City of Los Angeles

SOLID WASTE INTEGRATED RESOURCES PLAN - A ZERO WASTE MASTER PLAN

October 2013

COUNTING DOWN TO ZERO WASTE PLAN
Solid Waste Integrated Resources Plan

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Volume I Solid Waste Integrated Resources Plan

Phase 1 Forming the Zero Waste Guiding Principles

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Acknowledgements

City of Los Angeles

Volume I Solid Waste Integrated Resources Plan
Phase I Forming the Zero Waste Guiding Principles

Mayor
Eric Garcetti

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April 2015

Acknowledging the City representatives responsible for final adoption of the Solid Waste Integrated Resources Plan in April 2015.

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October 2013

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FSC

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List of Acronyms, Abbreviations, and Definitions

AB 32	Assembly Bill 32, The Global Warming Solutions Act of 2006
AB 341	Assembly Bill 341, Established the statewide goal of 75 percent by 2020 and mandatory commercial recycling by July 2012 (chaptered October 6, 2011)
AB 939	Assembly Bill 939, The California Integrated Waste Management Act of 1989 Public Resources Code, Section 40000 et seq.
Advanced Thermal Recycling	Advanced Thermal Recycling (ATR) is a second generation advancement of waste-to-energy technology in which municipal solid waste (MSW) is converted, in an oxygen rich environment, to a hot exhaust gas composed primarily of carbon dioxide and water vapor. The inorganic material is converted to bottom ash, for beneficial use, and fly ash which requires disposal. The hot exhaust gas can be used to generate heat or steam to in turn produce electricity. ATR is equipped with advanced pollution control technologies that include both Selective Catalytic Reduction (SCR) and Selective Non-Catalytic Reduction (SNCR) systems that effectively diminish air emissions to a greater extent than its predecessors. ATR technology has been commonly applied in Europe to produce energy from MSW. Currently, no facility of its type exists in the United States.
Alternative Technology[1]	"Alternative Technology" is a term that refers to specific technologies for treating residual solid waste, such as: thermal, biological, chemical, and physical technologies. Some examples of thermal technology include plasma arc gasification, pyrolysis, and Advanced Thermal Recycling. Some examples of biological technologies include anaerobic digestion and aerobic composting. Examples of physical technologies include autoclaving and advanced materials recovery systems.
Black Bin Materials	"Black bin materials" are discarded materials that are handled or controlled by the City directly or through permits, including discarded materials from residential, commercial, and institutional sources.

[1] *Evaluation of Alternative Solid Waste Processing Technologies*, URS Corporation, September 2005. http://www.alternativetechnology.lacity.org/PDF/final_report.pdf (accessed October 1, 2013).

List of Acronyms, Abbreviations, and Definitions (continued)

Blue Bin Materials	"Blue bin materials" are source-separated recyclable materials that have been separated from residual waste for recycling, including recyclable materials from residential, commercial, and institutional sources.
Bottle Bill	California Beverage Container Recycling and Litter Reduction Act
CA	California
CAA	The Clean Air Act of 1976
Cal/EPA	California Environmental Protection Agency
CalRecycle	California Department of Resources Recycling and Recovery
CARB	California Air Resources Board
C&D	Construction and demolition debris
CEQA	California Environmental Quality Act
CERCLA	The Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CHaRM	Center for Hard to Recycle Materials
City	City of Los Angeles
Conversion Technology[2]	"Conversion Technology" is a term that refers to specific solid waste processing technologies including, but not limited to, non-combustion thermal technologies, such as gasification and pyrolysis; chemical technologies such as acid hydrolysis or distillation; and biological technologies such as anaerobic digestion. For the purposes of this report, Conversion Technology is a subset of Alternative Technology consisting of technologies that do not employ direct combustion of the feedstock.
CNG	Compressed Natural Gas
DOC	Department of Conservation
DPW	Department of Public Works
DTSC	Department of Toxic Substances Control
EIR	Environmental Impact Report
EPA	Environmental Protection Agency

[2] California Environmental Protection Agency, New and Emerging Conversion Technologies Report to the Legislature, June 2007. http://www.calrecycle.ca.gov/publications/Documents/Organics%5C44205016.pdf (accessed October 1, 2013).

List of Acronyms, Abbreviations, and Definitions (continued)

EPR	Extended Producer Responsibility
EPS	Expanded Polystyrene Foam (typically used in take-out containers and coffee cups and also known as Styrofoam™)
GHG	Greenhouse Gas
Green Bin Materials	"Green bin materials" are source-separated organic materials that have been separated from residual waste for composting, anaerobic digestion, and mulching, including yard trimmings, food scraps, and compostable paper from residential, commercial, and institutional sectors.
HHW	Household Hazardous Waste
LANCER	Los Angeles City Energy Recovery
LASAN	City of Los Angeles Bureau of Sanitation
LAUSD	Los Angeles Unified School District
LEA	Local Enforcement Agency
MRF	Materials Recovery Facility
Multi-family complex	"Multi-family complex" or "Multi-family dwelling" is a building, structure, unit, or location designed for residential occupancy, exclusive of "Single-family residences." These are typically apartments, townhomes, and condominiums. Multi-family residences consisting primarily of three (3) and four (4) units are serviced by LASAN. Multi-family dwellings with five (5) units or more are primarily serviced by private sector commercial haulers. Some multi-family dwellings of five (5) units or more that have continually received City service have been "grandfathered" into public collection and will continue to receive residential curbside collection services from LASAN.
PAYT	Pay-As-You-Throw
PSD	Prevention of Significant Deterioration
RENEW LA	Recovering Energy, Natural Resources, and Economic Benefit from Waste for Los Angeles
Residential curbside	"Residential curbside" customers include generators in single-family residences and some multi-family residences, primarily with four units or less, serviced by LASAN.

List of Acronyms, Abbreviations, and Definitions (continued)

Residual waste	"Residual waste" or "residual solid waste" refers primarily to the discarded materials that remain after reducing, reusing, recycling, and composting; or after processing the materials through a mixed materials processing facility. This material can be further converted into energy or fuel through an Alternative Technology facility or disposed as solid waste in a landfill.
RCRA	The Resource Conservation and Recovery Act of 1976
RMDZ	Recycling Market Development Zone
RPS	Renewable Portfolio Standard
S.A.F.E.	Solvents, Automotive, Flammables, and Electronics
SARA	The Superfund Amendments and Reauthorization Act of 1986
SCAQMD	South Coast Air Quality Management District
Single-family	"Single-family residence" or "Single-family home" is a building designed for residential occupancy, and containing one or two dwelling units (duplexes).[3] Single-family residences and duplexes are serviced by LASAN.
Solid waste	"Solid waste" has the meaning set forth the California Public Resources Code Section 4019[4] and includes all discarded materials (residential, commercial, industrial, and institutional).
SRCRD	Solid Resources Citywide Recycling Division
State	State of California
SWIRP	*Solid Waste Integrated Resources Plan*
UNLV	University of Nevada, Las Vegas
U.S. (or US)	United States
Wasteshed	"Wasteshed" refers to geographic area within the City of Los Angeles consisting of a residential solid waste collection district. The City is divided into six wastesheds: East Valley, West Valley, South Los Angeles, North Central, West Los Angeles, and Harbor.

[3] Los Angeles Municipal Code, Chapter VI Public Works and Property, Article 6.1, Section 66.40.
[4] California Public Resources Code, http://law.justia.com/california/codes/prc/40100-40201.html. (accessed October 1, 2013).

List of Acronyms, Abbreviations, and Definitions (continued)

Waste-to-energy	"Waste-to-energy" is the process of combusting material in a chamber to produce heat. The heat flows through a boiler to produce steam to generate electricity. The system is equipped with pollution-control systems to reduce air emissions.
Zero Waste	"Zero Waste" maximizing diversion from landfills and reducing waste at the source, with the ultimate goal of striving for more-sustainable solid waste management practices.[5]

[5] The internationally peer-reviewed definition of "Zero Waste" was developed by the Zero Waste International Alliance, http://zwia.org/standards/zw-definition/ (accessed October 1, 2013).

Executive Summary

The City of Los Angeles (City) is part of a worldwide movement to re-evaluate attitudes toward consumption, disposal, product stewardship, and infrastructure to reduce waste and promote sustainability. The City has been a leader in protecting its natural environment and the health and safety of its residents. The City's Bureau of Sanitation (LASAN) has been responsible for the safe and efficient management of solid waste generated within the City since 1890.

On June 28, 2005, the City Council approved the adoption of a Zero Waste goal. Upon this approval, the City Council directed LASAN to expand existing programs and create new programs, as necessary, to accomplish this goal using the *Recovering Energy, Natural Resources, and Economic Benefit from Waste for Los Angeles (RENEW LA) Plan* as a guiding document.

The *RENEW LA Plan*, adopted in February 2006, provided a blueprint for Zero Waste; it identified 12 goals to set the City on the path to Zero Waste. The goal of Zero Waste as defined by the *RENEW LA Plan* is to reduce, reuse, recycle, or convert the resources currently going to disposal so as to achieve an overall diversion rate of 90 percent or more by the year 2025.

In 2006, the City committed to the following goals:

- Achieve 70 percent diversion by 2013, which has since been accelerated to 75 percent by 2013
- Site an Alternative Technology facility in the City
- Convert the LASAN collection truck fleet to clean-burning fuel
- Implement a stakeholder-driven *Solid Waste Integrated Resources Plan* (SWIRP)

In April 2007, LASAN began an intense stakeholder-driven process to develop SWIRP, the long-range Zero Waste master plan. During the first phase, which was completed in May 2008, a total of 256 public outreach meetings were conducted (109 key constituent meetings, 27 grassroots house meetings, 75 business interviews, 42 regional workshops in the six wastesheds throughout the City, and three citywide conferences). Over 3,000 stakeholders have been engaged in the development of the *Zero Waste Plan*.

During the year-long planning process, stakeholders gathered in regional workshops and citywide conferences to establish the vision and goals for achieving Zero Waste. The City conducted six workshops in each of the six wastesheds and a workshop in a downtown citywide location (42 workshops total) as well as three citywide conferences.

In May 2008, the SWIRP stakeholders identified the road to Zero Waste by developing the following 12 guiding principles:

1. **Education to decrease consumption** – Stakeholders felt that the City should instill a "zero waste culture" in Los Angeles. A key strategy for increasing awareness among the next generation of Angelenos was the stakeholder recommendation to partner with Los Angeles Unified School District to develop a Zero Waste curriculum and increase recycling in the schools.

2. **City leadership as a model for Zero Waste practices** – Stakeholders agreed that the City should "walk its talk" by demonstrating leadership in recycling at all City facilities and parks and by modeling Zero Waste behaviors such as phasing out expanded polystyrene foam takeout containers.
3. **Education to increase recycling** – Stakeholders asserted that the City should put more emphasis on educating residents and businesses about existing City programs and should encourage them to make recycling and Zero Waste "second nature."
4. **City leadership to increase recycling** – Stakeholders want the City to use its stature in Sacramento to lobby for State legislation on initiatives that are best implemented at the state level, such as producer responsibility and packaging legislation.
5. **Manufacturer responsibility** – Stakeholders supported initiatives to encourage or require producers of products and packaging to take responsibility for the "end of life" management of those products and packaging.
6. **Consumer responsibility** – Stakeholders believed that consumers, including residents and businesses, need to be part of the solution and should be required to participate in recycling and composting programs.
7. **Convenience** – Stakeholders felt that recycling programs should be convenient and that it should be as easy to recycle as it is to waste. A key strategy for increasing convenience is to provide recycling receptacles wherever there are waste receptacles.
8. **Incentives** – Stakeholders suggested that the City provide more incentives for recycling and composting, such as "pay-as-you-throw" rate structures.
9. **New, safe technology** – Stakeholders supported the development of new technology for managing the City's waste. However, stakeholders emphasized that the technology would need to be demonstrated to be safe and should not impact already burdened communities.
10. **Protect public health and the environment** – Stakeholders strongly believed that protecting public health and the environment should be at the forefront of all decision-making. When embarking on any new idea or plan, the City should carefully consider the long-term consequences and impacts.
11. **Equity** – Throughout the planning process, stakeholders supported the concept of equity—shared responsibility for taking care of our waste problems. Stakeholders felt that all areas of the City should share in the burden and benefits of new facilities and that new developments should pay their fair share of the system-wide costs. All generators should have access to recycling and composting programs, and sensitive environmental areas and communities should not be burdened with waste impacts. Green jobs created by new programs and facilities should support the local communities, including disadvantaged youth and recently incarcerated residents who need help transitioning back into the community.

12. **Economic efficiency** – Stakeholders felt that the City must invest carefully in new programs and facilities, but costs should not outweigh other considerations. The City should also consider the long-term economic benefits of reducing waste and creating a more-sustainable society. The City should find solutions that are both economically efficient and environmentally preferable and should promote economic sustainability through investment in green jobs and economic development.

During Phase 1, the stakeholder process identified the steps the City needs to take to become a leader in Zero Waste. Stakeholders provided the City with their vision for a sustainable City, in which the City demonstrates its leadership in recycling and Zero Waste; all residents and businesses fully participate in the City's recycling and composting programs; and all future generations learn and share in the goals and values of Zero Waste. Stakeholders identified and discussed the policies, programs, and facilities that will be needed to implement this vision, which was addressed in Phase 2 of the SWIRP planning process and documented in the *Policy, Program, and Facility Plan*.

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Section 1 Introduction

The City of Los Angeles (City) Bureau of Sanitation (LASAN) initiated a stakeholder-driven planning process in the spring of 2007 to develop the City's *Solid Waste Integrated Resources Plan* (SWIRP), a long-range master plan for solid waste management in the City. The process brought together residents, businesses, and organizations with the goal of developing a comprehensive plan. This report provides the background and planning context for the plan; it also describes the process that led to the development of the 12 guiding principles.

1.1 Background

The City entered into the planning process for SWIRP during a dynamic period in solid waste management planning:

- **Regulatory Environment** – Having achieved 50 percent diversion from landfills in California, the State legislature, regulatory agencies, and communities throughout California are setting their sights on higher diversion goals.
- **Embracing Zero Waste** – Faced with limited landfill capacity, dwindling natural resources, and concerns about environmental impacts, communities around the world have embraced the concept of Zero Waste.
- **Global Environment** – The potential impacts of climate change have driven local, state, and federal governments to adopt strategies for reducing greenhouse gas emissions.

This section provides an overview of Zero Waste from a global perspective and describes the City's history, key policy issues, and regulatory climate that have driven the development of this plan.

1.1.1 A Global Perspective

1.1.1.1 Vision of a World without Waste

> "Zero Waste should become second nature as part of the culture of the family, education system, and community."
>
> *Jay Goldberg, North Central Regional Working Group*
> *SWIRP Goals and Objectives Workshop, September 2007*

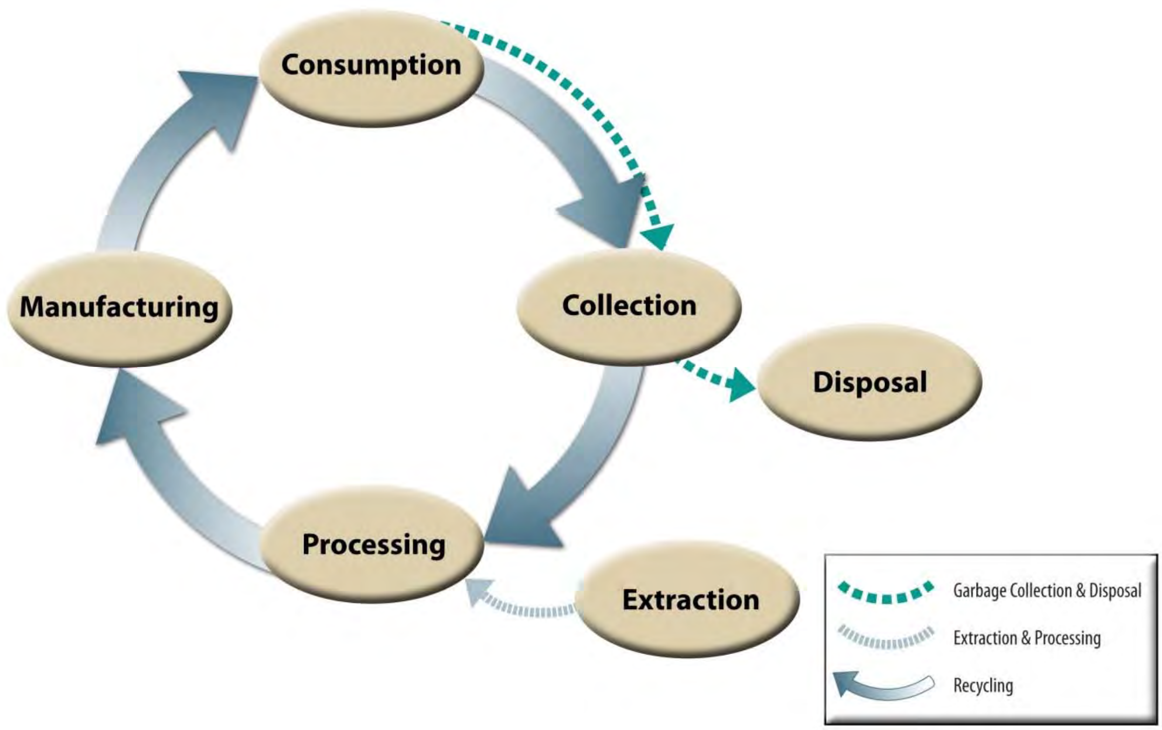
Stakeholders in the City embraced the concept of Zero Waste, where the practice of extraction, consumption, and disposal are shifted from a linear process to a closed loop system where discarded materials become resources. This "Zero Waste Loop" is illustrated in Figure 1. Zero Waste is not a literal goal that achieves "100 percent recycling," since there could continue to be some materials that cannot be recycled and cannot be redesigned. However, the vision of Zero Waste is to strive for sustainability by actively maintaining existing programs and seeking new opportunities for diversion. This vision is shared by the City's leadership and by stakeholders in the City.

1.1.1.2 What is Zero Waste?

As defined by the GrassRoots Recycling Network,[6] Zero Waste is a design principle that goes beyond recycling and focuses on reducing waste primarily, then reusing and recycling products, and composting the remaining organics. Zero Waste works to redesign the system to mimic natural systems in which all materials are a resource for another benefit or use. As illustrated in Figure 1, Zero Waste systems strive to eliminate waste by reducing consumption and getting products and packaging redesigned for repair and reuse and then recycled back to the marketplace or composted back into soil.

In this report, the term "Zero Waste" means maximizing diversion from landfills and reducing waste at the source, with the ultimate goal of striving for more-sustainable solid waste management practices.

Figure 1: The Zero Waste Loop



[6] GrassRoots Recycling Network, http://www.grrn.org/zerowaste/zerowaste_faq.html (accessed October 1, 2013).

1.1.1.3 Zero Waste around the World

> "Zero Waste begins when we realize that there is no 'away' into which we can throw what we call our waste. This center is a visible demonstration of the economic and aesthetic potential of what we discard."
>
> *G. Ananthpadmanabhan, Executive Director, Greenpeace India*[7]

The City is part of a worldwide movement that began in the mid-1990s as communities recognized that waste was not inevitable and cities could plan for a future that went beyond "end of pipe" strategies, a future in which waste is regarded as a resource rather than a discarded material. Several countries around the world have embraced the Zero Waste vision. The following examples are of Zero Waste communities from around the world.

Canberra, Australia. In 1996, Canberra, the capital city of Australia, became the first government to adopt a "Zero Waste" strategy after a year-long community outreach process that engaged special interest groups, local governments, and professional organizations. The "No Waste by 2010" plan set a goal of 95 percent diversion through residential curbside recycling, construction and demolition (C&D) debris diversion, anaerobic digestion and composting of organic materials, and regulation of non-recyclable packaging. Canberra achieved 75 percent diversion in 2009. The government is working on a new strategy to take the "no waste" principle beyond 2010.[8]

New Zealand. Since 1999, 51 out of the 71 local governments in New Zealand have adopted a Zero Waste policy, with most aiming for Zero Waste by 2015. This policy included a commitment to full and open community participation and ownership of a Zero Waste strategy involving community, council, and business sector partnerships. In September 2008, New Zealand passed the "Waste Minimisation Act," which contains two main provisions: the waste levy provision assesses $10 per ton on landfilled waste, and the product stewardship provision allows the government to require the private sector to divert priority products through waste reduction and recycling.[9] Community groups and grassroots enterprises play a large role in waste reduction initiatives in New Zealand. These waste reduction initiatives help create green jobs and generate income for local communities.

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[7] October 22, 2003, at an event advocating for extended producer responsibility in Kovalam, Kerala, India.
[8] ABC News, "The ACT Government's aim of 'No Waste by 2010' will not be met as Canberra's waste level continues to climb." March 1, 2010. http://www.abc.net.au/news/video/2010/02/26/2831779.htm (accessed October 1, 2013).
[9] Zero Waste New Zealand, Waste Minimisation Act, http://www.zerowaste.co.nz/whats-nz-doing/waste-minimisation-act/ (accessed October 1, 2013).

Kamikatsu, Japan. In 2003, the village of Kamikatsu set a goal of Zero Waste by 2020. The village's two thousand residents separate materials in 34 categories for reuse, recycling, and composting. Ninety-eight percent of the population uses home composters, and reusable and recyclable items are taken to the village's Zero Waste centers. As a result, the village's recycling rate has increased from 55 percent to 80 percent.[10]

Zero Waste Center in Kamikatsu, Japan

Kovalam, Kerala, India. Kovalam is a small fishing village on the coast of the Arabian Sea near Kerala's capital city, Thiruvananthapuram. Kovalam became a tourist destination in the 1990s, and with the tourists came trash. Kovalam built resource recovery parks for reusable, recyclable, and repairable materials; developed biogas to energy plants to divert biodegradable materials; and trained local community-based manufacturers to provide alternatives to non-recyclable products through local enterprises, creating 160 jobs between 2002 and 2005.[11]

Canada. Fifteen local governments in Canada have established a goal of Zero Waste. Industry-led product stewardship is the focus of the province of British Columbia, where producers and consumers of products are responsible for end-of-life product management, rather than taxpayers or local government. The Recycling Regulation, enacted on October 7, 2004, under the authority of the Environmental Management Act, currently includes product categories for electronics, tires, beverage containers, used oil, oil filters and oil containers, paint, pharmaceuticals, and residuals (flammable liquids, solvents,

[10] The Guardian, "Climate change: How quest for Zero Waste community means sorting the rubbish 34 ways," August 4, 2008, http://www.guardian.co.uk/environment/2008/aug/05/recycling.japan (accessed October 1, 2013).
[11] International POPs Elimination Project, "Case study of Zero Waste Kovalam: A progressive waste management programme with a focus on the best available technology options and material substitution," April 2005, http://www.ipen.org/ipepweb1/library/ipep_pdf_reports/7ind%20zero%20waste%20kovalam.pdf (accessed October 1, 2013).

pesticides, and gasoline). The regulation makes the producer (manufacturer, distributor, or importer) responsible for the lifecycle management of their products, including financing the collection and recycling of discarded products.[12]

1.1.1.4 Zero Waste in California

Several communities in California have adopted Zero Waste strategies to manage their community's waste and resources. Since 2000, the following communities across California have adopted Zero Waste as a goal:[13]

- Alameda
- Berkeley
- Burbank
- Capitola
- Del Norte County
- El Cajon
- Fairfax
- Fresno
- Glendale
- Los Angeles
- Marin County
- Mountain View
- Novato
- Oakland
- Ocean Beach
- Oceanside
- Pasadena
- Palo Alto
- San Bernardino County Zero Waste Communities
- San Diego County (Citizens Advisory Committee only)
- San Francisco
- San Jose
- San Juan Capistrano
- San Luis Obispo County
- Santa Cruz County
- Santa Monica
- Scotts Valley
- Sonoma County (Local Task Force, citizens committee only)
- Sunnyvale
- Watsonville

1.1.1.5 New Technology

A strategy for maximizing diversion from landfills is the development of new technology for processing residual waste—the waste that is left over after reducing, reusing, recycling, and composting. The terms often used to label these new technologies are "Conversion Technology" and "Alternative Technology."

"Conversion Technology" is the term used by CalRecycle to describe new and emerging non-combustion thermal, chemical, and biological technologies. "Alternative Technology" is the term used by the City to refer to both new and emerging technologies and proven commercial scale technologies, including those that use combustion, such as advance thermal recycling.

[12] British Columbia Ministry of Environment: "Product Stewardship in B.C.," http://www.env.gov.bc.ca/epd/recycling/history/history.htm (accessed October 1, 2013)
[13] Zero Waste International Alliance: http://zwia.org/news/zero-waste-communities/ (accessed October 1 2013, 2013)

Since 2003, the City has investigated options for diverting waste through Alternative Technologies such as: thermal, biological, chemical, and physical technologies for treating waste. Examples of thermal technology include plasma arc gasification, pyrolysis, and advanced thermal recycling. Examples of biological technologies include anaerobic digestion and aerobic composting. Examples of physical technologies include autoclaving and advanced materials recovery systems. These technologies are all methods to process discarded materials as alternatives to landfilling them in order to generate energy (both electrical and thermal) and recover useful by-product materials.

The City has evaluated vendor proposals for commercial-scale technologies (200 to 1,000 tons per day) and emerging technologies (up to 200 tons per day). The City is currently undergoing a citywide siting study to potentially locate an Alternative Technology facility.

Alternative Technology facilities are used to manage solid waste in the United States (U.S.), Europe, Israel, Asia, and Canada. However, in the U.S., the only technology that has been implemented on a commercial scale is waste-to-energy. There have been pilot demonstrations of other new and emerging technologies in the U.S., but the absence of larger-scale commercial facilities in this country has been an obstacle in demonstrating the capabilities of these technologies for processing residual solid waste.

Public-sector interest in conversion technologies has increased in the U.S. in recent years, based on the desire to enhance recycling and the beneficial use of waste, reduce dependence on landfills and imported fossil fuels, and reduce greenhouse gas emissions. In addition to the City of Los Angeles, investigations and initiatives have been conducted or are underway in the following cities:

- Los Angeles County, California
- Salinas Valley Solid Waste Authority, California
- Santa Barbara (City and County), California
- San José, California
- New York, New York
- St. Lucie County, Florida
- Taunton, Massachusetts

Conversion technologies are still emerging as methods to process residual waste. Gasification is used at the commercial scale for coal, and plasma arc technology is used at the commercial scale to treat hazardous and radioactive wastes. Anaerobic digestion is used at the commercial scale for homogenous food processing waste and manures. However, each of these technologies has limited experience with mixed waste feedstocks.

Barriers to implementing Alternative Technology facilities (inclusive of conversion technologies) include regulatory requirements, potential facility impacts, funding, and siting concerns. The City's objective in evaluating new technology is to identify safe and proven methods for diverting residual solid waste from landfilling that are environmentally sound, energy-efficient, and socially and economically acceptable.

1.1.2 The City's History of Managing Waste

The Bureau of Sanitation (LASAN) has been managing solid waste since 1890 and collecting solid waste from residential curbside customers since 1943. Since that time, the City's waste-handling trends have evolved from the very early days when residents and businesses typically burned or buried waste in their back yards to state-of-the art programs and facilities focusing on maximizing diversion from disposal. Table 1 provides a timeline of waste management milestones achieved in the City of Los Angeles.

Table 1: City of Los Angeles Waste Management Timeline

City of Los Angeles Waste Management Timeline	
1890	First solid waste incinerator constructed in the City
1943	Residential collection provided by LASAN, including separate collection of organics and recyclables
1957	Backyard incineration banned in response to concerns about air quality
1961	Sam Yorty elected mayor on a platform of ending source-separated collection
1960s	Bishops Canyon, Branford, and Gaffey Street landfills close
1974	Sheldon-Arleta Landfill closes
1979	City Council directs LASAN to evaluate alternatives to reduce the City's reliance on landfill disposal
1985	Toyon Canyon Landfill closes and LASAN initiates pilot recycling program to collect plastic, paper, glass, tin, and aluminum
1987	Los Angeles City Energy Recovery (LANCER) project terminated due to public concern about environmental impacts and lack of public input
1989	*Citywide Recycling Implementation Plan* and Long-Haul Study developed; *Solid Waste Management Plan* initiated
1989	California legislature passes California Integrated Waste Management Act of 1989 (AB 939),[14] which mandates that cities and counties achieve 25 percent diversion by 1995 and 50 percent by 2000
1990	LASAN begins implementation of yellow bin curbside recycling, green bin yard trimmings collection, and holiday tree recycling program; LASAN implements automated collection for residential curbside solid waste, introducing the "black bin"
1992	City develops AB 939 Source Reduction and Recycling Element

[14] The California Integrated Waste Management Act of 1989 (AB 939) Public Resources Code, Section 40000 et seq. This California legislation is commonly referred to as AB 939, and references to it often imply the State-mandated diversion requirements associated with the Act.

City of Los Angeles Waste Management Timeline (continued)	
1993	*Solid Waste Management Plan* completed; LASAN implements horse manure diversion program; LASAN implements automated collection for residential curbside yard trimmings, introducing the "green bin"
1995	LASAN implements tire recycling program, and curbside collection program expands citywide
1996	Lopez Canyon Landfill closes
1997	LASAN implements automated collection for residential curbside recycling, introducing the "blue bin"
2000	City develops *Solid Resources Infrastructure Strategy Facilities Plan*, LASAN implements electronic waste recycling program, and LASAN begins conversion of collection trucks to Liquefied Natural Gas (LNG) fuel to reduce emissions; City achieves 58.8 percent diversion
2001	City develops Waste Characterization and Quantification Study and Year 2000 AB 939 Report
2003	LASAN initiates research on Alternative Technologies
2004	LASAN implements multi-family pilot recycling program
2005	City Council approves a goal of Zero Waste, Councilmember Greig Smith issues report titled "Recovering Energy, National Resources, and Economic Benefit from Waste for Los Angeles" (*RENEW LA*), and LASAN publishes report on Evaluation of Alternative Solid Waste Processing Technologies
2006	City Council adopts *RENEW LA* as a blueprint for Zero Waste
2007	*Solid Waste Integrated Resources Plan* initiated, citywide multi-family recycling program available to all buildings, and LASAN increases materials accepted in the curbside recycling program
2008	City Council bans expanded polystyrene foam containers at City facilities, LASAN implements residential food scraps pilot collection program, and stakeholders sign on to the SWIRP guiding principles
2009	LASAN drafts *Policy, Program, and Facility Plan* based on stakeholder input
2011	City adopts a mandatory C&D recycling ordinance; City achieves 76.4 percent diversion
2012	Assembly Bill 341 is implemented requiring large commercial generators and multi-family complexes to recycle
2013	City Council approves single-use bag ban beginning January 1, 2014, and approves commercial and multi-family franchise initiative and implementation plan

Sources: *City of Los Angeles Solid Waste Planning Background Studies Summary Report, January 2006; City of Los Angeles Year 2000 AB 939 Report, August 2001; Solid Resources Infrastructure Strategy Facilities Plan, November 2000;* LASAN program data.

1.1.2.1 City Programs

The City operates the largest municipal waste management fleet in the country, collecting recyclables, yard trimmings, and residual waste from 750,000 residential curbside customers in the City. The City's collection fee structure uses a Pay-As-You-Throw (PAYT) system for residential curbside collection, based on the number of black bins.

The City currently collects the following materials in the blue bin for recycling:

- Mixed clean paper, including newspapers, magazines, and telephone directories
- Cardboard boxes and chipboard
- Cartons (aseptic packaging) including fruit juice boxes, milk cartons, and soup cartons
- Aluminum foil
- Aluminum, tin, steel, and bi-metal cans
- Empty paint and aerosol cans (with caps removed)
- Wire hangers and small scrap metal items
- Glass bottles and jars including soda, sauce, and other food jars
- All clean plastics labeled 1 to 7
- Plastic and film bags, including clean grocery and dry cleaner bags
- All clean expanded polystyrene foam (e.g., Styrofoam™)
- Miscellaneous plastics including plastic coat hangers, non-electronic toys, and laundry baskets

The City currently collects the following materials in the green bin for mulching and composting:

- Grass
- Leaves
- Weeds (dirt removed)
- Tree branches
- Clean wood (free of nails, paint, or other treatment)

The City implemented a residential food scraps pilot program in September 2008 for 8,700 households in the South Los Angeles and North Central wastesheds. During the pilot, the City collected the following additional materials for diversion as part of the green bin service:

- Food scraps, including fruits, vegetables, grains, meat, and bones
- Compostable paper, including napkins, paper towels, food-contaminated paper, and cardboard, such as takeout containers and pizza boxes

The City also provides special residential collection services including bulky item collection, appliance and electronics recycling, and horse manure collection. In addition, the City operates seven centers for Solvents, Automotive, Flammables, and Electronics (S.A.F.E. Centers) and provides mobile collection events for used oil and electronic waste (e-waste).

Private-sector haulers, regulated by LASAN, provide solid waste collection for the City's multi-family complexes (with more than four units), commercial buildings, and industrial facilities. LASAN provides technical assistance to all private businesses to help them reduce the quantity of solid waste.

The City's Solid Resources Citywide Recycling Division (SRCRD) has implemented a Los Angeles Unified School District (LAUSD) recycling program. The program provides educational outreach as well as recycling services with 90-gallon curbside blue bins to all schools. The interactive presentations are targeted to 3rd-, 4th-, and 5th-grade students, and they include topics such as the three Rs (reduce, reuse, and recycle) and overviews of the City's landfills and waste stream. Blue bin recycling collection services are provided to all schools within the City in the LAUSD. As of 2013, all schools are participating in the LAUSD recycling program. SRCRD provides 650 school presentations to approximately 20,000 students each year, which is now augmented by the contracted hauler for the school district. Overall, the program has educated over 120,000 students to date.

Additional programs managed by LASAN include:

- Restaurant food scraps recycling program, which encourages local restaurants to divert food scraps and other compostable organics generated in the kitchens from disposal. Participating restaurants are given a specially marked "Food Waste Only" bin, which a private hauler collects up to six times per week. The restaurant maintains its existing solid waste hauler for trash pick-up.
- Multi-family blue bin recycling that is available to all buildings at no charge through the City's contracted collectors.
- Technical assistance to businesses to develop office and commercial recycling programs.
- Directing the flow of C&D waste through Building and Safety project permit requirements in order to ensure that these materials go to processing facilities for maximum recovery.
- Recycling Market Development Zone (RMDZ) program, a State-funded program implemented by the City to provide funding and technical assistance to recycling and reuse businesses operating within the City.

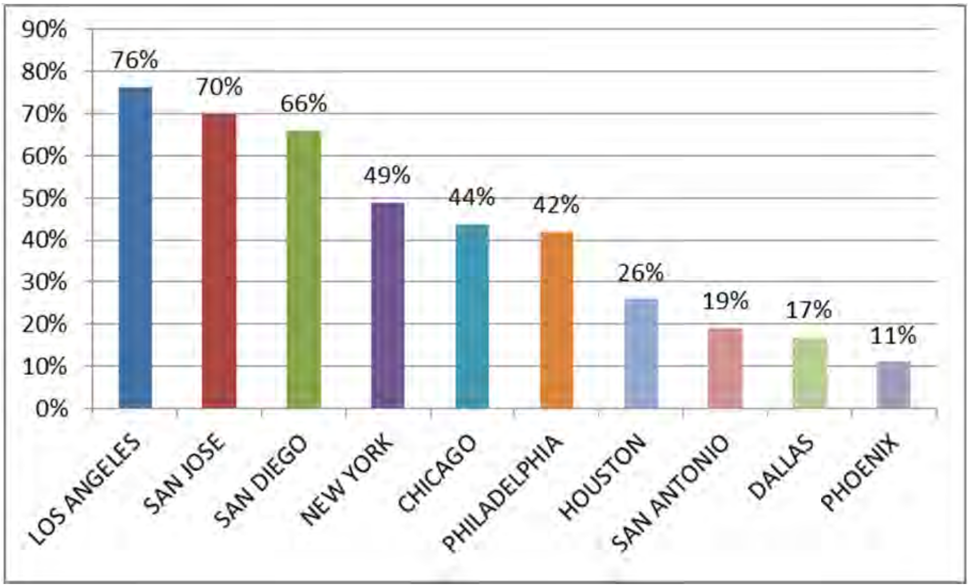
The City continues to review its options to increase diversion from the commercial and multi-family waste streams through initiatives such as:

- Leveraging the exclusive commercial and multi-family franchise to provide commercial customers with more-convenient and uniform recycling and organics collection service.[15]

Having one franchise hauler within each service district in order to minimize the number of haulers and associated traffic impacts and increase collection efficiency. The City is a leader in recycling and diverted 76.4 percent of materials from disposal in 2011. As listed in Figure 2, among the ten largest cities in the country, Los Angeles has the highest recycling rate.

[15] April 24, 2013, the City Council approved LASAN's Exclusive (one hauler per franchise area) Franchise Implementation Plan for commercial and multi-family solid waste collection and recycling in the City. The Council Action on Exclusive Franchises is available through the City of Los Angeles Council File 10-1797-81.

Figure 2: Big City Leader



Source for City of Los Angeles: Zero Waste Progress Report, March 2013
Source for other cities: Waste & Recycling News, Municipal Recycling Survey 2011, February 21, 2011

1.1.3 City Policy Drivers

The City has embarked on an exciting and challenging new era in solid waste management, envisioning a world without waste where materials are returned to the economic mainstream for reuse, recycling, and composting and residual materials are used as resources to create clean, renewable energy. The City articulated this vision in the context of the *GREEN LA Plan*.

1.1.3.1 GREEN LA Plan

In May 2007, the City unveiled *GREEN LA*, an Action Plan to make the City of Los Angeles the greenest city in the nation and the national leader to fight global warming. The 50+ initiatives of the plan include diverting 70 percent of the City's waste by 2013.

The City established additional directives for solid waste management, including:

- Implement a stakeholder-driven *Solid Waste Integrated Resources Plan*
- Convert the LASAN collection fleet to clean fuel
- Shift from reliance on waste disposal to a greater focus on resource recovery
- Establish an operating Alternative Technology facility

1.1.3.2 *RENEW LA Plan*, Blueprint for the Future Solid Waste Management System

Former Councilmember Greig Smith introduced the *RENEW LA (Recovering Energy, Natural Resources, and Economic Benefit from Waste for Los Angeles) Plan,* which was adopted by the City Council in February 2006. This 20-year plan is the blueprint that guides the City in reducing the use of landfills by maximizing recycling and reuse and by converting much of the solid waste that currently would go to landfills into clean energy and valuable raw materials and by-products (including gypsum and hydrochloric acid). Many of the plan components have been implemented.

RENEW LA calls for the following actions:

- Establish *RENEW LA* oversight committee
- Adopt *RENEW LA* Blueprint and Zero Waste Policy
- Modify zoning code to allow conversion technologies by right in M2 (light industrial) and M3 (heavy industrial) zones with conditions
- Establish site areas for conversion technology in each of the collection districts
- Site and develop the first and second conversion technology facilities
- Establish a fund from Sunshine Canyon host fees for development of facilities that reduce landfilling
- Implement recycling in 50 percent of the commercial sector
- Mandate a time-certain reduction in the City's solid waste disposed at Sunshine Canyon
- Expand multi-family recycling to 50 percent of the City
- Establish City tax breaks for Zero Waste and new re-manufacturing companies
- Establish a green energy producer bonus from the Department of Water and Power
- Add residential food waste to the green bin program

1.1.3.3 Zero Waste and the *Solid Waste Integrated Resources Plan*

The City has chosen Zero Waste as its master plan for addressing solid waste management for the next generation, and LASAN continues to develop programs and policies that will be included in SWIRP.

Achieving Zero Waste will require radical changes in areas of manufacturing and packaging, consumer habits, product disposal, and, finally, our thinking about what it means to "take away the garbage." The materials we generate and discard from our homes and workplaces can no longer be thought of as waste, but rather as materials that can be reduced, reused, recycled, composted, and ultimately converted back to resources or energy.

The City has a long history of implementing new strategies and programs for managing its solid waste system to meet new challenges over time. The shift of emphasis from waste disposal to waste diversion has been influenced by a growing public concern for the environment, resistance to siting landfills in urban areas, and diminishing availability of land for new landfills. The response to these factors has been a greater regulatory role of federal, state, and local governments to implement integrated waste management practices that emphasize source reduction, reuse, recycling, and composting options to dramatically reduce the amount of waste remaining for disposal.

The City has taken these historical trends further and, under the strong leadership of its elected officials, has collected stakeholder input in developing the policies, programs, and infrastructure that will be needed to maximize diversion on the path toward Zero Waste.

1.2 Solid Waste Regulations

1.2.1 Planning Context

Since the 1960s, federal, state, and city governments have developed a regulatory framework to ensure that solid and hazardous wastes are managed in an environmentally sound manner. Multiple agencies at each governmental level have responsibility for regulating each component of the solid waste management system including collection, processing, and final disposal. Regulation is generally used to set basic standards for waste transportation, handling, and disposal to ensure consistency and to protect public health and the environment. Education and voluntary programs are used to increase recycling, waste reduction, and composting rates and to promote producer responsibility (through voluntary takeback programs).

1.2.1.1 Role of the Federal Government in Regulating Solid Waste

The federal government sets basic requirements to ensure consistency among states and regulations to protect public health and the environment. The U.S. Environmental Protection Agency (U.S. EPA) is responsible for hazardous and non-hazardous solid waste management through the Office for Solid Waste and Emergency Response. The Resource Conservation and Recovery Act of 1976 (RCRA) established landfill construction, management, and closure guidelines. This act also regulates hazardous waste management facilities that treat, store, or dispose of hazardous waste. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), known as Superfund, was enacted by Congress to address abandoned hazardous waste sites in the U.S. CERCLA has subsequently been amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The Office of Air and Radiation regulates the solid waste–related air emissions, enforcing the Clean Air Act of 1976 (CAA) and subsequent amendments.

1.2.1.2 Role of the State Government in Regulating Solid Waste

AB 939 was the first recycling legislation in the country to mandate recycling diversion goals. California has successfully used AB 939 to motivate cities and counties to reduce reliance on landfill disposal and increase waste diversion through recycling, composting, and source reduction. The California Natural Resources Agency's Department of Resources Recycling and Recovery (CalRecycle) administers the California Beverage Container Recycling and Litter Reduction Act (Bottle Bill), which was enacted in 1986. California has historically been more proactive than any other state or the federal government in establishing the regulatory structure to promote Zero Waste. California is also likely to continue in this direction in the future as it works toward a statewide goal of 75 percent diversion by 2020.

The California Environmental Protection Agency (Cal/EPA) and the California Natural Resources Agency both regulate hazardous and non-hazardous solid waste management within the State. Within the California Natural Resources Agency, CalRecycle manages non-hazardous waste collection, processing, recycling, and disposal. CalRecycle is responsible for monitoring cities and counties to ensure that they are implementing adequate source reduction, recycling, composting, and other diversion methods to meet the AB 939 waste-diversion mandates. The Department of Toxic Substances Control (DTSC) focuses on preventing humans and ecosystems from being exposed to hazardous chemicals and keeping them out of the waste stream.

The California Air Resources Board (CARB) is responsible for maintaining healthy air quality, including developing the regulations to enforce the Global Warming Solutions Act (AB 32), enacted in 2006. With the passage of AB 32, California became a national leader in legislation to reduce greenhouse gas emissions. This act makes a commitment to reduce the State's emissions to 1990 levels by 2020,[16] which is a reduction of approximately 25 percent from the expected emissions in the absence of regulation.

The local Air Quality Management Districts throughout the State are responsible for ensuring that ambient air quality standards are attained and maintained in their respective air basins. The City is located within the South Coast Air Quality Management District (SCAQMD), which regulates local air quality. All new construction within the SCAQMD, including solid waste processing and disposal facilities, must undergo a New Source Review in compliance with federal, state, and SCAQMD regulations.

1.2.1.3 The City's Role in Regulating Solid Waste

Approximately 450 permitted private waste haulers, including construction-related contractors, provide waste-hauling services in the City. Under the current waste-hauler permit system, multi-family dwellings (primarily those over five units), commercial customers, and industrial customers are allowed to select and negotiate waste disposal and/or recycling contracts with any of the City's permitted private waste haulers.

In 2012, the City Council indicated its intention to move from the current private hauler permit system to a franchise system for the collection of discarded materials from both multi-family and commercial properties not collected by the City. The franchise system is intended to help the City reach its Zero Waste goals, and will contain elements such as maximum disposal amounts per zone, aggressive diversion programs (including outreach and education), clean fuel requirements, and worker health and safety requirements, to be administered by LASAN.

In November 2012, the City Council directed LASAN to begin the environmental review process pursuant to the California Environmental Quality Act (CEQA) for the commercial and multi-family private hauler franchise initiative adopted by Council, to return with an implementation plan for the

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[16] Assembly Bill 32, available at http://www.arb.ca.gov/cc/docs/ab32text.pdf (accessed, October 1, 2013)

franchise system, and requested the City Attorney to draft required ordinances for the project (Council File number 10-1797). On April 24, 2013, the City Council approved LASAN's Implementation Plan, adopted the 10 goals of the franchise program, and directed LASAN to proceed with the development of a Request For Proposals. The City Council is expected to consider the commercial and multi-family private hauler franchise ordinance and associated environmental documentation in early 2014.

The Planning Department oversees land use development and zoning requirements and establishes and allows solid waste and recycling facilities to be sited in specific zones. In August 2010, the City Council approved an amendment to the Zoning Ordinance to allow Alternative Technology facilities in heavy industrial (M3), commercial and light industrial (M2), and public facility (PF) zones within the City.

The Building and Safety Department is the Local Enforcement Agency (LEA) designated by CalRecycle for permitting, inspecting, and enforcing regulations at permitted solid waste disposal sites, solid waste transformation facilities, transfer and processing stations, materials recovery facilities, and composting facilities. LEA also inspects and enforces litter, odor, and nuisance compliance at solid waste landfills.

1.2.2 Current Legislative and Regulatory Climate

1.2.2.1 Mandatory Commercial Recycling (AB 341)

On July 1, 2012, the mandatory commercial recycling regulation was implemented statewide. The regulation, AB 341, requires all businesses that generate more than 4 cubic yards of solid waste per week and multi-family complexes with five or more units to arrange for recycling services. To comply with AB 341, commercial businesses and multi-family complexes that meet the criteria must implement recycling services through one or more of the following methods:

- Self-haul recyclable materials to a recycling center
- Subscribe to recycling services through a private hauler
- Arrange for the pickup of recyclable materials
- Subscribe to recycling services that can include mixed-waste processing that yields diversion results comparable to source separation

AB 341 also established a statewide goal of 75 percent source reduction, recycling, and composting by 2020. CalRecycle must report to the legislature by January 2014 on methods for achieving a 75 percent recycling rate.

1.2.2.2 Greenhouse Gas Emissions Reductions

The waste sector in the U.S. emitted approximately 100 million metric tons of carbon dioxide equivalent emissions in 2012, which represents the sixth-largest generator in the industry sector.[17] The waste sector includes solid waste landfills, industrial waste landfills, and facilities that operate combustors or

[17] United States Environmental Protection Agency, "Greenhouse Gas Reporting Program 2012: Reported Data," http://www.epa.gov/ghgreporting/ghgdata/reported/index.html (accessed October 1, 2013).

incinerators for the disposal of non-hazardous solid waste. Landfills are the third-largest source of generated methane emissions in the U.S. and contributed approximately 17.5 percent of the total U.S. emissions of generated methane in 2011.[18]

On January 2, 2011, greenhouse gas (GHG) emissions from the highest-generating sources were addressed in the Prevention of Significant Deterioration (PSD) and Title V Operating Permit Programs. In a phased approach to permit GHGs, U.S. EPA's GHG Tailoring Rule established the initial emission permitting thresholds (in Steps 1 and 2). On June 29, 2012, U.S. EPA issued a final rule (Step 3) to maintain the GHG permitting thresholds established previously in Steps 1 and 2.[19]

While there are currently no City-imposed regulations on climate change, the *GREEN LA Plan* established a goal of reducing GHG emissions to 35 percent below 1990 levels by 2030.[20] What currently appear to be relatively aggressive local policies might likely settle in as mandatory pieces of larger national goals as federal regulation evolves over the next 5 years. These local initiatives are important, since they will continue to have drastic effects on day-to-day activities at the local level. However, in the future, nationally set goals will likely determine overall emission reductions.

Landfills are one of the largest sources of methane, a powerful GHG that is 21 times more potent than carbon dioxide.[21] As described in the *GREEN LA Plan*, the City can significantly reduce its GHG emissions levels through waste reduction and recycling. Recycling can reduce GHG both by reducing methane generation at landfills and by saving energy through recycling. Figure 3 lists the energy savings per ton of each material recycled.

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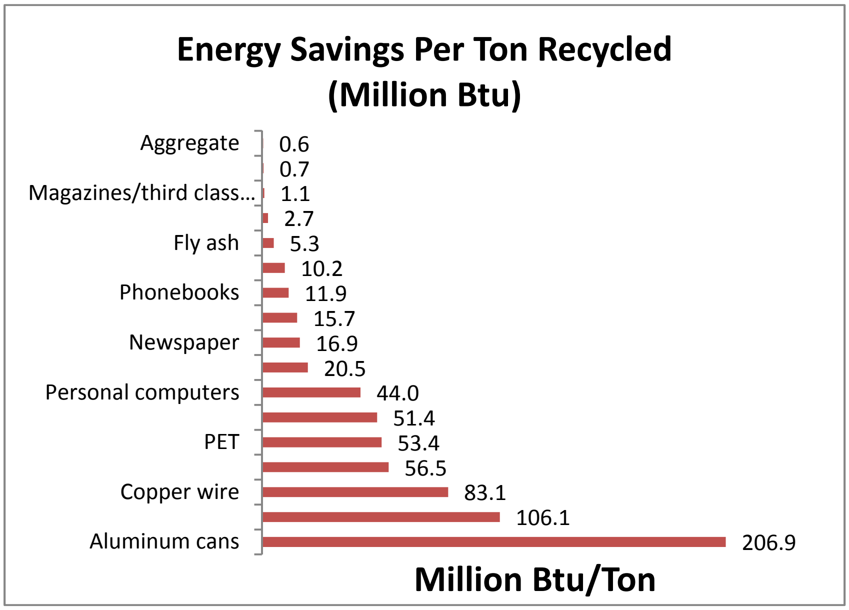
[18] United States Environmental Protection Agency, Landfill Methane Outreach Program, http://www.epa.gov/lmop/basic-info/index.html (accessed October 1, 2013).

[19] United States Environmental Protection Agency, "Clean Air Act Permitting for Greenhouse Gases," http://www.epa.gov/nsr/ghgpermitting.html (accessed October 1, 2013).

[20] GREEN LA website, http://environmentla.org/pdf/GreenLA_CAP_2007.pdf (accessed October 1, 2013).

[21] United States Environmental Protection Agency, "Greenhouse Gas Emissions," http://www.epa.gov/methane/scientific.html (accessed October 1, 2013).

Figure 3: Energy Savings by Material Type



Source: Anne Choate and Henry Ferland, *Waste Management and Energy Savings: Benefits by the Numbers* (Washington, D.C., U.S. EPA, September 4, 2005), p. 2.

1.2.2.3 Alternative Technologies

The City Council has made a commitment to end urban landfilling and directed LASAN to look at alternatives to landfilling for post-source separated solid waste. After an extensive review of new Alternative Technologies for processing solid waste, the City initiated a procurement process for both emerging technologies and commercially proven technologies. The City evaluated proposals for the implementation and siting of Alternative Technology facilities that are environmentally, technically, and economically feasible for the City.

Alternative Technologies are categorized by LASAN into three groups: thermal, biological/chemical, and physical. These technology groups are further subdivided into about twenty viable technologies, including but not limited to pyrolysis, gasification, advanced thermal recycling, anaerobic and aerobic digestion. These Alternative Technologies provide methods to process solid waste as an alternative to landfilling.

In 2005, the City conducted an evaluation of Alternative Technologies to assess the environmental, technical, and economic feasibilities. The results of the evaluation are documented in the City's report, "Evaluation of Alternative Solid Waste Processing Technologies."[22] Advances in technology, best available emissions control systems, and ash management practices make Alternative Technologies a viable option to landfilling. Additionally, these technologies allow for the reduction of fossil fuel usage,

[22] *Evaluation of Alternative Solid Waste Processing Technologies, City of Los Angeles, September 2005,* http://www.alternativetechnology.lacity.org/PDF/final_report.pdf. (accessed October 1, 2013).

recovery of energy and recyclable material, the reduction in greenhouse gases compared to landfilling, and the creation of green jobs.

The following sections describe the recent history and current regulatory and legislative climate for different types of Alternative Technologies.

1.2.2.4 Waste-to-Energy

Waste-to-energy is the process of combusting material in a chamber to produce heat. The heat flows through a boiler to produce steam to generate electricity. The system is equipped with pollution-control systems to reduce air emissions.

The public's concern about pollutants in the air emissions and siting led to community opposition to the development of waste-to-energy facilities, including the LANCER project planned for the City of Los Angeles.

By 1989, of 34 major waste-to-energy facilities proposed in California, only the following three were built:

- Stanislaus Resource Recovery Facility in Stanislaus County
- Commerce Refuse-to-Energy Facility in the City of Commerce
- Southeast Resource Recovery Facility in Long Beach

In 1989, AB 939 included in its definition of "transformation" the three existing waste-to-energy facilities and allowed jurisdictions to receive diversion credit of up to 10 percent of the 50 percent diversion requirement through transformation.[23]

Under the Public Utilities Code, "A facility that directly combusts solid waste to produce electricity is eligible for the [Renewable Portfolio Standard] RPS only if it is located in Stanislaus County and was operational before September 26, 1996."[24] Due to this legislation, only energy produced from the Stanislaus Resource Recovery Facility qualifies as "renewable energy" under the RPS.

State legislation has been introduced to allow facilities that convert solid waste into energy or chemicals to count as a renewable electricity generation facility under the State's RPS and allows local governments to count solid waste that is converted into energy toward their recycling diversion goals.[25] However, to date, no legislation has been passed.

Currently, there are 86 waste-to-energy facilities operating in 25 states throughout the U.S. However, there have been no new facilities built in the U.S. since 1995, but some plants have expanded to handle additional waste and create more energy and some new facilities are currently under construction.[26]

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[23] California Public Resources Code Section 41780.
[24] Public Utilities Code, Section 399.12, Subdivision (e)(2).
[25] Assembly Bill 222 introduced by Assembly Members Anthony Adams and Fiona Ma. This bill failed passage in 2010, but may be reintroduced in a future legislative session.
[26] United States Environmental Protection Agency, Energy Recovery from Waste, http://www.epa.gov/waste/nonhaz/municipal/wte/ (accessed October 1, 2013)

1.2.2.5 Advanced Thermal Recycling

Advanced Thermal Recycling (ATR) is a second generation advancement of waste-to-energy technology in which municipal solid waste (MSW) is converted, in an oxygen rich environment, to a hot exhaust gas composed primarily of carbon dioxide and water vapor. The inorganic material is converted to bottom ash, for beneficial use, and fly ash which requires disposal. The hot exhaust gas can be used to generate heat or steam to in turn produce electricity. ATR is equipped with advanced pollution control technologies that include both Selective Catalytic Reduction (SCR) and Selective Non-Catalytic Reduction (SNCR) systems that effectively diminish air emissions to a greater extent than its predecessors. ATR technology has been commonly applied in Europe to produce energy from MSW. Currently, no facility of its type exists in the United States.

1.2.2.6 Biomass-to-Energy

Biomass electricity is drawn from combusting organic matter. Under State law, "biomass conversion" is defined as the controlled combustion, when separated from other solid waste and used for producing electricity or heat, of agricultural crop residues; bark, lawn, yard, and garden clippings; leaves, silviculture residue; tree and brush pruning; wood, wood chips, and wood waste; or non-recyclable pulp or non-recyclable paper.[27] According to the California Energy Commission, there are 27 biomass-to-energy facilities in the State that process forestry and agricultural by-products and urban wood waste.

Under State law, jurisdictions can count up to 10 percent of their 50 percent diversion goal through biomass conversion.[28] Energy produced from biomass is considered renewable energy under the State's RPS.

1.2.2.7 Anaerobic Digestion

Anaerobic digestion is a biological process in which microorganisms break down biodegradable materials (for example, food and paper) in an oxygen-deficient system, creating a biogas (consisting mostly of methane and carbon dioxide) that can be used to generate electricity or be converted into a transportation fuel.

According to the California Energy Commission, there are 22 animal waste or food waste digesters in operation in the State that process manures and food manufacturing residues. The technology is also used for the treatment of wastewater at wastewater treatment plants.

Under State regulations, anaerobic digestion is regulated like composting, and jurisdictions can receive credit for diverting materials through anaerobic digestion.[29]

Energy produced from anaerobic digestion is considered renewable energy under the State's RPS.

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[27] California Public Resources Code, Section 40106.
[28] California Public Resources Code Section 41783.1.
[29] CalRecycle, "Permitting Compostable Material Handling Operations and Facilities," May 5, 2010, http://www.calrecycle.ca.gov/SWFacilities/Permitting/facilitytype/compost (accessed October 1, 2013)

1.2.2.8 Other Thermal Technologies (including Pyrolysis, Gasification, and Plasma Arc Gasification)

There are other thermal treatment technologies that are used outside the U.S. for processing residual solid waste, including pyrolysis, gasification, and plasma arc gasification. These technologies and other Alternative Technologies for processing residual solid waste are described in the City's report "Evaluation of Alternative Solid Waste Processing Technologies."[30]

Pyrolysis, gasification, and plasma arc gasification are all technologies used to treat waste producing a synthesis gas ("syngas") that can be used to produce electricity or can be converted into a transportation fuel. Pyrolysis is the thermal degradation of organic carbon-based materials through the use of an indirect, external source of heat in the absence or almost complete absence of free oxygen. Gasification is the thermal conversion of organic carbon-based materials that involves the partial oxidation through the use of an indirect, external source of heat, high pressure, and in a limited supply of air/oxygen (less than stoichiometric, or less than is needed for complete combustion). Plasma arc technology uses an electrical discharge to heat gas, typically air, oxygen, nitrogen, hydrogen, or argon, or combinations of these gases. The heated gas, or plasma, can then be used for welding, cutting, melting, or treating waste materials. These technologies are sometimes referred to as "conversion technologies." Under State law, "municipal solid waste conversion" means "a technology that uses a noncombustion thermal process to convert solid waste to a clean-burning fuel for the purpose of generating electricity."[31]

These technologies may be included under the definition of renewable energy under the RPS, but only if the facility meets the following specific environmental standards:[32]

1) The technology must not use air or oxygen in the conversion process.
2) The technology produces no discharge of air contaminants.
3) The technology produces no discharges to surface water or groundwater.
4) The technology produces no hazardous waste.
5) To the extent feasible, the technology removes all recyclable materials from the solid waste.

Under State law, "pyrolysis" is considered "transformation," and jurisdictions may count up to 10 percent of their 50 percent diversion goal through transformation. "Gasification" is specifically not included in the definition of "transformation."[33]

State legislation has been introduced to allow facilities that convert solid waste into energy or chemicals to count as a renewable electricity generation facility under the State's RPS and allows local governments to count solid waste that is converted into energy toward their recycling diversion goals. However, currently, no legislation has been passed.

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[30] Evaluation of Alternative Solid Waste Processing Technologies, City of Los Angeles, September 2005. http://www.alternativetechnology.lacity.org/PDF/final_report.pdf (accessed October 1, 2013).
[31] California Public Resources Code, Section 25741, Subdivision (b)(3)
[32] California Energy Commission, Renewables Portfolio Standard Eligibility, Commission Guidebook, January 2008.
[33] California Public Resources, Code Section 40201.

1.2.2.9 Siting Alternative Technology Facilities

Siting new Alternative Technology facilities in California is potentially controversial. According to the California Energy Commission, some of the major issues associated with siting Alternative Technology facilities include the following:[34]

- Ability to meet air quality requirements
- Possible classification of the ash as a hazardous material
- Disposal of ash and other by-products
- Possible conflict with adjacent land uses
- Disturbances to biological resources
- Use of large amounts of water for cooling purposes (if wet cooling towers are used)
- Changes to visual quality due to power plant structures and traffic patterns
- Transportation impacts from numerous truck trips from the residual solid waste source to the facility (note that collection and transportation would already be occurring, so the facility would cause a change in traffic patterns only)
- Likely public opposition because of uncertainties over health, safety, odor, and traffic impacts (since it is most economical for the facility to be located near urban centers where the waste is generated)
- Possible conflict between using residual solid waste for electricity generation and programs and goals for waste reduction and recycling
- Possible leaks of hazardous materials that could require the site to be cleaned up after the facility closes

All of these issues can potentially be addressed or mitigated through appropriate design and management.

1.2.2.10 Air Emissions

Some types of Alternative Technology facilities use residual solid waste as a primary feedstock for the production of energy or fuel. All facilities that combust waste, biogas, or syngas create air emissions, such as:

- Nitrogen oxides (NO_x)
- Sulfur oxides (SO_x)
- Particulate matter (PM_{10})
- Toxic chemicals (dioxins, furans)
- Volatile organic compounds (VOCs)
- Carbon dioxide (CO_2)
- Carbon monoxide (CO)

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[34] California Energy Commission, Municipal Solid Waste Power Plants, http://www.energy.ca.gov/biomass/msw.html (accessed October 1, 2013).

SCAQMD requires that any Alternative Technology facility must include best available pollution control technology to reduce air pollutants to permissible levels. Thus, any new facility sited by the City would need to meet stringent emission controls and other mitigations identified by SCAQMD.

In October 2011, CARB approved regulations for the first nationwide GHG cap-and-trade program under the California Global Warming Solutions Act of 2006 (AB 32). AB 32 serves as one of the strategies California has used to reduce the GHG emissions that cause climate change. Some Alternative Technology facilities will be regulated under the cap-and-trade program, implemented in 2012, based on GHG emissions in 2013.[35]

1.2.2.11 Extended Producer Responsibility

The City is a member of the California Product Stewardship Council, whose mission is to shift California's product waste management system from one focused on government-funded and ratepayer-financed waste diversion to one that relies on producer responsibility in order to reduce public costs and drive improvements in product design that promote environmental sustainability. One of the initiatives of the Council is to implement producer responsibility at the state level.

Producer responsibility is a category included in CalRecycle's Strategic Directives,[36] which states the following directive: "producers assume the responsibility for the safe stewardship of their materials in order to promote environmental sustainability." Specifically, CalRecycle will pursue these initiatives:

- Use CalRecycle's existing authority to foster "cradle-to-cradle" producer responsibility.
- Seek statutory authority to implement the Extended Producer Responsibility Framework adopted by the Board in January 2008.
- Develop and maintain relationships with stakeholders, including the public and other interested parties that result in producer-financed and producer-managed systems for discarded products.

On September 19, 2007, CalRecycle adopted an overall framework for an Extended Producer Responsibility (EPR) System in California. Many of the concepts that are part of this framework have been included in State legislation that has been introduced and that would authorize CalRecycle to implement a statewide product stewardship program and select products that would be regulated under that program. The goal of the legislation is to improve product design, encourage reuse and recycling, address excessive packaging, provide convenient collection alternatives for consumers, provide incentives for producers to reduce the lifecycle impacts of products and packaging, and reduce the use of toxics in products.

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[35] California Air Resources Board, "Cap-and-Trade Program," http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm (accessed October 1, 2013).
[36] CalRecycle, "SD-5: Producer Responsibility," August 24, 2009, http://www.calrecycle.ca.gov/AboutUs/StrategicPlan/2009/SD05.htm (accessed October 1, 2013)

1.2.2.12 Other Legislative Trends

Every year, numerous bills are introduced into the State legislature addressing recycling and solid waste management. Key topics of interest to State legislators over the course of recent legislative sessions include:

- Reducing the impacts of single-use plastic bags and plastic litter in the marine environment
- Producer responsibility for specific hazardous or difficult-to-recycle materials including pharmaceuticals, mattresses, compact fluorescent light bulbs, batteries, and sharps (hypodermic needles and lancets)
- Requiring commercial generators (such as restaurants and grocery stores) to divert food scraps
- Regulating "chemicals of concern" such as Bisphenol A (BPA), Phthalates
- Adopting "green chemistry," to minimize and eliminate the use of harmful chemicals

Section 2 Phase I Stakeholder-Driven Planning Process

The SWIRP stakeholder-driven planning process commenced in the spring of 2007. During Phase 1 (April 2007 through May 2008), stakeholders from across Los Angeles came together to formulate the City's goals to provide sustainability, resource conservation, source reduction and recycling, renewable energy, maximum materials recovery, and environmental protection for solid waste management planning through 2030. This section documents Phase 1 of SWIRP and the process that the City's stakeholders went through to reach consensus.

