Fort Collins Waste Reduction & Recycling Plan - Core Ideas On the Road to Zero Waste

Gary Liss & Rick Anthony
Zero Waste Associates

Presentation to Community Conversation

October 15, 2013

Plan Process

May - Reviewed Existing System

June – 1st Visit, Council Futures Committee, Tours of Facilities & 2 Public Meetings

July – 2nd Visit, Met with Stakeholders, Boards, More Tours & 2 Public Meetings

August - Analyzed Policies, Programs, Facilities, Economics & Impacts

Sept. - Draft Zero Waste Plan

Oct. – 3rd Visit, Draft Review, Final Public Mtg.

Nov. - Final Plan

Zero Waste =

Reduce
Reuse
Recycle

- Focusing 1st on Reducing & Reusing, then Recycling, Composting, Digesting and Redesigning
- Maximizing the highest and best use of resources to reinvest in the local economy to create more wealth and jobs for residents, help local businesses operate more efficiently at reduced costs and liabilities, and reduce greenhouse gases

Zero Waste International Alliance's Definition of Zero Waste

Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use.

Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them.

Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.

ZERO WASTE
INTERNATIONAL ALLIANCE
working towards a world without waste

Plan Process

May - Review Existing System & Working Group 1st Meeting

June – 1st Visit, Council Futures Committee, Tours of Existing System & 2 Public Meetings

July – 2nd Visit, Stakeholders, NRAB & 2 Public Meetings

August - Analyze Policies, Programs, Facilities, Economics, Impacts & Timeline

Sept. - Draft Zero Waste Plan

Oct. – Draft Review

Nov. - Final Plan

City Plan Systems Approach

ID principles and linkages among inter-connected topics:

- Carbon Emissions
- Energy Consumption
- Energy Conservation
- Energy Production
- Conservation of Resources
- Economic development
- Job Creation & Training
- Housing
- Toxics Reduction
- Water Quality
- Household Water Use
- Air Quality/Mobile Emissions
- Habitat Protection/Restoration
- Biodiversity/Wilderness
- Protected Open Space
- Transportation
- Vehicle Miles Traveled
- Pollution Prevention

ID mutually beneficial actions to support multiple principles and policies, foster new relationships, leverage funding and maximize resources

