

**Five Year Update to the  
Master Plan for Waste Reduction**

## MEMORANDUM

**TO:** Mayor Osborne and Members of City Council

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**DATE:** February 8, 2011

**SUBJECT: Study Session:** Five-year Update to the Master Plan for Waste Reduction

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### **PURPOSE:**

The purpose of study session is to update City Council on the status of community waste reduction efforts and to get council feedback on policy issues in order to define the framework within which the Master Plan for Waste Reduction (the Plan) can be updated. A lot has changed since the original Plan was accepted in 2006; and in 2011, it is time for the five-year update to realign the Plan with current conditions, identify state-of-the-art practices, and clarify Boulder's path to zero waste.

Council feedback is needed on the goals and priorities that will be contained in the updated Plan; council's interest in pursuing new regulatory approaches to move toward zero waste; and the process for updating the Plan. The Plan update process includes two main phases:

#### **Phase I. Identify Priorities, Goals and Metrics**

<i>Sep 2010</i>	Scoping and research
<i>Oct – Dec 2010</i>	Public and task force feedback
<i>Dec 2010 – Feb 2011</i>	Environmental Advisory Board (EAB) and task force recommendations
<i>Feb 8, 2011</i>	City Council study session

#### **Phase II. Update Plan**

<i>Jan - Jun 2011</i>	Work with Eco-Cycle to develop web-based decision support system
<i>Jan – Jun 2011</i>	Refine analyses with EAB, task force and public
<i>2nd Quarter 2011</i>	Develop Draft Plan
<i>3rd Quarter 2011</i>	Council consideration of Draft Plan

City Council's policy guidance will enable staff to bring a Plan framework to the community and, over the coming months, complete the update. Similar to the 2006 Master Plan for Waste Reduction, the updated Plan will follow the city's standard master plan format with three

investment levels: fiscally constrained, action and vision; as well as targets corresponding to recommended priorities and goals. The Plan contains three levels of recommended facilities, services, education and regulation.

The draft Plan update will be brought to council in advance of council's consideration of annexation for 6400 Arapahoe Road, and will provide clarity around diversion estimates and costs for various zero waste programs. This will help council determine whether or not to commit additional public funds for Phase II development at 6400 Arapahoe, which reflects the Center for ReSource Conservation (CRC) and Eco-Cycle's vision for that site. (See **Attachment A** for site review and annexation process and schedule.) This study session will inform the high level framework, to which details will be added in writing the Plan update.

### **Questions for City Council:**

1. Should waste diversion (percent of material diverted from landfills) continue to be the primary goal against which zero waste progress is measured?
  - a. Does council have feedback on other potential priorities and related metrics that might be considered in the plan update process?
2. Does council want staff to investigate possible regulatory approaches to achieve zero waste goals where they have not or cannot be met with incentives or assistance?
  - a. If so, what factors should be taken into account when considering regulatory options?
  - b. Are there any regulatory approaches that should not be considered?
3. Does council concur with the staff recommendation to work with Eco-Cycle to develop a Web-based decision support system and consider how this tool might be used in the Plan update process [as it model the impacts of various zero waste investment strategies]?

### **I. BACKGROUND:**

#### **A. 2006 Master Plan for Waste Reduction**

The Master Plan for Waste Reduction presents the framework, guiding principles and investment philosophy for working toward zero waste in Boulder. In 2006, the current Plan (included as **Attachment B**) was accepted along with adoption of a Zero Waste resolution. Each of the Plan investment levels – fiscally constrained, action and vision – includes recommendations for facilities, services, education and regulations to approach zero waste.

The guiding principles of the current Plan include:

- Identify service voids;
- Create effective partnerships to expand services with minimal city investment;
- Support programs that are convenient;
- Utilize economic incentives; and
- Help build infrastructure and then require its use once it's convenient and economical.

The current Plan's investment strategy for the Trash Tax focuses on building infrastructure by providing convenient programs and services that further waste reduction 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. The Plan also recommends making recycling mandatory, once the infrastructure exists or alternatively, if convenient, voluntary programs prove to be unsuccessful.

In all instances, the general investment strategy is for the city to only provide programs that protect the environmental health and safety of the community, giving preference to cooperative ventures with for-profit and non-profit organizations above sole municipal control.

By following this approach Boulder residents and businesses have access to more facilities and services than were available in 2006. Facility and service costs were often borne by the private sector and regulations have increased diversion with limited cost impact to the city. The following table gives an overview of the programs that were anticipated when the current Plan was written. Highlighted are the fiscally constrained and action plan programs that have been implemented; the dates listed indicate the implementation year. In 2010, the focus turned to expanded technical assistance for businesses through development of an online resource kit and renewed outreach to businesses through the Partners for a Clean Environment program.

**2006 Master Plan for Waste Reduction Investment Program**

<b>Fiscally constrained Plan: 60% by Dec. 2007</b>
Residential compost collection: <b>2009</b>
Residential single stream recycling: <b>2009</b>
Commercial compost collection subsidy: <b>2006</b>
C & D (construction and demolition) debris recycling regulation: <b>2008</b>
Expanded business assistance programs: <b>2008, 2010</b>
Ban on electronic waste
City of Boulder Center for Hard-to-Recycle-Materials (CHaRM) expansion
<b>Action Plan: 70% by Dec. 2012</b>
Minimum recycling for multifamily units: <b>2009</b>
Public place recycling: <b>2008</b>
Fine for electronics disposal
C & D bond
More aggressive “pay-as-you-throw” (volume-based trash rates)
Increase or rebate business trash tax
Regulations establishing a commercial recycling goal
<b>Vision Plan: 85% by Dec. 2017</b>
Regulations requiring commercial recycling
Develop a mixed C & D recycling center
Establish local “take back” laws

**B. Significant shifts since the 2006 Plan acceptance**

Since 2006, many of the actions described in the Plan have been completed although not necessarily on the envisioned time line. Despite delays, once each program began, the total material diverted has been close to what was expected; however, the overall waste stream has increased from 2005 levels. In some cases, this results in a smaller percent diversion than was

outlined in the Plan. Some of the changes that have occurred since the current Plan was accepted include:

1. ***Single Stream Recycling.*** The Plan anticipated that the Boulder County Recycling Center would be modified to accept single-stream recyclables in January 2007. The conversion was completed in late 2008, nearly two years later than planned. The modifications paved the way for the city to require residential trash haulers to collect single stream recycling (all recyclables in one container rather than sorted into two containers) and composting from the curb; however, this started in the spring of 2009 rather than in Jan. 2007. This delay also caused a ripple effect for other city programs:
  - a. Single stream recycling for businesses and multifamily complexes became available in 2009 instead of 2007.
  - b. Annual spring clean-up and fall leaf drop-off programs were continued through the end of 2008; and planned investments in commercial programs and incentives using newly available spring clean up funds were delayed until 2009.
2. ***Recycle Row/6400 Arapahoe.*** The 2006 Plan identified a one-time investment of \$400,000 to develop “Recycle Row” as a consolidated area for recycling and reuse activities. Instead, in 2009 the city increased the trash tax to its maximum level to issue bonds to purchase property at 6400 Arapahoe Road to accomplish the intent of Recycle Row. The property cost was \$5,450,000; this results in an annual debt expense of \$400,000 to \$576,300 per year for each of the next 20 years. This property purchase is intended to serve as a more permanent home for Eco-Cycle’s offices, the City of Boulder/Eco-Cycle Center for Hard-to-Recycle Materials (CHaRM) and ReSource, the used building materials yard operated by CRC. The purchased property also includes two acres that are not yet programmed and could be sold or leased for other waste reduction facilities. This affects implementation of the Plan in two ways:
  - a. The level of investment means that the additional \$332,000 anticipated in the current action plan and the \$678,000<sup>1</sup> to implement the vision plan have been committed to other zero waste initiatives.
  - b. In order to make progress toward the community’s zero waste goals, existing trash tax expenditures should be evaluated for potential reallocation. After 2014, when part of the 6400 Arapahoe debt is retired, an additional \$176,300 will be available for additional zero waste initiatives.

There have been several other changes since the current Plan was written; these will be reflected in the update to the Plan. These include:

1. ***Climate Action Plan.*** The Climate Action Plan (CAP) was accepted in 2006 with an initial goal of reducing emissions to a level 7 percent below 1990 levels by 2012. Based on the protocol currently used for measuring greenhouse gas impacts, Boulder’s solid waste stream contributes approximately three percent to local emissions.

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<sup>1</sup> The 2006 Master Plan for Waste Reduction assumed trash maximum tax revenues of \$1,878,000. Current actual trash tax revenues are approximately \$100,000 less at \$1,776,300

2. **Compost Facility.** In 2002, Western Disposal opened a compost facility near its transfer station on 63<sup>rd</sup> St. The facility accepts: compostable materials (food and yard waste) collected from the curb by any residential hauler in Boulder; commercial and multifamily unit compostable materials collected by Western Disposal; and compostable materials dropped off at the city-sponsored yard waste drop-off center.
3. **Hazardous Materials Management.** A new expanded facility located behind the Boulder County Recycling Center on 63<sup>rd</sup> St. has replaced the outdoor facility previously located at Western Disposal's transfer station. Hazardous materials from residents and small businesses will be accepted at this facility beginning in February and early summer, respectively.
4. **Boulder County Zero Waste Plan.** Boulder County adopted its first zero waste plan in Dec. 2010 to support its goal of achieving zero waste by 2025. The city's plan update will build on the County's policy and programmatic guidance and will incorporate regional collaboration opportunities. A summary of the County's top recommendations is included as **Attachment C**.

### **C. 2011 Trash Tax Appropriations**

The city's trash tax, originally established in 1989, is used to fund the city's zero waste programs and services. In 1994, voters approved a trash tax increase. In 1992, 1995, 2001 and 2009, the city expanded the types of recyclable materials collected. In 2009, council approved increasing the trash tax to its voter-approved limit to pay for property acquisition and development of the 6400 Arapahoe site. The total estimated trash tax revenue for 2011 is \$1,776,300. Of this, \$1,200,000 makes up the operational budget; the rest (\$576,300) is dedicated to debt service. **Attachment D** summarizes 2011 appropriations. The updated Plan will present an investment strategy for addressing the city's priorities and goals. The current trash tax revenues will be reflected as the fiscally constrained plan; the action and vision plan levels will estimate funding needs and identify potential sources of additional funds.

### **D. What is Zero Waste?**

The city's Zero Waste Resolution presents the framework for policy and operational decisions that follow the guiding principles of zero waste:

*Managing resources instead of waste; conserving natural resources through waste prevention and recycling; turning discarded resources into jobs and new products instead of trash; promoting products and materials that are durable and recyclable; and discouraging products and materials that can only become trash after their use.*

Zero waste is consistent with the three Rs (reduce, reuse and recycle) where each area receives emphasis to create a whole system approach to resource use and management that is similar to how resources are reused in nature. Zero waste involves designing products for reuse, repair and recycling back into nature or the marketplace such that waste and consumption are minimized and recycling is maximized.

The city's role in creating a zero waste community has focused on the following:

- Supporting development of facilities for processing of reusable, recyclable and compostable materials
- Providing services and incentives for material collection
- Adopting regulations to:
  - require volume-based trash rates
  - support reuse of materials, and
  - remove barriers to recycling and compost service
- Educating the community to reduce waste, encourage reuse and to increase diversion

In addition, the city has worked with community partners to:

- Design, manufacture and distribute with sustainability in mind
- Provide collection services and/or processing facilities to handle discarded materials
- Educate customers
- Create green jobs

Some components of zero waste remain the purview of state and federal governments:

- State or national recycling goals
- State or national minimum recycled-content requirements
- State or national mandates or incentives for manufacturers to design for durability, reuse or recyclability
- State or national efforts to shift subsidies away from virgin material extraction and production or creating material-specific fees or tariffs

The city has collaborated with other communities, the Colorado Municipal League and zero waste advocacy organizations to support relevant Colorado legislation. Earlier this fall, the Colorado Association for Recycling (CAFR) Board of Directors approved certain recommendations from the policy committee regarding legislative initiatives to undertake in the 2011 session. Three items were approved:

1. An electronics waste bill similar to others passed in 24 other states, based on the model of producer responsibility.
2. A database collection bill that would allow the Colorado Department of Public Health & Environment to expand its current data collection from just waste, recycling and composting *facilities* to data collection on waste, recycling and composting from *communities* with populations of 25,000 or more.
3. An economic incentive bill that would allow for the designation of recycling market development zones which would encourage the growth and development of recycling businesses.

The city will monitor and likely lend support to these bills if they are introduced, as they are consistent with established city priorities: the bill relating to electronic waste could achieve the intent behind the electronics waste ban and fine suggested in the current Plan, and recycling market development legislation could present opportunities for 6400 Arapahoe Road.

## **II. ANALYSIS:**

The first section of this analysis summarizes the current state of waste diversion in Boulder. The details behind this summary are included in **Attachments E, F, and G**. Secondly; this section looks at existing facilities, service incentives, education and regulations. Each of these efforts contributes to the community's zero waste goals.