2.1 City's Vision for a Stakeholder-Driven Planning Process

The City has undertaken a community-based approach to planning for a sustainable city of the future and making that vision a reality through a two-phase process.

Phase 1 Goals:

- Educate stakeholders about the opportunities for sustainable resource management now and throughout the next 20 years.
- Create a consensus-based process to ensure that all voices are heard and everyone has the opportunity to participate.
- Establish community-based goals and objectives that reflect the needs, concerns, and vision of the community as a whole.
- Identify the policies, programs, and facilities that will be needed to achieve these goals.

Phase 2 Goals:

- Continue to engage stakeholders in the community-based planning process to ensure that the stakeholders are committed to realizing the Phase 1 goals in the Phase 2 plan.
- Inform the City's stakeholders about the costs, risks, and benefits of the options.
- Ensure that these options are both feasible and practical and that our choices are cost-effective and environmentally sound.
- Fully analyze the City's waste stream and waste projections through the planning period.
- Clearly describe and conceptually design each system component of the integrated resources management plan, including the policies, programs, and facilities identified in Phase 1, and ensure that they will work together to achieve the City's goals in an integrated resources system.
- Estimate and evaluate the costs of the system components and prepare a funding and financing plan.
- Conduct an environmental review of the integrated resources system.

- Identify all of the implementation tasks, policy changes, decision points, and schedule for implementing the strategic vision identified in Phase 1.

2.2 Phase 1 Stakeholder Engagement

The first year of SWIRP was critical. It was during this phase that stakeholder input and participation were most needed for further development of specific elements and approaches for the overall 6-year SWIRP effort. Early activities included stakeholder collaboration with LASAN to develop both guiding principles and a strategic, feasible vision to define the Zero Waste infrastructure, programs, policies, regulations, incentives, new "green collar" jobs, technological innovation, and financial strategies necessary to accomplish the City's goal of becoming the most efficient and effective Zero Waste city in the nation.

2.2.1 Who Should Be a Stakeholder?

In the City of Los Angeles, everyone is a stakeholder. Everyone in the City—residents, businesses, institutions, schools, visitors, and City departments—contributes to the City's solid waste problems and is critical to implementing the solutions. LASAN conducted an extensive outreach process during the spring and summer of 2007 to identify the stakeholders who would commit to working with the City to develop SWIRP. To ensure that the planning process was as inclusive as possible, the City conducted extensive stakeholder outreach that included:

- **Key Constituent Interviews** – 109 interviews with community leaders, environmental groups, business organizations, unions, government partners, and industry representatives.
- **Business Outreach** – 75 interviews with business owners and managers of businesses including Fortune 500 companies and small "mom-and-pop" operations.
- **House Meetings** – 27 grassroots meetings in living rooms across the City designed to include people who might not typically participate in formal community meetings.
- **Regional Workshops** – 6 evening workshops held in each of the City's 6 collection districts or "wastesheds," and a citywide meeting held downtown during the daytime (42 meetings total).
- **Citywide Conferences** – 3 citywide conferences held throughout the year where stakeholders could come together from the regional working groups to talk about citywide issues.

Table 2 provides the schedule for the SWIRP Phase 1 planning process.

Table 2: Phase I Schedule for May 2007 through May 2008

May	June	July	August	Sep	Oct 20th
Key constituent meetings House meetings	Key constituent meetings Business interviews House meetings	Findings Analysis Key constituent meetings Business interviews House meetings	Workshop Series 1 Forming the Foundation	Workshop Series 2 Goals and Objectives	1st Citywide Conference Sign-on for Zero Waste LA
Nov	**Dec**	**Feb 2nd**	**Feb**	**March**	**May 3rd**
Workshop Series 3 Policy and Program Options	Workshop Series 4 Facility Options	2nd Citywide Conference Policy, Program and Facility Options	Workshop Series 5 Evaluation	Workshop Series 6 Recommend-ations	3rd Citywide Conference Sign-off on Guiding Principles

2.2.2 Outreach Process

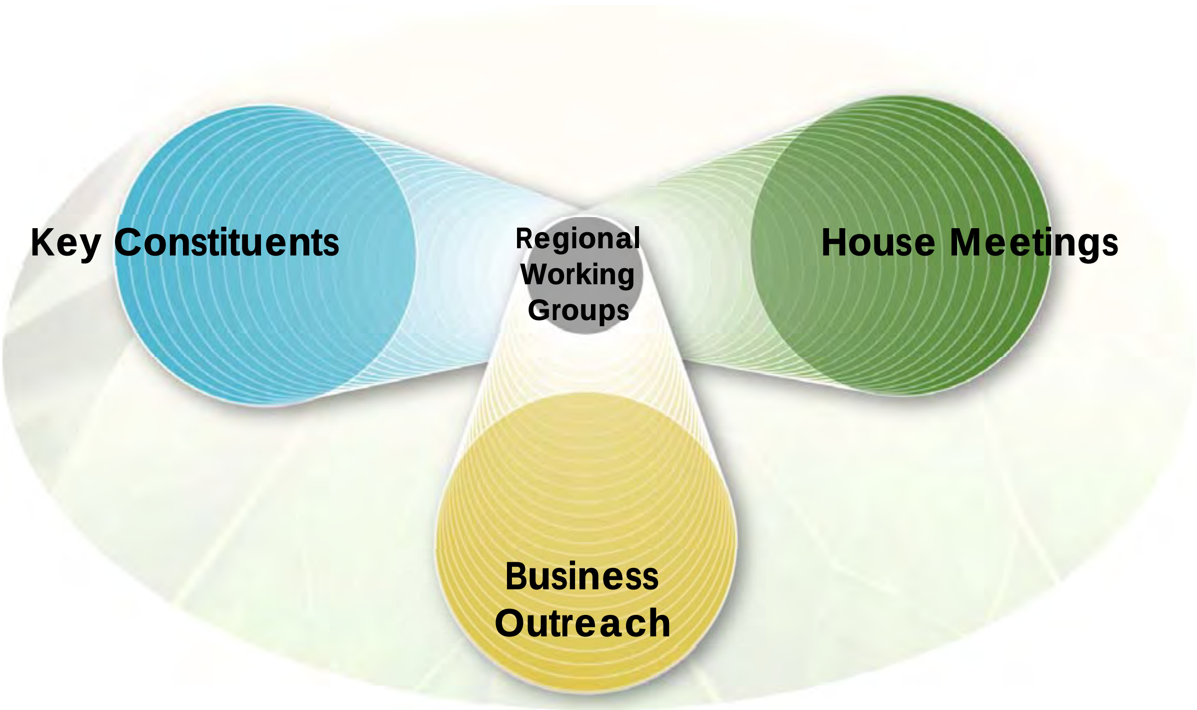
The early outreach process was developed to identify issues of concern to the City's stakeholders and to encourage their participation in the planning process. As shown in Figure 4, stakeholders were identified through the key constituent interviews, house meetings, and business meetings and were invited to participate in the regional workshops and citywide conferences. The results from the early outreach process are summarized in Section 2.3.

LASAN also participated in community events throughout the City to inform event participants about the SWIRP planning process and to identify potential SWIRP stakeholders. LASAN also introduced SWIRP at special meetings and to community groups, including, but not limited to, the following:

- Crenshaw High School Career Fair
- Granada Hills Neighborhood Council
- Korean Festival
- Los Angeles Disposal Association
- Los Angeles Environmental Youth Conference
- Los Angeles Neighborhood Initiative
- Pacoima Fair
- Korean Festival

- San Pedro Lions Club
- San Pedro Neighborhood Council
- University of California Student Government
- West Los Angeles Public Library

Figure 4: Forming the Regional Working Groups



2.2.3 Outreach Tools

2.2.3.1 Multimedia Program

The City developed a multimedia outreach program to maximize participation in the Phase 1 planning process. This program included an up-to-date website, the development of outreach partners for channels of communication, e-mail alerts and direct mailings, a media relations strategy, newsletters, and direct phone calls. The City used this comprehensive outreach strategy to reach as many community members as possible and keep them updated throughout the entire year.

2.2.3.2 Website

Throughout the process, the City maintained an up-to-date website with information about the overall SWIRP process, a schedule of upcoming meetings, and summaries of meetings completed, including documentation of stakeholder feedback. The website, www.zerowaste.lacity.org, also includes a brief overview of the history leading up to the SWIRP process, fact sheets about the City's solid waste system, a list of Frequently Asked Questions (and the answers), links to other Zero Waste–related websites, and copies of SWIRP newsletters.

2.2.3.3 Newsletters

The City prepared three newsletters, one released after each citywide conference, to update stakeholders on the status of the planning process. The newsletters included a summary of events, stakeholder feedback, results from the workshops and conferences, and information about what SWIRP stakeholders were doing in their local communities to promote Zero Waste. Each newsletter began with a letter from a City official describing the planning process and encouraging participation. The newsletters are available from the City's website at www.zerowaste.lacity.org.

2.2.3.4 Media Relations Strategy

The City implemented a media relations plan that emphasized media (press releases and advertisements) in community and ethnic newspapers to encourage participation in the workshops. This media relations drive began in July 2007 and continued throughout Phase 1. The City held an initial press conference at the first regional workshop in the Granada Hills area of Los Angeles and conducted two media briefings prior to the second and third citywide conferences. The City also prepared press releases and press advisories and contacted the editorial boards of technical publications to solicit their interest in the SWIRP planning process.

2.2.3.5 E-mails and Mailing

At the beginning of the project, a database of over 60,000 names and addresses was used to distribute meeting announcements and invitations to become a SWIRP stakeholder. This database was compiled by combining the mailing and e-mailing lists of the Los Angeles River Revitalization Project, the Proposition O workshops, the wastewater *Integrated Resources Plan*, several community and public projects, seniors, and low-income residents of the City. The first distribution began in July 2007. Throughout the process, the SWIRP database was edited to include community members who identified themselves as SWIRP stakeholders. The database was edited in order to reduce excess mail and also to e-mail those who were not able to participate in the SWIRP planning process but wanted to remain informed. The City distributed print and e-mailed invitations to the SWIRP database (of approximately 2,500 SWIRP stakeholders) 3 weeks prior to each meeting.

2.2.3.6 Survey Monkey

To ensure that the Phase 2 planning process was tailored to the needs of the SWIRP stakeholders, the City issued an electronic questionnaire through SurveyMonkey.com after the third citywide conference.

Input was sought on workshop and conference content, venues and facility arrangements, the outreach and registration process, and an overall rating of the planning process. LASAN received very constructive and practical critiques, such as "find ways to make more voices heard" and "do something about the parking problems at the convention center" and, most frequently, "improve LASAN outreach and education." Stakeholders made it clear that the City needs to provide more education and outreach to inform residents about the City's recycling programs. These comments were used in planning the Phase 2 outreach process to develop the style and content of the meetings and to identify appropriate venues for the workshops and conferences. LASAN also received approval from the stakeholders for reaching out to the community to include everyone in planning for the future. Survey respondents gave the SWIRP planning process an overall rating of "excellent."

2.2.3.7 Facilities Tours

SWIRP stakeholders view the C&D processing area at Downtown Diversion

During Phase 1 of the planning process, LASAN began to engage SWIRP stakeholders in a conversation about the infrastructure and facilities that will be needed over the next 20 years. In November 2007 and January 2008, stakeholders took a "behind the scenes" look at the types of facilities that are currently used by the City for recycling and disposal. Over 60 stakeholders participated in the tours, and many expressed their appreciation at getting to see the facilities first-hand. Facilities that were toured include the following:

- **Athens Materials Recovery Facility** – a facility that processes mixed municipal solid waste and separates recyclables from waste.
- **City of Los Angeles East Valley Solid Resources Complex** – the facility that houses the City's liquefied natural gas fueling station, container management warehouse, and truck yard.
- **Downtown Diversion** – a C&D debris processing facility.
- **E-Recycling of California** – an electronic waste de-manufacturing and recycling facility that processes some of the City's electronic waste.
- **Construction & Demolition Recycling, Inc. (formerly Interior Removal Specialists)** – an interior demolition company that reuses, recycles, and donates material generated from commercial remodeling projects.
- **Lopez Canyon Environmental Center** – a mulching operation owned and operated by the City that processes some of the City's yard trimmings.
- **Southeast Resource Recovery Facility** – a waste-to-energy facility in Long Beach that receives about 100 tons of waste per day from City generators.

- **Sun Valley Paper Stock** – a facility that separates and processes some of the mixed recyclables from the City's curbside program.
- **Sunshine Canyon Landfill** – a landfill owned and operated by BFI/Republic Services, Inc., that receives about 5,000 tons of waste per day from City generators.

The tours helped the stakeholders get first-hand knowledge of the types of facilities that will be needed in the future. The stakeholders were impressed with the efficiency and effectiveness of the facilities and appreciated the hospitality of the facility operators.

In June and July 2008, a City delegation, including former Councilmember Greig Smith, toured state-of-the-art facilities in Europe, Japan and Canada to identify new emerging technologies and commercial-scale technologies for processing residual waste. Some of the facilities that were toured include the following:

City delegation at CMT Plant (under construction) in Marseille, France

- ArrowBio Anaerobic Digestion Facility, Tel Aviv, Israel
- Eco Park 2 – Valorga Anaerobic Digestion Facility, Barcelona, Spain
- CMT Waste-to-Energy and Anaerobic Digestion Plant (under construction), Marseille, France
- Kawasaki Steel Facility - Thermoselect Gasification System, Chiba, Japan
- Müllverwertung Rugenberger Damm Waste-to-Energy Plant, Hamburg, Germany
- Nagareyama Facility – Ebara Gasification System, Tokyo, Japan
- NDAVER Keppel Seghers Waste-to-Energy Plant, Antwerp, Belgium
- Plasco Trail Road Plasma Arc Gasification Facility, Ottawa, Canada
- Tokyo Waterfront Recycle Power Plant (TRP) – Ebara Gasification System, Tokyo, Japan
- TREA Breisgau - Waste-to-Energy Plant, Freiberg, Germany
- Valdemingomez Complex Material Recovery Facility, Las Dehesas Site Madrid, Spain

2.3 Early Outreach

The early outreach process was designed to solicit input from community leaders, residents, and businesses across the City and to engage potential stakeholders in participating in the regional workshops. The interview process helped the City determine the public's perception of solid waste and explore the public's vision for a cleaner, greener Los Angeles.

The purpose of the stakeholder interviews and meetings was to hear first-hand the leading issues and concerns related to solid waste and to solicit recommendations for both motivating greater public participation and ultimately changing waste disposal behavior.

2.3.1 Key Constituents

This section summarizes the input received from key constituents throughout the City. Key constituents are members of the community, including elected officials, government agencies, unions, major employers, and public interest groups, who are currently engaged in City issues. LASAN conducted 109 one-on-one interviews with key constituents during the Phase 1 planning process. The City is especially grateful to the community leaders, businesspeople, and concerned citizens who gave so generously of their time to participate in the interviews. The depth of content that was gained from these interviews was insightful, since it brought to light many new ideas that will be valuable for the City to explore. The candor and enthusiasm expressed by those interviewed provided a significant opportunity to consolidate far-reaching and creative ideas into an effective and inspirational plan that can be implemented in the years ahead to achieve Zero Waste in Los Angeles.

2.3.1.1 Community Organizations

A number of individuals representing community-based organizations, nonprofits, faith-based entities, and spiritual congregations were interviewed. Diverse and far-reaching ideas were expressed during these interviews. Recurring themes included the need to combine messages of recycling with sustainable communities; prioritizing environmental protection as something everyone can and should do; recognizing that people will need to be taught or exposed to source reduction measures; and the strong sentiment that collateral materials and messages should be available and disseminated in many languages.

Equity and environmental justice issues were discussed as a part of any solution that includes facility development. As a result of these discussions, the community recognizes that, as innovative Zero Waste methods come to fruition, there should be opportunities for new green sector jobs in their communities. Many expressed their belief that strict enforcement measures where waste sources can be more easily tracked, such as in businesses and residential households, should be implemented to further encourage behavior modification.

Korean Cultural Center representatives signing on for a Zero Waste LA

2.3.1.2 Environmental Organizations

The City has long been a leader in supporting environmental initiatives aimed at improving air quality, protecting our coastline and park spaces, providing comprehensive recycling, and diligently expanding our natural resources. As a result, there is a broad range of influential stakeholders with extensive experience in the challenges of motivating greater civic participation and inspiring comprehensive sustainable behavior.

Key and recurring messages included combining personal environmental stewardship with a fundamental responsibility to share the earth's resources wisely. There was great enthusiasm for the emerging green industries and "green-collar" jobs that are expected to evolve from more focused and comprehensive green living. There was also a desire to streamline the messages from all of the City's programs about benefitting the environment into one simple message. People will better relate to that simple message and see the many programs as a unified effort to make our City a better place.

2.3.1.3 Business Organizations

The directors and managers of business organizations, including Chambers of Commerce, support a Zero Waste concept with more convenient commercial recycling programs. They generally do not support banning products—certainly not before acceptable alternatives are in place. Business representatives noted policies, regulations, and laws that seemed at odds with the goal of working toward Zero Waste. For example:

- Since residential recycling is free but there is a charge for commercial recycling, people at many businesses take the business's recyclables to their blue bin at home to recycle or to sell at a buyback recycling center.

- There is confusion about the legality of removing cardboard and other recyclables from a business's dumpster or dumpster area. Is this officially considered "scavenging" and therefore illegal? Or is this considered "waste hauling" and therefore legal?
- As food scraps are diverted for composting, what are the health laws that affect the frequency of pick-up, location of storage, and other issues? Restaurant employees and others who handle food don't want to comply with one regulation only to inadvertently not comply with another.
- Is tap water actually clean enough to drink? Recyclable plastic water bottles are recycled in the best case and end up in the trash in the worst case. Why not eliminate that waste stream altogether?
- The 311 information number is not accessible to cell phones, and one business had to change a setting in its land lines to be able to access 311.
- There can be confusion about zoning laws for businesses of different types that want to locate near each other (for example, food establishments in industrial zones) so that one business can use the waste of the other as feedstock for its product. Do zoning laws allow a mushroom farm to locate next to a framing company and use that company's sawdust waste to grow mushrooms?

Business organizations know the current laws and proposed legislation. They quickly see where there are potential conflicts among regulations as well as challenges for their businesses. They are interested in costs and economics, but, in our interviews, they placed much more emphasis and interest in being prepared for the future. To some of these organizations, being prepared recognizes that the low-cost landfill option is quickly disappearing in Los Angeles. To others, the costs and benefits of recycling and diversion (and resale) were already being realized. They understand that SWIRP is one of the key means for having the infrastructure, policies, and services in place that enable their constituents and businesses to keep up with the times.

2.3.1.4 Private-Sector Haulers and Recycler

People working in the industry bring a wealth of experience and information to SWIRP. They are on the front lines, know every aspect of solid waste management, and have thought about the future.

Compared to leaders of community and environmental organizations, owners and managers of hauling companies, landfills, and recycling companies tend to focus on the details rather than the vision. They are well aware that the solid waste world is changing and are already thinking about how to design and site needed facilities, the cost of services, and how the "nuts and bolts" of their profession need to react to this changing environment.

They are concerned about the practical questions such as how to do their work in a changing environment. People working in the industry are also very concerned about the amount of contamination in recycling bins. They strongly support education to increase recycling and decrease contamination. They are interested in costs, but, like business organizations, they are also very interested in having the systems and programs in place for them to do their jobs.

2.3.1.5 Government Partners

The outreach effort to government partners—primarily representatives from other local cities and counties—provided good feedback. There's a great sense from these meetings that "we're all in this together," and that there is a political will behind building partnerships between jurisdictions in order for us to achieve Zero Waste as a region. While region-wide collaboration is encouraged, all believe that cities must address their own waste problems without negatively impacting other communities. Not surprisingly, there is recognition that the current "low-cost" tipping fees (disposal fees at landfills) do not encourage a commitment to recycling.

Further, although many community and environmental groups are supportive of Zero Waste, they are simultaneously skeptical that it is feasible. Government partners, by contrast, are optimistic that this is actually achievable, even by 2020. Government partners cited several factors, including the availability of technologies and programs, the strength of political will in the region to achieve Zero Waste, and the progress of current efforts to increase recycling and reduce urban landfilling. There is also support for improving front-end waste separation as well as using Alternative Technologies. Most of the government partners interviewed prefer voluntary compliance programs and are opposed to using refuse surcharges to fund City services.

2.3.2 House Meetings

In order to ensure a higher level of participation from local residents, LASAN implemented a grassroots house meeting campaign throughout the City. The purpose of the house meetings was to bring together local residents who are not usually involved in other stakeholder groups to participate in the planning process for SWIRP. The house meetings allowed the City to tap into a whole new set of people and ideas and served as a tool to gauge the "average person's" view of solid waste.

As part of Phase 1, the City held 27 house meetings throughout Los Angeles, bringing over 445 interested neighbors together in informal settings to learn about SWIRP and to begin discussions about how best to motivate and sustain greater public participation in recycling programs. At each house meeting, participants expressed concerns on a broad range of issues regarding solid waste and recycling.

House meeting participants had many ideas for incentives and fees on the issue of recycling. Many felt that the current trash pick-up fees were excessive for the service received. Residents felt that there should be penalties for placing the wrong items in each bin. Residents also felt that there should be zero tolerance for littering and that this should be more carefully regulated. Additionally, residents in neighborhoods with landfills felt that the trash fees should be reinvested in their communities. Many of the residents would like LASAN to regulate and assess fees on private recycling centers and to regulate scavengers more closely to prohibit people from removing recyclables from blue bins.

House meeting participants believed that creating an aggressive educational campaign using radio, television, and schools to educate communities and students about recycling and reducing waste would be the most effective method of marketing the City's recycling programs. Residents requested that the City develop a more easily accessible website with more detailed information about recycling and bulky item pick-up. Residents also expressed concerns about illegal dumping. Residents felt that, if there is more information and more accessible recycling programs in place (for both residential and business generators), not only will more people participate, but illegal dumping will not be as much of an issue.

SWIRP stakeholders attending a house meeting at a neighbor's home

Environmental issues were a key component of house meeting participant feedback. Most of the residents wanted all City collection vehicles to run on clean fuels and appreciated hearing that the City has converted 50 percent of its fleet to clean fuel. Additionally, residents recommended two other ideas to reduce waste: first, to create a program to encourage the use of natural and biodegradable items for residents and businesses, and second, to require grocery stores in the City to use only biodegradable bags.

House meeting participants suggested creating incentive programs for businesses, apartment buildings, and community organizations to increase participation. These programs might include contests within communities or business districts, citywide recycling contests, or fee waivers for reaching a certain level of recycling. Residents also recommended that all multi-family dwellings be equipped with blue recycling bins and were thrilled with the City's new recycling program for multi-family buildings. Residents recommended that, with all of the construction going on throughout the City, the Department of Building and Safety should enforce recycling during construction projects.[37]

Special item recycling was another major subject that was discussed at the house meetings. Recommendations included working more closely with hospitals to recycle pharmaceutical items and to educate pharmaceutical companies on how they can recycle more, create more S.A.F.E. Centers throughout the City, and have more hazardous materials collection sites and home pick-ups. Comments from the stakeholders included concerns about illegal dumping and bulky item pick-up response time.

Finally, residents also had many suggestions and comments about business-related recycling. House meeting participants suggested either making business recycling mandatory in the City or creating an

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[37] The mandatory C&D ordinance was adopted by the City Council on December 17, 2010. All mixed C&D waste generated within City limits must be taken to City certified C&D waste processors. http://san.lacity.org/solid_resources/recycling/c&d.htm (accessed October 1, 2013).

incentive program for businesses to recycle. Also, participants recommended creating a more comprehensive business recycling program.

2.3.3 Business Interviews

LASAN conducted direct outreach to the business sector in order to obtain input and participation from local "average businesses" not represented by business associations or other organized groups. LASAN conducted 75 interviews and dialogues with businesses in order to:

- Identify business concerns and issues
- Identify best practices
- Use these best practices to guide recommendations
- Construct and communicate the business case for the plan
- Identify business representatives to participate in the regional working groups

Most workers spend at least 8 hours a day in their places of employment. Unlike at home, the waste stream is noticeably different, and collection methods vary from employer to employer. Recognizing these differences in the content of the waste stream and the inconsistencies in the private sector's separation and collection mechanisms, LASAN believed that it was important to speak with the owners, managers, or employees responsible for initiating and/or overseeing and implementing effective recycling programs for their respective businesses and organizations.

Many businesses expressed an interest in receiving standard guidelines and technical assistance for providing employees with information about recycling and to assist them with the proper disposal of waste generated on site. While most businesses seemed eager to separate recyclables in their workplace, others were concerned about allocating extra time and labor costs to these activities and about the amount of space required for extra bins and storage.

In general, the business managers interviewed were enthusiastic about implementing recycling mechanisms and expressed a willingness to think about more effective ways to increase their recycling activities and raise awareness among their employees.

Managers, like most others, were especially interested in convenient solid resource management methods that were not overly burdensome or costly. Many embraced general themes that promote good business practices and proactive recycling objectives. Managers also expressed a strong desire to hear about proven successes. They believe that there are many business recycling success stories out there that would motivate others and inspire them to do a better job.

Businesses with creative and successful programs were proud and quite enthusiastic to describe their successes to the City. For example, one local grocery store has a very extensive recycling program that includes repurposing fresh produce for house-made juice and bakery items, donating unsellable food to homeless shelters, diverting deli grease and cardboard boxes, in-house recycling of cans and bottles, and encouraging reuse through sale of canvas and mesh bags. For their efforts they have been recognized as a "green business," and the conservation mindset has been established for both their employees and their customers.

2.3.4 Results and Conclusions from the Early Outreach Process

The early outreach process assisted the City in developing the stakeholder participatory decision-making process designed to reach all potential stakeholders. The one-on-one meetings with community organizations, environmental and business groups, private-sector haulers, and government partners provided guidance to the planning process and specific visions and goals for SWIRP. Stakeholders participating in the regional workshops benefited from this guidance and reviewed and responded to the goals outlined by their fellow community members. The goals identified in the early outreach meetings, listed below in Table 3, were discussed by the stakeholders during the first workshop and conference series and were used by the stakeholders as a foundation for the development of the stakeholder-driven guiding principles developed in Phase 1 of the SWIRP planning process.

Table 3: Stakeholder Input on Goals in the Early Outreach Meetings

Community Organizations

- Zero Waste is the major guiding principle. Everything stems from here.
- Focus on protecting the environment. Everything else, such as protecting neighborhoods, eliminating greenhouse gases, and creating green jobs, should follow.
- Zero Waste is not truly achievable but is a goal to aim for.
- Los Angeles' *Zero Waste Plan* will create more jobs. These jobs will encourage people to work in the wasteshed in which they live.
- Value cleanliness and prioritize family and home.
- Communities will be clean. Rich, poor, or in between, people highly value the quality of life in their neighborhoods.
- Los Angeles will be a Zero Waste city and will have waste-to-energy projects, but we will make sure that equity—environmental justice—is maintained so that the wealthy and poor communities share the burdens and the benefits.
- Equity is of utmost importance, that it is not a City of "haves" and "have-nots." Los Angeles should be a city where diversity is valued.
- SWIRP plans will be developed from the local (individual wasteshed) perspective of waste management.
- Develop green jobs and hire young people. Create pride in the community.
- Value resources; conserve water; educate people to conserve natural resources and recycle more.
- Good management of solid resources will produce opportunities for cost reduction, safer neighborhoods, and good health.
- People will recycle and become green as a way of improving the world for children.
- Twenty years from now, Los Angeles will have blue skies, more public transportation, and less traffic.
- All recyclable products will be recycled.
- Companies will become green and act as role models for their employees.
- Corporate buildings will recycle.
- Los Angeles will combine education and enforcement to get people to do their part to recycle, reduce waste, stop scavenging, and keep neighborhoods and waterways clean.
- Waste reduction will start with manufacturers. They will produce things that don't have to be replaced frequently. Upgrades—rather than replacement—will be easier.
- Manufacturers will design, manufacture, and sell environmentally friendly products.
- Landfills will take only inert materials.
- Poorly handled trash affects future generations. Value children's health and future.
- Los Angeles will be a more-sustainable city, and recycling will be extended to multi-family housing and the commercial sector.
- Recreational areas will not be converted to industrial-use areas.

- We will reduce our dependence on landfills.
- Commercial recycling will be mandated.
- People will be educated about the impacts of excessive trash and encouraged to compost. Los Angeles will seek new uses of by-products to reduce and offset collection costs.
- Los Angeles will encourage the establishment of small, local processing centers and will convert 80 to 90 percent of trash into energy or reuse.
- All yard trimmings will be processed and reused locally.
- Everything from processing to end uses will be managed locally as much as possible.
- Power generation will come from waste products that have no alternative uses.
- Clean-burning incinerators will be used for waste-to-energy systems.
- Packaging will be reduced at the source.
- Government services will be paperless.
- Businesses and homes will be paperless too.
- Certain areas of the City that have had more than their fair share of trash- or recycling-rated facilities will not be sites for future solids-handling facilities. Sun Valley, Granada Hills, and the LANCER site were mentioned specifically, but there are more communities that feel this way.
- Solid resources decisions will prioritize fairness and equity.
- Good plans will be backed up with strong enforcement.
- Recycling will be maximized and the amount of refuse that goes to Alternative Technology will be minimized, unless that technology is environmentally safe.
- All landfills will harness methane for energy.
- We need to invest in future technologies, even if they are expensive today.
- We will revamp our current trash collection mentality and get away from the landfill mentality.
- Cities and county agencies will work together to make implementation of good ideas easy and sensible.
- Housing will be affordable.
- Trash will be reduced to minimal amounts. Inerts will be shipped out of the urban area by rail.
- Residents will take for granted (automatically think) that very few materials belong in the black bins.
- Integrated planning will take into account all environmental and sustainability issues. All City sustainable and environmental issues should be integrated and not separated from each other. This includes City projects and programs.

Environmental Organizations

- Protect the environment and individual health. All SWIRP guiding principles stem from here.
- Los Angeles will establish a bureaucracy that supports local solutions. This might involve establishing a nonprofit structure to support emerging micro-businesses.
- Los Angeles will be a leader in sustainability.
- Mayor Villaraigosa's *Carbon Plan* will help guide SWIRP goals and guiding principles. Find common ground.
- We will look at the total picture regarding waste and pollution and will not be shortsighted. We will not take one problem—like waste—and convert it into another problem—like air pollution.
- Responsibility for waste management will shift from focusing on consumers to everyone involved, including the producers, distributors, jurisdiction, and consumers.
- Remove the politics of trash and focus on "leave the earth better than how you found it by conserving natural resources."
- We will develop the concept of "sufficiency." People will recapture their autonomy.
- SWIRP will reduce waste and address the toxic stream source.
- We will look at the total lifecycle of products—cradle to cradle.
- The 20-year plan will focus on the big picture, not just costs.
- Solutions will integrate big-picture issues such as reducing the need for air conditioning, pumping water, etc.
- People will feel personal responsibility for their actions. They will realize that they are part of the earth's environment and feel guilty when they don't do the right thing.
- Los Angeles will be litter-free; will have more green space; and will have smart planning and development that includes energy efficiency, environmentally responsible waste management, and water-wise use.
- Markets will be created for materials that cannot currently be recycled.
- Recyclable products will be reused/recycled/composted before they are used for energy.
- Waste will be managed locally.
- People will buy "recycled."
- Jobs will be created locally.
- Fewer trucks with trash or recyclables will be on Los Angeles' streets.
- Resource Recovery Parks will be the #1 priority.
- There will be more green jobs and more emphasis on sustainability.
- For every job at a landfill, you could create 75 new jobs at a Resource Recovery Park.
- SWIRP will focus on waste reduction, not just recycling or Alternative Technology.
- Garbage will be treated as an economic concept. It is made up of resources with value to create energy or be reused in other ways.
- More recycling will allow us to use less virgin materials and save natural resources.
- SWIRP will consider the 2 percent solution for achieving 70 percent and higher diversion rates. Big "magic bullets" are not the solution. Pursue achievable and incremental wins. Small, decentralized solutions will avoid some of the community impacts and environmental justice issues that work against successfully moving recycling rates upward.

Business Organizations

- The restaurant industry will be green in 10 years.
- Food packaging will be safe, environmentally responsible, and cost effective.
- We will provide more education about what can be recycled.
- Cities and counties will pool public education dollars to do more, high-level advertising campaigns together.
- We will pursue alternative energy at lower costs. We will place solar panels on government buildings. City and government will be a model for the public by using more alternative energy sources.
- We will design for the environment.
- Building owners will provide recycling and renewable energy options for tenants.
- City's *Climate Change Action Plan* will reduce greenhouse gases by 35 percent by 2030.
- Cost-effective and convenient food waste composting will be available.
- Urban landfills will continue to be used until they fill because that is the cheapest and best option available to Los Angeles. At the same time, develop options, such as Alternative Technology facilities, to deal with the closure of filled urban landfills.

Private Haulers and Recyclers

- We will have a holistic approach: preservation of resources, reduction of pollution, saving the environment, being cost effective.
- Zero Waste is not the only answer. Remember, the most important thing to the homeowner and business is that they don't want stuff sitting at the curb.
- The aesthetics of a green city will include trees, open spaces, parks, and an open and welcoming approach to green building and sustainable design.
- The City will drive the infrastructure by streamlining siting and permitting and providing incentives for organics and food waste recyclers.
- Conversion technology will be pursued with vigor.
- Use a material recovery facility (MRF) First. All collected solids will be "MRFed" before they go to a landfill or conversion technology facility.
- Los Angeles will recognize and support the efforts of the private sector, ensuring future capacity by expanding MRFs and transfer stations to include both new materials and increased volume.
- We will explore methods to share cost savings or revenue with neighborhoods that host facilities or show superior diversion.
- We will have more drop-off centers to service residents.
- Regional collaborations will be pursued.

Private Haulers and Recyclers

- Trusting and believing comes from action. People will see results from their feedback.
- We will create local jobs that promote a cleaner and more-sustainable environment.
- Green jobs will be created in accounting and design (measuring greenhouse gases, measuring carbon credits, designing non-polluting facilities).
- Los Angeles development standards will go beyond what we have now for MRFs and transfer stations. The new ecological footprint will have to be quieter, cleaner, more physically attractive, and buffered from neighborhoods. The City will have to pay more to meet these standards.
- We will develop a blue ribbon advisory group to advise City leadership on SWIRP.
- We will create trade incentives to encourage manufacturing in urban areas subject to industrial closed-loop economy standards because low emissions and water recirculation will cost more.
- Organics generated in Los Angeles will be used by composting and electricity.
- We will have a visible, meaningful recognition program for companies that aggressively recycle. To reach Zero Waste, all recycling initiatives will be mandatory.
- Recycling will be mandatory for both residential and commercial.[38]
- Recycling will not be mandatory.
- We will support conversion technology, but not at the expense of recycling.
- Local governments will follow their own policies. Even though the California Integrated Waste Management Board holds local governments responsible for meeting AB 939, these requirements were only recently implemented by State facilities. This did not send the appropriate message.
- We will have a conversion technology strategy as developed by *RENEW LA*.
- We will develop a responsible climate action plan, including moving away from large, centralized facilities to more decentralized wasteshed-based infrastructure.
- Waste haulers and recyclers will be part of the solution.
- Recycling programs and facilities will promote environmental protection and will benefit the economy.
- We will focus on the value of recycling as related to reduction of greenhouse gases.

[38] Note that some input from stakeholders was contradictory. For example, some private haulers and recyclers felt that mandatory recycling was desirable and some felt that it was undesirable. As a result of this input a phased approach to mandatory recycling was discussed during Phase 2 of SWIRP.

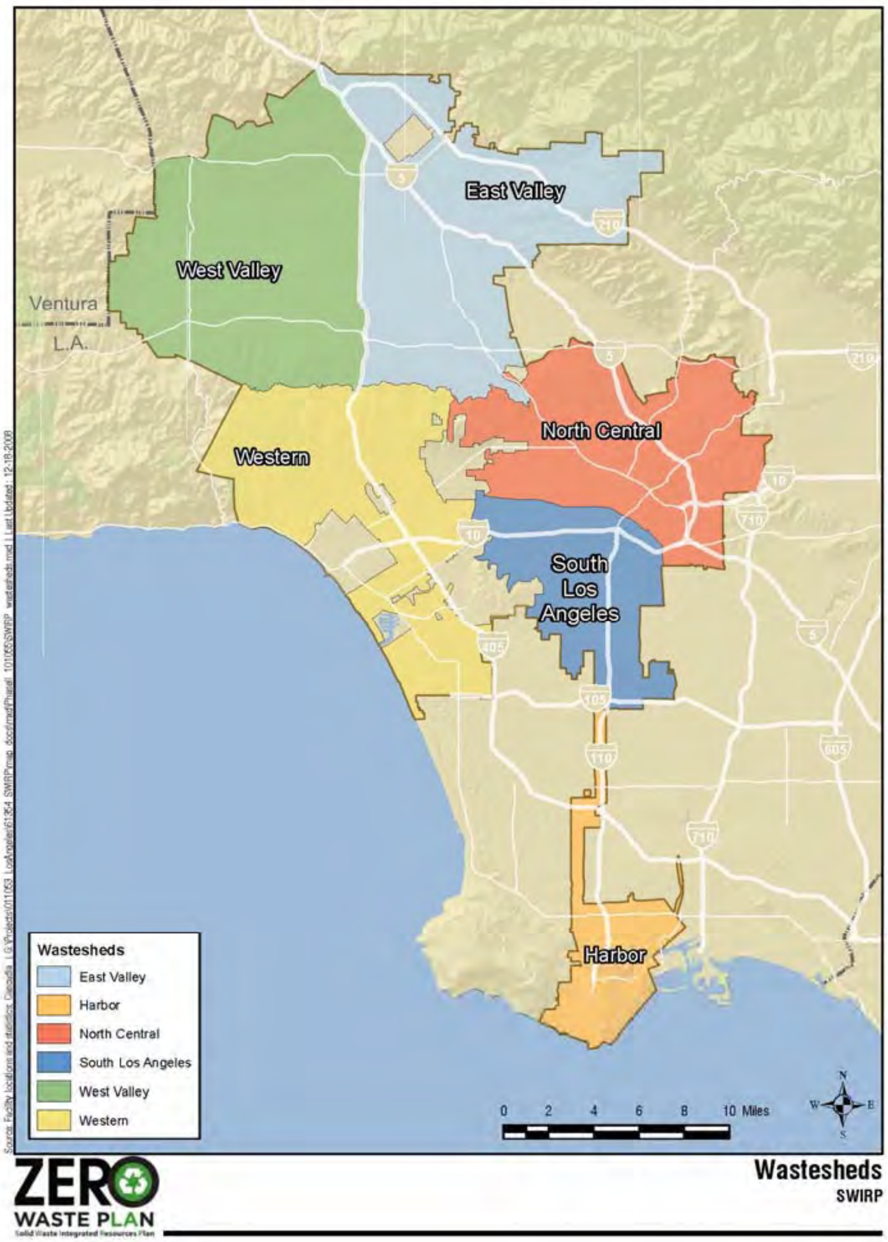
Government Partners

- We will have a regional approach and will form partnerships between cities to achieve Zero Waste.
- Cities will take care of their own solid waste problems without negatively impacting other communities.
- We will achieve Zero Waste by 2020.
- We will have the political will to create a different paradigm.
- The proven simple technologies used in Europe that offer fully assembled turnkey systems will be pursued with vigor.
- Front-end separation of wastes will be maximized so that what is left can be handled with Alternative Technology that produces clean energy and reduces greenhouse gas emissions.
- Conversion technology is the answer to the region's problems.

2.4 Wasteshed Regional Working Groups

The City organized the SWIRP planning process around the City's six collection districts or "wastesheds," which are East Valley, West Valley, Western, North Central, South Los Angeles, and Harbor. The regional working groups were formed in these wastesheds, and participants were drawn from contacts made during the early outreach meetings and from the local neighborhoods, community groups, churches, and local businesses. The basic boundaries of the wastesheds are illustrated in Figure 5.

Figure 5: Los Angeles Collection Districts or "Wastesheds"



2.4.1 Waste Generation in the City and Waste Disposal by Wasteshed

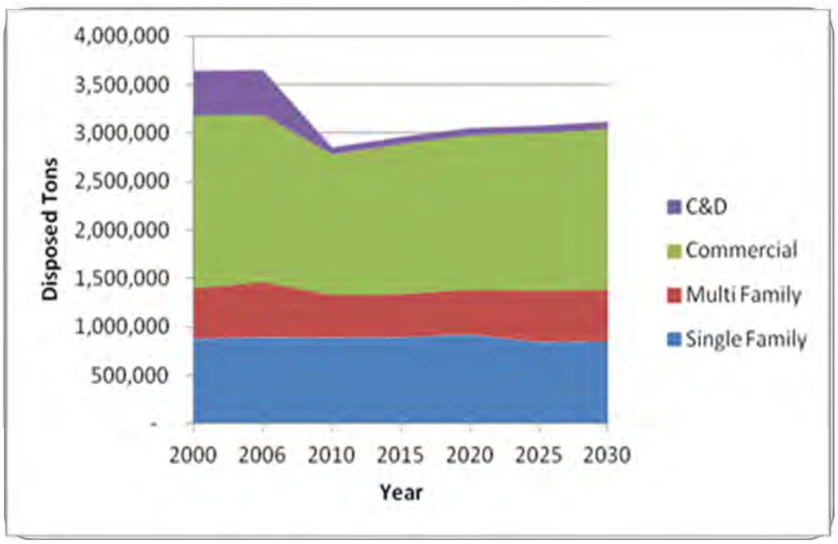
2.4.1.1 Waste Generator Sectors

Waste is generated by residents, businesses, institutions, public venues, and City departments and at C&D sites within the City. For planning purposes, the City tracks disposal tons by generator type:

- Residential curbside (residents in detached homes and some multi-family residences, primarily with four units or less, serviced by LASAN)
- Multi-family complexes (residents in apartments, condominiums, and townhouses of more than four units, primarily serviced by private sector commercial haulers)
- Commercial businesses (small and large businesses, institutional and industrial generators, and public venues, all of which generate waste that is collected by a permitted private waste-hauling company)
- C&D sites

Figure 6 shows the projected waste disposal by generator sector through 2030. Projections help to target materials for new diversion programs. Residential disposal projections are based on expected population growth with a constant per-capita disposal rate.[39] Commercial disposal projections are based on expected increases in employees within each industry.[40]

Figure 6: Projected Waste Disposal by Generator Sector



Source: City of Los Angeles Generation Projection Model – January 2013

[39] Based on Southern California Association of Governments (SCAG) population projections through 2030.
[40] Based on SCAG employment projections for the following seven categories: Manufacturing, Transportation/Communication/Utilities, Wholesale, Retail, Financial/Insurance/Real Estate, Services, and Government. The employment category that includes construction was specifically excluded.

2.4.1.2 Documenting Tons by Generator Sector

LASAN provides collection services to residential curbside customers from the six wastesheds within the City. Disposal tonnage information is generated from scale tickets issued as the collection vehicles arrive at transfer stations or landfills to empty their loads. Each disposal facility in California must provide the State with data on the tonnages received as well as the jurisdiction from which the waste was generated. The total tons of waste disposed annually from all jurisdictions in the State is documented in a database (the Disposal Reporting System) maintained by CalRecycle.

Waste collected by permitted waste haulers serving commercial customers and multi-family complexes (with five units or more) is documented based on citywide data from the CalRecycle Disposal Reporting System and allocated to the City's six wastesheds based on the numbers and types of commercial businesses and multi-family residential generators within each wasteshed.

Tonnage information for separate collection of yard trimmings, recyclables, C&D materials, and other materials diverted from landfill disposal are also tracked as loads are delivered to MRFs, compost facilities, C&D facilities, or designated areas at transfer stations and landfills where the materials are handled for recovery. Facility operators use scale house transaction records to implement their tracking systems, but they may also use other methods such as volume-to-weight conversions based on the observed volume of the load delivered.

Waste "generation" is the sum of tons diverted plus tons disposed and is used to determine the City's rate of waste diversion, as shown in the equation below.

Waste Generation = Disposal + Diversion

2.4.1.3 Tons Generated, Disposed, and Diverted in the City

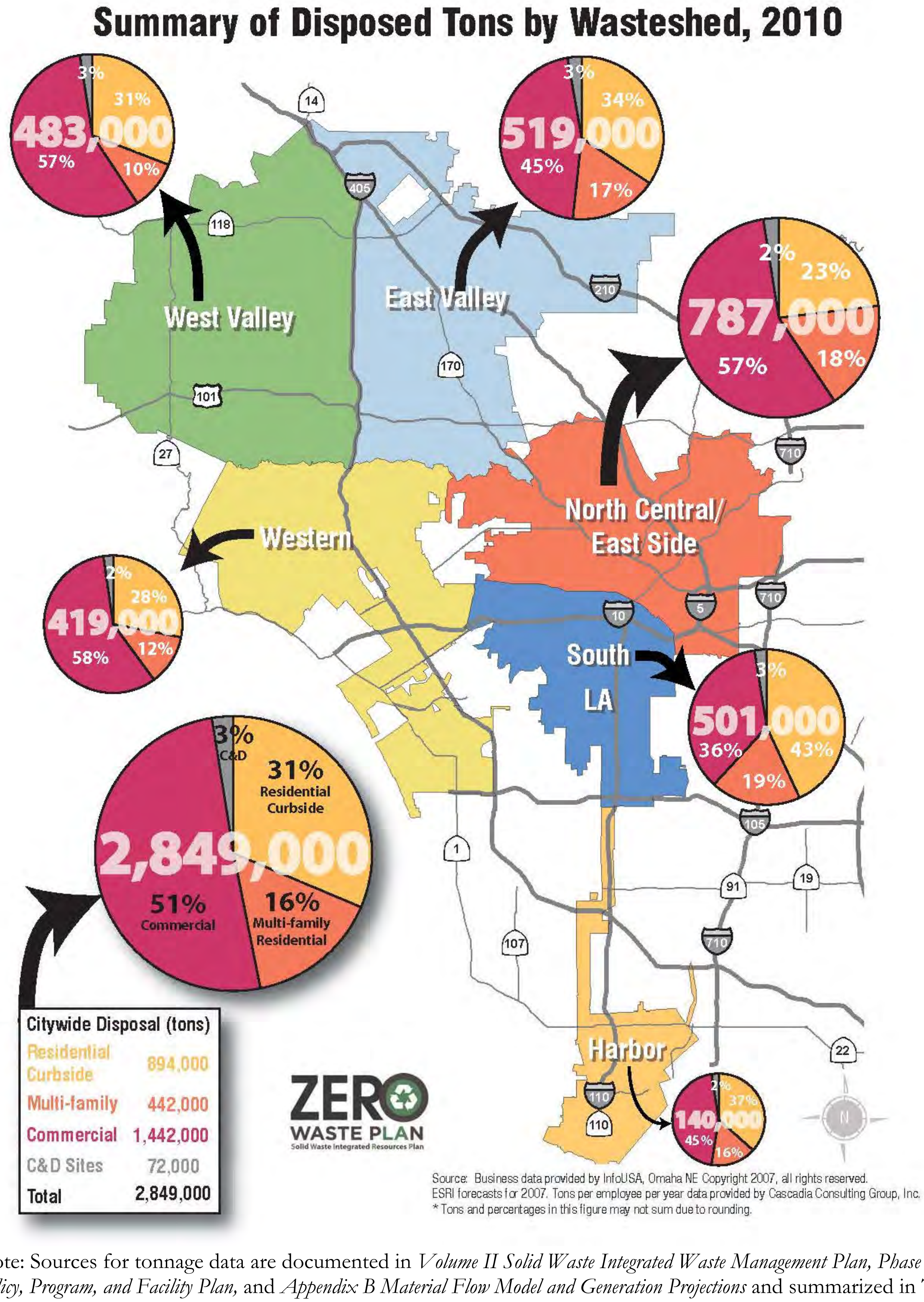
Residents and businesses in the City generated a total of 10 million tons of materials in 2010. The tons disposed and diverted by the residential curbside substream are based on LASAN records. Estimates for the disposed waste from multi-family, commercial, and C&D site substreams were developed based on total 2010 tonnage figures from the *CalRecycle Disposal Reporting System* and on commercial per employee and multi-family per household disposal rates calculated in the *City of Los Angeles Waste Characterization and Quantification Study Year 2000*, July 2002. Of that amount, 7.2 million tons (or 72 percent)[41] were diverted from disposal:

- C&D materials – 2.2 million tons
- Recyclables – 2.6 million tons
- Organics – 0.8 million ton
- Reuse and reduction – 1.6 million tons

The remaining 2.8 million tons were disposed in landfills. Figure 7 shows the waste disposed by generator sector within each of the City's six wastesheds in 2010.

[41] The City reached 72 percent in 2010, the base year for SWIRP. By 2011, the City achieved 76.4 percent diversion (Zero Waste Progress Report, March 2013).

Figure 7: Summary of Disposed Tons by Wasteshed in 2010



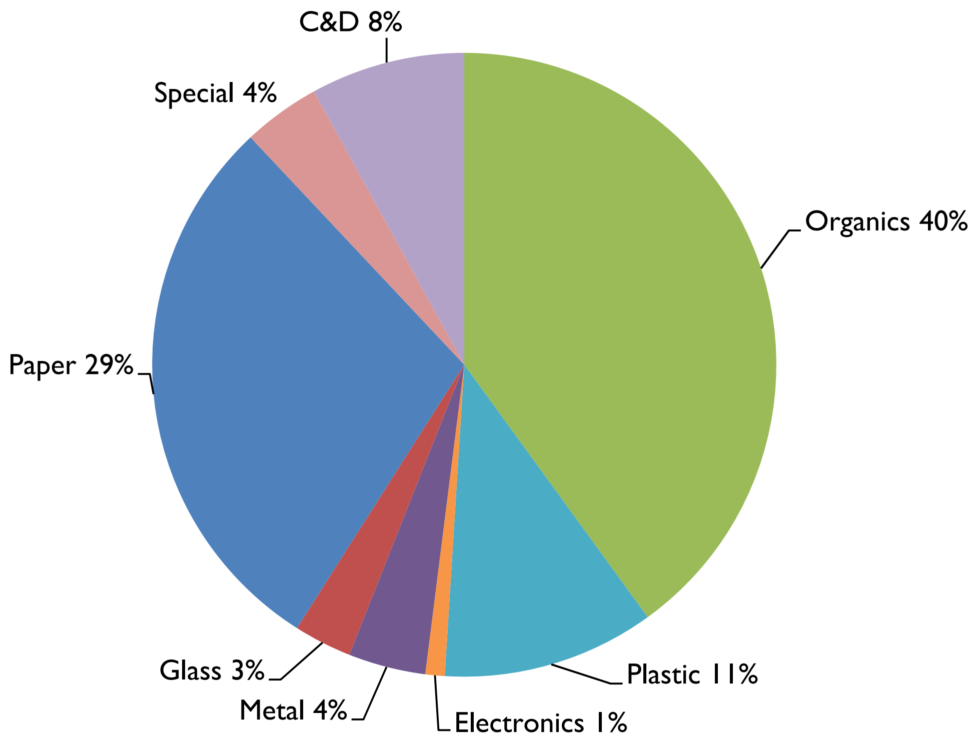
Note: Sources for tonnage data are documented in *Volume II Solid Waste Integrated Waste Management Plan, Phase 2 Policy, Program, and Facility Plan,* and *Appendix B Material Flow Model and Generation Projections* and summarized in Table 3, page B-12.

2.4.1.4 Composition of Disposed Waste

Most of the waste disposed in landfills by generators in the City includes materials that can be recycled or composted. Figure 8 shows the composition of disposed waste in the City.

- **Organics** include compostable materials, such as yard trimmings, food scraps, and compostable paper contaminated with food scraps.
- **C&D** includes asphalt roofing and paving materials, concrete, gypsum board, rocks, and soils.
- **Special** waste includes materials that require special handling, household hazardous waste, ash, biosolids, tires, and bulky items.
- **Paper**, **Glass**, **Metal**, and **Plastics** include the standard commodity types.
- **Electronics** include computers, monitors, televisions, and other electronic equipment.

Figure 8: City of Los Angeles Waste Characterization (Citywide)[42]



[42] *City of Los Angeles Waste Characterization and Quantification Study Year 2000*. Supplemental information from *CalRecycle Self-Haul Waste Characterization Study, 2003*.

2.4.2 Regional Working Group Planning Process

Members of the regional working groups representing the six wastesheds were recruited from the City's 90 Neighborhood Councils and nominated by City Council members. Members were also referred by key constituents and through the business interviews and house meetings. Each of the six wastesheds of the City is the equivalent of a medium-sized city. By focusing the planning process in each of the wastesheds, LASAN sought to involve local residents and businesses in planning for the programs and facilities that will be needed locally. Having workshops in each wasteshed allowed LASAN staff to come to the stakeholders rather than expecting the stakeholders to come to LASAN. This grassroots effort was designed to produce the broadest perspective and best opportunity for getting true community participation.

2.4.2.1 The Role of Regional Working Groups

The six regional working groups took on the major tasks of the Phase 1 planning effort. Over the course of the 1-year planning period, the regional working groups met six times to focus on specific subject areas based on the workshop topics described below. The results from these workshops were brought together in three citywide conferences.

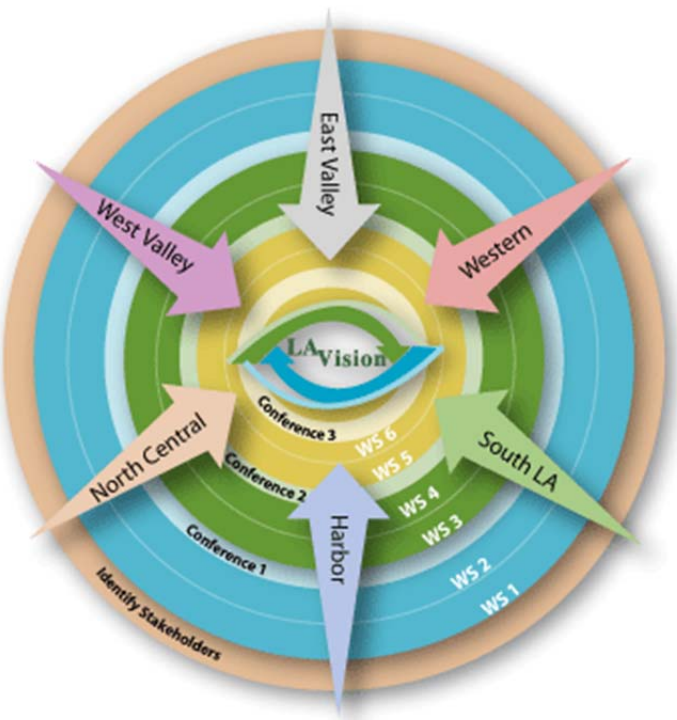
2.4.2.2 Workshop Topics

- **Workshop 1 Forming the Foundation, August 2007** – Stakeholders set the stage for SWIRP and identified the constraints and opportunities for achieving Zero Waste.
- **Workshop 2 Goals and Objectives, September 2007** – Stakeholders reviewed existing City goals and polices and the goals and objectives established in other Zero Waste communities. Stakeholders identified the goals for SWIRP (including education, manufacturer responsibility, consumer responsibility, City leadership, and culture change).
- **Citywide Conference 1 Goals and Objectives, October 2007** – Stakeholders discussed the goals and objectives identified in the regional workshops and established the top goals for SWIRP.
- **Workshop 3 Policy and Program Options, November 2007** – Stakeholders discussed and ranked 40 different policy and program options identified through the stakeholder process.
- **Workshop 4 Facility Options, December 2007** – Stakeholders took a "virtual" facilities tour (viewing slides of local facilities and examples from around the world) and discussed community-scale facility options (repair and reuse businesses, used building materials yards, Resource Recovery Centers) and regional-scale facility options (MRFs, composting facilities, C&D facilities, Alternative Technology facilities).
- **Citywide Conference 2 Policy, Program, and Facility Options, February 2008** – Stakeholders reviewed policy, program, and facility options using a system dynamics decision tool to illustrate different leverage points that the City can undertake to achieve different results (in diversion, greenhouse gas emissions reduction, relative costs, and relative ease of implementation).

- **Workshop 5 Evaluation, February 2008** – Stakeholders evaluated the policy, program, and facility leverage points discussed in the citywide conference and began to identify emerging guiding principles for SWIRP.
- **Workshop 6 Guiding Principles, March 2008** – Stakeholders refined the guiding principles and applied them to the City's policy discussion for reducing plastic litter in the environment. Stakeholder feedback was provided to the City Council in its consideration of the plastics policy adopted in July 2008.
- **Citywide Conference 3 Guiding Principles, May 2008** – Stakeholder panelists shared their Zero Waste journeys, and stakeholders signed off on the guiding principles.

Figure 9 illustrates how the stakeholder outreach, workshops, and citywide conferences led the identification of the guiding principles.

Figure 9: Regional Working Group Process



Workshops and conferences were scheduled so that each series of two sequential regional workshops led into one citywide conference. This sequence was repeated three times so that there were three series of workshops and three citywide conferences in the first year.

Each workshop built the foundation for the citywide conferences. The first series of workshops focused on setting the goals and objectives for the SWIRP process. Community members at the first citywide conferences evaluated the goals and objectives developed in the workshops and developed preliminary metrics. The second series of workshops focused on developing policy, program, and facility options. The final series of workshops focused on evaluating the policy options and developing recommendations and guiding principles for the development of the *Policy, Program, and Facility Plan* in Phase 2 of SWIRP.

2.5 Conference Series 1 Developing the Vision

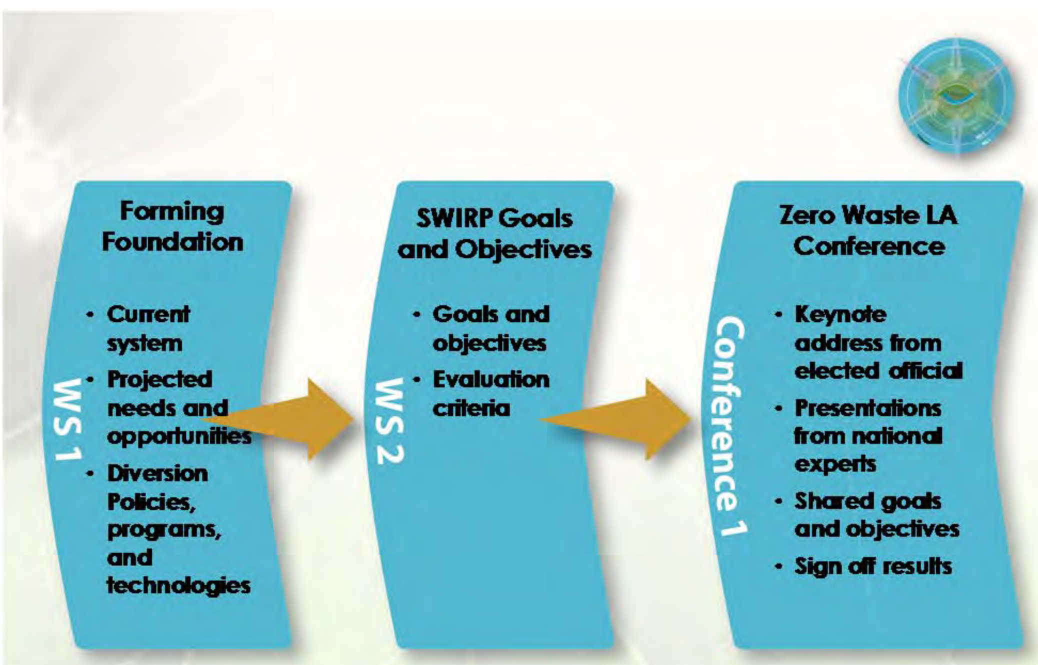
The first conference series focused on providing a foundation for the stakeholders on the City's solid waste system and developing the stakeholder vision for SWIRP.

Figure 10 illustrates the workshop process leading up to the first citywide conference.

2.5.1 Workshop 1 – Forming the Foundation

The focus of workshop series 1 in August 2007 was to introduce the Zero Waste planning process and discuss opportunities and constraints for achieving Zero Waste. LASAN also provided the stakeholders with an introduction to the City's solid waste system.

Figure 10: Conference Series 1 Developing the Vision



At the first of the workshops, the West Valley workshop in the Granada Hills area of Los Angeles, Former District 12 Councilmember Greig Smith welcomed stakeholders to the Zero Waste planning process and introduced them to *RENEW LA*, the City's blueprint for Zero Waste. Councilmember Smith also was the first person to sign the SWIRP Zero Waste banner and then invited all of the stakeholders present to "sign on for a Zero Waste LA." This banner was brought to each of the workshops and citywide conferences for stakeholders to sign.

Councilmember Greig Smith kicks off the first workshop in August 2007

City staff described the planning context for SWIRP and the current and planned LASAN recycling programs:[43]

- Residential curbside recycling
- Multi-family residential recycling
- Residential yard trimming collection and processing
- Griffith Park Composting Facility
- Mulch/compost giveaway sites
- Bulky item collection for residential curbside and multi-family generators
- S.A.F.E. (Solvents, Automotive, Flammables, and Electronics)
- Christmas tree recycling
- Backyard composting
- Restaurant food scraps recycling
- C&D recycling
- LAUSD Blue Bin Recycling Program
- Ambassador Program
- Residential food scraps pilot
- Commercial and office recycling
- Potential incentives and/or requirements for private-sector haulers

The City's Residential Collection Program

[43] Presentations are posted on the City's website at www.zerowaste.lacity.org (accessed October 1, 2013).

The City also introduced the concept of Zero Waste:

- Take a whole-systems approach
- Recognize that waste is not inevitable
- Discarded materials are potentially valuable resources
- Go beyond "end of the pipe" strategies
- Maximize recycling and composting
- Reduce consumption
- Design waste out of the system
- Ensure the highest and best use of products and packaging at the end of their useful lives
- Reuse products and packaging, retaining their original form and function
- Recycle or compost materials that are not reduced or reused
- Expand, attract, and support green businesses and "green collar" jobs
- Reserve sufficient land for Zero Waste infrastructure
- Buy green goods and services

After hearing the presentation, the stakeholders split up into small groups to discuss the opportunities and constraints in the City for achieving Zero Waste.

Opportunities identified by the stakeholders in conference series 1 included:

- Provide incentives to businesses to encourage recycling
- Reduce packaging
- Integrate mulch program in school gardens
- Increase media advertising
- Increase opportunities for local recycling businesses
- Provide more recycling bins in City parks and facilities
- Ban expanded polystyrene (EPS) foam take-out containers and/or plastic bags

Constraints identified by the stakeholders included:

- Contamination, participation, logistics
- Lack of education about existing recycling programs and Zero Waste
- A growing population
- Not enough incentives
- Illegal dumping
- Lack of enforcement
- Language barriers

The full list of stakeholder ideas generated at workshop series 1 is listed on the City's website at www.zerowaste.lacity.org. All of the ideas discussed during the first workshop series formed the foundation for the goals, policies, and program ideas codified in later workshops.

2.5.2 Workshop 2 – Goals and Objectives

During workshop series 2 in September 2007, stakeholders identified the goals and objectives for the planning process, which included the following.

