C I T Y O F B O U L D E R
PLANNING BOARD INFROMATION ITEM

TO: Planning Board

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DATE: October 22, 2015

SUBJECT: Information Item: Zero Waste Strategic Plan

PURPOSE

The City of Boulder has a goal of becoming a Zero Waste community, which in practical terms means 85 percent of the materials discarded in Boulder would be reused, recycled, or composted and only 15 percent would be buried in landfills.

The purpose of this memo is to provide the Planning Board information on the Zero Waste Strategic Plan (ZWSP), a draft of which City Council reviewed in February 2015. This memo provides updates on the community's zero waste progress to date and reviews the goals, objective and strategies that make up the ZWSP. City Council is tentatively scheduled to receive and accept this strategic plan on November 10, 2015.

BACKGROUND

The City of Boulder's Master Plan for Waste Reduction was completed and accepted by City Council in February 2006 along with a Zero Waste Resolution. This plan contained a goal of 85 percent waste diversion by 2017. The process to update the plan began in 2011, but the process was put on hold to dedicate staff resources to the Disposable Bag Fee ordinance development and implementation and completion of construction for Phase I of 6400 Arapahoe.

Work on the strategic plan resumed in late 2012 with the hiring of Kessler Consulting, Inc., with LBA Associates, to conduct a Zero Waste Program Evaluation study. The study evaluated current waste diversion facilities, programs and policies and identified potential alternatives for achieving the community's zero waste goals. A waste task force helped define the scope, strategies, and criteria in the study. The waste task force consisted of industry experts, community leaders and interested organizations including Boulder County, Eco-Cycle, Western Disposal, Boulder County Public Health (zero waste business advisors), the Center for Resource Conservation, the Boulder Area Rental Housing Association, the University of Colorado and more.

The results of the study were presented to City Council in Feb. 2014, at a study session on July

29, 2014 and at a council meeting on February 17. At these meetings, council weighed in on the ZWSP format, goal areas and priority initiatives. The feedback received from council included the following:

- Waste diversion is very important, especially as it tracks very closely with greenhouse gas reductions
- Toxicity reduction should stand on its own and not be set against the other goals
- Re-use activities and source reduction should be prioritized over recycling or composting
- Requirements for commercial recycling and composting and composting at multi-family complexes should be prioritized
- Single-family residential strategies are a lower priority than the commercial strategies
- Recycling and composting need to be made more convenient and accessible in multi-family complexes
- Cost-effectiveness should be the primary consideration in facility investment
- The entire property at 6400 Arapahoe should be kept open for zero waste activities and other entities besides ReSource and Eco-Cycle should be allowed to locate there; especially those that can highlight innovation in the zero waste arena
- The city should not invest in a construction and demolition (C&D) facility

In addition, council requested staff pursue Universal Zero Waste Requirements that were adopted by ordinance on June 16. The requirements include provisions that:

- All property owners must provide adequate trash, recycling and composting service to their tenants and occupants;
- All businesses must separate recyclables and compostables from the trash; providing properly placed containers and signage to facilitate the collection of recyclables and compostables;
- All special events in Boulder must provide both recycling and composting collection;
- The "six-day review" special trash collection period for student move-in must begin to also include a requirement for twice per week recycling collection; and
- All recyclable materials must be directed to the Boulder County Recycling Center, with a provision allowing the City Manager to set conditions under which clean, pre-sorted paper may be sold elsewhere.

Current progress toward the existing goal of 85 percent waste diversion is presented in the table below.

Diversion Rates		
	2004	**2014**
Single-Family Residential	48%	58%
Multi-Family Residential	14%	20%
Commercial and Industrial	25%	28%
Community Wide	**30%**	**34%**

ZERO WASTE STRATEGIC PLAN

The ZWSP is designed to be a guiding document that provides an overarching framework to prioritize future zero waste investment options and assist council and staff decision-making. In addition to the written plan, the content will also be accessible by the community as part of a new "zero waste portal" on the city website (www.ZeroWasteBoulder.com) that will go live during

the second week of October. The new Web portal will help the community understand the progress that has been made towards the goals, what strategies the city is currently pursuing and how they can get involved. Attached to the ZWSP is an Action Plan that describes the next two to three years of significant work plan items and initiatives to be pursued, which will be updated annually to reflect any changes or additions. The main components of the plan include:

- Outline of roles for the city and its community partners
- Zero Waste Goals and Performance Metrics
- Trash Tax Guiding Investment Principles
- Evaluation Criteria for Future Initiatives

Key Components of the Strategic Plan

Roles

The ZWSP includes an outline of roles developed with the city's primary waste reduction partners. While not intended to be an exclusive or static list, this explanation will assist in guiding and prioritizing the efforts the city should pursue in years to come.

Goals and Performance Metrics

The ZWSP expands upon the original 2006 goal of 85 percent waste diversion in recognition that the percentage of waste diverted from the landfill, on its own, provides an insufficient picture of the waste reduction efforts of the community. Additional goals related to source reduction, climate, and participation are included in the plan. While the goals are not prioritized, as they are all critical in achieving a zero waste community, the desire to prioritize source reduction efforts, or reducing waste before it is created, is reflected in the Guiding Investment Principles.

Waste Diversion Goal

- **85% Waste Diversion in each sector by 2025** (Residential single-family, Residential multi-family, and Commercial)

Source Reduction Goal

- **Measure per capita total waste generation** (Trash, recycling and compost) **and work to decrease this over time.**

Climate Change Goal

- **Measure greenhouse gas** (GHG) **emissions from waste disposal to the greatest extent possible and implement strategies to reduce GHG emissions from waste.**

Participation Goal

- **Maximize the number and diversity of individual participants in zero waste services and programs.**

Guiding Investment Principles

The guiding investment principles focus on providing convenient programs and services that reduce waste but are not initially viable for the private sector to provide. Once a new program or facility investment is determined to help achieve one or more of the plan's goals and there is sufficient funding to support the investment, it will be evaluated according to the investment principles and given a score for how many principles it aligns with.