### **Current zero waste activities**

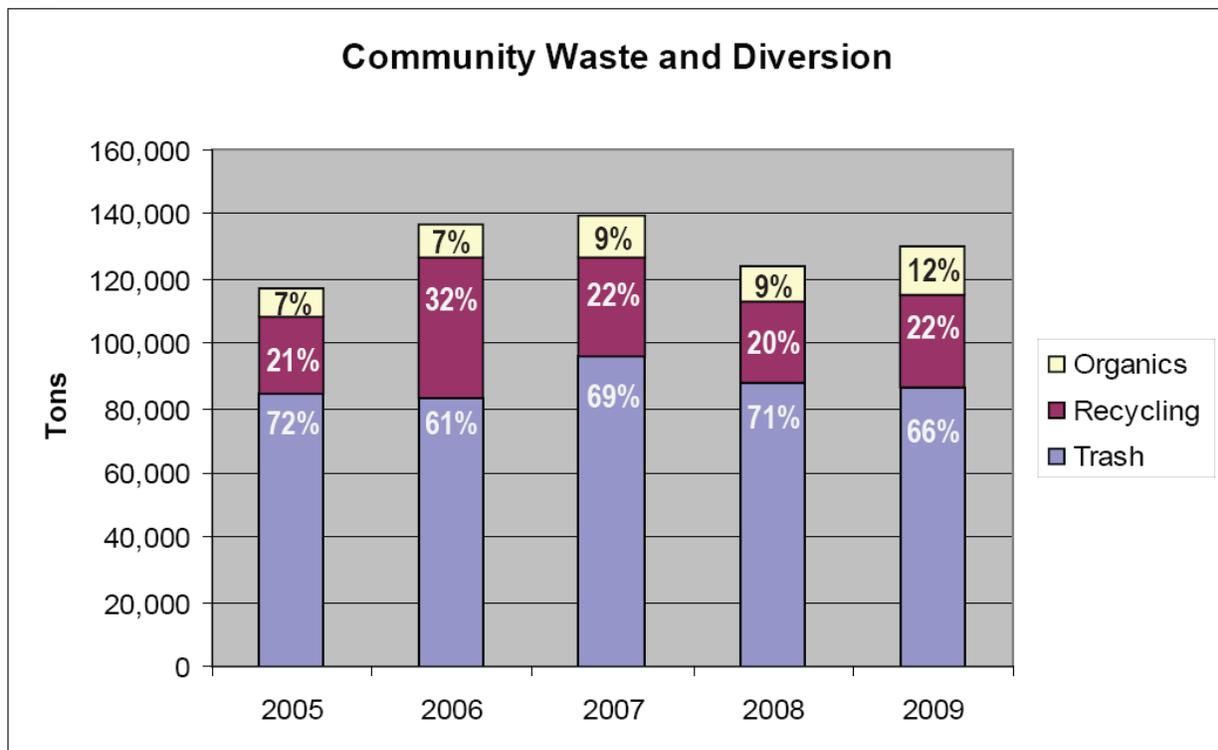
#### **A. Boulder's current waste diversion**

Boulder's current diversion rate is 34 percent overall. By sector, diversion rates are 46 percent for single family residential; 25 percent for commercial; and 17 percent for multi family residential.

The city currently measures progress toward its zero waste goal by taking the percent of the weight of total materials recycled and composted and dividing this by the weight of the total discarded materials (those recycled + composted + those wasted and landfilled):

$$\text{Percent diversion} = \frac{\text{Recycled materials} + \text{composted materials} + \text{reused materials}}{\text{Total materials discarded}}$$

While this is a common practice, it may be problematic when attempting to create a zero waste community. The following chart, which shows the generation and diversion trends since 2005, illustrates issues that could arise when [percent] diversion is the only metric used to measure progress toward zero waste.



Since the 2006 Plan was accepted, total discards and waste generation has been on a generally upward trend, with a few outlying years. However, calculated as it is, the percent diversion does

not appear to have increased significantly. A close analysis of the statistics that fed into this chart shows the following:

- Composting has been steadily increasing in every sector;
- The residential curbside compost service collects 84 percent more material than the average of what was collected in the Spring Clean-up and fall leaf drop off programs of prior years;
- Single-family residential recycling tonnages have decreased by about 15 percent, primarily because it is *lighter*: there is more plastic in the recycling now and less glass than in 2005;
- Commercial recycling has been on a generally upward trend;
- In 2006, there was significantly more construction material recycled than in prior or subsequent years due, in part, to construction projects at the University of Colorado; and
- The economic downturn in 2008 resulted in fewer materials in all waste and recycling categories.

As another example, the residential curbside compost collection program began in spring 2009. At the time of the current Plan acceptance (2006), the projected diversion from this program was 14 percent of the residential waste stream; this translated to 7 percent of the overall waste stream. Today, although the program does prevent 14 percent of the residential waste stream from going to the landfill, this represents only approximately two percent of the overall waste stream.

As this analysis shows, if diversion is always reported as a ratio of materials recycled to materials generated, it is difficult to see absolute increases or decreases in the materials being generated or collected, or to have a full understanding of progress being made toward the community's zero waste goal.

## **B. Goals and priorities for the updated Plan**

To inform decisions about goals and priorities for the updated Plan, staff researched several peer cities and states including: Austin; Portland, Oregon; Seattle; San Francisco; San Diego; Berkeley; Santa Cruz; Gainesville, Florida; Boston and the state of North Carolina. Most communities cite diversion from landfill as their top priority and they measure progress toward their goal as a ratio of diverted material (reused + recycled + composted materials) to total discarded materials (reused + recycled + composted + trash). Portland, Oregon has established two additional goals: zero growth in the overall waste stream; and reduction of toxic waste, such as electronics and chemicals, in the landfill.

To further identify appropriate goals for the Plan update, staff met with the Environmental Advisory Board (EAB) and a task force of waste reduction experts (**Attachment H**) to provide feedback. Their top recommendations on the goals and priorities for the updated Plan are:

1. Increase community wide diversion from the landfill
2. Encourage source reduction as a way to reduce the quantity of all discarded materials
3. Reduce toxic materials in the waste stream

Further, the groups suggested the following strategies be incorporated into zero waste planning:

1. Incorporate "triple bottom line" (social, environmental and economic) analyses in decision-making

2. Work to increase participation in existing services, especially by businesses and multifamily complexes
3. Ensure adequate facility capacity exists to accommodate maximum service use, especially C & D.

### C. Existing Waste Reduction Facilities

#### i. Diversion and costs

A variety of local facilities accept and process recyclable materials generated in Boulder. Some of the facilities' operations are funded in part or in whole by the city. The table below provides a summary. A complete listing and relevant facility information is included as **Attachment I**.

Local Waste Reduction Facility	City of Boulder tons processed	2009 diversion percent	Cost to the city	City cost per ton
Boulder County Recycling Center	24,552	19%	\$0	\$0
Hazardous Materials Management Facility	37	0.03%	Trash Tax: \$1,800 plus Utility Fund: \$215,000*	\$5,860
Yard Waste Drop-off Center	5,838	4.5%	\$105,000	\$18
Wood Waste Drop-off Center	1,893	1.5%	\$50,000	\$24
City of Boulder/ Eco-Cycle CHaRM**	646	0.5%	Operating costs: \$100,000 Facility costs ~\$288,000**	\$600
Western Disposal Composting Facility	7,200	5.5%	\$0	\$0
ReSource**	587	0.5%	~\$288,000**	\$490
Western Disposal Transfer Station	786	0.6%	\$0	\$0
Other Construction & Demolition (C & D) diversion	1,873	1.4%	\$0	\$0

\* Utility funded facility costs = \$20,000 annually plus operational costs for 2009 = \$195,000

\*\* The 2011 facility cost for 6400 Arapahoe is \$576,000. This table splits this facility investment equally between CHaRM and ReSource (at \$288,000 each)

Many of these facilities have additional processing capacity to support the city's progress toward zero waste. Outstanding facility needs include a C & D waste processing facility and a compost facility that could serve Boulder. Boulder County is leading an investigation of options for a C&D processing facility. The city intends to collaborate with the County in terms of planning for a C&D facility; but does not intend to contribute capital.

Currently, the only compost site near Boulder is located on 63<sup>rd</sup> Street and is operated by Western Disposal and capacity exists to accept more materials. One other Front Range compost site is located at Stapleton in Denver. Western Disposal's compost site accepts compostable materials from residents, the University of Colorado and Western's own commercial customers, but does not currently accept commercially-generated compostable materials from other haulers. The city has been discussing options with Western to allow other haulers to use its facility to address local compost needs. Other ideas are being discussed with Boulder County.

## *ii. Goals and priorities served*

In reviewing the information in the preceding table, it might appear that “cost per ton” is the most obvious and important factor to consider in defining potential investment priorities aimed at increasing waste diversion rates. However, while cost per ton is an important consideration, it does not reflect the full range of potential city priorities. For example, the hazardous materials management facility accepts the most toxic components of the waste stream that would otherwise be dumped illegally, causing environmental impact; or could be managed by a hazardous waste contractor, which would be prohibitively expensive. Likewise, 6400 Arapahoe Road (CHaRM and ReSource) represents a large city investment for a relatively small amount of material. However some of the materials collected are toxic and others are re-usable; so there are many life cycle cost savings that are not reflected in a simple *city cost per ton* calculation. In addition, if these facilities serve a significant number of Boulder residents and businesses, they are serving to “change the norms” around the community attitudes toward waste. This is an intangible benefit that may be difficult to quantify, but is an important building block for a zero waste community.

## *iii. Metrics to measure success*

The city may want to consider several metrics to measure the success of existing waste reduction facilities and as a tool to evaluate trade-offs between alternative investment options. Some examples are:

1. Tons diverted
2. Total cost and cost per ton diverted
3. Participation rates
4. Volume of toxic waste managed properly
5. Greenhouse gas emissions reduced by avoiding disposal of the collected materials
6. Greenhouse gas emissions reduced by avoiding vehicle trips to a processing facility located further away from the point of generation
7. Jobs created and economic expansion

## **D. Current service incentives**

### *i. Diversion and costs*

The city currently offers several incentives, primarily to businesses, to encourage participation in services that increase landfill diversion:

- **Business recycling coupon** – A coupon for businesses to receive three months of free recycling service if the business does not yet have recycling collection. This coupon has served 64 businesses since 2002. It has been most popular with small businesses and small recycling haulers. Recently, use of the recycling coupon has tapered off because businesses are more willing to pay for recycling service.
- **Business compost collection subsidy** – An ongoing cost buy-down where the city pays \$2.50 for each cubic yard of compostable material collected from a Boulder business in a month. City costs in 2009 were \$47,785 and 3,522 tons of organics were diverted.
- **Free technical assistance and waste audits for businesses** – The Partners for a Clean Environment (PACE) program helps businesses reduce and divert their waste by helping assess current waste management practices and by providing technical assistance for recycling, composting, green purchasing and hazardous materials management. This service expanded significantly in the fourth quarter of 2010 to proactively seek additional

businesses and to include business waste audit services. In the fourth quarter alone, 650 businesses were notified of the free service; of those notified, 120 requested a site visit and 30 businesses received waste audits. In 2011, this part of the PACE program cost the city \$22,239 (contract with Boulder County Public Health).

- **University of Colorado (CU) student move-in recycling collection** – The city pays for extra corrugated cardboard collection from the high-density off-campus student neighborhoods during August move-in weeks. For 2009, extra cardboard collection costs were \$9,542 and more than 17 tons of additional material was diverted.

Since the commercial sector generates approximately twice the amount of materials as the residential sector, it is critical to work with businesses to address diversion, toxicity and source reduction. While barriers for business diversion can be complex, the recently implemented commercial education program, technical assistance and waste audits are reported to be very helpful to businesses that do not have supplementary resources to focus on zero waste. Since 2009, funds have been available for increased commercial waste reduction activities, and new programs have been tested to serve Boulder's business community.

#### *ii. Goals and priorities served*

Most city-funded service incentives have historically focused on increasing tons recycled and composted. However, other priorities have, at times, also been pursued. For example, the CU student move-in recycling collection was established to address trash accumulation issues; the new business educational resources include purchasing policies written to promote source reduction; and the new technical assistance and waste audits allow for an increased focus on businesses' product and packaging design for durability and recyclability.

#### *iii. Metrics to measure success*

In addition to the diversion, the success of service incentives can be measured by:

1. Participation levels in the programs
2. Increases in the number of businesses subscribing to collection services
3. Decrease in contamination levels at the Boulder County Recycling Center
4. Decrease in illegal dumping or trash accumulation violations
5. Increase in business purchases of recycled content office supplies
6. Increased reuse activities among business customers in the city

### **E. Existing City of Boulder Zero Waste Regulations**

#### *i. Diversion and costs*

The city has successfully used regulations to influence community diversion and to require materials reporting to track results. Generally, regulations cost the city far less than facilities or service incentives. The direct costs to the city are limited to staff and consulting costs to develop the regulations and, once enacted, the costs to administer and enforce the regulations. Below is a summary of existing City of Boulder regulations and the approximate diversion attributable to each:

1. Requirements on the haulers:
  - **Single Family Residential:** Residential trash haulers are required to provide single stream recycling and composting collection with basic trash service and use the volume-based pricing system designed to increase waste diversion. This means that recycling and

compost collection costs are embedded in basic trash service costs. Approximate diversion increases have been as follows:

- In 2001, after volume-based pricing went into effect, over 30 percent of Boulder's single-family residents decreased their trash collection service levels (the city did not collect tonnage reports prior to this)
- After single stream recycling went into effect, single family residential recycling rates increased by 11 percent
- After the composting collection began community organics diversion increased by approximately 30 percent
- **Multifamily Residential** [housing units with shared trash and recycling service in a common area]: Trash haulers providing trash collection to multifamily customers must also provide recycling collection at no additional charge. For multifamily customers with centralized trash collection areas, haulers are required, at a minimum, to provide recycling containers with a volume equal to one half of the volume of the trash collection service.
  - In 2009, when this regulation was enacted, multifamily recycling increased by 58 percent.
  - There are no requirements for compost collection in multi family developments.
- **All trash and recycling haulers** are required to report to the city their annual quantities of trash, recycling and compostable materials collected in the city. In addition, all residential trash haulers are required to bring recyclable materials to the Boulder County Recycling Center, unless requested by the resident to do otherwise.
  - There is no diversion specifically attributable to this requirement
  - This costs the city a minimal amount of staff time to compile the hauler reports and track diversion each year
- **Trash Tax** – All trash haulers providing service in Boulder must report annual amounts of trash collected.
  - There is no diversion that results from the requirement that haulers pay trash tax to the city
  - This costs the city approximately 25 hours each year in staff time performing audits of the haulers' trash tax submissions

2. Requirements on businesses and residents:

- **Businesses** – No requirements currently exist for recycling or compost collection on businesses. Costs for recycling and compost collection are separate from and in addition to trash service costs.
- **Construction and Demolition (C & D) Materials** – As part of the Green Points Green Building requirements, the city requires that new residential construction projects recycle at least 50 percent of the construction waste generated. Full residential demolition projects are required to divert at least 65 percent of materials generated. The tonnage recycled as a result of this ordinance is included in the recycling tonnages reported from the commercial haulers. Staff is undertaking analysis of the Green Points applications to estimate recycling specifically attributable to this requirement (it is self-reported).