2.5.2.1 Education

- Create a mass media education campaign targeting the general population focusing on the three "Rs" with specific examples on behavior changes
- Create a mandatory curriculum for the K–12 school system that interweaves environmental education into all aspects of coursework

2.5.2.2 Manufacturer Responsibility

- Phase out all non-recyclables and non-compostable items from the City
- Produce products with less toxic materials
- Penalize non-compliant vendors
- Hold businesses/industry accountable for their product/packaging

2.5.2.3 Consumer Responsibility

- Reduce packaging and increase consumer responsibility
- Mandatory recycling for businesses (by City or private haulers)
- Pay-As-You-Throw Strategy
- Uniform rules for the residential and business sector
- Reduce contamination so the materials can be recycled
- Change behaviors not just as individuals but as a collective group

2.5.2.4 City Leadership

- The City of Los Angeles should serve as a model in practicing reduce, reuse, and recycling
- Equitable distribution in siting facilities
- Facilities sized and scaled for each community
- Recycling bins at all public venues
- Reduce traffic impacts in residential neighborhoods
- Open additional convenient S.A.F.E. Centers
- The City of Los Angeles should revise its purchasing practices and purchase only from "green" vendors
- Recycling solutions need to be convenient and doable

2.5.2.5 Changing the Culture

- Refocus local production, local recycling, local manufacturing
- Recycling must not become a political issue
- Zero Waste should become second nature as part of the culture of the family, education system, and community
- Create political will to continue and implement the *Zero Waste Plan*

2.5.3 Citywide Conference I – Vision, Goals and Objectives

Over 300 stakeholders attended the City's first citywide conference in October 2007. The conference opened with presentations[44] from Zero Waste experts. Nancy Sutley, former Deputy Mayor of Energy and Environment, outlined the progress the City is making toward a green Los Angeles. Gary Petersen from the California Integrated Waste Management Board gave a presentation, "There is No Away," which chronicled the history of recycling in Los Angeles and the options for using the resources that are currently being landfilled. American Public Media's Tess Vigeland, host of *Marketplace* and *Marketplace Money*, presented Tess' Trash Challenge, in which for 2 weeks she led a Zero Waste lifestyle as documented on the air and in her blog, www.publicradio.org/columns/marketplace/trash. Attendees were then invited to undertake their own Zero Waste challenge.

A business panel discussion with representatives from REI, Vons, Ricoh Electronics, and Toyota Motor Sales focused on the challenges and accomplishments in changing corporate cultures to incorporate Zero Waste. After the panel discussions and presentations, community members broke into small groups to confer and identify the top citywide goals for SWIRP. Seven top goals (selected from those discussed at the workshops) were identified, as listed below.

2.5.3.1 Top Citywide Goals

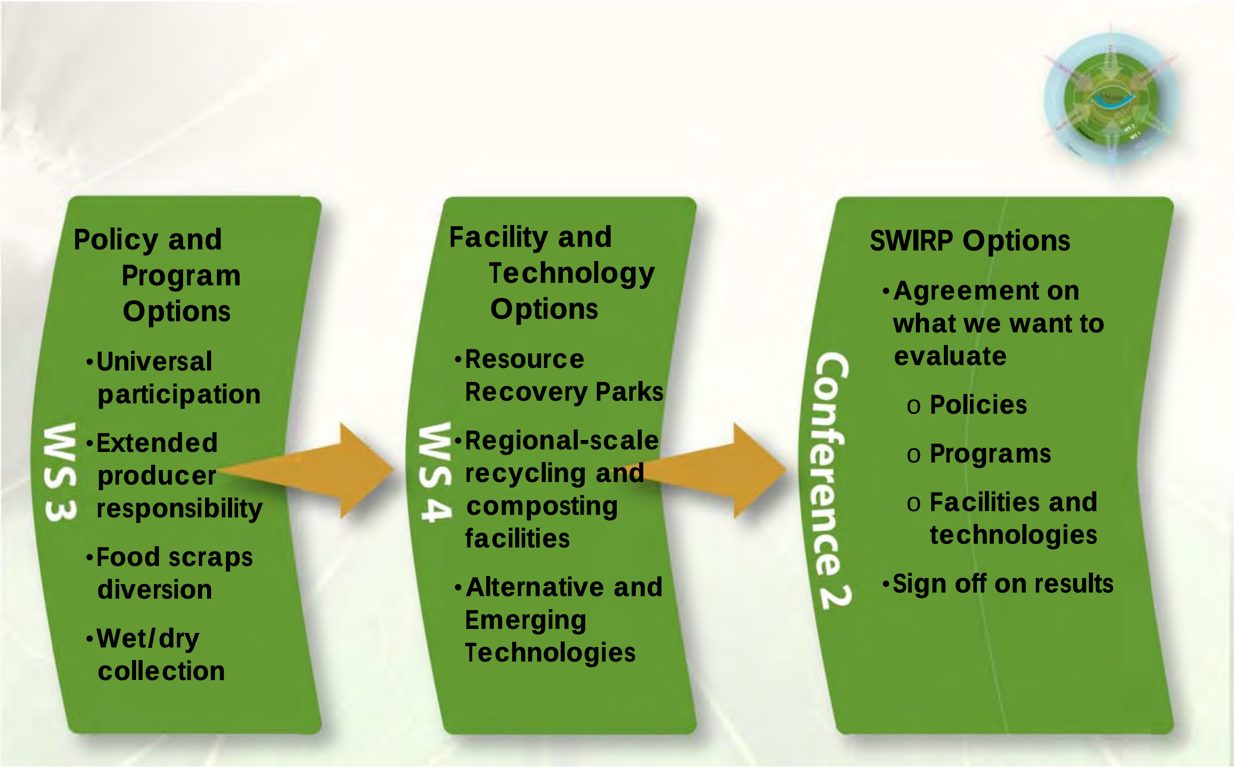
1. Create mass media education campaign targeting the general population focusing on the three "Rs" with specific examples of behavior changes.
2. City should serve as a model in practicing reduce, reuse, and recycling.
3. Hold businesses/industry accountable for their products and packaging.
4. Recycling solutions need to be convenient and doable.
5. Create political will to continue and implement the *Zero Waste Plan*.
6. Recycling bins at all public venues.
7. Zero Waste should become second nature as part of the culture of the family, education system, and community.

[44] The presentations are posted on the City's website at www.zerowaste.lacity.org (accessed October 1, 2013).

2.6 Conference Series 2

The second conference series focused on the policy, program, and facility options available for implementation in the City and identified the stakeholder priorities. Figure 11 illustrates the workshop process leading up to the second citywide conference.

Figure 11: Conference Series 2 Identifying the Options



2.6.1 Workshop 3 – Policy and Program Options

During workshop series 3 in November 2007, stakeholders discussed and ranked 40 different policy options identified through the stakeholder process, including the list of ideas developed in workshop series 1 and the goals and objectives discussed in workshop series 2 and at the citywide conference. For the purpose of discussion, the policy and program options were divided into the following categories:

- **Upstream** – policies that focus on reducing products and packaging at the source and engaging manufacturers to take responsibility for their products and packaging through product stewardship.
- **Downstream** – policies and programs to divert materials from disposal.
- **Changing the culture** – policies and programs to influence behavioral change and to transform public attitudes about waste.

- **Green businesses, green buildings, and green jobs** – policies to promote green businesses, develop green buildings, and create green jobs.
- **Management of restricted materials and residual solid waste** – policies to address materials that cannot be diverted from disposal and the treatment of residual solid waste prior to disposal.

Specific policies and programs discussed by the stakeholders at the November 2007 workshops are listed below.

Policy and Program Options

Upstream Policies

Make Businesses Responsible for Products and Packages

1. Be a strong advocate for legislation and programs regionally, statewide, nationally, and globally that make businesses responsible for their packaging and products.
2. Engage industry, make them aware of materials and products that are problems for the City, and establish a process for resolving those problems.
3. Ban products or packages from being sold or require businesses and institutions to take back designated products and packaging sold in Los Angeles that are toxic in their manufacture, use, or disposal, and/or are not currently recyclable in the area.
4. Engage industry; make them aware that all new manufactured products need to be approved as reusable, recyclable, or compostable.

Downstream Policies

Source Separation

5. Require all residents, businesses, and institutions to source-separate designated reusables, recyclables, and compostables (including yard trimmings, discarded food, and food-contaminated paper).
6. Encourage deconstruction, salvage, and reuse of materials from C&D projects in addition to existing recycling requirements.
7. Place recycling bins wherever there are trash cans in all public locations.

Incentives and New Rules

8. Require private recyclers and waste haulers to provide collection services to commercial businesses to achieve increased recycling goals.
9. Require all multi-family-dwelling building owners to provide recycling services to their tenants.
10. Require reuse or recycling of all bulky items and composting of brush collected from throughout the City (residential curbside, multi-family, and business), whether served by City or private haulers.

11. Increase fees on private waste-hauling services to provide more economic incentives for recycling and to generate funds for new recycling programs.
12. Increase the use of rebates to provide incentives for marginally economic materials to be reused, recycled, or composted.
13. Support local, regional, and state landfill surcharges and bond issues to fund low-interest loans and/or grants to develop needed local recycling and composting infrastructure in urban areas.
14. Increase incentive to residents to reduce waste through revised Pay As You Throw rates (for example, lower rate for 32-gallon bin) and an expanded "Recycle for Dollars" Lottery and/or RecycleBank system.
15. To maintain incentive for recycling, charges for extra recycling and compost services for commercial businesses should not be more than 50 percent of the cost of trash service.

Restore the Health of Our Soil with Composting

16. Adopt policy that no compostable organics should go to landfill.
17. Support elimination of State "credit" to count Alternative Daily Cover as diversion immediately to help stimulate the development of new composting facilities (including urban areas), particularly ones that can process food scraps.
18. Support the phase-out of the use of yard trimmings statewide as Alternative Daily Cover (used in place of soil to cover trash at the end of the day).
19. Help market urban organics to farmers to restore the health of soils and reduce use of fertilizers, pesticides, and irrigation water.
20. Support legislation to require Caltrans to use mulch and compost made from urban organics to landscape freeways and to use other recycled materials (for example, rubberized asphalt) in sub-base and road mixes.

Support Zero Waste Infrastructure

21. Develop Resource Recovery Parks (neighborhood takeback centers) in each wasteshed of Los Angeles (or nearby) to accept all reusables, recyclables, and compostables from the public and provide locations for reuse, recycling, and composting businesses to process materials, manufacture products, and sell products to the public.
22. Form partnerships with the private sector for Zero Waste infrastructure development for the multi-family and commercial waste streams.
23. Modify the zoning code to allow Zero Waste infrastructure by right in appropriate zones.
24. Have the City provide markets for reusables, recyclables, and compostables.
25. Include *Zero Waste Plan* as part of climate action plans.

Changing the Culture

26. Fund programs on an ongoing basis to educate residents, businesses, and visitors about the new rules and changes over time.

27. Work with LAUSD to integrate Zero Waste into the curriculum and to implement Zero Waste systems for all schools and administrative offices.
28. Train managers of buildings and facilities about Zero Waste systems and resources.
29. Use Facebook, Twitter, Instagram, YouTube, texting, and celebrities to talk about Zero Waste messages.
30. City agencies lead by example to implement all actions asked or required of residents and businesses and report on progress annually.

Green Businesses, Green Buildings, and Green Jobs

31. Help retain and expand green businesses. Provide preferences in City procurement, funding, and permitting for certified green businesses in Los Angeles.
32. Purchase Zero Waste products and services; return to vendor any wasteful packaging; reduce packaging and buy in larger units; use reusable shipping containers; purchase reused, recycled, and compost products; buy remanufactured equipment; lease, rent, and share equipment; buy durables using lifecycle cost analyses; and purchase less-toxic products.
33. Adopt the "precautionary principle" for all City purchases. The precautionary approach seeks to minimize harm by using the best available science to identify safer, cost-effective alternatives.
34. Ask businesses to adopt Zero Waste goals and plans that follow Zero Waste business principles (examples are available on the Grassroots Recycling Network website[45]).
35. Expand the City's use of green buildings and encourage residents and businesses to build more green buildings. Restore functional buildings rather than demolish them.

Management of Restricted Materials and Residual Solid Waste

36. Eliminate use of urban landfills for all City-collected municipal solid waste and encourage other communities regionally and statewide to reduce reliance on landfilling and strive for Zero Waste and sustainability.
37. Require processing of all materials (including organics) before they are landfilled.
38. Develop Alternative Technologies to handle "black bin" materials and further process residual solid waste. Limit the City's commitment to such facilities to no more than 10 percent of the total waste stream currently disposed by residents and businesses, require continuous monitoring systems for all criteria and non-criteria pollutants, and adopt best available control technology for dioxins, furans, and other criteria and non-criteria pollutants.
39. Each wasteshed of the City should share in the responsibility for providing Zero Waste infrastructure and disposal or transfer services for residual solid waste. Facilities should be sized and scaled for each community. All communities should have equal access to all facilities and

[45] Grassroots Recycling Network: www.grrn.org/zerowaste/business (accessed October 1, 2013).

services especially for multi-family dwellings, although facilities could vary for each wasteshed. Facilities should be decentralized and collection services provided so that residents do not have to drive far to properly discard materials.

40. The *Zero Waste Plan* should support the *GREEN LA Plan* goals for 20 percent green energy from renewable sources, the conversion of the City's fleet to clean fuel, and a 35 percent reduction of greenhouse gases below 1990 levels by 2030.

At each workshop, the stakeholders were divided into small groups and were asked to indicate which policies they strongly agreed with and which policies they strongly disagreed with. The following nine policies were the ones most strongly supported by stakeholders:

1. Strong advocacy for legislation and programs regionally, statewide, nationally and globally that makes business responsible for their packages and products.
2. Engage industries by making them aware that some materials and products are problems for the City, (they may be harmful to the environment or difficult for the City to recycle) and establish a process for resolving those problems.
3. Engage industries by making them aware that all new manufactured products and packaging need to be approved as reusable, recyclable, or compostable (i.e., blue dot/green dot system – putting a blue dot on recyclable items and a green dot on compostable items).
4. Encourage deconstruction, salvage, and reuse of materials from C&D projects in addition to existing recycling requirements.
5. Place recycling bins wherever there are trash cans in all public locations.
6. Require all multi-family dwelling building owners to provide recycling services to their tenants.
7. Support legislation to require Caltrans to use mulch and compost made from urban organics to landscape freeways, and to use other recycled materials in sub-base and road mixes (e.g., rubberized asphalt).
8. Fund programs on an on-going basis to educate residents, businesses, visitors, and new immigrants about the new rules and changes over time.
9. Work with LAUSD to integrate Zero Waste into the curriculum and to implement Zero Waste systems for all schools and administrative offices.

2.6.2 Workshop 4 – Facility Options

Workshop series 4 in December 2007 focused on facility options. The stakeholders who attended the facility tours in November 2007 were invited to provide a recap of their impressions of the facilities they visited.

The November 2007 facility tours were:

- **Athens Materials Recovery Facility** – a MRF that processes residual waste from other cities.
- **City of Los Angeles East Valley Solid Resources District Yard** – one of the City's district yards that includes a liquefied natural gas fueling station for the City's collection fleet.
- **Downtown Diversion** – a C&D processing facility.
- **Lopez Canyon Environmental Center** – a City-owned mulching facility that processes some of the City's compostable material.
- **Southeast Resource Recovery Facility** – a waste-to-energy facility that processes some of the City's residual solid waste.
- **Sun Valley Paper Stock** – a MRF that processes some of the City's blue bin materials.

At each workshop, stakeholders who were unable to attend the tours had the opportunity to view a virtual tour of the facilities and also viewed a slideshow presentation of community-scale and regional-scale facility types from Los Angeles and around the world. The following is a description of the community-scale and regional-scale facilities that were presented and discussed at the workshop.

2.6.2.1 Community-Scale Facilities

Community-scale facilities include:

- Repair and reuse businesses
- Used building materials yards or re-stores
- Resource Recovery Centers
- Resource Recovery Parks
- S.A.F.E. Centers
- Product care centers

Resource Recovery Park in Monterey County

The more materials that can be processed and used within the City's communities, the less pressure there will be on citywide and regional facilities. Community-scale or neighborhood-scale facilities also create jobs and impart skills at the local level to reduce the environmental and economic burdens of transporting workers and materials in the local economy. Further, by using materials locally (materials such as compost or building materials recovered through deconstruction), the value of these products will rise, strengthening the economics of these programs.

Reuse and Repair Businesses

Many household items can be feedstock for repair enterprises or programs that return items for reuse. These enterprises and programs also help people acquire important skills, including retail, which can be used to get jobs or further personal projects. Examples of reuse and repair businesses include:

- **Bicycle Repair.** Nonprofit bicycle repair operations focus on imparting skills and refurbished bicycles within their communities. Often these shops combine sales of refurbished bicycles with sales of new bicycles and accessories.
- **Appliance Repair.** Appliances that are not too old to be repaired and that do not meet new efficiency standards are refurbished and sold at greatly discounted prices. This process also trains workers in mechanical and electrical skills. Appliances that are too old to be repaired are recycled through the scrap metals yards and brokers. Appliance fix-it shops take responsibility for removing liquids such as Freon from refrigerators prior to final recycling as prescribed by law. An excellent example of a small-scale appliance program is St. Vincent de Paul, Springfield/Eugene, Oregon.
- **Furniture Repair.** Furniture repair shops are involved with cosmetic repairs on slightly damaged items or comprehensive overhaul of wood or metal-framed furniture. These facilities train workers in upholstery skills and woodworking. Some of these operations recycle mattresses by stripping out stuffing, sterilizing the material for reuse, and recycling the metal springs.
- **Textile Refurbishing and Recycling.** There is a vibrant international market for textile discards. Rags are valued at over $100 per ton. A textile operation can collect high-grade textile discards and segregate quality items that can be repaired and resold in local markets. Reused clothing stores throughout the U.S. make high-quality items available at modest prices. These entities also train workers in skills associated with textile refurbishment. Clothing refurbishing enterprises and programs can link with the City's well-established design and fashion industries. For example, the Korean Cultural Center in Los Angeles is producing embroidered canvas bags for sale as replacements for one-way paper and plastic grocery and shopping bags.
- **Bulky Item Collection for Repair and Recycling.** All cities have bulky items that have to be collected on a regular basis. If not, some bulky items such as furniture, appliances, windows, and other building materials are improperly discarded in streets, alleys, and parks. The City has aggressively addressed this problem by initiating bulky item collection services and a recycling program for multi-family dwellings.
    - <u>Reuse partners</u>. Items collected could be made available to fix-it shops as inventory for their operations. Other entities can recycle materials that cannot be refurbished. In Oakland, California, the City contracts with a grassroots reuse group that handles the bulky items collection for the City and then refurbishes and recycles items before ultimate disposal. In Fremont, California, a nonprofit for reuse precedes the garbage company's bulky pickup truck and collects whatever they think is reusable.

- Lot sales. Lot sales allow fix-it shop operators to bid on a large number of bulky items as opposed to acquiring single items. This approach allows speedy processing of bulky items. In Austin, Texas, the most profitable operation for an extensive Goodwill operation is the "Blue Hangar," which is where all the reusable items are sold after not being "sellable" in Goodwill's network of stores in the area.

Used Building Materials

"Re-stores" are businesses or organizations (such as Habitat for Humanity's ReStore locations) that sell used building materials. Some entities also resell new building materials donated by builders, manufacturers, and households. Successful resale operations require an estimated 100,000 square feet under roof for maximum efficiency, but many programs have started with as little as 15,000 square feet under roof, plus space for loading docks and customer and employee parking. A resale business of 100,000 square feet requires 10 workers. Expandable space is critical, as re-stores traditionally grow rapidly. Moving a re-store can be very expensive. Hence, a re-store has a great advantage if it uses space that can be readily expanded through lease or new construction. Re-stores can save a community $250,000 annually based on reduced prices for good building materials and supplies.

A re-store typically relies on three sources of materials for inventory/sales. First, the re-store might be affiliated with a deconstruction entity that provides recovered building materials. If the re-store is a nonprofit organization, it receives donations from builders, contractors, brokers, and businesses that are remodeling their facilities (such as hotels, apartment houses, or office buildings). Second, traditional building material retail stores provide overstock or outdated but still useful products. A third source of inventory is individual households that are remodeling and want to see their old but still useful cabinets, appliances, and flooring put to good use. It is important for a re-store to establish relationships with all of these sources of inventory.

Resource Recovery Centers

Each neighborhood in Los Angeles could support a small center for drop-off of hard-to-recycle items. These centers could be staffed and supported by advanced product fees collected on a citywide basis, with payments from the City on a per-ton basis for diverting materials from disposal to donations and local enterprises. Neighborhood business districts would also benefit from a neighborhood-scale center to service their immediate needs. A drop-off site for corrugated cardboard could reduce by 50 percent the amount of waste hauled by a contractor. Commercial haulers could own and operate these small centers, which would earn revenue from tip fees and sale of materials.

Resource Recovery Parks

Resource Recovery Parks are places where materials can be dropped off for donation or buyback; these parks co-locate reuse, recycling and composting, processing, manufacturing, and distribution activities. Typically, these facilities are located in industrially zoned areas that are reserved for companies that process secondary materials or make products from these materials.

The Resource Recovery Park concept has been evolving naturally in California at landfills and transfer stations. These facilities have continued to provide additional recycling opportunities for self-hauled loads. Landfills and transfer stations have been near the centers of waste generation. A Resource Recovery Park can make the landfill or transfer station more sustainable by diversifying revenue, conserving capacity, and extending the useful life of those facilities.

S.A.F.E. Centers

Seven drop-off points have been established by the City for **S**olvents, **A**utomotive, **F**lammables, **E**lectronics (S.A.F.E.) and other materials. Residents can drop off household chemicals, paint, medicine, needles, light fixtures, pool supplies, motor oil, pesticides, and batteries. These materials are then processed for recycling where feasible and for proper disposal as needed. S.A.F.E. Centers are staffed when they are open to the public.

Additional locations might be needed to make drop-off more convenient for people who live far from the existing sites. Management of S.A.F.E. Center materials is costly. Residents have expressed support for takeback programs or extended producer responsibility. These concepts require manufacturers of products either to take the products back for proper recycling and disposal or to contribute financially to the City's program to undertake these responsibilities.

In Boulder, Colorado, Eco-Cycle, a grassroots recycling program under contract with the City, has started a Center for Hard-to-Recycle Materials (CHaRM) to address the need to manage new products that enter the discard stream and are not readily recyclable or reusable. The CHaRM Center accepts computers, printers, TVs, cell phones, textiles, plastic bags, white block foam, and other hard-to-recycle materials. CHaRM ensures that electronic components are dismantled in the U.S. and that toxins are handled in a responsible manner. Most recently, in an effort to put the responsibility for hard-to-recycle materials back on manufacturers, CHaRM has launched the Partners for Responsible Recycling that encourages retailers and brand manufacturers to assist CHaRM in developing in-store takeback programs. Eco-Cycle now gets financial support from industries that produce the products that are dropped off at that CHaRM facility.

British Columbia, Canada, has also pioneered the development of takeback programs with industry. In the l980s, the Province determined that household products and vehicles were major contributors to the household hazardous waste (HHW) stream. (Paint made up 70 percent of HHW; solvents, thinners, and fuels, 17 percent; and domestic pesticides, 7 percent. Together these products accounted for 94 percent of the HHW stream, all of which was paid for by taxpayers.) The provincial government therefore adopted Extended Producer Responsibility programs for producers and users of products that created the problem waste. These products included paints, solvents and flammable liquids, pesticides, pharmaceuticals, tires, and lubricating oil.

This model applies the takeback and producer responsibility principles to HHW management.

Product Care Centers

As takeback programs expand and increase, more manufacturers will take more products back. Retailers must be the intermediaries in moving the materials from consumer to manufacturer. Yet, retail stores often do not have the space or workforce to manage takeback products and materials. A community product care center can serve numerous manufacturers, which would pick up the products and materials they are responsible for. This model has been developed extensively in British Columbia. By aggregating materials, collection costs are reduced. Further, properly trained staff for a product care center will keep products and materials safe from contaminating other materials or the environment. As noted above, a product care center could be integrated into other community-scale facilities, forming a small Resource Recovery Center.

2.6.2.2 Regional-Scale Facilities

Regional-scale facilities include:

- Materials recovery facilities
- Transfer stations
- C&D processing facilities
- Composting facilities
- Biomass-to-energy facilities
- Alternative Technology facilities

Anaerobic Digestion Facility in Germany

Materials Recovery Facility

A materials recovery facility (MRF) is an intermediate processing facility designed to remove recyclables and other valuable materials from the waste stream. A "dirty MRF," also known as a mixed material processing facility, removes reusable materials from mixed solid waste. A "clean MRF" separates materials from commingled recyclables, typically collected from residential or commercial curbside programs.

Transfer Station

A transfer station is a facility that receives, handles, separates, converts, or otherwise processes solid waste, whose activities are governed by the CalRecycle Registration Permit tier or Solid Waste Facility Permit requirements. Such facilities typically transfer solid waste directly from one container to another or from one vehicle to another for transport, or temporarily store solid waste prior to final disposal at a landfill or waste-to-energy facility.

C&D Processing Facility

This is a facility designed to process building materials from C&D sites. Typical C&D materials include asphalt, concrete, Portland cement, brick, lumber, wallboard, roofing material, ceramic tile, plastic pipe, and associated packaging.

Composting Facility

This is a facility for collecting, grinding, mixing, piling, and supplying sufficient moisture and air to organic materials to speed natural decay. The finished product of a composting operation is compost, a soil amendment suitable for incorporating into topsoil and for growing plants. Compost is different than mulch, which is a shredded or chipped organic product placed on top of soil as a protective layer. Compost technologies include:

- **Windrow** – compostable material is piled in long rows and regularly turned to enhance aerobic activity and control temperature.
- **In-vessel** – compostable material is placed in enclosed reactors (metal tanks, concrete bunkers, or plastic tubes) where airflow and temperature can be controlled through perforated pipes buried in the material.
- **Aerated static pile** – compostable material is placed in piles on perforated pipes under removable covers, and fans are used to push or pull air through the pipes to control the composting process.
- **Anaerobic digestion** – compostable material is placed in a chamber where microbial activity occurs in the absence of oxygen, producing biogas that can be used for energy production. Anaerobic digestion of residual solid waste is sometimes included in descriptions of "Conversion Technology" or "Alternative Technology." Anaerobic digestion is regulated as composting under State law.

Biomass-to-Energy Facility

This is a waste-to-energy facility for controlled burning of specified organic materials such as wood waste, agricultural crop residues, leaves, grass clippings, and prunings to produce electricity or heat.[46]

Alternative Technology Facility

As described in Section 1.2.2.3, "Alternative Technology" is a term that refers to specific technologies for treating residual solid waste, such as thermal, biological, chemical, and physical technologies. Some examples of thermal technology include plasma arc gasification, pyrolysis, and advanced thermal recycling (or second-generation waste-to-energy). Some examples of biological technologies include anaerobic digestion and aerobic composting. Examples of physical technologies include autoclaving and advanced materials recovery systems.

In 2005, LASAN prepared a detailed report that evaluated various types of Alternative Technologies for treating residual solid waste that are used around the world.[47] The report included identification and characterization of Alternative Technologies, an overview of the regulations affecting Alternative

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[46] CalRecycle, Local Government Central, Glossary of Terms, http://www.calrecycle.ca.gov/LGcentral/Glossary/default.htm (accessed October 1, 2013).
[47] *Evaluation of Alternative Solid Waste Processing Technologies, City of Los Angeles, September 2005,* www.alternativetechnology.lacity.org/background_documents.htm (accessed October 1, 2013).

Technologies, an assessment of Alternative Technologies and technology vendors, and a lifecycle analysis.

2.6.2.3 January 2008 Facility Tours

Stakeholders attending the workshops in December 2007 appreciated hearing about the types of facilities and technologies described by the City. Participants in the November 2007 facility tours found them to be very helpful in visualizing the City's future facility needs. To accommodate stakeholder interest and to provide an additional opportunity for stakeholders to become familiar with solid waste facilities and processes, a second facility tour was scheduled in January 2008.

The January 2008 facility tours were:

- **E-Recycling of California** – an electronic waste de-manufacturing and recycling facility that processes some of the City's electronic waste.
- **Construction & Demolition Recycling, Inc. (formerly Interior Removal Specialists)** – an interior demolition company that reuses, recycles, and donates material generated from commercial remodeling projects.
- **Southeast Resource Recovery Facility** – a waste-to-energy facility in Long Beach that receives about 100 tons of waste per day from City generators.
- **Sunshine Canyon Landfill** – a landfill owned and operated by BFI/Republic Services, Inc., that receives about 5,000 tons of waste per day from City generators.

As a result of the tours and workshop, stakeholders had a better understanding of the types of facilities that might be needed in the City over the next 20 years.

2.6.3 Citywide Conference 2 – Policy, Program, and Facility Options

The second citywide conference in February 2008 began with a Zero Waste film festival and a welcome from City officials. The almost 400 participants then broke into groups to discuss the goals and objectives and the policy, program, and facility options available for achieving Zero Waste.

At this citywide conference, two methods of evaluation were used: a traditional facilitation method using small group discussion and a computer-based method using a computer-based decision tool.

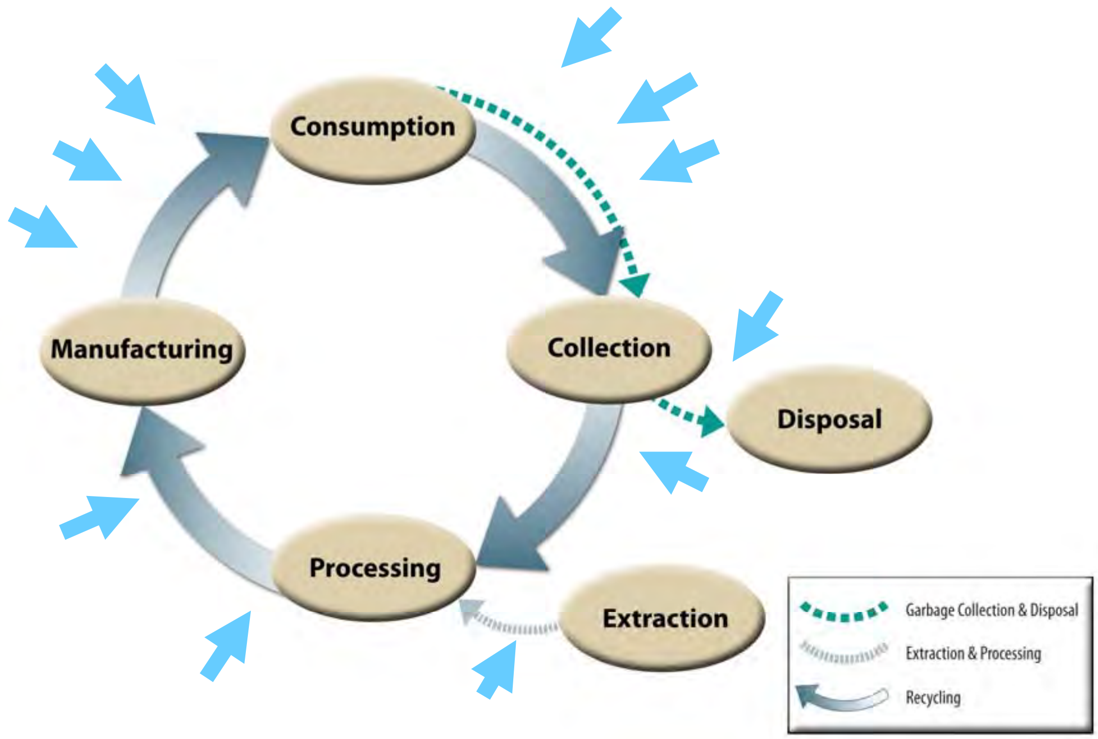
In partnership with the City, a computer-based decision tool was developed by Professor Krystyna Stave of the Department of Environmental Studies at the University of Nevada, Las Vegas (UNLV). Prof. Stave is an expert in system dynamics (an approach for understanding the behavior of complex systems) and has developed system dynamics simulation tools to assist stakeholders in participating in public policy planning for other resource conservation projects (including transit and traffic studies and water conservation and management).

To support UNLV's research, the stakeholders at the conference were divided into two groups. One group used the decision tool developed by UNLV to test the effectiveness of the leverage points, and the other group used the traditional facilitation method of small group discussions with trained facilitators to assist the stakeholders in prioritizing the leverage points. The hypothesis being tested by UNLV was that stakeholders using the decision tool would choose the more "effective" leverage points (those with the higher potential of reducing waste to landfills if implemented). UNLV's research concluded that the stakeholders using the decision tool had a better understanding of the information and focused more on the information that had been presented. Stakeholders in the traditional facilitation group, however, were more satisfied with the evaluation process and were more confident in their recommendations.

The purpose of the facilitated discussion and the computer-based decision tool was to help stakeholders understand the City's solid waste system and evaluate the consequences of strategic options for achieving Zero Waste.

As illustrated in Figure 12, the structure of the decision tool was based on the Zero Waste loop and the "leverage points" around that loop where the City can influence the flow of materials though the system.

Figure 12: Leverage Points along the Zero Waste Loop



Stakeholders were introduced to the concept of a "leverage point" and were then asked to identify and discuss the leverage points around the Zero Waste loop.

The idea of a leverage point is…

If we could change something by a certain amount, what impact would it have on the system?

The eight strategic leverage points that were tested by the stakeholders were:

Manufacturing

1. Increase the average useful life of consumer products
2. Reduce the amount of waste in products and packaging
3. Increase the recycled content of products and packaging
4. Make products and packaging more recyclable

Consumption

5. Change the average amount of material consumed by each consumer

Collection

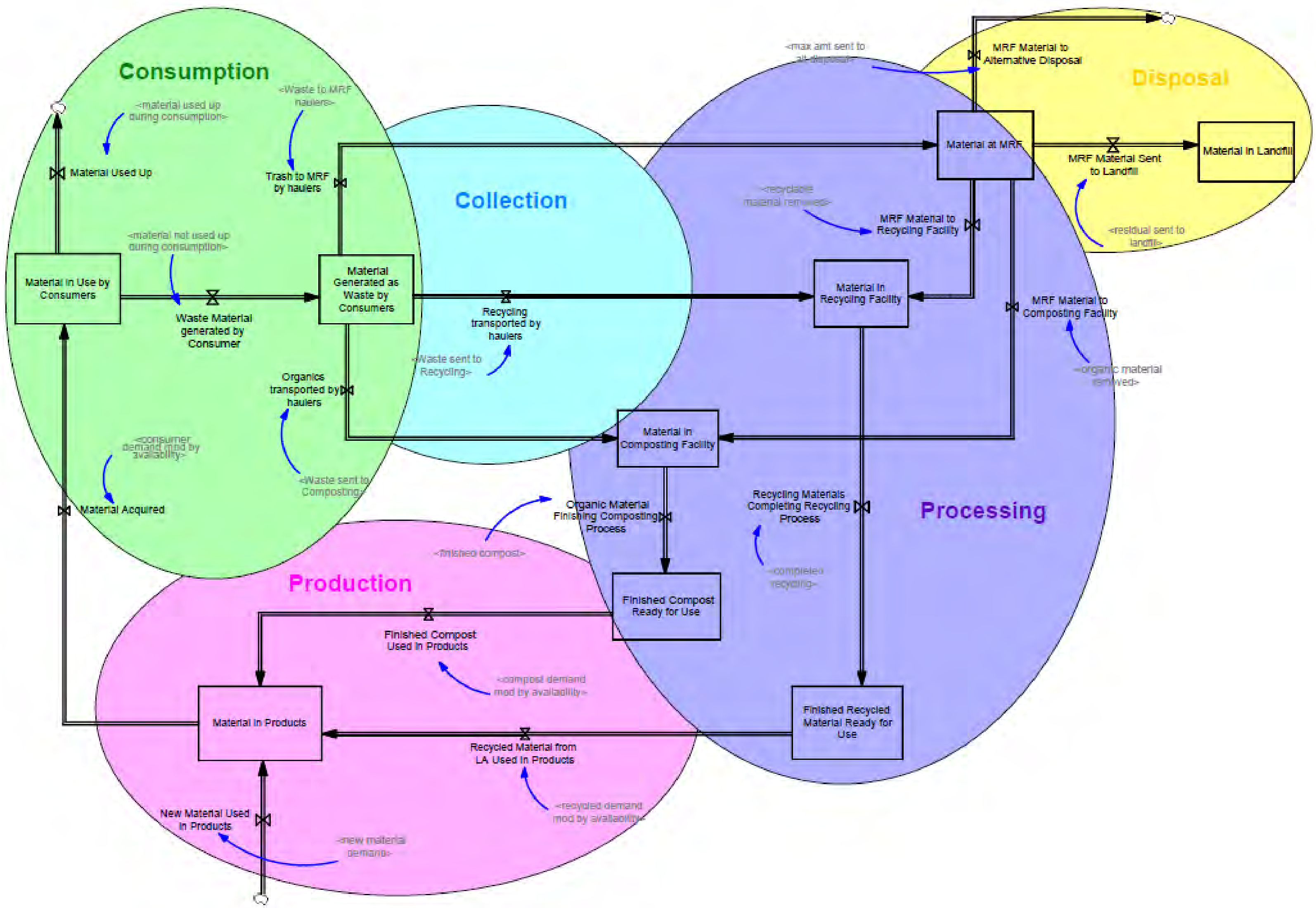
6. Increase consumer diversion rates

Processing

7. Increase the processing capacity for diverted materials
8. Increase capacity for Alternative Technologies

The backbone of the decision tool developed by UNLV mirrored these leverage points. Figure 13 shows how materials flow through the system from production and consumptions to collection, processing, and disposal.

Figure 13: Material Flow Backbone of the Zero Waste Decision-Tool

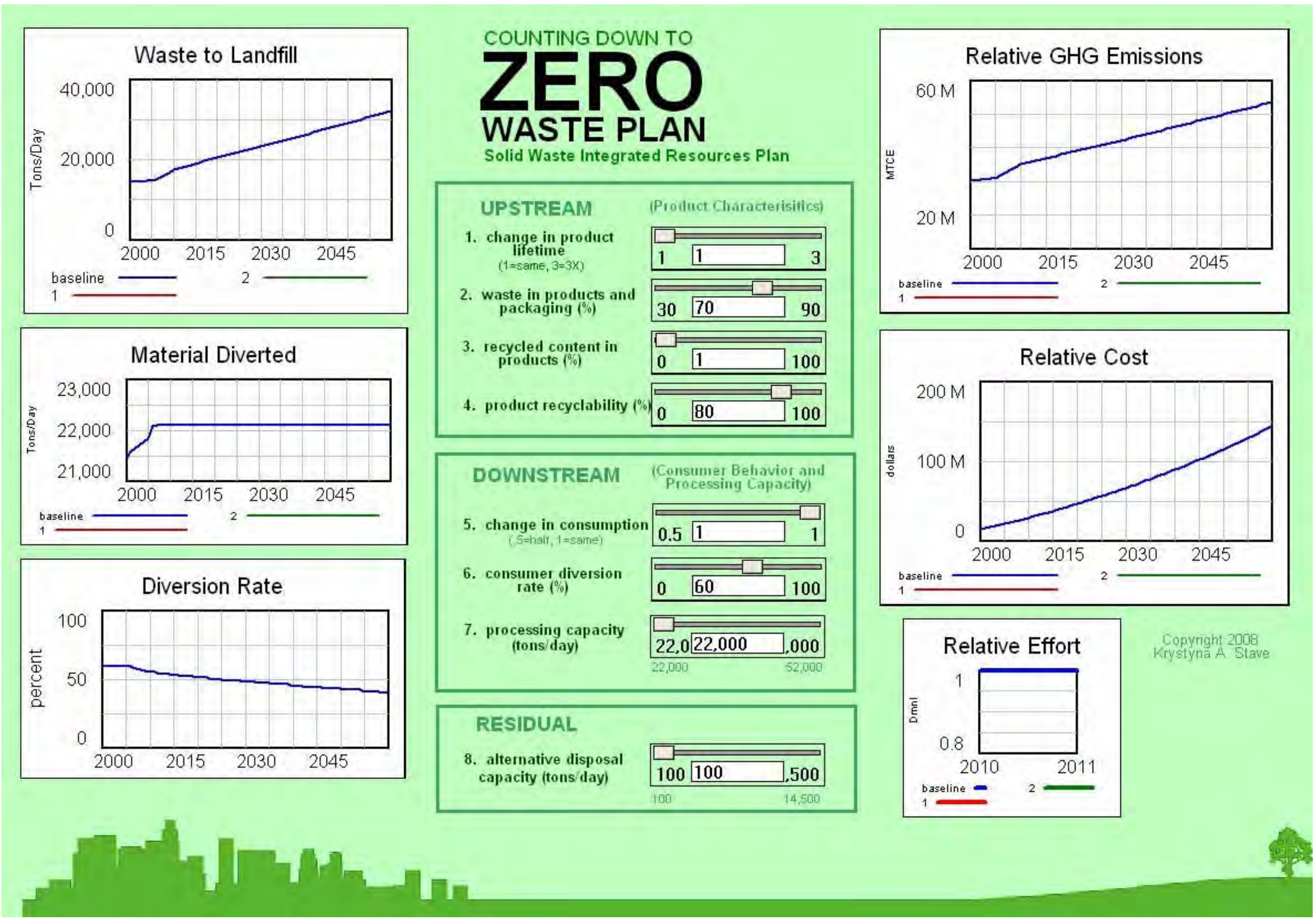


Stakeholders tested the eight strategic leverage points through the Zero Waste decision tool interface shown in Figure 14. The decision tool included six measures for comparing the output of the strategic decisions:

- Waste sent to landfill
- Material diverted
- Diversion rate
- Relative greenhouse gas emissions reduction
- Relative cost
- Relative effort of implementation

Stakeholders used the decision tool to test the leverage points by manipulating the toggle bars (increasing product lifetime, reducing waste in packaging, etc.) and observing the outputs.

Figure 14: User Interface of Zero Waste Decision Tool



Stakeholders in both groups discussed the strengths and weaknesses of each leverage point, evaluated the effectiveness of each leverage point, and prioritized each leverage point on a scale of 1 (low) to 10 (high) based on how aggressively the City should invest its time, energy, and resources into the leverage point. Stakeholders prioritized each leverage point based on how much effort the City should put into each leverage point:

- Most effort (9 to 10 points)
- More effort (7 to 8 points)
- Average effort (5 to 6 points)
- Less effort (3 to 4 points)
- Least effort (1 to 2 points)

Table 4 summarizes the results from the citywide conference. Stakeholders directed the City to put more emphasis in the traditional roles of city government, thereby increasing consumer diversion and processing capacity. Stakeholders directed the City to put less emphasis on strategies that are typically outside of the control of local government, thereby increasing the useful life of products.

Table 4: Citywide Conference 2 Results

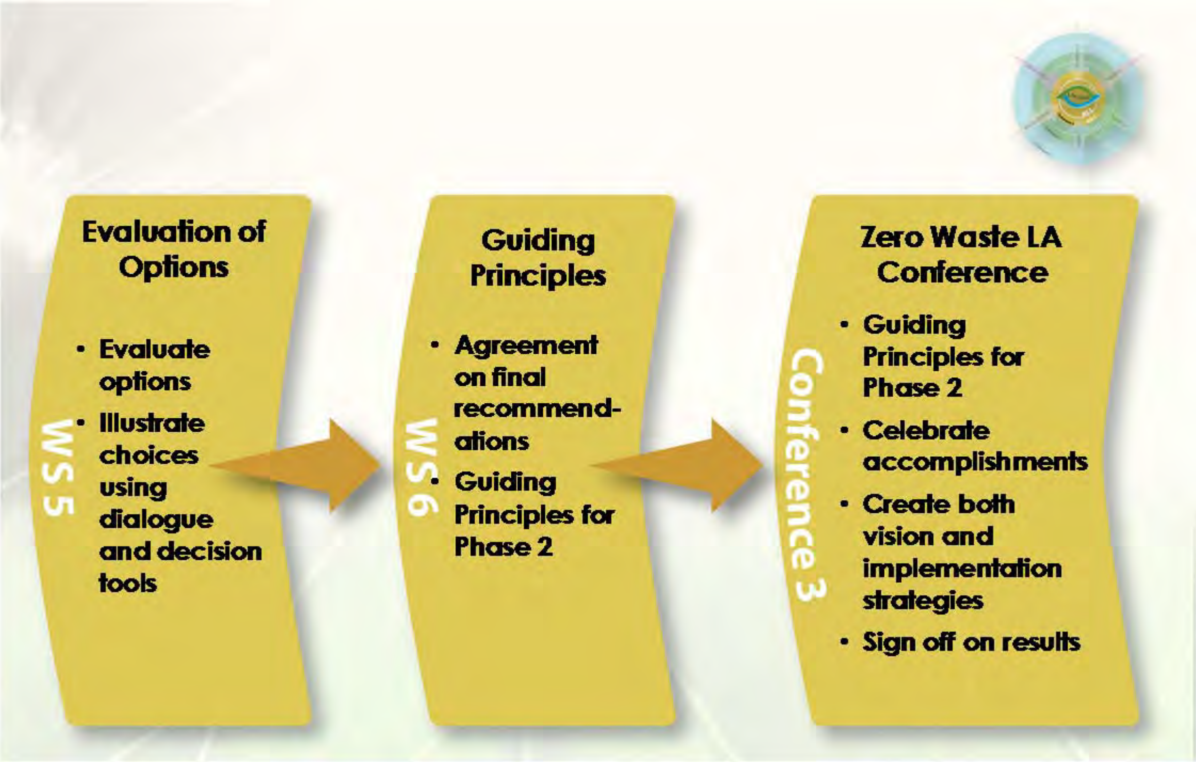
Leverage points	Priority
1. Increase useful life of products	6
2. Reduce waste in products	8
3. Increase recycled content in products	7
4. Make products more recyclable	7
5. Change consumption	7
6. Increase consumer diversion	8
7. Increase processing capacity	8
8. Increase Alternative Technology	8

Stakeholder recommendations from conference series 2 were used in conference series 3 to develop the guiding principles.

2.7 Conference Series 3

The third conference series focused on the stakeholder guiding principles and recommendations. Figure 15 illustrates the workshop process leading up to the third citywide conference.

Figure 15: Conference Series 3 Guiding Principles for Phase 2



2.7.1 Workshop 5 – Evaluation of Options

The discussion of leverage points led stakeholders to think about the types of concepts or strategies that would emerge as "guiding principles" for SWIRP. At workshop series 5 in February 2008, stakeholders reviewed the results of the citywide conference and discussed regional priorities. Throughout the regional workshop discussions, there was a high degree of consensus on the priorities of the leverage points. Similar to the results from the citywide conference, stakeholders at the regional workshops directed the City on the level of effort to put into each leverage point, as shown in Table 5.

Table 5: Workshop 5 Results

Leverage points	Downtown	West Valley	East Valley	North Central	Western	South LA	Harbor	Average
1. Increase useful life of products	5	6	6	7	6	6	6	6
2. Reduce waste in products	7	8	7	9	8	8	8	8
3. Increase recycled content in products	6	7	7	8	8	8	8	7
4. Make products more recyclable	7	8	7	8	8	8	9	8
5. Change consumption	8	7	7	8	7	8	7	7
6. Increase consumer diversion	9	8	8	9	9	7	9	8
7. Increase processing capacity	9	7	8	9	8	7	9	8
8. Increase Alternative Technology	9	9	8	8	8	8	9	8

Stakeholders then discussed the "emerging guiding principles" that were identified through the stakeholder planning process, including:

- **Education** – stakeholders asserted that the City should put more emphasis on educating residents and businesses about existing City programs and instilling a "Zero Waste culture" in the City. A key strategy for increasing awareness among the next generation of Angelenos was the stakeholder recommendation to partner with LAUSD on developing a Zero Waste curriculum and increasing recycling in the schools.

- **City leadership** – stakeholders agreed that the City should "walk its talk" by demonstrating leadership in recycling at all City facilities and parks. The City should also use its stature in Sacramento to lobby for State legislation on initiatives that are best implemented at the state level, such as producer responsibility and packaging legislation.
- **Consumer responsibility** – stakeholders believe that consumers, including both residents and businesses, need to be part of the solution and should be required to participate in recycling and composting programs.
- **Manufacturer responsibility –** stakeholders supported initiatives to encourage or require producers of products and packaging to take responsibility for the end of life of those products and packaging.
- **Convenience** – stakeholders felt that recycling programs should be convenient and it should be as easy to recycle, as it is to waste. A key strategy for increasing convenience is to provide recycling receptacles wherever there are waste receptacles.
- **Incentives –** stakeholders suggested that the City provide more incentives for recycling and composting, such as "pay-as-you-throw" rate structures.
- **New, safe technology** – stakeholders supported the development of new technology for managing our waste. However, stakeholders emphasized that the technology would need to be demonstrated to be safe and should not impact already burdened communities.
- **Protect public health and the environment** – stakeholders strongly believed that protecting public health and the environment should be a primary tenant of the *Zero Waste Plan*.
- **Equity** – throughout the planning process, stakeholders supported the concept of equity, and shared responsibility for taking care of our waste problems. Stakeholders felt that all areas of the City should share in the burden and benefits of new facilities and new developments should pay their fair share of the system-wide costs. Green jobs created by new programs and facilities should support the local communities, including disadvantaged youth and recently incarcerated residents who need help transitioning back into the community.

2.7.2 Workshop 6 – Guiding Principles

Workshop series 6 in March 2008 focused on discussing the emerging guiding principles. The guiding principles were based on the ideas and priorities that the stakeholders had been discussing since workshop series 1 in August 2007 and included thoughtful consideration of the goals, policies, programs, facilities, and leverage points that emerged over the course of the workshops and citywide conference. Throughout the regional workshops, stakeholders refined and expanded on the guiding principles originally discussed during workshop series 5. Stakeholders clarified that "education" should include both education to decrease consumption and education to increase recycling. Stakeholders also expanded "city leadership" to include both "City leadership as a model for Zero Waste practices" and "City leadership to increase recycling." Stakeholders also identified another important guiding principle: "economic efficiency." The City must invest carefully in new programs and facilities but should also consider the long-term economic benefits of reducing waste and creating a more-sustainable society. The result of these discussions led to the emergence of the final guiding principles.

Emerging Guiding Principles Identified during Workshop Series 6

1. Education to decrease consumption
2. City leadership as a model for Zero Waste practices
3. Education to increase recycling
4. City leadership to increase recycling
5. Manufacturer responsibility
6. Consumer responsibility
7. Convenience
8. Incentives
9. New, safe technology
10. Protect public health and the environment
11. Equity
12. Economic efficiency

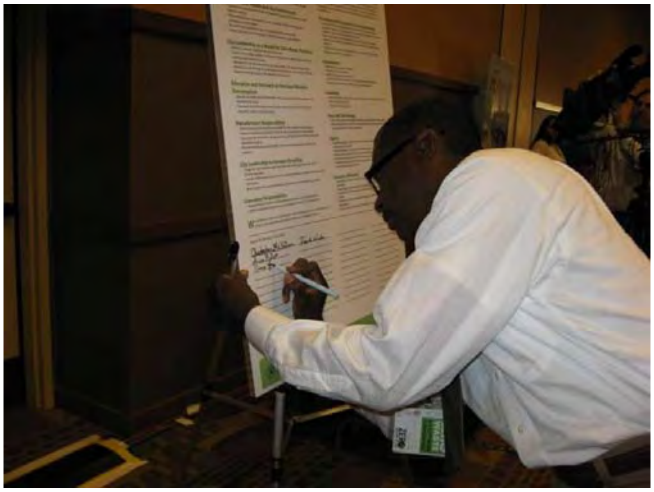
Stakeholders were then asked to apply these principles to a policy issue pending before the City Council regarding plastic litter in the Los Angeles river watershed and the ocean. Stakeholders discussed potential policy options to address plastic litter in the environment, concerns about these policies, and potential solutions.

Potential Policy Options to Address Plastic Litter in the Environment

- Mandatory recycling
- Product takebacks
- Expanded polystyrene foam ban
- Plastic bag ban
- Fee on single-use items
- Mandatory rebate for bringing reusable bags or takeout containers

Stakeholders supported the City Council in taking action to reduce plastic litter in the environment but were concerned about financial impacts on low-income families and “mom and pop” businesses, since alternatives to plastic bags and EPS take-out containers are sometimes more expensive. Stakeholders favored State legislation and a uniform approach. In July 2008, the City Council voted to initiate local legislation to ban plastic bags from stores and supermarkets in the City if, by 2010, the State fails to impose a 25-cent fee on every shopper who requests them. The City Council also directed City staff to phase out the use of expanded polystyrene foam takeout containers at City facilities, thus demonstrating a key guiding principle—City Leadership as model for Zero Waste practices.[48]

2.7.3 Citywide Conference 3 – Recommendations



A Community Member Signing Off on the Zero Waste Goals

On May 3, 2008, the City concluded Phase 1 of the SWIRP planning process with the final citywide conference. Nearly 400 people participated in this conference, which began with speeches by Commissioner Cynthia Ruiz, former President of the Board of Public Works, and Enrique Zaldivar, Director of LASAN. The conference was focused on the stakeholders and their SWIRP experiences and included two panel discussions.

The first panel included seven community members representing the City's seven regional working groups (from the six wastesheds plus the downtown daytime working group) who discussed their experience with the planning process and the results of Phase 1.

The second panel was a Zero Waste Challenge panel that included three presentations from community members who shared the steps they had undertaken to get closer to Zero Waste at home, at school, and at work. One speaker focused on his food scraps composting project at home and his concept of making "salad for the garden." Two LAUSD students gave a presentation of the results of their project to achieve Zero Waste at home and at school by recruiting multi-family buildings to participate in the City's new collection program and initiating recycling at their school. The third speaker described the Zero Waste strategies that had been implemented in his company's supply chain operations.

The third citywide conference was a celebration of the achievement of the stakeholders. A banner with the 12 guiding principles was prominently hung, and large mounted poster boards were stationed around the room for the community members to sign.

[48] On May 23, 2012, the City Council adopted a policy to ban distribution of single-use plastics bags and impose a 10-cent fee on single-use paper bags at supermarkets and select retail stores within the City. The effective date of the ordinance was August 1, 2013 and will apply to specified retail stores on January 1, 2014 (Council File number 11-1531).

2.8 Guiding Principles

The result of the citywide stakeholder outreach process yielded a set of guiding principles that stakeholders recommended be applied to all policies and projects in the future. At the third citywide conference, stakeholders signed a pledge to guide and support the City in the development of SWIRP and adopted the guiding principles to provide the over-arching vision for the plan. The following are the 12 guiding principles that were adopted by the stakeholders at the third citywide conference.

2.8.1 Protect Public Health and the Environment

Providing Outreach to All Community Members

- Protection of public health and the environment should be at the forefront of all decision-making.
- When embarking on any new idea or plan, carefully consider the long-term consequences and impacts.
- Be careful not to adversely impact already burdened communities.
- Reduce the City's "carbon footprint" through greenhouse gas reduction.

2.8.2 City Leadership as a Model for Zero Waste Practices

- Become a national model for Zero Waste practices.
- Use the City's market presence and purchasing power to support waste reduction and recycling in new purchases.
- Advocate for new citywide policies to reduce waste and increase recycling and composting both through local ordinances and programs and through continual leadership and advocacy at the regional and state levels.

2.8.3 Manufacturer Responsibility

Community Outreach Event

- Hold businesses and industry accountable for their products and packaging.
- Require manufactured products to be reusable, recyclable, and/or compostable.
- Encourage deconstruction, salvage, and reuse of materials from C&D projects.
- Educate industry about the economic benefits of environmentally preferable materials and products.

2.8.4 Incentives

- Provide incentives, such as tiered rates or rebates, to encourage residents and businesses to reduce, reuse, and recycle.
- Use "carrots," not just "sticks."

2.8.5 City Leadership to Increase Recycling

- Create the most effective waste reduction and recycling programs at all City facilities and parks.
- Provide model waste reduction and recycling programs to residents, businesses, and institutions.
- Work closely with recycling facilities to determine new markets for recyclables.
- Facilitate the expansion of new and existing processing capacity.

2.8.6 Convenience

- Make recycling easy and convenient.
- Solutions need to be "doable."
- Make recycling easier than wasting.
- Implement a "Blue Dot" system that identifies all recyclable materials.
- Place recycling bins next to all trash cans in all public locations.

Zero Waste Workshop Brainstorming Session

2.8.7 Economic Efficiency

- Find solutions that are both economically efficient and environmentally preferable.
- Costs should not outweigh other considerations.
- Account for the full economic impacts of decisions rather than short-term cost savings.
- Promote economic sustainability through investment in green jobs and economic development.
- Invest in future generations and long-term solutions.

Zero Waste Workshop

2.8.8 Education and Outreach to Decrease Wasteful Consumption

- Educate the public about the benefits of decreasing wasteful consumption.
- Zero Waste should become second nature as part of the culture of the family, education system, and community.

2.8.9 New, Safe Technology

- Invest in new technologies that help to accomplish Zero Waste goals.
- New technologies must be safe and avoid adversely impacting the public health and environment of the host community.

2.8.10 Equity

- Promote equitable solutions that do not unfairly reward or penalize one community over another.
- Share the benefits and impacts fairly among each community.
- Do not unfairly burden existing ratepayers with the impacts from new development.
- Provide Zero Waste solutions for all community members, from residential curbside and multi-family generators and small and large businesses to churches, schools, and community-based organizations.
- Do not burden environmentally sensitive natural or wilderness areas or impacted communities.

2.8.11 Education and Outreach to Increase Recycling

- Partner with the Los Angeles Unified School District, private schools, and preschools to integrate Zero Waste into their curricula and to implement Zero Waste systems for all schools and administrative offices.
- Fund ongoing Zero Waste education and outreach programs for residents, businesses, and visitors and provide timely updates about the new rules and changes over time.
- Communicate using terms that everyone can understand and in the many languages spoken in our community.

Providing Educational Materials to the Community

2.8.12 Consumer Responsibility

- Require that all residents and businesses participate in recycling programs.
- SWIRP stakeholders should become advocates for the City's *Zero Waste Plan.*

These guiding principles were the culmination of all of the stakeholder input and would be used to guide the development of the Phase 2 *Policy, Program, and Facility Plan*. These principles provide the framework for evaluating the feasibility of new policies, programs. or facilities for the City's waste management system to achieve the City's goal of Zero Waste.

Section 3 Transition from Phase 1 to Phase 2

3.1 Phase 1 Results and Phase 2 Planning Process

Phase 1 of SWIRP concluded in May 2008 with the adoption of the 12 guiding principles. This section describes how the Phase 1 results drive the Phase 2 planning process, introduces the Phase 2 planning process, and provides the Phase 2 timeline. The Phase 2 outreach process is fully described in Volume II of SWIRP, the *Policy, Program, and Facility Plan*.

3.1.1 Phase 1 Focus and Introduction to Phase 2

The goal and focus of Phase 1 of the SWIRP planning process was to reach out to stakeholders from all over the City to participate in a stakeholder-driven planning process to identify the guiding principles for the Phase 2 *Policy, Program, and Facility Plan*. During Phase 1, stakeholders provided the City with their vision of the sustainable City of the future, where the City demonstrates its leadership in recycling and Zero Waste; all residents and businesses fully participate in the City's recycling and composting programs; and all future generations learn and share in the goals and values of Zero Waste. Stakeholders identified and discussed the policies, programs, and facilities that will be needed to implement this vision.

In Phase 1, stakeholders undertook a community-based consensus process resulting in the adoption of stakeholder guiding principles. In Phase 2, the City worked with the stakeholders to bring the vision to reality.

The Phase 2 planning process included the following activities:

- Continue to build on the community consensus process established in Phase 1 through regular meetings of the regional working groups.
- Conduct a detailed review of the City's current and future diversion and disposal needs.
- Further define and describe the integrated resource management system including the policies, programs, and facilities identified in Phase 1, and describe how they will be integrated into the City's current and planned solid waste system.
- Develop and describe scenarios for achieving the goals and objectives identified in Phase 1, including:
    - Policies for minimizing waste generation at the source and maximizing recovery of materials generated
    - Requiring manufacturers to take responsibility for the ultimate disposition of products and packaging
    - Facility alternatives, such as neighborhood-based Resource Recovery Parks, regional processing and Alternative Technologies, and ultimate disposal options for residual solid waste
- Assist the stakeholders in identifying scenarios for final evaluation and selection of the preferred alternative to each scenario.

- Document and describe the preferred system scenario and develop the *Policy, Program, and Facility Plan*.
- Carefully review the system elements and evaluate their impacts to the City's environment.
- Develop a funding and financing plan that includes an economic analysis of the Zero Waste system, a projection of capital and operating costs for the system elements, the impacts on the ratepayers, and alternative fee mechanisms.
- Produce a detailed implementation plan that includes all of the tasks, including the decision points and detailed implementation steps, necessary to implement the integrated resources system, including all policies, programs, and facilities.

The result of the Phase 2 planning process is a detailed community-based implementation plan that documents the planning and consensus-building effort and provides a detailed path to the City's future.

3.1.2 Phase 2 Planning Process

Phase 2 of the SWIRP planning process culminates in the development of the stakeholder-driven *Policy, Program, and Facility Plan*. The elements of the plan include:

- Analysis of the policies, programs, and facilities identified during Phase 1 to estimate their diversion potential and planning-level costs
- Development of a material flow model to pinpoint diversion opportunities by projecting tons generated by generator sector and material type citywide and within the City's six wastesheds though 2013
- Evaluation of the policies, programs, and facilities based on scenarios identified through the stakeholder planning process

3.1.2.1 Policy, Program, and Facility Analysis

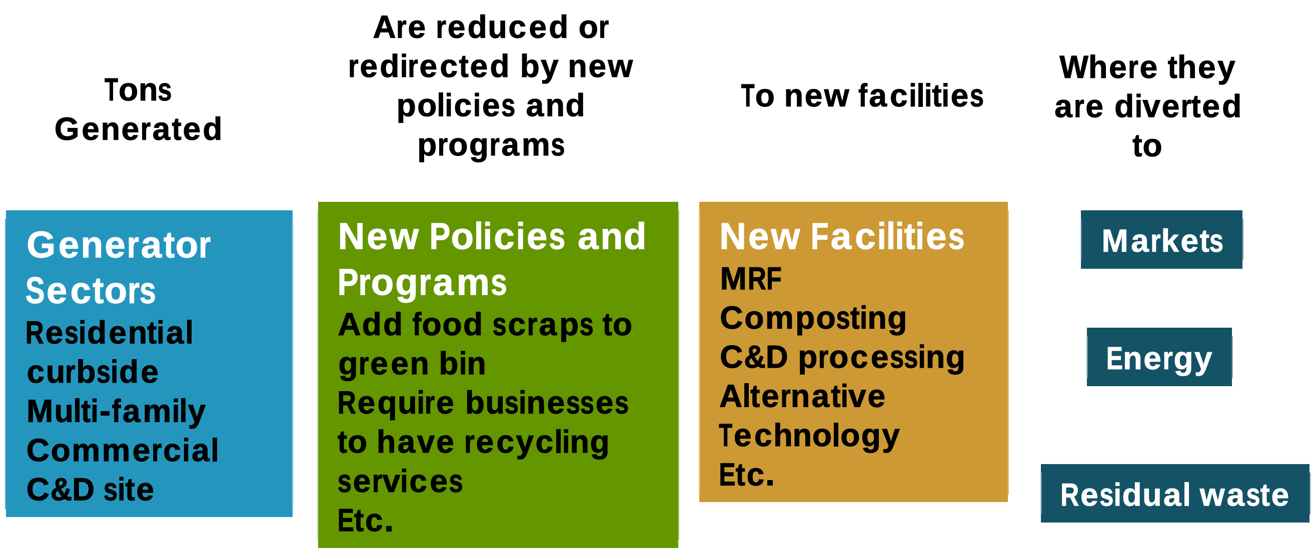
The policy and program analysis includes defining and describing the policies and programs identified by the stakeholders during the Phase 1 planning process. In order to evaluate the effectiveness of the policies and programs in diverting materials from disposal, the policy and program analysis includes estimates of the potential diversion rates and planning-level costs for each policy and program. The analysis also includes research and documentation of benchmarking of programs from other jurisdictions.

The facility analysis includes developing descriptions of the facility types that will be needed in the City through 2030; identifying the existing facility infrastructure in the City and in the region that are used by generators in the City; evaluating the existing capacity for managing recyclables, organics, and residual solid waste in the City; and identifying the future facility requirements. The facility analysis includes estimates of the potential diversion rates and planning-level costs for each facility type. The analysis also includes a description of design elements and other operational considerations for mitigating impacts of facilities to enhance community acceptance and identification of market development opportunities in the City.

3.1.2.2 Material Flow Model

The material flow model is designed to pinpoint diversion opportunities for targeted materials by generator sector through 2030. Based on projections of waste generation and documented assumptions for participation rates and efficiency, the material flow model is able to estimate the diversion potential of different policies, programs, and facilities. Figure 16 depicts how the material flow model works. Tons generated by residential curbside, multi-family, commercial, and C&D sites are reduced by new policies and programs and then are directed to new facilities, where they are diverted to market or converted into energy, and residual solid waste is finally disposed.