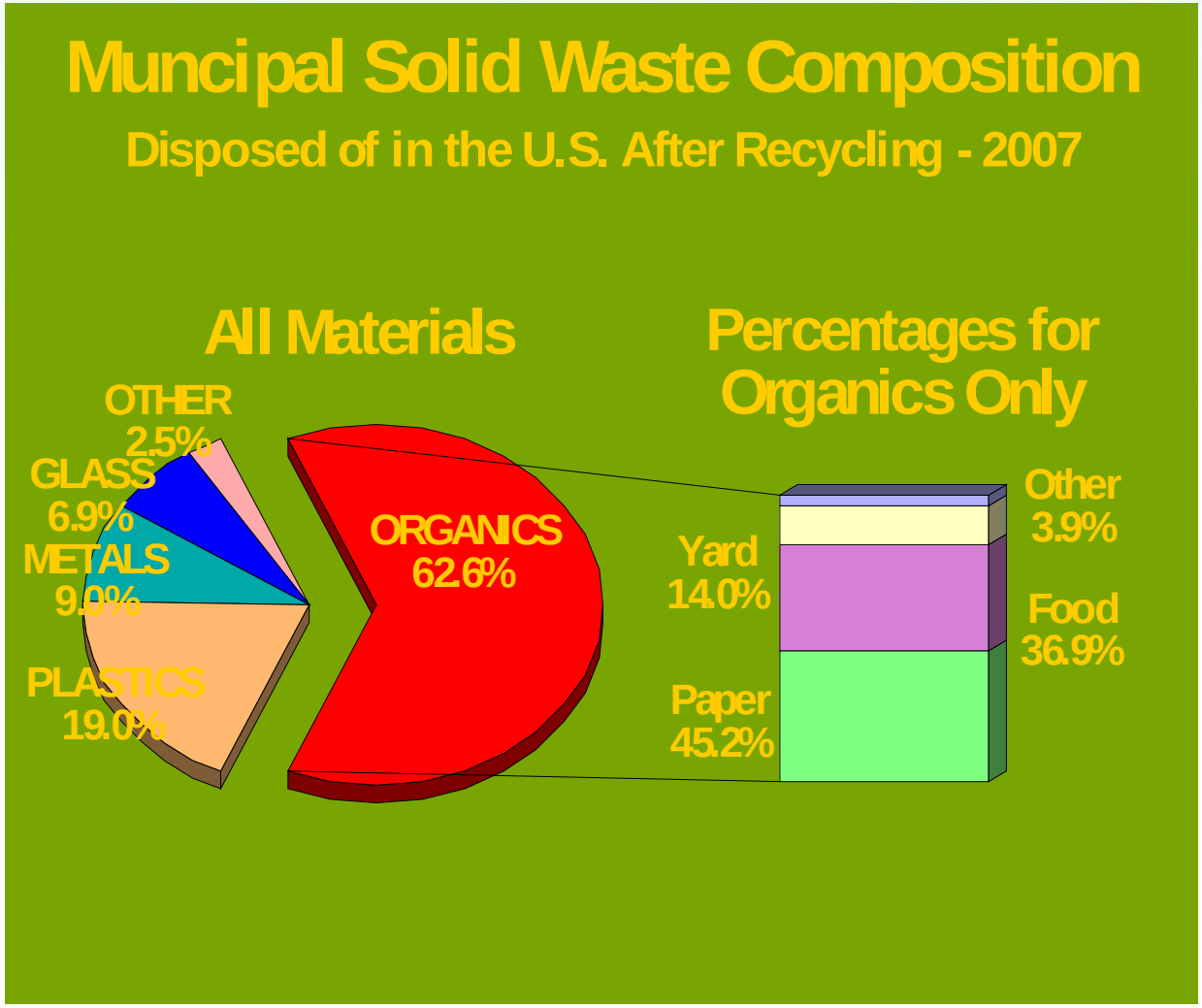
Community Values to Include in Plan

- Expanded re-use, recycling and composting to create jobs and local revenue
- Support for climate protection
- Increased reduction of waste at the source
- "Carbon-sensitive" collection for more types of discards
- Source separation if can optimize recovery
- Analyze Triple Bottom Line, Life-cycle, and GHG
- Product Stewardship & Extended Producer Responsibility
- Discards are feedstocks, second-life products, and energy resources
- Zero Waste, recognizing waste as economic inefficiency to eliminate
- Recover renewable energy from solid waste (incl. recovered landfill gas)
- Analyze public ownership of local facilities & City role in new infrastructure (e.g. new Larimer Co. Landfill)

Zero Waste & Global Warming

- Landfills are one of the largest sources of Greenhouse Gases (GHG)
- Methane is 21-72x more potent than CO_2
- 71 Tons "Upstream" For Every Ton MSW
- Recycling & composting all discards in CA = eliminating all auto exhaust in CA