### ***ii. Goals and priorities served***

Most of the requirements are intended to support the diversion goal by requiring service, use of local facilities or reporting to enable diversion tracking. Volume-based rates also serve the goal of source reduction by encouraging households to choose a less expensive trash service by recycling more and/or generating less. The toxicity goal is not currently addressed in any city requirements.

### ***iii. Metrics to measure success***

The success of regulations could be measured in many different ways depending on the nature of the regulations. Some metrics may be:

1. Tons diverted before and after regulation
2. Participation in services or number of customers using facilities before and after regulations
3. Total cost and cost per ton diverted
4. Greenhouse gas emissions reduced by avoiding disposal of the collected materials
5. Jobs created and economic expansion

## **E. Community Education**

The city supports zero waste education by funding the following:

- Recycle Boulder hotline administered by the Center for ReSource Conservation
- University of Colorado (CU) Green Teams for student-to-student outreach and education
- Student education in Boulder Valley School District schools coordinated through Eco-Cycle
- Other Eco-Cycle education, funded in part by the city, including a contribution toward the production of the Eco-Cycle Times, the Eco-Cycle Holiday Guide and other periodic and seasonal outreach.

### ***i. Diversion and costs***

In 2011, the city will spend approximately \$75,000 on these education programs. Diversion estimates are not made for these activities although they influence participation primarily in recycling and compost collection programs and services that are reported to the city by the haulers. Beginning in 2011, the city will begin to track the results of these education programs more closely through awareness surveys; surveys of participants in associated programs that ask how they heard about the program; and tracking of call and walk-in traffic at the Center for ReSource Conservation.

### ***ii. Goals and priorities served***

Education has the potential to serve all zero waste priorities – diversion, source reduction and toxicity - especially ongoing, broad-based education that could change community norms about waste. Student education programs have been particularly successful by shifting school operations toward zero waste and creating awareness for the students' families.

### ***iii. Metrics to measure success***

In addition to ancillary diversion and participation calculations, other metrics include:

1. Web site hits
2. Coupons redeemed for services
3. Calls to the Recycle Boulder hotline

## **Looking Toward the Future**

This section identifies barriers or gaps in service and provides illustrative examples of ways the city may choose to address those gaps. These examples are not comprehensive lists, but they are meant to convey some real examples of how council feedback on goals and priorities might translate into programs and actions in the updated Plan.

The current Plan's guiding principles include direction to "move progressively in the medium- and long-term to make recycling mandatory, once the [facility and service] infrastructure exists or alternatively, if convenient, voluntary programs prove not to be successful." Council members are asked to consider whether, as part of the update to the Plan, staff should investigate options for regulatory approaches to address some of these barriers or gaps in service.

### **A. Single Family Residential**

#### ***i. Barriers and gaps***

According to trash and recycling hauler reports, single family household waste diversion was 46 percent in 2009. According to Western Disposal, nearly 100 percent of single family homes participate in the curbside recycling program and put composting out for collection at least once per month. However, using data from hauler reports, the average single family household puts 13 lbs. of compostables out on each collection day. This is about half of what had been estimated as the potential for compostable materials prior to the start of the curbside collection program. And, although nearly all of the households participate in the curbside recycling program, surveys have indicated that residents are confused about what is recyclable and as a result, there is still some amount of recyclables ending up in the trash.

Further, the Boulder County waste diversion study showed that the trash contains corrugated cardboard, compostable tissues and paper towels and a small amount of household hazardous wastes such as pharmaceuticals and household cleaners. This would indicate that more education is needed about what can be recycled and composted. With respect to the household hazardous waste, although it is small in quantity, it presents a toxicity issue when it ends up in landfills.

Some barriers and gaps to address with single family residents include awareness of

- Community zero waste goals
- Recycling and compost guidelines
- Facilities that accept hard-to-recycle and toxic materials
- Reduce and reuse opportunities

#### ***ii. Some possible ways to address these gaps...and the goals they serve***

1. Increase the types of materials that are allowed to be collected in the curbside compost cart
  - a. This can increase diversion and may increase participation as well.
2. Educate residents about the types of materials that are recyclable and compostable:
  - a. This can increase diversion and may increase participation as well.
  - b. Often, increasing awareness about recyclable packaging also increases "pre-cycling," where a consumer makes purchasing choices that minimize packaging waste.
3. Educate consumers about alternatives to household hazardous wastes as well as proper disposal practices

- a. This will decrease the toxicity of the waste stream.
4. Educate residents about their role in achieving the zero waste goal
  - a. This will support diversion, toxicity and source reduction goals.
5. Adjust the rate structure so larger trash carts cost more
  - a. Diversion and source reduction can be increased.

## **B. Multifamily Residential**

### ***i. Barriers and gaps***

According to trash and recycling hauler reports, multifamily unit waste diversion was 17 percent in 2009. Other leading cities report similarly low diversion and challenges for this sector. Some barriers to higher diversion at multifamily housing are high resident turnover and limited education – issues with improper recyclable and compostable materials sorting (contamination) are more common in comparison to single family homes. The fact that property owners or managers are not onsite in most cases is another barrier.

### ***ii. Some possible ways to address these gaps...and the goals they serve***

1. Educate tenants and landlords/property managers on recycling and compost guidelines:
  - a. This will serve diversion and source reduction goals.
2. Offer incentives to the haulers, tenants or landlords:
  - a. Participation will increase.
  - b. Diversion and source reduction goals could be addressed.
3. Provide in-unit bins for tenants:
  - a. This can increase participation and serve diversion goal.
4. Confirm complexes are in compliance with the recycling requirement:
  - a. Addresses the diversion goal.
  - b. Also addresses “changing the norms” if participation increases.

## **C. Business**

### ***i. Barriers and gaps***

Recycling and compost collection services are available to businesses if requested. According to trash and recycling hauler reports, business waste diversion was 25 percent in 2009.

Furthermore, over 60 percent of commercial trash customers have some level of recycling service but fewer than five percent have compost collection service.

Some barriers to implementing recycling or compost service include:

- Businesses must initiate additional services, unlike the residential sector where services are included with trash collection service;
- There are increased expenses unless a business is able to reduce its level of trash service;
- Landlord/tenant split incentive (e.g., owner or property management company pays trash bills, and may be unwilling to subscribe to additional services);
- Shared service containers often suffer from “the tragedy of the commons” and contamination is an issue;
- Insufficient space for additional carts or dumpsters.

*ii. Some possible ways to address these gaps...and the goals they serve*

1. Regulations can be enacted to require haulers allow shared service in certain business districts:
  - a. This can increase participation and diversion.
2. Service incentives can be implemented to help smaller businesses pay for additional collection services:
  - a. This can increase participation and diversion.
  - b. This can help create jobs by allowing small hauling companies to flourish.
3. Educational resources can be provided to ensure employees and custodial staff understand recycling and compost guidelines:
  - a. This serves the diversion goal.
  - b. This serves any goals associated with “changing the norms.”
4. Regulations can be enacted to overcome the split incentive:
  - a. This serves the diversion goal.
  - b. This increases participation.
  - c. This results in a relatively low cost to the city.
5. The city could establish a “rates and dates” ordinance whereby a waste diversion goal is set to be achieved through voluntary efforts by a date certain. If that date arrives and the diversion goal is not met, then regulations start.<sup>2</sup>
  - a. This serves the goal of diversion.
  - b. Increases participation.
6. Technical assistance can be expanded to help a business establish recycling services and maximize the effectiveness of recycling and composting services that are already in place
  - a. This serves the goals of diversion, source reduction and toxicity reduction.
  - b. Increases participation and helps “change the norms.”

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<sup>2</sup> Most of the peer cities researched have adopted some form of commercial recycling regulation.

**Developing a Comprehensive Strategy in the Updated Plan**

The table below illustrates how various components of a comprehensive zero-waste strategy can address multiple goals and priorities. This type of framework—similar to that which was used in the update of the Climate Action Plan in 2009—may be used within the updated Plan to inform tradeoffs between alternative investments as well as to ensure that the various components of the city’s waste reduction efforts are working together to address key goals and priorities.

	<b>Goals and Priorities</b>		
<b>Addressing Priorities</b>	<b>Diversion</b>	<b>Toxicity</b>	<b>Source Reduction</b>
Education for HMM and CHaRM		√	
Reduce and reuse education	√	√	√
Business, multifamily or hauler incentives	√		√
Technical assistance	√	√	√
Business or multifamily requirements	√		√
Mixed C & D recycling facility	√		
Policies and bans	√	√	√

In preparing for the planning effort, a critical piece of information is to confirm what the city’s zero waste goals are, and whether staff should investigate options for regulations as part of the Plan update process. These are the areas of focus identified in the first two “Questions for City Council” listed on page 4 of this memo.

**Eco-Cycle’s decision support system**

The third question for Council (on page 4) refers specifically to an opportunity the city has to work with Eco-Cycle and a private software developer to create and pilot a ground-breaking Web-based “decision support system” that could help model the triple-bottom-line impacts of various city zero waste (regulatory, service, facility and educational) decisions. Eco-Cycle’s description of the system is included as **Attachment J**. The city is currently working with Eco-Cycle to provide input regarding key components that would be helpful to have included in the design of the tool. Once more information is available, the tool will be evaluated as to whether it should be used to help craft the Plan update. Any input that Council has relating to the use of this tool would be helpful.

**NEXT STEPS:**

As noted earlier, the update process includes two phases of public input occurring before and after the February City Council study session. Public input was gathered at five Boulder Matters

events in fall 2010 and through a survey on the city's web site. Starting in Dec. 2010, a task force of local zero waste experts and the EAB were consulted for input. Subsequent to receiving council policy guidance, staff will return to the task force, EAB, affected parties and the general public to craft specific Plan elements that can pave the way to zero waste, including:

1. Guiding principles
2. Zero waste goals
3. Recommended investment packages for fiscally constrained, action and vision plan elements, including costs and diversion associated with:
  - a. Facilities,
  - b. Service incentives,
  - c. Regulatory approaches, and
  - d. Educational programs

Staff will return to council in the third quarter of 2011 to review a draft updated Plan.

**ATTACHMENTS:**

- A. 6400 Arapahoe Road Process and Schedule
- B. 2006 Master Plan for Waste Reduction
- C. Summary of Boulder County Zero Waste Action Plan recommendations
- D. 2011 trash tax appropriations
- E. Community diversion trend chart
- F. Sector diversion trend chart
- G. Summary of community diversion
- H. Task Force members list
- I. Community waste reduction facilities
- J. Eco-Cycle's Decision Support System

# 6400 Arapahoe Road - Process and Schedule

## SITE ANALYSIS, PROJECT VISIONING, PROGRAMMING PHASE FEBRUARY 18 - EARLY MAY 2010

TASK	WHO	WHEN	OUTCOMES
Project Kick-Off Goals, Schedule, Preliminary Program	Consultant Team Staff Team ReSource & Eco-cycle	February 18, 2010 12:30-2:00 pm	Project Roles Project Process, Schedule
Site Visit and Program and Operational Review	Consultant Team Staff Team ReSource & Eco-cycle	Week of February 22	Site Analysis Needs Assessment As-builts
Program and Site Analysis Review	Consultant Team Staff Team ReSource & Eco-cycle	March 4, 2010 12:30-2:00 pm	Non-Profits Program - Phase 1 and Future
City Visioning Worksession	Consultant Team Staff Team Other identified staff	March 11, 2010 12:30-2:00 pm	City Vision Opportunities and Constraints
Stakeholder Brainstorming Meeting	Consultant Team Staff Team ReSource & Eco-cycle BVSD, CDOT, Thorne, EAB, CAB, County Staff, Industry Leaders and Advocats	March 18, 2010 12:30-2:00 pm	Vision Statement Project Goals Opportunities/Constraints
Neighborhood Meeting Preparation	Consultant Team Staff Team ReSource & Eco-cycle	April 1, 2010 12:30-2:00 pm	Confirm Vision, Goals, Opportunities and Constraints
Neigh. Meeting #1 Vision, Goals, Opportuni- ties and Constraints	Consultant Team Staff Team ReSource & Eco-cycle	April 5, 2010 6:30-8:00 pm	Community input on vi- sion, goals, opportunities and constraints
Concept Development	Consultant Team	Mid March - Mid April	Conceptual Alternatives Pros/Cons Analysis Phasing Strategies
Review Concepts	Consultant Team Staff Team ReSource & Eco-cycle	April 15, 2010 12:30-2:00 pm	Input on Development Concepts and Phasing



# 6400 Arapahoe Road - Process and Schedule

## CONCEPT PLAN PHASE SEPTEMBER - NOVEMBER 2010

TASK	WHO	WHEN	OUTCOMES
Staff and Consultant Team Worksession - Preferred Concept Alternative	Consultant Team Staff Team ReSource & Eco-cycle	April 29, 2010 12:30-2:00 pm	Select preferred alternative - Phase 1 and Future
City Council Study Session - Concept Update	Consultant Team Staff Team ReSource & Eco-cycle	June 3, 2010	Input on project
Neigh. Meeting #2 Development Concepts	Consultant Team Staff Team ReSource & Eco-cycle	June 2010	Community input on concepts
Preliminary Concept Plan Submittal Materials	Consultant Team	Between July 1 and August 2	Concept Plan materials to submit to P& DS
Staff Review of Concept Plan Materials and Memo Preparation (6 weeks)	Planning and Development Services Staff	August/September	Review comments to team and memo to Planning Board
Planning Board Public Hearing on Concept Plan	Consultant Team Staff Team ReSource & Eco-cycle	November 4, 2010	Planning Board comments on Concept Plan

### LEGEND

	MEETING
	CONSULTANT WORK
	PUBLIC MEETING
	TASK COMPLETED



# 6400 Arapahoe Road- Process and Schedule

## ANNEXATION, USE REVIEW AND SITE REVIEW PHASE 2011

TASK	WHO	WHEN	OUTCOMES
Update to Master Plan for Waste Reduction	LEAD Staff	4th Quarter 2010 and 1st Quarter 2011	Council Study Session February 22, 2011 Updated Plan
Site-Review Kick-Off PB Comments, other Considerations	Consultant Team Staff Team	January 14, 2011	
Preliminary Site Review, Use Review and Annexation Documents		February 18, 2011	
Staff and Consultant Team Worksession - Review Plans and Documents		February 24, 2011	
Neigh. Meeting #3 Preferred Plan		March 1, 2011	
Final Site Review, Use Review and Annexation Documents		March 18, 2011	
Planning Board Public Hearing on Site Review and Annexation/Zoning		June 1, 2011	
City Council Public Hearing on Annexation		August 2011	