Figure 16: Material Flow Model Flow Diagram



3.1.2.3 Scenario Evaluation

During the Phase 2 planning process, stakeholders evaluated scenarios for implementation. Based on an interactive process involving the regional working groups, the initial list of scenarios was screened qualitatively to focus on those alternatives that have the highest potential for success considering cost, impact, feasibility, and implementation requirements. The City analyzed the remaining options to estimate the impacts and costs through 2030. The projected impacts of these alternatives were compared to baseline projections of waste generation and disposal to determine how much material could be diverted over time. The impacts of different programs were combined to project overall progress toward the City's goals and the estimated total cost of reaching those goals. Based on stakeholder direction, evaluation using the guiding principles, and assessments about diversion potential, cost-effectiveness, and other community values, the stakeholders identified a preferred path for implementation.

3.1.3 Phase 2 Stakeholder-Driven Planning Process

The stakeholder-driven planning process continued in Phase 2 with regional meetings of the working groups and the fourth citywide conference. Table 6 provides the schedule for the SWIRP Phase 2 planning process.

Table 6: Phase 2, Year 1 Schedule September 2008 through May 2009

Sep	Nov	March	May 30th
Workshop Series 7 The Road to Zero Waste Continues	Workshop Series 8 Key Issues for the Zero Waste Plan	Workshop Series 9 Evaluating Scenarios for Zero Waste	4th Citywide Conference Policy, Program, and Facility Plan

3.1.3.1 Workshops

The focus of workshop 7 in September 2008 was the Phase 2 workplan: future program and policy development, future service needs by wasteshed, facility capacity needs, new technologies, and disposal options for residual solid waste.

In response to stakeholder input, workshop 8 in November 2008 included the following key issues for discussion: Zero Waste culture change, planning and management of private solid waste facilities, solid waste infrastructure and service voids, and the status of the City's research into new technologies.

During workshop 9 in March 2009, the stakeholders evaluated the policy and program scenarios and discussed the "blue bin" and "green bin" processing facilities and "black bin" processing facility options.

3.1.3.2 Citywide Conference

The fourth citywide conference in May 2009 culminated the Phase 2, Year 1 planning process with an overview of the draft *Policy, Program, and Facility Plan* and feedback from stakeholders through panel discussions and the debut of the SWIRP stakeholder video "Reaching for Zero." Stakeholders were also treated to a Zero Waste fashion show produced by Haute Trash, a nonprofit organization comprised of designers who create fashions out of discarded materials in order to raise awareness about resource conservation and promote Zero Waste.

3.1.3.3 Goals and Expectations

The purpose of the Phase 2 effort was the development of the stakeholder-driven *Policy, Program, and Facility Plan*, which incorporates all of the stakeholder vision and goals for Zero Waste, policies and programs to be implemented by the City, and feedback and direction on future facility development.

3.2 Phase 2 Timeline

3.2.1 Phase 2 Workplan

The Phase 2 planning process included the development of the *Policy, Program, and Facility Plan* in 2008 and 2009, the Program Environmental Impact Report, and the *Financing and Funding Plan* and implementation strategy in 2010 through 2013. Table 7 provides the schedule for Phase 2. Stakeholder meetings continued throughout the planning process to ensure that all of the components of the plan incorporate the vision and goals of the stakeholders.

Table 7: Phase 2 Schedule 2008 through 2013

2008-2009	2010-2013
Tasks o Policy, Program, and Facility Plan **Events** o Regional workshops o 4th citywide conference	**Tasks** o Environmental Impact Report o Financing and Funding Plan o Implementation strategy **Events** o Regional workshops o 5th Citywide conference

3.2.1.1 Policy, Program, and Facility Plan

Phase 2, the *Policy, Program, and Facility Plan*, fully describes all components of the integrated solid resources system, including all policies, programs, and facilities. The plan fully describes the policies and programs identified by the stakeholders for implementation and quantifies the diversion potential and planning-level costs. The plan also identifies the new "blue bin" and "green bin" processing capacity that will be needed as a result of implementing the new programs. It also identifies and describes the "black bin" processing facilities that could be developed in the City to treat residual solid waste prior to ultimate disposal.

3.2.1.2 Environmental Impact Report

All discretionary actions of the City are subject to conformance with the California Environmental Quality Act (CEQA). CEQA requires that the City identify the significant environmental impacts of its actions and avoid or mitigate those impacts, if feasible. For the *Policy, Program, and Facility Plan*, the City prepared a Program Environmental Impact Report (EIR) to evaluate the potential impacts of implementing the policies, programs, and facilities identified in the plan. Since specific facilities and sites are not identified in this planning-level document, the Program EIR evaluates the impacts at a citywide level. Specific facility projects that are developed in the future will require the City to prepare project EIRs specific to those facilities and locations. Even actions that appear to be good for the environment, could have unintended environmental impacts. Evaluation of these types of impacts is important prior to City Council action to adopt the plan.

3.2.1.3 Funding and Financing Plan

The City has developed a funding and financing plan to identify the funding mechanisms for implementing the Zero Waste programs. The funding and financing plan includes a detailed economic model that project the costs, revenues, and rate impacts of the integrated resources plan through 2030. The funding and financing plan incorporates the existing and planned City infrastructure and synthesizes this information with the cost model developed for the system components. The funding and financing plan includes the impacts on the ratepayers and alternative fee mechanisms.

3.2.1.4 Implementation Strategy

Concurrent with the development of the funding and financing plan, the City developed a detailed implementation strategy. The implementation strategy is a roadmap to the City's integrated resources management future and describes how all existing and planned policies, programs, and facilities will work together to achieve the City's goals. The implementation strategy includes all of the analyses and information developed for each task in Phase 2, including:

- Waste models, material flows, and generation projections
- Existing programs and facilities analyses and service voids
- Policy, program, and facility system components
- *Policy, Program, and Facility Plan* summary
- Funding and financing plan summary
- Action plan and schedule

The City's Littlest Stakeholder

Section 4 Phase 1 Conclusion

4.1 What Did We Accomplish?

The Phase 1 planning process for SWIRP included both contemplating our future Zero Waste system in separate regional groups throughout the City and coming together to share both our differences and our common goals through the citywide conferences. The regional workshops allowed stakeholders to define themselves as regions within the City for planning and deliberation. The citywide conferences brought the regional groups together to share findings and observations and identify communitywide goals.

Differences between the working groups emerged. For example, in both the Harbor and the East Valley, stakeholders are impacted by existing facilities and feel as though they already have their fair share of the burden of these facilities. Stakeholders in South LA were very focused on changing the culture away from wasting and increasing economic development and green jobs. Stakeholders in North Central were very interested in new policies and programs (including food scraps diversion and EPS take-out container bans), and stakeholders in West LA and West Valley were very interested in new technologies. The Downtown working group was very pragmatic about how future programs and facilities would be implemented and what they would cost. All of the regional working groups shared the view that the most important thing the City can do is increase education and awareness among residents, businesses, students, government workers, and visitors.

While there were differences across the City, the vision and goals were remarkably consistent. Stakeholders concurred on the top goals for SWIRP. There was tremendous support for the 12 guiding principles that emerged as a result of both regional discussions and the citywide celebrations. Stakeholders found that despite differences in demographics and geography, stakeholders throughout the City had more in common than they had differences. All of the stakeholders supported the City's vision of a cleaner, greener City, and all embraced the path toward Zero Waste, recognizing that change will not come overnight but that change is necessary for our families and our future. The investment will take time, energy, and effort. But the investment will be worth it.

4.2 Why Does it Matter?

> "Our planet is under a lot of pressure—as the population of the world grows, more and more people are producing trash. If we don't recycle and we continue to use up Earth's non-renewable resources and waste energy, global warming will affect the environment, plants, animals, and people. This will lead to the extinction of the human race, and more importantly, all life on Earth."

Rebecca Snegg and Wendy Rodgers,
6th graders from West LA
SWIRP Citywide Conference, May 2008

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Volume II Solid Waste Integrated Resources Plan

Phase 2 Policy, Program, and Facility Plan

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Acknowledgements

City of Los Angeles

Volume II Solid Waste Integrated Resources Plan
Phase 2 Policy, Program, and Facility Plan

Mayor

Eric Garcetti

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Bob Blumenfield	CD 3	Mike Bonin	CD 11
Tom LaBonge	CD 4	Mitchell Englander	CD 12
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April 2015

Acknowledging the City representatives responsible for final adoption of the Solid Waste Integrated Resources Plan in April 2015.

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Acknowledgements

City of Los Angeles

Volume II Solid Waste Integrated Resources Plan
Phase 2 Policy, Program, and Facility Plan

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October 2013

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Solid Resources Processing and Construction Division
Solid Resources South Collection Division
Solid Resources Valley Collection Division

FSC

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Appendices

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List of Acronyms, Abbreviations, and Definitions

AB 2020 — Assembly Bill 2020, the California Beverage Container Recycling and Litter Reduction Act, "Bottle Bill"

AB 32 — Assembly Bill 32, the Global Warming Solutions Act of 2006

AB 341 — Assembly Bill 341 established the statewide goal of 75 percent by 2020 and mandatory commercial recycling by July 2012 (chaptered October 6, 2011)

AB 939 — Assembly Bill 939, the California Integrated Waste Management Act of 1989 Public Resources Code, Section 40000 et seq.

AD — Anaerobic Digestion

ADC — Alternative Daily Cover

Advanced Thermal Recycling

Advanced Thermal Recycling (ATR) is a second generation advancement of waste-to-energy technology in which municipal solid waste (MSW) is converted, in an oxygen rich environment, to a hot exhaust gas composed primarily of carbon dioxide and water vapor. The inorganic material is converted to bottom ash, for beneficial use, and fly ash which requires disposal. The hot exhaust gas can be used to generate heat or steam to in turn produce electricity. ATR is equipped with advanced pollution control technologies that include both Selective Catalytic Reduction (SCR) and Selective Non-Catalytic Reduction (SNCR) systems that effectively diminish air emissions to a greater extent than its predecessors. ATR technology has been commonly applied in Europe to produce energy from MSW. Currently, no facility of its type exists in the United States.

APC — Air Pollution Control System

Alternative Technology[1]

"Alternative Technology" is a term that refers to specific technologies for treating residual solid waste, such as: thermal, biological, chemical, and physical technologies. Some examples of thermal technology include plasma arc gasification, pyrolysis, and advanced thermal recycling. Some examples of biological technologies include anaerobic digestion and aerobic composting. Examples of physical technologies include autoclaving and advanced materials recovery systems.

ARF — Advanced Recycling Fee

[1] *Evaluation of Alternative Solid Waste Processing Technologies*, URS Corporation, September 2005. http://www.alternativetechnology.lacity.org/PDF/final_report.pdf (accessed October 1, 2013).

List of Acronyms, Abbreviations, and Definitions (continued)

ASP	Aerated Static Piles
ATB	Alternative Technology: Biological
ATR	Alternative Technology: Advanced Thermal Recycling
ATT	Alternative Technology: Thermal
Black bin facilities	"Black bin facilities" are facilities capable of processing residual waste from residential black bins, commercial solid waste sources, or residual waste from processing facilities.
Black bin materials	"Black bin materials" are discarded materials that are handled or controlled by the City directly or through permits, including discarded materials from residential, commercial, and institutional sources.
Blue bin facilities	"Blue bin facilities" are facilities capable of processing source-separated recyclable and reusable materials, including materials recovered from the Bureau of Sanitation blue bin program and source-separated commercial recycling. Other facilities for source-separated materials are also included within this category, including Resource Recovery Centers for self-hauled materials and construction and demolition debris (C&D) processing facilities.
Blue bin materials	"Blue bin materials" are source-separated recyclable materials that have been separated from residual waste for recycling, including recyclable materials from residential, commercial, and institutional sources.
BOE	Board of Equalization
BSS	Bureau of Street Services
C&D	Construction and demolition debris
CA	California
Cal/EPA	California Environmental Protection Agency
CEQA	California Environmental Quality Act
CalRecycle	California Department of Resources Recycling and Recovery
CARB	California Air Resources Board
City	City of Los Angeles
CLARTS	Central Los Angeles Recycling & Transfer Station

List of Acronyms, Abbreviations, and Definitions (continued)

Clean MRF — Clean Material Recovery Facility for processing source-separated recyclable materials from residential and commercial sources. Refer also to "blue bin facilities."

Commercial and Multi-Family Private Hauler Franchise Initiative — "Commercial and Multi-Family Private Hauler Franchise Initiative" or "Franchise Initiative" is a City Council initiative to move from the current private hauler permit system to a franchise system for collection of discarded materials from multi-family and commercial properties not collected by the Bureau of Sanitation. Refer also to "Private Hauler Franchise Initiative."

Contaminants — "Contaminants" are the non-recyclable, non-compostable materials left over after processing residual waste or source-separated recyclables or organics. This material is typically disposed in a landfill. Refer also to "residue."

Conversion Technology[2] — "Conversion Technology" is a term that refers to specific solid waste processing technologies including, but not limited to, non-combustion thermal technologies, such as gasification and pyrolysis; chemical technologies such as acid hydrolysis or distillation; and biological technologies such as anaerobic digestion. For the purposes of this report, Conversion Technology is a subset of Alternative Technology consisting of technologies that do not employ direct combustion of the feedstock.

CRRR — Community Recycling and Resource Recovery

CRTs — Cathode ray tubes

CRV — California Redemption Value

DPW — Department of Public Works

EEI — Education and the Environment Initiative

EIR — Environmental Impact Report

EP&Cs — Environmental Principles and Concepts

EPA — Environmental Protection Agency

EPP — Environmentally Preferable Purchasing

EPPP — Environmentally Preferable Purchasing Policy

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[2] California Environmental Protection Agency, New and Emerging Conversion Technologies Report to the Legislature, June 2007. http://www.calrecycle.ca.gov/publications/Documents/Organics%5C44205016.pdf (accessed October 1, 2013).

List of Acronyms, Abbreviations, and Definitions (continued)

EPR	Extended Producer Responsibility
EPS	Expanded polystyrene foam (typically used in take-out containers and coffee cups and also known as Styrofoam™).
E-waste	Discarded electronics such as computers and televisions
GHG	Greenhouse Gas
GPY	Gallons Per Year
Green bin facilities	"Green bin facilities" are facilities capable of processing yard trimmings, food scraps and other compostable materials, either source-separated or sorted from other residual waste at processing facilities.
Green bin materials	"Green bin materials" are source-separated organic materials that have been separated from residual waste for composting, anaerobic digestion, and mulching, including yard trimmings, food scraps, and compostable paper from residential, commercial, and institutional sectors.
HCl	Hydrochloric Acid
HDPE	High-density polyethylene, plastic used for milk jugs
HDPS	High-density polystyrene, plastic used in compact disk covers
HHW	Household Hazardous Waste
Hog fuel	"Hog fuel" is chipped wood or sawmill residues used as fuel at biomass facilities
LADWP	Los Angeles Department of Water and Power
LARA	Los Angeles Regional Agency
LARMDZ	Los Angeles Recycling Market Development Zone, designation includes the boundaries of the entire City of Los Angeles
LAUSD	Los Angeles Unified School District
LACSD	The Sanitation Districts of Los Angeles County
LASAN	City of Los Angeles Bureau of Sanitation
LEED	Leadership in Energy and Environmental Design, a program of the U.S. Green Building Council
LNG	Liquefied Natural Gas
Material stream	Materials that have been segregated from residual waste for recycling

List of Acronyms, Abbreviations, and Definitions (continued)

MMP	Mixed Material Processing for processing residual waste from residential and commercial sources
MRF	Material Recycling Facility. Refer also to "Clean MRF."
Multi-family complex	"Multi-family complex" or "Multi-family dwelling" is a building, structure, unit, or location designed for residential occupancy, exclusive of "Single-family residences." These are typically apartments, townhomes, and condominiums. Multi-family residences consisting primarily of three (3) and four (4) units are serviced by LASAN. Multi-family dwellings with five (5) units or more are primarily serviced by private sector commercial haulers. Some multi-family dwellings of five (5) units or more that have continually received City service have been "grandfathered" into public collection and will continue to receive residential curbside collection services from LASAN.
MW	Megawatt
NRDC	National Resources Defense Council
OCC	Cardboard
ONP	Newspaper
PAYT	Pay As You Throw
PET or PETE	Polyethylene terephthalate, plastic used for soda bottles
Private Hauler Franchise Initiative	"Private Hauler Franchise Initiative" or "Franchise Initiative" is a City Council initiative to move from the current private hauler permit system to a franchise system for collection of discarded materials from multi-family and commercial properties not collected by the Bureau of Sanitation. Refer also to "Commercial and Multi-Family Private Hauler Franchise Initiative."
R&D	Research and Development
R/C	Remainder/Composite
RACLA	Recycling Across Los Angeles
RDF	Refuse-Derived-Fuel
RENEW LA	Recovering Energy, National Resources, and Economic Benefit from Waste for Los Angeles

List of Acronyms, Abbreviations, and Definitions (continued)

Residential curbside	"Residential curbside" customers include generators in single-family residences and some multi-family residences, primarily with four units or less, serviced by LASAN.
Residual waste	"Residual waste" or "residual solid waste" refers primarily to the discarded materials that remain after reducing, reusing, recycling, and composting; or after processing the materials through a mixed materials processing facility. This material can be further converted into energy or fuel through an Alternative Technology facility or disposed as solid waste in a landfill.
Residue	"Residue" is the non-recyclable, non-compostable material left over after processing residual waste or source-separated recyclables or organics. This material is typically disposed in a landfill. Refer also to "contaminants."
RFID	Radio Frequency Identification Device
RRC	Resource Recovery Center
RRP	Resource Recovery Parks
S.A.F.E.	Solvents, Automotive, Flammables and Electronics
SB 20	Senate Bill 20, the Electronic Waste Recycling Act of 2003
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SIC	Standard Industrial Classification system
Single-family residence	"Single-family residence" or "Single-family home" is a building designed for residential occupancy, and containing one or two dwelling units (duplexes).[3] Single family residences and duplexes are serviced by LASAN.
Solid waste	"Solid waste" or "waste" has the meaning set forth in the California Public Resources Code Section 4019[4] and includes all discarded materials (residential, commercial, industrial, and institutional). "Solid waste" is generally used to refer to materials that have not been segregated for reuse, recycling or composting.
State	State of California
SWIRP	Solid Waste Integrated Resources Plan
Syngas	Synthesis gas

[4] California Public Resources Code: http://law.justia.com/california/codes/prc/40100-40201.html (accessed October 1, 2013).

List of Acronyms, Abbreviations, and Definitions (continued)

TAZ	Transportation Analysis Zone
Tip fee	"Tip fee" or "tipping fee" is the price charged to deliver materials to a solid waste or recycling facility.
tpd	Tons per day
tpy	Tons per year
U.S. (or US)	United States
U.S. EPA	United States Environmental Protection Agency
Waste stream	Materials that have not been segregated for reuse, recycling and composting
Wasteshed	"Wasteshed" refers to a geographic area within the City of Los Angeles consisting of a residential solid waste collection district. The City is divided into six wastesheds: East Valley, West Valley, South Los Angeles, North Central, West Los Angeles, and Harbor.
Waste-to-energy	"Waste-to-energy" is the process of combusting material in a chamber to produce heat. The heat flows through a boiler to produce steam to generate electricity. The system is equipped with pollution-control systems to reduce air emissions.
Zero Waste	"Zero Waste" means maximizing diversion from landfills and reducing waste at the source, with the ultimate goal of striving for more sustainable solid waste management practices.[5]

[5] The internationally peer-reviewed definition of "Zero Waste" was developed by the Zero Waste International Alliance, http://zwia.org/standards/zw-definition/ (accessed October 1, 2013).

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Executive Summary

The City of Los Angeles (City) initiated a stakeholder-driven planning process in the spring of 2007 to develop the City's *Solid Waste Integrated Resources Plan* (SWIRP), a long-range master plan for solid waste management in the City. SWIRP was conducted in two phases.

> **Phase 1** - The goal and focus of Phase 1 of the SWIRP planning process was to reach out to stakeholders from all over the City to participate in identifying the guiding principles for SWIRP. This process was documented in Volume I of SWIRP *Phase 1 Forming the Zero Waste Guiding Principles*.
>
> **Phase 2** - The Phase 2 planning process continued to build on the stakeholder-driven process established in Phase 1 to develop this report, the *Phase 2 Policy, Program, and Facility Plan*. Phase 2 continued with the development of the *Program Environmental Impact Report*, the *Financial Plan,* and *Implementation Strategy*.

This report describes the policies, programs, and facilities that will be needed to reach the City's goals; estimates the diversion potential; identifies the alternatives to the plan; and describes the Phase 2 planning process.

The City regularly undertakes long-range planning efforts to address its solid waste infrastructure and program needs. SWIRP is the successor to these planning studies; builds on the resulting findings and research; and will be the solid waste master planning document for the City's solid waste programs through 2030.

The blueprint for SWIRP is the *RENEW LA Plan - Recovering Energy, Natural Resources, and Economic Benefit from Waste for Los Angeles*, the guidance document developed by Councilmember Greig Smith in 2005. RENEW LA was adopted by the full City Council in 2006 and provides the foundation for the SWIRP planning process. *RENEW LA* establishes the vision for Zero Waste and includes the goal of 90 percent diversion by 2025.

The City has implemented many state-of-the-art programs for managing solid waste and diverting waste from landfills, including:

- Four bin collection program for residential curbside customers (blue bin for commingled recycling, green bin for yard trimmings, black bin for residual waste, and brown bin for horse manure).
- Multi-family blue bin recycling available to all multi-family buildings in the City.
- Bulky item collection available to all residential curbside and multi-family generators.
- School site blue bin recycling and classroom recycling presentations available to all schools within the Los Angeles Unified School District that are within the City limits.
- Restaurant food scraps collection available to all restaurants in the City.
- Commercial recycling technical assistance available to all commercial and institutional generators in the City.

- City Department recycling available to all City offices and facilities.
- Seven Solvents, Automotive, Flammables and Electronics Centers (S.A.F.E. Centers) for proper management of household hazardous wastes located throughout the City.

These commercial and residential programs are managed by the Bureau of Sanitation (LASAN) Solid Resources Program. LASAN is responsible for the collection, disposal, and recycling of over 1.5 million tons of discarded materials per year for the residents of the City. The multi-family and commercial programs are managed by LASAN though permitted private haulers.

Approximately 450 permitted private waste haulers provide waste hauling services in the City, which includes construction-related contractors. Under the current waste hauler permit system, multi-family dwellings over four units, commercial, and industrial customers are allowed to select and negotiate waste disposal contracts with any of the City's permitted private waste haulers. LASAN provides multi-family customers with recycling services through three private hauler contracts.

Throughout Phase 1 and Phase 2 of the SWIRP planning process, the City's stakeholders and LASAN staff engaged in an interactive dialogue about the City's future vision of sustainability in planning for Zero Waste. The stakeholders envisioned a future where:

- Recycling is as convenient (or more convenient) as disposal
- Generators have universal access to recycling and it is more cost-effective than disposal
- Products and packaging are made to be disassembled or easy to recycle
- School children are experts in the three Rs (reduce, reuse, recycle) and take the message home to their families
- City government is a model for Zero Waste behavior

During the Phase 1 planning process, the stakeholders identified over 80 individual policies and programs for reaching Zero Waste and discussed over 20 different facility options. During Phase 2, in order to evaluate the effectiveness of the policies, programs, and facilities, a material flow model—a tool for projecting generation, diversion, and disposal over the planning period—was developed.

The policies and programs were grouped according to five scenarios as listed in Table 1. These scenarios were presented to the stakeholders at the regional workshops held in March 2009. Feedback from the workshops was incorporated into the policy, program, and facility phasing approach and presented to the stakeholders at the citywide conference held in May 2009.

Table 1: Policy and Program Scenarios

Scenario 1	No New Programs Baseline
Scenario 2	New Voluntary Downstream Policies and Programs
Scenario 3	Mandatory Requirements added to Scenario 2 Downstream Policies and Programs
Scenario 4	Upstream Policies added to Scenario 2 Downstream Policies and Programs
Scenario 5	Upstream Policies added to Scenario 3 Full Implementation of SWIRP Upstream, Downstream and Mandatory

During the Phase 1 and Phase 2 planning process, stakeholders discussed the types and numbers of facilities that will be needed to reach the SWIRP goals. To facilitate discussion of the types of facilities and their functions, the facilities were categorized as:

- **Blue bin facilities** – facilities capable of processing source-separated recyclable and reusable materials, including materials recovered from the LASAN blue bin program and source-separated commercial recycling. Other facilities for source-separated materials were also discussed within this category, including Resource Recovery Centers for self-hauled materials and construction and demolition debris (C&D) processing facilities.
- **Green bin facilities** – facilities capable of processing yard trimmings, food scraps and other compostable materials, either source-separated or sorted from other residual waste at a processing facility.
- **Black bin facilities** – facilities capable of processing residual waste from residential black bins, commercial sources, or residual waste from processing facilities.

The phasing schedule presented in Table 2 was developed based on direction from the stakeholders at the March 2009 workshops. The phasing schedule takes into account the diversion and disposal tonnage projections that would result from implementation of the policies and programs and identifies the number and types of facilities that will be needed. The policy, program, and facility phasing approach will achieve the City's goal of 90 percent diversion by 2025.

Table 2: Policy, Program and Facility Phasing[1]

2013	2020	2025	2030
New and expanded programs	Additional new programs plus mandatory programs[3]	Continue new and mandatory programs	Continue new and mandatory programs
Upstream Advocacy	Continue upstream advocacy	Continue upstream advocacy	Continue upstream advocacy
1 large or 2 small compost facilities[2]	1 resource recovery center 1 recycling facility and 2 small compost facilities	1 recycling facility and 2 small composting facilities	1 recycling facility
	2 black bin processing facilities	1 black bin processing facility	2 black bin processing facilities
75%	**87%**	**90%**	**97%**

[1] Phasing assumed under SWIRP may not reflect actual implementation and/or roll-out of specific policies, programs and/or facilities.
[2] Facilities may be implemented by either the public or private sector, or by joint public-private partnerships, and may also include expansions to existing facilities.
[3] Statewide mandatory commercial recycling for commercial customers generating four cubic yards or greater of solid waste per week was implemented in July 2012. Mandatory recycling and composting for all generators will be implemented locally by 2020.

The *Policy, Program, and Facility Plan* is organized as follows:

Section 1 - Introduction
Discusses the planning context and Phase 1 summary.

Section 2 - Phase 2 Stakeholder-Driven Planning Process
Describes the activities undertaken by the SWIRP stakeholders during Phase 2.

Section 3 - Policy and Program Analysis
Presents the analysis of the policies and programs identified by stakeholders during Phase 1, and the evaluation and screening process undertaken in Phase 2.

Section 4 - Facility Analysis
Presents the results of the analysis of facilities that will be needed through 2030.

Section 5 - Alternatives to the Plan
Discusses alternatives to SWIRP, including status quo (no new diversion programs, maintaining current diversion levels, and continued local landfilling); and long-haul transfer to remote landfills.

Section 6 - Land Use
Discusses the community planning process and criteria for siting new facilities.

Section 7 - Conclusion
Describes the next steps in the development of SWIRP, including the *Program Environmental Impact Report*, the *Financial Plan*, and the *Implementation Strategy*.

Appendix A - Policy and Program Analysis
Describes policy and program options which were identified by the stakeholders and identifies the diversion potential of each initiative.

Appendix B - Material Flow Model and Generation Projections
Describes the material flow model used to evaluate the effects of different Zero Waste strategies on disposal and diversion throughout the City.

Appendix C - Infrastructure and Material Flows
Documents flows of solid waste, recycling, construction and demolition debris, yard trimmings and organics, and household hazardous waste and electronics among all generators, transfer stations, processing and handling facilities, and landfills used by the City's businesses and residents.

Appendix D - Facility Analysis
Describes the approach and methods used to arrive at the number and types of facilities required for managing solid waste, recyclable and compostable materials, and construction and demolition debris.

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Section 1 Introduction

The City of Los Angeles (City) initiated a stakeholder-driven planning process in the spring of 2007 to develop the City's Solid Waste Integrated Resources Plan (SWIRP), a long-range master plan for solid waste management in the City. This report describes the policies, programs, and facilities that will be needed to reach the City's goals; estimates the diversion potential; identifies the alternatives to the plan; and describes the Phase 2 planning process.

1.1 Planning Context

The Bureau of Sanitation (LASAN) has been managing solid waste since 1890 and collecting solid waste from residents since 1943.

City Rubbish Collection, 1943

LASAN crews provide collection services to residential curbside customers which include generators in single-family residences and some multi-family residences, primarily with four units or less.

Approximately 450 permitted private waste haulers provide waste hauling services in the City, including construction-related contractors.[6] Under the current waste hauler permit system, multi-family dwellings over four units, commercial, and industrial customers are allowed to select and negotiate waste disposal and/or recycling contracts with any of the City's permitted private waste haulers. The City intends to move from the current private waste hauler permit system to a franchise system for the collection of discarded materials from multi-family and commercial properties.

The California Integrated Waste Management Act of 1989 (Assembly Bill 939, AB 939), as amended, established the statewide solid waste planning requirements for cities and counties in California and set diversion goals of 25 percent diversion by 1995 and 50 percent diversion by 2000. The City achieved 60 percent diversion in 2000 and has maintained consistently high rates of diversion, reaching 72 percent in 2010 and 76.4 percent in 2011 (based on the most current data available).

AB 939 requires that cities and counties develop a *Source Reduction and Recycling Element*, describing the policies and programs that would be implemented to reach the diversion requirements of the act; a *Household Hazardous Waste Element*, describing the programs and facilities that would be implemented to appropriately handle household hazardous waste generated within a community; and a *Non-Disposal Facility Element*, identifying the facilities that will be used to implement the diversion programs described

[6] Source: Department of Public Works, Bureau of Sanitation, Board Report No. 1, February 13, 2012.

in the *Source Reduction and Recycling Element*. The City completed the AB 939 planning requirements in 1993, and provides annual updates to the California Department of Resources, Recycling, and Recovery (CalRecycle), the State agency responsible for overseeing the implementation of AB 939. In 2004, the City formed the Los Angeles Regional Agency (LARA) along with 15 other cities in Los Angeles County to coordinate planning efforts and reporting to CalRecycle. The City is the lead agency for LARA and provides staffing and support to the agency.

In addition to the planning requirements under AB 939, the City regularly undertakes long-range planning efforts to address its solid waste infrastructure and program needs. SWIRP is the successor to these planning studies and builds on their findings and research, and will be the solid waste master planning document for the City's solid waste programs through 2030. Table 3 lists the major studies completed between 1989 and 2007.

Table 3: City of Los Angeles Solid Waste Planning Studies 1989 to 2007

Year	Planning Study
1989	• Recycling Implementation Plan • Long Haul Study
1993	• AB 939 Source Reduction and Recycling Element • Solid Waste Management Plan
2000	• Best Practices Report • Solid Resources Infrastructure Strategy Facilities Plan
2001	• Year 2000 AB 939 Report
2002	• Waste Characterization and Quantification Study Year 2000
2005	• Evaluation of Alternative Solid Waste Processing Technologies • Recovering Energy, Natural Resources, and Economic Benefit from Waste for Los Angeles (RENEW LA)
2007	• Initiated SWIRP planning process

Source: "City of Los Angeles Solid Waste Planning Background Studies Summary Report," January 2006.

1.1.1 RENEW LA

The blueprint for SWIRP is RENEW LA, the guidance document developed by Councilmember Greig Smith in 2005. RENEW LA was adopted by the full City Council in 2006 and provides the foundation for the SWIRP planning process. RENEW LA establishes the vision for Zero Waste and includes the goal of 90 percent diversion by 2025. RENEW LA recognizes that to manage discarded materials appropriately in the future, the City and its residents and businesses will need a new paradigm of sustainability and resource conservation. The strategies outlined in RENEW LA were carried forward in the stakeholder planning process for SWIRP and include:

- Residential food scraps collection (co-collected with yard trimmings in the green bin).
- Multi-family blue bin recycling.
- Pre-processing of commercial waste at mixed material processing facilities.
- Investment in new technologies – RENEW LA includes a description of "conversion technologies" including thermal conversion technologies (gasification and pyrolysis); anaerobic digestion; composting; autoclaving; and fermentation.

RENEW LA anticipated the need for seven new technology facilities for residual waste from both residential and commercial sources, one for each wasteshed and an additional facility outside of the City for use by generators within the City. The total capacity need identified through 2025 for all seven facilities was 14,500 tons per day (tpd) with daily capacities for each facility ranging from 1,250 to 3,000 tpd. Three of these facilities would be needed for residual waste from residential sources (residential curbside and multi-family) and four of these facilities would be needed for residual waste from commercial sources.[7]

The *Phase 2 Policy, Program, and Facility Plan* revisits the City's facility needs in light of the stakeholder-identified policies and programs and analyzes the capacity needed for "blue bin," "green bin," and "black bin" processing facilities through 2030.

1.1.2 SWIRP

Based on the vision of RENEW LA and the City directive to engage in a stakeholder-driven planning process, the City undertook the development of SWIRP in 2007. The goals of SWIRP are to:

- Conduct an innovative stakeholder-driven process to outline the City's objectives to provide sustainability, resource conservation, source reduction, recycling, renewable energy, maximum material recovery, and environmental protection for solid waste management planning through 2030.
- Evaluate existing collection, transfer, recycling, processing and disposal operations, and recommend programs, changes and new initiatives that will help the City meet at least 90 percent diversion from urban landfills and develop a long-term plan for disposal of residual waste.
- Identify cost-effective source reduction and solid waste management policy options, through a stakeholder process, taking into consideration communities and environments that may be affected, the numerous institutions concerned with solid waste management systems, and the potential for competing policy goals.

[7] *Recovering Energy, Natural Resources and Economic Benefit from Waste for Los Angeles*, Los Angeles City Councilman Greig Smith, June 2005, Table 5.8, page 5-46.

- Develop an integrated plan that is aligned with the City's objectives to protect the public health and environment and will enhance the City's leadership position in environmental planning well into the 21st century, through sustainability, resource conservation and source reduction, maximum material recovery, environmental protection, and renewable energy.

SWIRP was conducted in two phases.

Phase 1 -The goal and focus of Phase 1 of the SWIRP planning process was to reach out to stakeholders from all over the City to participate in identifying the guiding principles for SWIRP. This process was documented in Volume I of SWIRP *Phase 1 Forming the Zero Waste Guiding Principles*.

Phase 2 - The Phase 2 planning process continued to build on the stakeholder-driven process established in Phase 1 to develop this report, the *Phase 2 Policy, Program, and Facility Plan*. Phase 2 continued with the development of the *Program Environmental Impact Report*, the *Financial Plan,* and the *Implementation Strategy*.

1.2 Phase I Summary

In April 2007, LASAN began an intense stakeholder-driven process to develop SWIRP, the long-range Zero Waste master plan. During the first phase, which was completed in May 2008, a total of 256 public outreach meetings were conducted (109 key constituent meetings, 27 grass-roots house meetings, 75 business interviews, 42 regional workshops in the six wastesheds throughout the City, and three citywide conferences). Over 2,500 stakeholders have been engaged in providing feedback and input into the development of the Zero Waste plan.

During the year-long planning process, stakeholders gathered together in regional workshops and citywide conferences to establish the vision and goals for achieving Zero Waste. The City conducted six workshops in each of the six wastesheds plus a downtown citywide workshop (42 workshops total) and three citywide conferences.

In May 2008, the SWIRP stakeholders identified the road to Zero Waste by developing twelve stakeholder guiding principles:

1. **Education to decrease consumption** – Stakeholders felt that the City should instill a "Zero Waste culture" citywide. A key strategy for increasing awareness among the next generation of Angelenos was the stakeholder recommendation to partner with Los Angeles Unified School District to develop a Zero Waste curriculum and increase recycling in the schools.
2. **City leadership as a model for Zero Waste practices** – Stakeholders agreed that the City should "walk its talk" by demonstrating leadership in recycling at all City facilities and parks and modeling Zero Waste behaviors such as phasing out expanded polystyrene containers and single use water bottles.

3. **Education to increase recycling** – Stakeholders asserted that the City should put more emphasis on educating residents and businesses about existing City programs and encourage them to make recycling and Zero Waste "second nature."
4. **City leadership to increase recycling** – Stakeholders want the City to use its stature in Sacramento to lobby for State legislation on initiatives that are best implemented at the State level, such as producer responsibility and packaging legislation.
5. **Manufacturer responsibility** – Stakeholders supported initiatives to encourage or require producers of products and packaging to take responsibility for the "end of life" management of those products and packaging.
6. **Consumer responsibility** – Stakeholders believed that consumers, including both residents and businesses, need to be part of the solution and should be required to participate in recycling and composting programs.
7. **Convenience** – Stakeholders felt that recycling programs should be convenient and that it should be as easy to recycle as it is to waste. A key strategy for increasing convenience is to provide recycling receptacles wherever there are waste receptacles.
8. **Incentives** – Stakeholders suggested that the City provide more incentives for recycling and composting, such as "pay-as-you-throw" rate structures.
9. **New, safe, technology** – Stakeholders supported the development of new technology for managing the City's waste. However, stakeholders emphasized that the technology would need to be demonstrated to be safe and should not impact already burdened communities.
10. **Protect public health and the environment** – Stakeholders strongly believed that protecting public health and the environment should be at the forefront of all decision-making. When embarking on any new idea or plan, the City should carefully consider the long-term consequences and impacts.

Signing off on the Guiding Principles

11. **Equity** – Throughout the planning process, stakeholders supported the concept of equity; shared responsibility for taking care of our waste problems. Stakeholders felt that all areas of the City should share in the burden and benefits of new facilities and that new developments should pay their fair share of the system-wide costs. All generators should have access to recycling and composting programs and sensitive environmental areas and communities should not be burdened with waste impacts. Green jobs created by new programs and facilities should support the local communities, including disadvantaged youth and formerly incarcerated residents who need help transitioning back into the community.

12. **Economic efficiency** – Stakeholders felt that the City must invest carefully in new programs and facilities, but costs should not outweigh other considerations. The City should also consider the long-term economic benefits of reducing waste and creating a more sustainable society. The City should find solutions that are both economically efficient and environmentally preferable and promote economic sustainability through investment in green jobs and economic development.

During Phase 1, stakeholders provided the City with their vision of the sustainable City of the future, where the City demonstrates its leadership in recycling and Zero Waste; all residents and businesses fully participate in the City's recycling and composting programs; and all future generations learn and share in the goals and values of Zero Waste. Stakeholders identified and discussed the policies, programs, and facilities that will be needed to implement this vision and prepared for the development of the *Policy, Program, and Facility Plan* which was then undertaken in Phase 2 of the SWIRP planning process.

Phase 2 of the SWIRP planning process culminated in the development of this report, the stakeholder-driven *Policy, Program, and Facility Plan*.

The elements of the plan include the following:

- Analysis of the policies, programs, and facilities identified during Phase 1 to estimate their diversion potential and planning level costs.
- Development of a material flow model to pinpoint diversion opportunities by projecting tons generated by generator sector and material type citywide and within the City's six wastesheds through 2030.
- Evaluation of the policies, programs, and facilities based on scenarios identified through the stakeholder planning process.

Section 2 Phase 2 Stakeholder-Driven Planning Process

2.1 Overview

2.1.1 Phase 1 of the Stakeholder-Driven Planning Process

The purpose of the stakeholder-driven planning process was to ensure that the goals and vision of the community are reflected in SWIRP. The twelve guiding principles developed in Phase 1 established the direction for the plan.

During the year-long Phase 1 planning process, stakeholders gathered together in regional workshops and citywide conferences to establish the vision and goals for achieving Zero Waste. The City conducted six workshops in each of the six wastesheds plus a downtown citywide workshop (42 workshops total) and three citywide conferences. Each conference series consisted of two workshops (conducted in each of the six wastesheds) followed by a citywide conference where stakeholders across the City could share their perspectives and learn from each other. The workshops and conferences built upon each other and provided a foundation for the planning process, which would continue in Phase 2 with the development of the *Policy, Program, and Facility Plan*.

- **Conference Series 1 –** Stakeholders focused on the **Goals and Objectives** for SWIRP and shared their vision of Zero Waste.
- **Conference Series 2** – Stakeholders reviewed the **Policy, Program, and Facility Options** and discussed over 80 policy options and 20 facility options.
- **Conference Series 3 –** Stakeholders formulated, discussed, and signed off on the **Guiding Principles** for SWIRP.

2.1.2 Phase 2 of the Stakeholder-Driven Planning Process

During the first year of Phase 2 of SWIRP, stakeholders provided input on the specific policies and programs to be considered for implementation, and identified the needed infrastructure to implement the plan through 2030.

The planning process continued in Phase 2 with regional workshops and the fourth citywide conference, and culminated in the development of the *Phase 2 Policy, Program, and Facility Plan*. Table 4 provides the schedule for the SWIRP Phase 2, Year 1 planning process.

Table 4: Phase 2, Year 1 Schedule September 2008 through May 2009

September	November	March	May 30th
Workshop Series 7 The Road to Zero Waste Continues	Workshop Series 8 Key Issues for the Zero Waste Plan	Workshop Series 9 Evaluating Scenarios for Zero Waste	4th Citywide Conference Policy, Program, and Facility Plan

2.1.3 Conference Series 4

The fourth conference series focused on developing the input and content for the *Phase 2 Policy, Program, and Facility Plan*. The workshops were tailored based on stakeholder input to cover the issues of greatest interest and concern to the stakeholders. Figure 1 illustrates the workshop process leading up to the fourth citywide conference which culminated in the presentation of the *Policy, Program, and Facility Plan* summary.

Figure 1: Conference Series 4 Policy, Program, and Facility Plan

2.2 Workshop 7 – Phase 2 Workplan

The focus of workshop 7, in September 2008, was the Phase 2 workplan: future program and policy development, future service needs by wasteshed, facility capacity needs, new technologies, and disposal options for residual waste. At the workshops, stakeholders were able to learn about the new programs that had been implemented or initiated by the City over the past year, including some programs suggested by the stakeholders at earlier workshops. These programs included:

- Multi-family recycling available to all buildings
- Plastic bag policy and expanded polystyrene ban
- Mandatory construction and demolition debris recycling
- Pay-as-you-throw pilot
- Residential food scraps collection pilot program
- City facility recycling program
- Sharps (needles and syringes) management
- Illegal dumping clean-up through the multi-family bulky item pickup program

Stakeholders also provided input to the workplan and discussed four key policy questions:

South LA Workshop, Fall 2008

1. *Should programs be consistent across the City or should there be regional or generator differences? Food scraps collected with yard trimmings? More intensive processing of "black bin"?*

   Stakeholders strongly felt that the major City programs should be uniform across the City and all generators in the City should have equal access to the programs.

2. *Should the City continue to focus on source-separated programs or invest in "downstream" infrastructure?*

   Stakeholders strongly supported the City's source-separated programs (blue bin, green bin, black bin) and felt that they should continue to be the focus of the City's efforts. Stakeholders supported the processing of "black bin" materials and the concept of "MRF first," processing residual waste through a "dirty" Materials Recovery Facility (MRF) or Mixed Material Processing (MMP) facility, so that all recyclable or compostable materials that can be feasibly recovered are diverted from landfills.

3. *How should the City regulate the private haulers? Continue open-market competition? Consider rate-regulation and uniform programs? What are the unintended consequences of more regulation?*

   Stakeholders were cautious about changing the status quo and did not want to see small haulers forced out of business or commercial generators left with fewer choices through exclusive franchises. Stakeholders supported requirements, on both haulers and generators, to recycle.

4. *If we can actually achieve 90 percent or more diversion, should we reconsider our commitment to end urban landfilling? Should residual waste be hauled to other regional landfills? Should we consider rail-haul to the desert landfills?*

   Stakeholders felt strongly that the City should continue to pursue the elimination of urban landfilling (and all landfilling) and did not feel that the City should consider rail-haul to distant landfills. There was strong support for continued research into technologies to treat residual waste (environmentally and economically) and a belief that through Zero Waste policies and leadership the City could reduce waste at the source and achieve Zero Waste (or close to it).

2.3 Workshop 8 – Culture Change, Planning, and Alternative Technology

In response to stakeholder input at workshop 7, workshop 8 in November 2008, included the following key issues for discussion:

- Zero Waste culture change
- Planning and management of private solid waste facilities
- Solid waste infrastructure and service voids
- Status of the City's research into new technologies

To accommodate stakeholder interest in these issues and to identify related policy and program issues to be addressed by SWIRP, the City scheduled guest speakers on the topics listed above to present at the regional workshops. The speakers included representatives from the following organizations:

- **Zero Waste culture change**: L.A. SHARES, Interfaith Environmental Council, City of Los Angeles Office of Community Beautification, the Institute for Local Self-Reliance
- **Planning and management of private solid waste facilities**: City of Los Angeles Planning Department, CalRecycle Local Enforcement Agency
- **Solid waste infrastructure and service voids**: City of Los Angeles Bureau of Sanitation Processing and Construction Division and Support Services Division
- **Status of the City's research into new technologies**: City of Los Angeles Bureau of Sanitation Support Services Division, Recycling Development Office of the Scarborough Borough Council (United Kingdom)

L.A. SHARES Reuse Warehouse

At the workshop, stakeholders discussed case studies of organizational models for changing norms of behavior and motivating culture change. Stakeholders recommended expanding the neighborhood beautification grant program to include community Zero Waste grants. Stakeholders also recommended supporting the development of non-profits, as the City has done with L.A. SHARES, to create the social infrastructure for Zero Waste. These concepts were incorporated into the Zero Waste policy and programs for SWIRP.

Stakeholders also discussed facility planning and support for community-based Zero Waste businesses. Stakeholders had questions about the costs and emissions from Alternative Technology facilities. City staff described the process for evaluating new technology proposals. Stakeholders provided feedback to the City on facility development and Alternative Technology.

- Some communities have more than their fair share of facilities, so the new facilities should not be sited in these areas.
- Smaller facilities are preferred to large-scale regional facilities.
- Facilities should be fully enclosed to reduce noise, odor, and visual impacts.
- Facilities should blend into the surrounding land uses.
- All facilities will require state-of-the-art emissions controls and traffic mitigations.

2.4 Workshop 9 – Policy, Program and Facility Analysis

At workshop 9 in March 2009, the City presented the following results of the policy, program, and facility analysis:

- Over 80 policies and programs identified during Phase 1 meetings.
- Over 40 policies and programs modeled to project diversion estimates.
- Five scenarios used in the model: 1) No new policies or programs (baseline); 2) New policies and programs; 3) Adding mandatory requirements to Scenario 2; 4) Adding upstream policies to Scenario 2; and 5) Adding upstream policies to Scenario 3 (full implementation of SWIRP).
- Diversion estimates expected from each scenario.
- Maximum diversion rate from identified policies and programs expected to be 73 to 82 percent diversion.[8]
- New "blue bin" and "green bin" facility capacity needs, including clean materials recovery facilities, composting facilities, Resource Recovery Centers, and construction and demolition facilities.
- Alternatives for processing "black bin" materials, including mixed material processing, Alternative Technology advanced thermal recycling, Alternative Technology biological (anaerobic digestion), and Alternative Technology thermal (pyrolysis, plasma arc, gasification).
- Costs, impacts, and benefits of processing "black bin" materials, including high diversion rates, relatively high costs, emissions and other impacts, reduced landfilling, and other benefits.

[8] The material flow model was updated in 2012 using more recent data from 2010 and projected diversion rates between 79 and 86 percent.

Stakeholders provided feedback on the initial analysis and direction for completing the *Policy, Program, and Facility Plan*, by ranking the approaches discussed:

1. *What is the best Policy and Program Scenario?*

   Stakeholders preferred a phased approach, where voluntary programs are maximized prior to implementing mandatory requirements. The majority of stakeholders recommended implementing mandatory requirements if voluntary programs are not sufficient to reach the City's diversion goals.

2. *What is the best Facility Scenario (for "black bin" waste after recycling)?*

   Stakeholders recommended that the City proceed slowly and carefully in pursuing black bin processing. Stakeholders felt that education and outreach should be emphasized and source-separation programs provided to all generators. Some stakeholders were concerned about the potential impacts of Alternative Technology facilities, including potential emissions.

3. *Where should the City invest its limited funding?*

   Stakeholders emphasized that the City should focus on providing more education, outreach, and technical assistance. Investing in conventional processing technology and new technologies were lower ranked. Stakeholders recommended that the City pursue education over enforcement.

2.5 Citywide Conference 4 – Policy, Program, and Facility Plan

Based on the feedback provided by the stakeholders at the March 2009 workshops, the City developed a phasing plan and presented the draft *Policy, Program, and Facility Plan* summary at the citywide conference held on May 30, 2009.

Opening remarks for the conference were provided by Councilman Ed Reyes, Councilwoman Jan Perry, Board of Public Works President Cynthia Ruiz, and Bureau of Sanitation Director Enrique Zaldivar. Following the opening remarks, City staff presented the major plan elements of the draft *Policy, Program, and Facility Plan.*

A new video, "Reaching for Zero," was debuted at the conference to highlight the SWIRP planning process and stakeholder input. Stakeholders who were interviewed in the video were then part of a panel to share updates since being interviewed, and answer questions asked by other stakeholders.

To celebrate this major milestone in the planning process, stakeholders and City staff were featured in a Zero Waste fashion show presented by the design group, *Haute Trash*. This non-profit educational organization creates fashion out of discarded materials in order to entertain, educate, and empower others to rethink, reuse, and recycle. The organization aspires to change the way the community sees the world through art.

Over 300 stakeholders attended the conference in addition to 23 exhibitor organizations, City staff, and project team members.

Zero Waste Fashion Show Models

Conference series 4 provided a forum for the stakeholders to provide their direct input into the *Policy, Program, and Facility Plan*. Stakeholders from across the City and in each wasteshed were able to provide meaningful feedback and direction to the City in an interactive process to ensure that the plan elements were reflective of the community's values.

A summary of goals achieved at each workshop and conference is included below:

- During workshop 7, stakeholders provided direction on research elements and policy considerations for the plan.
- During workshop 8, stakeholders reviewed model programs for culture change and provided insights on planning for new facilities.
- During workshop 9, stakeholders reviewed the preliminary policy, program, and facility analysis and provided direction on phasing-in the policies, programs, and facilities.
- At the citywide conference, stakeholders reviewed the draft *Policy, Program, and Facility Plan* elements and celebrated the success of the stakeholder-driven planning process.

Section 3 Policy and Program Analysis

This section describes the City's existing policies and programs; the new policies and programs identified through the stakeholder planning process; the scenarios for implementation; potential diversion by scenario; and the phasing approach recommended by the stakeholders.

3.1 Introduction

3.1.1 City Council Directives

3.1.1.1 GREEN LA Plan

In May 2007, the City unveiled GREEN LA - An Action Plan to make the City of Los Angeles the greenest city in the nation and the national leader to fight global warming. The 50+ initiatives of the plan include diverting 70 percent of the City's waste by 2013. This goal was subsequently escalated to 75 percent by 2013. The City established additional directives for solid waste management, including:

- Implement a stakeholder-driven Solid Waste Integrated Resources Plan
- Convert the LASAN collection fleet to clean fuel
- Shift from reliance on *waste disposal* to a greater focus on *resource recovery*
- Establish an operating Alternative Technology facility

3.1.1.2 RENEW LA

RENEW LA, which was adopted by the City Council in 2006, establishes further policy directives for the City. RENEW LA identified the following action steps (the implementation of which were overseen by the RENEW LA Oversight Committee, an ad hoc committee of the City Council):

1. Establish RENEW LA Oversight Committee (complete).
2. Adopt RENEW LA Blueprint and Zero Waste policy (complete).
3. Modify zoning code to allow conversion technology by right in M2 (light industrial) and M3 (heavy industrial) zones with conditions (complete[9]).
4. Establish site areas for conversion technology in each of the wastesheds (in process).
5. Site and develop the first and second conversion technology facility (in process).
6. Establish a fund from Sunshine Canyon host fees for development of facilities that reduce landfilling (complete).
7. Implement recycling in 50 percent of the commercial sector (complete).
8. Mandate a time-certain reduction in City solid waste disposed at Sunshine Canyon (in process).

[9] The Los Angeles Municipal Code was amended by ordinance on August 4, 2010, and allows Solid Waste Alternative Technology Processing Facilities to be located in M2, M3 and PF zones based on specific findings of the City Planning Commission (described below in section 3.1.2.6).

9. Expand multi-family recycling to 50 percent of the City (complete).
10. Establish City tax breaks for Zero Waste and new re-manufacturing companies (in process).
11. Establish a green energy producer bonus from the Department of Water and Power (complete).
12. Add residential food waste to the green bin program (in process).

3.1.2 Existing City Policies

The City Council has adopted many resolutions, initiatives, and ordinances related to solid waste management. Highlighted below are the initiatives and ordinances that are directly related to the SWIRP policies and programs identified by the stakeholders.

3.1.2.1 Private Hauler Fee Ordinance

Adopted by the City Council in July 2002, the Private Hauler Fee Ordinance requires non-exclusive permitting of private haulers who operate in the City, and collects fees from those haulers who collect more than 1,000 tons of solid waste annually from City customers. With this revenue source, staff administers a number of private sector contracted programs which include the following:

- Multi-family recycling services for those serviced by private haulers
- Commercial and institutional waste assessments and recycling technical assistance
- Funding of reuse agencies receiving corporate donations, such as L.A. SHARES
- A rebate incentive program to encourage private haulers to recycle mixed refuse, mixed construction and debris loads, and mixed food waste loads
- Commercial food scraps recycling for restaurants
- Los Angeles Unified School District (LAUSD) blue bin recycling program
- Public outreach and education

3.1.2.2 Private Hauler Franchise Initiative

In 2012, the City Council indicated its intention to move from the current private hauler permit system to a franchise system for the collection of discarded materials from both multi-family and commercial properties not collected by the City. The franchise system is intended to help the City reach its Zero Waste goals, and will contain elements such as maximum disposal amounts per zone, aggressive diversion programs (including outreach and education), clean fuel requirements, and worker health and safety requirements, to be administered by LASAN.

In November 2012, the City Council directed LASAN to begin the environmental review process pursuant to the California Environmental Quality Act (CEQA) for the commercial and multi-family private hauler franchise initiative adopted by Council, to return with an implementation plan for the franchise system, and requested the City Attorney to draft required ordinances for the project (Council File number 10-1797). On April 24, 2013, the City Council approved LASAN's Implementation Plan, adopted the 10 goals of the franchise program, and directed LASAN to proceed with the development of a Request For Proposals. The City Council is expected to consider the commercial and multi-family private hauler franchise ordinance and associated environmental documentation in early 2014.

3.1.2.3 Green Building Ordinance

Adopted by the City Council on April 22, 2008, the Green Building Ordinance establishes the following:

- The Green Building Program; the Standard of Excellence incentive program for projects that register with the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) program.
- The Standard of Sustainability which requires residential and non-residential projects 50,000 square feet or above and residential projects 50 units or more to meet the intent of LEED at the Certified level.

3.1.2.4 Plastic Bag and Polystyrene Policy

Passed by the City Council in July 2008, the Plastic Bag Policy signaled the City's intent to ban plastic bags at supermarkets and retail locations by 2010 if the State did not impose a 25 cent per bag fee for each bag requested by a customer. The State legislation that has been introduced in the past has failed passage.[10] The most recent bill attempted was Senate Bill 405, in May 2013, which was not approved. Assembly Bill 158, another bill that aims to ban plastic bags, has had its hearing postponed until 2014.[11]

On May 23, 2012, the City Council adopted a policy to ban distribution of single-use plastics bags and impose a 10-cent fee on single-use paper bags at supermarkets and select retail stores within the City. The effective date of the ordinance was August 1, 2013 and will apply to specified retail stores on January 1, 2014.[12]

The City Council also voted to ban all polystyrene food service products at City offices, facilities, and City-sponsored events as of July 1, 2008. The City Council also voted to ban polystyrene food service products at City-permitted events by July 1, 2009, and to renegotiate all lease and concession agreements to phase out polystyrene food service products by 2010.

3.1.2.5 Environmentally Preferable Procurement Ordinance

Adopted on June 12, 2009, the Environmentally Preferable Procurement Ordinance establishes the policy for the City to implement the following:

- Purchase environmentally preferable products by including environmental considerations in the City's purchasing decisions, along with traditional criteria of price, performance, and availability.
- Incorporate environmental factors into the City's product specifications.
- Raise staff awareness of environmentally preferable products.

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[10] Assembly Bill 1998, introduced by Assembly member Julia Brownley, failed passage in 2010. Senate Bill 405, introduced by Senator Alex Padilla, failed passage in May 2013.

[11] Assembly Bill 158, introduced by Assemblymember Marc Levine, in January 2013.

[12] The Council Action on the single-use bag policy is available through the City of Los Angeles Council File 11-1531.

- Encourage suppliers and service providers to use environmentally preferable products when providing goods or services to the City.

3.1.2.6 Recycling Chute Ordinance

Adopted by the City Council on July 7, 2010, this ordinance does the following:

- Defines trash and recycling chutes.
- Requires recycling chutes for commercial and multi-family buildings when new or expanding projects are adding trash chutes.
- Requires proper identification for recycling chutes.

3.1.2.7 Solid Waste Alternative Technology Processing Facility Ordinance

Adopted by the City Council on August 4, 2010, this ordinance allows Alternative Technology facilities to be sited in M2 (light industrial/commercial), M3 (heavy industrial) and PF (Public Facility) zones within the City provided that the following criteria are met:

- The facility location would not result in an undue concentration of such facilities.
- An effort was made to locate the facility near existing solid waste facilities.
- The facility will not detrimentally affect residential or other sensitive land uses within a 1,500-foot radius of the proposed site.
- The facility operator will provide a quarterly newsletter and other benefits to the surrounding community.
- The facility and vehicles used for the facility are designed to mitigate noise, odor, and visual blight.
- Access, parking, and vehicle storage will not cause a traffic hazard.
- Hazardous waste, household hazardous waste, universal waste, radioactive waste and medical waste will not be received at the facility.

3.1.2.8 Construction and Demolition Debris Ordinance

All City Public Works construction projects are required to divert 75 percent of inert materials (including concrete, asphalt, and dirt) and 50 percent of all other materials generated by the construction project. The C&D ordinance, approved by the City Council on December 17, 2010, requires <u>all</u> mixed C&D debris generated within the City, from both public and privately developed projects, to be taken to a C&D debris processor certified by the City. Residential self-hauled material and source-separated recycled material are exempted.

3.1.3 Existing City Programs

The City has implemented many state-of-the-art programs for managing solid waste and diverting waste from landfills, including the following:

The City's Residential Collection Program

- Four bin collection program for residential curbside customers (blue bin for commingled recycling, green bin for yard trimmings, black bin for residual waste, and brown bin for horse manure).
- Multi-family blue bin recycling available to all multi-family buildings in the City.
- Bulky item collection available to all residential curbside and multi-family generators.
- School site blue bin recycling and classroom recycling presentations available to all schools within the City in the Los Angeles Unified School District.
- Restaurant food scraps collection available to all restaurants in the City.
- Commercial recycling technical assistance available to all commercial and institutional generators in the City.
- City Department recycling available to all City offices and facilities.
- Seven S.A.F.E. Centers for proper management of household hazardous wastes located throughout the City.

These commercial and residential programs are managed by the LASAN Solid Resources Program. LASAN is responsible for the collection, disposal, and recycling of over 1.5 million tons per year (tpy) of discarded materials for the residents of the City. The multi-family and commercial programs are managed by LASAN though permitted private haulers. Program responsibilities are divided among the divisions listed below.

3.1.3.1 Solid Resources Support Services Division

The Solid Resources Support Services Division provides administrative, technical, engineering, construction, and planning support to the Solid Resources Collection Divisions and their residential customers. The Division accomplishes this function through long-term planning (including the development of SWIRP), the study and evaluation of advanced technology for alternative treatment of residual waste (Alternative Technology), operation of the customer call center, management and operation of the refuse collection container program, the implementation of an alternative fuel program for the Bureau of Sanitation refuse collection fleet, and the implementation of a pilot residential food scraps collection program. The Division also oversees the LASAN yard trimmings processing, recyclables processing, and disposal contracts, as well as the development of the five-year Capital Improvement Program.

3.1.3.2 Solid Resources Citywide Recycling Division

The Solid Resources Citywide Recycling Division is responsible for the funding, development, and implementation of commercial, industrial, and institutional waste diversion programs for the City, including multi-family recycling, City Facilities Recycling Programs, and restaurant food scraps recycling.

The Division is also responsible for the management of the permitted private haulers, household hazardous waste, used oil, electronics, and other special materials (such as batteries and sharps (e.g., hypodermic needles and lancets)) for residents, small businesses, and City departments. This includes the operation of the S.A.F.E. Centers which provide a permanent, convenient option for the collection of these materials, and periodic mobile events. The Division also manages the Public Affairs Office of the Department of Public Works.

3.1.3.3 Solid Resources Processing and Construction Division

The Solid Resources Processing and Construction Division is composed of two groups with complementary responsibilities. The Technical Support Group provides specialized engineering and project management services, such as the development of City-owned and operated solid resource management facilities including composting and mulching facilities, transfer stations, and other similar facilities. The Operations Group provides specialized services by operating transfer stations, mulching and composting facilities, and performing landfill closure activities.

Central Los Angeles Recycling & Transfer Station

3.1.3.4 Solid Resources South Collection Division/Solid Resources Valley Collection Division

The Solid Resources Collection Divisions provide waste collection and recycling services for approximately 750,000 residential households in the City. The Divisions operate six collection wastesheds throughout the City. Crews are dispatched from each wasteshed to collect household refuse, recyclables, yard trimmings, bulky items, horse manure, tires, and dead animals. The number of crews per wasteshed ranges from approximately 30 to 130 depending on the size of the wasteshed.

3.2 SWIRP Policies and Programs

Throughout Phase 1 and Phase 2 of the SWIRP planning process, the City's stakeholders and LASAN staff engaged in an interactive dialogue about the City's future vision of sustainability in planning for Zero Waste. The stakeholders envisioned a future where:

- Recycling is as convenient (or more convenient) than disposal
- Generators have universal access to recycling and it is more cost-effective than disposal
- Products and packaging are made to be disassembled or easy to recycle
- School children are experts in the three Rs (reduce, reuse, recycle) and take the message home to their families
- City government is a model for Zero Waste behavior

The stakeholders acknowledged that the City has some of the most extensive recycling programs in the country, but expressed concern that not enough residents and businesses take advantage of these programs. The stakeholders also acknowledged that City government has a limited role in changing consumer behavior and limited ability to require producers to change their products and packaging. Nevertheless, stakeholders expect the City to be a leader and use its influence to create the changes that it seeks from its residents and businesses.

3.2.1 Culture Change and Education

Stakeholders identified "culture change," changing modes of behavior and attitudes toward waste, as an important component of Zero Waste. Culture change is not something that happens overnight, but it is a process that can lead to behavioral and personal changes. Culture change happens when people communicate openly and strive to build consensus through a call to action. It takes place when government leaders involve their residents and businesses in decision making (like the SWIRP planning process). It happens when neighbors band together to form a community, like neighborhood watch groups or community gardens. The City can support culture change by supporting community groups and other institutions that form the fabric of the City.

3.2.1.1 Community Beautification Grants for Zero Waste Projects

The Office of Community Beautification serves as a resource for community improvement programs throughout Los Angeles. These programs are designed to empower neighborhoods and community groups. By utilizing these services, participants improve their environment while building partnerships with the City. The Office of Community Beautification provides cash grants of up to $10,000 to community groups for physical improvements to neighborhoods. Examples of projects may include community gardens, landscaping, murals, pedestrian furniture, or whatever else community members can imagine for their neighborhoods. Stakeholders identified an opportunity for leveraging resources by expanding the role of this already successful program to include funding for community Zero Waste projects.

Los Angeles Indigenous Peoples Alliance Community Beautification Grant Project

3.2.1.2 Supporting the Development of Non-Profits

Stakeholders recognized that supporting the development of non-profits could be another useful strategy for creating cultural change. L.A. SHARES is an example of this approach. L.A. SHARES is a non-profit materials reuse program, which takes donations from the local business community of reusable goods and materials (both new and used) and redistributes these items free-of-charge to non-profits and schools throughout Los Angeles County.

Created in 1991, L.A. SHARES was formerly a pilot program of the City of Los Angeles Cultural Affairs Department known as Materials for the Arts. In 1994, in an effort to expand beyond the Los Angeles City limits and to service even more non-profit groups and schools, L.A. SHARES became an independent, non-profit organization.