Landfill methane is from rotting organics



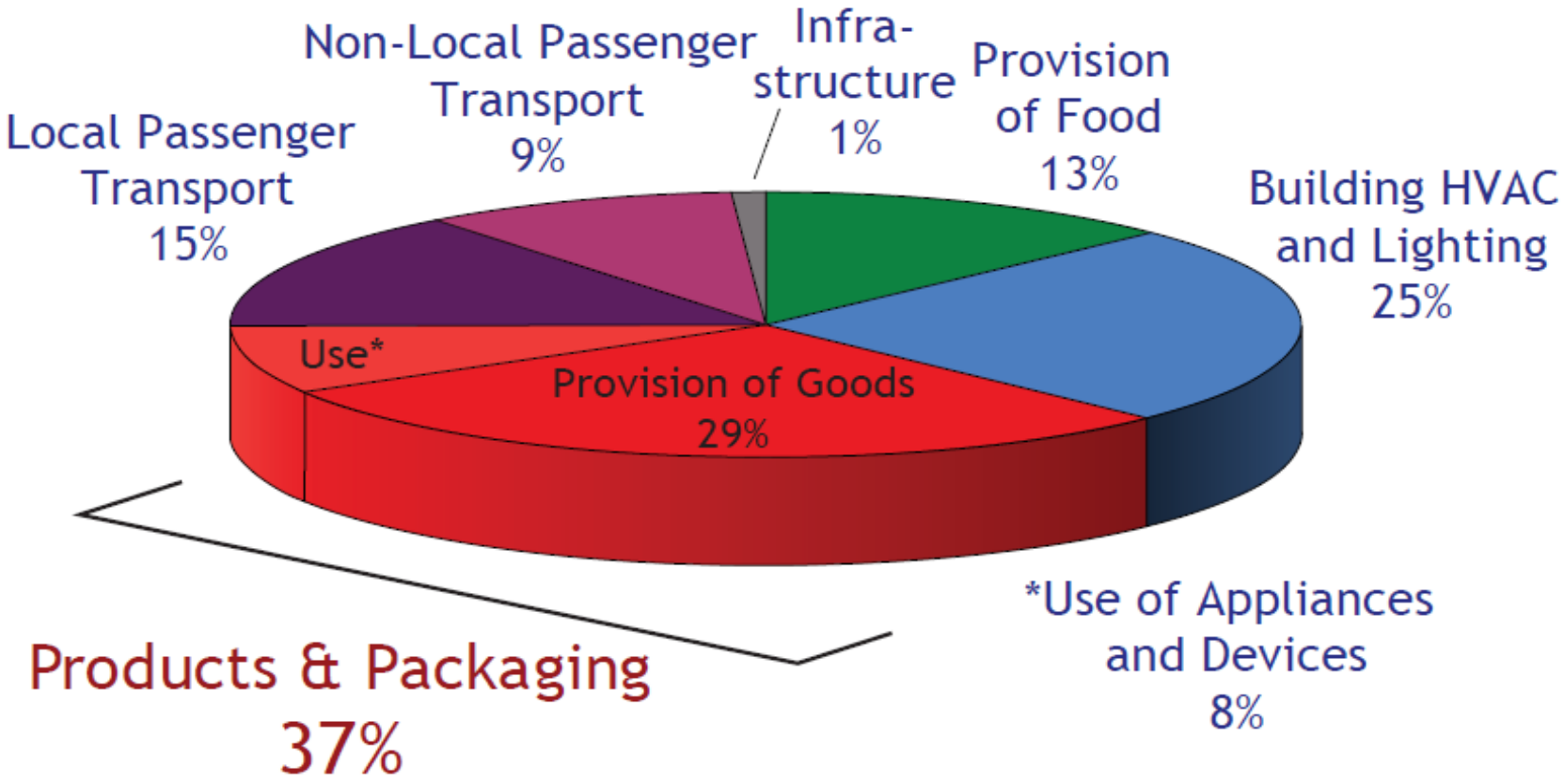


Figure 1: U.S. Greenhouse Gas Emissions: Systems-based view.
Source: U.S. EPA, 2009.

(Provision of Goods: all consumer goods including building components and vehicles.)

For more info: http://www.westcoastclimateforum.com/

Fort Collins Community-wide 2011 Greenhouse Gas Emissions

➢ Electricity (Gross)	45%
➢ Ground Travel	22%
➢ Natural Gas	19%
➢ Recyclable Materials Energy*	9%
➢ Air Travel	4%
➢ Landfill Gas	1%

*GHG emissions associated with having to manufacture new products when recyclables are thrown in the landfill.

Source: Fort Collins Climate Action Plan, 2011, page 7

Austin WARM Model Results

Table 3 - EPA WARM Model Summary[1]: Recycling/Composting vs. Landfilling

Material	Tons Landfilled	Total MTCE*	Tons Recycled / Composted	Total MTCE
Glass	50,000	518	50,000	(3,789)
Dimensional Lumber	12,000	(1,596)	12,000	(8,038)
Food Scraps	90,000	17,764	90,000	(4,874)
Yard Trimmings	200,000	(11,947)	200,000	(10,831)
Mixed Paper	360,000	34,187	360,000	(347,263)
Mixed Metals	50,000	518	50,000	(71,692)
Mixed Plastics	80,000	829	80,000	(32,600)
Mixed Organics	58,000	3,737	58,000	(3,141)
Aggregate	20,000	207	20,000	(42)
Total	**920,000**	**44,217**	**920,000**	**(482,270)**

*MTCE = Metric Ton Carbon Equivalent

Source: Austin Zero Waste Strategic Plan, 2008

What is Zero Waste?

- Zero Waste is a philosophy and a design principle for the 21st Century. It includes 'recycling' but goes beyond recycling by taking a 'whole system' approach to the vast flow of resources and waste through human society.
- Zero Waste maximizes recycling, minimizes waste, reduces consumption and ensures that products are made to be reused, repaired or recycled back into nature or the marketplace.