**LEGEND**

-  MEETING
-  CONSULTANT WORK
-  PUBLIC MEETING
-  TASK COMPLETED

DRAFT

# 6400 Arapahoe Road - Process and Schedule

## TECHNICAL DOCUMENT AND BUILDING PERMIT PHASE 2011 - 2012

TASK	WHO	WHEN	OUTCOMES
Tec Doc Kick-Off PB Comments and/or Conditions			
Preliminary Technical Documents - Civil, Land- scape, Architecture			
Staff and Consultant Team Worksession - Review Plans and Documents			
Technical Issues Review with Key P and DS Staff			
Final Tec Documents - Civil, Landscape, Architecture *			

FUTURE

\* Consider Concurrent Tec Doc and Building Permit Process



strategies ideas achievements a progress report

# City of Boulder Master Plan for Waste Reduction



**February 2006**

Prepared by:

City of Boulder

Office of Environmental Affairs

Kara Mertz

Elizabeth Vasatka

Marna Hibberd

## TABLE OF CONTENTS

Background . . . . .	page 3
Executive Summary . . . . .	page 3
What Is a Master Plan for Waste Reduction? . . . . .	page 4
History. . . . .	page 4
Vision Master Planning Group . . . . .	page 5
What Are The Guiding Principles . . . . .	page 5
Focus Areas . . . . .	page 6
Investment Program . . . . .	page 6
Current Plan . . . . .	page 6
New Programs for 2006 . . . . .	page 11
New Programs for 2007 . . . . .	page 12
Action Plan . . . . .	page 13
Vision Plan . . . . .	page 14
Implementation – Next Steps . . . . .	page 15

This document represents the result of input from national and international experts and community members who have given their time, expertise, and support to this project. We are indebted to the following individuals and organizations for their generous assistance:

**Kai Abelkis**, Boulder Community Hospital; **John Armstrong**, City of Fort Collins; **Adrian Card**, Colorado State University-Cooperative Extension; **Jeff Callahan**, Boulder County Resource Conservation Division, **Hilary Collins**, Boulder County Resource Conservation Division; **Jack Debell**, C.U. Recycling; **Allyn Feinberg**, President, Eco-Cycle Board of Directors; **Susie Gordon**, City of Fort Collins; **Stephanie Grainger**, Assistant City Manager, city of Boulder; **Jenny Hampton**, Center for Resource Conservation; **Gary Horton**, Western Disposal; **Bryce Isaacson**, Western Disposal; **Eiko Kato**, City Managers Office Intern, city of Boulder; **Anne Koenig**, formerly of Boulder County Health Department; **Stacy Lambright**, Boulder County Resource Conservation Division; **Eric Lombardi**, Eco-Cycle; **Janice Buswell-Lopitz**, Watershed Approach to Stream Health (WASH); **Marti Matsch**, Eco-Cycle; **Lisa Morzel**, community member, former City Council member; **Tom Plant**, Executive Director, Center for Resource Conservation; **Seth Portner**, Center for Resource Conservation; **Peter Richards**, interested citizen; **Ron Shaw**, Boulder County Health Department; **Lisa Skumatz**, Skumatz Economic Research Associates; **Linda Smith**, Eco-Cycle; **Sarah Van Pelt**, Office of Environmental Affairs, city of Boulder; **Carolyn Weinreich**, Office of Environmental Affairs, city of Boulder;

In addition, the entire Vision Planning process would not have been possible without the strategy and facilitation skills of **Mary Wolff, MRW and Associates**.

## BACKGROUND

The city has in place an established 50 percent waste reduction goal. At a May 25, 2004 City Council Study Session, staff was asked to create a plan for a larger vision and options for increasing the city's waste reduction goal. The following plan merges this Council request with the current city focus on master plan development. What follows is a Master Plan for Waste Reduction, identifying within it a "Current Plan," an "Action Plan" and a "Vision Plan."

Council may choose to adopt this Master Plan for Waste Reduction, to be later merged into a larger Strategic Plan for the Office Environmental Affairs and associated with the larger business planning process of the city. A Master Plan for Waste Reduction acts to create a framework for making strategic decisions about waste reduction programs and funding and, similar to the purpose of a citywide Business Plan, will help avoid:

- Maintaining functions at their current levels without comparing those uses to competing needs, implying that what is represents how the future should be;
- Reacting to the most vocal constituents, implying that needs that are heard most frequently and passionately should receive the scarce resources; and/or
- Funding the first few excellent ideas or proposals implying that whatever comes up first should grow.

## EXECUTIVE SUMMARY

Boulder has a long tradition of thinking strategically about the future it wants to create.

This Master Plan for Waste Reduction (MPWR) contains goals, objectives, and policy guidance for waste reduction and recycling programs. In addition, it outlines an investment strategy for waste reduction programs in Boulder. This MPWR presents three levels of investment: a fiscally constrained (current) plan of how to use the revenue the city expects to receive from current Trash Tax funding sources, an action plan of how the city could invest in waste reduction if additional revenue becomes available, and a vision plan, a collection of strategies that move the city and the community toward a sustainable low-waste economy.

The sidebar gives a brief overview and presents excerpts from the list of programs anticipated with these three levels of investment.

### Current Plan Excerpts

#### 60% by Dec. 2007

- Single-stream recycling at the Boulder County Recycling Center.
- Residential yard and food waste collection.
- Commercial food waste collection.
- C & D debris recycling.
- Ban on electronic scrap.
- More aggressive "pay-as-you-throw".

### Action Plan Excerpts

#### 70% by Dec. 2012

- Minimum recycling for multi-family units.
- C & D bond.
- Increase or rebate business Trash Tax.
- Fine for electronics disposal.
- Commercial recycling goal.

### Vision Plan Excerpts

#### 85% by Dec. 2017

- Mandatory source separation ordinance.
- Mixed C & D center.
- Local "take back" laws.



## WHAT IS A MASTER PLAN FOR WASTE REDUCTION?

This Master Plan for Waste Reduction (MPWR) is an initial attempt to formulate the city's long-range blueprint for waste reduction and smart resource use. This Master Plan attempts to address both material use and waste minimization. The MPWR 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. This MPWR covers all forms of solid waste, excluding wastewater treatment biosolids, whether it originates from residents, businesses, or the city organization. The MPWR attempts to formulate a roadmap that curbs the general tendency toward waste and instead, harnesses both the community and the economy to be efficient and effective motivators of resource conservation.

### 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 residents 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 curbside recycling program, expanding it city-wide in a partnership between the city, Eco-Cycle and Western Disposal. In 1992, 1995, and in 2001, the city expanded the types of recyclable materials collected. In 2001, the city also transformed the 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.



Boulder residents when surveyed consistently report recycling to be one of Boulder's signature programs, and repeatedly ask for increased recycling opportunities. Eco-Cycle continues to boast 450 active volunteer members in Boulder, and they continue to process the community's recyclables at a recycling facility owned by Boulder County. Their new, "Zero Waste" programs have expanded internationally, where they use Boulder as a model for other communities to follow. Western Disposal has integrated recycling into their modus operandi for their waste business in Boulder and has lobbied other communities in Boulder County to follow in the city's footsteps with respect to programs and legislation surrounding waste reduction and recycling.

The City Council, as part of the 2000 budget process, established a 50 percent waste reduction goal, to be achieved by 2005. The city is approaching that goal, with statistics in 2004 at:

- Single-family residential waste diversion: primarily materials collected through curbside recycling, Spring Clean-up, and the Yard Waste Drop-off Center:
  - ✓ 48 percent [up from 38 percent in 2003]
- Multi-family residential waste diversion:
  - ✓ 13 percent [up from 12 percent in 2003]
- Commercial and industrial waste diversion, predominantly achieved through private, collection contracts with Eco-Cycle, Western Disposal, Green Girl Recycling, Tri-R Recycling, and several other Denver area recycling companies:
  - ✓ 25 percent [up from 23 percent in 2003]

Because approximately 55 percent of Boulder's waste stream is generated by businesses and industry, Boulder's overall community-wide waste diversion for 2003 was 30 percent, up from 26 percent in 2003.

## VISION MASTER PLANNING GROUP

A group of experts and interested parties from throughout the Front Range gathered together and over a six month period carefully analyzed potential waste reduction programs for Boulder. This Vision Master Planning working group categorized all the potential new waste reduction programs into three categories: Short-term (0-2 years), Medium-term (2-5 years), and Long-term (5+ years). These categories were based on the following criteria:

- cost
- timing
- political will
- visibility
- diversion potential
- interagency/government cooperation
- infrastructure requirements
- toxicity reduction
- environmental impacts
- market value of recyclables
- program precedent
- viability
- measurability

The group created a laundry list of potential programs, partnerships, legislation, education, and facilities. This list was based on other communities' success stories, strategies that would build upon existing Boulder programs, and strategies that would address specific waste diversion needs in our community. Based on the expertise of the group members, the laundry lists were then categorized into strategies which could be implemented in the short- medium- and long-term planning horizons. Next, staff assigned diversion potential and general cost estimates to the categorized programs, partnerships, legislation, education, and facilities.

The working group then took this list of strategies and crafted the following vision for the future of waste reduction in Boulder. Upon examination, these short- medium- and long-term categories seemed to parallel the city's master planning process. Therefore, this Master Plan for Waste Reduction was crafted in an effort to create an effective and long-range context for waste reduction and resource conservation.

## WHAT ARE THE GUIDING PRINCIPLES OF THIS MASTER PLAN FOR WASTE REDUCTION?

The group's philosophy in selecting these particular strategies was to focus on areas where service voids exist. Once identified, the group felt that in the short-term, the city should either directly provide the community with waste reduction programs that are easy and understandable or alternatively require that private sector businesses provide programs to the community, making participation in them voluntary. Then moving progressively to the medium- and long-term, the group felt it advisable to make recycling mandatory, once the infrastructure exists or alternatively, if convenient, voluntary programs prove not to be successful. The only area where the group felt it was advisable to institute mandatory recycling programs in the short-term was where the toxicity of the waste stream presented a significant environmental threat.

### GUIDING PRINCIPLES

- **Identify service voids.**
- **Create effective partnerships** with for-profit and non-profit organizations to expand services with minimal city investment.
- **Support programs** that are convenient.
- **Utilize economic incentives** to alter habitual behavior.
- **Help build infrastructure** and then require its use once it's convenient and economical.

## FOCUS AREAS

Upon examination, it is clear that two forces have been in place shaping the past 16 years of city waste management policies and programs. In robust budget years (1993-1998), the waste hierarchy, “reduce, reuse, recycle” guided and informed programs and policies. However, in lean budget years, the city has chosen to concentrate limited staff resources on maintaining existing recycling programs, despite the fact that they fall third in this hierarchy. The focus has been on convenient and economically viable recycling programs that have resulted in measurable success.

The city will continue to do what has worked well and has been successful. The public-private partnerships that have been formed to take advantage of an educated population and strong community-based businesses are models throughout the world. In the current restricted budget environment (2000-present) focusing on efficiency, city staff realizes that while it is important to maintain existing programs insofar as they are effective, it is also important that the city audit and analyze the efficiency of programs and when possible, re-structure or eliminate those that do not adequately serve the community.

A significant outcome of the vision planning discussions is the recommendation that as funding becomes available, either from new sources or through program service adjustments, the city should invest more in waste prevention. This could take the form of education, operations and/or legislation in order to appropriately shift more emphasis to the top of the waste hierarchy: Reduce.

1. Reduce
2. Reuse
3. Recycle

## INVESTMENT PROGRAM

**Current Plan: 60% waste reduction by 2007 – \$1,200,000 total funding**

### Investment Strategy

The city’s investment strategy for the Trash Tax focuses on building infrastructure by providing convenient programs and services that further waste reduction 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.

In all instances, the general investment strategy is for the city to only provide programs that protect the environmental health and safety of the community, always giving preference to cooperative ventures with for-profit and non-profit organizations above sole municipal control.

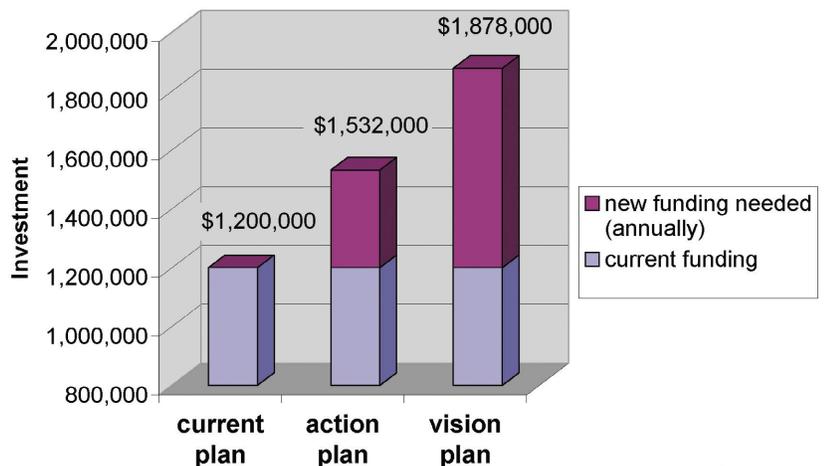


Figure 1

## Investment Packages

The “Current Plan” or fiscally constrained plan is based on existing or planned waste reduction programs that use the revenue the city expects to receive from current Trash Tax funding sources.

The philosophy guiding programs and services in the Current Plan is to continue to do what has worked well and has been successful, taking particular care to maintain the many successful public-private partnerships that have been fostered in Boulder. However, while it is important to maintain existing programs insofar as they are effective, it is also important that the city audit and analyze the efficiency of programs and when possible, re-structure or eliminate those that do not adequately serve the community.