3.2.1.3 Social Marketing

The City has an extensive public outreach program that provides print material, advertisements, and web-based information to City generators. The City conducts outreach at public events, conducts workshops and training programs, provides school assemblies and classroom presentations, and holds annual open houses at the District Yards (the home base for the collection crews within each wasteshed). However, based on feedback from the stakeholders at the Zero Waste workshops, waste prevention and recycling messages are not reaching all generators.

A community-based social marketing program could be implemented to help change the culture and behavior in the City, with different messages targeted to different demographic groups using a wide assortment of tools. The social marketing strategy would penetrate all three major aspects of each individual's life (home, work, and play) with a Zero Waste message. This would not take the form of three separate campaigns, but rather an integrated lifestyle campaign. The four phases of the social marketing campaign would focus on the following:

- **Awareness –** Employing mostly media tactics
- **Persuasion –** Hands-on, community-based work with community organizations, churches, school groups, and business groups
- **Implementation –** "How-to" strategies and tactics
- **Confirmation –** Publicity on awards, recognition, and success stories

Stakeholders felt that the City's recycling program (including the Recycling Ambassadors) should be a more prominent part of the local neighborhoods and the community.

There are also numerous opportunities to employ social media techniques (including Facebook, Twitter, Instagram, blogs, and podcasts) to reach out to and educate the younger population (ages 18-30) of the City who rely on the internet and other real-time technologies to communicate and mobilize around issues that they care most about (e.g., "being green" and "saving the planet"). LASAN should use both traditional and new outreach and marketing tools to reach all sectors of the residential and business communities.

Future Zero Waste Ambassadors

3.2.1.4 Zero Waste Curriculum

A key initiative identified by the stakeholders is working with LAUSD and private schools to take the Zero Waste message to the next generation of Los Angeles residents through providing a Zero Waste curriculum in the schools. One of the top goals of SWIRP, identified by stakeholders during Phase 1 is:

"Zero waste should become second nature as part of the culture of the family, education system, and community."

Stakeholders have emphasized school outreach as a way of reaching the greater community. By practicing Zero Waste at school, students learn the importance of reduction and conservation and bring the message back home to their families. In this way, LAUSD and the City can help change the "norms" of behavior to strive for Zero Waste.

Public schools are increasingly under financial and time pressure to deliver basic education and test preparation skills to students. Teachers need curricula aligned with the State standards. Pursuant to State law,[13] the California Environmental Protection Agency and CalRecycle are actively engaged in the development of the Education and Environment Initiative (EEI) that would bring a unified environmental education strategy to the State's schools.

The EEI is still under development and the model EEI curriculum does not currently include a Zero Waste module. However, communities throughout the State (including Alameda County Stopwaste.org) have expressed interest in developing a Zero Waste curriculum aligned to the State standards in math and reading. The City could advocate for the EEI to include Zero Waste subjects and it could also work with other agencies to independently develop a Zero Waste curriculum that could be adopted by LAUSD and other schools in the City. At almost every Zero Waste workshop held throughout Phase 1 and Phase 2, stakeholders have identified this initiative as the most important thing that the City could do to change the culture and support the goal of Zero Waste.

3.2.2 Upstream Policies

"Upstream" is a way of describing policies prior to the point of generation. Figure 2 depicts the Zero Waste loop discussed extensively in the workshops throughout Phase 1 and Phase 2. Within the Zero Waste loop, upstream policies would affect design of the product or package prior to manufacturing. Extended Producer Responsibility (EPR) is a strategy for encouraging manufacturers to take responsibility for the end-of-life of their products.

These initiatives seek to encourage manufacturers to design their products or packaging with less waste or with materials that are easy to recycle. In implementing EPR initiatives, the City would take an active role in advocating for legislation that requires product manufacturers, retail establishments, wholesale distributors and other appropriate entities to take back certain products or packaging that currently are difficult to recycle, contain toxics or otherwise pose problems when they are discarded as waste. The City would work with various federal, State, and regional agencies and community groups to ensure that effective take-back programs are enacted into law, thereby enhancing the City's goals to reduce the volume and toxicity of the materials entering the City's waste stream. Upstream policies could also

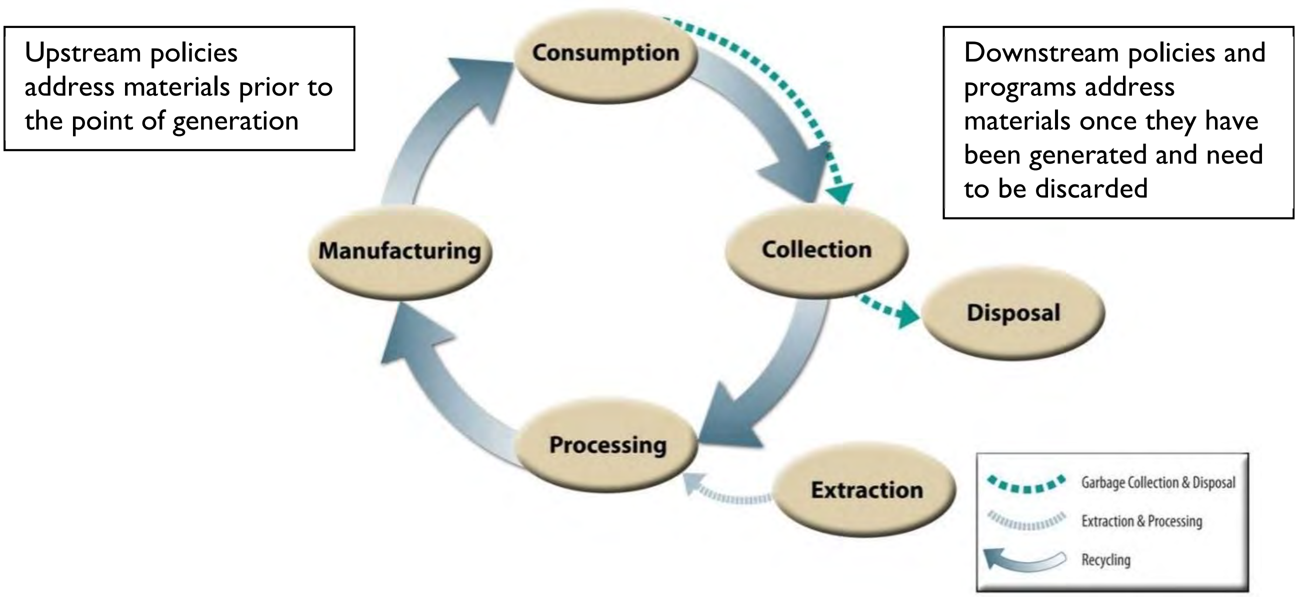
[13] Assembly Bill 1548 (Pavley, Chapter 665, Statutes of 2003) and Assembly Bill 1721 (Pavley, Chapter 581, Statutes of 2005).

include material bans, such as the City department expanded polystyrene foam ban and the single-use bag policy.[14] Upstream policies discussed by the stakeholders include:

- Advocating for EPR for toxics
- Advocating for EPR for difficult to recycle materials
- Advocating for State packaging legislation
- Single-use bag ban
- Advocate for businesses to develop life-cycle analyses for products and packaging, taking into account all environmental impacts of the product from manufacturing to the end of its useful life
- Advocate for legislation to incentivize manufacturers to use local reuse and recycling markets for the products they manufacture

These policies are described in *Appendix A Policy and Program Analysis*.

Figure 2: The Zero Waste Loop



3.2.2.1 Blue Dot/Green Dot Program

City staff have developed the concept of the "Blue Dot" program. Similar to the "Green Dot" program in Europe and Japan, manufacturers would voluntarily label their products and packaging to indicate whether they are recyclable or compostable.

[14] On May 23, 2012, the City Council adopted a policy to ban distribution of single-use plastics bags and impose a 10-cent fee on single-use paper bags at supermarkets and select retail stores within the City (Council File 11-1531).

Stakeholders have expressed confusion about what materials should be placed in the blue bin and the green bin. This program would make it easier for residents and businesses to recycle and compost.

Advocacy for this approach is best accomplished at the State level, as it may be difficult for manufacturers to comply at the municipal level. The Blue Dot/Green Dot program could also be implemented on a local level as a business recognition program, by providing Blue Dot/Green Dot symbols to commercial businesses that recycle or restaurants that divert food scraps.

This approach is further described in *Appendix A Policy and Program Analysis*.

3.2.3 Downstream Policies and Programs

"Downstream" policies and programs are those that address materials after they are generated. On the Zero Waste loop, they affect collection, processing, and disposal. Stakeholders have identified additional downstream programs that will be needed to achieve Zero Waste, including the following:

- Adding textiles to the blue bin program
- Adding food scraps to the green bin program
- Modifying collection rates to provide incentives (pay-as-you-throw)
- Providing more direct technical assistance
- Requiring all multi-family and commercial generators to have recycling collection services
- Requiring all C&D loads to be processed

These programs are described in *Appendix A Policy and Program Analysis*.

3.2.3.1 Universal Access to Programs

In developing its Zero Waste programs and infrastructure, the City needs to ensure that all generators have universal access to recycling programs. Currently, the City provides: residential curbside blue bin recycling and green bin yard trimmings collection; multi-family blue bin recycling available to all multi-family buildings; school blue bin recycling available to all LAUSD schools within the City; and food scraps collection available to all restaurants. Commercial recycling services are provided by private haulers operating within the City. Approximately 450 permitted private waste haulers provide waste hauling services in the City, including construction-related contractors.

The market for recyclable materials allows large volume generators to effectively divert their materials. As a whole, the commercial generator sector diverts 69 percent of materials generated away from landfills. However, not all commercial establishments have access to cost-effective recycling programs. Small volume generators (such as private schools and pre-schools, churches, small offices, and retail businesses) are not able to attract a private recycler, or the costs of recycling are prohibitive. The City has undertaken several initiatives designed to increase recycling in the commercial generator sector, including the following:

- **Business Recycling Guides** – The City distributes a recycling guide specifically designed for the 28 different types of businesses in the City. Information is tailored to each business group and includes waste prevention tips and case studies of similar local businesses that have implemented successful recycling programs.

- **AB 939 Fee Rebate** – Permitted haulers in the City pay the AB 939 Compliance Fee, which provides the funding for the City's multi-family and commercial programs. Haulers can receive a rebate for delivering mixed materials to a City Certified Processor. Approximately three million dollars are rebated each year.
- **Commercial and Multi-Family Private Hauler Franchise Initiative** – The City Council indicated its intention to move from the current private waste hauler permit system to a franchise system for the collection of waste from both multi-family and commercial properties, not collected by the City. The franchise system is intended to help the City reach its Zero Waste goals, and will contain elements such as maximum disposal amounts per zone, aggressive diversion programs, including outreach and education, clean fuel requirements, and worker health and safety requirements, to be administered by LASAN.
- **Recycling Market Development Zone** – The Recycling Market Development Zone (RMDZ) program was created in 1989 by State legislation[15] to develop local markets for recyclable materials. CalRecycle provides low-interest loans to qualifying processors and manufacturers. The City administers the loan program, which has provided over ten million dollars in direct loan proceeds to City businesses.
- **Business Waste Assessment and Technical Assistance Program** – In 2006, the Business Waste Assessment program was launched to provide free on-site waste evaluations and technical assistance to improve recycling for large businesses in the City. The assessment teams assist the businesses to identify an appropriate recycler, identify proper placement of bins, and develop streamlined recycling procedures. LASAN has completed 700 assessments and followed up with many more requests for technical assistance which did not require a site visit.
- **Multi-family Recycling Program** - The City has approximately 600,000 multi-family units which are not served by the four-bin curbside recycling program. These units act in an open market to acquire waste services from over a hundred permitted private waste haulers. In 2004, LASAN began a series of pilot programs to 70,000 units throughout Los Angeles to test the most effective recycling methods, and in 2007 began the rollout of a voluntary weekly blue bin program similar to the curbside recycling program using three contracted private haulers. In 2012, the program serviced over 429,000 units with "valet" type service each week through this voluntary recycling effort.
- **Restaurant Food Waste Recycling Program** - Nearly 70 percent of waste from restaurants is organic and can be diverted from landfills by composting or using other processing technologies. The City has over 8,000 restaurants within its boundaries. In 2004, LASAN initiated a pilot program in a limited area of the City to divert food scraps from restaurants to composting facilities. Due to the success of the pilot, the program was expanded citywide in 2007. In 2012,

[15] Senate Bill 1322 (Bergeson, Chapter 1096, Statutes of 1989), passed in conjunction with AB 939.

there were over 1,300 restaurants participating in the program. Staff estimates that over 48,000 tons of food scraps are being diverted annually from the current participating restaurants.

- **LAUSD Recycling Partnership** - In 2002, the City began an outreach program and pilot to offer blue recycling bins to elementary schools and coupled this effort with education of school staff and students on the proper way to participate in the recycling. With this successful partnership, LASAN rolled out this program citywide in 2006 and currently services approximately 700 LAUSD schools located within the City that have blue bin recycling. Over 90 percent of elementary schools are now enrolled in the recycling program. LASAN also educates 20,000 students annually to increase recycling and decrease blue bin contamination.

Educational Outreach for Recycling at Schools

- **Recycling Practices Survey** – In 2006, the City conducted a survey mailed to over 40,000 businesses to assess waste prevention and recycling practices. Respondents reported that the greatest challenges to recycling are separation and storage of recyclables and transporting the materials to a recycling center. Most businesses said that if free collection was available or if there was more of a rate incentive (such as a reduction in their waste bill), they would recycle more. They also requested more outreach and education and access to shared recycling bins in commercial areas.

The AB 939 Compliance Fee, a ten percent fee on gross revenues, is assessed on permitted haulers operating in the City for residual waste (i.e., materials collected that are not source-separated for recycling by the generator). This fee pays for the commercial programs operated by the City, including the multi-family blue bin recycling program, the LAUSD school recycling program, and subsidizes the restaurant food scraps recycling program. However, this funding is insufficient to pay for free recycling at commercial businesses.

To ensure that all commercial and multi-family customers have access to recycling services, on April 24, 2013, the City Council approved the Commercial and Multi-Family Private Hauler Franchise Initiative Implementation Plan and directed LASAN to proceed with the development of a Request For Proposals for the collection of discarded materials from commercial and multi-family generators in the City.[16]

3.2.3.2 Mandatory Participation in Programs

During Phase 1 and Phase 2 of SWIRP, the stakeholders discussed mandatory recycling requirements for both residents and businesses. During Phase 1, interviews were conducted with 75 businesses in the City,

[16] The Council Action on the Commercial and Multi-Family Private Hauler Franchise Initiative is available through the City of Los Angeles Council File 10-1797-81.

including large Fortune 500 companies and smaller local businesses. By and large, the business community supported mandatory recycling as long as there was a level playing field, the program was cost-effective, and did not impose an undue burden on commercial generators. Stakeholders at the workshops favored phasing-in mandatory requirements over time, first increasing outreach and education and providing better access to voluntary recycling programs.

Stakeholders supported implementation of mandatory requirements if voluntary programs are insufficient. This approach represents a major shift from voluntary to mandatory participation in recycling collection programs, and is intended to motivate all waste generators (residential and commercial) within the City to separate recyclable materials from the waste they generate at their homes or businesses, and place it in the appropriate blue bin, green bin or other appropriate recycling collection container on a regular basis for collection.

To effect this change, the City would need to develop and adopt a "Mandatory Recycling" policy that requires waste generators to source-separate recyclables from other waste, and set the recyclables out for collection as appropriate for the recycling programs and services available through the City or the private haulers. The ordinance would need to be carefully developed based on consideration of legitimate concerns raised by various stakeholders and consistency with City policy directives, and publicized adequately to inform all residents, businesses, service providers, and others of the intent and purpose of the ordinance.

Communities across California, including Fresno, Sacramento, San Diego, San Francisco, and Stockton have implemented mandatory recycling ordinances requiring generators to divert recyclable materials from disposal.

On July 1, 2012, the mandatory commercial recycling regulation was implemented state-wide. The regulation, Assembly Bill 341, requires all businesses that generate more than four cubic yards of solid waste per week and multi-family complexes with five or more units, to arrange for recycling services.

Many communities, including Alameda County, have implemented local ordinances to set local standards, and to supplement and expand on the State requirement. For example, Alameda County will require large commercial business and multi-family complexes to have mandatory collection of organics, in addition to recycling, by July 2014.

The South Bayside Waste Management Authority, a joint powers agency which includes ten communities within San Mateo County, conducted an evaluation of existing mandatory recycling programs and identified the following approaches for successful implementation:

- Use a detailed rationale
- Include all businesses, regardless of size or type
- Include all sectors
- Require source-separation of any material that is collected
- Do not specify materials by name in the ordinance
- Do not establish an acceptable threshold for contamination

- Require haulers to deliver tags and warning notices
- Require haulers to provide information about such actions
- Allow haulers, at their discretion, but subject to health/safety codes, not to collect incorrectly-placed materials
- Establish a protocol for enforcement
- Establish that government staff have the power to clarify the ordinance through the issuance of regulations
- Establish a sliding scale of fines based on service levels
- Establish a protocol to grant limited exemptions
- Use public sector inspectors or third-party contractors to verify non-compliance
- Include specific requirements for multi-family or multi-tenant building owners and managers
- Require haulers to conduct periodic waste audits of loads
- Establish a grace period of non-enforcement
- Initiate a stakeholder and scoping process for ordinance details
- Focus service delivery on the carrots rather than the threat of the sticks, but convey expectations ("it's the law") that recycling must be taken seriously ("enforcement measures can include...")
- Use a "light touch" on enforcement (enforce flagrant violations rather than minor infractions)

The research included the evaluation of mandatory requirements for both generators and private collection service providers. Regulatory requirements, such as seatbelt laws and smoking restrictions have contributed to changing the norms of behavior. Stakeholders in Los Angeles acknowledged that an eventual transition to mandatory requirements for all generators, residential and commercial, will be needed to achieve Zero Waste.

3.2.3.3 Commercial and Multi-Family Private Hauler Franchise Initiative

In 2012, the City Council indicated its intention to move from the current private waste hauler permit system to a franchise system for the collection of discarded materials from both multi-family and commercial properties not collected by the City.

On April 24, 2013, the City Council approved the Commercial and Multi-Family Franchise Initiative Implementation Plan and adopted the 10 goals of the franchise program:[17]

1. Meet the city's zero waste goals.
2. Meet and exceed State requirements for waste diversion and mandatory recycling.
3. Improve health and safety for solid waste workers.
4. Improve efficiency of the city's solid waste system.
5. Improve the city's air quality.

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[17] Bureau of Sanitation Final Implementation Plan for Exclusive Commercial and Multifamily Solid Waste Franchise Hauling System (Council File I0-1797-S15) http://clkrep.lacity.org/onlinedocs/2010/10-1797-s15_misc_4-12-13.pdf (accessed October 1, 2013).

6. Provide the highest level of customer service.
7. Create a consistent, clearly defined system, fair and equitable rates and contingency plans to ensure reliable service.
8. Create a system that ensures long term competition.
9. Ensure sufficient staffing to meet program goals.
10. Ensure reliable system infrastructure to provide uninterrupted service to customers.

The City Council is expected to consider the commercial and multi-family private hauler franchise ordinance and associated environmental documentation in early 2014.

The SWIRP policies and programs anticipated to fall under the private hauler initiative include, but are not limited to, the following:

- Multi-family recycling
- Multi-family yard trimmings
- Multi-family food scraps
- Modify multi-family and commercial collection rates
- Provide more public area recycling
- Require all commercial haulers to offer recycling services to their customers
- Request all businesses to have recycling
- Mandatory source separated recycling for multi-family and commercial sectors
- Mandatory organics separation for multi-family and commercial sectors
- Multi-family recycling ambassador program
- Expand commercial technical assistance
- Program reinforcement for multi-family and commercial sectors
- Large scale media campaign for multi-family and commercial sectors

3.3 Material Flow Model and Generation Projections

During the Phase 1 planning process, stakeholders identified over 80 individual policies and programs for reaching Zero Waste and discussed over 20 different facility options. To evaluate the effectiveness of the policies, programs, and facilities, a material flow model was developed and became a useful tool for projecting waste generation, diversion, and disposal over the planning period.

3.3.1 Generation Projections

Data gathering for the SWIRP analysis began in 2007, using 2006 as the "base year" for the plan. In 2012, additional research was conducted and the analysis was updated using 2010 as the base year. Baseline tonnages were identified for 2010 and projected through 2030. Table 5 provides the estimated baseline tonnage for 2010 by the "generator sector" where the material was generated (residential curbside, multi-family, commercial, and C&D sites).

Table 6 provides the projected solid waste quantities by generator sector with estimates for the planning year increments, based on projected changes in population and employment provided by the Southern California Association of Governments. City generators disposed of 2,849,237 tons of solid waste in 2010, or about 4.1 pounds per person per day. Assuming no additional programs are implemented to reduce waste, citywide disposal is projected to increase to over 3.1 million tons by 2030.

Table 5: Estimated 2010 Solid Waste Quantities by Generator (tons)

Source	Generator Division
Residential curbside (LASAN)	870,286
Self-hauled residential	23,485
Total residential curbside	893,771
Multi-family	441,749
Commercially-hauled commercial	1,353,777
Self-hauled commercial	88,014
Total commercial	1,441,791
C&D sites	71,927
Total	**2,849,237**

Source: LASAN database "Sanitation Refuse and Transfer Tonnage Calendar Year 2010" and CalRecycle Disposal Reporting System. Refer to *Appendix B Material Flow Model and Generation Projections*, Table 3, page B-12. Note that values may not sum to total due to rounding.

Table 6: Projected Solid Waste Quantities by Generator (tons)[1]

Year	Residential Curbside	Multi-Family	Commercial	C&D	Total
2010	893,771	441,749	1,441,790	71,927	2,849,237
2013	895,643	444,497	1,501,553	73,565	2,915,258
2020	924,252	465,415	1,584,306	76,977	3,050,949
2025	847,235	530,171	1,621,493	77,643	3,076,542
2030	856,944	537,190	1,649,062	78,741	3,121,937

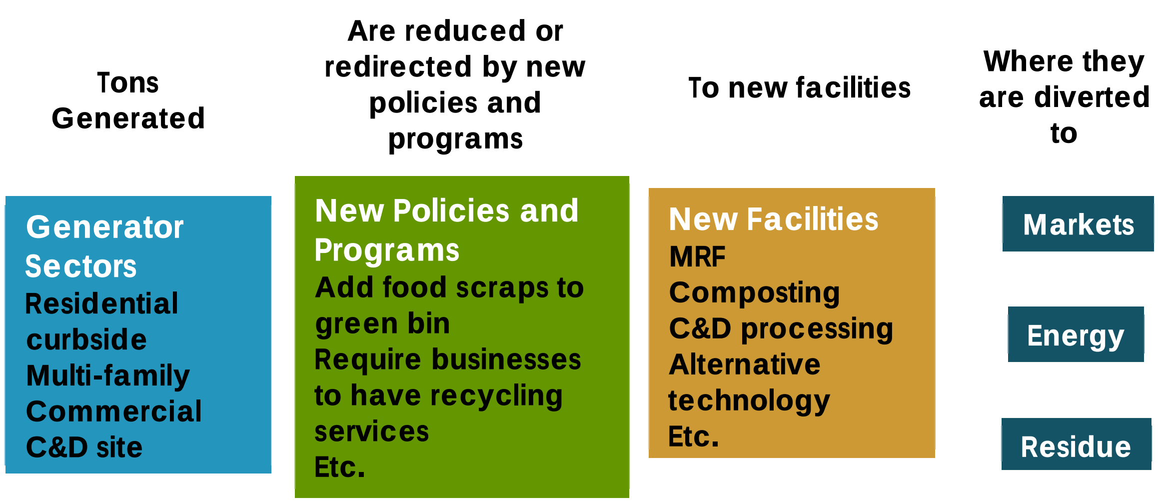
[1]Tonnage projections based on Southern California Association of Governments population and employment projections, Integrated Growth Forecast by Transportation Analysis Zone, 2010. Note that values may not sum to total due to rounding. Refer to *Appendix B Material Flow Model and Generation Projections*, Table 4, Page B-12.

3.3.2 Material Flow Model

The material flow model is designed to pinpoint diversion opportunities for targeted materials by generator sector through 2030. Based on projections of waste generation and documented assumptions for participation rates and efficiency, the material flow model is able to estimate the diversion potential of different policies, programs, and facilities.

Figure 3 depicts how the material flow model works. Tons generated by residential curbside, multi-family, commercial, and C&D sites, are reduced by new policies and programs and then are directed to new facilities, where they are diverted to market or converted into energy and residue is finally disposed. The material flow model and the waste generation projections are further described in *Appendix B Material Flow Model and Generation Projections.*

Figure 3: Material Flow Model Flow Diagram



3.4 Policy and Program Scenarios

During Phase 1, stakeholders identified over 80 individual policies and programs for reaching Zero Waste. The complete list of policies and programs is included in *Appendix A Policy and Program Analysis*. To quantify the diversion potential using the material flow model, research and analysis was conducted on over 40 policy and program options which were identified by the stakeholders as potential components of SWIRP.

The policies and programs included various options to address residential and non-residential waste streams, in order to maximize citywide waste diversion. In identifying the policies and programs to model, the following criteria were used:

- Ability to quantify (e.g., can reasonably project increased tonnages of materials that will be diverted from disposal, based on the policy or program being fully implemented).
- Did not duplicate another policy or program already in place.

- Did not duplicate facility analysis (e.g., Alternative Technology is included in facility analysis).
- Consistent with integrated waste management hierarchy set forth in AB 939: CalRecycle and local agencies shall promote the following waste management practices in order of priority:[18]
    1. Source reduction (and reuse)
    2. Recycling and composting
    3. Environmentally safe transformation (thermal treatment) and environmentally safe land disposal
- Consistent with the following 12 guiding principles selected by stakeholders:
    1. Education to decrease consumption
    2. City leadership as a model for Zero Waste practices
    3. Education to increase recycling
    4. City leadership to increase recycling
    5. Manufacturer responsibility
    6. Consumer responsibility
    7. Convenience
    8. Incentives
    9. New, safe, technology
    10. Protect public health and the environment
    11. Equity
    12. Economic efficiency

The policies and programs were grouped according to five scenarios. These scenarios, as listed in Table 7, were presented to the stakeholders at the regional workshops held in March 2009. Feedback from the workshops was incorporated into the policy, program, and facility phasing approach and presented to the stakeholders at the citywide conference held in May 2009.

[18] California Public Resources Code Section 40051.

Table 7: Policy and Program Scenarios

Scenario 1	No New Programs Baseline
Scenario 2	New Voluntary Downstream Policies and Programs
Scenario 3	Mandatory Requirements added to Scenario 2 Downstream Policies and Programs
Scenario 4	Upstream Policies added to Scenario 2 Downstream Policies and Programs
Scenario 5	Upstream Policies added to Scenario 3 Full Implementation of SWIRP Upstream, Downstream and Mandatory

Scenario 1: No New Policies or Programs

Scenario 1 assumes that the City does not implement any new policies or programs, in order to establish a base case for comparison with the other programs and policies selected for the waste diversion model. The City stays at 72 percent diversion.[19]

Scenario 2: New Policies and Programs

Scenario 2 includes the following programs selected from the master list of policies and programs to model for estimating diversion potential. They are not inclusive of all policies and programs to be implemented by the City. These policies and programs are further described in *Appendix A Policy and Program Analysis*.

Generator	New Policies and Programs (Scenario 2)
Residential curbside	Modify refuse and recycling rates Recycling ambassador (education) Add textiles to blue bin or partner with non-governmental organizations to increase textile diversion Bulky item reuse Add food scraps to green bin Large scale media/social marketing
Multi-family	Modify refuse and recycling rates Multi-family recycling Recycling ambassador (education) Add textiles to blue bin Bulky item reuse Multi-family green bin

[19] The 72 percent diversion is based on 2010 baseline year tonnage data.

Generator	New Policies and Programs (Scenario 2)
	Add food scraps to green bin Large scale media/social marketing
Commercial	Request all businesses to have recycling services Require all commercial haulers to offer recycling services to their customers Modify refuse and recycling rates Expanded technical assistance Large scale media campaign-social marketing Provide more public recycling areas
C&D sites	Require all C&D loads to be processed[20] Expanded technical assistance

Scenario 3: Adding Mandatory Requirements to Scenario 2

Scenario 3 includes the following programs selected from the master list of policies and programs:

Generator	Mandatory Requirements (Scenario 3)
Residential curbside and multi-family	Mandatory recycling separation Mandatory organics separation Ordinance requiring Resource Recovery Centers at transfer stations and landfills Recycling ambassadors (enforcement)
Commercial	Mandatory C&D recycling Mandatory recycling separation Mandatory organics separation Ordinance requiring Resource Recovery Centers at transfer stations and landfills Direct technical assistance (enforcement)
C&D sites	Ordinance requiring Resource Recovery Centers at transfer stations and landfills Direct technical assistance (enforcement) Increase diversion requirements at C&D facilities

Scenario 4: Adding Upstream Policies to Scenario 2

Scenario 4 includes the following programs selected from the master list of policies and programs to be applied to all generators:

Upstream Policies (Scenario 4)
Advocate for EPR for toxics Advocate for EPR for difficult to recycle materials Advocate for State packaging legislation Single use bag ban Advocate for businesses to develop life-cycle analyses for products and packaging Advocate for legislation to incentivize manufacturers to use local reuse and recycling markets

[20] The mandatory C&D ordinance was adopted by the City Council on December 17, 2010. All mixed C&D waste generated within City limits must be taken to City certified C&D waste processors. http://san.lacity.org/solid_resources/recycling/c&d.htm (accessed October 1, 2013).

Scenario 5: Adding Upstream Policies to Scenario 3 (Full Implementation of SWIRP)

Scenario 5 includes the following programs selected from the master list of policies and programs to be applied to all generators:

Upstream Policies (Scenario 5)
Advocate for EPR for toxics
Advocate for EPR for difficult to recycle materials
Advocate for State packaging legislation
Single use bag ban
Advocate for businesses to develop life-cycle analyses for products and packaging
Advocate for legislation to incentivize manufacturers to use local reuse and recycling markets

3.4.1 Scenario Evaluation

During the Phase 2 planning process, stakeholders evaluated the scenarios for implementation. Based on an interactive process involving the regional working groups, the initial list of scenarios was screened qualitatively to focus on those alternatives that have the highest potential for success, considering cost, impact, feasibility, and implementation requirements. In order to estimate the impacts and costs through 2030, the remaining options were analyzed. The projected impacts of these alternatives were compared to baseline projections of waste generation and disposal to determine how much material could be diverted over time. The impacts of different programs were combined to project overall progress towards the City's goals and the estimated total cost of reaching those goals. Based on stakeholder direction, evaluation using the guiding principles and assessments for diversion potential, cost-effectiveness, and other community values, the stakeholders identified a preferred path for implementation.

3.4.1.1 Diversion Potential

The diversion potential of each policy and program was estimated based on data from comparable policies and programs implemented in other communities, research based on national studies and City pilot data, and educated estimates based on experiences with other similar programs. The diversion rates presented in this section assume full implementation of the policies and programs all at once. However, new policies and programs will be developed over time through additional research, testing, and pilot programs before full-scale implementation. Several policies will require new ordinances which will require City Council action and time to implement. Table 8 presents the tons disposed, tons diverted, and the diversion rate by scenario. Table 9 presents the diversion rate by generator sector. Descriptions and diversion assumptions for each of the policies and programs included in each scenario are included in *Appendix A Policy and Program Analysis*.

Table 8: Projected Diversion Potential by Scenario[1]

Scenario	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1 No New Policies or Programs (2010 Baseline)	**3,121,937**	**7,978,008**	**72%**
Scenario 2 New Policies and Programs	**2,317,771**	**8,782,174**	**79%**
Scenario 3 Add Mandatory Requirements to Scenario 2	**1,620,029**	**9,479,916**	**85%**
Scenario 4 Add Upstream Policies to Scenario 2	**2,201,847**	**8,898,098**	**80%**
Scenario 5 Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)	**1,547,799**	**9,552,146**	**86%**

[1]Assumes 2010 baseline tonnage and implementation of all SWIRP policies and programs.
Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013.

Table 9: Diversion Potential by Generator Sector

Scenario	Residential Curbside	Multi-Family	Commercial	C&D	Citywide
Scenario 1 No New Policies or Programs (2010 Baseline)	**60%**	**23%**	**69%**	**97%**	**72%**
Scenario 2 New Policies and Programs	**70%**	**40%**	**77%**	**99%**	**79%**
Scenario 3 Add Mandatory Requirements to Scenario 2	**78%**	**58%**	**84%**	**99%**	**85%**
Scenario 4 Add Upstream Policies to Scenario 2	**71%**	**44%**	**78%**	**99%**	**80%**
Scenario 5 Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)	**79%**	**61%**	**85%**	**99%**	**86%**

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013.

By implementing all of the Zero Waste policies and programs identified by the stakeholders, the City could achieve as much as 86 percent diversion citywide, diverting over 9.5 million tons annually—over 1.5 million tpy more than the 2010 baseline levels.

3.4.1.2 Greenhouse Gas Emissions Reductions and Green Jobs

Landfills are one of the largest sources of methane, a powerful greenhouse gas which is 21 times more potent than carbon dioxide. As described in the GREEN LA plan, the City can significantly reduce its greenhouse gas emissions levels through waste reduction and recycling. Recycling can reduce greenhouse gases both by reducing methane generation at landfills and by saving energy through recycling. During Phase 1, stakeholders recommended that SWIRP support the GREEN LA plan goal of 35 percent reduction of greenhouse gases below 1990 levels by 2030, a reduction of 18.9 million tons of carbon dioxide emissions.

Estimates were prepared of the greenhouse gas emissions reductions that will be achieved and the green jobs that will be created by implementing the policies and programs identified by the stakeholders.

Based on the diversion results described in Table 9, Table 10 projects the greenhouse gas reduction potential of the scenarios using the U.S. EPA Waste Assessment Model (WARM) to estimate greenhouse gas reduction based on material types and amounts diverted. Table 10 also includes the number of green jobs that would be created through implementation of new policies and programs. This calculation was prepared by the Institute of Local Self-Reliance based on the methodology developed from their research published in *Recycling Economic Development through Scrap-Based Manufacturing* (Michael Lewis, 1994).

Table 10: Greenhouse Gas Emissions Reduction and Green Jobs by Scenario

Scenario	Greenhouse Gas Emissions Reduction ($MTCO_2E$)[1]	Equivalent number of passenger vehicles removed from the road[1]	Number of Green Jobs Created[2]
Scenario 1 No New Policies or Programs (Baseline)	--	--	--
Scenario 2 New Policies and Programs	1.4 million	281,600	2,000
Scenario 3 Add Mandatory Requirements to Scenario 2	1.0 million	204,300	1,600
Scenario 4 and 5 Add Upstream Policies to Scenarios 2 and 3	0.1 million	31,500	700
Total[3]	**2.6 million**	**517,400**	**4,300**

[1]Calculated based on US EPA WARM (February 2012 version) in metric tons of carbon dioxide equivalent.
[2]Source: *Recycling-Based Job Potential for Los Angeles*, Institute of Local Self-Reliance, March 2013.
[3]Note that values may not sum to total due to rounding.

By implementing all of the Zero Waste initiatives, the City would achieve 14 percent of its goal to reduce carbon dioxide emissions by 18.9 million metric tons by 2030. This is the equivalent of removing over 25 percent of the 2 million passenger vehicles registered in the City (as calculated by WARM). The new programs will also create approximately 4,300 new green jobs in the City, including jobs in refurbishing, recycling and processing, and remanufacturing.

3.5 Policy and Program Phasing

At the Phase 2 workshops in March 2009, stakeholders discussed the results of the policy and program analysis and provided the following recommendations:

- The City should devote more resources to outreach and education of all generators, including residential, commercial, and schools.
- The City should increase efforts to provide universal access to recycling to all generators and maximize voluntary programs prior to implementing mandatory requirements.
- The stakeholders continued to emphasize "education, education, education."

Table 11 presents the phasing schedule for the policies and programs identified by the stakeholders. The phasing schedule is based on the stakeholder direction to maximize voluntary programs before implementing mandatory requirements. Several programs identified by the stakeholders are currently being implemented (e.g., residential food scraps pilot) or are transitioning from voluntary to mandatory after a period of voluntary implementation (e.g., C&D ordinance, commercial recycling). LASAN is also expanding current programs, including the restaurant food scraps diversion program to provide rebates to all haulers providing food scraps collection.

The timing of some programs, such as mandatory commercial recycling, is influenced by State law. A future mandatory ordinance could require residential and smaller commercial generators to recycle and could add in the requirement that all generators divert organics.

Some programs will need to be phased in over time as infrastructure is developed. LASAN is in the process of securing composting capacity for its residential food scraps program. LASAN is also developing and securing transfer capacity for food scraps co-collected with yard trimmings to transfer these materials to processing facilities outside of the City. Additionally, LASAN is evaluating the option of utilizing existing wastewater infrastructure for the management of food scraps.

The facility analysis is presented in Section 4 and identifies the facilities that will be needed to process the materials generated through the implementation of the policies and programs listed in Table 11. To fully implement these programs, some new facility capacity will need to be developed or secured. The facility phasing schedule is included in Section 4, Table 34. The phasing schedule was presented to the stakeholders at the citywide conference in May 2009 and recommended for the implementation of SWIRP.

Table 11: Policy and Program Phasing through 2030

Scenario	2013	2020	2025	2030
Scenario 2 New Policies and Programs	-Increase Recycling Ambassadors -Bulky item reuse and recycling -Add textiles to blue bin or partner with non-governmental organizations to increase textile diversion -Add food scraps to green bin[21] -Large scale media/social marketing/education -Multi-family recycling (rollout to all buildings) -Provide more public area recycling containers (streets and parks) -Require all C&D loads to be processed[22] -Market development -Environmentally Preferable Purchasing Policy -Los Angeles Unified School District Zero Waste curriculum -Community Beautification Grants for Zero Waste Projects	-Rate structure modifications -Multi-family green bin (phase in as appropriate) -Commercial haulers to provide recycling services to all of their customers -All businesses to provide recycling within their businesses	-Continue new programs	-Continue new programs
Scenario 3 Add Mandatory Requirements to Scenario 2		-Mandatory recycling separation for all generators -Mandatory organics separation for all generators -Ordinance requiring Resource Recovery Centers at transfer stations and landfills -Increase diversion requirements at City Certified C&D facilities -Increased code enforcement	-Continue mandatory programs	-Continue mandatory programs
Scenario 4 and 5 Add Upstream Policies to Scenarios 2 and 3	-Advocate for Extended Producer Responsibility for toxics -Advocate for Extended Producer Responsibility for difficult to recycle materials -Advocate for State packaging legislation -Single use bag ban -Advocate for businesses to develop life-cycle analyses for products and packaging -Advocate for legislation to incentivize manufacturers to use local reuse and recycling markets -Advocate for manufacturer take back programs	-Continue upstream advocacy	-Continue upstream advocacy	-Continue upstream advocacy

[21] Requires LASAN to secure sufficient composting capacity from operators. Expansion of the program would be phased in as capacity is secured.
[22] Mandatory C&D ordinance was adopted by the City Council on December 17, 2010. All mixed C&D waste generated within City limits must be taken to City certified C&D waste processors. http://san.lacity.org/solid_resources/recycling/c&d.htm (accessed October 1, 2013).

Section 4 Facility Analysis

This section describes the City's existing solid waste system and infrastructure; the new facilities that will be needed to implement SWIRP programs; the scenarios for implementation; and the phasing approach recommended by the stakeholders.

4.1 Introduction

An essential component of SWIRP is the identification and development of future facilities to meet the City's recycling and solid waste infrastructure needs through 2030. Some of the City's current infrastructure is owned and operated by the City, including:

- Central Los Angeles Recycling & Transfer Station (CLARTS)
- Griffith Park Composting Facility
- Harbor Mulching Facility
- Lopez Canyon Environmental Center, including a composting/mulching facility
- Seven S.A.F.E. Centers located throughout the City
- Six District Yards serving each of the City's six wastesheds

However, much of the recycling and solid waste infrastructure used by generators in the City is owned and operated by the private sector and other public agencies, including the Sanitation Districts of Los Angeles County.

Over the past 20 years, as the City's landfills were closing, the City sought options for transfer and disposal of solid waste. In 2004, the City purchased the Central Los Angeles Recycling & Transfer Station and has been interested in seeking transfer station options in West Los Angeles.

In support of the City's goal of ending urban landfilling, the City has also evaluated long-haul options to the remote desert landfills. However, the City's orientation shifted with the adoption of the RENEW LA Plan in 2006. RENEW LA focused not on transfer and disposal, but maximizing diversion through source-separation programs, material recovery facilities, composting facilities, and converting residual waste into energy through new technologies.

The City has been investigating advanced technology for alternative treatment of residual waste since 2004 and is currently procuring the City's first Alternative Technology project.

Throughout Phase 1 of the SWIRP planning process, stakeholders discussed facility options and toured local facilities. During Phase 2, stakeholders identified the specific facility needs resulting from the implementation of the SWIRP policies and programs and discussed options for maximizing diversion from disposal through residual waste processing and treatment through Alternative Technologies.

4.1.1 Existing Solid Waste System and Infrastructure

An understanding of the private and public waste infrastructure and services currently used by the City is essential to inform planning and future infrastructure development. This section describes the City's existing solid waste system and infrastructure. *Appendix C Infrastructure and Material Flows* documents the flows of solid waste, recycling, construction and demolition materials, yard trimmings, and household hazardous waste and electronics among all generators, transfer stations, processing and handling facilities, and landfills used by the City's businesses and residents. The original facility surveys, documented in *Appendix C Infrastructure and Material Flows,* were conducted in 2006 and 2007. Updated citywide diversion tonnages for 2010 were identified in 2012. This information is included in the sections below, where appropriate.

There are currently over 40 facilities that are operating in and around the City that receive, process, and transport recyclable material and yard trimmings to markets, and solid waste to disposal. These include:

- Material Recovery Facilities (MRFs)
- Yard Trimmings and Food Scraps Processing Facilities
- Construction and Demolition Debris Processing Facilities
- Waste-to-Energy Facilities
- Transfer Stations
- Landfills

4.1.1.1 Material Recovery Facilities

An estimated 2.6 million tons of recyclables were collected from residents and businesses within the City in 2010. LASAN collection crews collected about 209,535 tons of recyclables (excluding contamination) from residential curbside customers using the curbside blue bins in 2010 and approximately 130,000 were self-hauled by residents. The City' multi-family collection contractors recycled 14,366 tons in 2010. Approximately 2,260,000 tons of recyclables were transported from commercial sources to MRFs and/or markets by commercial haulers and through commercial self-haul. Numerous local and regional facilities (material recovery facilities, recycling companies, end-user processors, etc.) handle recyclables delivered by multiple sources, and specific City data is not available.

The City contracts with various MRFs to process the blue bin recyclables collected by LASAN. The following MRFs have capacity to process blue bin recyclables collected by LASAN.

- Angelus Western Paper Fibers – Porter Street, Los Angeles
- Bestway Recycling – Main Street, Los Angeles
- City Fibers – Schoenborn Street, North Hills
- City Fibers, Inc. – Santa Fe Ave., Los Angeles
- CR&R – Western Ave., Stanton
- Potential Industries – East E Street, Wilmington
- RockTenn – Denker Avenue, Torrance
- Sun Valley Paper Stock – San Fernando Road, Sun Valley

There are 11 major processors of commercially generated recyclables. These facilities processed about 410,000 tons of commercial recyclables in 2007. About 207,000 of those tons are commercially hauled and about 203,000 are self-hauled by the business or institution that generated the recyclables. In addition to the 410,000 tons recycled by the major processors surveyed for this report, approximately 1.86 million tons of materials were diverted from disposal citywide. These additional sources of diversion include:

- Waste prevention activities undertaken by individual generators
- Materials that are reused on-site or diverted by other recyclers (other than the 11 major commercial processors listed here), including scrap metal dealers, pallet reuse, industrial food diversion, and many other sources.

These sources were documented in the *City of Los Angeles Waste Characterization and Quantification Study Year 2000*, July 2002. The 11 major processors surveyed in 2007 and 2008 for SWIRP were:

- Allan Company – Delaware Ave., Santa Monica
- Angelus Western Paper Fibers – Porter Street, Los Angeles
- Bestway Recycling – Firestone Blvd., Los Angeles
- Burbank Recycling – South Flower Street, Burbank
- Los Angeles Recycling Center – Main Street, Los Angeles
- Potential Industries – East E Street, Wilmington
- Recycle America Alliance – East Florence, Los Angeles
- RockTenn – Denker Avenue, Torrance
- South Coast Recycling – Doran Street, Los Angeles
- Sun Valley Paper Stock – San Fernando Road, Sun Valley
- West Valley Fibres – Keswick Street, Van Nuys

The "major processors" of commercially generated material include most of the same processors that handle the City's residential blue bin materials. The major processors were identified as those facilities handling the majority of commercially generated material in the City. Two of the City's residential processors, City Fibers (West Valley and South Los Angeles) and CR&R (Stanton), also process commercial recyclables, but at lower levels than the major processors.

Details about each of these facilities, including daily and annual capacity, materials processed, end-markets, costs, expansion plans, and opportunities are included in Attachment C-3 of *Appendix C Infrastructure and Materials Flows*, beginning on page C-3-1.

4.1.1.2 Yard Trimmings Processing Facilities

In 2010, an estimated 835,033 tons of yard trimmings were generated by residents and businesses within the City as follows:

- Residential yard trimmings collected by the LASAN from residential curbside customers (55 percent)
- Commercial yard trimmings collected by permitted waste haulers (25 percent)
- Self-haul/other yard trimmings brought to solid waste facilities by residents, landscapers or other businesses that generated it (21 percent)

LASAN brings residential curbside green bin yard trimmings to the following facilities:

- Yard trimmings processing facilities to be mulched and/or composted
- Transfer stations to be transported to yard trimmings processing facilities

Materials such as yard trimmings are considered diverted from disposal under State law if used as Alternative Daily Cover (ADC) in landfill operations, and count toward the diversion goals mandated by AB 939. City policy[23] does not allow yard trimmings collected by LASAN to be used as ADC. However, private haulers in the City can bring yard trimmings to landfills for use as ADC.

Private haulers bring yard trimmings to the following facilities:

- Landfills for beneficial use such as ADC
- Yard trimmings processing facilities to be mulched and/or composted
- Transfer stations to be transported to landfills for beneficial use, or to yard trimmings processing facilities

Eleven transfer stations reported receiving source-separated yard trimmings which were consolidated and delivered to landfills for beneficial use or to yard trimmings processors.

In 2006, about half of the yard trimmings generated in the City were taken to a transfer station before reaching a final destination. Ultimately, the majority of the yard trimmings generated in the City were composted, mulched or beneficially used at landfills. Table 12 lists the facilities that received and diverted yard trimmings from City sources in 2006. Details about each of these facilities, including daily and annual capacity, materials processed, end-markets, costs, expansion plans, and opportunities are included in the facility surveys included in Attachments C-1, C-2, and C-5 in *Appendix C Infrastructure and Materials Flows* beginning on page C-1-1.

4.1.1.3 Food Scrap Processing Facilities

The City implemented a residential food scraps pilot program in September 2008 for 8,700 households in the South Los Angeles and North Central wastesheds. During the pilot, the City is collecting the following additional materials for diversion as part of the green bin program:

- Food scraps, including fruits, vegetables, grains, meat, and bones
- Compostable paper, including napkins and paper towels, and food contaminated paper and cardboard, such as takeout containers and pizza boxes

These materials are taken to CLARTS, which is owned and operated by LASAN, and transferred to the Victor Valley Regional Compost Facility (formerly California Biomass), which is owned and operated by Arakelian Enterprises, in Victorville, California. This facility is permitted to compost food scraps.

In addition to the food scraps processing capacity needed for residential food scraps collection, the City has expanded its restaurant food scraps program.[24] Effective May 1, 2010, LASAN has included

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[23] Public Works Board Report on Green Waste Processing Contingency Plan adopted on September 22, 2006.
[24] LASAN food scraps program description: http://www.lacitysan.org/solid_resources/recycling/services/food.htm (accessed October 1, 2013).

commercial food scraps in the waste hauler rebate program. All permitted waste haulers will now have the opportunity to participate in the City's commercial food scraps division program by offering this service to their customers and receiving a rebate from the City.

For every ton of food scraps diverted from disposal, the City will provide a rebate of $35 per ton. The purpose of the rebate program is to encourage permitted haulers to increase the number of their customers participating in the food scraps program. In 2012, there were over 1,300 restaurants participating in the food scraps program. The City has also certified four food scraps processors, Athens Services, CLARTS, Community Recycling and Waste Management.[25] The rebate program is funded through the Waste Hauler Permit/AB 939 Compliance Fee.

There are 48 composting facilities in California that are permitted to accept food scraps. Twelve commercial scale facilities are located in southern California. Table 13 lists the facilities in Southern California permitted to accept food scraps. These facilities (except for Community Recycling) were not surveyed for this report because they did not receive tons from City sources in 2006, but are included as they are important for future planning.

[25] City Certified as of July 1, 2013.

Table 12: Facilities Receiving Yard Trimmings from City Sources in 2006[1]

Facilities that Processed Yard Trimmings from City Sources	Reported Citywide Tons Received (2006)	Percent Received (%)
Lopez Canyon (Lake View Terrace)	31,301	3.2
Griffith Park	39,684	4.1
North Hills Recycling	80,000	8.2
Harbor Mulching Facility	20,521	2.1
Van Norman (no longer in operation)	47,734	4.9
Eco-Logics (no longer in operation)	48,820	5.0
Subtotal	**268,060**	**27.6**
Transfer Stations that Receive Yard Trimmings	**Reported Citywide Tons Received (2006)**	**Percent Received (%)**
American Waste Transfer Station	280	0.0
Bel-Art Waste Transfer Station	35	0.0
Central Los Angeles Recycling & Transfer Station	917	0.1
Community Recycling	363,652	37.4
Compton Recycling and Transfer Station	283	0.0
Downey Area Recycling and Transfer Station	32	0.0
East Los Angeles Recycling & Transfer Station	296	0.0
Falcon Refuse	6,012	0.6
Mission Road Recycling and Transfer Station	81,304	8.4
Southern California Disposal	1,088	0.1
Waste Resources Recovery	384	0.0
Subtotal	**454,283**	**46.8**
Landfills and Waste-to-Energy Facilities that Process Yard Trimmings for Beneficial Reuse	**Reported Citywide Tons Received (2006)**	**Percent Received (%)**
Bradley Landfill	179,542	18.5
Calabasas Sanitary Landfill	15,602	1.6
Chiquita Canyon Sanitary Landfill	52,600	5.4
Puente Hills Landfill	63	0.0
Scholl Canyon Sanitary Landfill	2	0.0
Sunshine Canyon Landfill	1,287	0.1
Southeast Resource Recovery Facility	57	0.0
Subtotal	**249,153**	**25.6**
Total	**971,496**	**100.0**

[1]Data based on surveys conducted for SWIRP in 2007 and 2008. Refer to Attachments C-1, C-2 and C-5 in *Appendix C Infrastructure and Material Flows.*

The total listed in Table 12 is the sum of all of the tons of yard trimmings received by the facilities in this table. This number is larger than the total tons generated by residents and businesses within the City because approximately 70,000 tons of yard trimmings (out of the total approximately 454,000 tons handled at transfer stations) pass through transfer stations on their way to landfills for beneficial reuse. This table counts these tons twice—once in transfer stations and once at the landfills. Refer to Attachments C-1, C-2, and C-5 in *Appendix C Infrastructure and Materials Flows*, beginning on page C-1-1.

Table 13: Facilities in Southern California Permitted to Accept Food Scraps

Food Scrap Composting Facilities[1]	Location	Distance from CLARTS (miles one-way)[2]	Permitted Capacity (tons per day)[1]
California Biomass Compost Facility	Thermal, Riverside County	137	700
Coachella Valley Composting Facility	Coachella, Riverside County	129	250
Community Recycling Lamont Compost Facility	Lamont, Kern County	97	3,692
Victor Valley Regional Composting Facility (formerly California Biomass)	Victorville, San Bernardino County	92	700
Engel & Gray, Inc.	Santa Maria, Santa Barbara County	199	700[3]
El Corazon Compost Facility	Oceanside, San Diego County	83	500
Kochergan Farms Composting	Avenal, Kings County	188	1,000
Lancaster Reclaimable Anaerobic Composter	Lancaster, Los Angeles County	69	500
Liberty Composting (San Joaquin Composting)	Lost Hills, Kern County	160	2,620[4]
Miramar Greenery	San Diego, San Diego County	112	690
Ralphs Renewable Energy Facility	Compton, Los Angeles County	16	350
Tierra Verde Industries EcoCentre	Irvine, Orange County	40	3,000

[1]Source: CalRecycle Solid Waste Information System database, http://www.calrecycle.ca.gov/SWFacilities/Directory/Search.aspx (accessed October 1, 2013).
[2]Estimated using Google Maps.
[3]Based on permitted capacity of 208,800 tpy (300 operating days per year).
[4]Based on permitted capacity of 786,000 tpy (300 operating days per year).
Refer to *Appendix C Infrastructure and Material Flows*, Attachment C-5 page C-5-9.

4.1.1.4 Construction and Demolition Debris Processing Facilities

In 2006, an estimated 2.06 million tons of the disposed C&D materials generated within the City were taken to solid waste landfills for beneficial use. An additional 190,000 tons of C&D materials were recycled, and 360,000 tons were disposed in inert landfills. In 2006, the Puente Hills Landfill accepted more C&D materials from within the City than any other landfill, receiving 1.84 million tons, primarily soil and dirt for beneficial use. C&D materials can also be used for road construction at landfills. Approximately 360,000 tons of C&D materials were delivered to inert landfills in 2006. Most inert landfills are classified as "Inert Debris Engineered Fill Operations" under State regulations[26] and inert materials disposed at an inert landfill are considered beneficially reused and are not considered disposed as solid waste. Approximately 88 percent of the total C&D tons are commercially hauled and the

[26] California Code of Regulations Title 14, Natural Resources-Division 7, Article 5.95, Section 17388 (l).

remaining 12 percent are self-hauled. The City's C&D ordinance adopted December 17, 2010, requires that mixed C&D generated in the City be delivered to a C&D processor certified by the City.

Table 14 lists the facilities that received and diverted C&D debris from City sources in 2006. Details about each of these facilities, including daily and annual capacity, materials processed, end-markets, tipping fees, expansion plans and opportunities are included in the facility surveys included in Attachments C-1 and C-2 in *Appendix C Infrastructure and Materials Flows.*

Table 14: Facilities Receiving C&D Debris from City Sources in 2006[1]

Transfer Stations that Receive C&D	Reported Citywide Tons Received (2006)	Percent Received (%)
American Waste Transfer Station	2,075	0.1
Athens Transfer Station	22	0.0
Bel-Art Waste Transfer Station	283	0.0
Carson Transfer Station	5,281	0.2
Community Recycling	234,841	8.8
East Los Angeles Recycling & Transfer Station	2,485	0.1
Falcon Refuse	10,000	0.4
Mission Road Recycling and Transfer Station	202	0.0
Waste Resources Recovery	720	0.0
Subtotal	**255,909**	**9.6**
Landfills that Process C&D for Beneficial Reuse	**Reported Citywide Tons Received (2006)**	**Percent Received (%)**
Antelope Valley Public Landfill	6	0.0
Bradley Landfill	64	0.0
Calabasas Sanitary Landfill	35,271	1.3
Chiquita Canyon Sanitary Landfill	6,800	0.3
Lancaster Landfill	50,455	1.9
Puente Hills Landfill	1,838,071	68.6
Scholl Canyon Sanitary Landfill	87,765	3.3
Sunshine Canyon Landfill	42,262	1.6
Subtotal	**2,060,694**	**76.9**
Inert Landfills that Accept C&D for Disposal	**Reported Citywide Tons Received (2006)**	**Percent Received (%)**
Azusa Landfill	43,499	1.6
Peck Road	25,659	1.0
Chandler' s Landfill	12,679	0.5
Hanson Aggregates	916	0.0
Nu Way Arrow	85,950	3.2
Reliance Pit #2	625	0.0
Sun Valley Landfill	193,313	7.2
Subtotal	**362,641**	**13.5**
Total	**2,679,244**	**100.0**

[1]Data based on surveys conducted for SWIRP in 2007 and 2008. Refer to Attachments C-1 and C-2 in *Appendix C Infrastructure and Material Flows.*

The total listed in Table 14 is the sum of all of the tons of C&D materials received by the facilities in this table. This number is larger than the total tons generated within the City because approximately 60,000 tons of C&D materials pass through transfer stations on their way to their final destinations at the solid waste or inert landfills. This table counts these tons twice—once in transfer stations and once at the final destination at the solid waste or inert landfills. Approximately 190,000 tons of the C&D received by transfer stations is diverted for recycling. Refer to Attachments C-1 and C-2 in *Appendix C Infrastructure and Materials Flows*, beginning on page C-1-1.

4.1.1.5 Certified Mixed Debris Processors

The City publishes a Construction and Demolition Recycling Guide to assist C&D generators in diverting C&D material from disposal. The guide lists over 50 companies that receive, process, and market source-separated and mixed construction and demolition debris. Thirteen of these companies have been certified by the City as Certified Mixed C&D Debris Processors.

These facilities take in mixed construction and demolition debris for sorting and processing. The recyclable materials resulting from this process are sent out to recyclers and end users, and the remainder is disposed of in landfills.

These facilities have recycling rates that have been certified by the City through the voluntary Certified Processor program. Table 15 lists the certified processors, the materials recycled or reused, and each facility's recycling rate.[27]

[27] City Certified as of July 1, 2013. http://www.lacitysan.org/solid_resources/strategic_programs/ab939/compliance_fee.htm (accessed October 1, 2013).

Table 15: City Certified Mixed C&D Debris Processors[1]

Certified Processor	Materials Recycled/Reused	Recycling Rate
American Reclamation	Asphalt - Brick - Cardboard - Cinder Block - Concrete - Dirt - Drywall - Gypsum - Metal - Rock - Gravel - Tree Trimmings - Wood	87.36%
American Waste Pendleton Facility	Asphalt - Brick - Cardboard - Carpet - Cinder Block - Concrete - Dirt - Drywall - Gypsum - Metal -Rock - Gravel - Tree Trimmings - Wood	75.01%
California Waste Services Inc.	Asphalt - Brick - Cardboard - Cinder Block - Concrete - Dirt - Drywall - Gypsum - Glass - Metal - Rock - Gravel - Tree Trimmings - Wood	70.00%
Clean Up America	Asphalt - Brick - Cardboard - Cinder Block - Concrete - Dirt - Drywall - Gypsum - Metal - Rock - Gravel - Tree Trimmings - Wood	75.59%
Community Recycling & Resource Recovery, Inc.	Asphalt - Brick - Cardboard - Cinder Block - Concrete - Dirt - Drywall - Gypsum - Metal - Rock - Gravel - Tree Trimmings - Wood - Food Waste	94.34%
Construction and Demolition Recycling, Inc.	-Asphalt - Brick - Cardboard - Carpet - Cinder Block - Concrete - Drywall - Gypsum - Glass - Metal - Structural Elements for Reuse - Wood -	76.89%
CR Transfer	Asphalt - Brick - Cardboard - Cinder Block - Concrete - Dirt - Drywall - Gypsum - Metal - Rock - Gravel - Tree Trimmings - Wood	76.29%
Direct Disposal	Asphalt - Brick - Cardboard - Concrete - Dirt Metal - Rock - Wood	71.42%
Downtown Diversion / USA Waste of California	Asphalt - Brick - Cardboard - Carpet - Cinder Block - Concrete - Dirt - Drywall - Gypsum - Metal - Rock - Gravel - Structural Elements for Reuse - Tree Trimmings - Wood	83.80%
East Valley Diversion / USA Waste of California	Asphalt - Brick - Cardboard - Carpet - Cinder Block - Concrete - Dirt - Drywall - Gypsum - Metal - Rock - Gravel - Structural Elements for Reuse - Tree Trimmings - Wood - Commingled Debris	72.69%
Falcon Refuse Center / Allied Waste	Asphalt - Brick - Cardboard - Cinder Block - Concrete - Dirt - Drywall - Gypsum - Metal - Rock - Gravel - Tree Trimmings - Wood	81.85%
Madison Materials	Asphalt - Brick - Cardboard - Carpet - Cinder Block - Concrete - Dirt - Drywall - Gypsum - Glass - Metal - Rock - Gravel - Tree Trimmings - Wood - Tires - Electronic Waste - All Plastics	84.22%
Simi Valley Landfill and Recycling Center	Asphalt - Brick - Cardboard - Cinder Block - Concrete - Dirt - Drywall - Gypsum - Metal - Rock - Gravel - Tree Trimmings - Wood	78.38%

[1]City Certified as of July 1, 2013.

4.1.1.6 Transfer Stations

Slightly less than 50 percent of the solid waste generated in the City is taken to 17 regional transfer stations, where it is consolidated, loaded into large capacity transfer trailers, and delivered to landfills for ultimate disposal. The Central Los Angeles Recycling & Transfer Station accepted the largest quantities of residential curbside waste and self-hauled waste, as well as the most waste overall (31.8 percent) from within the City in 2006. American Waste Transfer Station received the largest quantity of commercial/multi-family waste from within the City in 2006. Table 16 lists the transfer stations that reported receiving solid waste from City generators in 2006. Details about each of these facilities, including daily and annual capacity, materials processed, end-markets, tipping fees, expansion plans and opportunities are included in the facility surveys included in Attachment C-1 in *Appendix C Infrastructure and Materials Flows,* beginning on page C-1-1.

Table 16: Regional Transfer Stations Receiving Solid Waste from City Sources in 2006[1]

Regional Transfer Stations	Reported Citywide Tons Received (2006)	Percent Received (%)
American Waste Transfer Station	274,291	12.8
Athens Transfer Station	112	0.0
Bel-Art Waste Transfer Station	54,005	2.5
Carson Transfer Station	76,468	3.6
Central Los Angeles Recycling & Transfer Station	683,752	31.8
Community Recycling	270,004	12.6
Compton Recycling and Transfer Station - Browning	112,883	5.3
Downey Area Recycling and Transfer Station	26,604	1.2
East Los Angeles Recycling & Transfer Station	48,531	2.3
Falcon Refuse	48,000	2.2
Innovative Waste Control	203,028	9.5
Mission Road Recycling and Transfer Station	191,985	8.9
Paramount Resource Recycling Facility	6,000	0.3
South Gate Transfer Station - Sanitation Districts	30,764	1.4
South Gate Transfer Station - Waste Management	19,433	0.9
Southern California Disposal	97,594	4.5
Waste Resources Recovery	3,696	0.2
Total	**2,147,150**	**100.0**

[1]Data based on surveys conducted for SWIRP in 2007 and 2008. Refer to Attachment C-1 in *Appendix C Infrastructure and Material Flows.*

4.1.1.7 Landfills and Waste-to-Energy Facilities

In 2006, solid waste collected by LASAN crews was taken to the Sunshine Canyon Landfill and the Calabasas Landfill (during service disruptions at Sunshine) for disposal, and to Southeast Resource Recovery Facility for energy conversion. Under current State law, solid waste delivered to waste-to-energy facilities is considered disposal unless a jurisdiction applies for diversion credit and meets other criteria.

Up to 10 percent of the 50 percent diversion requirement for jurisdictions can be met by delivering waste to the waste-to-energy facilities grandfathered under State law (Covanta Stanislaus, Commerce Refuse to Energy, and Southeast Resource Recovery Facility).[28] Solid waste collected by private haulers is delivered directly to 13 regional landfills for disposal and two waste-to-energy facilities for energy conversion.[29]

Table 17 lists the regional landfills and waste-to-energy facilities that received solid waste from City sources in 2006. Details about each of these facilities, including daily and annual capacity, materials processed, end-markets, tipping fees, expansion plans and opportunities are included in the facility surveys included in Attachment C-2 in *Appendix C Infrastructure and Materials Flows*, beginning on page C-2-1. Figure 4 shows the regional recycling and solid waste infrastructure used by City sources in 2006.