Evaluation Criteria

New initiatives that meet at least one investment principle will also be evaluated qualitatively and quantitatively according to the evaluation criteria in the plan. When evaluating the quantitative criteria these ratings will be based on estimated tons (of waste diverted or greenhouse gases avoided) or estimated increases in participation.

The final and perhaps most important piece of the criteria evaluation is a measure of cost effectiveness. Depending on the focus of the new initiative (i.e. increasing diversion, participation, etc.) the cost for the city to implement and sustain it will be divided by the relevant quantitative measure. This will provide an estimated cost per ton of material or per additional participant that the initiative will achieve. If a new initiative also has an associated cost to the user, those costs will also be considered.

Action Plan

Intended to dovetail with the short-term action plans of our community partners, the city's action plan covers the next two to three years of significant work plan items that will move us closer to the goals outlined in the Zero Waste Strategic Plan. This plan will be updated annually to reflect any changes or additions in strategies and investments. The 2015 Action Plan includes:

- Requirements for commercial recycling and compost collection
- Requirement for multifamily compost collection
- Robust business zero waste advising services to aid compliance with new requirements
- Further develop multifamily housing zero waste advising program

The city's zero waste partners will also be providing their action plans to append to the final ZWSP so that the community has a complete picture of what zero waste services, programs, and other initiatives are being pursued.

ATTACHMENTS

A: Zero Waste Strategic Plan and Action Plan

City of Boulder
Zero Waste Strategic Plan

October 2015

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Section 1: Introduction

Waste reduction has long been a community value in the City of Boulder, and since the adoption of a Zero Waste Resolution and the Master Plan for Waste Reduction by City Council in 2006, the city has worked to create the programs, services and facilities needed to reach the plan's goal of 85 percent waste diversion, a milestone recognized internationally to define a zero waste community. Many of these initiatives have been implemented and continue to be improved and expanded, including new facilities, advising programs, financial incentives and regulations. The city is fortunate to collaborate with a network of private, public and nonprofit partners in the community to collectively work towards becoming a zero waste Boulder. The process for updating this plan, renamed the Zero Waste Strategic Plan (ZWSP), provides an opportunity to re-evaluate the priorities, goals and initiatives Boulder can use to reduce waste generation and increase diversion across all sectors of the community.

How the Zero Waste Strategic Plan Will Be Used

Recognizing that the city does not have control of waste hauling and that Boulder relies on a strong network of nonprofit, for-profit, governmental and community partnerships to invest resources in the success of our zero waste systems, the Master Plan for Waste Reduction has transitioned to a Zero Waste Strategic Plan. This new strategic plan is designed to be a living document, and will set an overarching framework for reaching its goals but remain flexible to respond to changing community needs, opportunities and partner actions. The guiding principles in the plan will assist with prioritizing different trash tax investment options. The plan includes an Action Plan outlining which initiatives the city will pursue in the near-term based on current progress and immediate opportunities.

History

Recycling and waste reduction are interwoven into the fabric of what makes Boulder, Boulder. Beginning in 1976, when a group of Eco-Cycle volunteers began collecting recyclable materials from neighborhoods in old, yellow school buses, Boulder was one of the first communities in the country to have curbside recycling. In 1989, the city instituted the trash tax and took over the recycling program, expanding it to include city-wide curbside collection in a partnership between the city, Eco-Cycle, Western Disposal and the Boulder Energy Conservation Center (now, Center for Resource Conservation). In 1992, 1995, and in 2001, the city expanded the types of recyclable materials collected. In 2001, the city also transformed the municipally contracted, curbside program into a regulated, private sector industry, allowing the existing trash tax funding to be used to expand into commercial recycling and hard-to-recycle materials collection services.

When surveyed, residents consistently report recycling to be one of Boulder's signature programs, and repeatedly ask for increased recycling opportunities. Since 2010, the free zero waste assistance delivered through PACE (Partners for a Clean Environment) has provided services to more than 600 businesses. Surveys and meetings with business groups have also shown that most business leaders agree that recycling is a core value in Boulder and that their customers and employees demand the service.

Planning Framework

This plan fits under the policy umbrella of the Boulder Valley Comprehensive Plan (BVCP) and implements the broader community vision contained in the BVCP for the area of Environment, specifically subsections 4.33 through 4.44, Protect Natural Resources: Resource Conservation. It is also created within the context of the Sustainability Framework, a tool used to ensure that departmental plans align with and advance the goals and priorities of City Council and the

community. The categories of the Sustainability Framework are built upon the BVCP and the city's Priority Based Budgeting approach. The framework is comprised of seven categories:

Safe Community – When the City of Boulder enforces the law; plans for and provides timely and effective response to emergencies and natural disasters; fosters a climate of safety; encourages shared responsibility; and fosters an environment that is welcoming and inclusive, *then it will be a Safe Community*.

Healthy and Socially Thriving Community – When the City of Boulder cultivates a wide-range of cultural, educational and social opportunities; supports the physical and mental well-being of its community members; fosters inclusion, embraces diversity and respects human rights; and enhances multi-generational community engagement, *then it will be a Healthy and Socially Thriving Community.*

Livable Community – When the City of Boulder promotes and sustains a safe, clean and attractive city; facilitates diverse housing options; provides safe and well-maintained public infrastructure; provides adequate and appropriate regulation of public/private development and resources; encourages sustainable development supported by reliable and affordable city services; and supports and enhances neighborhood livability for all community members, *then it will be a Livable Community*.

Accessible and Connected Community – When the City of Boulder offers a variety of accessible and sustainable mobility options; plans and maintains effective infrastructure networks; supports strong regional multimodal connections; provides open access to information, encourages innovation, enhances communication and promotes community engagement; and supports a balanced transportation system that reflects effective land use and reduces congestion, *then it will be an Accessible and Connected Community*.

Environmentally Sustainable Community – When the City of Boulder supports and sustains natural resource and energy conservation; promotes and regulates an ecologically balanced community; and mitigates threats to the environment, *then it will be an Environmentally Sustainable Community*.

Economically Vital Community – When the City of Boulder supports an environment for creativity and innovation; promotes a qualified and diversified work force; fosters regional and public/private collaboration with key organizations; and invests in infrastructure and amenities that attract and retain

diverse businesses and entrepreneurs, *then it will be an Economically Vital Community*.