## Existing programs

The city currently sponsors several waste reduction programs with Trash Tax revenues. These include the following:

- Center for Hard-to-Recycle Materials (CHaRM)
- Yard Waste Drop-off Center
- Wood Waste Drop-off Center
- Spring Clean-up
- Fall Leaf Drop-off
- Green Teams, student-to-student outreach in off-campus student residential neighborhoods.
- Neighborhood Community Gardens Compost Project
- Boulder Valley School District Education Programs
- Farmers Market Home Composting Education
- Business Recycling Coupons: First three months of recycling service for free.
- Commercial Compost Collection Incentive
- Unlimited corrugated cardboard collection on “the Hill” during August move-in time

Many active community organizations and local businesses provide additional waste reduction programs such as Eco-Cycle, ReSource: the used building materials yard, CU Recycling, Extras for Education, Western Disposal and many other privately sponsored recycling programs.

The city contributes funding to Eco-Cycle for their Eco-Cycle Times newspaper, which is a very effective method for educating the community about recycling and waste issues, including material preparation guidelines. It is essential that the materials coming into the Boulder County Recycling Center are clean and uncontaminated. The fact that Boulder’s recyclable materials are consistently among the least contaminated in the industry is a testament to the conscientiousness of our community and the effectiveness of the ongoing community education.

In addition to recycling programs and education, the city has in place some limited waste prevention education. The goal of these programs is to inform residents of waste reduction options available to them in Boulder, including options to reuse materials and encourage “pre-cycling.”

Waste prevention education programs have included seasonal “Eco Elves” holiday waste reduction tips, a “choose to reuse” advertising campaign to promote thrift stores in November and December, and move-out fliers detailing re-use options for CU students distributed in May. The city also sponsors Boulder Valley School District education programs through Eco-Cycle. Children participate in tours of the Boulder County Recycling Center, CHaRM, the ReSource sales yard, as well as Western Disposal’s compost site and the Community Garden’s composting site. In other school education programs, students take a “pre-cycling” shopping trip to a grocery store, participate in “litterless lunch” contests, and try to maximize recycling during locker clean-up time. The city also requires recycling at all special events in Boulder, and encourages “zero waste” events when possible.





### **New programs initiated in 2005: Laying the groundwork for 50 percent waste diversion**

City Council approved funding for waste reduction as part of the 2005 budget process. Programs initiated in 2005 are expected to bring the city's overall recycling rate to approximately 38 percent by the end of the year. If 2005 pilot and research programs are carried out in the following years, current levels of funding are expected to be able to reach the community toward our 50 percent waste diversion goal by the end of 2006, and to 60 percent recycling by the end of 2007.

#### **Single Stream Recycling at the Boulder County Recycling Center (BCRC)**

Eco-Cycle and the Boulder County Resource Conservation Division are working together to design a mechanical retrofit to the BCRC to allow the recycling center to accept 'single stream' recyclables, meaning mixed papers, corrugated cardboard and commingled containers could all be delivered to the BCRC in one stream. A new screen at the recycling center would separate the papers from the commingled cans and bottles, and the materials could then be fed through the center's existing processing lines. This retrofit is expected to be in place by January 2007, paving the way for more efficient collection for both residential and commercial recycling customers, as only one cart or dumpster will then be required to collect all of a customer's traditional recyclables. In Boulder, this will translate into higher commercial and multi-family recycling volumes because there are many areas where space constraints are the primary impediment to maximum recycling. Because it is less expensive for haulers to provide single-stream recycling collection, we believe more businesses will likely sign up for recycling, thus increasing the business recycling rate for paper and commingled containers.

Staff estimates that approximately 125 additional businesses and multi-family complexes in Boulder will be able to recycle after the BCRC converts its process. Additionally, businesses that are already recycling will likely be able to increase their diversion due to the collection simplicity. Under the new system, they will be able to put all their recyclable materials in one dumpster, eliminating all the carts and streamlining material handling. Once the BCRC converts its process, staff will track the actual results closely. Although this conversion alone should increase recycling by only 1.4%, it paves the way for the city to coordinate residential yard and food waste collection.

#### **Residential yard and food waste pilot collection**

Beginning in April, 2005 and running through November, the city coordinated a pilot collection program where 400 households in two Boulder neighborhoods helped to test a new collection system. Currently, single-family residents use three carts for their trash and recycling. With the pilot program, these same three carts were used to collect trash, recycling, and compostables (yard and food wastes). This is made possible by combining all of the recyclables (commingled containers and mixed paper) together into one cart, exchanging the household's other existing recycling cart for a composting cart, and keeping the third cart for trash collection.

The purpose of this pilot program was to see how much residential food and yard waste is available for composting and how frequently it should be picked up. Staff was also trying to see if a regular, curbside organics collection program can meet a household's needs as well as, or better than, the current annual Spring Clean-up and Fall Leaf Drop-off programs. If this program were to be implemented city-wide for single-family households,

#### **2005 Programs**

- Single stream recycling pilot
- Residential yard & food waste collection pilot
- Commercial food waste collection assistance
- Construction & demolition debris collection

the city's goal would be to structure a program that would cost homeowners approximately the same as they pay now for trash and recycling only. It could save the city approximately \$100,000 in the first year of implementation and approximately \$200,000 annually thereafter, by replacing the annual Spring Clean-up and Fall Leaf Drop-off programs. In addition, this type of program could increase the community-wide diversion to approximately 45 percent. This program will be expanded to 2,400 households beginning April, 2006.

### Commercial food waste collection programs

Eco-Cycle, BFI, and Western Disposal are all beginning to offer businesses an option of subscribing to separate food waste collection; however, the customer base is currently limited to those businesses that are willing to pay a premium to have their organic materials collected separately for composting. Western Disposal has applied to the State of Colorado Department of Public Health and the Environment for a permit to begin accepting food wastes at its yard waste composting site on 63rd Street. City staff is working closely with all the haulers to design a short-term assistance program that will facilitate more businesses' participation until the economies of scale are sufficient to allow for a self-supporting private sector program. This new food waste subsidy program is expected to divert 6,696 tons annually, or 10 percent of the commercial waste stream. The 6,696 tons is a conservative estimate based on a portion of Boulders commercial establishments' participation.

### Construction and Demolition (C & D) debris

Staff is continuing to work with the Holiday Neighborhood to recycle construction waste from this model building project. Beginning in 2003, the city began working with the Center for Resource Conservation, Colorado Waste Services hauling company, Eco-Cycle and five prominent developers (Coburn Development, Affordable Housing Alliances, Wolff-Lyon, Wonderland Properties and Peak Properties) to maximize the waste diversion from this 333 unit housing project. Between August 2003 and September 2004, 414 tons of material were diverted. This represents approximately 50 percent of the total waste stream from the project.

The city Trash Tax funds continue to support the Wood Waste Drop-off Center located at Western Disposal's transfer station. This drop-off provides a lower cost alternative to the landfill for contractors and homeowners to recycle dimensional lumber. In 2003, this drop-off center diverted 521 tons of wood waste, and in 2004 the center diverted 587 tons from the city of Boulder. Each year of operation, the drop-off center has become more cost effective with the cost per ton decreasing from \$35 to \$25 per ton.

City staff is working to create more available C & D recycling opportunities for builders and remodelers to conveniently and cost effectively maximize their construction waste recycling. The city has partnered with the Boulder Green Building Guild, a non-profit building industry organization, to provide Green Points workshops and outreach to the building community. Through this partnership, the city has been able to reach many contractors who are now 'building green,' and seeding the market to create a positive environment for regional construction recycling haulers to solicit business in the Boulder market.

Staff is also investigating the logistics required for a one to two year mini-grant program for waste haulers to provide construction recycling services. Another option to seed the private sector's desire to start-up construction waste recycling businesses could also include a short term rebate program for C & D recycling offered to homeowners or builders. In addition, staff is investigating other communities' legislative initiatives such as a demolition bond deposit program (see below, in Action Plan section). The intent of these programs is to make the marketplace conducive for recycling to be cost competitive with waste disposal.





### “Recycle Row”

As part of a multi-year capital improvement project, city staff has been working with EcoCycle, Western Disposal, and ReSource to plan and conceptually develop Recycle Row, the one mile section of 63rd Street between Arapahoe and Valmont Roads, as a one-stop-shop where Boulder residents and businesses can access facilities to meet all their waste reduction and recycling needs. This stretch of roadway, one of the few remaining undeveloped industrial areas in the city, is currently the home of the Boulder County Recycling Center as well as ReSource, the used building materials yard. An aerial photograph follows, as Figure 2.

As the population centroid of Boulder County, this section of the city can serve as a gateway to Boulder from the east, providing a human-scale planned development that reflects the values of our community and is welcoming to visitors. Taken together, the planned uses for this one stretch of roadway will house the Center for Hard-to-Recycle Materials

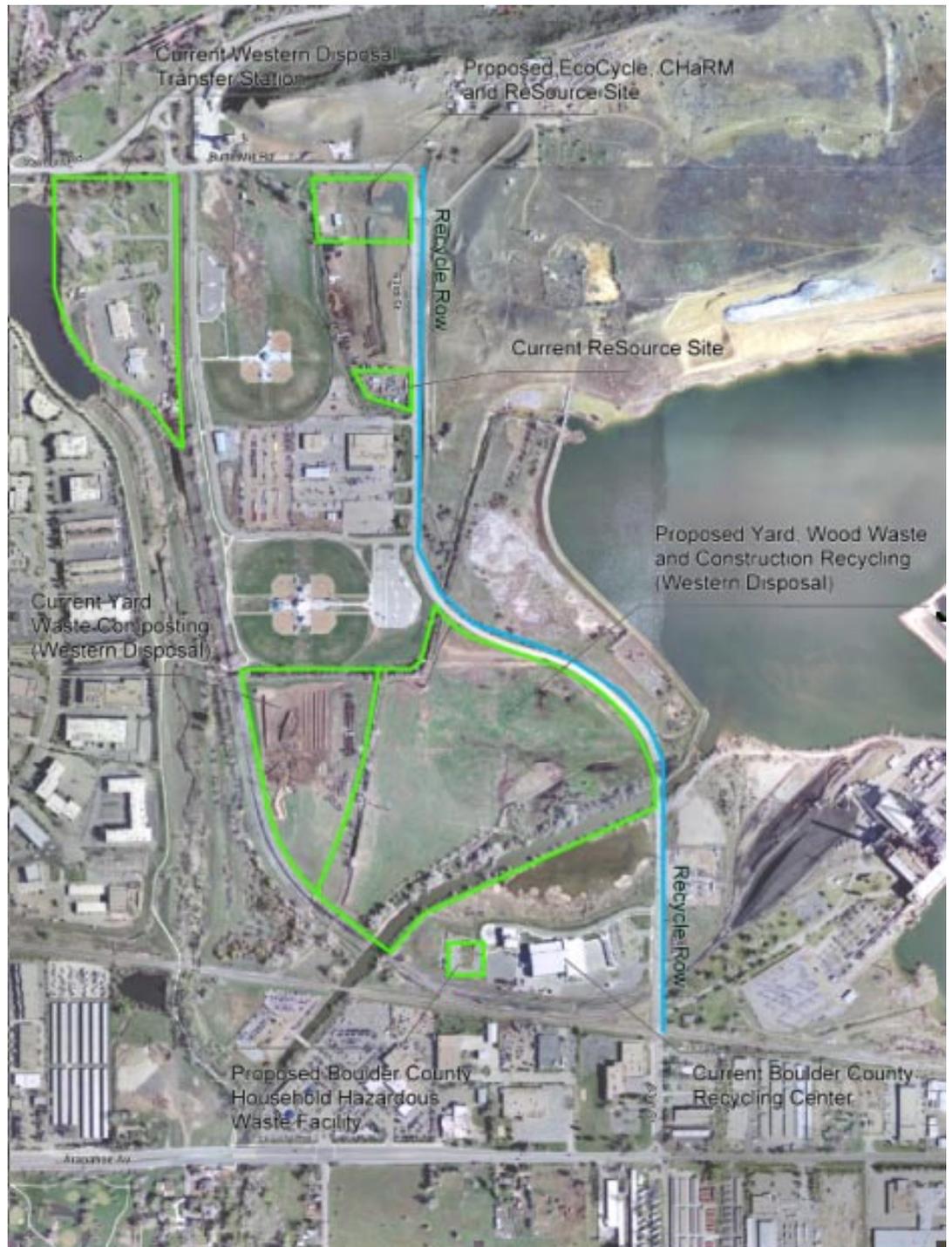


Figure 2

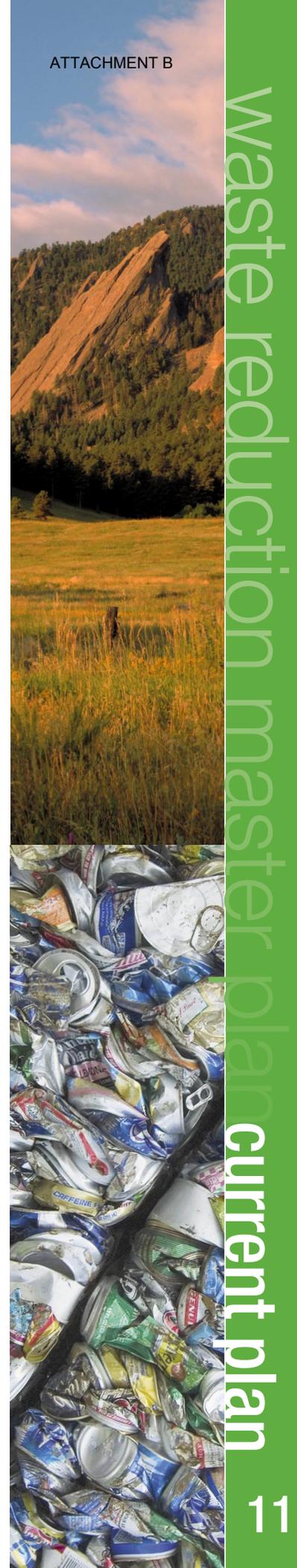
(CHaRM, the computer and consumer electronics recycling facility), ReSource, the used building materials yard, the new household hazardous waste and small business hazardous waste facility, a yard waste drop-off center, a yard and food waste composting center, and the county recycling drop-off center. In addition, the Center for Resource Conservation plans to create a sustainable living resource center to be co-located with ReSource. This would be an education center where visitors could learn about green building techniques, alternative energy and energy conservation options. There is also the potential to develop a construction and wood waste processing center, expansion for Eco-Cycle and ReSource, as well as other smaller-scale re-processors, essentially creating a market development zone for recycling-related businesses.