Table 17: Regional Landfills and Waste-to-Energy Facilities Receiving Solid Waste from City Sources in 2006[1]

Regional Landfills and Waste-to-Energy Facilities	Reported Citywide Tons Received (2006)	Percent Received (%)
Antelope Valley Public Landfill	8,483	0.2
Bradley Landfill	350,059	9.6
Calabasas Sanitary Landfill	321,147	8.8
Chiquita Canyon Sanitary Landfill	764,300	20.9
El Sobrante Sanitary Landfill	85,235	2.3
Frank R. Bowerman Sanitary Landfill	41,173	1.1
Lancaster Landfill	133,433	3.7
Olinda Alpha Sanitary Landfill	130,473	3.6
Prima Deshecha Sanitary Landfill	24,047	0.7
Puente Hills Landfill	96,414	2.6
Scholl Canyon Sanitary Landfill	3,553	0.1
Simi Valley Landfill-Recycling Center	62,376	1.7
Sunshine Canyon Landfill	1,599,344	43.8
Commerce Refuse-to-Energy Facility	7,140	0.2
Southeast Resource Recovery Facility	27,380	0.7
Total	**3,654,557**	**100**

[1]Data based on surveys conducted for SWIRP in 2007 and 2008. Refer to Attachment C-2 in *Appendix C Infrastructure and Material Flows.*

[28] CalRecycle: Requirements for Jurisdictions Claiming Transformation Disposal Deductions http://www.calrecycle.ca.gov/lgcentral/basics/Transform.htm (accessed October 1, 2013).

[29] The City has not applied for diversion credit for transformation. Material delivered to waste-to-energy facilities is considered disposed.

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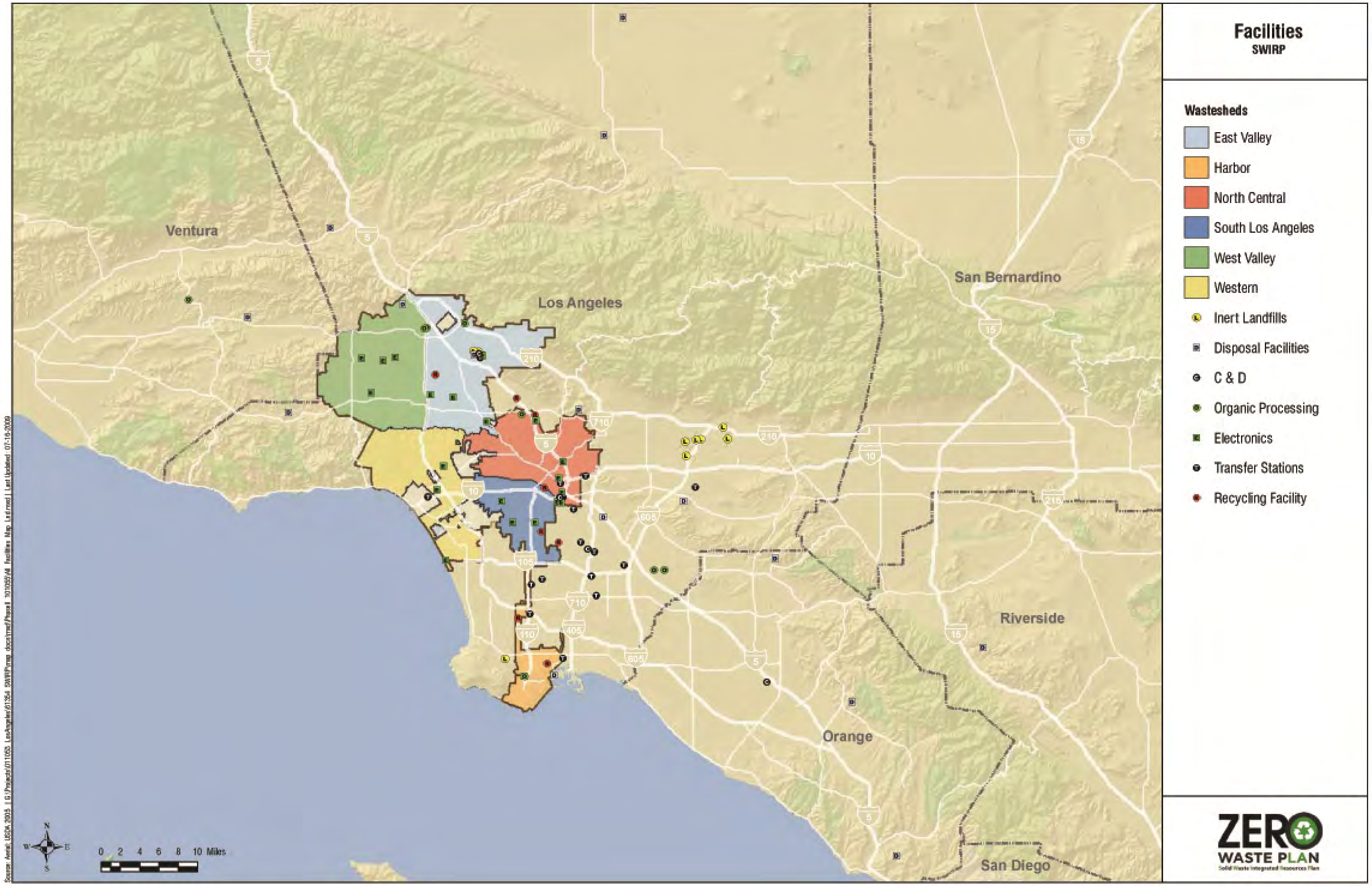
Figure 4: Recycling and Solid Waste Infrastructure Used by City Generators (2006)



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4.2 Facility Profiles

During the Phase 1 and Phase 2 planning process, stakeholders discussed the types and numbers of facilities that will be needed to reach the SWIRP goals. To facilitate discussion of the types of facilities and their functions, the facilities were categorized as:

- **Blue bin facilities** – facilities capable of processing source-separated recyclable and reusable materials, including materials recovered from the LASAN blue bin program and source-separated commercial recycling. Other facilities for source-separated materials were also discussed within this category, including Resource Recovery Centers for self-hauled materials and C&D processing facilities.
- **Green bin facilities** – facilities capable of processing yard trimmings, food scraps and other compostable materials, either source-separated or sorted from other waste at processing facilities.[30]
- **Black bin facilities** – facilities capable of processing residual waste from residential black bins, commercial waste sources, or residual waste from processing facilities.

Over 20 facility types were discussed by stakeholders and researched for the plan, including:

1. Clean MRF
2. Mixed Material Processing
3. C&D mixed processing
4. Inert landfill
5. Mulching facility
6. Aerobic composting of yard trimmings
7. Aerobic composting of yard trimmings and food scraps
8. Composting
9. Anaerobic digestion (source-separated organics)
10. Anaerobic digestion (residual waste wet)
11. Anaerobic digestion (residual waste dry)
12. Advance thermal recycling
13. Gasification
14. Plasma arc gasification
15. Pyrolysis

[30] "Green bin facilities," such as composting facilities, can also process materials collected through the City's brown bin collection program for horse manure.

16. Hydrolysis
17. Biomass-to-energy
18. S.A.F.E. Centers
19. Reuse/Resource Recovery Center(small scale self-haul MRF with reuse)
20. Used item store (e.g., Goodwill)
21. Transfer station
22. Preprocessing prior to create feedstocks for Alternative Technologies
23. Dismantling facility

Appendix D Facility Analysis provides detailed descriptions of these facility types. Based on this analysis, 12 facility types were selected for evaluation in the material flow model. Table 18 lists these facility types. As described in *Appendix B Material Flow Model and Generation Projections*, the material flow model was designed to be dynamic. The facilities selected for the model were those that were best suited to match the policies and programs identified by the stakeholders during the SWIRP planning process. Additional viable processing technologies could be considered for development in the future and can be evaluated for their diversion potential using the material flow model.

Table 18: Facility Types Evaluated for the Material Flow Model

	Facility Type	Materials Processed
Blue bin facilities[31]	Clean MRF	Residential blue bin materials and commercial source-separated recyclables
	C&D mixed processing	Mixed C&D debris
	Resource Recovery Center	Self-hauled recyclable and reusable materials
Green bin facilities	Mulching facility	Yard trimmings
	Aerobic composting facility	Yard trimmings, food scraps and other compostable materials
	Anaerobic digestion (organics)	Source-separated organics
	Biomass-to-energy	Wood waste
	Facility Type	**Materials Processed**
Black bin facilities	Mixed material processing facility (MMP)	Residential black bin materials and commercial solid waste
	Anaerobic digestion (residual waste)	Residential black bin materials and commercial solid waste
	Gasification	Residential black bin materials and commercial solid waste
	Pyrolysis	Residential black bin materials and commercial solid waste
	Advanced thermal recycling	Residential black bin materials and commercial solid waste

4.2.1 Blue Bin and Green Bin Facilities

The SWIRP policies and programs have the potential to divert over 1.5 million tons more per year than the 2010 baseline levels. The City will require additional blue bin and green bin infrastructure capacity, for both residential and commercial generators, to meet this need. LASAN currently contracts with private sector recyclers for processing residential blue bin material. Green bin material is processed at both private sector facilities and at the City-owned composting and mulching facilities. Commercial recycling and C&D processing is provided through private sector recyclers.

The City has a large and vibrant private sector recycling infrastructure, contributing to the 69 percent diversion rate for the commercial sector. Large generators of recyclable commodities sell their materials to local processors. Local processors have good access to end use markets through the ports of Los Angeles and Long Beach.

[31] "Blue bin facilities" are categorized as all facilities capable of processing source-separated recyclables and reusable materials, including materials from the LASAN blue bin program and source-separated commercial and C&D recycling.

The market for yard trimmings in southern California has been dominated by the landfills, which use processed yard trimmings for ADC. City policy prohibits the use of City-collected yard trimmings for ADC. Thus, the City has developed mulching and composting operations to supplement the limited alternatives available through the private sector. Compost facilities are required to control their emissions and can be difficult to site locally. Most of the existing private sector composting operations are located in agricultural areas outside of the City.

The existing blue bin and green bin capacity was documented and the potential new capacity that will be needed to fully implement the SWIRP policies and programs was evaluated.

The blue bin and green bin processing facilities discussed by the stakeholders were evaluated. These include:

- Clean MRFs
- Aerobic composting/mulching facilities
- Resource Recovery Centers
- C&D processing facilities

Note that anaerobic composting or anaerobic digestion may also be suitable for source-separated organics generated in the City. Anaerobic digestion is a biological process where microorganisms break down biodegradable materials, in this case food scraps or other organics, in an oxygen-deficient environment, creating a biogas that can be used to produce electricity or converted into a transportation fuel. This type of biogas consists primarily of methane and carbon dioxide. Although the first phase of the biological process (hydrolysis phase) often operates in batch-type processes, the methane generating and subsequent electrical generation phase of these facilities are designed to operate continuously and provide uninterruptible power. With a proper feedstock, these reactions can reduce the volume of materials by approximately 70 percent and produce a biogas which can be converted into energy or fuel. The residuals or "digestate" from this process can be sent to a compost facility for further processing.

4.2.1.1 Clean MRF

Phoenix North Transfer Station and Material Recovery Facility

Typical Facility	
Tons per day	50-600
Cost per ton	Pays $10-30
Acres required	5-10

Curbside Processing

Refer to Facility Descriptions in Attachment D-2 of *Appendix D Facility Analysis*

Clean MRFs receive and process source-separated recyclables from residential blue bin programs and commercial recycling programs. Clean MRFs use various technologies and methods to sort, bale, and ship material by commodity type to markets. Clean MRFs typically recover traditional recyclable materials, including newspaper, cardboard, mixed paper, aluminum cans, bi-metal cans, plastic bottles, mixed plastics and glass containers. Typical contaminants include food scraps, auto parts, yard trimmings, wood, dirt and other inerts, glass shards, and garbage. Contaminant levels for Clean MRFs are strongly tied to the performance of the residential curbside recycling programs to eliminate contamination, which depends on education and enforcement. Clean MRFs have been in operation in the US and internationally for over 25 years and are considered to be mature, proven technologies.

Local examples include:

- Angelus Western Paper Fibers – Porter Street, Los Angeles
- Bestway Recycling – Main Street, Los Angeles
- City Fibers – Schoenborn Street, North Hills
- City Fibers, Inc. – Santa Fe Avenue, Los Angeles
- CR&R – Western Avenue, Stanton
- Potential Industries – East E Street, Wilmington
- RockTenn – Denker Avenue, Torrance
- Sun Valley Paper Stock – San Fernando Road, Sun Valley

4.2.1.2 Aerobic Composting

Lamont Composting Facility, Kern County

Typical Facility	
Tons per day	100-1,000
Cost per ton	$35-60
Acres required	15-60

Refer to Facility Descriptions in Attachment D-2 of *Appendix D Facility Analysis*

Griffith Park Composting Facility

Aerobic composting facilities are designed for collecting, grinding, mixing, piling, and supplying sufficient moisture and air to organic materials to speed natural decay. The finished product of a composting operation is compost, a soil amendment suitable for incorporating into topsoil and for growing plants. Compost is different from mulch, which is a shredded or chipped organic material placed on top of soil as a protective layer. Compost facilities can vary greatly in size. Small compost facilities are typically in the range of 100-250 tpd (26,000-65,000 tpy), and large compost facilities range from 1,000 to 3,000 tpd (260,000-780,000 tpy), based on 260 operating days per year. Compost technologies include:

- **Windrow** – compostable material is piled in long rows and regularly turned to enhance aerobic activity and control temperature and moisture.
- **In-vessel** – compostable material is placed in enclosed reactors (metal tanks, concrete bunkers or plastic tubes or "ag bags") where airflow and temperature can be controlled through perforated pipes buried in the material.
- **Aerated static pile** – compostable material is placed in piles on perforated pipes under removable covers, and fans are used to push or pull air through the pipes to control the composting process.

Local examples include:

- Griffith Park Compost Facility - Griffith Park Drive, Los Angeles (aerated static pile)
- Community Recycling Lamont Compost Facility - Lamont, Kern County (windrow)

Yard trimmings can be processed into mulch at a chip-and-grind/mulching facility. This type of facility typically includes minimal processing (chipping, grinding, and possibly screening) of the feedstock to produce a mulch product or to prepare wood as fuel for biomass power plants.

Local examples include:

- Harbor Mulching Facility – North Gaffey Street, Los Angeles
- North Hills Recycling – Blucher Ave., Granada Hills

4.2.1.3 Resource Recovery Center

San Luis Obispo County Resource Recovery Park

Tons per day	10-200
Cost per ton	$50-100
Acres required	2

Monterey Regional Waste Management District

Refer to Facility Descriptions in Attachment D-2 of *Appendix D Facility Analysis*

Resource Recovery Centers are small centers for drop-off of hard to recycle items, including mattresses, large blocks of expanded polystyrene foam, and textiles. Resource Recovery Parks are places where materials can be dropped off for donation or buyback and co-locates reuse, recycling and composting, processing, manufacturing,[32] and distribution activities. Typically, these facilities are located in industrially zoned areas that are reserved for companies that process secondary materials or make other products from these materials.

The Resource Recovery Park concept has been evolving naturally in California at landfills and transfer stations. These facilities have continued to provide additional recycling opportunities for self-hauled loads. Landfills and transfer stations have been near the centers of waste generation. A Resource Recovery Park can make the landfill or transfer station more sustainable by diversifying revenue, conserving capacity, and extending the useful life of those facilities.

Self-haul customers are typically charged by the load. For example, at the Cold Canyon Landfill in San Luis Obispo County, self-haul customers are charged $ 30.00 per load (which equates to $ 72.00 per ton).[33] At this facility customers must separate recyclables at the Resource Recovery Center or pay an additional $20 fee if they are unwilling to sort their loads.

Reuse stores or drop-off centers may not charge a fee or may pay for some materials.

Local examples of drop-off centers for hard to recycle materials include:

- Architectural Details, a reuse and salvage organization, East Foothill Boulevard, Pasadena
- Habitat For Humanity Restore, a reuse and salvage organization, Rice Avenue, Oxnard

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[32] Resource Recovery Parks can include manufacturing activities for reclaimed materials. The Cabazon Resource Recovery Park in Indio, California, has a manufacturing plant that makes crumb rubber from old tires and biomass-fueled power generation plant. The facility is seeking additional manufacturers and processors to co-locate at the facility.
[33] By comparison, Sunshine Canyon Landfill self-haul customers are charged the minimum rate of $59.88 per ton and Puente Hills Landfill self-haul customers are charged $ 37.40 minimum per load or $38.41 per ton.

4.2.1.4 Construction and Demolition Facility

Downtown Diversion C&D Facility, Los Angeles

Refer to Facility Descriptions in Attachment D-2 of *Appendix D Facility Analysis*

Typical Facility	
Tons per day	50-500
Cost per ton	$30-40
Acres required	10

C&D Processing

C&D mixed processing facilities receive and process construction and demolition debris. These types of facilities provide different levels of processing depending on acceptable materials they receive, and may produce a variety of commodities at each facility. Typical C&D materials include: asphalt, concrete, Portland cement, brick, lumber, wallboard, roofing material, ceramic tile, plastic pipe, and associated packaging. Typical commodities produced include gypsum, clean wood, ferrous metal, aluminum, inert material (including engineered fill) and ADC.

Local examples include the City's 13 certified processors:

- Allied-Falcon Refuse Center – East I Street, Wilmington
- American Reclamation – Doran Street, Los Angeles
- America Waste Services – Pendleton Street, Sun Valley
- California Waste Services, Inc. – West 152 Street, Gardena
- Clean Up America - East Lugo Street, Los Angeles
- Community Recycling & Resource Recovery, Inc. – De Garmo Avenue, Sun Valley
- Construction and Demolition Recycling, Inc. – Rayo Avenue, South Gate
- CR Transfer - Knott Avenue, Stanton
- Direct Disposal – Noakes Street, Los Angeles
- Downtown Diversion, Inc. – East Olympic Boulevard, Los Angeles
- East Valley Diversion / USA Waste of California, Sheldon Street, Sun Valley
- Madison Materials – East 4th Street, Santa Ana
- Simi Valley Landfill and Recycling Center – Madera Road, Simi Valley

4.2.2 Black Bin Processing Facilities

Black bin processing facilities include mixed material processing facilities, anaerobic digestion, advanced thermal recycling, and non-combustion thermal technologies, such as gasification, plasma arc gasification, and pyrolysis.

Black bin processing facilities target residual waste that is left-over after recycling and composting and can include residual waste from blue bin and green bin processing facilities. By implementing all of the policies and programs identified by the stakeholders and described in *Appendix A Policy and Program Analysis*, the City could achieve a citywide diversion rate of 86 percent. However, at that rate of recovery, City generators would still produce over 1.5 million tons of solid waste annually. This material would need to either be disposed in local or remote landfills or processed for further recovery.

LASAN defines these black bin processing facilities as "Alternative Technology," meaning alternatives to landfill disposal.

To support the City's goal of ending urban landfilling, LASAN has investigated options for diverting waste through Alternative Technologies such as: biological, thermal, chemical, and physical technologies for treating waste. Some examples of biological technologies include anaerobic digestion and aerobic composting. Some examples of thermal technology include gasification, plasma arc gasification, pyrolysis, and advanced thermal recycling. An example of chemical technology is acid hydrolysis. Examples of physical technologies include autoclaving and advanced material recovery systems. These technologies are all methods to process residual waste as alternatives to landfilling in order to generate energy and recover useful by-product materials.

Currently, the City is evaluating vendor proposals for commercial scale (200 to 1,000 tpd) and emerging technologies (10 to 200 tpd).

The term "Alternative Technology" is all-inclusive. A subset of these black bin processing facility types is called "conversion technology"; the term used by CalRecycle to describe new and emerging non-combustion thermal, chemical, and biological technologies. Anaerobic digestion, which is sometimes included in the list of "conversion technologies," is regulated as composting under State law.[34]

The black bin processing facilities discussed by the stakeholders include:

- Mixed material processing (also known as "dirty MRF")
- Advanced thermal recycling
- Anaerobic digestion
- Non-combustion thermal technologies (including plasma arc gasification, gasification, and pyrolysis)

[34] Public Resources Code section 40200(b)(3).

4.2.2.1 Mixed Material Processing Facility

Rainbow Disposal, Huntington Beach

Products/By-Products
Recyclables Compostables

Typical Facility	
Tons per day	200-400
Cost per ton	$40-60
Acres required	5-7

Mixed Material Processing

Refer to Facility Descriptions in Attachment D-2 of *Appendix D Facility Analysis*

A mixed material processing (MMP) facility, also referred to as a dirty MRF, is a facility that sorts recyclable material from residual waste from residential and commercial sources. These facilities can also be adapted to sort or remove different materials to prepare residual waste for composting, advanced thermal recycling, and other Alternative Technologies. Desired loads include residual waste from residential and commercial generators, and undesirable loads include concentrated amounts of C&D materials or concentrated amounts of wet materials, such as restaurant food. All of the other black bin processing facility types can include a mixed material processing facility to prepare the materials for the technology.

Local examples include:

- Athens MRF – City of Industry, Los Angeles County
- Rainbow Disposal – Huntington Beach, Orange County
- CVT – Anaheim, Orange County
- CR&R – Stanton, Orange County

4.2.2.2 Advanced Thermal Recycling

TREA Breisgau Advanced Thermal Recycling - Freiberg, Germany

Tons per day	500-2000
Cost per ton	$100-200
Acres required	5-15

Products/By-Products
Heat for energy
Metals, Chemicals
Ash for beneficial use

Müllverwertung Rugenberger Damm Advanced Thermal Recycling Facility - Hamburg, Germany

Refer to Facility Descriptions in Attachment D-2 of *Appendix D Facility Analysis*

Advanced Thermal Recycling (ATR) is a technology that uses complete combustion of organic carbon-based materials in an oxygen-rich environment, producing an exhaust gas composed primarily of carbon dioxide and water with inorganic materials converted to bottom ash and fly ash. ATR facilities use residual waste from residential or commercial generators, or residual waste from other solid waste facilities, to produce an uninterruptible source of energy and by-products. ATR facilities produce energy, recover metals from the bottom ash, and reduce waste volume by combusting the waste and injecting air at atmospheric pressure to reach the chemically balanced air-fuel ratio for combustion. The hot exhaust gases flow through a boiler, where steam is produced for driving a steam turbine-generator, producing electricity. Exhaust air is treated with advanced pollution control technologies that remove air pollutants to meet stringent clean air emissions standards from environmental regulatory agencies. Cooled exhaust gas flows through emissions control systems before being exhausted through stacks into the atmosphere. Common by-products for controlling air quality of plant emissions include gypsum and hydrochloric acid (HCl). Other products include the recovery of ferrous and non-ferrous metals from the bottom ash. The fly ash and bottom ash are separated and the bottom ash can be reused as landfill cover, processed for road base, or possibly used for other beneficial uses. Benefits of ATR include: volume reduction of residual waste, energy from waste, and green jobs.

Examples ATR facilities include:

- TREA Breisgau Advanced Thermal Recycling Facility, Freiberg, Germany
- Müllverwertung Rugenberger Damm Advanced Thermal Recycling Facility, Hamburg, Germany

4.2.2.3 Anaerobic Digestion

Dranco, Brecht, Belgium

Typical Facility	
Tons per day	200-500
Cost per ton	$100-130
Acres required	5-10

Products/By-Products
Biogas for energy
Digestate for compost

Valorga Process, Barcelona, Spain

Refer to Facility Descriptions in Attachment D-2 of *Appendix D Facility Analysis*

Anaerobic digestion is a biological process where micro-organisms break down biodegradable materials, (e.g., food and paper) in an oxygen-deficient system, creating a biogas that can be used to produce electricity or can be converted into a transportation fuel. The technology converts organic waste to energy using bacteria to break down waste to produce biogas. This type of biogas consists primarily of methane and carbon dioxide. These facilities process food scraps, food-soiled paper and other organics. Although the first phase of the biological process (hydrolysis phase) of these facilities often operate in batch-type processes, methane generating and subsequent electrical generation phases of these facilities are designed to operate continuously and provide uninterruptible power. With a proper feedstock, these reactions can reduce the volume of waste by 70 percent, provide energy, and residuals can be sent to a compost facility.

According to the California Energy Commission, there are 22 animal waste or food waste digesters in operation in the State that process manures and food manufacturing residues. The technology is also used for the treatment of biosolids at wastewater treatment plants.

There are several facilities under development locally to process solid waste and organic feedstocks; including Ralphs Renewable Energy Facility and the Lancaster Reclaimable Anaerobic Composter (which are permitted as anaerobic digestion research projects in Los Angeles County).

Local examples of anaerobic digestion for the treatment of wastewater include:

- Hyperion Sewage Treatment Plant – City of Los Angeles
- Terminal Island Sewage Treatment Plant – City of Los Angeles

4.2.2.4 Non-Combustion Thermal Technology (Plasma Arc/Gasification/Pyrolysis)

JFE Thermoselect - Chiba, Japan

Products/By-Products
Syngas for energy
Ash for beneficial reuse
Chemicals

Typical Facility	
Tons per day	100-500
Cost per ton	$120-200
Acres required	2-7

Plasco Conversion System - Ottawa, Canada

Refer to Facility Descriptions in Attachment D-2 of *Appendix D Facility Analysis*

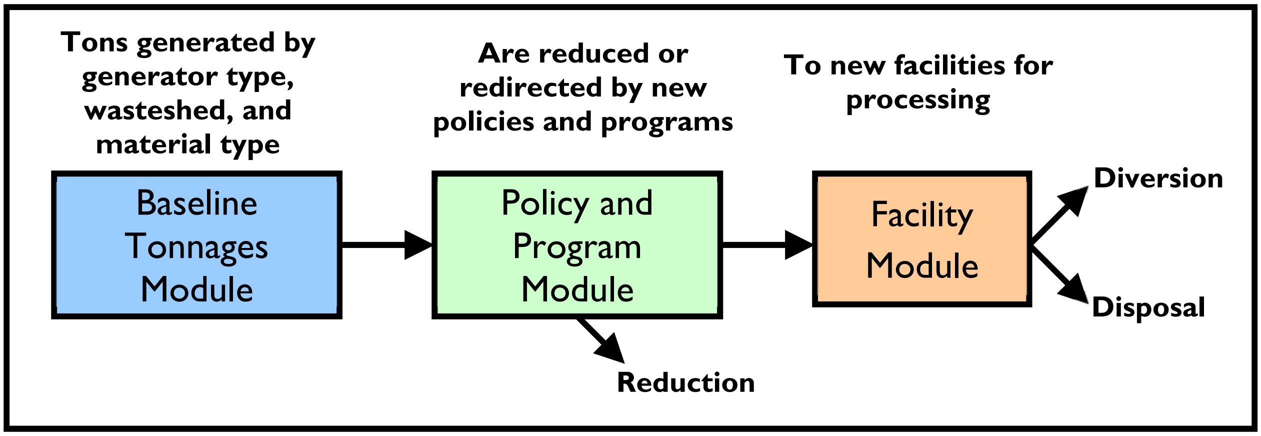
Pyrolysis, gasification, and plasma arc gasification are all technologies used to treat waste producing a synthesis gas ("syngas") that can be used to produce electricity or can be converted into a transportation fuel. Pyrolysis is the thermal degradation of organic carbon-based materials through the use of an indirect, external source of heat in the absence or almost complete absence of free oxygen. Gasification is the thermal conversion of organic carbon-based materials that involves the partial oxidation through the use of an indirect, external source of heat, high pressure, and in a limited supply of air/oxygen (less than stoichiometric, or less than is needed for complete combustion). Plasma arc technology uses an electrical discharge to heat gas, typically air, oxygen, nitrogen, hydrogen, or argon, or combinations of these gases. The heated gas, or plasma, can then be used for welding, cutting, melting, or treating waste materials. These facilities use an external heat source to heat waste to high temperatures in a low oxygen environment. This causes the waste to decompose and produce syngas. Syngas consists primarily of hydrogen, carbon monoxide, and carbon dioxide. With a proper feedstock, this process can reduce the volume of waste by 80 percent, and is intended to produce more energy than is required for processing the materials. Ideal feedstock for these facilities includes mixed paper, plastics, and other dry organics. Temperatures for treating waste using these technologies range from: 750°F to 1,650°F for pyrolysis; 1,400°F to 2,500°F for gasification; and 5,000-8,000°F for plasma arc gasification.

Gasification is used at the commercial scale for coal, and plasma arc technology is used at the commercial scale to treat hazardous and radioactive wastes. These technologies are still emerging as methods to treat residual waste. There are active proposals for development of non-combustion thermal technology being considered by the City of Los Angeles, the City of Santa Barbara and Santa Barbara County, Los Angeles County, and the Salinas Valley Solid Waste Authority (Monterey County).

4.3 Facility Analysis

In order to determine the number, types, and sizes of the facilities that will be needed through 2030, the facility scenarios using the 13 facility types described in Section 4.2 were developed. The facility scenarios were programmed into the material flow model and tested using the results from the policy and program scenarios as illustrated in Figure 5.

Figure 5: Structure of the Material Flow Model



Tons are fed through the baseline module and modeled by generator sector, wasteshed, and material type. Using the baseline tonnages and projecting waste generation through 2030, the model applies the participation rate and efficiency rate assumptions for each policy and program selected in the policy and program module. "Participation rate" means the percentage of total generator sector tons available that are targeted by the program, and "efficiency rate" means the percentage of those remaining targeted tons that can be reasonably diverted by the program. The assumptions were based on research of comparable programs and policies implemented in other communities. The output of this analysis is the resulting tons of material that are either diverted or disposed. The material flow model is further described in *Appendix B Material Flow Model and Generation Projections.*

Using the results from the material flow model, the numbers and types of facilities that will be needed through 2030 were estimated. These included:

- Blue bin facility requirements
- Green bin facility requirements
- Black bin processing scenarios (four scenarios are described)

Sections 4.3 and 4.4 provide the projected number of facilities that would be needed (assuming no additional capacity is available) and Section 4.5 provides the existing facility capacity and expansion potential and shows the net new number of needed facilities.

4.3.1 Blue Bin Facility Requirements

The projected number of facilities that would be required to process all new blue bin materials is calculated in this section. Existing infrastructure, much of which is controlled by private industry, currently processes all blue bin materials that are being generated in the City at this time. In addition to this infrastructure, new facilities would also need to be constructed to process increases in the generation of blue bin materials between 2010 and 2030. The projected demand of blue bin facilities is the number of facilities that would be required to process the additional tons of blue bin materials generated in the City in 2030 if no processing infrastructure already existed. Section 4.5 details the number of facilities that would be required after existing available processing capacity is considered. The increase in tonnage for blue bin materials between 2010 and 2030 is shown in Table 19 for each of the five policy scenarios:

1. Scenario1 – No New Policies or Programs (Baseline)
2. Scenario 2 - New Policies and Programs
3. Scenario 3 – Add Mandatory Requirements to Scenario 2
4. Scenario 4 – Add Upstream Policies to Scenario 2
5. Scenario 5 – Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)

Table 19: Projected Increase in Annual Tons of Blue Bin Materials between 2010 and 2030

Wasteshed	Additional tons of blue bin materials between 2010 and 2030 by wasteshed				
	Scenario 1 No New Policies or Programs (Baseline)	**Scenario 2** New Policies and Programs	**Scenario 3** Add Mandatory Requirements to Scenario 2	**Scenario 4** Add Upstream Policies to Scenario 2	**Scenario 5** Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)
Overall	340,455	771,362	1,110,746	746,807	1,042,859
East Valley	65,870	146,121	207,087	136,074	189,965
Harbor	13,999	35,011	50,599	32,357	46,120
North Central	93,917	207,221	312,576	223,014	312,341
South LA	28,841	94,742	145,764	86,746	131,901
West Valley	98,155	178,957	237,965	168,401	220,462
Western	39,674	109,310	156,755	100,216	142,069

Refer to *Appendix D Facility Analysis*, Table 13, Page D-28. Note that values may not sum to total due to rounding.

As shown in Table 19, the increase in generation from population growth and other changes (including demographic shifts and economic development) not related to new policies and programs will increase the number of tons generated in the City by over 340,000 tpy under Scenario 1, while different policy scenarios can increase the production of blue bin tonnage by over 1 million tpy under Scenario 5. The number of Clean MRFs that would be required to process the projected increases is shown in Table 20.

Table 20: Projected Blue Bin Facility Demands (200,000 TPY)

Wasteshed	Additional blue bin facilities needed in 2030 by wasteshed				
	Scenario 1 No New Policies or Programs (Baseline)	**Scenario 2** New Policies and Programs	**Scenario 3** Add Mandatory Requirements to Scenario 2	**Scenario 4** Add Upstream Policies to Scenario 2	**Scenario 5** Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)
Overall	2	4	6	4	5
East Valley	<1	1	1	1	1
Harbor	<1	<1	<1	<1	<1
North Central	<1	1	2	1	2
South LA	<1	<1	1	<1	<1
West Valley	<1	1	1	1	1
Western	<1	1	1	1	1

Refer to *Appendix D Facility Analysis*, Table 14, Page D-29. Note that values may not sum to total due to rounding. Note that "<1" means less than one facility is needed and some facilities could serve multiple wastesheds.

In the wastesheds listed in Table 20, less than one facility is indicated by "<1," and suggests that, in those cases, facilities may be desired to serve multiple wastesheds. The number of facilities by wasteshed indicated in the table above may not add up to the total number of facilities required per scenario, due to rounding. The number of facilities is rounded to the nearest whole facility. The symbol "<1" is used when the total tons available are less than 50 percent of the capacity of one facility. In each scenario, transfer station capacity may be desired in certain districts, such as Harbor, to make transportation of blue bin materials to Clean MRFs more efficient and environmentally friendly.

4.3.2 Green Bin Facility Requirements

The projected number of facilities that would be required to process all new green bin materials is calculated in this section. All green bin materials generated in the City at this time are processed using existing infrastructure. Much of the existing composting and mulching infrastructure is owned and operated by the City. A portion of the existing infrastructure is controlled by private industry.

As the City expands its food scraps program (where food scraps and compostable paper are co-collected with yard trimmings), some of the existing composting and mulching facilities will need to be re-permitted to accept food scraps. In addition to this infrastructure, new facilities would also need to be constructed to process increases in the generation of green bin materials between 2010 and 2030. The projected demand of green bin facilities is the number of facilities that would be required to process the additional tons of green bin materials generated in the City in 2030 if no processing infrastructure already existed. Section 4.5 details the number of facilities that would be required after existing available processing capacity is considered.

The increase in tonnage for green bin materials between 2010 and 2030 is shown in Table 21 for each of the five policy scenarios.

Table 21: Projected Increase in Annual Tons of Green Bin Materials between 2010 and 2030

Wasteshed	Additional tons of green bin materials in 2030 by wasteshed				
	Scenario 1 No New Policies or Programs (Baseline)	**Scenario 2** New Policies and Programs	**Scenario 3** Add Mandatory Requirements to Scenario 2	**Scenario 4** Add Upstream Policies to Scenario 2	**Scenario 5** Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)
Overall	26,460	216,890	557,118	216,890	557,118
East Valley	29,669	68,615	134,025	68,615	134,025
Harbor	1,173	10,026	26,436	10,026	26,436
North Central	(7,316)	40,786	133,172	40,786	133,172
South LA	(19,608)	12,481	66,356	12,481	66,356
West Valley	60,825	99,692	166,561	99,692	166,561
Western	(38,283)	(14,710)	30,568	(14,710)	30,568

Refer to *Appendix D Facility Analysis*, Table 10, Page D-26. Note that values may not sum to total due to rounding.

Table 21 shows that only a little over 26,000 tons of additional green bin materials (under Scenario 1) are expected to be generated from population increases and waste generation increases per capita. However, Scenarios 2 through 5 policies and programs are capable of increasing green bin materials by an additional 220,000 to 560,000 tons. Note that for some of the wastesheds, the green bin materials decline in 2030 from the base year of 2010. This is because the population projections provided by the Southern California Association of Governments predict a decline in single-family households across Los Angeles beginning in 2025.

Two options for green bin facilities are shown below. Table 22 shows the number of green bin facilities that would be required if small capacity 60,000 tpy (approximately 230 tpd) at 260 operating days per year) facilities are used. Table 23 shows the number of green bin facilities that would be required if larger capacity 260,000 tpy (approximately 1,000 tpd) facilities are used.

Table 22: Projected Small Green Bin Facility Demands (60,000 TPY)

Wasteshed	Additional small green bin facilities needed in 2030 by wasteshed				
	Scenario 1 No New Policies or Programs (Baseline)	**Scenario 2** New Policies and Programs	**Scenario 3** Add Mandatory Requirements to Scenario 2	**Scenario 4** Add Upstream Policies to Scenario 2	**Scenario 5** Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)
Overall	1	4	9	4	9
East Valley	<1	1	2	1	2
Harbor	<1	<1	<1	<1	<1
North Central	<1	1	2	1	2
South LA	<1	<1	1	<1	1
West Valley	1	2	3	2	3
Western	<1	<1	1	<1	1

Refer to *Appendix D Facility Analysis*, Table 11, Page D-27. Note that values may not sum to total due to rounding.

Table 23: Projected Large Green Bin Facility Demands (260,000 TPY)

Wasteshed	Additional large green bin facilities needed in 2030 by wasteshed				
	Scenario 1 No New Policies or Programs (Baseline)	**Scenario 2** New Policies and Programs	**Scenario 3** Add Mandatory Requirements to Scenario 2	**Scenario 4** Add Upstream Policies to Scenario 2	**Scenario 5** Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)
Overall	<1	1	2	1	2
East Valley	<1	<1	<1	<1	<1
Harbor	<1	<1	<1	<1	<1
North Central	<1	<1	1	<1	1
South LA	<1	<1	<1	<1	<1
West Valley	<1	<1	1	<1	1
Western	<1	<1	<1	<1	<1

Refer to *Appendix D Facility Analysis*, Table 12, Page D-27. Note that values may not sum to total due to rounding.

In some columns in the above tables, the number of green bin facilities by wasteshed is less than one ("<1"), and suggests that some facilities may be required to serve multiple wastesheds in the City. The number of facilities is rounded to the nearest whole facility. For example, Scenario 4 in Table 23 includes many partial facilities that sum to one overall. The symbol "<1" is used when the total tons available are less than 50 percent of the capacity of one facility.

Transfer stations may be utilized in some wastesheds to help efficiently haul green bin materials to the facilities. Some combination of large and small facilities will likely be desired, and will depend on both the availability of land and the requirements and availability of markets. Large capacity compost facilities may need to be sited outside the City limits, in which case transfer stations will be required to efficiently transport green bin materials to these facilities.

4.4 Facility Scenarios

4.4.1 Black Bin Processing Scenarios

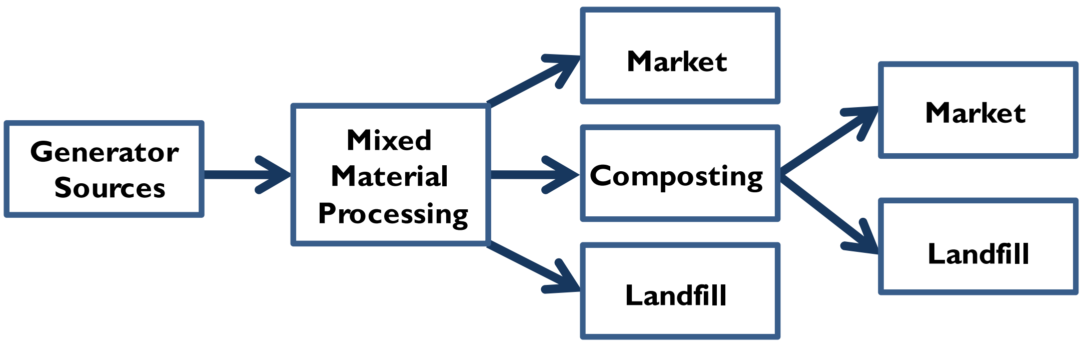
Eight black bin facility scenarios were initially tested and the preliminary results were presented to the stakeholders at the regional workshops held in March 2009. Each of the eight facility scenarios is described in *Appendix D Facility Analysis*. Based on the feedback from the stakeholders, four primary facility scenarios to test four different black bin processing strategies were analyzed in detail. These were labeled Facility Scenarios B, D, E, and F.

- All facilities include pre-processing using an automated mixed material processing facility (MMP). This facility type prepares the feedstock for other facilities.
- Facility Scenario B tests the results using MMP and aerobic composting.
- Facility Scenario D tests the results using MMP and Alternative Technology -Advanced Thermal Recycling (ATR).
- Facility Scenario E tests the results using MMP and anaerobic digestion/Alternative Technology biological (ATB).

- Facility Scenario F tests the results using MMP and non-combustion thermal (including gasification/plasma arc/pyrolysis)/Alternative Technology thermal (ATT).

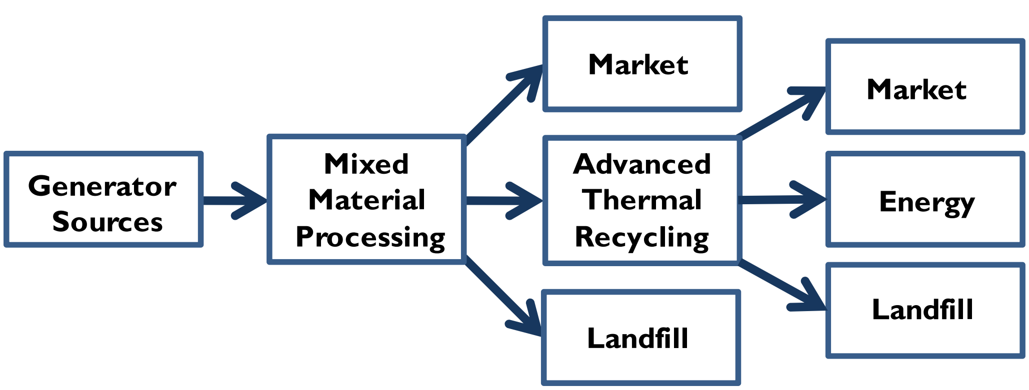
Facility Scenario B: Under this scenario, MMP receives all residual waste and processes it to recover recyclables for market and compostable materials for composting. Materials that are not recyclable or compostable are sent to landfill. Compost facilities process compostable materials for market and send non-compostable residues to landfill. This scenario separates all organics and materials that have markets for diversion and residue is disposed at landfills. A diagram of this scenario is shown below:

Facility Scenario B



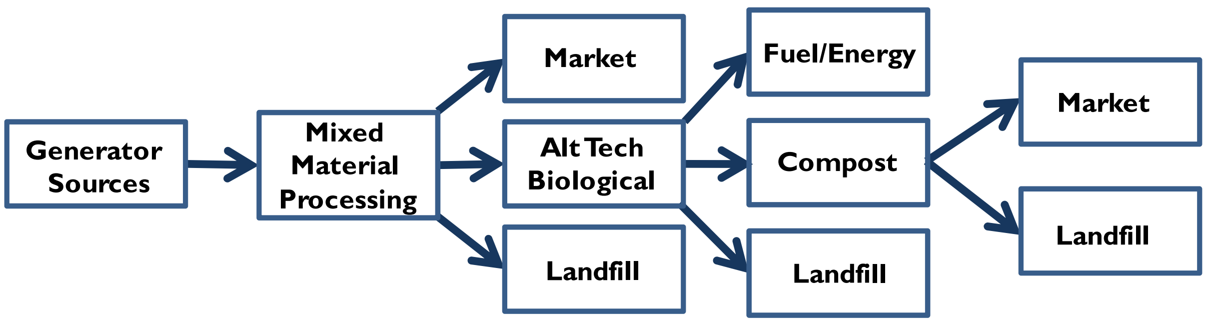
Facility Scenario D: MMP receives all residual waste and processes it to separate marketable materials from materials acceptable for conversion at an ATR facility and non-processable residue (which is sent to landfill). The ATR facility receives residual materials from MMP for conversion to energy and by-products. This scenario assumes that it is more desirable to recover material for recycling than convert it to energy at an ATR facility. MMP would remove all marketable materials, and would prepare non-marketable residual materials for ATR. Preparation for ATR would include screening waste to remove glass, C&D, metals, soil, and other inert materials which would increase conversion efficiency. This scenario represents a situation where recycling is preferred over ATR, but post-processing residual materials are still sent to ATR, ash is beneficially reused at landfills, and residue is disposed at landfills. A diagram of this scenario is shown below:

Facility Scenario D



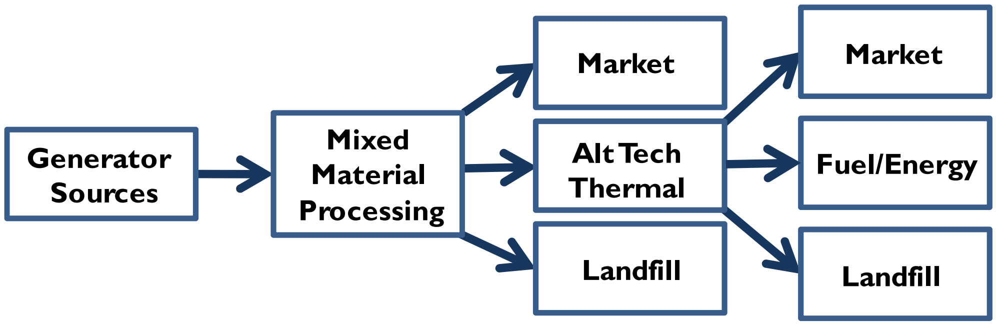
Facility Scenario E: MMP receives all residual waste and processes it to separate marketable materials from organic materials (food, food-soiled paper, and other organics) and non-processable residue (which is sent to landfill). ATB converts the organic materials into fuel or energy, and post-processing residual materials are composted or sent to landfill. MMP would thus provide a feedstock of food, food-soiled paper, and other organics. This scenario represents a situation where recycling is prioritized, organic materials are sent to ATB prior to composting, and materials which cannot be recycled, digested or composted are disposed at landfills. A diagram of this scenario is shown below:

Facility Scenario E



Facility Scenario F: MMP receives all residual waste and processes it to separate marketable materials from materials acceptable for processing at an ATT facility and non-processable residue (which is sent to landfill). ATT converts materials into energy or fuel, and creates ash and other by-products. Marketable by-products are sold to markets and non-marketable residues are sent to landfill. MMP would create a feedstock of paper, plastics, dry organics, and other material that would be desirable for ATT. This scenario represents a situation where recycling is prioritized, materials that cannot be recycled are sent to ATT, and materials that cannot be converted or recycled are disposed at landfills. A diagram of this scenario is shown below:

Facility Scenario F



4.4.2 Black Bin Facility Requirements

The number of required black bin facilities was calculated by putting the projected waste characterization through the different facility scenarios using the expected facility performances (for diversion potential and processing efficiency) to determine how each material type would travel through the facility scenario. The facility performance expectations (as described in *Appendix D Facility Analysis* - Attachment D-2 Facility Descriptions), were used to determine how much material would need to be handled by each facility type. These tonnage volumes are shown in Table 24:

Table 24: Projected Processing Requirements in 2030 - Annual Tons by Facility Type

Facility Scenario	Facility Type	Projected tons received by each facility type in 2030, by policy scenario				
		Scenario 1 No New Policies or Programs (Baseline)	**Scenario 2** New Policies and Programs	**Scenario 3** Add Mandatory Requirements to Scenario 2	**Scenario 4** Add Upstream Policies to Scenario 2	**Scenario 5** Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)
B	MMP	3,043,196	2,283,754	1,603,556	2,167,830	1,531,326
	Compost	1,697,094	1,275,375	863,645	1,248,719	854,019
D	MMP	3,043,196	2,283,754	1,603,556	2,167,830	1,531,326
	ATR	2,367,430	1,794,942	1,277,985	1,704,628	1,219,510
E	MMP	3,043,196	2,283,754	1,603,556	2,167,830	1,531,326
	ATT	2,030,548	1,522,253	1,051,143	1,441,188	998,653
F	MMP	3,043,196	2,283,754	1,603,556	2,167,830	1,531,326
	ATB	1,559,308	1,173,993	785,261	1,147,337	775,636

Refer to *Appendix D Facility Analysis*, Table 7, Page D-23. Note that values may not sum to total due to rounding.

As shown in Table 24, the City is expected to generate between 1.5 and 3 million tons of residual waste in 2030 that will require processing. This range is based on the generation projections (described in *Appendix B Material Flow Model and Generation Projections*) and varies based on the program and policy scenarios implemented (described in *Appendix A Policy and Program Analysis*).

The siting of a limited number of large-scale (2,000 to 5,000 tpd) solid waste processing facilities within the City limits to handle the amount of residual waste, listed in Table 25, would be extremely difficult due to potential environmental impacts and potential community resistance. Alternatively, direct hauling and/or using transfer stations to deliver residual waste to remote processing sites would be extremely costly and impractical. Consequently, the number of smaller ("community scale") facilities (less than 2,000 tpd) that would be needed to process the waste generated within the City were identified. Table 25 summarizes the number of required smaller scale facilities that would be suitable for siting throughout the City to process all the black bin materials in 2030.

Table 25: Projected Black Bin Facility Demand

Facility Scenario	Facility Type	Number of black bin facilities required by policy scenario				
		Scenario 1 No New Policies or Programs (Baseline)	**Scenario 2** New Policies and Programs	**Scenario 3** Add Mandatory Requirements to Scenario 2	**Scenario 4** Add Upstream Policies to Scenario 2	**Scenario 5** Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)
B	MMP	15	11	8	11	8
	Compost (large)	7	5	3	5	3
	Compost (small)	28	21	14	21	14
D	MMP	15	11	8	11	8
	ATR	6	5	4	5	3
E	MMP	15	11	8	11	8
	ATT	11	8	6	8	5
F	MMP	15	11	8	11	8
	ATB	9	6	4	6	4

Refer to *Appendix D Facility Analysis*, Table 8, Page D-24. Note that values may not sum to total due to rounding.

Depending on the scenario of policies and programs implemented in the City, anywhere from 8 to 15 MMP facilities may be required to process all black bin materials generated in 2030. The number of MMP facilities required by wasteshed to process black bin materials is presented in Table 26.

Table 26: Projected Black Bin Facilities Required by Wasteshed

Wasteshed	Total black bin facilities required in 2030 by wasteshed				
	Scenario 1 No New Policies or Programs (Baseline)	**Scenario 2** New Policies and Programs	**Scenario 3** Add Mandatory Requirements to Scenario 2	**Scenario 4** Add Upstream Policies to Scenario 2	**Scenario 5** Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)
Overall	15	11	8	11	8
East Valley	3	2	2	2	2
Harbor	1	1	<1	1	<1
North Central	4	3	2	3	2
South LA	2	2	1	2	1
West Valley	3	2	2	2	2
Western	2	1	1	1	1

Refer to *Appendix D Facility Analysis*, Table 9, Page D-25. Note that values may not sum to total due to rounding.

The number of facilities by wasteshed indicated in Table 26 may not add up to the total number of facilities required per scenario, due to rounding. The number of facilities is rounded to the nearest whole facility. The symbol "<1" is used when the total tons available are less than 50 percent of the capacity of one facility. In some cases, use of transfer stations may be required to help efficiently transfer material between wastesheds in order to maximize the capacity of a facility.

4.4.3 Diversion Potential

As shown in Table 27, assuming citywide implementation, the diversion potential for each of the black bin processing scenarios is very high. Biological treatment methods, such as aerobic composting and anaerobic digestion are somewhat less efficient than thermal treatments, as they process only the compostable or digestible portion of the materials.

Table 27: Projected Diversion Potential by Policy and Facility Scenario

Facility Scenario	Facility Type	**Scenario 1** No New Policies or Programs (Baseline)	**Scenario 2** New Policies and Programs	**Scenario 3** Add Mandatory Requirements to Scenario 2	**Scenario 4** Add Upstream Policies to Scenario 2	**Scenario 5** Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)
No black bin processing		72%	79%	85%	80%	86%
B	MMP, Compost	91%	93%	95%	94%	95%
D	MMP, ATR	98%	98%	98%	98%	98%
E	MMP, ATB	90%	93%	94%	93%	94%
F	MM, ATT	95%	96%	97%	96%	97%

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013

4.4.4 Cost Estimates

Table 28 provides the estimated cost per ton for each of the facility types.

- Processing costs for most "blue bin" facilities are less than projected landfill costs
- Processing costs for some "green bin" facilities are comparable to projected landfill costs
- Processing costs for some "black bin" facilities are comparable to projected landfill costs
- Processing costs for Alternative Technology-biological are generally higher than projected landfill costs due to:
  - Feedstock preparation (preprocessing)
  - Emerging nature of the technology (technology for processing residual waste is still being piloted)
- Processing costs for thermal facilities are generally higher than projected landfill costs due to:
  - Cost of air pollution control technology
  - Purchase of emission reduction credits
  - Cost of operations and maintenance

Table 28: Facility Cost Estimates

"Blue Bin and Green Bin" Facilities	Cost per ton (net)	$/household per month increase
Clean MRF	Pays $10-30	--
Composting	$40-60	$1-3
Resource recovery center	$50-100	NA
C&D processing	$30-40	NA
"Black Bin" Processing Facilities	**Cost per ton (net)**	**$/household per month increase**
Preprocessing/composting	$50-80	$2-5
Anaerobic digestion	$100-130	$7-10
Gasification, pyrolysis, plasma arc	$120-200	$9-18
Advanced Thermal Recycling	$120-200	$9-18
Disposal Facilities	**Cost per ton (net)**	**$/household per month increase**
Local landfill	$35-50	$0-2
Remote landfill	$80-100	$5-7

Source: Los Angeles Facility Cost Estimates, HDR Engineering, March 2009.
Cost per ton estimate based on the Facility Descriptions in Attachment D-2 in *Appendix D Facility Analysis*, beginning on page D-2-1. Costs are estimated for residential curbside customers only.

To illustrate the potential cost per household per month, current costs for processing and disposal were compared to future costs of processing and disposal, based on each facility type. Currently, the City pays $30 to $40 per ton for processing yard trimmings, compared to $40 to $60 per ton for processing yard trimmings and food scraps (once the program is implemented citywide). These increased processing costs would have the effect of increasing the monthly household rate by $1 to $3 dollars per month.

Similarly, the costs for "black bin" processing facilities range from $50 to $200 per ton, depending on the technology. The City currently pays about $35 per ton to landfill locally. If all of the residential "black bin" tons were processed citywide, this could increase the monthly household rate by $2 to $18 per month depending on the technology.

4.5 Existing Facility Capacity and Expansion Potential

The total number of facilities required was determined assuming full build-out of all desired facilities and assuming that no facilities currently exist to process waste. This section discusses existing solid waste facilities in and around the City and discusses the existing available capacity and the potential for expansion capacity using published information and surveys of facility operators. This section does not address possible institutional obstacles and/or jurisdictional constraints for utilizing the available capacity, but is intended to identify potential capacity realizing that additional research and more detailed analysis would be needed to confirm the possible use of the available capacity.

Detailed information on the facilities, their processing capacity, and the methods used to determine existing and potential expanded capacity is provided in *Appendix D Facility Analysis*. A summary of the results of the analysis is shown in Table 29, which gives a range of available processing capacity (as permitted) and expansion potential for different facility types. For purposes of evaluating the future facility needs citywide, the lower end of the range was used for the analysis.

Table 29: Available Processing Capacity and Expansion Capacity by Facility Type

Facility Type	Available Processing Capacity (tons per day)		
MMP	1,750	-	3,600
Clean MRF	1,200	-	2,600
Composting	550	-	1,100
Chipping and Grinding	900	-	2,300
C&D Processing Facilities	2,300	-	4,850
Transfer Stations	4,800	-	8,150
Food scraps	150	-	300
Waste-to-Energy Facilities	Approx.		1,200
Landfills	25,000	-	28,000

Refer to *Appendix D Facility Analysis*, Table 15, Page D-30.
Source for waste-to-energy and landfills: County of Los Angeles Countywide Integrated Waste Management Plan: 2012 Annual Report

The actual number of additional Clean MRFs, which will be required to process recyclable materials, is shown in Table 30. This number takes into account the potential additional capacity at the existing Clean MRFs to be between 1,200 and 2,600 tpd. Assuming each facility operates six days per week, and using the conservative end of the range at 1,200 tpd, existing Clean MRFs could process about 360,000 tpy of source separated recyclables generated in the City. Table 30 details the expected number of Clean MRFs that will be required in the future assuming full implementation of programs.

Table 30: Blue Bin Facility Requirements by 2030

Facility Type	Number of blue bin facilities required				
	Scenario 1 No New Policies or Programs	**Scenario 2** New Policies and Programs	**Scenario 3** Add Mandatory Requirements to Scenario 2	**Scenario 4** Add Upstream Policies to Scenario 2	**Scenario 5** Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)
Projected Demand					
Clean MRF	2	4	6	4	5
Net New Facilities Needed					
Clean MRF	0	2	4	2	3

Refer to *Appendix D Facility Analysis*, Table 18, Page D-31.

The actual number of additional green bin facilities, which will be required to process green bin materials, is shown in Table 31. This number takes into account the potential additional capacity at the existing green bin facilities to be between 550 and 1,100 tpd. Assuming each facility operates six days per week, and using the conservative end of the range at 550 tpd, existing green bin facilities could process about 165,000 tpy. Table 31 details the expected number of green bin facilities that will be required by 2030, assuming full implementation of programs.

Table 31: Green Bin Facility Requirements by 2030

Facility Type	Number of green bin facilities required				
	Scenario 1 No New Policies or Programs	**Scenario 2** New Policies and Programs	**Scenario 3** Add Mandatory Requirements to Scenario 2	**Scenario 4** Add Upstream Policies to Scenario 2	**Scenario 5** Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)
Projected Demand					
Compost (large)	<1	1	2	1	2
Compost (small)	<1	4	9	4	9
Net New Facilities Needed					
Compost (large)	0	0	1	0	1
Compost (small)	0	1	6	1	6

Refer to *Appendix D Facility Analysis*, Table 17, Page D-31.
Note: Large compost facilities are assumed to handle 260,000 tpy or 1,000 tpd (based on 260 operating days per year). Small compost facilities are assumed to process 60,000 tpy or 230 tpd (based on 260 operating days per year).

Table 32 shows the projected number of MMP facilities that will be required to process all the black bin materials remaining after implementation of each policy and program scenario. This number takes into account the potential available capacity at existing black bin facilities which is estimated to be between 1,750 and 3,600 tpd. Assuming each facility with available capacity receives material 300 days per year, and using the conservative end of the range at 1,750 tpd of potential available capacity, existing MMP facilities could process about 525,000 tpy of black bin materials. Table 32 details the expected number of black bin facilities that will be required by 2030, assuming full implementation of programs.

Table 32: Black Bin Facility Requirements by 2030

Facility Type	Number of black bin facilities required				
	Scenario 1 No New Policies or Programs	**Scenario 2** New Policies and Programs	**Scenario 3** Add Mandatory Requirements to Scenario 2	**Scenario 4** Add Upstream Policies to Scenario 2	**Scenario 5** Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)
Projected Demand					
MMP	15	11	8	11	8
Net New Facilities Needed					
MMP	12	8	5	8	5

Refer to *Appendix D Facility Analysis*, Table 16, Page D-30

One Resource Recovery Center for convenient drop off of recyclable materials, bulky items, and hard to recycle materials is anticipated to be needed at full implementation of all of the policies and programs identified in SWIRP. Approximately 22,000 tpy of materials self-hauled by residents and commercial businesses would be managed through this facility. The ordinance requiring Resource Recovery Centers at landfills and transfer stations in the City may result in the development of more Resource Recovery Centers located throughout the City which will enhance convenience for self-haul generators.

Available C&D processing capacity is between 2,300 tpd and 4,850 tpd (717,600-1,513,200 tpy), but C&D generation is only expected to increase by about 62,000 tpy by 2030, including all the changes in policies and programs. Therefore, no net new C&D processing facilities are anticipated to be needed through 2030.

Table 33 summarizes the net number of Resource Recovery Centers, Clean MRFs (blue bin facilities), compost facilities (green bin facilities), and MMP facilities (black bin facilities) that would be required by the City for implementation of policy and program scenarios (assuming utilization of existing facility capacity takes place first).

Table 33: Net New Facilities Needed for SWIRP Implementation by 2030

Scenario	Anticipated Citywide Diversion	Number of Facilities Needed				
		Resource Recovery Centers	Blue Bin	Green Bin	Black Bin	Total
Scenario 1 No New Policies or Programs (2010 Baseline)	91 to 98%	0	0	0	12	12
Scenario 2 New Policies and Programs	93 to 98%	0	2	1 small	8	11
Scenario 3 Add Mandatory Requirements to Scenario 2	94 to 98%	1	4	1 large or 6 small	5	11-16
Scenario 4 Add Upstream Policies to Scenario 2	93 to 98%	0	2	1 small	8	11
Scenario 5 Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)	94 to 98%	1	3	1 large or 6 small	5	10-15

4.6 Facility Development

4.6.1 City's Role in Facility Development

The City's role in facility development has changed over the years. Prior to the closure of the City-owned landfills, the City managed the entire solid waste infrastructure for residential curbside customers. With the implementation of blue bin and green bin programs, the City has found it cost-effective to use some private sector infrastructure. Currently, the City uses a combination of public and private facilities:

- **Blue bin** – All facilities used by the City for processing of blue bin materials are provided through private contractors.
- **Green bin** – The City uses a combination of public and private facilities for composting and mulching of compostable materials and horse manure (brown bin) materials.
- **Black bin** – The City uses a combination of public and private facilities for the processing of black bin materials. The City owns no disposal facilities and contracts for disposal through privately owned landfills. Some black bin material is taken to the Southeast Resource Recovery Facility, owned by the City of Long Beach and the Sanitation Districts of Los Angeles County.

The recycling and solid waste infrastructure for commercial and C&D generator sectors is provided through private sector operators. As described in the facility surveys included in Attachments C-1 through C-6 of *Appendix C Infrastructure and Material Flows*, several of these operators are currently planning facility expansions to meet the demand for new diversion capacity. Many operators are also investing in new transfer station capacity, mixed material processing and new technology for treating residual waste.

The City has historically supported the development of private sector infrastructure through incentives (such as C&D and mixed debris diversion incentive payments and the restaurant food scraps program), policies and regulation. The private sector operators would also like the City's support in streamlining the siting and permitting process for new private sector facilities or facility expansions.

The stakeholders supported continued development of private sector infrastructure through new requirements (such as mandatory C&D diversion or commercial recycling).

Blue bin processing facilities (for both residential and commercial recycling) and C&D processing facilities are anticipated to be developed over time by the private sector based on market demand without the need for direct intervention by the City. Infrastructure for green bin and black bin processing capacity may require the involvement of the City, through long-term commitments of materials. The City currently directly controls only residential curbside material. Thus, the City is anticipated to have direct involvement in the development of only the facilities that will be needed for the residential green bin and black bin materials.

The City is currently procuring the first black bin processing facility for residential solid waste, which could include two facilities, a commercial scale facility (200 to 1,000 tpd) and an emerging scale facility (10 to 200 tpd). Depending on the throughput of the selected commercial scale facility and the potential of the selected emerging facility to scale up to commercial scale, these two facilities could be sufficient for most of the City's residential black bin processing needs through 2030 (about 2,000 tpd at full implementation of programs).

4.6.2 Facility Phasing

The phasing schedule shown in Table 34 was prepared based on the direction of the stakeholders at the March 2009 workshops. The phasing schedule takes into account the diversion and disposal tonnage projections that would result from implementation of the policies and programs, and identifies the number and type of facilities that will be needed. The policy, program, and facility phasing approach achieves the City's goals of 75 percent diversion by 2013 and will achieve 90 percent diversion by 2025.

Table 34: Policy, Program and Facility Phasing[1]

2013	2020	2025	2030
New and expanded Programs	Additional new programs plus mandatory programs[3]	Continue new and mandatory programs	Continue new and mandatory programs
Upstream Advocacy	Continue upstream advocacy	Continue upstream advocacy	Continue upstream advocacy
1 large or 2 small compost facilities[2]	1 resource recovery center 1 recycling facility and 2 small compost facilities	1 recycling facility and 2 small composting facilities	1 recycling facility
	2 black bin processing facilities	1 black bin processing facility	2 black bin processing facilities
75%	87%	90%	97%

[1]Phasing assumed under SWIRP may not reflect actual implementation and/or roll-out of specific policies, programs and/or facilities.
[2]Facilities may be implemented by either the public or private sector, or by joint public-private partnerships, and may also include expansions to existing facilities.
[3]Statewide mandatory commercial recycling for commercial customers generating four cubic yards or greater of solid waste per week implemented in July 2012. Mandatory recycling and composting for all generators will be implemented locally by 2020.

4.7 Facility Aesthetics

It is important to integrate a facility into the community it serves, both functionally and aesthetically. Certain design and operational considerations can be applied to help integrate any structure into its neighborhood. Some communities, including the cities of Santa Barbara and Santa Monica, have established a set of aesthetic guidelines for new buildings to promote a sense of community and harmony among buildings. The following are typical design principles used to integrate solid waste facilities within the community and neighborhood they are to be built in:

- **Traffic** – Site location, off-site routes, and ingress and egress plans should be chosen to work with existing traffic patterns and limit the potential traffic burden. Facilities should also be designed to screen large scale operations from public view and to provide efficient design and operation to minimize the amount of vehicles waiting in queue and to ensure that queuing does not occur on public roadways.
- **Building size** – Solid waste facilities generally require a large clear floor space with a high roof clearance, so several design approaches are used to minimize or reduce the visual impact of the facility. These approaches can include designing the facility to blend in with nearby buildings,

identifying highways, roads and other important vantage points, and using landscape and other screens to protect the neighbors' view of the facilities.

- **Noise** – Sites should be arranged to minimize the time trucks spend idling in queue, to provide screens and landscaping that diffuse sound, and provide onsite parking as a buffer zone for sound. Operation and process noises that occur inside the facilities can be minimized by fully enclosing the building, orienting openings to face screens, and lining or insulating buildings to reduce sound.
- **Odor, dust, litter, and animal control** – Building design should include controls for reducing dust, while site design should consider prevailing wind conditions and sensitive neighbors. Proper material storage and cleaning can prevent odor and reduce the possibility of vermin (rodents and birds).
- **Community Involvement** – Projects can also increase their appeal to the community by including an education/information center, which would be capable of holding community meetings, educating citizens about recycling, and providing tours to schools. Providing a sustainable site, which may include LEED certification, may also help promote the facility in the community.

A discussion concerning aesthetics and community integration can be found in Section 5 of *Appendix D Facility Analysis* page D-45.

4.8 Market Development

Markets are a necessary component for any Zero Waste system. Intermediate and end markets provide the vehicle for beneficial use of the diverted materials by returning them to the manufacturing and production of new products. Markets also provide an important revenue source to help sustain diversion programs. Without sufficient markets even the best diversion programs will fail.

4.8.1 Commodities

The City's proximity to the ports of Los Angeles and Long Beach provides the City's processors and service-providers with the ability to readily market commodity grade materials, such as paper, plastics, and metals. Commodities are traded on the worldwide market and flow to manufacturing facilities in the U.S. and abroad. The City supports processing infrastructure through the Los Angeles Recycling Market Development Zone (LARMDZ) which provides low-interest loans to qualifying processors and manufacturers. The City can further expand local processing and manufacturing capacity by establishing local remanufacturing tax credits.

4.8.2 C&D

C&D debris is defined as materials generated through construction and demolition projects. C&D debris comprises a wide range of materials consisting of commodity recyclables (cardboard, plastic, and metals), inert materials, wood, gypsum, and wallboard. All of these materials have vibrant local markets for processing or reuse.

4.8.3 Yard Trimmings

Landfills in southern California have accepted yard trimmings for ADC at very low rates, which have had the effect of suppressing the markets for composting. City policy prohibits the use of yard trimmings for ADC, thus the LASAN has had to develop its own composting and mulching infrastructure to supplement private compost markets. Anticipated changes in State regulations regarding ADC and the closure of the Puente Hills Landfill (a large local market for ADC) will put pressure on the existing composting infrastructure in Southern California. Opportunities for development of markets for yard trimmings must include the following:

- **Reduce Contamination.** Increase outreach efforts to educate City residents about acceptable and unacceptable materials for the green bin program. This effort will lead to a reduction in contamination, improved handling of the material during processing, a better compost product, improved marketability, and lower production cost.
- **Support Ongoing Outreach Efforts.** CalRecycle held a number of workshops highlighting the benefits of recovered organics on agricultural soils. To support the ongoing outreach efforts, the City can work with CalRecycle, the local Resource Conservation Districts, and University Extension agents to support and expand these efforts.
- **Enhanced Organics Marketing Plan.** To enhance its marketing efforts, the City can undertake a written organics marketing plan that provides a detailed strategy for managing the increased volumes of organics to be diverted. The City can continue investigating how to access agricultural and horticultural markets for compost and mulch.
- **Adopt Compost Use Specifications.** The City can adopt or adapt existing CalTrans specifications for using compost and mulch in all City and/or City-contracted public works projects (such as erosion control and stormwater management).
- **Compost Use in New Development.** The City can also consider adopting a compost use requirement for any new residential or commercial development or re-development.
- **Increased use by residents.** Enhanced outreach and education of the residents of Los Angeles related to free pick-up of mulch and compost at mulch give-away sites throughout the City.

4.8.4 Food Scraps

Nearly 50 percent of the existing composting facilities in California are permitted to accept food scraps, and the number of facilities capable of handling food scraps is increasing rapidly. In addition, CalRecycle is currently examining the scientific basis for requiring food scraps to be processed at the highest tier-composting permit.[35] A number of Notification-tier facilities are successfully using a Research Notification to allow them to accept food scraps while they process the higher tier permit. The addition

[35] CalRecycle permits composting facilities according to different "tiers", based on the throughput of the facility and the types of materials processed. The lowest tier (requiring the least regulation) is the "Exempt" tier, followed (with increasing regulation) by the "Notification," "Registration," and "Full Solid Waste Facility Permit" tiers. "Research Notification" is a special designation for facilities permitted under the Notification tier that are testing composting methods. These provisions are described in the California Code of Regulations, Title 14, beginning with Section 17850.

of residential food scraps to residential yard trimmings is seen as a relatively easy collection program to implement with significant diversion potential (for the residential sector). The recommended market development strategies required to accommodate the addition of residential food scraps to residential yard trimmings collection are similar to those listed above for overall yard trimmings market development, with the following additions:

- If the addition of food scraps in the green bin is implemented citywide, the City must undertake a comprehensive outreach and education program to encourage residents to reduce contamination and increase participation. This will result in a cleaner feedstock material for processing and a better final product for the markets.
- The City should support efforts at the State level to allow all composting facilities to accept food scraps for composting (not only those permitted at the highest tier) without re-permitting the facilities. This will increase the options for City-collected organics.

4.8.5 Bulky Items

Based on route observations and estimates provided by LASAN crews, about 50 percent of the bulky items collected through the LASAN Bulky Item program could be reused or recycled if they were collected and delivered to an intermediate warehouse or delivered directly to end-use markets. Currently, LASAN is able to divert appliances, electronics, and some mattresses through special routing for these materials. All other bulky items are collected in compactor trucks which crush the items making them unsuitable for resale.

There is a vibrant reuse and recycling market in the City. However, to access these markets, the materials should be collected in a stake-bed or box truck to preserve the quality of the materials. LASAN could partner with reuse organizations to provide separate pick-up of reusable items. Alternatively, the City could lease space adjacent to its District Yards or CLARTS for aggregating the materials for resale, reuse or recycling.

Bulky Items Collected in the City

Appendix D Facility Analysis contains detailed information on both existing and emerging markets for traditional recyclables, compost, and other potential by-products from diversion programs. Attachment D-4 to the appendix also details information about developing markets for fuel, energy, and other possible by-products of Alternative Technologies.

Section 5 Alternatives to the Plan

This section describes the alternatives to SWIRP and addresses the infrastructure requirements of the status quo option (no new programs, residual waste is landfilled locally) and the long-haul options potentially available to the City. It also describes the transfer station capacity requirements, should the City or private sector operators be unsuccessful in developing sufficient local processing capacity.

5.1 Status Quo

The City has met and exceeded its regulatory requirements under State law to divert 50 percent of materials from disposal. The City achieved 72 percent diversion in 2010 and is the recycling leader among the ten largest cities in the U.S.[36] Under the "status quo" option, the City would continue its existing programs and maintain 72 percent diversion, based on the 2010 baseline data. City generators would continue to dispose of residual waste at local landfills.

Residential black bin materials from all residential curbside customers are collected by LASAN crews. This material (approx. 3,350 tpd in 2010) is direct-hauled to the Sunshine Canyon Landfill or the Calabasas Landfill for disposal; transferred at the Falcon Transfer Station or the Southern California Disposal Transfer Station for disposal at the Sunshine Canyon Landfill; or transferred at CLARTS for disposal at Sunshine Canyon Landfill or the El Sobrante Landfill. A small amount of black bin materials (approximately 100 tpd) from the Harbor wasteshed is also delivered to the Southeast Resource Recovery Facility for transformation.

The Sunshine Canyon Landfill has a permitted capacity of 12,100 tpd and a remaining life of over 20 years. The Calabasas Landfill has a permitted capacity of 3,500 tpd and a remaining life of 12 years. The El Sobrante Landfill has a permitted capacity of 16,054 tpd and a remaining life of 32 years.

Sunshine Canyon Landfill, Los Angeles

Multi-family, commercial, and C&D solid waste is collected by the private sector. This material (approximately 7,000 tpd) goes to a variety of transfer stations, and landfills throughout the region.

Approximately 425 tpd are self-hauled to landfills and transfer stations from residential and commercial sources.

[36] Waste & Recycling News, Municipal Recycling Survey 2010, February 15, 2010.

5.1.1 Projected Disposal Rates

Table 35 depicts the City's projected disposal tons through 2030 assuming that the City maintains its 2010 baseline diversion rate (72 percent) and does not implement any new diversion programs.

Table 35: Projected Annual Disposal Tons[1]

Sector	2010	2013	2020	2025	2030
Residential curbside	893,771	895,643	924,252	847,235	856,944
Multi-family	441,749	444,497	465,415	530,171	537,190
Commercial	1,441,790	1,501,553	1,584,306	1,621,493	1,649,062
C&D	71,927	73,565	76,977	77,643	78,741
Total	**2,849,237**	**2,915,258**	**3,050,949**	**3,076,542**	**3,121,937**

[1]Tonnage projections based on Southern California Association of Governments population and employment projections, Integrated Growth Forecast by Transportation Analysis Zone, 2010. Note that values may not sum to total due to rounding. Refer to *Appendix B Material Flow Model and Generation Projections*, Table 4, Page B-12.

Table 36 depicts the projected tons disposed per day for each generator sector, calculated based on five operating days per week (260 days per year). City generators currently dispose of nearly 11,000 tpd in area landfills and are projected to dispose of approximately 12,000 tpd by 2030 (assuming no new programs).

Table 36: Projected Daily[1] Disposal Tons

Sector	2010	2013	2020	2025	2030
Residential curbside[2]	3,438	3,445	3,555	3,259	3,296
Multi-family	1,699	1,710	1,790	2,039	2,066
Commercial	5,545	5,775	6,093	6,237	6,343
C&D	277	283	296	299	303
Total	**10,959**	**11,213**	**11,734**	**11,833**	**12,007**

[1]Based on 260 operating days per year.
[2]Residenital curbside and commercial sectors include self-hauled waste. LASAN collected 3,350 tpd of residential curbside black bin materials in 2010 (which does not include residential self-haul waste).

5.1.2 Existing Landfill Capacity

The permitted capacities of the landfills within the region are shown in Table 37. Even with the closure of the Puente Hills Landfill in October 2013, it appears that there will be sufficient landfill capacity in the area for years to come.

However, there is expected to be upward pressure on pricing when Puente Hills closes, which could encourage more diversion and thus, less demand for landfill disposal.

Table 37: Los Angeles Region Landfill Permitted Capacity[1]

Facility	Permitted Daily Capacity (Tons)	2012 Average Yearly/Daily Tonnage (Tons)[2]	Anticipated Closure Date
Antelope Valley Landfill	3,564	252,000/966	2042
Puente Hills Landfill	13,200	2,144,000/8,215	2013
Sunshine Canyon City/County Landfill	12,100	2,217,000/8,500	2037
Chiquita Canyon Landfill	5,000	906,000/3,470	2019
Calabasas Landfill	3,500	187,000/716	2025
Scholl Canyon Landfill	3,400	211,000/808	2030
Lancaster Landfill	1,700	208,000/800	2044
Savage Canyon Landfill	350	78,000/300	2048
City of Burbank Landfill	240	33,000/126	2053
Pebbly Beach Landfill	49	3,000/11	2020
San Clemente Landfill	10	400/1.5	2032
El Sobrante Landfill[3]	16,054	1,928,000/7,400	2045
Simi Valley Landfill[3]	9,250	663,000/2,500	2052
Frank R. Bowerman Sanitary Landfill[3]	11,500		2053
Olinda Alpha Sanitary Landfill[3]	8,000		2021
Mesquite Canyon Landfill[3]	20,000		2097

[1] Source: County of Los Angeles Countywide Integrated Waste Management Plan: 2012 Annual Report
[2] Based on 5-days/week landfill operation (261 days/year)
[3] Source: www.calrecycle.ca.gov/SWFacilities/Landfills/Tonnages/

5.2 Long Haul Options

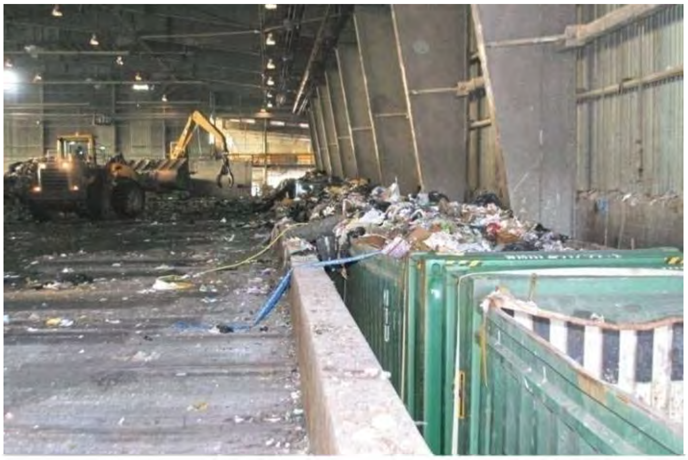
Landfill capacity is potentially available to City generators through long-haul or rail-haul to remote landfills. However, there are challenges associated with both long-haul (using transfer trucks) and rail-haul (using railcars).

5.2.1 Long-Haul

Depending on the area of the City, LASAN currently either hauls residual waste directly to local landfills in route trucks or transfers residual waste from route trucks to transfer trucks at transfer stations for hauling longer distances to landfills within the region. As capacity at local landfills decreases, there are potential long-haul options for the City to remote landfills, as discussed later in this section. However, hauling residual waste to distant disposal facilities will impact the host communities (where the landfills are located), the communities along the routes to the landfills (that will be impacted by emissions from truck traffic), and other communities impacted by the threat of global warming (due to greenhouse gas emissions from truck traffic).

Long-haul trucking can also be costly to ratepayers, potentially off-setting the lower tipping fees associated with remote landfills. The transfer fee for using CLARTS is $8.01 per ton and the CLARTS trucking cost is approximately $2.30 per mile (based on July 2013 costs). Thus, the cost to send solid waste to a remote landfill 200 miles away would be over $50 per ton for the transfer and trucking alone (including the vehicle round trip).

5.2.2 Rail-Haul



Loading Waste into Railcars, Bronx, New York

The Sanitation Districts of Los Angeles County (LACSD) has been looking at rail based transport to distant landfills as part of its overall integrated solid waste management system for nearly twenty years. LACSD serves over 5 million residents living in 78 cities and unincorporated areas. Currently, most of the residual waste remaining after source reduction and recycling in Los Angeles County is transported by truck to disposal sites that are running out of space. As siting of new disposal facilities in populated areas has become more difficult, consideration has focused on more distant facilities. For several of these sites, rail transportation is seen as an attractive alternative to long-haul trucking. LACSD is moving forward with a plan that involves rail served facilities with capacity available to meet the needs of the County into the next century. The potential facility is the Mesquite Regional Landfill, in Imperial County, which was purchased in 2002 and constructed in 2008. This landfill is designed and permitted to receive waste via rail.

The planned system involves materials recovery facilities and transfer stations, where the residual waste resulting from the processing of the recyclables and solid waste requiring disposal is loaded into intermodal containers. These containers are then transported to intermodal yards, where they are loaded onto railcars. These cars are then joined together to form the unit trains that make the 200+ mile run to the remote landfills. One such facility, the Puente Hills MRF, began operation in July 2005. LACSD is pursuing the permitting and construction of a dedicated intermodal yard adjacent to the Puente Hills MRF. This addition will permit the loading of containers with more waste than would otherwise be permitted in a situation that requires transfer of the loaded containers from the containerization facility to the intermodal site over public roads, due to weight restrictions. While there are several privately run intermodal yards in the region which could also serve as the transfer point for intermodal containers, congestion in these yards makes them less desirable.

A major part of the system is arranging for train transportation of the solid waste trains, which are expected to go to the remote landfill on existing rail lines. Each train would haul approximately 3,000 to 4,000 tons of waste. LACSD is negotiating with Union Pacific Railroad to arrange for use of the tracks for its waste-by-rail program.

5.2.2.1 Key Issues in Implementing a Rail Based Disposal System

A lot of track must be laid before a municipality decides that it is going to implement a rail based component of its long-term strategic plan. LACSD has been evaluating strategies for meeting its future landfill and transportation needs for many years. As far back as the early 1990s, rail haul was identified as a potential solution to the projected shortfall in local disposal capacity.

Among the key issues that must be addressed in implementing rail based disposal are:

- Where and how will the solid waste be loaded into rail capable containers?
- How will containers move from the loading site to the railhead, if they are not coterminous?
- How will the containers move from the origin to the destination?
- How is the waste transferred to the ultimate disposal site?

Key program decisions that must be made include:

- **Type and Size of Shipping Container –** It is important to maximize container density, as the railroads charge for moving the car independent of the weight of the contents.
- **Number of Cars and Containers** - The number of cars and containers required to meet the system requirements is very dependent on the turn time associated with moving the containers to the disposal site and returning the containers to the facility for loading. Rail haul will typically increase the number of containers required. This is due to the fact that individual containers may be en route for two weeks or more depending on the turn time from origin to destination. Turn time is a function of the distance to the disposal site, the railroads involved, and the nature of the routing plan and scheduling.
- **Routing** - Another issue is determining how the car moves from origin to destination, whether it is part of a dedicated train made up solely of solid waste, a unit train, or mixed in with other general merchandise and handled as part of the railroad's general freight. The impact can be significant. In examining alternative routing schemes, it is not unusual to find that turn times associated with unit trains can be half of the turn time associated with moving the cars as part of general freight.
- **Location of Transfer Station** - The best transfer station site is one located near existing rail lines or rail spurs. If construction of rail cannot occur on-site or immediately adjacent, then full containers will need to be trucked to a common intermodal facility for transfer to railcars.

- **Transfer of Solid Waste at Destination from Rail to Disposal Site** - The preferred alternative is to have direct rail access to the disposal location. This eliminates the issues related to road transport of solid waste containers. Special trailers with additional axles and over weight load permits may be required and increase hauling costs. Alternatively, an intermodal facility within a reasonable driving distance from the disposal location would be needed. Transport from the rail off-loading facility to the disposal facility may require road upgrades necessary to haul the heavily-loaded vehicles.
- **Own or Lease the Equipment** - Containers and railcars can either be owned or leased from the railroad or a number of available leasing companies. Another issue is ownership of the cars, whether owned by the public sponsor, the private supplier of the overall service or the railroads themselves. The railroad in most instances owns and provides the motive power, although there are instances in which the party operating a unit train is providing all the required equipment and in effect is simply renting track rights.
- **Terms of the Service Agreements** - The service agreements would need to address all of the issues related to a long-term public private partnership found in a waste transportation and disposal agreement. There are several aspects related to rail that add additional complexities to the agreement(s). First, there are typically more parties involved in providing the suite of services. In addition to the public participant needing processing/disposal services and the waste industry providing the service, there are short line and Class 1 railroads that are necessary participants in the transaction. Putting in place the required agreements among these parties requires significant effort on the part of the project team. Allocating various project risks is a balancing act trading off risk versus reward.
- **Contingency Plans** - An alternative plan is required in the event of disruption of the core transfer/transport and disposal system. Elements to be considered in establishing alternatives include establishing primary and secondary disposal locations, reachable via alternative routes, which in some instances will entail different service providers and potential shifting of the mode of transportation, on an emergency basis, if needed.

5.2.3 Remote Landfills

5.2.3.1 Mesquite Regional Landfill, Imperial County, California

Mesquite Regional Landfill, Imperial County

LACSD is developing a remote disposal system program that will provide disposal capacity for the communities of Los Angeles County to replace the capacity that will be lost when the Puente Hills Landfill closes in 2013 and local landfill capacity diminishes. The planned remote disposal system will be comprised of materials recovery/transfer stations, intermodal rail facilities, and remote out-of-county landfills. The materials recovery/transfer stations will process waste to remove recyclable materials, and the residual waste will be packed into sealed "intermodal containers," which will look like any other shipping containers. The containerized waste will be transported to intermodal rail facilities such as Puente Hills MRF, the Downy Area Recycling and Transfer facility, and the South Gate Transfer Station where the containers will be loaded onto rail cars for transport to the remote landfills. Containerized waste arriving at the remote landfill will be unloaded from the rail cars and transported to an operating area for disposal.

LACSD completed the purchase of the Mesquite Regional Landfill in December 2002. The Mesquite Regional Landfill encompasses approximately 4,200 acres, with a disposal area of approximately 2,300 acres. When fully operational, the landfill's daily disposal capacity will reach approximately 20,000 tons of refuse per day. A five-mile rail spur, to be constructed by the Districts on a Bureau of Land Management easement, will allow access to the site by trains hauling containerized waste. In early 2005, the Districts completed a master plan that addresses the integrated development of the site, provides geotechnical information, and includes a startup plan and a project implementation schedule. Construction of the infrastructure necessary to begin landfill operations began in 2006. The waste-by-rail infrastructure is scheduled to be completed in 2013.

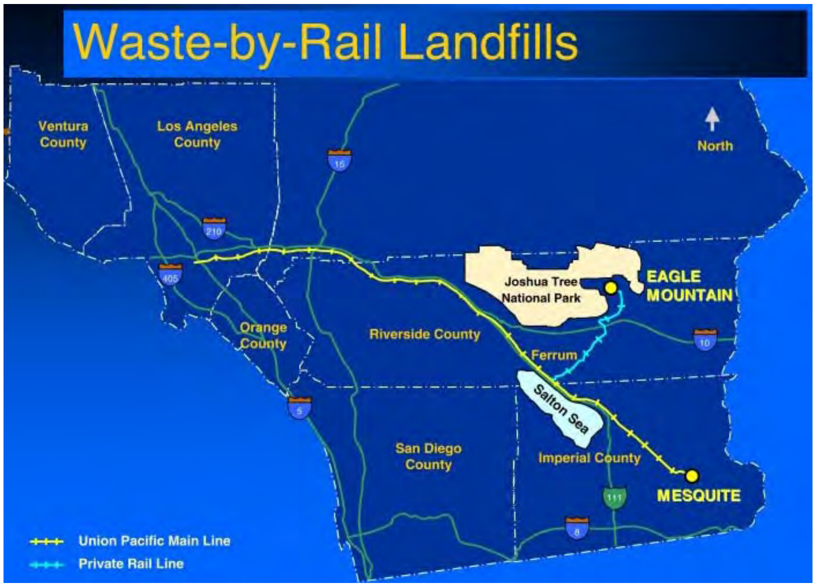
5.2.3.2 Avenal Regional Landfill, Kings County, California

The Avenal Regional Landfill is located in Kings County, about 189 miles from the City of Los Angeles. The landfill is owned and operated by Madera Disposal Systems and is permitted to receive 6,000 tpd of solid waste. The estimated closure year for the landfill is 2020.

5.2.3.3 El Sobrante Landfill, Riverside County, California

The El Sobrante Landfill is located in Riverside County, about 59 miles from the City of Los Angeles. The landfill is owned and operated by USA Waste Services of California and is permitted to receive 16,054 tpd of solid waste. The estimated closure year for the landfill is 2045.

5.2.3.4 Eagle Mountain Landfill, Riverside County, California



LACSD Waste-by-Rail Landfills

The Eagle Mountain Landfill is located ten miles north of Desert Center in Riverside County, about 184 miles from the City of Los Angeles. The landfill is owned by Mine Reclamation Corporation and was permitted in 2000, but is not yet operational. The facility had been proposed as a waste-by-rail project for the LACSD, along with the Mesquite Regional Landfill, to replace the Puente Hills Landfill after its closure in October 2013 and once other regional landfills reach capacity. The Eagle Mountain Landfill is designed to receive 20,000 tpd of solid waste and would have a project life of approximately 100 years. Development of the Eagle Mountain Landfill has been controversial and on July 30, 2010, the 9th Circuit Court of Appeals denied motions for a re-hearing by project proponent Kaiser Eagle Mountain Inc., which hoped to reverse the court's November ruling against the project. On May 22, 2013, the LACSD Board determined that the agency will cease negotiations with Mine Reclamation Corporation.

5.2.3.5 Gregory Canyon Landfill, San Diego County, California

The Gregory Canyon Landfill is proposed for northern San Diego County and would accept solid waste, inert waste, and dewatered sewage sludge and would not be allowed to accept hazardous wastes for disposal. The proposed project site covers approximately 1,770 acres, with landfill activities occurring on approximately 183 acres. The landfill will have a design capacity of approximately 46 million cubic yards (or 31 million tons) of waste and an expected service life of approximately 30 years.

The solid waste facilities permit is being reviewed by the local Lead Enforcement Agency and CalRecycle. An updated Environmental Impact Report was circulated in early 2013.

5.2.3.6 Copper Mountain Landfill, Arizona

The Copper Mountain Landfill (CML) is located in Wellton, Arizona. CML accepts residential solid waste (including yard trimmings), white goods (void of CFCs), construction and demolition debris, tires (segregated and temporarily stored until they are shipped off-site), asbestos, wastewater treatment plant sludge, petroleum contaminated soil (PCS), fly ash and other non-hazardous waste. The Copper Mountain Landfill has a design capacity of approximately 2.8 million tons and a future lifespan of approximately 50 years.

5.2.3.7 ECDC Landfill, Utah

ECDC Environmental L.C. is a rail-served landfill facility, owned by Allied Waste Industries. Over 2,300,000 tons of waste has been shipped to ECDC by Waste By Rail, Inc., since ECDC landfill facility opened in 1992.

Located in East Carbon Utah, this facility is situated on 2,500 acres of private land and is permitted for the disposal of over 300 million cubic yards of non-RCRA wastes.

The ECDC facility can process over 30,000 tons of waste per day and contains over 10,000 feet of railroad track that is served by the Union Pacific Railroad. Southern California customers of ECDC include: Lockheed, the City of Los Angeles Department of Water and Power, the Port of Los Angeles, and the Sanitation Districts of Los Angeles County.

According to the Utah Solid Waste Plan Update, dated March 2002, ECDC has the capacity to dispose of all of the waste generated in Utah for the next 100 years.

5.2.3.8 Apex Regional Landfill, Clark County, Nevada

The Apex Regional landfill is owned by Republic Services and is located in Clark County, Nevada. The Apex landfill has a capacity of 865,000,000 cubic yards, and is projected to close in 2150. The landfill is Nevada's largest landfill, receives an average of over 11,000 tons of solid waste per day, and is open 24 hours a day, seven days a week. Although the Apex Landfill is not currently receiving imported waste, it is accessed by a rail line, making future importation from southern California a possibility. Apex's estimated life under the current permit is in excess of 40 years, and Republic owns additional acreage at the site that would allow for further expansion.

5.3 Transfer Station Capacity

This plan assumes that the City and private sector operators will be successful in siting the needed number of blue bin, green bin, and black bin facilities throughout the City and within each wasteshed. The stakeholders who participated in the SWIRP planning process supported the development of community scale facilities within each wasteshed to handle the materials generated within each wasteshed. However, because of the difficulties of siting new or expanding existing facilities, the City may need to transfer some materials between wastesheds for processing or transfer materials outside of the City for composting or ultimate disposal.

Citywide disposal is projected to be 1.5 million tpy at full implementation of SWIRP programs. This is the equivalent of 5,100 tpd (based on 300 operating days per year). Residents and businesses in the City are expected to generate up to 1.4 tpy or 4,600 tpd (based on 300 operating days per year) of green bin materials citywide in 2030 at full implementation of programs. If the City or private sector operators are unsuccessful in siting new green bin processing capacity, at least some additional transfer station capacity may need to be secured by 2030 in order to meet the City’s needs. Up to 9,700 tpd of black bin and green bin materials generated citywide may need to be transferred between wastesheds or outside of the City if the City or private sector operators are unsuccessful in siting new MMP facilities and compost facilities within the City.

Attachment D-3 Existing Facility Capacity Analysis in *Appendix D Facility Analysis*, beginning on page D-3-1 describes the excess capacity currently available at existing transfer stations within the region used by City generators in 2006. The analysis concluded that there was between 4,800 and 8,150 tpd of available or planned capacity at existing transfer stations. Table 38 summarizes this analysis.

The additional transfer capacity was estimated using the information developed from the Facility Surveys included in Attachment C-1 in *Appendix C Infrastructure and Materials Flows*, beginning on page C-1-1. Each facility was asked about its current expansion plans and expansion potential.

- Several facilities, including Athens (Sun Valley), Community Recycling, Compton, Paramount, Southern California Disposal, and Waste Resources Recovery were actively engaged in pursuing permits for expansion. CLARTS developed a master plan to evaluate the feasibility of increasing its processing capacity.
- Several facilities were known to have some excess capacity or were operating at less than their permit limits including, American Waste, CLARTS, and the East Los Angeles Recycling & Transfer Station (ELARTS).
- The Falcon Refuse Transfer Station, located in the Harbor wasteshed, had no current plans to expand its facility. However, it reported that it has the physical capability of expanding from 1,850 tpd to 5,600 tpd. In addition, the Bradley Transfer Station (which was not operating in 2006 during the timeframe of the facility surveys) was pursuing an expansion to 5,000 tpd.

Based on this information, there is potentially as much as 15,400 tpd of excess or potential new transfer capacity in the region that could be available to generators in the City. LASAN may wish to secure long-term agreements for some transfer capacity. However, it appears that the private sector operators are investing in sufficient capacity to meet the needs of the generators in the City.

Table 38: Existing and Planned Transfer Station Capacity

Transfer Stations	Permitted Capacity (tpd)	Estimated Additional Transfer Capacity (tpd)
American Waste Transfer Station	2,225	100-200
Athens Services Transfer Station	5,000	--
Athens (Sun Valley)	1,500	500-1,000
Bel-Art Waste Transfer Station	1,500	--
Carson Transfer Station	5,300	--
Central Los Angeles Recycling & Transfer Station (CLARTS)	4,025	1,000-2,500
Community Recycling	1,700	500-800
Compton Recycling and Transfer Station (Browning Ferris Industries)	1,500	600-1,000
Downey Area Recycling and Transfer Station (DART)	5,000	--
East Los Angeles Recycling & Transfer Station (ELARTS)	700	100-150
Falcon Refuse	1,850	--
Innovative Waste Control	1,250	--
Mission Road Recycling and Transfer Station (Waste Management)	1,785	--
Paramount Resource Recycling Facility	2,400	200-500
South Gate Transfer Station – Los Angeles County Sanitation District	1,000	--
South Gate Transfer Station – Waste Management	2,000	--
Southern California Disposal	1,056	300-500
Waste Resources Recovery	500	1,500
Total	**40,291**	**4,800-8,150**

Data based on surveys conducted for SWIRP of facilities used by City generators in 2006.
Refer to *Appendix D Facility Analysis*, Table 19, page D-33.
Note: Falcon Refuse has the physical capability of expanding from 1,850 tpd to 5,600 tpd and Bradley Transfer Station (which was not operating in 2006 during the timeframe of the facility surveys) is pursuing an expansion to 5,000 tpd.

Section 6 Land Use

6.1 General/Community Plans

California State law requires every city and county to adopt a comprehensive General Plan to guide future development. The City's 35 community plans collectively comprise the Land Use Element of the General Plan. As part of the recently established New Community Plan Program, the Planning Department is studying the land use plans for nine of the City's 35 communities. The purpose of this ongoing program is to ensure that the plans are kept up-to-date so they can effectively guide growth and development in the City's neighborhoods. Community Plans guide the physical development of the City's neighborhoods by designating land for a range of uses such as housing, business, industry, and open space. The planning process involves community input to identify issues and opportunities and set goals for development.

Community Planning Areas

Planning for public infrastructure, including reserving space for recycling and solid waste infrastructure (such as S.A.F.E. Centers, Resource Recovery Centers, processing facilities and District Yards), is an important consideration in the development of the City's Community Plans. LASAN is working with the Planning Department to ensure that public infrastructure needs are being considered in the planning process and new facilities are identified in the solid waste section of the Community Plans.

6.2 Environmental Justice

Solid waste facilities have usually been sited in heavy industrial zones and residents living adjacent to these zones may be affected by cumulative impacts. When siting new solid waste facilities, the City must consider Environmental Justice concerns and take a precautionary approach. Environmental Justice is defined in California law[37] as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies." The California Environmental Protection Agency (Cal/EPA) has prepared an Environmental Justice Action Plan to develop guidance on Environmental Justice issues (such as "precautionary approaches" and "cumulative impacts") for State boards, commissions, and regulatory agencies to ensure that Environmental Justice concerns are integrated into the State's environmental programs. Working definitions include:[38]

- **Cumulative impacts** means exposures, public health or environmental effects from the combined emissions and discharges in a geographic area, including environmental pollution from all sources, whether single or multi-media, routinely, accidentally, or otherwise released. Impacts will take into account sensitive populations and socio-economic factors, where applicable and to the extent data are available.
- **Precautionary approach** means taking anticipatory action to protect public health or the environment if a reasonable threat of serious harm exists based upon the best available science and other relevant information, even if absolute and undisputed scientific evidence is not available to assess the exact nature and extent of risk.

6.3 Planning Code Amendments

To facilitate the siting of new technology facilities for treating residual waste and recognizing Environmental Justice concerns about impacted communities within industrial zones, RENEW LA sought to expand the number of locations within the City that could be considered for new technology facilities.

Based on this RENEW LA goal, LASAN worked with the Planning Department to amend the Zoning Ordinance to allow Alternative Technology facilities in the M3 (heavy industrial), M2 (commercial and light industrial) and PF (public facility) planning zones within the City. By increasing the number of potential sites for new technology, the City can identify potential locations that will not adversely affect already impacted Environmental Justice communities. The Solid Waste Alternative Technology Processing Facility Ordinance was adopted by the City Council on August 4, 2010.[39]

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[37] California Government Code section 65040.12.

[38] California Environmental Protection Agency, EJ Action Plan, http://www.calepa.ca.gov/EnvJustice/ActionPlan/ (accessed October 1, 2013).

[39] Solid Waste Alternative Technology Processing Facility Ordinance, http://clkrep.lacity.org/onlinedocs/2008/08-0594_ord_181272.pdf (accessed October 1, 2013)

6.4 Siting Options

SWIRP stakeholders have affirmed the approach of siting facilities locally and sharing the benefits and impacts. In the context of the stakeholder guiding principle of "equity," stakeholders specifically directed that SWIRP:

- Promote equitable solutions that do not unfairly reward or penalize one community over another.
- Share the benefits and impacts fairly between each community.
- Will not burden other communities or environmentally sensitive natural or wilderness areas with waste generated in Los Angeles.

During Phase 1, stakeholders discussed both "neighborhood scale" and "regional scale facilities."

- **Neighborhood scale facilities** – including S.A.F.E. Centers, Resource Recovery Centers, small scale reuse and recycling operations and small scale composting operations should be sited in areas that are nearby generators to facilitate convenient access for drop-off and retail sales.
- **Regional scale facilities** – including large scale recycling, composting, C&D facilities, transfer stations and Alternative Technology facilities should be sited in areas that will reduce impacts on local communities.
- **All facilities** – should be designed to blend into the surrounding land uses and should include mitigation measures to reduce impacts, such as traffic, noise, odor, and emissions.

In evaluating sites for new solid waste facilities, the City must take into account siting criteria to reduce impacts to the surrounding community. The City is currently conducting a siting study to identify potential sites for Alternative Technology facilities. Siting criteria includes the following:

- **Parcel area** – the area required for a facility is dependent upon the technology and the throughput of the facility. However, a minimum of five acres would be needed, with larger areas preferred because this would provide more flexibility and buffer from adjacent landowners. The five acre minimum could be met by parcels that individually or combined total five or more acres in area; sites less than five acres will be included if they have adjacent sites, when combined would exceed five acres.
- **Parcel ownership** – the preferred scenario is to locate the facilities at a site owned by the City or other municipalities because land acquisition in this case should be easier.
- **Parcel access** – feedstock for the facilities would be delivered via collection or transfer trucks. Therefore, access to freeways and a major road will minimize traffic impacts on local streets.
- **Land use compatibility** – permitting and public support will be enhanced if the facility is located amongst other similar facilities in M2 (light industrial) and M3 (heavy industrial) and PF (public facility) zones.
- **Direct impact on people** – the goal for this project is to locate the facility as far removed from residential areas as is feasible.
- **Impact on local communities** – another goal is to locate the facility in areas that do not have sensitive land uses such as schools, medical facilities, historic buildings, or parks.

- **Environmental justice** – the goal is to locate this project without impacting low income communities or minority communities.

The City has screened over 20,000 parcels that could be potentially suitable for Alternative Technology with the goal of evaluating a short list of 20 sites for feasibility. Once a top ranked site or sites has been identified, the City will perform an extensive environmental review that will evaluate the environmental impacts, the potential mitigation measures, and alternatives to the project. Public outreach will continue throughout the process to ensure that the site and mitigation measures are appropriate for the host community.

Section 7 Conclusion

The Phase 2 planning process continued with development of the *Program Environmental Impact Report*, the *Financial Plan*, and the *Implementation Strategy*.

7.1 Next Steps

7.1.1 Environmental Review

The City is required by State law, the California Environmental Quality Act,[40] to conduct an environmental review of any plans or projects that could have a significant impact on the environment. The purpose of the environmental review is to identify potential environmental impacts of the proposed plan or project, analyze these potential impacts, and identify mitigation measures for reducing these impacts to less than significant levels.

The environmental review process also provides a forum for the public to hear about proposed projects, comment on their potential impacts, and provide input through the public hearing process.

The *Policy, Program, and Facility Plan* is not a specific "project" under State law. Therefore, the City conducted a Program Environmental Impact Report (EIR) to evaluate the potential impacts of the plan as a whole. Individual projects, such as any new facility development, would require additional site-specific environmental review and the development of separate environmental documentation.

7.1.2 Financial Plan

The SWIRP financial plan comprises an economic analysis of the SWIRP policies, programs, and facilities, a projection of capital and operating costs for the system, the impacts on the rate payers, and alternative fee mechanisms. It contains a detailed economic model that will be used to project the costs, revenues, and rate impacts of the plan through 2030, with:

- **Capital Project Cost** – including all stationary and mobile equipment, buildings, land, site preparation, utilities, start-up, development, environmental, design, and construction
- **Annual Operating Expenses** – including labor, maintenance, fuel, utilities, general and administrative, consumables, supplies, insurance, and if privately owned, taxes, overhead, and profit, and tip fees paid to privately owned recovery/disposal facilities
- **Transportation Cost** – including the cost associated with transporting materials to markets and residual waste to either Alternative Technology facilities or final disposal sites
- **Potential Revenues** – including assumptions on recoverable materials and associated market prices, energy sales revenue, interest on reserve funds, and tip fees paid to the City
- **Funding Sources** – including service fees, franchise fees, permit fees, producer fees, capital financing, federal, and State grants and loans

[40] Public Resources Code Section 21000 et seq.

7.1.3 Implementation Strategy

The SWIRP implementation strategy includes all of the tasks, including the decision points, and detailed implementation steps necessary to implement SWIRP, including all policies, programs, and facilities.

The implementation strategy is a comprehensive roadmap to the City's integrated resources management future and describes how all existing and planned policies, programs, and facilities will work together to achieve the City's goals. The implementation plan includes all of the analyses and information developed for Phase 2, including:

- Waste models, material flows, and generation projections
- Existing programs, facility analyses, and service voids
- Integrated resources management system components
- Integrated facilities/program plan summary
- EIR summary
- Financial plan summary
- Action plan and schedule

7.2 Phase 2 Stakeholder-Driven Planning Process

The stakeholder-process continued throughout Phase 2, with regional workshops and citywide conferences to ensure that the plan elements reflected the goals and visions of the SWIRP stakeholders and the guiding principles they established in Phase 1. Table 39 provides the Phase 2 schedule.

Table 39: SWIRP Phase 2 Schedule

2008-2009	2010-2014
Tasks Policy, Programs, and Facility Plan **Events** Regional workshops 4th Citywide conference	**Tasks** Environmental Impact Report Financing and funding plan Implementation strategy **Events** Public hearings on draft and final EIR Regional workshops 5th Citywide conference

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Appendix A

Policy and Program Analysis

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Section 1 Introduction

The City of Los Angeles (City) initiated Phase 1 of the Solid Waste Integrated Resources Plan (SWIRP) in the spring of 2007. The City is taking an innovative approach to developing SWIRP by engaging residents, businesses, and other stakeholder groups to provide input and guidance throughout the planning process. The goal of this process is the development of a master plan to achieve Zero Waste in Los Angeles. During Phase 1, stakeholders met with City staff to formulate the City's goals to provide sustainable solutions, resource conservation, source reduction and recycling, renewable energy, maximum material recovery, and environmental protection for solid waste management planning through 2030. Phase 1 culminated in the adoption of stakeholder guiding principles at a citywide conference held on May 3, 2008.

Phase 1 activity involved numerous meetings and brainstorming sessions with stakeholders, resulting in the identification of over 80 potential policies and programs that the City could implement and/or improve upon. During the Phase 2 process, the City conducted research and analysis of over 40 of those policy and program options which were identified as potential components of SWIRP and began the development of a material flow model to quantify the diversion potential associated with the options under consideration. The policies and programs include various options to address residential and non-residential waste streams to maximize citywide waste diversion.

The material flow model was developed to evaluate the effects of different Zero Waste strategies on disposal and diversion throughout the City. This spreadsheet-based model of the City's waste stream tracks materials as they originate from the generators of the materials and pass through various types of facilities, and are then directed to markets, transformation, or final disposal. The material flow model is described in detail in *Appendix B, Material Flow Model and Generation Projections*.

During Phase 2, the City's stakeholders provided input in the development of an integrated *Policy, Program, and Facility Plan*. This report addresses the policy and program components of that plan and provides an analysis of the policy and program options that were then selected for the material flow model.

Section 2 Policies and Programs Selected for Material Flow Model

The City conducted a workshop in December 2008 to review the various policy and program initiatives developed during SWIRP Phase 1 and to select those that would be included in the material flow model.

2.1 Criteria for Selection

The criteria used for making the policy and program selections were as follows:

- Quantifiable (e.g., can reasonably project increased tonnages of materials that will be diverted from disposal, based on the policy or program being fully implemented)
- Did not duplicate another policy or program already in place
- Did not duplicate facility analysis (e.g., alternative technology is included in facility analysis)
- Consistent with integrated waste management hierarchy (e.g., first reduce waste at the source, then pursue reuse and recycling to further divert waste from landfills) advocated by the California Department of Resources, Recycling, and Recovery (CalRecycle)
- Consistent with the following 12 guiding principles selected by stakeholders:
    1. Education to decrease consumption
    2. City leadership as a model for Zero Waste practices
    3. Education to increase recycling
    4. City leadership to increase recycling
    5. Manufacturer responsibility
    6. Consumer responsibility
    7. Convenience
    8. Incentives
    9. New, safe technology
    10. Protect public health and the environment
    11. Equity
    12. Economic efficiency

2.2 Policy and Program Initiatives Reviewed and Selected

The master list of policy and program initiatives identified by SWIRP stakeholders during Phase 1 is presented in Tables 1 through 6. For ease of review, and by using the criteria for selection described in Section 2.1, we have highlighted the policy and program initiatives that correspond to the scenarios described in Section 3 as follows:

- Scenario 2 – yellow (new programs)
- Scenario 3 – blue (mandatory requirements)
- Scenarios 4 and 5 – green (advocacy for upstream producer responsibility)

Table 1: Non-Residential Policies and Programs

Non-Residential Policies and Programs
1. Mandatory business recycling programs
a. Requiring all businesses to have recycling services (of any kind)
b. Requiring all businesses to separate specific materials for recycling (Santa Cruz County, CA; Seattle, WA)
c. Requiring all businesses to reach a specific diversion level (e.g., 50%)
d. Banning certain materials from disposal (cardboard, construction and demolition (C&D))
e. Mandating C&D recycling – 50% and above (current program – increased diversion rates)
f. Requiring all food service establishments to participate in the City's food scrap diversion program (current program – increased participation)
g. Rolling out recycling services to all public schools in the City (current program – increased participation)
h. Rolling out recycling services to all multi-family buildings in the City (current program – increased participation)
2. Requirements on commercial haulers
a. Requiring all commercial haulers to reach a specific diversion level
b. Requiring all commercial haulers to provide recycling services to all of their customers
c. Requiring preprocessing of all loads prior to disposal (MRF first)
d. Requiring processing of all C&D loads
e. Requiring processing of all roll-off loads
3. Commercial rate structure incentives
a. Modifying refuse and recycling rates to encourage diversion instead of disposal

Table 1: Non-Residential Policies and Programs (continued)

Non-Residential Policies and Programs
4. Increased outreach and technical assistance to commercial businesses to increase recycling
a. Direct technical assistance (City staff or contractors)
b. Large-scale media campaigns (e.g., Don't Mess with Texas, Flex Your Power)
c. Social marketing programs for specific generator types or districts (Business Improvement Districts or Building Owner and Manager Association or other)
5. Self-haul
a. Ordinance requiring Resource Recovery Centers at all transfer stations and landfills
b. Site Resource Recovery Centers in each collection district
c. Increased outreach and education

Table 2: Other Polices and Programs (Upstream)

Other Policies and Programs (Upstream)
Extended producer responsibility (EPR)
1. EPR for toxics
2. EPR for difficult-to-recycle materials
3. EPR for easy-to-recycle materials
4. Packaging legislation
5. Single-use bag ban
6. Advance disposal fees and takebacks
7. Local product sales bans
8. Local takeback requirements
9. Local product bans from collection system
10. Local product bans from transfer and disposal
11. Voluntary local EPR programs
Environmentally preferable purchasing (EPP)
12. EPP for recyclables
13. EPP for takebacks and less-toxics
14. Precautionary principle (e.g., determine whether product/supply has negative impact before purchasing)
Product redesign
15. Product redesign for toxics
16. Product redesign for difficult-to-recycle products

Table 3: Other Policies and Programs (Downstream)

Other Policies and Programs (Downstream)
17. City Department Mandatory Diversion
18. CLARTS Recycling
19. Residential Pay-As-You-Throw (PAYT)
20. Residential Blue Bin Ambassadors for additional capture
21. Residential textiles
22. Residential black bin to MRF
23. C&D plan
24. Mandatory C&D recycling – see non-residential above
25. Resource Recovery Centers
26. Bulky item reuse and refurbishment
27. Public area recycling
28. Multi-family recycling – see non-residential above
29. Source separation recycling (mandatory recycling separation policy)
30. Zero Waste at schools
31. Organics out of landfills
32. Restaurant food scrap recycling – see non-residential above
33. Other organics collection programs
34. Organics markets – Caltrans
35. Organics markets – City to farmers or local community gardens and nurseries
36. Organics markets – phase out ADC
37. Residential yard trimmings increase
38. Yard trimmings disposal ban
39. Residential food to green bin
40. Planning and zoning (help farmers, composters, reuse and recycling businesses obtain permits)
41. Focus on more business assistance – see non-residential above
42. Incentive rates and fees for commercial (see non-residential above) and residential
43. Waste hauling and landfill fees and surcharges
44. Franchises

Table 3: Other Policies and Programs (Downstream) (continued)

Other Policies and Programs (Downstream)
45. Non- or semi-exclusive franchises
46. Exclusive franchise
47. Mandatory commercial dirty MRF
48. Dirty MRF all residuals
49. Mandatory organics separation
50. Multi-family recycling
51. Multi-family green waste collection

Table 4: Change the Culture

Change the Culture
52. Education
53. Training and instructions
54. Inspiration
55. Messages
56. Signage
57. Feedback and contests

Table 5: Green Businesses and Jobs

Green Businesses and Jobs
58. Promote sustainability tools
59. City buys from green businesses and Zero Waste processors
60. Permit assistance
61. Zoning assistance
62. Zero Waste procurement practices
63. Local market development
64. Regional market development
65. State recycled-content legislation
66. Other State and federal market development initiatives
67. Residuals management
67. Zero Waste success matrix (R&D)
68. Fair share policy

Table 6: Residual Waste Management

Residual Waste Management
69. No put or pay
70. Phase out urban landfilling
71. MRF first
72. Digest non-source-separated materials
73. Digest residual waste after processing through dirty MRF
74. Digest biosolids
75. Alternative Technology
76. Support *Green LA Plan* goals

Additional policies and programs that cannot be quantified in the material flow model are included in SWIRP because they enhance the effectiveness of waste diversion policies and programs needed to meet Zero Waste goals. These programs are described in Section 5.

Section 3 Scenarios for Material Flow Model

3.1 Developing Scenarios

A number of the selected programs are logically related to each other because they provide new or enhanced services to residents and businesses, while many of the policy options would require the City to adopt ordinances or modify hauler requirements to place mandatory requirements on residents, businesses, and waste haulers. In addition, advocating for Extended Producer Responsibility (EPR) is distinct from other programs and policies because it focuses on changes in the production and distribution of packaging and products on a regional, national, or even international level. Many of the policies and programs will be developed over time through additional research, testing, and pilot programs before a full-scale rollout takes place.

The result of these workshop discussions was the development of the following five scenarios for the selected programs and policies:

1. No new policies or programs (Baseline)
2. New policies and programs
3. Add mandatory requirements to Scenario 2 (new policies and programs)
4. Add upstream policies to Scenario 2 (new policies and programs)
5. Add upstream policies to Scenario 3 (mandatory policies and programs)

These scenarios were presented to the SWIRP stakeholders at the regional workshops in March 2009. Scenario 5 is considered the full implementation of SWIRP, since it includes all new, mandatory and upstream policies and programs.

The policies and programs, including the waste generator sector targeted by the program, are described below.

3.1.1 Scenario 1: No New Policies or Programs (Baseline)

Scenario 1 assumes that the City does not implement any new policies or programs, in order to establish a base case for comparison with the other programs and policies selected for the material flow model. The City stays at 72 percent diversion.[1]

3.1.2 Scenario 2: New Policies and Programs

Table 7 presents Scenario 2 and includes programs selected from the master list (Section 2.2) of policies and programs.

[1] The 72 percent diversion rate is based on 2010 baseline year tonnage data.

Table 7: Scenario 2 New SWIRP Policies and Programs

Generator Sector	Initiative (Scenario 2)
Residential curbside	Modify refuse and recycling rates Recycling ambassador (education) Add textiles to blue bin or partner with a non-government organization to increase textile diversion Bulky item reuse Add food scraps to green bin Large scale media/social marketing
Multi-family	Modify refuse and recycling rates Multi-family recycling Recycling ambassador (education) Add textiles to blue bin or partner with a non-government organization to increase textile diversion Bulky item reuse Multi-family green bin Add food scraps to green bin Large scale media/social marketing
Commercial	Require all businesses to have recycling services Require all commercial haulers to provide recycling services to their customers Modify refuse and recycling rates Direct technical assistance Large scale media campaign-social marketing Provide more public recycling areas
C&D sites	Require all C&D loads to be processed Direct technical assistance

3.1.3 Scenario 3: Add Mandatory Requirements to Scenario 2

Table 8 presents Scenario 3 (Mandatory Policies and Programs), which includes programs selected from the master list of policies and programs added to Scenario 2 (New Policies and Programs).

Table 8: Scenario 3 Mandatory Policies and Programs

Generator Sector	Initiative (Scenario 3)
Residential curbside and multi-family	Mandatory recycling separation Mandatory organics separation Ordinance requiring Resource Recovery Centers at transfer stations and landfills Recycling ambassadors (enforcement)
Commercial	Mandatory C&D recycling Mandatory organics separation Ordinance requiring Resource Recovery Centers at transfer stations and landfills Direct technical assistance (enforcement)
C&D sites	Ordinance requiring Resource Recovery Centers at transfer stations and landfills Direct technical assistance (enforcement) Increase diversion requirements at C&D facilities

3.1.4 Scenario 4: Add Upstream Policies to Scenario 2

Scenario 4 includes upstream programs selected from the master list of policies and programs added to Scenario 2 (New Policies and Programs), including:

- Advocate for EPR for toxics
- Advocate for EPR for difficult-to-recycle materials
- Advocate for State packaging legislation
- Single-use bag ban
- Advocate for manufacturers to develop lifecycle analyses for products and packaging, taking into account all environmental impacts of the product from manufacturing to the end of its useful life
- Advocate for legislation to incentivize manufacturers to use local reuse and recycling markets for the products they manufacture

3.1.5 Scenario 5: Add Upstream Policies to Scenario 3

Scenario 5 (Full Implementation of SWIRP) includes upstream programs selected from the master list of policies and programs added to Scenario 3 (Mandatory Policies and Programs), including:

- Advocate for EPR for toxics
- Advocate for EPR for difficult-to-recycle materials
- Advocate for State packaging legislation
- Single-use bag ban
- Advocate for manufacturers to develop lifecycle analyses for products and packaging, taking into account all environmental impacts of the product from manufacturing to the end of its useful life
- Advocate for legislation to incentivize manufacturers to use local reuse and recycling markets for the products they manufacture

3.2 Analysis of Diversion Potential of Policies and Programs

Through research of comparable programs and policies selected for the material flow model (described in *Appendix B, Material Flow Model and Generation Projections*), reasonable assumptions were developed to calculate the waste diversion associated with each option. The assumptions regarding participation and efficiency associated with each program were developed to reflect diversion potential once the program is fully implemented, and has been in place for two to three years. This way, sustainable levels of diversion potential are reflected appropriately.

Tables 9 and 10 list the participation rates and efficiency rates developed for the model. "**Participation rates**" means the percentage of total generator sector tons available that are targeted by the program; "**efficiency rates**" means the percentage of the targeted tons that can be reasonably diverted by the program; and "**capture rate**" is the yield or product of the participation rate and efficiency rate which is used to estimate the net tons diverted. These participation and efficiency rates are inputs in the material flow model and are used to calculate the net additional tons that can be diverted for each program and policy implemented. For example, if the target generator sector produces 100 tons per year of aluminum cans, and the program has a 50 percent participation rate and 30 percent efficiency rate, then the total resulting capture rate would be 15 percent and the program would yield 15 additional tons of diversion (e.g., 100 tons available × (50 percent participation × 30 percent efficiency = 15 percent capture) = 15 tons).

3.2.1 Residential Policy and Program Assumptions

Table 9 provides the residential policy and program assumptions for the "participation rate," "efficiency rate," and the resulting "capture rate" for each program. The programs are grouped by scenario and are color-coded to match the scenario colors included in Tables 1 through 6.

Table 9: Residential Policy and Program Assumptions

		Policy	Materials	Participation	Efficiency	Capture Rate
Scenario 2	**21.**	Add textiles to residential blue bin	Textiles	50%	50%	25%
	39.	Add food scraps to green bin	Food, compostable paper	30%	30%	9%
	26.	Bulky item reuse, refurbishment, and recycling	Major appliances Bulky items	90% 90%	75% 23%	68% 21%
	19.	Pay-As-You-Throw	Recyclable materials[1] Compostable materials[2] All other materials[3]	100% 100% 100%	32% 18% 6%	32% 18% 6%
	20.	Recycling ambassador	Recyclable materials	15%	30%	5%
	4b/c.	Social marketing/media campaign	Recyclable materials, electronics, appliances, bulky items, tires, HHW	20%	25%	5%
	50.	Add multi-family recycling	Other ferrous Other nonferrous, recyclable film, mixed plastic reuse, textiles All other recyclable materials	35% 20% 50%	50% 50% 50%	18% 10% 25%
	51.	Add multi-family green waste collection	Green waste	20%	50%	10%
	3a.	Modify refuse and recycling rates (multi-family)	Recyclable materials Compostable materials All other materials	100% 100% 100%	8% 5% 1%	8% 5% 1%
Scenario 3	**29.**	Mandatory recycling separation policy	Paper Metal, glass All other recyclable materials	100% 100% 75%	75% 80% 75%	75% 80% 56%
	49.	Mandatory organics separation policy	Food, compostable paper Green waste	90% 95%	30% 90%	27% 86%
	5a.	Ordinance requiring Resource Recovery Centers	Recyclable materials, organics, selected C&D materials[4], bulky items, electronics Concrete, asphalt paving, tires Major appliances	50% 75% 75%	40% 50% 100%	30% 38% 75%
	4a/20.	Enforcement		10%	50%	5%

Table 9: Residential Policy and Program Assumptions (continued)

		Policy	Materials	Participation	Efficiency	Capture Rate
Upstream						
	1 EPR	Advocate for EPR for toxics	HHW	90%	90%	81%
	2 EPR	Advocate for EPR for difficult to recycle materials	Major appliances, mixed plastic non reuse, tires	80%	75%	60%
	4 EPR	State packaging legislation	EPS, mixed plastic non-reuse	90%	90%	81%
	5 EPR	Single-use bag ban	Paper bags, mixed waste paper, recyclable film	90%	90%	81%

[1]**Recyclable materials:** Cardboard, paper bags, newspaper, mixed waste paper, compostable paper, glass containers, tin/steel cans, other ferrous materials, aluminum cans, other nonferrous, plastic #2 containers, plastic #1 containers, expanded polystyrene, recyclable film, mixed plastic reusable/recyclable, textiles
[2]**Compostable materials:** Compostable paper, food, green waste
[3]**All other materials:** Remainder/composite paper, flat glass, remainder/composite glass, remainder/composite metal, electronics, major appliances, mixed plastic non reuse/recycle, manures, remainder/composite organic, concrete, asphalt paving, asphalt roofing, lumber, gypsum board, rock, soil and fines, remainder/composite construction and demolition, HHW, ash, sewage solids, bulky items, tires
[4]**Selected C&D Materials:** Asphalt roofing, lumber, gypsum board, rock, soil, fines

3.2.2 Commercial Policy and Program Assumptions

Table 10 provides the commercial policy and program assumptions for the "participation rate," "efficiency rate," and the resulting "capture rate" for each program. The programs are grouped by scenario and are color-coded to match the scenario colors included in Tables 1 through 6.

Table 10: Commercial Policy and Program Assumptions

		Policy	Materials	Participation	Efficiency	Capture Rate
Scenario 2	1a.	Requiring all businesses to have recycling services	Recyclable paper	100%	20%	20%
			Mixed plastic reusable/recyclable	100%	5%	5%
			All other recyclables	100%	15%	15%
	2b.	Requiring all commercial haulers to provide recycling services to all of their customers	Glass containers	20%	70%	14%
			Recyclable plastics	40%	90%	36%
			Recyclable paper and metal	20%	90%	18%

Table 10: Commercial Policy and Program Assumptions (continued)

		Policy	Materials	Participation	Efficiency	Capture Rate
	3a.	Modifying refuse and recycling rates	Recyclable materials	100%	32%	32%
			Compostable materials	100%	18%	18%
			All other materials	10%	6%	6%
	4a.	Direct technical assistance	Recyclable paper	20%	10%	2%
			Recyclable glass and metal	10%	10%	1%
			Recyclable plastics	5%	10%	1%
			Food, green waste	5%	1%	0%
			Lumber	10%	10%	1%
	4b/c.	Large-scale media campaign	Recyclable paper	5%	20%	1%
			Recyclable metal	20%	10%	2%
			Glass containers	5%	5%	0%
			Recyclable plastics, food, green waste	20%	20%	4%
	28.	Public area recycling	Recyclable paper, containers (metal and plastic)	1%	10%	0%
Scenario 3	**1d.**	Banning certain materials from disposal	Electronics, appliances, lumber, HHW, bulky items, tires	90%	90%	81%
	29.	Mandatory recycling separation policy	Recyclable paper	85%	80%	68%
			Glass containers	90%	95%	86%
			Recyclable metal	85%	70%	60%
			Recyclable plastics	85%	60%	51%
	52.	Mandatory organics separation policy	Organics	80%	50%	40%
	5a.	Ordinance requiring Resource Recovery Centers	Recyclable materials, organics, selected C&D materials[4], bulky items, electronics	50%	40%	20%
			Concrete, asphalt paving, tires	75%	50%	38%
			Major appliances	75%	100%	75%

Table 10: Commercial Policy and Program Assumptions (continued)

		Policy	Materials	Participation	Efficiency	Capture Rate
Upstream	1 EPR	Advocate for EPR for toxics	HHW	90%	90%	81%
	2 EPR	Advocate for EPR for difficult-to-recycle materials	Major appliances, mixed plastic non reuse, tires	80%	75%	60%
	4 EPR	State packaging legislation	EPS, mixed plastic non reuse	90%	90%	81%
	5 EPR	Single-use bag ban	Paper bags, mixed waste paper, recyclable film	90%	90%	81%

[1]**Recyclable materials:** Cardboard, paper bags, newspaper, mixed waste paper, compostable paper, glass containers, tin/steel cans, other ferrous materials, aluminum cans, other nonferrous, plastic #2 containers, plastic #1 containers, expanded polystyrene, recyclable film, mixed plastic reusable/recyclable, textiles
[2]**Compostable materials:** Compostable paper, food, green waste
[3]**All other materials:** Remainder/composite paper, flat glass, remainder/composite glass, remainder/composite metal, electronics, major appliances, mixed plastic non reuse/recycle, manures, remainder/composite organic, concrete, asphalt paving, asphalt roofing, lumber, gypsum board, rock, soil and fines, remainder/composite construction and demolition, HHW, ash, sewage solids, bulky Items, tires
[4]**Selected C&D Materials:** Asphalt roofing, lumber, gypsum board, rock, soil, fines

Section 4 Description of Policies and Programs

This section presents a brief description of each policy, program, and technical assistance initiatives including an analysis of how the City would most likely implement the program, a brief description of City-initiated pilot studies (if applicable), waste generator sectors targeted by the program, and the material types that would be diverted once the program is fully implemented. The descriptions are grouped by program, policy or technical assistance and are further grouped by whether the City will implement or whether they will be implemented through the Exclusive Franchise System to address multi-family and commercial generators. In addition, the corresponding number on the master list in Section 3 is referenced. Table11 lists all of the programs, policies, and technical assistance initiatives.

Table 11: SWIRP Policies, Programs, and Technical Assistance

No.	Name	Name Corresponding to Policy/Program List	Number Corresponding to Policy/Program List
SWIRP Policies, Programs, and Technical Assistance Implemented by the City			
Programs			
1	Increase textile diversion	Add textiles to residential blue bin	21
2	Bulky item reuse and recycling	Bulky item reuse, refurbishment, and recycling	26
3	Residential curbside food scraps	Add food scraps to green bin	39
4	Social marketing/media campaign	Large-scale media campaign	4b/4c combined
5	Modify residential collection rates	Pay-As-You-Throw	19
6	Community beautification grants	N/A	Added to policy/program list based on stakeholder comments at Phase 2 workshops
7	LAUSD Zero Waste curriculum	Rolling out recycling services to all public schools in the City (current program--increased participation) & Zero Waste at schools	1g, 30
8	Increase diversion at C&D facilities	Requiring processing of all C&D loads	2d
Policies			
9	Mandatory recycling separation for residential curbside	Source separation recycling (mandatory recycling separation policy)	29
10	Mandatory organics recycling for residential curbside	Mandatory organics separation policy	49
11	Resource Recovery Center ordinance	Ordinance requiring Resource Recovery Centers	5a

Table 11: SWIRP Policies, Programs, and Technical Assistance (continued)

No.	Name	Name Corresponding to Policy/Program List	Number Corresponding to Policy/Program List
12	EPR and packaging reduction	Advocate for EPR for toxics, Advocate for EPR for difficult-to-recycle materials, State packaging legislation, and single-use bag ban	EPR 1, 2, 4, & 5
13	Ban certain material from disposal	Banning certain materials from disposal	1d
Technical Assistance			
14	Expand Recycling Ambassador program for residential curbside	Direct technical assistance and Recycling Ambassador	4a, 20
15	Recycling Ambassador program for residential curbside (reinforcement)	Recycling Ambassador	20
SWIRP Policies, Programs, and Technical Assistance Implemented through the Exclusive Franchise System Addressing Multi-Family and Commercial Generators			
Programs			
16	Multi-family recycling	Add multi-family recycling	50
17	Multi-family yard trimmings	Add multi-family green waste collection	51
18	Multi-family food scraps	N/A	N/A
19	Modify multi-family and commercial collection rates	Modify refuse and recycling rates (multi-family)	3a
20	Require all commercial haulers to provide recycling services to their customers	Require all commercial haulers to provide recycling services to all of their customers	2b
21	Request all businesses to have recycling services	Require all businesses to have recycling services	1a
22	Provide more public area recycling	Public area recycling	27
Policies			
23	Mandatory recycling separation for multi-family and commercial sectors	Source separation recycling (mandatory recycling separation policy)	29
24	Mandatory organics recycling for multi-family and commercial sectors	Mandatory organics separation policy	49
Technical Assistance			
25	Multi-family Recycling Ambassador program	Direct technical assistance	4a
26	Expand commercial technical assistance	Direct technical assistance	4a
27	Recycling Ambassador program for multi-family and commercial (reinforcement)	Direct technical assistance	4a

4.1 SWIRP Programs, Policies, and Technical Assistance Implemented by the City

The first 15 programs listed in Table 11 are programs that will be implemented by the City. Each of these programs is described in this section.

4.1.1 Program 1: Increase Textile Diversion

This program gives the Bureau of Sanitation (LASAN) the ability to add textiles to the existing list of materials that residents can place in the blue bin for curbside collection. Alternatively, the City could collaborate with nonprofit or other private organizations (such as USAgain, Planet Aid, GAIA, or Campus California), to increase the network of textile recycling drop-off centers throughout the City. This would require that the City's contracted recycling processors identify viable long-term markets to ensure that textiles are recovered to the maximum extent feasible and have a positive market value. Some textiles are better suited for recovery and processing, while other textiles do not have viable markets or processors to accept them. In our research for textile programs, we found that the curbside recycling program in San Jose, California includes textiles in the materials collected, and residents are requested to place clean textiles inside a clear plastic bag and place the bag in the recycling cart. The San Jose program accepts the following materials:

- Clean cotton, linen, polyester, rayon and wool fabrics
- Blankets and sheets
- Clothes

The San Jose program does not accept boots and shoes, carpets and rugs, nylon, pillows, rubber, stuffed animals, vinyl, or electric blankets as acceptable materials for recycling, and asks residents to discard or donate those items as appropriate. Residents must supply their own plastic bags, as they are not provided for the program.

LASAN staff will continue its ongoing discussions with its curbside processors and representatives of the textile industry to identify market opportunities in the Los Angeles region for various textiles that could be recycled through the curbside program. Once appropriate program parameters are established, the City will need to provide appropriate public outreach so that residents can easily identify the acceptable textile items for recycling.

Adding textiles to the City's recycling program would be an added convenience for residents; however, residents should still be encouraged to utilize existing "reuse" organizations (Goodwill Industries, Salvation Army, thrift stores, etc.) to donate usable clothes or other types of textile items.

Although this program is geared to textiles, it could very readily include additional materials over time if markets and collection/sorting procedures for them are developed.

Targeted generators include all residential curbside customers serviced by LASAN collection crews.

Table 12: List of Materials Targeted through Textile Diversion

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags		23	Food	
2	Newspaper		24	Green waste	
3	Mixed waste paper		25	Manures	
4	Compostable paper		26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers		28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans		31	Lumber	
10	Other ferrous		32	Gypsum board	
11	Aluminum cans		33	Rock, soil, and fines	
12	Other nonferrous		34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers		38	Bulky items	
17	Plastic #1 containers		39	Tires	
18	Other containers		40	Remainder/composite special	
19	Expanded polystyrene		41	Mixed residue	
20	Recyclable film				
21	Mixed plastic reusable/recyclable				
22	Mixed plastic non-reuse/recycle				

4.1.2 Program 2: Bulky Item Reuse and Recycling

LASAN currently picks up large or bulky household items such as mattresses, couches, carpet and other furniture from all residences serviced by the City of Los Angeles. Residents are required to request this service at least one day in advance, and the City collects the bulky items on the day of regular solid waste collection. In one of the City's wastesheds (Valley Collection District), LASAN crews have begun separating mattresses by collecting them in a dedicated truck, then having a contractor recycle the wood, metal, foam, and fabric. The City also collects large metal items and household appliances (white goods) such as refrigerators, washers, and dryers from residences serviced by the City. Most of these materials are returned to the City's yard and put into roll-off containers to be picked up by a vendor to be processed for scrap metals. Most of the other bulky items collected by the City are landfilled, although some scavenging does take place prior to collection.

Under this program, the City would partner with a number of reuse entities (thrift stores, repair shops, and nonprofits such as L.A. SHARES, Goodwill Industries, and Salvation Army) to repair, reuse, and resell appropriate bulky items that are currently being set out for collection by LASAN crews and landfilled. The City would enter into service contracts with reuse partners to define operating procedures, service requirements, and performance standards, and to establish program parameters to ensure that the bulky-item reuse program is closely coordinated with the bulky-item collection program operated by the City and does not impede City operations. Under this approach, it is likely the City would provide its bulky-item daily route sheets or service addresses to its reuse partners, who would then proceed ahead of the City collection crews and collect all the items it considers to be reusable or repairable. An alternative could be to have the customer contact the reuse partner directly to arrange its own separate collection of the reusable items, which would eliminate some of the scavenging of materials set out for collection and reduce the workload for the City program.

To enhance the effectiveness of the reuse program, the City could modify its bulky-item collection service request form (on the LASAN website) to ask residents to indicate which items they selected for collection are in good shape and reusable, and have the City customer service representatives ask callers for the same information when they request service over the phone.

The City should continue to encourage residents to recycle bulky items through charitable organizations and thrift stores. This message could be conveyed through the City's Bulky-Item Collection web page, on all printed program materials, and through the Customer Service call center. An additional component of this program would include City sponsorship or promotion for neighborhood and/or apartment complex swap meets or garage sales to encourage residents to donate, rather than discard, reusable bulky items.

Targeted generators include all residential curbside customers and all multi-family complexes.

Table 13: List of Materials Targeted through Bulky Item Reuse and Recycling

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags		23	Food	
2	Newspaper		24	Green waste	
3	Mixed waste paper		25	Manures	
4	Compostable paper		26	Textiles	
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers		28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans		31	Lumber	
10	Other ferrous		32	Gypsum board	
11	Aluminum cans		33	Rock, soil, and fines	
12	Other nonferrous		34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances	X	37	Sewage solids	
16	Plastic #2 containers		38	Bulky items	X
17	Plastic #1 containers		39	Tires	
18	Other containers		40	Remainder/composite special	
19	Expanded polystyrene		41	Mixed residue	
20	Recyclable film				
21	Mixed plastic reusable/recyclable				
22	Mixed plastic non-reuse/recycle				

4.1.3 Program 3: Residential Curbside Food Scraps

In September 2008 the City launched a pilot program for residential food-scrap collection aimed at diverting food scraps and food-soiled paper products from landfills. The pilot involves 8,700 residential curbside customers in five neighborhoods within the South Los Angeles and North Central wastesheds. Residents in the pilot areas are asked to separate their food scraps and food-soiled paper in their homes, and place these materials into the green bins they already have for yard trimmings for weekly curbside collection. For convenience, the residents were given a 2-gallon covered kitchen pail to collect food scraps. The combined yard trimmings and food-scrap material is taken to CLARTS, a City-owned transfer station, where it is transferred into long-haul trucks and transported to the American Organics facility in Victorville for composting.

The expansion of the pilot program is contingent upon the availability of permitted organic-material-processing facilities within the Southern California region capable of handling food scraps with sufficient processing capacity to accommodate the increased organics tonnages that would be collected through the expanded green bin program. LASAN issued a Request for Proposals (RFP) to solicit proposals for the processing of residential organics including yard trimmings, food scraps, and horse manure. The selected contractors are to provide organic material processing operations consisting of, but not limited to, chipping, grinding, and mulching; biological processing such as composting, co-composting, anaerobic digestion/co-digestion, and fermentation for the conversion of material into reusable products and energy recovery. It is projected that new contracts for organics processing will be executed in late 2013.

Targeted generators include all residential curbside customers serviced by LASAN collection crews.

Table 14: List of Materials Targeted through Residential Curbside Food Scraps

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags		23	Food	X
2	Newspaper		24	Green waste	
3	Mixed waste paper		25	Manures	
4	Compostable paper	X	26	Textiles	
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers		28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans		31	Lumber	
10	Other ferrous		32	Gypsum board	
11	Aluminum cans		33	Rock, soil, and fines	
12	Other nonferrous		34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers		38	Bulky items	
17	Plastic #1 containers		39	Tires	
18	Other containers		40	Remainder/composite special	
19	Expanded polystyrene		41	Mixed residue	
20	Recyclable film				
21	Mixed plastic reusable/recyclable				
22	Mixed plastic non-reuse/recycle				

4.1.4 Program 4: Social Marketing/Media Campaign

A community-based social marketing program could be implemented to help change the culture of wasting and increase Zero Waste behavior in the City, with different messages targeted to different demographics using a wide assortment of tools. The City would work closely with electronic and print media to encourage their coverage of the City's goals, plans, and project implementation, and to challenge them to help engage the public in creative new ways. Funding programs on an ongoing basis (over multiple five-year campaign periods) to educate target audiences about the new rules and changes is an important part of implementing Zero Waste. This program would greatly enhance public awareness about where to reuse, recycle, and compost materials to keep them out of landfills, and encourage residents, businesses, workers, and visitors to fully participate in achieving a Zero Waste future.

The goal of this program is to create a culture change using social marketing and media campaign strategies. These strategies require efforts beyond a typical large-scale recycling campaign. Behavior change on this magnitude will require significant investment in outreach to have a powerful impact at the beginning and then remain consistently potent over each five-year campaign. It will be essential to command the attention of the public and gradually increase their participation in the many new behaviors that will be required to get to Zero Waste.

For the media and outreach campaign, the first step in this multi-year effort would be the development of a strategic outreach plan to determine exactly which segments of the population would be targeted, and identify specific messages, and tactics. The proposed strategy is to penetrate all three major aspects of each individual's life (home, work, and play) with a Zero Waste message. This would not take the form of three separate campaigns, but rather would be an "integrated lifestyle" campaign. In terms of overall strategic framework, the first year would be a large-scale **<u>Awareness</u>** campaign, employing mostly mass media tactics with media buys. The media campaign would shift more towards the **<u>Persuasion</u>** phase, which typically requires more hands-on, community-based work. The campaign would then go back to a media focus during the **<u>Implementation</u>** (how-to) phase. Finally, the **<u>Confirmation</u>** phase would focus on publicity for the success stories, awards ceremonies, and other positive benefits.

An example of this phased approach would be as follows:

> **Year 1: Awareness** campaign with minimal **Persuasion** (mass-media-focused)
>
> **Year 2-3: Persuasion** campaign with minimal decision making and **Implementation** (experiential/community-focused)
>
> **Year 4-5: Implementation** campaign with minimal **Confirmation** (combination of focus on hands-on and mass media)
>
> **Year 5: Confirmation** with publicity for successes, and beginning **Awareness** of the next stage, becoming a circular process getting the public closer to Zero Waste behavior (mass media-focused, again)

Targeted generators include all residential curbside customers, multi-family complexes, and commercial generators.

Table 15: List of Materials Targeted through Social Marketing/Media Campaign

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	X
2	Newspaper	X	24	Green waste	X
3	Mixed waste paper	X	25	Manures	
4	Compostable paper	X	26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	
7	Flat glass	X	29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans	X	31	Lumber	
10	Other ferrous	X	32	Gypsum board	
11	Aluminum cans	X	33	Rock, soil, and fines	
12	Other nonferrous	X	34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	X
14	Electronics	X	36	Ash	
15	Major appliances	X	37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	X
17	Plastic #1 containers	X	39	Tires	X
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle	X			

Note: Materials targeted by the residential curbside recycling program include all cartons - refrigerated, shelf-stable, aseptic packaging. These materials were not separately categorized in the *City of Los Angeles Waste Characterization and Quantification Study Year 2000*, July 2002. For a list of materials targeted by the residential curbside recycling program, refer to the LASAN website: http://www.lacitysan.org/solid_resources/recycling/curbside/what_is_recyclable.htm (accessed October 1, 2013).

4.1.5 Program 5: Modify Residential Collection Rates

This policy is a variable-unit pricing system where residents are charged for solid waste collection services based on the volume or weight of solid waste they set out for collection. Under a volume-based program, residents are charged rates based on the number and size of containers the resident subscribes to for solid waste collection. The volume-based program would entail offering various sized residual waste "black bin" containers to encourage residents to subscribe for a container that meets their basic household disposal needs while at the same time provides the correct price incentive to reduce waste. Residents who use a smaller cart would be charged less than residents using a larger cart. Under a weight-based program, residents are charged rates based on the weight of solid waste set out rather than the size of cart used. The fee structure under either type of a Pay As You Throw (PAYT) program requires the application of a universal fee structure, assuming a fixed cost to determine the base rate for standard costs such as equipment, labor and service, and a tiered cost for the amount of material collected.

A PAYT program would provide pricing incentives for residents to select a smaller container for solid waste, or reduce the weight of disposed waste, and thereby encourage them to separate their recyclables and yard trimmings more consistently. Depending on the level of pricing incentives to reduce waste, some customers will likely practice source reduction in addition to recycling in order to reduce their fees for solid waste service. This PAYT rate policy could be conveyed through modification of the existing rate structure that the City uses to charge residents for solid waste management services.

Targeted generators include all residential curbside customers serviced by LASAN collection crews.

Table 16: List of Materials Targeted through Residential Collection Rates

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	X
2	Newspaper	X	24	Green waste	X
3	Mixed waste paper	X	25	Manures	X
4	Compostable paper	X	26	Textiles	X
5	Remainder/composite paper	X	27	Remainder/composite organic	X
6	Glass containers	X	28	Concrete	X
7	Flat glass	X	29	Asphalt paving	X
8	Remainder/composite glass	X	30	Asphalt roofing	X
9	Tin/steel cans	X	31	Lumber	X
10	Other ferrous	X	32	Gypsum board	X
11	Aluminum cans	X	33	Rock, soil, and fines	X
12	Other nonferrous	X	34	Remainder/composite construction and demolition	X
13	Remainder/composite metal	X	35	HHW	X
14	Electronics	X	36	Ash	X
15	Major appliances	X	37	Sewage solids	X
16	Plastic #2 containers	X	38	Bulky items	X
17	Plastic #1 containers	X	39	Tires	X
18	Other containers	X	40	Remainder/composite special	X
19	Expanded polystyrene	X	41	Mixed residue	X
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle	X			

Note: Materials targeted by the residential curbside recycling program include all cartons - refrigerated, shelf-stable, aseptic packaging. These materials were not separately categorized in the *City of Los Angeles Waste Characterization and Quantification Study Year 2000*, July 2002. For a list of materials targeted by the residential curbside recycling program, refer to the LASAN website: http://www.lacitysan.org/solid_resources/recycling/curbside/what_is_recyclable.htm (accessed October 1, 2013).

4.1.6 Program 6: Community Beautification Grants

The Office of Community Beautification provides cash grants of up to $10,000 to community groups for physical improvements to neighborhoods. Examples of projects may include community gardens, landscaping, murals, pedestrian furniture, or whatever else the community can imagine for its neighborhood. The Office of Community Beautification is funded through the City's General Fund and, in addition, receives some community development grants.

The Office of Community Beautification contracts with 14 geographically diverse, nonprofit, community-based organizations to provide clean-up and beautification services in the City of Los Angeles. In 2007-08, these contractors removed 31,748,959 square feet of graffiti from 653,520 locations citywide, and collected 130,622 bags of trash, litter, and weeds from along the public right-of-way.

Data are not available for purposes of quantifying diversion for this program. Materials targeted are already accounted for in other policies and programs in the material flow model.

Targeted generators include community groups throughout the 15 Council Districts.

4.1.7 Program 7: LAUSD Zero Waste Curriculum

Supporting the development and implementation of a Zero Waste curriculum would supplement the City's current outreach to Los Angeles Unified School District (LAUSD) schools. Curriculum resources aligned to the California Academic Content Standards are available through CalRecycle.[2] The existing curriculum resources, *Closing the Loop*, targets students in kindergarten through sixth grade. *Closing the Loop* is a compilation of 50 lessons to help students discover and nurture an environmental ethic and stewardship of natural resources. The activities focus on solid waste and environmental awareness topics including landfills, recycling, packaging, resource conservation, waste prevention, worm composting, and more. Each lesson encourages students to explore their natural environment, identify waste management issues, and engage in personal and community action projects.

LASAN support of the curriculum through *Closing the Loop* and the Education and the Environment Initiative (EEI) will require program outreach and support to the individual schools and teachers through Service Learning workshops modeled on the Los Angeles Department of Water and Power (LADWP) workshop series.

LADWP annually holds 50 workshop sessions, most in conjunction with LAUSD. Some sessions are also held jointly with UCLA and other organizations.

Nearly 1,000 teachers participate in the sessions annually. The workshops emphasize science and technology related to water supply, conservation, and quality, energy sources, generation, transmission, and distribution, basic electricity and electrical safety, and also "Green LA" subjects including energy efficiency, solar power, renewable energy or green power, tree planting, electric transportation, recycling, and air quality. Most workshops emphasize hands-on instruction to assist teachers in helping students

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[2] *Closing the Loop* Curriculum http://www.calrecycle.ca.gov/Education/curriculum/CTL/ (accessed August 30, 2013)

learn by doing. The sessions include hands-on kits and other lesson materials available to teachers at no cost.

The workshops are held to assist teachers with covering subjects related to water, energy, and the environment. Credentialed LAUSD teachers experienced in staff development lead the workshop sessions. LADWP staff also assists in making presentations to teachers at several workshop sessions. The workshops demonstrate methods to incorporate water, energy, and environmental subjects into the curriculum and model instructional methodologies.

The City provides a recycling program for public schools within the LAUSD. Program staffing includes one full-time and two part-time City employees. The program offers education and recycling services to the schools. The recycling services include equipment (school blue bins for recycling) so participating schools can receive weekly recycling service. By January 2013, 722 schools (out of 796 in the City) had received blue bin recycling services.[3]

The City also provides education materials and recycling presentations for elementary schools, targeting 3rd, 4th, and 5th grade students. Since the program's inception, City staff have presented to over 120,000 students, approximately 20,000 students each year. The number of annual school presentations has increased since the program started in 2006, as indicated in the summary below:

- 2006 - 332 Presentations
- 2007 - 447 Presentations
- 2008 - 562 Presentations
- 2009 - 873 Presentations
- 2010 - 750 Presentations
- 2011 - 709 Presentations
- 2012 – 650 Presentations

While the City program currently cannot provide recycling service to private schools, it does offer recycling presentations at all schools.

The City's program currently does not provide any curriculum resources other than the presentations. Providing a Zero Waste curriculum at the LAUSD schools was a key program priority for SWIRP stakeholders. Supporting the development and implementation of a Zero Waste curriculum will supplement the City's current outreach to LAUSD schools. Curriculum resources aligned to the California Academic Content Standards are available through CalRecycle.[4] In addition to its existing curriculum resources, the California Environmental Protection Agency (Cal/EPA) and CalRecycle are actively engaged in developing the Education and the Environment Initiative (EEI) pursuant to AB 1548

[3]City of Los Angeles/ LAUSD Recycling Program

[4]*Closing the Loop* Curriculum http://www.calrecycle.ca.gov/Education/curriculum/CTL/ (accessed August 30, 2013)

(Pavley, Chapter 665, Statutes of 2003) and AB 1721 (Pavley, Chapter 581, Statutes of 2005).[5] These landmark laws mandate the development of a unified education strategy to bring education about the environment into California's primary and secondary schools.

Key elements of EEI include:

- Development of California's Environmental Principles & Concepts, (EP&Cs)
- Alignment of the EP&Cs to California's Academic Content Standards
- Development of a model curriculum to teach the EP&Cs to California's K-12 students; incorporation of the EP&Cs into criteria for instructional materials for science, history/social science, English/language arts, and mathematics
- Alignment of the State's diverse environmental education programs and materials with the EP&Cs

The development and implementation of the EEI mandates has seven phases, the first four of which have been completed. Phase 5 and 6 are currently in process and Phase 7 is on-going.

Phase One: Environmental Principles & Concepts (completed)
Phase Two: Alignment of the EP&Cs to California's Academic Content Standards (completed)
Phase Three: Development of Model Curriculum Plan (completed)
Phase Four: Development of Model Curriculum (completed)
Phase Five: Disseminate Model Curriculum and Professional Development (in process)
Phase Six: Assessment of Model Curriculum (in process)
Phase Seven: Ongoing Operation and Outreach of EEI Implementation (ongoing)

The EEI Curriculum, which was approved by the State Board of Education in early 2010, was developed and vetted in a lengthy and highly transparent public process. The EEI Curriculum received final unanimous approval by the State Board of Education on January 7th, 2010.

Data are not available for quantifying diversion for this program. Materials targeted are already accounted for in other policies and programs in the material flow model.

Targeted generators include public and private schools within the City.

[5]Education and the Environment Initiative http://www.californiaeei.org/ (accessed August 30, 2013)

4.1.8 Program 8: Increase Diversion at C&D Facilities

This policy would modify the C&D Ordinance by increasing the minimum diversion requirements of the Certified Processor Program.

Effective January 2011, the existing C&D Ordinance requires Certified Processors to maintain the following minimum diversion rates: Year One 50 percent, Year Two 60 percent and Year Three 70 percent. This program would increase those minimum requirements in future years.

This program would increase the minimum diversion requirements to 90 percent for inert debris and 75 percent of all remaining debris. An amendment to the C&D Ordinance would be required to implement the increased diversion requirements.

The ordinance amendment would result in significantly increased waste diversion of the target C&D materials, particularly during times of increased economic activity when more construction and renovation projects are undertaken.

Targeted generators include applicants who seek a City permit for construction and demolition projects.

Table 17: List of Materials Targeted through Diversion at C&D Facilities

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags		23	Food	
2	Newspaper		24	Green waste	
3	Mixed waste paper		25	Manures	
4	Compostable paper		26	Textiles	
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers		28	Concrete	X
7	Flat glass		29	Asphalt paving	X
8	Remainder/composite glass		30	Asphalt roofing	X
9	Tin/steel cans		31	Lumber	X
10	Other ferrous	X	32	Gypsum board	X
11	Aluminum cans		33	Rock, soil, and fines	X
12	Other nonferrous	X	34	Remainder/composite construction and demolition	X
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers		38	Bulky items	
17	Plastic #1 containers		39	Tires	
18	Other containers		40	Remainder/composite special	
19	Expanded polystyrene		41	Mixed residue	
20	Recyclable film				
21	Mixed plastic reusable/recyclable				
22	Mixed plastic non-reuse/recycle				

4.1.9 Program 9: Mandatory Recycling Separation for Residential Curbside

This policy presents a major shift from voluntary to mandatory participation in recycling collection programs. It is intended to motivate residential waste generators for which the City provides services to separate recyclable materials from the waste they generate and place it in the appropriate blue bin on a regular basis for collection.

To effect this change, the City would need to establish "Mandatory Recycling" for residential curbside customers that requires waste generators to separate recyclables from other waste, and set the recyclables out for collection as appropriate for the recycling programs and services available through LASAN.

This initiative would need to be carefully developed based on a consideration of legitimate concerns raised by various stakeholder groups while being consistent with City policy directives. It would also need to be adequately publicized to inform all residents of the intent and purpose.

Targeted generators include all residential curbside customers serviced by LASAN collection crews.

Table 18: List of Materials Targeted through Mandatory Recycling Separation for Residential Curbside

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	
2	Newspaper	X	24	Green waste	
3	Mixed waste paper	X	25	Manures	
4	Compostable paper		26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans	X	31	Lumber	
10	Other ferrous	X	32	Gypsum board	
11	Aluminum cans	X	33	Rock, soil, and fines	
12	Other nonferrous	X	34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	
17	Plastic #1 containers	X	39	Tires	
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle				

Note: Materials targeted by the residential curbside recycling program include all cartons - refrigerated, shelf-stable, aseptic packaging. These materials were not separately categorized in the *City of Los Angeles Waste Characterization and Quantification Study Year 2000*, July 2002. For a list of materials targeted by the residential curbside recycling program, refer to the LASAN website: http://www.lacitysan.org/solid_resources/recycling/curbside/what_is_recyclable.htm (accessed October 1, 2013).

4.1.10 Program 10: Mandatory Organics Recycling for Residential Curbside

This policy represents a major shift from voluntary to mandatory participation in organics collection programs. It is intended to motivate residential curbside customers within the City to separate organic materials from the waste they generate at their home and place it in the green bin on a regular basis for collection. To effect this change, the City would need to require residential curbside customers to separate organics from other waste, and set the organics out for collection.

This initiative would need to be carefully developed based on consideration of legitimate concerns raised by the City stakeholders and be consistent with City policy directives, as well as being adequately publicized to inform all residents of the intent and purpose.

Targeted generators include all residential curbside customers serviced by LASAN collection crews.

Table 19: List of Materials Targeted through Mandatory Organics Recycling for Residential Curbside

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags		23	Food	X
2	Newspaper		24	Green waste	X
3	Mixed waste paper		25	Manures	X
4	Compostable paper	X	26	Textiles	
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers		28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans		31	Lumber	
10	Other ferrous		32	Gypsum board	
11	Aluminum cans		33	Rock, soil, and fines	
12	Other nonferrous		34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers		38	Bulky items	
17	Plastic #1 containers		39	Tires	
18	Other containers		40	Remainder/composite special	
19	Expanded polystyrene		41	Mixed residue	
20	Recyclable film				
21	Mixed plastic reusable/recyclable				
22	Mixed plastic non-reuse/recycle				

4.1.11 Program 11: Resource Recovery Center Ordinance

This policy calls for establishing Resource Recovery Centers (RRCs), which would need to be co-located or in close proximity to any transfer station or landfill located within the City. A Resource Recovery Center is a facility open to the public that would receive certain recoverable materials that are typically brought to a disposal site by residents or businesses in self-hauled loads.

The intent of this ordinance is to ensure that materials that are recyclable or reusable would be diverted from the other waste that is self-hauled for disposal. The materials received at the RRC would be processed and marketed as recyclables, or made available for reuse/resale (either at the RRC or elsewhere within the City). If the City adopted this ordinance, it would likely result in local disposal sites (local transfer stations and landfills or other designated Public Works areas) redesigning their sites to provide for a separate drop-off and staging area where the public would be able to drop off their recoverable materials for free before proceeding to the designated disposal area. At some facilities, the diversion activity would take place after the fee gate and the public would be required to separate materials for recycling and reuse. If they would like to proceed directly to the disposal area, they would be required to pay an extra fee. Tipping fees at RRCs can provide a significant incentive to users. Most provide drop-off or buyback options for revenue-generating recyclables; some charge lower rates for certain items (yard trimmings, clean fill). For example, the Resource Recovery Center at the Cold Canyon Landfill in San Luis Obispo charges a flat rate for all small vehicles, and then an extra fee if the generator does not want to separate out materials. Cold Canyon reports that 97 percent of users elect to separate their materials.

This ordinance would only apply to landfills and transfer stations operating within the City limits. However, the majority of self-haul tons are disposed within the City limits.

In 2006, approximately 132,000 tons of self-haul waste was disposed by residential and commercial generators in the City. Of the 132,000 tons disposed, approximately 102,000 tons were disposed at landfills and transfer stations within the City limits and approximately 30,000 tons were disposed at landfills and transfer stations outside of the City limits.

Diversion levels and costs at RRCs can vary widely depending on the extent of the diversion activities. These activities can include public area drop-off for traditional recyclables (cans, bottles, and paper), salvaging materials from the tipping area at a transfer station or landfill (large pieces of metal, cardboard or wood), diverting reusable items (furniture, building materials, and household goods), and providing retail sales on site. Some activities may be co-located at a transfer station or landfill, but others may be off-site. The concept of using off-site facilities has been described as a "serial MRF," where multiple salvage, processing and sales activities happen in a variety of locations in close proximity to each other that are cross-promoted.

RRCs provide one of the very few opportunities to divert self-hauled materials. Requiring landfills and transfer stations to provide drop-off areas for recycling and reuse is a low-cost, low-impact method of diverting some potentially recyclable material prior to disposal. Proper signage to direct self-haulers to the drop-off area, and signs designating the materials accepted at each storage bin or off-loading area, are typically sufficient to educate the public about the recycling options available at the facility. Processing self-hauled materials for recycling or providing salvage operations at landfills or transfer stations can also increase diversion, but requires increased costs.

Facility operators may have concerns about traffic flow and space for recycling. The ordinance could specify that the RRC be implemented when the facility is undergoing a major redesign or is applying for a Conditional Use Permit. The ordinance could also identify desired features (such as increased processing and salvaging from self-haul loads) and minimum requirements (such as staged bins for traditional recyclables).

The ordinance could allow facilities to develop additional collection and processing capacity within one-half mile if there is not enough room on site to include those additional activities.

City staff would be in charge of providing an RRC at CLARTS, since it is a City-owned facility. Privately owned facilities are required to provide RRCs per the ordinance on their own.

Targeted generators include self-haul residential and commercial generators.

Table 20: List of Materials Targeted through Resource Recovery Center Ordinance

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	X
2	Newspaper	X	24	Green waste	X
3	Mixed waste paper	X	25	Manures	
4	Compostable paper	X	26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	X
7	Flat glass		29	Asphalt paving	X
8	Remainder/composite glass		30	Asphalt roofing	X
9	Tin/steel cans	X	31	Lumber	X
10	Other ferrous	X	32	Gypsum board	X
11	Aluminum cans	X	33	Rock, soil, and fines	X
12	Other nonferrous	X	34	Remainder/composite construction and demolition	X
13	Remainder/composite metal		35	HHW	
14	Electronics	X	36	Ash	
15	Major appliances	X	37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	X
17	Plastic #1 containers	X	39	Tires	X
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle				

4.1.12 Program 12: EPR and Packaging Reduction

The upstream extended producer responsibility (EPR) initiatives call for the City to take an active role in advocating for legislation that requires product manufacturers, retail establishments, wholesale distributors and other appropriate entities to take back certain products or packaging that currently are difficult to recycle, contain toxics, or otherwise pose problems when they are discarded as waste. The City would work with various federal, State and regional agencies and community groups to ensure that effective take-back programs are enacted into law, thereby enhancing the City's goals to reduce the volume and toxicity of the materials entering the City's waste stream.

The following are the priorities the City would focus on under this program:

- Advocacy for legislation making businesses responsible for their products that contain **toxics** such as pharmaceuticals, fluorescent lights, household batteries, treated wood, and other materials banned from disposal statewide
- Advocacy for legislation making businesses responsible for their products that are **difficult-to-recycle materials**, such as disposable diapers, composite materials, tires, white goods, durable goods, plastic, and food packaging
- Advocacy for **packaging legislation** making businesses responsible for their packaging, including alternatives to expanded polystyrene (expanded polystyrene containers, "peanuts" and "blocks") and plastic bags (statewide); and support for reusable shipping containers
- Adoption of a **citywide reusable bag policy** at designated supermarkets and retail establishments (local policy approved by the City Council May 23, 2012)[6]
- Advocacy for businesses to develop **life-cycle analyses for products and packaging**, taking into account all environmental impacts of the product from manufacturing to the end of its useful life
- Advocacy for legislation to incentivize manufacturers to use **local reuse and recycling markets** for the products they manufacture

Manufacturers marketing products in Europe, Canada, and Japan have voluntarily implemented the "Green Dot" program.[7] Packaging is labeled with a Green Dot symbol to indicate that the manufacturer has paid into the Green Dot program based on the weight and composition of the package. Funds raised through this program are used to provide supplemental recycling collection services.

City staff has developed the concept of the "Blue Dot" program. Similar to the Green Dot program, manufacturers would voluntarily label their products and packaging to indicate whether they are recyclable or compostable. Stakeholders have expressed confusion about which materials should be

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[6]The Council Action on the single-use bag policy is available through the City of Los Angeles Council File 11-1531. The effective date of the ordinance was August 1, 2013 and will apply to specified retail stores on January 1, 2014.

[7]Description of Duales System Deutschland http://www.gruener-punkt.de/?L=1 (accessed August 30, 2013)

placed in the blue bin and which should be placed in the green bin. This program would make it easier for residents and businesses to recycle and compost.

Advocacy for this approach is best accomplished at the State level, as it may be difficult for manufacturers to comply at the municipal level. For example, the Province of Ontario, Canada is considering a similar system in conjunction with its 70 percent recycling goal.[8] Products and packaging would be labeled with a blue, green or black dot to indicate whether the material was recyclable, compostable or required disposal. This requirement would also encourage producer responsibility by incentivizing manufacturers to make their products and packaging more recyclable and compostable.

The Blue Dot/Green Dot program could also be implemented on a local level as a business recognition program, by providing Blue Dot/Green Dot symbols to commercial businesses that recycle or restaurants that divert food scraps.

Targeted generators include all residential curbside customers, multi-family complexes, and commercial generators.

[8]Interview with Craig Bartlett, Manager of Waste Operations, the Regional Municipality of Durham, Ontario, October 22, 2009.

Table 21: List of Materials Targeted through EPR and Packaging Reduction

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	
2	Newspaper		24	Green waste	
3	Mixed waste paper	X	25	Manures	
4	Compostable paper		26	Textiles	
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers		28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans		31	Lumber	
10	Other ferrous		32	Gypsum board	
11	Aluminum cans		33	Rock, soil, and fines	
12	Other nonferrous		34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	X
14	Electronics	X	36	Ash	
15	Major appliances	X	37	Sewage solids	
16	Plastic #2 containers		38	Bulky items	
17	Plastic #1 containers		39	Tires	X
18	Other containers		40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable				
22	Mixed plastic non-reuse/recycle	X			

4.1.13 Program 13: Ban Certain Material from Disposal

Communities across the U.S. have increased participation in recycling and composting programs through the implementation of disposal bans. Most of the focus on disposal bans has been on toxic materials, electronic waste, appliances, and yard trimmings. Over half of the states in the U.S. have a disposal ban for yard trimmings. State bans are also supplemented by local bans and enforcement. For example, Mecklenburg County, North Carolina is reinforcing the state ban on plastic beverage containers, aluminum cans, wood pallets and appliances through implementation of local bans and enforcement. The City of Seattle, Washington has achieved a 70-percent diversion rate in its residential programs through implementation of a local disposal ban of recyclable materials and yard trimmings, where residents may not place recyclable materials or yard trimming in their collection containers for solid waste. Metro Vancouver, British Columbia is also considering implementation of a food scrap ban by 2015.

This program would include a feasibility study to identify materials to target for landfill bans including electronics, appliances, lumber, and bulky items. The bans would then be implemented in conjunction with new programs for diverting banned materials and mandatory recycling requirements.

4.1.14 Program 14: Expand Recycling Ambassador Program for Residential Curbside

This program focuses on improving recycling habits, reducing contamination of the blue bins, and decreasing the amount of waste entering landfills. By hiring additional Recycling Ambassadors within LASAN, the City would expand public education and outreach services and encourage residents to participate more consistently in the existing blue bin recycling program. Ambassadors would conduct field surveys, monitor participation patterns, and spot-check containers to identify problem areas (i.e., neighborhoods with low participation, contamination problems, broken or missing containers). They would work with the collection crews to resolve service issues, and contact residents to discuss areas of concern. The program is geared towards increasing public education on the benefits of participating in the curbside recycling program, and resolving service problems and/or obstacles to participation.

This program supports the implementation and the effectiveness of other Zero Waste efforts, such as Increase Textile Diversion, Bulky Items Reuse and Recycling, and Residential Curbside Food Scraps.

Targeted generators include all residential curbside customers serviced by LASAN collection crews.

Table 22: List of Materials Targeted through Recycling Ambassador Program for Residential Curbside

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	X
2	Newspaper	X	24	Green waste	X
3	Mixed waste paper	X	25	Manures	
4	Compostable paper	X	26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans	X	31	Lumber	
10	Other ferrous	X	32	Gypsum board	
11	Aluminum cans	X	33	Rock, soil, and fines	
12	Other nonferrous	X	34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	X
14	Electronics	X	36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	X
17	Plastic #1 containers	X	39	Tires	
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle				

Note: Materials targeted by the residential curbside recycling program include all cartons - refrigerated, shelf-stable, aseptic packaging. These materials were not separately categorized in the *City of Los Angeles Waste Characterization and Quantification Study Year 2000*, July 2002. For a list of materials targeted by the residential curbside recycling program, refer to the LASAN website: http://www.lacitysan.org/solid_resources/recycling/curbside/what_is_recyclable.htm (accessed October 1, 2013).

4.1.15 Program 15: Recycling Ambassador Program for Residential Curbside (Reinforcement)

The mandatory programs are assumed to have been in place for some time prior to implementing reinforcement. Implementing reinforcement would shift the focus from education efforts to education combined with enforcement efforts. The intent of this program would be to include code enforcement to secure consistent participation in the established recycling and organics collection programs available to waste generators (and mandated by various City policies designed to increase the City's waste diversion).

Code violations would likely be discovered by Recycling Ambassadors working in neighborhoods and commercial districts, while monitoring recycling programs, or through complaints registered by concerned residents, businesses, waste haulers, recyclers or other parties. In either case, information regarding code violations would be followed up by LASAN code enforcement staff and/or staff from the City's Code Enforcement department, to ensure the violations are corrected by the appropriate party. In cases where the party refuses to correct the problems or is unwilling to cooperate with the City to find a resolution, City staff would be able to take appropriate actions, which could include imposition of fines, penalties, or other sanctions that are consistent with City code enforcement.

Targeted generators include all residential curbside customers serviced by LASAN collection crews.

Table 23: List of Materials Targeted through Recycling Ambassador Program for Residential Curbside (Reinforcement)

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	X
2	Newspaper	X	24	Green waste	X
3	Mixed waste paper	X	25	Manures	
4	Compostable paper	X	26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	X
7	Flat glass		29	Asphalt paving	X
8	Remainder/composite glass		30	Asphalt roofing	X
9	Tin/steel cans	X	31	Lumber	X
10	Other ferrous	X	32	Gypsum board	X
11	Aluminum cans	X	33	Rock, soil, and fines	X
12	Other nonferrous	X	34	Remainder/composite construction and demolition	X
13	Remainder/composite metal		35	HHW	X
14	Electronics	X	36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	
17	Plastic #1 containers	X	39	Tires	
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle				

Note: Materials targeted by the residential curbside recycling program include all cartons - refrigerated, shelf-stable, aseptic packaging. These materials were not separately categorized in the *City of Los Angeles Waste Characterization and Quantification Study Year 2000*, July 2002. For a list of materials targeted by the residential curbside recycling program, refer to the LASAN website: http://www.lacitysan.org/solid_resources/recycling/curbside/what_is_recyclable.htm (accessed October 1, 2013).

4.2 SWIRP Policies, Programs, and Technical Assistance Implemented through the Exclusive Franchise System

SWIRP identified 12 programs that apply specifically to multi-family and commercial sectors. These include Program 16 to Program 27, as listed in Table 11. Each of these SWIRP programs could be implemented using various regulatory mechanisms, including ordinances and permits through exclusive franchises.

On November 14, 2012 the Los Angeles City Council directed LASAN to pursue exclusive franchises for multi-family and commercial sectors. Thus, these SWIRP programs will be implemented in the context of an exclusive franchise system (where one service provider is authorized to provide collection services for all customers within a specific geographical area within the City). This section provides a description of the programs to be implemented as part of the exclusive franchise system.

The new exclusive franchises will be designed to maximize diversion from multi-family and commercial sectors. Future planning and procurement activities will specify the requirements of the franchisees, which may include source-separated recycling and organics collection (three bins for recycling, organics and solid waste); wet/dry collection (two bins for recycling and organics with no separate collection for solid waste); or a one-bin system (one bin with solid waste collected for mixed waste processing), as appropriate.

LASAN anticipates creating eleven exclusive franchise areas/zones, two areas/zones for five of the six wastesheds of the City (East Valley, West Valley, North Central, West LA, and South LA) and one area/zone for the smaller Harbor wasteshed.

4.2.1 Program 16: Multi-Family Recycling

The City conducted a pilot program in 2004 and, based on the results of the program, the City implemented a multi-family recycling program in 2007 that offered the same voluntary blue bin recycling service being provided to residential curbside customers. This recycling service consists of City provision of blue bins and weekly collection service. The program was structured to keep multi-family accounts in an open market for refuse collection by permitted private haulers. The City contracts with selected haulers to provide recycling services only to multi-family complexes. The service areas of the City are divided into separate zones or wastesheds for the purpose of awarding the collection contracts. Contracted haulers provide recycling service at all multi-family complexes requesting the service in their specific service area, with the City providing outreach and training, and the contractors providing containers and collection/recycling services.

The multi-family recycling program implemented by the City presented a smooth transition from pilot to permanent program, and also ensured that City staff has the required control to implement and monitor an effective citywide multi-family program. Specific standards were written into the service contracts and are being monitored by City staff to ensure that all required services are being provided. Multi-family complex owners and/or managers, not the residents, need to request the free service by contacting the City. Tenants can provide the owner/manager with their contact information, and City staff follow up on the information to encourage the responsible parties to participate.

Multi-family residential buildings with five units or more are eligible for recycling service. Multi-family residential buildings can be apartment buildings, condominiums, cooperatives, mobile home parks, and other properties zoned for multiple residential units. Buildings that are formally registered into the program are offered free recycling services once a week, blue bins to store recyclables, and educational information about the types of materials accepted in blue bins. There is no cost to property owners or residents that participate in the program. The program is funded through AB 939 Compliance Fees paid by haulers servicing buildings in the City.

Under the new franchise system, the City will require that recycling services be provided to all multi-family complexes.

Targeted generators include multi-family complexes with five units or more.

Table 24: List of Materials Targeted through Multi-Family Recycling

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	
2	Newspaper	X	24	Green waste	
3	Mixed waste paper	X	25	Manures	
4	Compostable paper	X	26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans	X	31	Lumber	
10	Other ferrous	X	32	Gypsum board	
11	Aluminum cans	X	33	Rock, soil, and fines	
12	Other nonferrous	X	34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	
17	Plastic #1 containers	X	39	Tires	
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle				

4.2.2 Program 17: Multi-Family Yard Trimmings

This program expands the multi-family recycling program implemented by the City in 2007 by including the addition of green bin collection service for yard trimmings using the same parameters to ensure an effective citywide multi-family green bin program.

The multi-family green bin program could be designed to have program features that would be consistent with, and complement, the multi-family blue bin recycling program. For example, multi-family residential buildings of five units or more would be eligible for green bin service. Buildings that are formally registered into the program would be offered green bin services once a week, green bins to store yard trimmings and similar materials, and educational information about the types of materials accepted in green bins.

The City and its franchised haulers would likely implement a pilot prior to full implementation of a citywide multi-family green bin program in order to better assess collection methods and cost, demand for service, program constraints, and overall effectiveness. Many multi-family complexes employ contractors to maintain landscaped areas and remove yard trimmings, and others have limited outdoor space and/or generate minimal amounts of yard trimmings, so it would be difficult to assess the program's diversion potential and effectiveness without conducting a pilot study prior to launching a full-scale program.

Under the new franchise system, the City may require that yard trimmings collection services be provided to all multi-family complexes.

Targeted generators include multi-family complexes with five units or more.

Table 25: List of Materials Targeted through Multi-Family Yard Trimmings

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags		23	Food	
2	Newspaper		24	Green waste	X
3	Mixed waste paper		25	Manures	
4	Compostable paper		26	Textiles	
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers		28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans		31	Lumber	
10	Other ferrous		32	Gypsum board	
11	Aluminum cans		33	Rock, soil, and fines	
12	Other nonferrous		34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers		38	Bulky items	
17	Plastic #1 containers		39	Tires	
18	Other containers		40	Remainder/composite special	
19	Expanded polystyrene		41	Mixed residue	
20	Recyclable film				
21	Mixed plastic reusable/recyclable				
22	Mixed plastic non-reuse/recycle				

4.2.3 Program 18: Multi-Family Food Scraps

This program expands the multi-family recycling program implemented by the City and includes the addition of green bin collection service for food scraps. The multi-family green bin program could be designed to have program features that would be consistent with, and complement, the multi-family blue bin recycling program. Under the new franchise agreements, the City may require that food scrap collection services be provided to all multi-family complexes.

Targeted generators include multi-family complexes with five units or more.

Table 26: List of Materials Targeted through Multi-Family Food Scraps

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags		23	Food	X
2	Newspaper		24	Green waste	
3	Mixed waste paper		25	Manures	
4	Compostable paper	X	26	Textiles	
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers		28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans		31	Lumber	
10	Other ferrous		32	Gypsum board	
11	Aluminum cans		33	Rock, soil, and fines	
12	Other nonferrous		34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers		38	Bulky items	
17	Plastic #1 containers		39	Tires	
18	Other containers		40	Remainder/composite special	
19	Expanded polystyrene		41	Mixed residue	
20	Recyclable film				
21	Mixed plastic reusable/recyclable				
22	Mixed plastic non-reuse/recycle				

4.2.4 Program 19: Modify Multi-Family and Commercial Collection Rates

This is similar to the PAYT policy for residential curbside customers serviced by LASAN, except it is applicable to customer rates charged by the commercial haulers operating within the City. The goal of the program is to establish sufficient customer rate incentives for commercial and multi-family solid waste customers to increase recycling and decrease solid waste service. This policy would help to minimize the common industry practice of offering price incentives based on volume discounts to customers that subscribe for higher levels of solid waste service, thereby creating pricing incentives for customers to shift to increased recycling services.

The City would approve any new rate structure as a component of the new franchise system and would seek to ensure that rates are fair and equitable across all of the service areas and generator types.

Targeted generators include commercial generators and multi-family complexes with five units or more.

Table 27: List of Materials Targeted through Multi-Family and Commercial Collection Rates

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	X
2	Newspaper	X	24	Green waste	X
3	Mixed waste paper	X	25	Manures	X
4	Compostable paper	X	26	Textiles	X
5	Remainder/composite paper	X	27	Remainder/composite organic	X
6	Glass containers	X	28	Concrete	X
7	Flat glass	X	29	Asphalt paving	X
8	Remainder/composite glass	X	30	Asphalt roofing	X
9	Tin/steel cans	X	31	Lumber	X
10	Other ferrous	X	32	Gypsum board	X
11	Aluminum cans	X	33	Rock, soil, and fines	X
12	Other nonferrous	X	34	Remainder/composite construction and demolition	X
13	Remainder/composite metal	X	35	HHW	X
14	Electronics	X	36	Ash	X
15	Major appliances	X	37	Sewage solids	X
16	Plastic #2 containers	X	38	Bulky items	X
17	Plastic #1 containers	X	39	Tires	X
18	Other containers	X	40	Remainder/composite special	X
19	Expanded polystyrene	X	41	Mixed residue	X
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle	X			

4.2.5 Program 20: Require all Commercial Haulers to Provide Recycling Services to their Customers

Under the new franchise system, all franchisees would be required to provide recycling services to commercial waste generators. Depending on the design of the franchise system, the franchisees may be allowed to implement whatever programs work best in terms of collection efficiency and handling methods, but reporting requirements would be necessary to enable the City to monitor the program to ensure it is offered consistently throughout the commercial sector. This program would require City staff to conduct periodic monitoring (in the field) and to respond to customer complaints to ensure that maximum feasible recycling services are provided to all commercial customers.

The City would revise the existing permitting system and direct all franchised haulers in the City to provide recycling services to commercial customers citywide. The requirement for recycling service under this program would specify that recycling must be provided to customers (note that this program does not require customers to recycle, which is addressed in Program 23: Mandatory Recycling Separation for Multi-Family and Commercial Sectors), and depending on the design of the franchise system, would allow the hauler to determine the collection methodology, provision of customer containers, processing arrangements, and other components of the recycling services the hauler offers to its customers. The City would specify in the requirements which materials must be included in the recycling program to ensure that customers have a reasonable level of service for recycling the types of materials they generate.

In communities that have exclusive franchise agreements with haulers for commercial solid waste service, commercial recycling service is often included in the scope of services to ensure that customers have the option to recycle through their hauler. This program would allow commercial customers to arrange recycling service with their waste collector, rather than making arrangements with third-party recycling companies. Many recycling firms require special conditions to be met (minimum quantities of materials, source separation by type or material grade, on-call arrangements) before they agree to provide service, which often discourages commercial customers from recycling.

Targeted generators include commercial generators and multi-family complexes with five units or more.

Table 28: List of Materials Targeted through all Commercial Haulers to Provide Recycling Services to their Customers

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	
2	Newspaper	X	24	Green waste	
3	Mixed waste paper	X	25	Manures	
4	Compostable paper		26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans	X	31	Lumber	
10	Other ferrous	X	32	Gypsum board	
11	Aluminum cans	X	33	Rock, soil, and fines	
12	Other nonferrous	X	34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	
17	Plastic #1 containers	X	39	Tires	
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle				

4.2.6 Program 21: Request all Businesses to Have Recycling Services

This program would request that all commercial establishments have access to recycling services through their building owners and managers. The intent of the program would be to ensure that each business establishment within the City that subscribes for solid waste collection service also implements some type of recycling program to help reduce the amount of waste generated by that business.

Table 29: List of Materials Targeted through all Businesses to Have Recycling Services

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	
2	Newspaper	X	24	Green waste	
3	Mixed waste paper	X	25	Manures	
4	Compostable paper		26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans	X	31	Lumber	
10	Other ferrous	X	32	Gypsum board	
11	Aluminum cans	X	33	Rock, soil, and fines	
12	Other nonferrous	X	34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	
17	Plastic #1 containers	X	39	Tires	
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle				

4.2.7 Program 22: Provide More Public Area Recycling

This program would require placement and servicing of recycling containers wherever litter cans are located in all public locations. This would provide convenient opportunities for the general public and visitors to the City to recycle a variety of materials such as beverage containers, newspaper, mixed paper, and other materials that are included in the curbside program, and would increase opportunities for the public to recycle when shopping, visiting parks, public buildings, and other City facilities. Placement of recycling containers in public areas is a popular service advocated by the public. Revenues from the sale of the commingled materials, coupled with potential funding from the State Department of Conservation and other agencies that offer equipment grants for recycling and litter reduction, could help offset program costs.

The Bureau of Street Services (BSS) maintains approximately 2,900 "white" litter receptacles located along public streets. Under the City's Adopt-A-Basket program, another 1,200 "green" receptacles are maintained by constituents or businesses, and about 1,000 receptacles located at bus shelters are maintained by the Norman Bench contractor. In addition, the Department of Recreation and Parks maintains a significant (but not quantified) number of litter receptacles at the more than 400 facilities it manages. LASAN manages the City facility recycling program and provides receptacles for commingled recyclables next to the litter receptacles at City facilities, including City Hall and the Public Works Building.

Before implementing this program, the City would most likely conduct pilot studies to determine the type of recycling containers that are best suited for various locations (commercial strips, bus shelters, downtown sidewalks, parks, senior centers). In addition, the City should explore the feasibility of using the Adopt-A-Park partners for servicing the recycling containers, or explore contracting with other nonprofits such as the Los Angeles Conservation Corps for collecting recyclables. The Los Angeles Conservation Corps is a nonprofit organization that provides at-risk young adults and school-aged youth with opportunities for success through job skills training, education, and work experience with an emphasis on conservation and service projects that benefit the community. It operates a program sponsored by the California Department of Conservation, Division of Recycling to teach Conservation Corps young people how to provide recycling education to the public. This program is known as Recycling Across Los Angeles (RACLA) and teaches corps members how to develop and service recycling accounts, and promote recycling through a comprehensive education program. They help set up recycling campaigns and drives at elementary schools and set up mechanisms for ongoing recycling, including delivery of recyclable materials to nearby recycling centers. To the extent the City can partner with community groups and nonprofits such as the Conservation Corps, the cost of this program can be minimized. The pilot program could explore opportunities for partnering with existing community programs and sponsors.

The materials for diversion in public areas targeted by this program are classified as originating from the commercial (non-residential) sector and some public area recycling may be provided through the City's franchised haulers.

Targeted generators include the general public (residents, workers on lunch breaks, out-of-town visitors) visiting public areas throughout the City, as well as attendees at major public attractions.

Table 30: List of Materials Targeted through More Public Area Recycling

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	
2	Newspaper	X	24	Green waste	
3	Mixed waste paper	X	25	Manures	
4	Compostable paper		26	Textiles	
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans	X	31	Lumber	
10	Other ferrous		32	Gypsum board	
11	Aluminum cans	X	33	Rock, soil, and fines	
12	Other nonferrous		34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	
17	Plastic #1 containers	X	39	Tires	
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable				
22	Mixed plastic non-reuse/recycle				

4.2.8 Program 23: Mandatory Recycling Separation for Multi-Family and Commercial Sectors

This policy presents a major shift from voluntary to mandatory participation in recycling collection programs. It is intended to motivate multi-family and commercial waste sectors within the City to separate recyclable material from the waste they generate at their home or business and place it in the appropriate blue bin or recycling collection container on a regular basis for collection.

To effect this change, the City and its franchised haulers would need to establish "Mandatory Recycling" that requires waste generators to separate recyclables from other waste, and set the recyclables out for collection as appropriate for the recycling programs and services available through their service provider.

This initiative would need to be carefully developed based on consideration of legitimate concerns raised by various stakeholder groups and be consistent with City policy directives. It would need to be publicized adequately to inform all multi-family residents, businesses, service providers, and others of the intent and purpose of the initiative.

Assembly Bill 341 (adopted by the California legislature in 2011) established a statewide goal of 75 percent by 2020 and requires commercial generators (with more than four cubic yards per week of solid waste) and multi-family complexes (with five units or more) to recycle. However, it does not specify the materials to be collected or the level of recycling services received. It does not require generators to participate in programs offered by their buildings.

Targeted generators include commercial generators and multi-family complexes with five units or more.

Table 31: List of Materials Targeted through Mandatory Recycling Separation for Multi-Family and Commercial Sectors

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	
2	Newspaper	X	24	Green waste	
3	Mixed waste paper	X	25	Manures	
4	Compostable paper		26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans	X	31	Lumber	
10	Other ferrous	X	32	Gypsum board	
11	Aluminum cans	X	33	Rock, soil, and fines	
12	Other nonferrous	X	34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	
17	Plastic #1 containers	X	39	Tires	
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle				

4.2.9 Program 24: Mandatory Organics Recycling for Multi-Family and Commercial Sectors

This policy presents a major shift from voluntary to mandatory participation in organics recycling collection programs. It is intended to motivate multi-family and commercial waste sectors within the City to separate recyclable materials from the waste they generate at their home or business, and place it in the appropriate bin or organics recycling collection container on a regular basis for collection.

To effect this change, the City and its franchised haulers would need to establish "Mandatory Organics Recycling" that requires waste generators to separate organics from other waste, and set the organics out for collection as appropriate for the organics recycling programs and services available through their service provider.

This initiative would need to be carefully developed based on consideration of legitimate concerns raised by various stakeholder groups and be consistent with City policy directives. It would need to be publicized adequately to inform all multi-family residents, businesses, service providers, and others of the intent and purpose.

Assembly Bill 341 (adopted by the California legislature in 2011) established a statewide goal of 75 percent by 2020 and requires commercial generators (with more than four cubic yard per week of solid waste) and multi-family complexes (with five units or more) to recycle. However, it does not address organic materials and does not require generators to participate in programs offered by their buildings.

Targeted generators include commercial generators and multi-family complexes with five units or more.

Table 32: List of Materials Targeted through Mandatory Organics Recycling for Multi-Family and Commercial Sectors

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags		23	Food	X
2	Newspaper		24	Green waste	X
3	Mixed waste paper		25	Manures	X
4	Compostable paper	X	26	Textiles	
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers		28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans		31	Lumber	
10	Other ferrous		32	Gypsum board	
11	Aluminum cans		33	Rock, soil, and fines	
12	Other nonferrous		34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers		38	Bulky items	
17	Plastic #1 containers		39	Tires	
18	Other containers		40	Remainder/composite special	
19	Expanded polystyrene		41	Mixed residue	
20	Recyclable film				
21	Mixed plastic reusable/recyclable				
22	Mixed plastic non-reuse/recycle				

4.2.10 Program 25: Multi-Family Recycling Ambassador Program

This program will provide education and assistance to multi-family customers in order to encourage them to initiate or expand recycling and waste reduction practices. The focus of the program is on improving recycling habits, reducing contamination of the recycling bins, and decreasing the amount of waste entering landfills. By hiring recycling ambassadors or providing these services through its franchised haulers, the City would expand public education and outreach services and encourage multi-family customers to participate more consistently in the recycling programs being offered by the franchisees. Recycling Ambassadors would conduct field surveys, monitor participation patterns, and spot-check containers to identify problem areas (i.e., neighborhoods with low participation, contamination problems, broken or missing containers).

The City and its franchised haulers would publicize the Recycling Ambassador Program and encourage multi-family customers to use this free service to increase recycling wherever feasible.

Under the new franchise system, the City could require that the franchisees provide dedicated staff to encourage multi-family customers to expand recycling and waste reduction practices.

Targeted generators include multi-family complexes with five units or more.

Table 33: List of Materials Targeted through Multi-Family Recycling Ambassador Program

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	X
2	Newspaper	X	24	Green waste	X
3	Mixed waste paper	X	25	Manures	
4	Compostable paper	X	26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	X
7	Flat glass		29	Asphalt paving	X
8	Remainder/composite glass		30	Asphalt roofing	X
9	Tin/steel cans	X	31	Lumber	X
10	Other ferrous	X	32	Gypsum board	X
11	Aluminum cans	X	33	Rock, soil, and fines	X
12	Other nonferrous	X	34	Remainder/composite construction and demolition	X
13	Remainder/composite metal		35	HHW	X
14	Electronics	X	36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	
17	Plastic #1 containers	X	39	Tires	
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle				

4.2.11 Program 26: Expand Commercial Technical Assistance

This program will provide enhanced technical assistance to commercial customers to encourage them to initiate or expand recycling and waste reduction practices at their place of business. The City and its franchised haulers would publicize the technical assistance program and encourage businesses to use this free service to increase recycling wherever feasible and at the same time lower their disposal costs.

Technical assistance would include conducting on-site waste assessments to identify target materials for recycling and waste reduction, providing contact information for securing recycling services, and distributing appropriate outreach materials describing best practices for setting up or expanding recycling services for different types of businesses. Technical assistance would help to minimize or overcome various obstacles to recycling faced by commercial customers (space constraints, labor and sorting requirements, lack of information or training, etc.). Technical assistance would encourage more commercial customers to set up an effective recycling program that is suited to the customer's site, whether it be a large office complex, bar, restaurant, factory, warehouse, shopping center, small retail business or other type of commercial site.

Under the new franchise system, the City could require that the franchisees provide dedicated staff to encourage commercial customers to expand recycling and waste reduction practices.

Targeted generators include commercial generators.

Table 34: List of Materials Targeted through Commercial Technical Assistance

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	X
2	Newspaper	X	24	Green waste	X
3	Mixed waste paper	X	25	Manures	
4	Compostable paper	X	26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	
7	Flat glass		29	Asphalt paving	
8	Remainder/composite glass		30	Asphalt roofing	
9	Tin/steel cans	X	31	Lumber	
10	Other ferrous	X	32	Gypsum board	
11	Aluminum cans	X	33	Rock, soil, and fines	
12	Other nonferrous	X	34	Remainder/composite construction and demolition	
13	Remainder/composite metal		35	HHW	
14	Electronics		36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	
17	Plastic #1 containers	X	39	Tires	
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle				

4.2.12 Program 27: Recycling Ambassador Program for Multi-Family and Commercial (Reinforcement)

The mandatory programs are assumed to have been in place for some time prior to implementation of reinforcement, which would shift the focus from education efforts to education combined with enforcement efforts. The intent of this program would be to include code enforcement to secure consistent participation by multi-family residents and businesses in the established recycling and organics collection programs available to waste generators (and mandated by various City policies designed to increase the City's waste diversion).

Mandatory programs may be administered by franchised haulers with potential enforcement efforts supported through City staff.

Code enforcement would rely on coordinated efforts between hauler and City staff working in the Multi-Family Recycling Ambassador and Commercial Technical Assistance Programs and other LASAN staff, as appropriate, to ensure violators of the City code are aware of and take appropriate actions to comply with the recycling and other waste diversion requirements established by the relevant City ordinances. Code violations would likely be discovered by commercial technical assistance staff or Recycling Ambassadors working in neighborhoods and commercial districts, while monitoring recycling programs, or through complaints registered by concerned residents, businesses, waste haulers, recyclers or other parties. In either case, information regarding code violations would be followed up by LASAN code enforcement staff and/or staff from the City's Code Enforcement department, to ensure the violations are corrected by the appropriate party. In cases where the party refuses to correct the problems or is unwilling to cooperate with the City to find a resolution, City staff would be able to take appropriate actions, which could include imposition of fines, penalties, or other sanctions that are consistent with City code enforcement.

Targeted generators include commercial generators and multi-family complexes with five units or more.

Table 35: List of Materials Targeted through Recycling Ambassador Program for Multi-Family and Commercial (Reinforcement)

	Material	Check if Applies		Material	Check if Applies
1	Cardboard, paper bags	X	23	Food	X
2	Newspaper	X	24	Green waste	X
3	Mixed waste paper	X	25	Manures	
4	Compostable paper	X	26	Textiles	X
5	Remainder/composite paper		27	Remainder/composite organic	
6	Glass containers	X	28	Concrete	X
7	Flat glass		29	Asphalt paving	X
8	Remainder/composite glass		30	Asphalt roofing	X
9	Tin/steel cans	X	31	Lumber	X
10	Other ferrous	X	32	Gypsum board	X
11	Aluminum cans	X	33	Rock, soil, and fines	X
12	Other nonferrous	X	34	Remainder/composite construction and demolition	X
13	Remainder/composite metal		35	HHW	X
14	Electronics	X	36	Ash	
15	Major appliances		37	Sewage solids	
16	Plastic #2 containers	X	38	Bulky items	
17	Plastic #1 containers	X	39	Tires	
18	Other containers	X	40	Remainder/composite special	
19	Expanded polystyrene	X	41	Mixed residue	
20	Recyclable film	X			
21	Mixed plastic reusable/recyclable	X			
22	Mixed plastic non-reuse/recycle				

Section 5 Additional SWIRP Policies and Programs Not Included in Material Flow Model

Additional policies and programs that cannot be quantified in the material flow model will be included in SWIRP because they enhance the effectiveness of waste diversion policies and programs needed to meet Zero Waste goals. Table 36 lists policies and programs that were identified by SWIRP stakeholders during Phase 1 and are recommended for inclusion in the SWIRP plan.

Table 36: Additional SWIRP Policies and Programs Not included in Material Flow Model

Program	Number corresponding to Policy/Program list
Recycling Market Development Zone (RMDZ)	63
Environmentally Preferable Purchasing (EPP) Ordinance	EPP 11 and 12

5.1 Recycling Market Development Zone (RMDZ)

In January 2003, the California Integrated Waste Management Board (CIWMB)[9] reauthorized Los Angeles' Citywide Recycling Market Development Zone (LARMDZ) designation to include the boundaries of the entire City of Los Angeles. The RMDZ program was established by the CIWMB to stimulate recycling based manufacturing businesses and create jobs. The LARMDZ program is a collaborative effort between the City of Los Angeles, the Los Angeles business community, and the CalRecycle to enable Los Angeles to continue to contribute towards meeting statewide waste diversion goals while promoting positive economic development at the local level.

Since the designation of the Los Angeles RMDZ, a total of 15 loans worth over $11.5 million have been funded. As a result of the approved RMDZ loans, over 170 new jobs were created and approximately 142,000 tons per year of secondary material were recycled into new products. The RMDZ program has made loans for the following material types: e-waste (i.e., computer processors, telecommunication equipment), paper, construction, and demolition debris (asphalt, wood, cement, and drywall), plastic, used textiles, used tires, and yard trimmings.

In addition to the RMDZ Revolving Loan program, the City of Los Angeles RMDZ program offers a wide range of support mechanisms applicable to manufacturers that use secondary materials including tax incentives, low-interest financing, 35 percent electric rate reduction, work source centers, employment training and business assistance.

[9] CIWMB was the predecessor agency to CalRecycle.

Additional financial incentives may include Industrial Development Bond Financing; