers, and then provides pickup.

Curbside compost and weekly recycle pick-ups.

Get rid of SINGLE USE PLASTICS! We recycle and compost everything we can and the amount of non-recyclable plastics we throw away is alarming.

We do the best we can.

Commercial composting. We are not great home composters, and we would be able to compost a lot that currently ends up in our trash that can be composted at a commercial compost facility.

Focus Groups

Broomfield hosted a series of online focus groups to obtain input on the Zero Waste Plan from homeowners, small businesses and renters in a smaller, more intimate, setting than the larger community workshops. Participants were asked to provide input on the barriers and opportunities for Zero Waste in Broomfield. Responses are highlighted below.

Homeowners

Interested in curbside composting and seasonal leaf collection

Concerns about more trucks on the road

Interested in single hauler for efficiency

Need better building codes for construction and demolition diversion requirements

More household hazardous waste collection

Expansion of the Broomfield Recycling Center as a Center for Hard to Recycle Materials facility

Community needs a better connection to land/growing food

Business Owners

Need to align with regional programs

Business and residential programs should be consistent

Concerned that adding services could add costs

Everyone needs to play by the same rules

Concerned that people think everything going in the landfill anyway so why bother to recycle

Renters

Multifamily residents may have limited space for multiple containers.

Low income residents may struggle with extra costs

Pay as you Throw or Save as You Throw (Pay less if you produce less) may be hard for large families

Need to make sure that outreach programs for recycling are in multiple languages and not just English and Spanish

ZERO WASTE ACTION PLAN



APPENDIX A STAKEHOLDER ENGAGEMENT

Community Workshops

Broomfield held four community workshops (two online and two in-person) to get feedback on the potential solutions to the barriers and opportunities identified through the focus groups and stakeholder meetings. The participants reviewed and discussed the Zero Waste initiatives and provided input for prioritization.

During the online workshops, residents gave feedback on four primary Zero Waste strategies: single hauler (where Broomfield would contract with one hauler for citywide services), community recycling & composting ordinance (where haulers would be required to provide services), construction & demolition recycling requirements, and outreach and education. Residents discussed and were supportive of moving to a pay-as-you-throw system (where customers have tiered rates and those with more trash pay more). They also supported consistent rules and minimum standards for recycling.

The in-person workshops allowed residents to give more feedback. After a presentation given by the Broomfield's sustainability manager, participants visited different stations where they could review and discuss several Zero Waste strategies considered for implementation in Broomfield. They then indicated their top four priority strategies using dot voting (placing stickers to indicate preferences).

The top four initiatives were:

- Universal Collection - Single Hauler/Districting
- Community Recycling & Composting Ordinance
- Center for Hard to Recycle Materials
- Construction, Deconstruction, & Demolition Diversion

Appendix B Methodology

A diversion potential and greenhouse gas (GHG) emissions reduction analysis was conducted to estimate the possible tons of landfill discarded materials and GHG emissions that can be diverted and reduced through the chosen initiatives (initiatives are detailed in the companion Impact Analyses document published along with this plan). This analysis requires the landfill data to be divided into material types based on a waste characterization study. Landfill tonnage data (Table 1) used in this analysis were from 2020 ReTRAC data supplied by the haulers to the City and County of Broomfield per their license agreement. Three different waste characterization study data were used in this analysis: Waste Audit - City and County of Broomfield Final Report,¹ Waste Composition and Characterization Analysis, City of Fort Collins, CO,² and Boulder County Waste Composition Study.³

Waste characterization results from the Waste Audit - City and County of Broomfield Final Report were used to analyze diversion potential and GHG emission reduction for initiatives related to single-family residents. The Waste Audit - City and County of Broomfield waste composition study was not used for the other sectors (commercial, multi-family residents, construction & demolition, and municipality) based on insufficient data. For the commercial and multi-family resident analysis and the municipal analysis, the Fort Collins waste composition study was used. For the construction & demolition analysis the Boulder County waste composition study was used. Both the Fort Collins and Boulder County waste composition studies provided a two season sampling period with robust sample sizes.