Creating Recycle Row will put Boulder in a position to maximally expand waste reduction services beyond the traditional recyclables, allow for operations that refurbish and upgrade recyclable materials, and demonstrate sustainability to our community and visitors alike.

## NEW PROGRAMS FOR 2006

(all funding included in current Trash Tax revenues)

1. **Expand the current yard/food waste collection pilot program to 2,400 households.** Investigate further the issues surrounding city-wide regular curbside yard and food waste collection. **New diversion potential:** 1.3% of the residential waste stream (.7% of the overall waste stream) **Estimated cost** (one year): \$25,000
2. **Institute reporting requirements for recycling haulers.** Similar to the reporting requirement for trash haulers currently in place. **No new diversion potential** specifically attributable to this activity. **Estimated cost** (annually): \$1,500 in staff time
3. **Conduct a Construction and Demolition Waste Diversion Potential Study.** Staff found that by extrapolating from the number and size of building permits issued for construction by the city in a typical recent year, the amount of available construction debris for recycling from new construction and remodels was significantly less than anticipated. However, these estimates did not include recovered material from demolition projects. The working group concurred that it would be advantageous to conduct case studies of the potential diversion from demolition projects. Staff agreed it would be helpful to cooperate with the Center for Resource Conservation on a study of this sort. **No new diversion potential** specifically attributable to this activity. **Estimated cost** (yr 1): \$10,000 - \$50,000
4. **Work to expand CHaRM.** As part of the Recycle Row project, expand the city of Boulder-Eco-Cycle Center for Hard-to-Recycle Materials to allow for more electronics re-use and future diversion of new hard-to-recycle materials such as textiles, carpet, carpet padding, non-container glass, and Styrofoam®. This entails re-locating Eco-Cycle from the City Municipal Service Center property. Although the new diversion potential is relatively small, the materials are a significantly toxic part of the waste stream. **New diversion potential:** 0.3% of the commercial/industrial waste stream (0.2% of the overall waste stream) **Estimated cost** (total, yrs 1-3): \$400,000 to re-locate Eco-Cycle;
5. **Implement and expand commercial assistance programs.** Building on the “3-months-free” coupon designed to incite new businesses to sign up for recycling service, design an incentive and subsidy program to encourage more aggressive recycling by businesses who are already aware, but not maximizing their waste diversion. Base some technical assistance programs on the PACE model. **New diversion potential:** 8% of the commercial/industrial waste stream (4% of the overall waste stream) **Estimated cost** (annually): \$100,000.
6. **Complementary programs.** These programs provide beneficial support for existing programs, often in the forms of education and outreach or “buy recycled.” Although their merit is undeniable, it is difficult to attribute a precise diversion quantity to these specific programs.





- Continued marketing of the CU Green Teams, student-to-student outreach operated by the CU Environmental Center.
- Enhanced recycling education in K-12 Boulder Valley School District.
- Put recycling requirements in the model lease for rental properties.
- Proclamations, endorsements and awards for recycling challenges in neighborhoods and HOA communities.
- Continue giving good reasons on how recycling positively impacts our community.
- Mini grants for C & D haulers/businesses.
- Create a recycling market development zone (as part of Recycle Row).
- Encourage on-site re-use and/or salvage of C & D waste.
- Encourage recycling collection service sharing where space is a significant constraint, or include commercial collection on residential routes.

**NEW PROGRAMS FOR 2007**  
**(all funding included in current Trash Tax revenues)**

- 7. Expand the yard/food waste collection pilot program city-wide.** In 2007 implement yard/food waste collection program. If possible replace once-per-year Spring Clean-up and Fall Leaf Drop-off programs with more convenient weekly or bi-weekly yard waste collection from April through November. **New diversion potential:** 14% of the residential waste stream (7% of the overall waste stream) **Estimated cost** (yr 1): \$300,000 **Estimated cost** (subsequent years): \$200,000
- 8. Ban e-scrap (Residential and Commercial/Industrial).** The European Union estimates that 10 lbs. per person per year of electronics end up in the waste stream. Work with manufacturers and retailers to institute legislation that would ban electronics from being disposed of in the trash. Though these represent a small portion of the waste stream by weight, they represent a significantly toxic portion of the waste stream. **New diversion potential:** 1.5% of the overall waste stream **Estimated cost** (yrs 1 & 2): \$10,000 in staff time; \$10,000 in education materials **Estimated cost** (subsequent years): \$5,000 staff time [enforcement]
  - Increase Education about electronic waste toxicity issues.
- 9. Coordinate a multi-family complex volunteer coordinator network.** This will increase recycling in multi-family complexes. Coordinate in conjunction with the haulers and the C.U. Environmental Center’s student Green teams & Eco-Cycle. Implement subsequent to conversion to single-stream recycling. **New diversion potential:** 0.4% of the commercial/industrial waste stream (0.1% of the overall waste stream) **Estimated cost** (annually): \$1,500 in staff time
- 10. Complementary programs.** These programs provide beneficial support for existing programs, although it is difficult to attribute a precise diversion quantity to these programs.
  - Small scale pilot projects to test new programs.
  - Require local compost mix as a soil amendment for new housing projects.
  - Conduct a market development study for construction waste (e.g., gypsum wallboard)

**Action Plan: 70% waste reduction by 2012 –  
\$1,532,000 total funding; \$332,000 new funding**

This “Action Plan” represents the next best steps toward reaching the community’s waste reduction goals if additional funding becomes available.

The strategies contained in the Action Plan are presented as a package that together would reach the city to 70 percent waste reduction. It is anticipated that program initiation would be staggered over the period between 2007 and 2012, taking into consideration the cost, political viability, diversion potential and adherence to the Focus Areas waste hierarchy outlined above on page six. The strategies are listed in a general order, based on their adherence to the waste hierarchy as well as the Guiding Principles discussed above, on page five, namely:

- **Identify service voids.**
  - **Create effective partnerships with for-profit and non-profit organizations.**
  - **Support programs that are convenient.**
  - **Utilize economic incentives to alter habitual behavior.**
1. **Complementary programs.** These programs provide beneficial support for other recycling programs, often in the forms of education and outreach or “buy recycled.” Although it is difficult to attribute a precise diversion quantity to these specific programs, their merit is undeniable. To the extent that these programs focus on the higher tiers of the waste hierarchy described on page six (“Reduce” and “Reuse”), they should be implemented as early as possible in the Action Plan time frame.
    - A. Waste exchange (approximately \$25,000: staff time and advertising)
    - B. In-store de-packaging requirements/ point of purchase recycling; focus on shoe stores first (\$10,000: staff time)
    - C. Require recycling plans during construction phase of commercial building process, then validate plans once occupied
    - D. Non- traditional market development assistance (\$6,500: staff time)
    - E. Require businesses to prepare recycling plans (\$16,500: staff time & outreach)
    - F. Require mandatory recycling language in commercial leases (\$6,500: staff time)
    - G. Recycling bins in all public places (approximately \$50,000 for bins)
    - H. Pay for plastic bags at grocery stores
  2. **Conduct a Service Void Analysis study.** Initiate a study to identify areas where recycling services are not available, and also identify current service vulnerabilities, such as sectors where one company provides a service that only caters to a sub-section of the population. **No new diversion potential** specifically attributable to this activity. **Estimated cost** (one-time): \$25,000 - \$50,000
  3. **Construction and demolition recycling bond.** A deposit would be levied prior to issuance of a construction or demolition permit to be fully refunded upon documentation of reuse and/or recycling of waste materials. This should be implemented only after a series of viable end-use markets are available. **New diversion potential:** currently unknown% of the waste stream (see discussion above, New Programs for 2006: 3, page 8) **Estimated cost** (yrs 1 & 2): \$10,000 in staff time; **Estimated cost** (subsequent years): minimal staff time
  4. **Investigate a more aggressive residential “pay-as-you-throw” ordinance.** Investigate increasing the relative costs of the 64- and 96-gallon trash subscriptions, such that a greater incentive will be in place for waste diversion. Implement this only after the yard and food waste collection program is implemented. **New diversion potential:** 8% of the residential waste stream (4% of the overall waste stream) **Estimated cost** (yr 1): \$8,500 in staff time; **Estimated cost** (subsequent years): minimal staff time





5. **Minimum multi-family unit recycling requirement.** Early in 2008, require by ordinance a minimum recycling service level per unit for multi-family units. **New Diversion potential:** 7% of the residential waste stream (3% of the overall waste stream) **Estimated cost** (year 1): \$6,500 in staff time plus \$10,000 in education materials
6. **Institute a fine for disposing of commercial electronics in the Trash.** A ban on some “e-scrap” already exists for commercial and industrial users. Increase education and institute a fine for illegally disposing of cathode ray tubes in the trash. **New diversion potential:** 1% of the commercial waste stream (0.5% of the overall waste stream) **Estimated cost** (year 1): \$6,500 in staff time plus \$10,000 in education materials **Estimated cost** (annually, thereafter): \$5,000 in staff time
7. **Legislate a commercial recycling goal.** Institute a “Rates and Dates” law, where a certain percentage of the commercial waste stream must be recycled by 2012. This encourages private sector haulers to provide increased commercial recycling services. Define recycling to include specific, targeted materials. If goal is not met, in 2012, a commercial source separation ordinance should be instituted (see Vision Plan: 1, below) **New diversion potential:** 10% of the commercial waste stream (5% of the overall waste stream) **Estimated cost** (year 1): \$6,500 in staff time plus \$10,000 in education materials
8. **Increase or rebate the Trash Tax for commercial businesses.** Once the Boulder County Recycling Center converts to single-stream recycling, and ensuring adequate recycling opportunities are made available, increase the Trash Tax, such that businesses have a concrete economic incentive to recycle (ensure there’s no Trash Tax on the yards recycled). Alternately, businesses could also get a specific rebate on their Trash Tax if they proved they were recycling. **New diversion potential:** 5% of the commercial/industrial waste stream (2.5% of the overall waste stream) **Estimated cost** (year 1): \$8,500 in staff time

**Vision Plan: 85% waste reduction by 2017 –  
\$1,878,000 total funding; \$678,000 new funding**

This “Vision Plan” represents the future of waste reduction in Boulder, from our current perspective of the early 21st century. It is anticipated that as technology progresses and trends in material use and waste management advance, the Vision Plan will need to be updated to continue to represent an achievable ideal for a sustainable, low-waste community.

The strategies contained in the Vision Plan are presented as a package that together would reach the city to 85 percent waste reduction. It is anticipated that program initiation would be staggered over the period between 2012 and 2017. The strategies are envisioned as longer-term solutions to difficult waste management issues. Some of them are mandatory recycling or “pre-cycling” ordinances, employed as a last resort, only if voluntary programs prove to not be successful. Some of the strategies represent large capital investments, creating infrastructure required to make recycling convenient enough to be economically viable. In this Vision Plan, it is particularly important for the city to adhere to the guiding principles of this Master Plan, following the general investment strategy where the city always gives preference to cooperative ventures with for-profit and non-profit organizations above sole municipal control.

1. **Institute a commercial source-separation ordinance.** If the “rates and dates” ordinance described above (Action Plan: # 6) is not effective. Require that any business that generate substantial amounts of paper and/or cardboard separate this material from the trash. May also include compostable organic materials above a certain quantity. **New diversion potential:** 20% of the commercial/industrial waste stream (11% of the overall waste stream) **Estimated cost** (yr 1): \$10,000 - \$20,000 staff time and outreach materials (range depends on number of materials targeted) **Estimated cost** (annually, thereafter): \$ 5,000 staff time.

2. **Mixed Waste Construction and Demolition (C & D) debris Recycling Center.** Help private sector to capitalize on a mixed waste C & D recycling center for use county-wide. May include business plan feasibility analyses, permitting assistance, low-interest loans, etc. **New diversion potential:** currently unknown% of the waste stream (see discussion above, Short-Term strategy #4) **Estimated cost** (year 1 through year 3): \$10,000 - \$250,000 staff time and financial assistance (range depends on level of sponsorship and/or ownership)

### 3. Complementary Programs.

- Local producer "take back" laws where possible
- Exempting areas from "floor/area ratios" in designing new construction for recycling

## IMPLEMENTATION – NEXT STEPS

At the time of drafting this Master Plan for Waste Reduction, city staff embarked on a business and public input process during the second half of 2005. This involved several open houses, a tabletop display explaining the Master Plan with comment solicitation cards which was moved about town, a community-wide survey, a utility bill insert, and a "Recycling 101" short course. Staff also hosted a focus group with businesses representing retail, office buildings, manufacturers, hospital employees, apartment owners, and restaurants. In addition, city staff presented the Master Plan for public and Board comment at two city Environmental Advisory Board meetings and a Boulder County Resource Conservation Advisory Board meeting.

Staff presented the results of this feedback process to City Council at a study session on November 22, 2005 and will present a Master Plan for Waste Reduction to Council for acceptance on April 18, 2006.

With acceptance of this plan, the city will commit itself to the strategies contained in the Current Funding program and to actively lay the groundwork and pursue funding needed to implement the Action Plan.





## ATTACHMENT C

### **Boulder County's Zero Waste Action Plan Recommendations**

The final draft of Boulder County's *Zero Waste Action Plan* was approved by the Board of County Commissioners in December 2010. The plan's 28 recommendations are expected to divert 75 percent or more of the County's waste stream over the next 15 years.