Source: GrassRoots Recycling Network, http://www.grrn.org/page/what-zero-waste

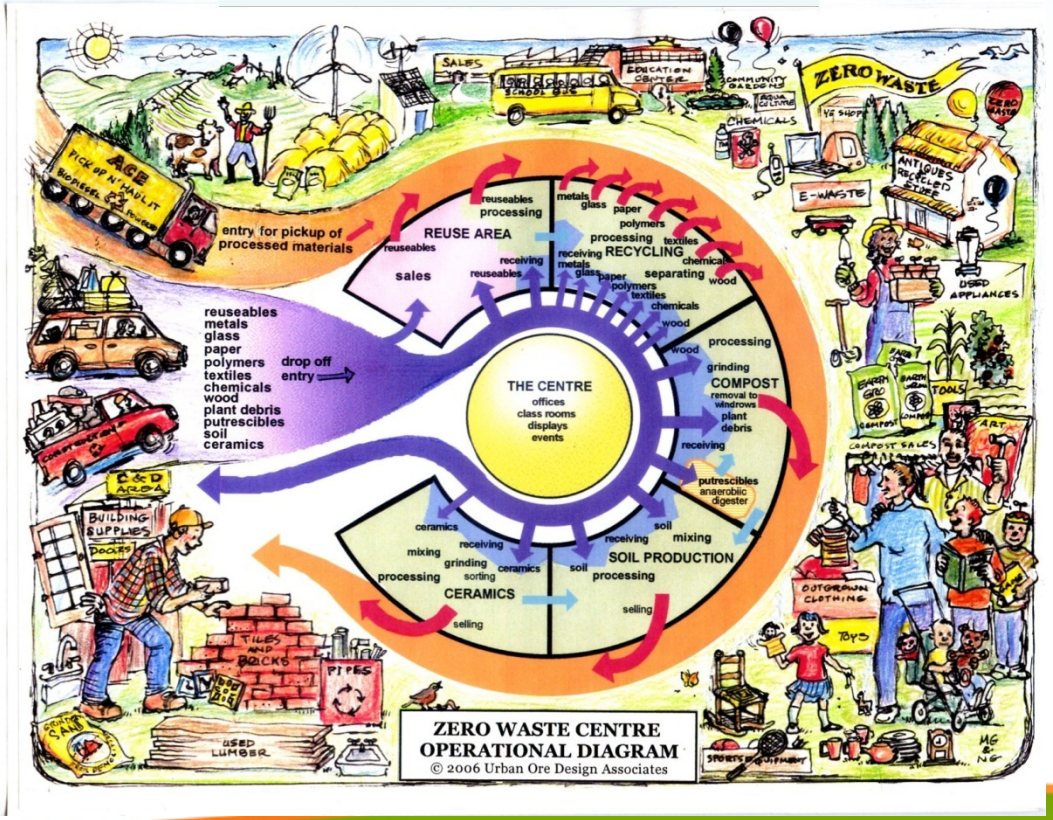
Upstream

- Clean Production
- Product Redesign
- Product Stewardship

Dranco, Brecht, Belgium

Downstream

- Reduce & Reuse
- Recycle
- Compost
- Clean Energy
- Resource Recovery Parks



Public Meetings

- June 11 – Reduce + Reuse (including product bans, Product Stewardship, Extended Producer Responsibility, Rate Structure Incentives)
- June 12 – Recycling (including residential, commercial, industrial, institutional, self-haul, construction + demolition)
- July 16 – Composting (including backyard, on-site, windrow, and in-vessel, for all organics)
- July 17 – Waste to Clean Energy (anaerobic digesters, biodiesel, mass burn, pyrolysis, gasification, plasma arc, RDF, cement kilns)

Review of Existing System

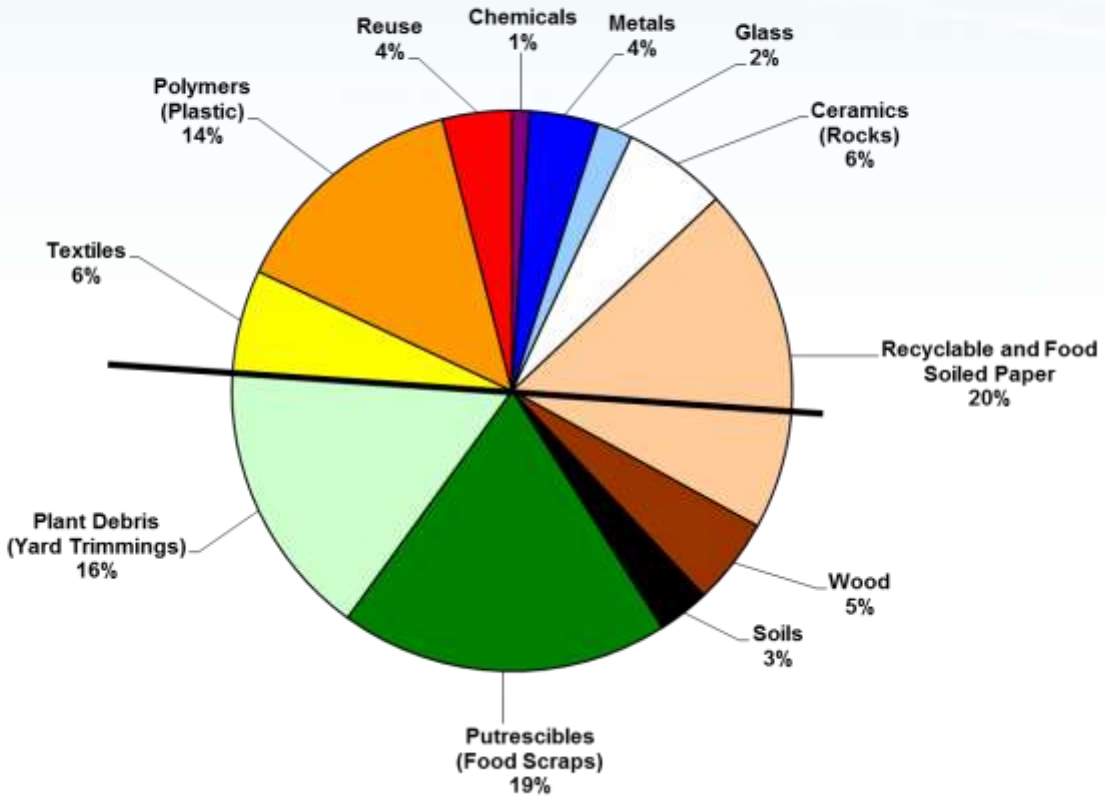
- Residential, Commercial, Industrial, Institutional, Self-Haul
- Policies and Programs
- Ordinances and Contracts
- Relevant State Laws
- Existing Reports
- Websites and Promotional Materials
- Tour Facilities and meet with Service Providers (Reuse, Recycling, Composting, Digestion, Landfills)
- Input from Public Meetings
- Stakeholder interviews