Good Governance – When the City of Boulder models stewardship of the city's financial, human, information and physical assets; supports strategic decision making; enhances and facilitates transparency, accuracy, efficiency, effectiveness and quality customer service; supports, develops and enhances relationships between the city and community/regional partners; and provides assurance of regulatory and policy compliance, *then it will have provided Good Governance*.

The ZWSP exists to promote an environmentally sustainable community, encouraging the prevention of waste and the recycling/composting of materials to ensure the efficient use of resources and reduce pollution. Additionally, Boulder's unique zero waste landscape, which relies heavily on fostering partnerships, supports organizations that contribute to the economic vitality of the community.

The strategies that will be needed to reach the zero waste goals of this plan will further good governance and address many of the other categories as well. The attached Action Plan identifies which Sustainability Framework categories each initiative promotes.

Section 2: Current Progress and Getting to Zero Waste

Despite the progress since the original 2006 Master Plan for Waste Reduction, community-wide waste diversion, which includes single-family residential, multi-family residential and commercial properties, rose modestly from 30 to 33 percent in the nine years between 2004 and 2013. Gains have been made in the residential sector's diversion rates; however, the percentage of Boulder's waste stream generated by the commercial sector has increased significantly while the corresponding diversion rate has remained stagnant. This has contributed to keeping Boulder's community-wide diversion rate relatively low.

Diversion Rates		
	2004	**2014**
Single-Family Residential	**48%**	**58%**
Multi-Family Residential	**14%**	**20%**
Commercial and Industrial	**25%**	**28%**
Community Wide	**30%**	**34%**

Getting to Zero Waste

When the city's Zero Waste Resolution was passed in 2006, it included the following specific reasons why Boulder should strive to be a zero waste community, including:

- the disposal of materials in facilities such as landfills and incinerators wastes natural resources, wrongly transfers liabilities to future generations, and has the potential to cause damage to human health;
- avoiding the creation of waste materials in the first place is the most economically efficient and environmentally sustainability resource management strategy; and
- a resource-based economy will create and sustain more productive and meaningful jobs than a disposal-based economy.

The Resolution also began to outline the city's role in achieving this zero waste vision, stating that "government can be ultimately responsible for establishing criteria needed to eliminate waste, for creating the economic and regulatory environment in which to achieve it, and for leading by example". Inherent in this description is the reality that the city cannot work alone, and that only through collaboration with its private, nonprofit and public sector partners can the entire community achieve zero waste. One aim of this plan is to further define the appropriate roles for the city and its partners given the current infrastructure and regulatory environment present which will guide trash tax investment decisions in the future.

One of the city's partners, Eco-Cycle, developed a *Bridge Strategy to a Zero Waste Community,* which details the path a community can take to achieve the zero waste milestone. At its core, the strategy has three phases:

- **Phase One: ACCESS** – develop infrastructure and provide access to recycling services across all sectors.

- **Phase Two: PARTICIPATION** – build participation in a source separation society and target hard-to-recycle material streams.

- **Phase Three: ZERO WASTE** – reduce per-capita discard generation and phase "waste" items out of the community.

In parallel with this strategy, Boulder has already done significant work developing the infrastructure and access needed for all residents, businesses, employees and visitors to properly separate most of their waste materials. This list below of basic facilities needed builds upon the facilities in Eco-Cycle's strategy and includes eight facilities that Boulder needs:

BASIC FACILITY NEEDS	
• Materials Recovery Facility for Recycling	√
• Composting Facility	√
• Center for Hard-to-Recycle Materials (CHaRM)	√
• Deconstruction Reuse Facility	√
• Construction and Demolition Debris Recycling Facility	
• Creative Reuse Center	
• Zero Waste Transfer Station for Residue (for "whatever's left")	

Boulder is fortunate to have in place four of these seven facilities; however work needs to be done to provide universal access to them and to ensure a high level of participation in their services. The city continues to build participation through education, services, incentives and regulations. Future trash tax investments in new programs, services and facilities guided by this plan will work to build that participation to new heights and to improve source reduction efforts, reducing per-capita waste generation to create a more efficient society.

This is how Boulder will get to zero waste. While not all of the solutions to every part of the waste stream exist today, focusing on the trajectory of maximizing participation at every level and reducing the use of materials designed for the landfill will allow the community to reach the goals of this plan.

VISION

It is the city's vision that Boulder is a place where residents, business owners, employees and visitors are empowered and take personal action to generate zero waste. It is a place where all are informed on how to play their part in achieving the goals of the Zero Waste Strategic Plan. The community will minimize the creation of all types of waste through conscious consumption choices and reuse opportunities, and will be able to divert waste materials that are produced to the appropriate recycling, compost or reuse services.

In recognition that a large part of enabling personal action is knowledge of how each person can contribute to achieving these goals, this ZWSP has an accompanying website at www.ZeroWasteBoulder.com that will be updated consistently and aims to condense and summarize all the information the community needs to achieve the vision.

Existing Programs

[This content will be a sidebar/call-out box in the section above]

The city currently sponsors a variety of waste reduction programs and incentives with Trash Tax revenues that drive materials to existing facilities. These include the following (and more information about each can be found at www.ZeroWasteBoulder.com):

• Yard Waste Drop-Off Center at Western Disposal
• Wood Waste Drop-Off Center at Western Disposal
• Green Teams – Student-to-student outreach in off campus residential neighborhoods
• Boulder Valley School District Educational Programs
• Extra corrugated cardboard collection on University Hill during August move-in time period
• Sponsorship of Eco-Cycle Times, Holiday Guides and other educational materials
• Business Start-up Rebate for towards interior bins, compostable bags, signage, etc.
• Property Manager Rolling Grant Program to offset cost of expanding enclosures
• Free one-on-one business advising program through PACE (Partners for a Clean Environment)
• Custom zero waste signs for inside businesses
• Multi-family housing recycling and composting advising program
• $250 Zero Waste Special Event Rebate

Section 3: City and Partner Roles

In contrast to communities with municipal control over waste hauling, state mandates or high landfill tip fees that encourage zero waste investments, Boulder relies on a strong network of nonprofit, for-profit, governmental and community partnerships to invest resources in the success of our zero waste systems. In this dynamic environment, the City of Boulder has a role to: facilitate a community vision around zero waste; "set the rules" so everyone can play on an even

field; and work with each community partner to collaboratively build facilities and deliver strategic programs and services.