Short-term steps to be implemented by 2015 or sooner:

- Support capacity for construction and demolition transfer, sorting and possible processing
- Support capacity for additional composting
- Require construction and demolition project recycling and reuse

Mid-term steps to be implemented by 2018 or sooner:

- Support ban on recyclables going to landfill
- Support ban on yard waste going to landfill
- Require trees and slash from landscaping to be diverted from landfill

## ATTACHMENT D

<b>2011 Trash Tax Appropriations</b>	
Personnel salary and benefits (4.5 FTEs)	\$ 465,882
Administrative expenses	\$109,320
Information resources/data management	\$ 16,000
Eco-Cycle education (in BVSD and general education)	\$30,500
CRC hotline	\$44,500
Trash tax contribution to LEAD marketing	\$63,000
Yard waste drop off center	\$ 105,000
Commercial waste reduction education	\$ 50,000
Commercial composting subsidies/recycling coupons	\$82,775
Wood waste drop-off center	\$50,000
City office recycling	\$62,788
Center for Hard-to-Recycle Materials (CHaRM)	\$ 100,000
Public place & special events recycling	\$ 25,000
Deconstruction services	\$ 15,000
Hazardous materials management	\$ 1,800
New business waste reduction planning and programs	\$ 120,000 (one-time)
<b>Subtotal (non-debt)</b>	<b>\$1,200,000</b>
6400 Arapahoe: debt service (through 2030)	\$ 440,000
6400 Arapahoe: county loan payments (through 2013)	\$ 136,300
<b>Total</b>	<b>\$ 1,776,300</b>

# Community-Wide Waste Reduction



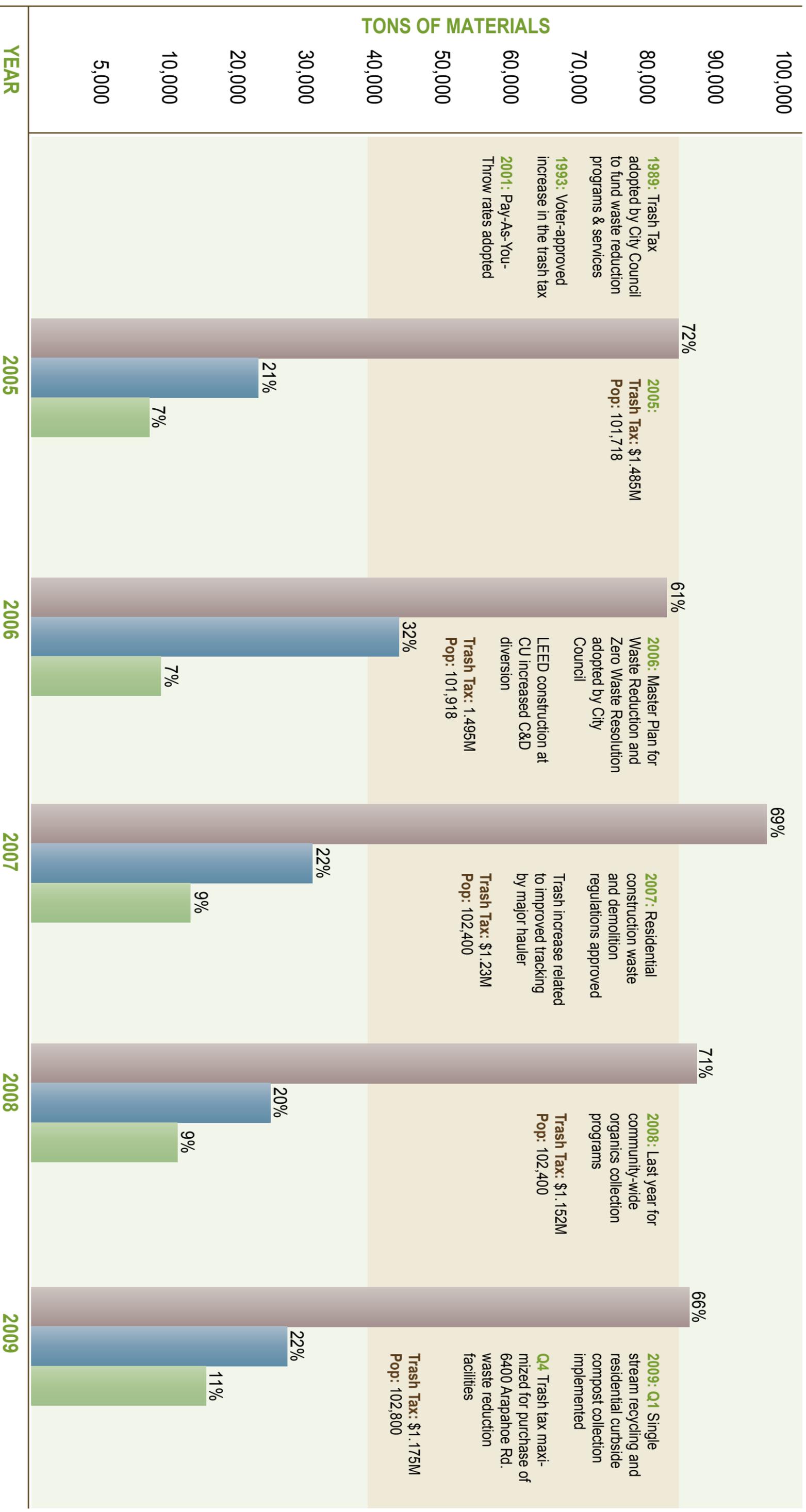
Landfilled Waste



Recycled Materials

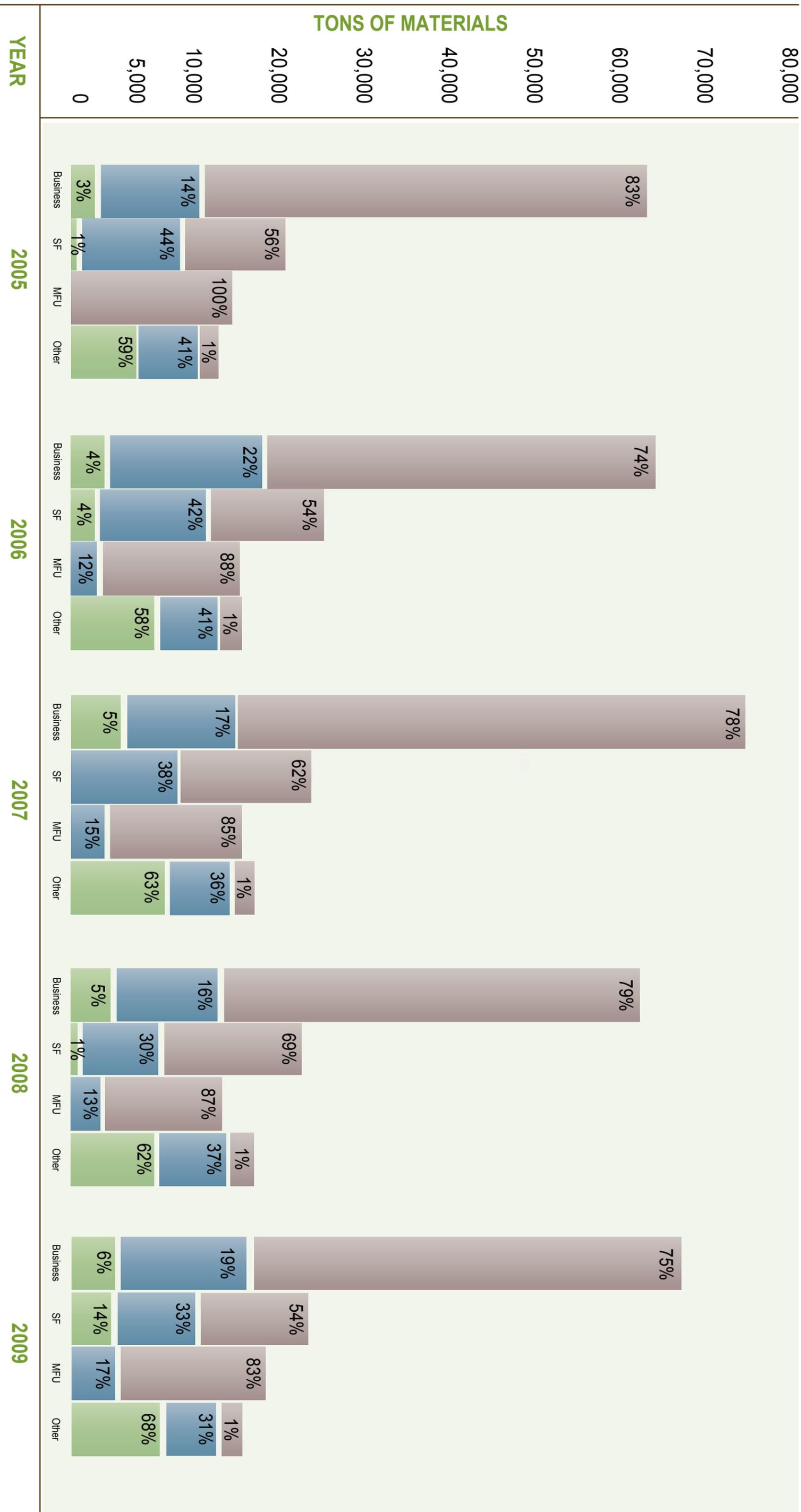
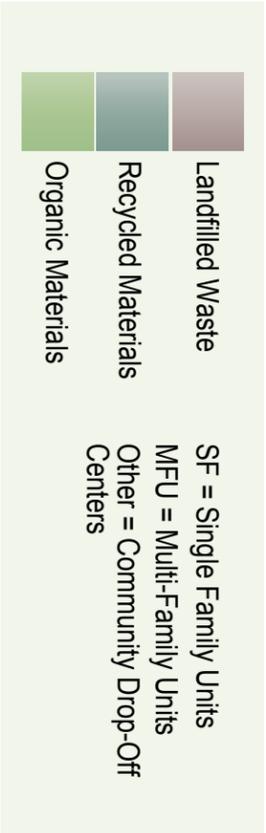


Organic Materials



# Waste Reduction by Sector

Materials Collected by Haulers and at Facilities

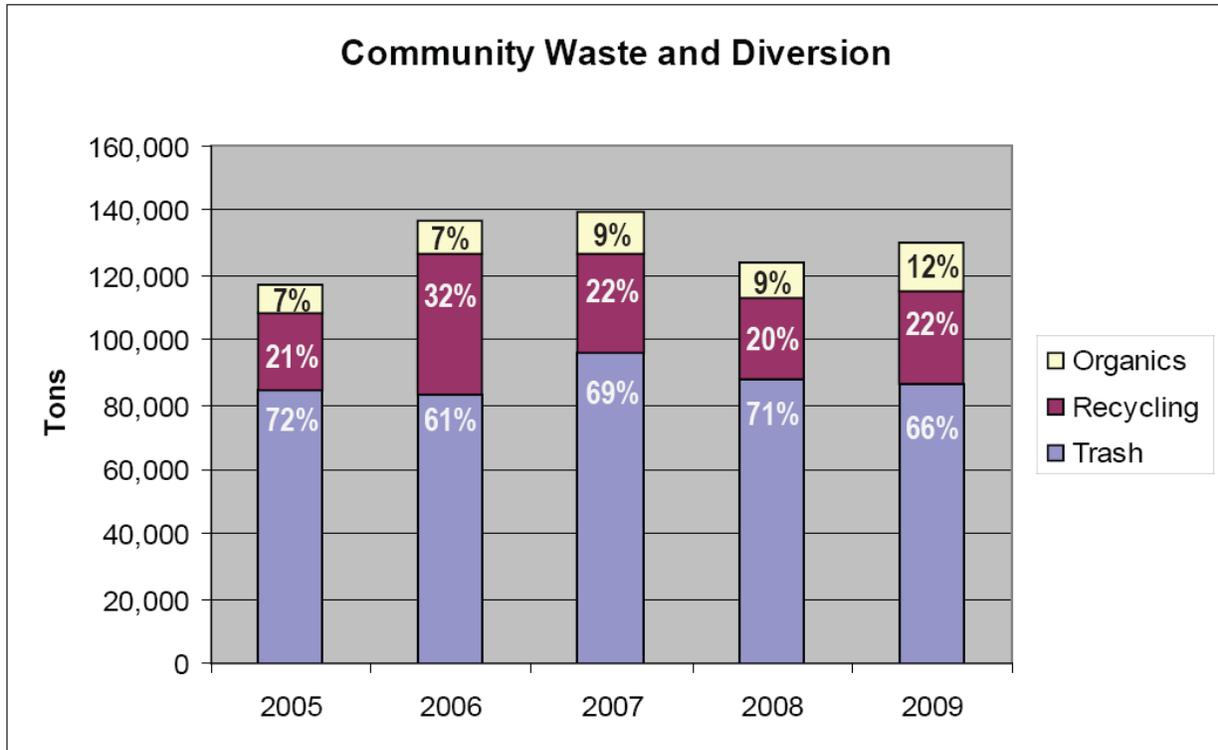


\*MFU recycling in 2005 bus. data

**Summary of Community Diversion**

To measure progress toward the waste diversion goal, the city uses materials weight data provided annually by trash and recycling haulers and by local drop-off facility operators. Since 2001, trash haulers have been required to provide this information the city.

The chart below summarizes community diversion between 2005 and 2009. The community rate of diversion was 34 percent in 2009.



**What is still in the Trash?**

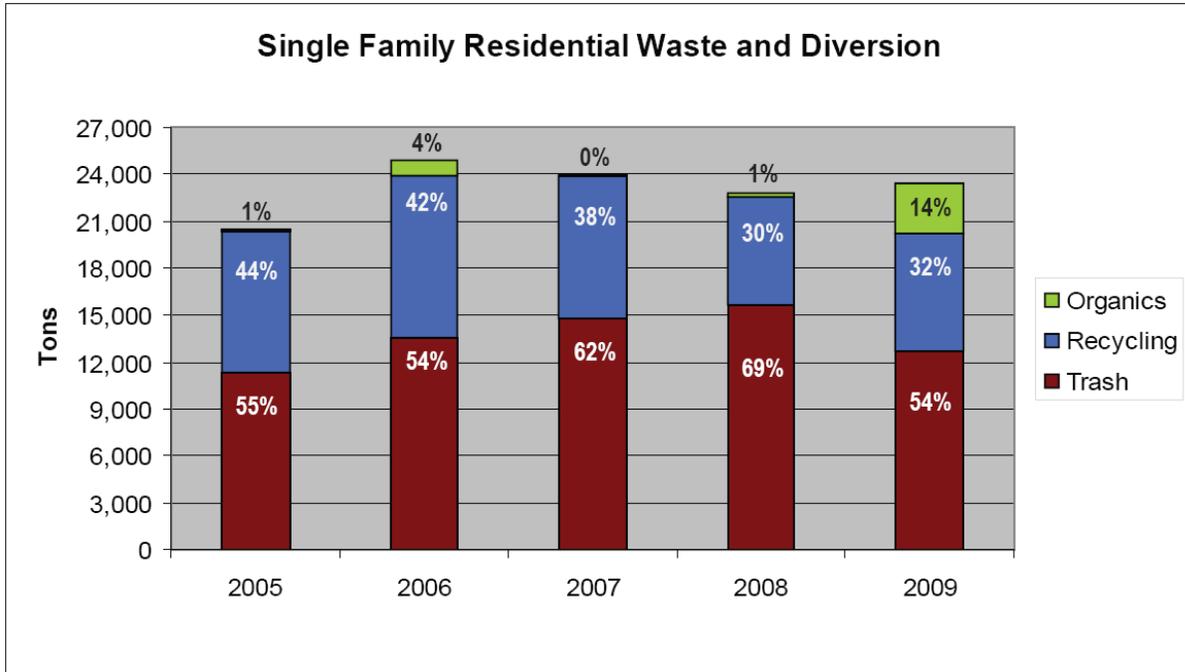
While diversion results help evaluate what is working and where adjustments are needed, it is also important to know what materials are going to the landfill. In 2010 Boulder County commissioned a Waste Composition Study to better understand what materials are still being sent to the landfill. The final analysis, delivered to the county in December, included 80 samples of residential, multifamily and business waste from around the county.

Results show that traditional recyclables are – in general – being effectively diverted from landfill. However, yard waste and other organics comprised 41 percent of the waste stream. This shows a need for increased attention to compost collection, countywide. The city is working with Boulder County to identify what portion of the discarded organics originated from within the City of Boulder.

**Single Family Diversion**

By the end of the first quarter of 2009, curbside service for all single family households had changed to single stream recycling and organics collection. These service changes have reduced

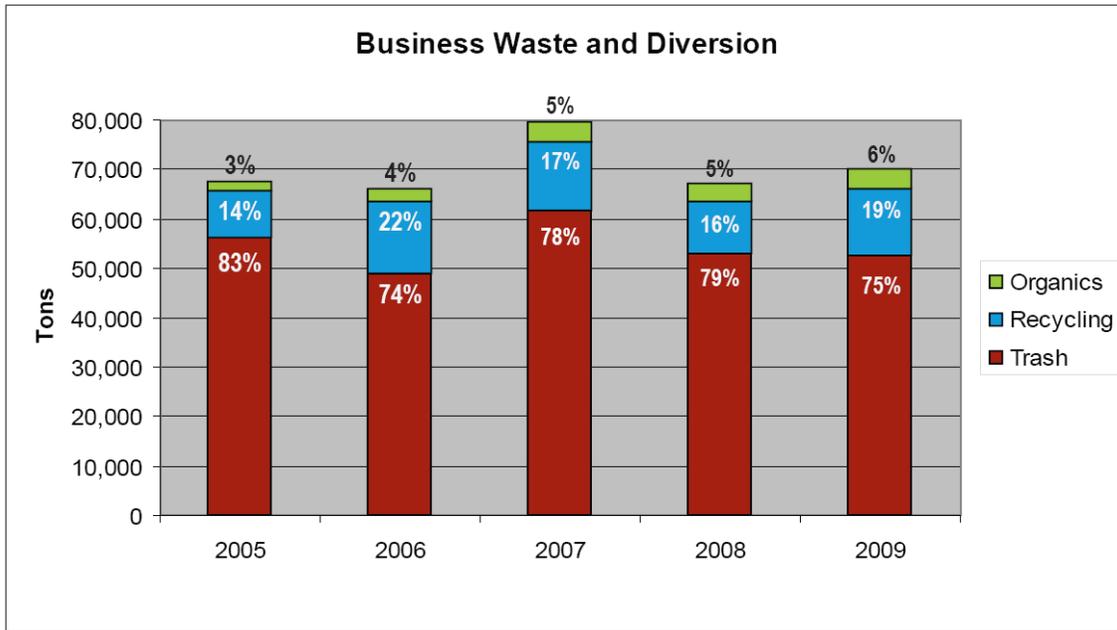
trash and increased diversion rates. Beginning in spring 2011 Western Disposal, the primary hauler serving single family households, will offer residents expanded compost service without increase cost. The chart below summarizes hauler reports of materials collected from single family households.



In 2009, 46 percent of single family residential materials were diverted compared to 31 percent in 2008 and trash went down by 19 percent. The increase in diversion and reduced trash amounts could be related to single stream and curbside compost services that started in 2009.

**Business Diversion**

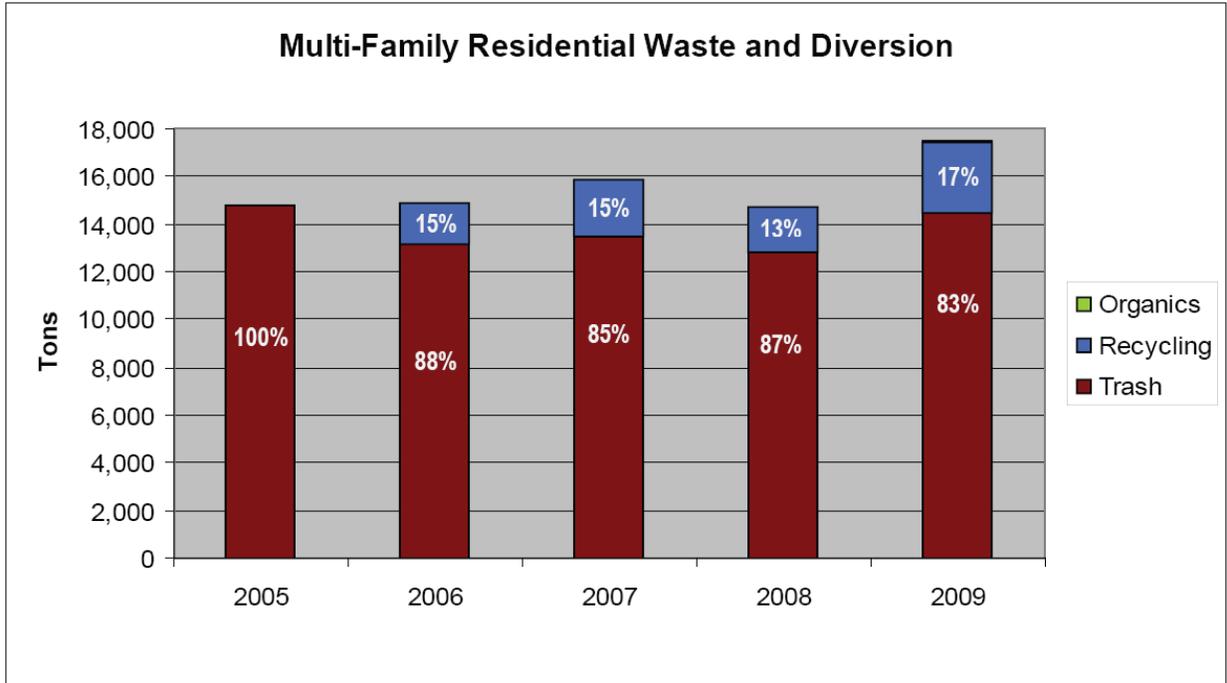
The chart below summarizes materials collected from businesses including large institutions like CU from 2005 through 2009.



Business waste diversion was 25 percent in 2009. Respective changes in recycling and compost amounts compared to 2008 are 28 and 15 percent increases and trash amounts decreased by one percent. Unlike the residential sector, the city has not implemented requirements for recycling collection, compost collection or rate requirements on businesses or their haulers. Western Disposal claimed that the noticeable increase in trash for 2007 was related to improvements in tracking.

**Multifamily Diversion**

The chart below summarizes hauler reports of materials collected from multifamily complexes. Note: multifamily recycling data were combined with business data until 2006.



Total diversion from multifamily housing was 17 percent in 2009 but this sector is showing promising increases in diversion; recycling amounts increased by 58 percent and 2009 was the first year that haulers reported collecting compost from multifamily housing. (Note: Yard waste from business and multifamily properties is counted in the community organics total).

**Master Plan for Waste Reduction Task Force Members**

<b>Name</b>	<b>Employer/Organization</b>
Kate Bailey	Eco-Cycle
Tim Bentz	Boulder Area Rental Housing Association
Jennifer Bohn	Boulder County
Jeff Callahan	Boulder County
Jack DeBell	University of Colorado
Erin Dodge	Boulder County
Allyn Feinberg	Eco-Cycle Board
Keith Frausto	Center for ReSource Conservation
Juri Freeman	Skumatz Economic Research Associates, Inc.
Lisa Friend	Boulder County
Gary Horton	Western Disposal
Sheila Horton	Boulder Area Rental Housing Association
Bryce Isaacson	Western Disposal
Shawn LaBarre	Center for ReSource Conservation
Eric Lombardi	Eco-Cycle
Cathy Lurie	ZeroIn
Marti Matsch	Eco-Cycle
Tom Orlando	Housing Helpers
Anne Peters	Gracestone, Inc.
Dan Powers	Boulder Chamber
Lisa Skumatz	Skumatz Economic Research Associates, Inc.
Choen Vogt	Boulder County

**ATTACHMENT I**

**Community Waste Reduction Facilities**

<b>Local Waste Reduction Facilities</b>	<b>Ownership</b>	<b>Operations Funding</b>	<b>Other Partners</b>	<b>2009 Diversion</b>	<b>Tons</b>
Boulder County Recycling Center	Boulder County	Revenue from sale of materials.	Eco-Cycle operates under contract to Boulder County	19%	24,552
Hazardous Materials Management Facility	Boulder County <sup>1</sup>	Boulder County and Broomfield municipalities. Trash tax investment - \$1,800. City Utilities Dept. cost - \$195,000	Western Disposal land <sup>2</sup>	0.03%	37
Yard Waste Drop-off Center	City of Boulder	City and County subsidize their communities' usage. Trash tax investment - \$105,000	Western Disposal land	4.5%	5,838
Wood Waste Drop-off Center	City of Boulder	City and County subsidize their communities' usage. Trash tax investment - \$50,000	Western Disposal land	1.5%	1,893
City of Boulder/ Eco-Cycle CHaRM	City of Boulder <sup>3</sup>	City of Boulder <sup>4</sup> , Eco-Cycle and user fees. Trash tax investment - \$100,000	Eco-Cycle operates under contract to the city	0.5%	646
Composting facility	Western Disposal	Customers through collection fees	City of Boulder issues state permit for operations	5.5%	7,200
ReSource	Center for ReSource Conservation (CRC)	Self-supporting	City property at 6400 Arapahoe	0.5%	587
Western Disposal Transfer Station	Western Disposal	Western Disposal		0.6% <sup>5</sup>	786

<sup>1</sup> New facility costs will be shared between Boulder County municipalities and Broomfield

<sup>2</sup> New facility will be on Boulder County owned property

<sup>3</sup> Currently located at the Boulder's Municipal Service Center, will locate tollocated 6400 Arapahoe, owned by the City

<sup>4</sup> Discussions are anticipated with Boulder County municipalities on potential cost sharing opportunities

<sup>5</sup> Western Disposal extracts recyclables from the transfer station waste stream

<b>Local Waste Reduction Facilities</b>	<b>Ownership</b>	<b>Operations Funding</b>	<b>Other Partners</b>	<b>2009 Diversion</b>	<b>Tons</b>
Other Construction & Demolition (C&D) diversion <sup>6</sup>	CU and private companies	Self-supporting		1.4%	1,873
<b>Total community diversion</b>				<b>34%</b>	<b>43,412</b>
<b>Total trash generated (landfilled)</b>				<b>66%</b>	<b>86,635</b>
<b>Total materials generated</b>				<b>100%</b>	<b>130,047</b>

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<sup>6</sup> Materials processed at facilities outside Boulder



### **Zero Waste Community Planning Decision Support System (DSS) and Simulation Model**

Achieving the goal of making Boulder a Zero Waste community will require a combination of building properly designed facilities, implementing a series of creative collection programs, and creating financial incentives and policy approaches to ensure strong participation from all sectors of the community. The trick will be knowing which are the right facilities, programs and policies, and how to prioritize among them to create the Zero Waste plan that is best for Boulder. This is a challenge for any community embarking on the goal of Zero Waste, and as a result, Zero Waste plans become expensive, confusing, and do not deliver results quickly enough. To assist in this challenge, Eco-Cycle, in partnership with the sustainable communities software firm Renomics, is building a Decision Support System and Simulation Model (DSS model) that will analyze the triple bottom line (TBL) impact of each element of a Zero Waste plan using a 20-year lifecycle analysis framework. The TBL outcomes will quantify the financial costs, environmental impacts (particularly related to greenhouse gas emissions), and local economic impacts (including jobs creation and economic vitality). This will produce a data-driven analysis of how these policies, programs and infrastructure investments come together to form a multi-year plan that gets the intended results on a faster timeline. By assessing the triple bottom line impact, the city will be able to more quickly and cost-effectively make the best planning decisions for its bottom line, the community and our planet.

The Eco-Cycle/Renomics model will be a robust online service (“cloud computing”) that will allow a community to: (1) create a knowledgebase of all relevant local Zero Waste data; (2) create a multi-year action plan for attaining Zero Waste goals; and (3) update community progress on a monthly basis quickly and easily for the purposes of tracking results and fine-tuning the ZW Community Plan.

In early 2010, Eco-Cycle gathered together nine Zero Waste experts from across the U.S. and Canada to identify the key policies, practices and infrastructure needed to reach 90% resource recovery. These findings form the basis of our DSS model as it calculates all the costs and impacts of following our proposed 10-year plan. However, the tool will be flexible enough to model the impacts of other popular programs and policies aimed at increasing waste diversion. Most importantly, the Eco-Cycle DSS model will provide an order-of-magnitude economic assessment of the costs and benefits of every element in the plan.

This Eco-Cycle/Renomics DSS model will be the first to combine the financial, environmental and economic impacts of Zero Waste planning into one tool, and goes even further by creating a dynamic tool for city staff to update, assess, evaluate and plan for years to come. Our vision is big for this product, but we are confident it can be done. With the city of Boulder as the first real-world application of the tool, the city is once again taking the lead on the next building wave of progress in creating a more sustainable world. In addition, by being the first community to use the model, Boulder will be receiving the benefits of this project at dramatically lower costs compared to the full charge applied to future communities.