Along with landfill data and waste characterization data, [GHG emission factors](#) by material type from the US EPA Waste Reduction Model (WARM) Tool were used in this analysis. This analysis was completed by sector: single-family residents, commercial including multi-family residents, municipal, and construction and demolition and then the results were combined to show the cumulative estimated diversion and reduction for each Zero Waste initiatives.

Each initiative was analyzed to estimate the diversion potential (tons) and the GHG emissions (Metric ton carbon dioxide equivalent - MTCO₂E) reduced and then those data were combined among all initiatives to represent the total estimated tons diverted and total estimated GHG emissions reduced for each sector and by each initiative. This analysis begins by estimating the capture rate for each material type for an initiative. This capture rate estimation is based on knowledge from other communities or best estimates and errors on the side of a conservative estimates. The estimated capture rate for the initiative was then multiplied by the tons in each material category. The tons estimated to be captured by an initiative were then multiplied by the GHG emission factor (source reduction or recycling/composting) to estimate the GHG emission reduced by this initiative. This process was repeated for each material category that related to the initiative. Totals and the overall capture rate was calculated

¹ Waste Audit - City and County of Broomfield Final Report, November 2020

² Waste Composition and Characterization Analysis, City of Fort Collins, CO November 2016

³ 2019 Boulder County Waste Composition Study

(total tons estimated to be diverted or reduced through this initiative divided by the total tons from the sector). The tons estimated to be diverted through the initiatives and the GHG emissions estimated to be reduced were added up among sectors to show the cumulative results of these initiatives, which is shown in Table 4.

The [GHG emissions factors](#) used to estimate GHG emissions reduced from implementation of each initiative are from the WARM Tool and were updated in November 2020. Two GHG emissions factor categories were used: a source reduction GHG emissions factor and a recycling and composting GHG emission factor. For each ton of material either source reduced or diverted through recycling or composting, WARM identifies the metric ton of carbon dioxide equivalent (MTCO₂E) reduced. The GHG emissions factor used is a combination of the MTCO₂E reduced from either source reduction, recycling, or composting 1 ton of that material plus the emissions associated with landfilling 1 ton of that material. The initiative and material type directed which GHG emissions factor was used (i.e., source reduction or recycling/composting) in the analysis and if there was any uncertainty, the more conservative GHG emissions factor was used. The recycling and composting emissions factor was used more frequently than the source reduction emissions factor. When there was a material type without a directly related emission factor (there are 54 factors in WARM and sometimes there are material types without associated factors), appropriate [proxies](#) were used in their place.⁴

⁴ Personal Communication with Jarrod Bridge, US Environmental Protection Agency, Office of Resource Conservation and Recovery (ORCR)

The Zero Waste initiatives build on each other to achieve the high diversion levels anticipated by the City Council. The timelines show the planned implementation schedule, diversion tons and greenhouse gas emissions potential, and the resources that will be needed to implement these initiatives. By enacting these initiatives, Broomfield will become a leader in Zero Waste and create a path to sustainability for the Broomfield community.

Diversion Tons by Zero Waste Initiative by Year

Zero Waste Initiatives	Short Term (1-3 years)			Medium Term (4-7 years)				Long Term (8-10 years)		
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Policies										
1. Community Recycling & Composting Ordinance	7,080	7,080	7,080	7,080	7,080	7,080	7,080	7,080	7,080	7,080
2. Product Policies				219	219	219	219	219	219	219
3. Lead Colorado on Reusables								941	941	941
4. Clean Community Fee								1,672	1,672	1,672
5. Construction, Deconstruction, & Demolition				7,901	7,901	7,901	7,901	7,901	7,901	7,901
Programs										
6. Lead by Example				868	868	868	868	868	868	868
7. Outreach and Education	4,955	4,955	4,955	4,955	4,955	4,955	4,955	4,955		4,955
8. Technical Assistance				3,029	3,029	3,029	3,029	3,029	3,029	3,029
9. Universal Collection - Single Hauler/Districting	4,782	4,782	4,782	4,782	4,782	4,782	4,782	4,782	4,782	4,782
10. Service Provider Incentives	1,022	1,022	1,022	1,022	1,022	1,022	1,022	1,022		1,022
11. Food Waste Prevention Campaign				745	745	745	745	745	745	745
12. Business Recognition Program			662	662	662	662	662	662	662	662
Infrastructure										
13. Building Materials Reuse Center								510	510	510
14. Center for Hard to Recycle Materials				731	731	731	731	731	731	731
Total	17,839	17,839	18,501	31,994	31,994	31,994	31,994	35,117	35,117	35,117

Greenhouse Gas Emissions Reduction Potential (MTCO₂e) by Zero Waste Initiative by Year

Zero Waste Initiatives	Short Term (1-3 years)			Medium Term (4-7 years)			Long Term (8-10 years)			
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Policies										
1. Community Recycling & Composting Ordinance	-8,582	-8,582	-8,582	-8,582	-8,582	-8,582	-8,582	-8,582	-8,582	-8,582
2. Product Policies				-435	-435	-435	-435	-435	-435	-435
3. Lead Colorado on Reusables								-2,969	-2,969	-2,969
4. Clean Community Fee								-2,062	-2,062	-2,062
5. Construction, Deconstruction, & Demolition				-3,079	-3,079	-3,079	-3,079	-3,079	-3,079	-3,079
Programs										
6. Lead by Example				-1,169	-1,169	-1,169	-1,169	-1,169	-1,169	-1,169
7. Outreach and Education	-6,012	-6,012	-6,012	-6,012	-6,012	-6,012	-6,012	-6,012	-6,012	-6,012
8. Technical Assistance				-2,530	-2,530	-2,530	-2,530	-2,530	-2,530	-2,530
9. Universal Collection - Single Hauler/Districting	-5,652	-5,652	-5,652	-5,652	-5,652	-5,652	-5,652	-5,652	-5,652	-5,652
10. Service Provider Incentives	-591	-591	-591	-591	-591	-591	-591	-591	-591	-591
11. Food Waste Prevention Campaign				-3,100	-3,100	-3,100	-3,100	-3,100	-3,100	-3,100
12. Business Recognition Program			-901	-901	-901	-901	-901	-901	-901	-901
Infrastructure										
13. Building Materials Reuse Center								-598	-598	-598
14. Center for Hard to Recycle Materials				-677	-677	-677	-677	-677	-677	-677
Total	(20,837)	(20,837)	(21,738)	(32,728)	(32,728)	(32,728)	(32,728)	(38,357)	(38,357)	(38,357)

Estimated One-Time and Annual Costs by Zero Waste Initiative by Year (in \$1,000s)

Zero Waste Initiatives	One-Time Costs	Short Term (1-3 years)			Medium Term (4-7 years)				Long Term (8-10 years)			10-Year Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
Policies												
1. Community Recycling & Composting Ordinance	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$550
2. Product Policies	\$50				\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$400
3. Lead Colorado on Reusables	\$50								\$50	\$50	\$50	\$200
4. Clean Community Fee	\$50								\$25			\$75
5. Construction, Deconstruction, & Demolition	\$50				\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$400
Programs												
6. Lead by Example	\$10				\$35	\$35	\$35	\$35	\$35	\$35	\$35	\$255
7. Outreach and Education	\$25	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$525
8. Technical Assistance	\$10				\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$430
9. Universal Collection - Single Hauler/Districting	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$1,100
10. Service Provider Incentives	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11. Food Waste Prevention Campaign	\$20				\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$370
12. Business Recognition Program	\$10			\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$90
Infrastructure												
13. Building Materials Reuse Center	\$10								\$50	\$50	\$50	\$160
14. Center for Hard to Recycle Materials	\$75				\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$250
Total One-Time Costs	\$510											