Due to this unique zero waste landscape in Boulder, this plan aims to clarify the roles of both the City and its partners in moving towards the community's zero waste goals. The process of developing this plan included conversations with many partners to define the roles outlined below. While not intended to be an exclusive or static list, this explanation will assist in guiding and prioritizing the efforts the city should pursue in years to come. It is important to recognize that these individual roles are only effective when they are taken together and many organizations are working toward a common vision. For example, the City could develop an ordinance designed to level the playing field between private companies, but it may go nowhere unless community members are willing to add their expertise to inform ordinance options; advocates can inform and organize the community; regional facilities can adapt operations if necessary to respond to the proposed regulation; and community members can participate in the resulting zero waste programs and services. It is with this in mind that the following guidance was developed.

Roles of the City of Boulder:

- Council and staff development and support for state and federal legislation
- Support regional and statewide efforts in areas such as product stewardship, locally generated compost, toxics reduction and other forms of market development and waste prevention
- Collaborate on planning efforts to craft a community-wide vision for zero waste; set goals; plan local facilities, programs and services
- Collaborate with other partners to create educational messages and materials that help inform and empower community members to reach toward zero waste
- Own and manage leases and operating agreements with the Center for Resource Conservation (CRC) for ReSource and Eco-Cycle for the Center for Hard-to-Recycle Materials at 6400 Arapahoe
- Develop and manage city programs and services, including yard waste and wood waste drop-off facilities, and provide financial incentives when needed and appropriate
- Ensure zero waste policies, programs and services "protect the common good" and conform to state and federal laws and regulations, and promote the health, safety, and welfare of the residents of Boulder
- Develop and implement regulation, associated enforcement and land use approvals within the City of Boulder
- Provide financial support and contracts for critical infrastructure/facilities[1]
    - If the private sector cannot independently fund
    - To ensure longevity of facilities
    - To ensure equitable access to facilities
    - To serve current and near-term City/Boulder community needs[1]
- Support the Partners for a Clean Environment service providing zero waste advising services, recognition, and certification of performance to City of Boulder businesses
- Create and manage community working groups/task forces when needed
- Pursue City Council motions, actions, recognition when needed/appropriate

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[1] The City may invest in a facility that ultimately serves the entire region if Boulder's needs are more immediate than the rest of the county. Conversely, if the need for processing capacity is more heavily weighted in the rest of Boulder County or is more equitably distributed across the county, Boulder County or other communities should take the lead in facility investment and contracting.

- Serve as a member of regional committees for infrastructure planning; standardized reporting; education and outreach; etc.
- Provide expertise on zero waste issues, education, opportunities, and services by participating in working groups and on advisory boards; participate in Resource Conservation Advisory Board discussions and subcommittees for regional policy discussions, zero waste facility planning and feedback to the Board of County Commissioners on the operations of the Boulder County Recycling Center

Roles of Boulder County:

- Commissioner and staff development and support for state and federal legislation
- Support regional and statewide efforts in product stewardship, cooperative purchasing of recycled-content materials and locally generated compost, toxics reduction, and other forms of market development and waste prevention
- County-wide leadership through the intergovernmental Resource Conservation Advisory Board (RCAB), and other community partnership building activities, to:
    - Promote resource conservation, zero waste and a healthy environment through policy change recommendations, regional planning, goal setting, educational outreach and advisory services, providing grant funding, development and management of facilities and programs, and standardized reporting.
    - Foster regional agreements to formalize commitments and activities--initially on zero waste education and outreach--using guiding principles to standardize messaging, facilitate cost sharing, and to better define the roles of county, municipal, nonprofit and for-profit partners.
- Manage regional facilities, programs and services, including owning and managing the Boulder County Recycling Center, the Hazardous Materials Management Facility and public drop-off recycling centers, waste transfer stations, yard waste and wood waste drop-off facilities and construction and demolition (C&D) drop-off facilities.
- Provide financial support and contracts for critical infrastructure/facilities
- Regulate deconstruction waste diversion, hauling of waste, recyclables, etc. in unincorporated Boulder County
- Ensure that zero waste policies, programs and practices conform to state and federal laws and regulations, and promote the health, safety, and welfare of the residents of Boulder County
- Support the Partners for a Clean Environment service providing zero waste advising services, recognition, and certification of performance to Boulder County businesses in partnership with municipalities and potentially other entities
- Provide expertise on zero waste issues, education, opportunities, and services by participating in working groups and on advisory boards.

Roles of other Community Zero Waste Partners:

- Help galvanize the community around the vision of Zero Waste Boulder
- Educate and communicate to partner's customers/members
- Community organizing
- Research on national and international best practices
- Private investment in facilities or services
- Test services/material recovery prior to full-scale implementation
- Operate "waste exchanges" where proprietary information must be protected (thus inappropriate for the city or county to hold as public record)
- Operator for publicly-sponsored or privately-held facilities or services

- Volunteer mobilization
- Social media pushes and other community education requiring quick turnaround
- Advocacy to represent desires of community members
- Tracking and reporting (measurement and verification) for partner organizations' own activities

Nonprofit
- Investments that can be supported by grants or cross-subsidized by organization's commercial strategies ("social enterprise")
- Focus on "how to change the world"
- Partner with the city to "protect the common good"
- Fee-based services

For-profit
- Investments with payback potential
- Facility capital improvements
- Fee-based services

Community members
- Expertise to inform government-sponsored initiatives
- Feedback to government on proposed programs, services and regulations
- Collaborative program development and partner in entrepreneurial iniatives
- Participation in zero waste services
- Customers for zero waste services and facilities

Section 4: Goals and Performance Metrics

This ZWSP expands upon the original 2006 goal of 85% waste diversion in recognition that the percentage of waste diverted from the landfill, on its own, provides an insufficient picture of the waste reduction efforts of the community. Additional goals related to source reduction, climate, and participation are included in this plan as a result of input received throughout the update process regarding community priorities.