Businesses Leading the Way to Zero Waste in Fort Collins area

- Hewlett-Packard
- New Belgium Brewery
- Anheuser-Busch
- MillerCoors
- Intel
- Woodward

U.S. zero waste BUSINESS COUNCIL

Figure 1 - Fort Collins Colorado Discards Sorted into the 12 Market Categories July 2013



Note: Half of the materials are suitable for compost (those below the black line, including food soiled paper)

Fort Collins DRAFT 3 Commodity Analysis

Categories	%	Annual Tons	$/ton	Annual Revenues Lost ($)
1. Reuse	4	5,600	$400	2,240,000
2. Textiles	6	8,300	$80	664,000
3. Polymers	14	19,500	$100	1,950,000
4. Metals	4	5,600	$80	448,000
5. Glass	2	2,800	$20	556,000
6. Paper	25	34,800	$20	696,000
7. Putrescibles	14	19,500	$7	136,500
8. Plant Debris	16	22,200	$7	155,400
9. Wood	5	7,000	$8	56,000
10. Soils	3	4,200	$7	29,400
11. Ceramics	6	8,300	$4	33,200
12. Chemicals	>1	1,400	$1	1,400
	100	139,100		$6,465,900

Service Opportunity Analysis

- Food scraps
- Demolition Debris
- Durable goods (mattresses, carpet)
- Window and Other glass
- #3-7 & other plastic
- Wood
- Paint

Goals and Objectives

- **Zero Waste Goal by 2035**
  - 75% waste diversion by 2020
  - 90% waste diversion by 2025
- **Reduce Tons to Landfill** from 140,000 tons per year:
  - To 95,000 tons by 2020
  - To 55,000 tons by 2025
- **Reduce Per Capita Waste Disposal** from 5.12 lbs./person/day:
  - To 3.5 lbs. by 2020
  - To 2.2 lbs. by 2025

Goals and Objectives

- **Create new jobs & Add Value to Local Economy**
  - 150 jobs by 2020
  - 300 jobs by 2025
  - 434 jobs when fully Zero Waste
- **Reduce Greenhouse Gas Emissions**
  - Based on actual tons of landfilled waste:
  - Reduce annual emissions 60,000 MTCO2e by 2020, which = 12,500 cars off roads in Fort Collins
  - Reduce annual emissions 120,000 MTCO2e by 2025. which = 25,000 cars off roads in Fort Collins
  - Reduce annual emissions 187,389 MTCO2e by 2035. which = 39,000 cars off roads in Fort Collins

Values and Principles

- **Choice and Diversity** - Diverse solutions that build upon open competitive, free market system and entrepreneurial investments in new programs, facilities and services
- **Universal Opportunities** - For all sectors: single- and multi-family dwellings, industries, commercial businesses, institutions, visitors
- **New Rules and Incentives** –City's primary role is to adopt clear goals and to facilitate, educate, and enforce the rules that are adopted

Recommendations

1. Universal Recycling

- Update, expand, educate and effectively implement the City's Pay-As-You-Throw Ordinance
- **Residential**
  - Phase in over 2 years yard trimmings weekly for no less than six months/year to all and every other week trash
- **Multi-Family**
  - Include all multi-family dwellings within two years

Recommendations

1. Universal Recycling

- **Commercial**
  - Include all businesses within five years
  - At least equal amount of recycling as trash service
  - Share locking recycling and composting containers
  - Allow haulers to place additional recycling and composting containers in no more than two parking spaces

Recommendations

2. Prohibited Materials (from Landfilling)

- Build on existing (electronics and cardboard)
- Phase in when markets locally available:
  - **Conventional recyclables (bottles, cans, paper)**
  - **Yard trimmings**
  - **Construction debris**
  - **Demolition debris**
  - **White goods (large household appliances)**
  - **Food scraps and food soiled paper**

Recommendations

3. Construction, Deconstruction & Demolition (C&D)

- **Expand Building Code recycling requirements to**
  - Include remodeling, deconstruction, and demolition for projects over 2,500 square feet
  - Add more materials & require the reuse or recycling of 50%
  - Require refundable deposit to City at outset
  - Develop training programs for contractors, builders, and service providers

Recommendations

3. C&D (continued)

- **Adopt new Building Code deconstruction goals**
  - Require “soft strip” (to take out all items that are portable and detachable).
- **Assist industry to develop recycling facilities for construction, deconstruction and demolition materials**
- **Include strategies in Disaster Preparedness Plans for how to recycle debris when disasters occur**

Recommendations

4. Composting Organic Materials

- Adopt goal to phase out landfilling organics by 2018
- Collect yard trimmings weekly for at least 6 months/year
- Help develop composting facilities for all compostable organics (including food scraps and food-soiled paper).
- Require haulers to collect all compostable organics weekly, year-round, once facilities are available
- Develop more pilot composting & digestion programs

Recommendations

5. Reduce and Reuse

- Promote reusable shipping containers and returnable pallets
- Help provide robust move-in and move-out programs for reuse and recycling of furniture, appliances, floor coverings and equipment for apartments
- Reduce wasting food and support food donations

Recommendations

6. Waste-to-Clean-Energy

- **Develop & adopt Hierarchy of Highest and Best Use**
  - To assist in evaluation of technology proposals, and use of particular feedstocks,
  - To prioritize energy technologies and feedstocks the City would like to focus on
- **Encourage, and continue to partner with, Colorado State University to research and pilot innovative technologies for different applications**

Recommendations

7. Culture Change

- Place recycling bins in tandem with all City-serviced public trash bins with comprehensive signs
- Enhance programs to educate residents, businesses & visitors about how & where to reduce, reuse & recycle
- Expand staffing or interns to contact all businesses to assist them in complying with new rules
- City develop materials (including decals for containers) for haulers to distribute
- Require all venues and events with over 1,000 attendees to meet Zero Waste standards

Recommendations

8. Reinvest Resources in Local Economy

- **Engage City's economic development staff & tools**
- **Prioritize reuse and manufacturing activities, including:**
  - Wood –mini-sawmill for deconstructed lumber
  - Food - Support food donations and local composting & digestion
  - C&D debris – Help develop local recycling facility
  - Durable goods, mattresses, carpet, batteries and paint – Support startup of take-back programs.

Recommendations

8. Reinvest Resources in Local Economy

- Work with Colorado State University to research and develop innovative technologies for reuse, recycling, and composting, behavioral science research, and unique local markets or uses for recycled products
- Work with social service organizations to train and refer individuals as prospective employees in reuse, recycling or composting operations

Recommendations

9. Product Stewardship

- Adopt fees on products or packaging sold in Fort Collins that are hard to reuse, recycle or compost. (e.g., enact a litter fee on single-use paper or plastic bags & EPS)
- Work with CSU to ban plastic bottled water on campus
- Before any products are banned, develop a plan

Recommendations

10. Funding

- Adopt recycling investment fees on waste hauling services or waste shipped for landfilling
- Part of proceeds for City outreach and education materials and staffing, expanding the Integrated Recycling Facility into a Resource Recovery Park, & grants and loans for reuse, recycling and composting
- Other proceeds to help haulers implement programs