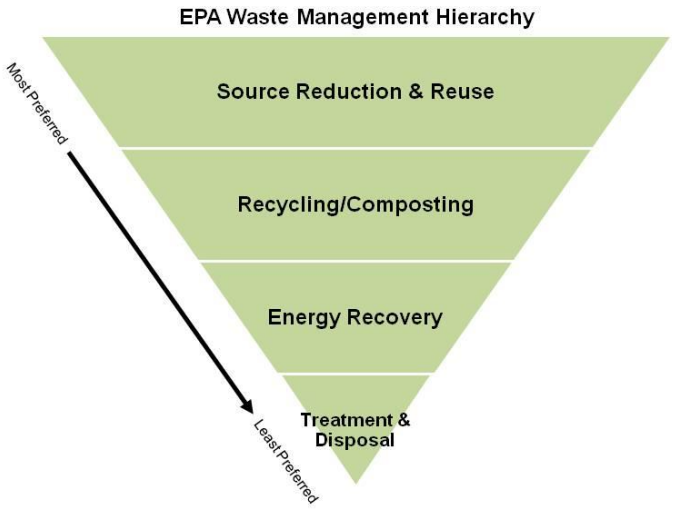
Waste Diversion

The percentage of waste diversion is calculated by taking the weight of total materials recycled and composted and dividing this by the weight of the total discarded materials (total recycled, composted, and landfilled). In 2006 City Council adopted a goal of 85% waste diversion, which is the internationally accepted diversion rate for a zero waste community, in recognition that currently there are materials in the waste stream that cannot yet be recycled, composted, or otherwise repurposed. The new target date to achieve this level of waste diversion is 2025. Each sector of the Boulder community, including single-family residential, multi-family residential, and commercial should each achieve 85% waste diversion.

- **GOAL: 85% WASTE DIVERSION IN EACH SECTOR BY 2025 (RESIDENTIAL SINGLE-FAMILY, RESIDENTIAL MULTI-FAMILY, AND COMMERCIAL)**

- **PERFORMANCE METRIC: WASTE DIVERSION BY SECTOR (REPORTED ANNUALLY)**

Source Reduction
While much of the city's focus since the acceptance of the original master plan has been on recycling and compost services and infrastructure, this ZWSP has an increased focus on reducing waste at its source. This priority is aligned with the EPA's waste hierarchy, which ranks the most environmentally sound strategies for municipal solid waste. This hierarchy emphasizes source reduction and reuse as the most preferred approach.



Source reduction goals are commonly measured by calculating the total waste material generation per capita (including all discarded materials that are thrown in the trash, recycled and composted). According to EPA data, the average American generated 4.38 pounds of total waste per day in 2012, and recycled or composted 1.51 pounds of those materials. The city will begin to measure this metric annually. It will be based on the required reports of the waste haulers operating in the city and the city will prioritize initiatives that reduce this number.

- **GOAL: MEASURE PER CAPITA TOTAL WASTE GENERATION (TRASH, RECYCLING AND COMPOST) AND WORK TO DECREASE THIS OVER TIME**

- **PERFORMANCE METRIC: POUNDS OF TOTAL WASTE PER PERSON PER DAY (REPORTED ANNUALLY)**

Climate Change
The renewal of the Climate Action Plan Tax in 2012 and the continued support of the city's Climate Commitment efforts demonstrate Boulder's recognition that the community supports the imperative of drastically reducing our greenhouse gas (GHG) emissions. City master and strategic plans that address the focus areas of the Climate Commitment are a main tool for achieving those emission reductions, and waste is one of these focus areas. Boulder's past GHG inventories did calculate emissions from the disposal of waste, but the methodology then did not take full account

of recycling and compost practices. The city's new GHG inventory, currently under development, will include improved methods to measure the GHG impacts of the transport and disposal of waste.

In addition to emissions from the disposal of waste, there is emerging recognition of the importance of measuring the GHG impacts created by the consumption choices a community makes. The city will continue to monitor the evolution of this process, as there is not yet a widely adopted methodology for incorporating consumption measures into GHG inventories.

- **GOAL: MEASURE GHG EMISSIONS FROM WASTE DISPOSAL TO THE GREATEST EXTENT POSSIBLE AND IMPLEMENT STRATEGIES TO REDUCE GHG EMISSIONS FROM WASTE.**

- **PERFORMANCE METRIC: GHG EMISSIONS GENERATED FROM WASTE DISPOSAL (REPORTED ANNUALLY)**

Participation

In addition to performance metrics above, increasing participation in Boulder's zero waste programs in also a priority. Beginning in 2010, the annual Boulder hauler reporting form included a request for the number of trash, recycling and compost customers (by service address) by sector in addition to tonnage data. In addition, while we track the number of customers using the CHaRM or ReSource, we are working with Eco-Cycle and CRC to help identify and increase the number of "unique" customers accessing those city-sponsored facilities. The city will continue to collaborate with partners to develop improved measures of participation across all programs and facilities. Initiatives will be created or adjusted with the goal of maximizing the number and diversity of individual participants in zero waste services and programs. Community-wide surveys on zero waste programs and participation will be used when possible to gauge diversity of participants.

- **GOAL: MAXIMIZE THE NUMBER AND DIVERSITY OF INDIVIDUAL PARTICIPANTS IN ZERO WASTE SERVICES AND PROGRAMS.**

- **PERFORMANCE METRIC: NUMBER OF UNIQUE PARTICIPANTS USING ZERO WASTE PROGRAMS, SERVICES AND FACILITIES (REPORTED ANNUALLY)**

Section 5: Evaluation Process

Guiding Investment Principles

This strategic plan will guide the city's annual decisions about which investments in new or expanded programs, incentives and facilities should be made by providing a clear framework to evaluate the options. Generally speaking, the basic trajectory of strategies the city implements is to begin with voluntary programs, then encourage broader participation with financial incentives, and finally moving to regulatory approaches when incentives do not create enough of the desired outcomes.

The guiding investment principles focus on providing convenient programs and services that reduce waste but are not initially viable for the private sector to provide. Programs and services are designed to be "spun off" when either the economic motivators or the desires of the program

participants have shifted sufficiently to allow the private sector to take over. Sometimes this shift requires enabling legislation so that all private sector companies are playing by the same rules.

Once a new program or facility investment is determined to help achieve one or more goals and there are sufficient trash tax funds to support the investment, it will be evaluated according to the following investment principles and given a numerical score for how many principles it aligns with:

- Preference will be given to cooperative ventures with for-profit and nonprofit organizations over sole municipal control.
- One-time funding is preferable to ongoing program support.
- Investments will be prioritized if they are "opportunistic" and take advantage of fund matches or enjoy significant community support.
- The city will avoid duplicating services where an existing community organization can either provide the service or whose existing services could be built upon.
- Investments will be prioritized if they have the ability to achieve multiple community sustainability goals in addition to the zero waste goals in this plan.
- Following the Environmental Protection Agency's Waste Management Hierarchy, preference will be given first to source reduction or waste avoidance; then to recycling and composting; then to energy recovery for non recyclable materials; and lastly to treatment and disposal. The City will generally not invest in energy recovery facilities that use materials that would otherwise be recyclable or compostable as a feedstock.
- The City will strive to fund projects that test new and innovative waste reduction solutions, especially solutions that provide an alternative to disposing materials that are not currently recyclable or compostable or those that offer a more efficient process for recycling (or reusing) a material.
- Toxic materials are inherently non-sustainable. Any investment is encouraged that can reduce their use, whether through legislation, education or encouraging producer responsibility.
- The city can fund business plans and technical assistance to help partners determine private sector (for-profit or nonprofit) viability.

All new investments options in a given budget year will be ranked according to how well it scores against these investment principles. By ensuring that new investments meet at least one of these principles the city will fund programs, services and facilities that are consistent with its role as defined in this plan.

Evaluation Criteria
Following the initial ranking with the investment principles, new initiatives that meet at least one investment principle will also be evaluated qualitatively and quantitatively according to evaluation criteria. For each criterion the initiative will receive 3 points for a "high" rating, 2 points for a "medium" rating, and 1 point for a "low" rating. When evaluating the quantitative criteria these ratings will be based on estimated tons (of waste diverted or greenhouse gases avoided) or estimated increases in participation.

Quantitative	Rating based on:
Diversion Potential	Tons of waste that will be diverted from the landfill
Greenhouse Gas Reduction Potential	Tons of greenhouse gas emissions that will be avoided
Community Engagement	Ability to encourage broad community participation and raise awareness across diverse audiences

Qualitative	Rating based on:
Upstream Conservation	Ability to support source reduction, repair, reuse or reduced toxicity
Difficulty of Implementation	Consideration of how difficult an initiative will be to implement, taking into account staffing, funding and policy needs

The final piece of the criteria evaluation is a measure of **cost effectiveness**. Depending on the focus of the new initiative (i.e. increasing diversion, participation, etc.) the cost to implement and sustain it will be divided by the relevant quantitative measure. This will provide an estimated cost per ton of material or per additional participant that the initiative will achieve.

These four filters (goals, investment principles, evaluation criteria and cost effectiveness) and the resultant rankings will allow staff and Council to determine zero waste priority work plan items and investments.

Section 6: Issues, Challenges, and Potential Initiatives

Commercial Sector

Issues and Challenges
Based on discussions with the city's business zero waste advisors, surveys and meetings with property owners and business leaders, it is clear that some barriers exist to implementing recycling or compost service in businesses. These barriers include:

- Businesses and multi-family property managers must initiate and pay for additional services, unlike the single-family residential sector where services can be included with trash collection service.
- Unless a business is able to reduce its level of trash service, these costs are additive.
- There is a landlord/tenant split incentive, where an owner or property management company pays the trash bills and may be unwilling to subscribe to additional services requested by businesses.

- Trash and recycling containers in common collection areas often suffer from "the tragedy of the commons," and contamination is an issue. Many businesses report illegal dumping as a significant concern, especially if they are to be required to add recycling or compost collection service.
- There is often insufficient space for additional carts or dumpsters, especially in dense commercial districts.

Potential New Initiatives

Business Recycling Requirement – This universal recycling requirement for businesses would likely require every business to subscribe to single-stream recycling collection. Any such ordinance would need to include exemptions for extreme financial hardship and significant space constraints; an adequate phase-in period; and be paired with incentives and technical assistance. **[Universal Zero Waste Ordinance adopted June 16, 2015 and takes effect June 16, 2016.]**

Food Business Compost Collection Requirement – This universal requirement for business that serve, sell or prepare food or other compostable organic materials (florists, grow operations, landscapers) would require compost collection service. Again, specific exemptions, technical assistance and incentives should be designed to help affected businesses overcome common barriers at start-up. **[Universal Zero Waste Ordinance adopted June 16, 2015 and takes effect June 16, 2016.]**

Take-Out Packaging – This strategy would encourage voluntary use of recyclable or compostable packaging by take-out restaurants. Significant technical assistance and incentives to encourage more widespread adoption would be needed, including helping establish proper on-site collection systems for recyclable and compostable take-out packaging.

Potential Commercial Initiatives	Goals Addressed	New Diversion (tons)	New GHG Reductions (tons)
Business Recycling Requirement	Diversion Climate Participation	5,500 – 11,900	17,000 – 36,600
Food Business Compost Collection Requirement	Diversion Climate Participation	8,600 – 17,100	1,800 – 3,600
Take-Out Packaging	Diversion Climate Participation	100 – 200	< 100

Single-Family Residential Sector

Issues and Challenges

While this sector has access to curbside recycling and compost collection and diverts a higher percentage of waste than other sectors, waste sorts reveal that there are still gains to be made from the recyclable and compostable materials still present in the trash. According to previous years' surveys and input at public meetings, the main barrier to greater diversion is persistent confusion over what materials are recyclable and compostable. Single-family residents would benefit from a more intense focus on:

- Clarity around recycling and composting guidelines
- Technical assistance to overcome barriers to food waste composting

- Facilities that accept hard-to-recycle and hazardous materials
- Reduce and reuse opportunities

Potential New Initiatives

Every Other Week Trash Collection – This strategy would decrease regular single-family trash collection to an every-other-week frequency while increasing organics or recycling collection to a weekly frequency. Any resident still wishing to subscribe to weekly trash collection could do so for an additional charge.

Homeowner Collection Service Requirement – This requirement would modify Boulder Revised Code subsection 6-3-3(b) to require all homeowners to subscribe to curbside trash collection, which is not currently mandated. This would provide an estimated 20% of the single-family residents in Boulder with curbside recycling and compost collection service. This requirement would help alleviate the problem of illegal dumping, since residential rental property owners are the only property owners required to subscribe to trash collection, they frequently report instances of illegal dumping.

Potential Single-Family Initiatives	Goals Addressed	New Diversion (tons)	New GHG Reductions (tons)
Every Other Week Trash Collection	Diversion Climate Participation	2,500 – 5,000	2,600 – 5,200
Homeowner Collection Service Requirement	Diversion Climate Participation	7,400	15,000

Multi-Family Residential Sector

Issues and Challenges

Similar to the experiences of other cities, the multi-family housing sector has the lowest diversion rate of all sectors in Boulder. This is due to barriers including the high resident turnover, inadequate recycling containers on site and limited education received by residents since many do not interact with their waste hauler. In multi-family housing complexes issues with improper recyclable and compostable materials sorting (contamination) are more common in comparison to single-family homes and property owners report a significant problem with illegal dumping. The fact that property owners or managers are often not onsite is also a barrier.

Potential New Initiatives

Multi-Family Composting – This strategy could either modify existing policy to require haulers provide compost collection to multi-family accounts in addition to recycling; or could require multi-family property owners to subscribe to recycling and composting service. This requirement should be phased in over time with significant technical assistance and should be accompanied by a review of potentially conflicting land use code requirements to accommodate a smooth transition to any new requirement.

Existing Policy Enforcement – This strategy would increase resources for enforcement of the existing recycling requirement for multi-family housing, which requires that haulers provide a volume of recycling collection equal to at least half of the volume of trash collection offered to multi-family customers.

Potential Multi-Family Initiatives	Goals Addressed	New Diversion (tons)	New GHG Reductions (tons)
Multi-Family Composting	Diversion Climate Participation	300 – 600	< 100
Existing Policy Enforcement	Diversion Climate	2,100 – 5,800	9,400

Zero Waste Facilities

While Boulder is close to having access to all of the zero waste facilities needed to achieve the plan goals, there are several remaining needs that will have to be addressed in coming years. This list below outlines possible facility needs anticipated today, however future technological developments or partnership opportunities may arise, at which time those facility investments will be evaluated according to the guiding principles in this plan.

Potential New Facility Investments

Compost Site for Commercial Organics - Currently, compostable materials collected from businesses are taken to Western Disposal's compost facility only if that business contracts with Western as its hauler. Other haulers take commercially generated compostable materials to processing facilities that are outside of Boulder County. A city-supported compost facility, at Western or another site, could ensure capacity to serve Boulder's zero waste needs for the long-term, ensure the gate fees are equitable for all haulers using the facility, and make the system more efficient and cost-effective while reducing transportation fuel emissions. In April 2015, A-1 Organics, in partnership with The EDF Group, a private energy firm based in France, is opening a biofuel organic materials digester in Weld County. This facility will be set up to accept compostable materials from businesses from throughout the Colorado Front Range. The digester will create two end-products - a peat moss substitute and natural gas. The facility has already signed a 20-year contract with the Sacramento Municipal Utility District and can accommodate additional compostable food waste collected from Boulder restaurants and supermarkets.

Construction and Demolition (C&D) Recycling Facility - Right now there is no facility in close proximity to Boulder that can sort and process mixed construction and demolition waste. Having this type of facility would greatly increase the diversion from construction projects.

Expanded CHaRM and ReSource - "Phase II" of development at 6400 Arapahoe, already approved through site review by City Council and Planning Board, allows for expanded capacity inside the existing leased area for CHaRM and ReSource. This development would allow each facility to accept a greater quantity and more types of materials for recycling and reuse.

Creative Reuse Center - A creative reuse center typically accepts industrial waste items that cannot be recycled and makes them available very inexpensively to the community, often artists, teachers and students for reuse. This type of facility would increase diversion, address upstream conservation and could increase community engagement and participation in other zero waste initiatives of the city.

Improvements to Boulder County Recycling Center (BCRC) - In order for the BCRC to accept a broader range of plastic packaging (including small, plastic "clamshell" food containers) and a larger quantity of commercial recyclables, the facility needs equipment upgrades.

Waste to Energy Facilities - In the broad definition of how Boulder can become a zero waste community, it would be inappropriate to ignore the possible role of facilities that could process low-grade waste into heating or vehicle fuels. In keeping with the adopted hierarchy of 1-reduce 2- reuse and 3- recycle, it would be appropriate for Boulder to fully exploit the possibility for materials to either be reused, recycled or composted before investing in waste-to-energy. However, for the last remaining waste materials that are unable to be reliably marketed for reuse or recycling, this may be a viable investment option in the future. Notwithstanding this investment priority, Boulder customers may still benefit if the private sector invests in waste-to-energy facilities (e.g., A-1 Organics food waste digester) that allow additional materials to be diverted from the landfill.

Zero Waste Strategic Plan
2015 – 2016 ACTION PLAN
October 2015

What is this Action Plan?
The 2015-2016 Zero Waste Strategic Plan (ZWSP) is designed to set an overarching framework for achieving the zero waste goals set within it and provide guiding investment principles and evaluation criteria to assist with the prioritization of year-to-year opportunities for investing Trash Tax revenue in new and/or expanded programs, incentives and facilities for the Boulder community. This Action Plan is designed to accompany the ZWSP and outlines the strategies the city will pursue in the coming three years based on current waste reduction needs and funding available. The Action Plan, along with community progress towards the ZWSP goals, will be updated annually.