Recommendations

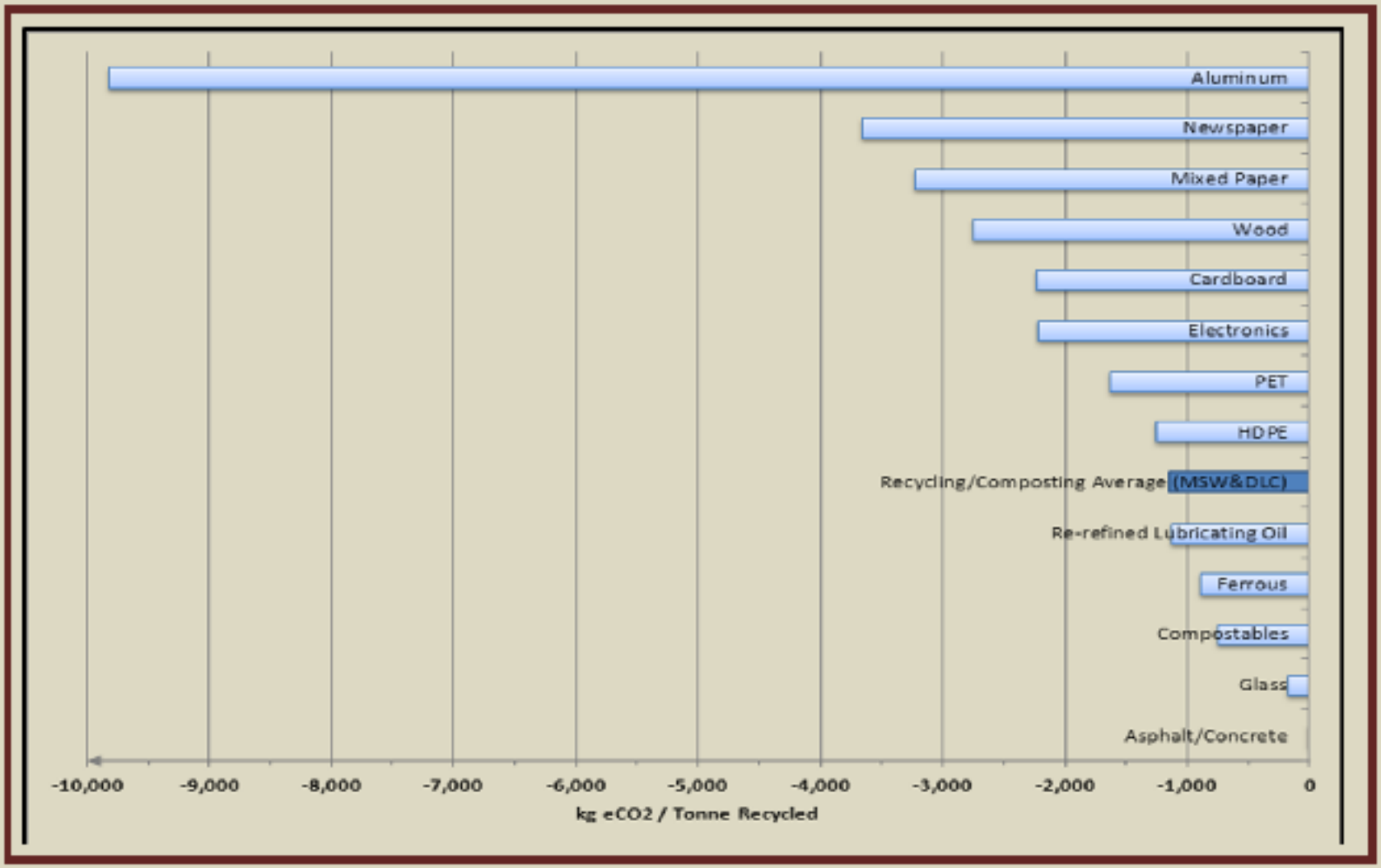
11. Regional Cooperation

- Public/private and/or intergovernmental partners to help ID locations and develop facilities (e.g., composting, C&D recycling, and more RR Parks)
- Collaborate & don't duplicate infrastructure
- Work with Larimer County and City of Loveland on regional options
- Work more broadly on C&D recycling facility to respond to natural disasters

Tell us what you think!

- Fill out Feedback Form at: http://fcgov.road-to-zero-waste-feedback.sgizmo.com/s3/
- Join the dialog at: https://groups.google.com/d/forum/zerowastefortcollins
- Susie Gordon, 970-221-6265, sgordon@fcgov.com
- Gary Liss, 916-652-7850, gary@garyliss.com
- See Past Community Conversations videos at: http://www.fcgov.com/zerowaste/community.php

GHG Reductions per Ton Recycled



Source: Recycling & Climate Change, Dr. Jeffrey Morris, Resource Recycling Conference, 10-27-10

Waste Reduction in San Francisco Climate Action Plan

- 302,000 tons reduced by:
  - Recycling and Composting
  - Construction and Demolition Waste Recycling
  - Source Reduction & Waste Prevention