The City of Boulder Action Plan is intended to be viewed in tandem with other community zero waste partners' action plans. Taken together, they paint a more complete picture of the Boulder community's zero waste facilities, services and regulations, as these are all needed to move toward the zero waste Boulder that is encapsulated by the Strategic Plan. A "Zero Waste Boulder" requires the seven basic zero waste facilities described in the plan with universal access – plus high levels of participation in services driven by programs, incentives and regulations – to bring materials to these facilities and minimize the amount of waste heading toward our neighboring counties' landfills.

Focus of 2015-2016 Action Plan
The most recent diversion data for each sector is presented below. Despite the progress made since the original 2006 Master Plan for Waste Reduction, community-wide waste diversion has only risen modestly to 33 percent in 2013. Gains have been made in the residential sector's diversion rates; however, the percentage of Boulder's waste stream generated by the commercial sector has increased significantly while the corresponding diversion rate has remained stagnant. This has contributed to keeping Boulder's community-wide diversion rate relatively low. Due to this, as well as the significant barriers faced by the commercial sector, the 2015 Action Plan primarily targets this sector along with the multifamily residential sector; and work with community partners to ensure cost-effective, universal access to facilities that can serve the Boulder community for years to come.

Diversion Rates		
	2004	**2014**
Single-Family Residential	48%	58%
Multi-Family Residential	14%	20%
Commercial and Industrial	25%	28%
Community Wide	**30%**	**34%**

2015-2016 Work Plan Items

- Expand multifamily housing assistance program based on findings of 2014 targeted pilot project which increased diversion at five complexes by between 4% and 16%.
    - Create a strategy for a cost-effective and efficient approach to providing zero waste education and assistance to the broader multi-family community.
    - Gather data and research the existing multi-family complexes to inform and prioritize outreach efforts.
    - Develop tiers of service to address common barriers (will be tailored to needs):
        - First tier will include a toolkit with resources, educational videos, handouts and signs for waste enclosures
        - Second tier will include toolkit alone with additional assistance, including adjustments to collection service levels, door-to-door outreach, and training for residents
        - Final tier will also include waste audits, recycling and compost containers for units, and on-going feedback to residents
    - ***Sustainability Framework categories: Livable Community, Environmentally Sustainable Community***

- Finalize Universal Zero Waste Ordinance
    - Develop City Manager's Rule
    - Develop ordinance implementation plan
    - Develop compliance and enforcement plan, including tracking system
    - Research online self-reporting form option for compliance
    - Research ways to encourage and incentivize edible food waste donations
    - ***Sustainability Framework categories: Livable Community, Environmentally Sustainable Community, Economically Vital Community***

- Expand business assistance and advising program with multiple tiers of service:
    - Toolkit for do-it-yourself businesses to include employee training videos, free signage, list of resources; examples of good collection setups ("Tier 1" outreach)
    - "Tier 2" advising and technical assistance to inform business about the Universal Zero Waste Ordinance, help them establish internal collection systems and signage; incentives available for standardized, bulk-purchased collection bins
    - "Tier 3" zero waste advising delivered by PACE advisors focused on:
        - Food-generating businesses that need to establish compost collection service
        - Commercial leased spaces where landlord-tenant issues could introduce compliance issues
        - Businesses that choose to go beyond basic service provision and work toward achieving 70-85% waste diversion
    - ***Sustainability Framework categories: Livable Community, Environmentally Sustainable Community, Economically Vital Community***

- Update waste contracts to reflect partner roles outlined in ZWSP.
    - ***Sustainability Framework categories: Environmentally Sustainable Community, Good Governance***

- Negotiate with Western Disposal and A-1 Organics for equitable, cost-effective and convenient composting options for all area organics haulers.
    - ***Sustainability Framework categories: Environmentally Sustainable Community, Good Governance***

Evaluation of 2015-2016 Strategies

Strategy	Diversion Potential* (tons/year)	Avoided Greenhouse Gas Emissions** (mtCO2e/yr)	Community Engagement	Upstream Conservation	Ease of Implementation	Cost-Effectiveness
Expanded Multifamily Housing Assistance (2,000 units)	340 tons	104 mt	2	1	3	$128/ton diversion $22/MF unit
Universal Zero Waste Ordinance (effective June 2016)	14,100 – 29,000 tons	4,228 – 12,056 mt	3	2	2	Implementation: $13 - $6/ton diversion On-going: $1 - $0.54/ton diversion
2015 Business Advising Program (200 Businesses)	828 tons	249 mt	2	2	3	$92/ton diversion $380/business
2016 Business Advising Program -Tier 3 full advising (200 businesses)	828 tons	249 mt	2	2	3	$92/ton diversion $380/business
2016 Business Advising Program -Tier 2 limited advising (220 Businesses)	396 tons	118 mt	2	2	3	$140/ton diversion $251/business

**Diversion potential for each strategy is based on assumptions around the amount of waste a business or multifamily housing unit produces and the average diversion improvement that can be expected based on prior experience or pilot studies. This calculation will get more accurate in future years with the implementation of the new RE-TRAC waste data collection system and Universal Zero Waste Ordinance tracking system currently being designed.*

***Avoided greenhouse gas emissions are calculated using the same waste reduction carbon factor used in Boulder's community greenhouse gas inventory, which does not include consumption-based climate impacts. This calculation will get more accurate in future years with the implementation of the new RE-TRAC waste data collection system.*

Additional Future Initiatives for the Next Two to Three Years

- Continue improving business assistance and advising program in response to needs and barriers that arise.

- Assess the rate of early compliance with any commercial regulations adopted and adjust business technical assistance to bring as many businesses on board prior to compliance deadlines.

- Expand the reach of the multifamily residential assistance program.

- Expand community-wide educational efforts on available services, incentives, and facilities as well as proper recycling/composting/source reduction methods.

- Collaborate with Boulder County and other partners on developing a regional construction and demolition recycling facility.

- Perform a programming exercise to further Investigate/Analyze future uses of 6400 Arapahoe site.
    - As part of this, consider a community conversation to re-name the site
    - Analyze the potential to locate ArtParts creative reuse center on site along with expansion needs for Eco-Cycle and ReSource