Economic Value Of Pollution Reductions From Recycling In San Luis Obispo

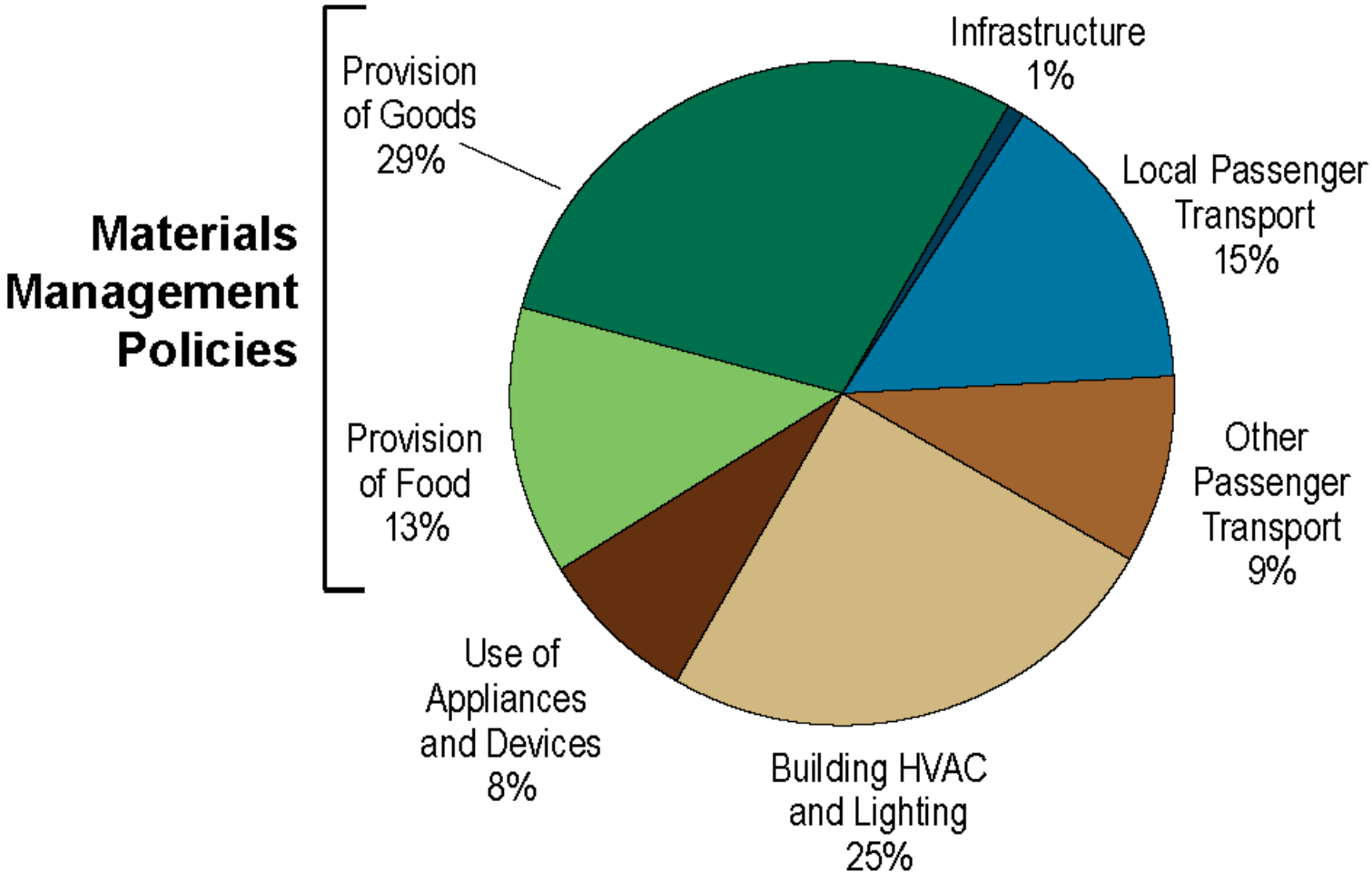
	Recycling Reductions Vs.			Pollutant	Value of Reductions	
	LFG	WTE	Units	Cost	LFG	WTE
Global Warming	4,513.9	3,679.7	lbs CO_2	$0.018	$81.25	$66.24
Acidification	12.8	3.0	lbs SO_2	$0.130	$1.66	$0.39
Eutrophication	0.3	0.08	lbs N	$0.002	$0.001	$0.0002
Criteria Air Pollutants	0.0002	0.0001	DALYs	$45,771	$9.53	$6.68
Human Toxicity	0.0005	0.0005	lbs Pb	$2.15	$0.001	$0.001
Ecological Toxicity	0.6	0.5	lbs 2,4-D	$1.45	$0.86	$0.72
Economic Benefit of Reductions Per Ton Recycled			=		$93.31	$74.03

How Far Can we Ship Recyclables?

INCREMENTAL ENERGY REQUIRED TO COLLECT, PROCESS AND TRANSPORT SOURCE SEPARATED RECYCLABLE OR COMPOSTABLE MATERIALS (Average)	
Incremental Collection Energy	86 kJ/kg
Additional Energy to Prepare Materials for Markets	96 kJ/kg
Breakeven	Kilometers to Markets
• Lowest Energy Savings	8,166 t o 36,250
• Highest Energy Savings	16,305 to 72,377

Source: Dr. Jeffrey Morris, Sound Resource Management, *Recycling versus incineration: an energy conservation analysis,* Journal of Hazardous Materials, 47 (1996)277-293, Elsevier

U.S. GHG Emissions (2006): Systems View



Urban Environmental Accords

- World Environment Day in SF 2005
- 100 Largest Cities Asked to Adopt
- Zero Waste by 2040 is one of Accords

Source: http://www.sfenvironment.org/our_policies/overview.html?ssi=15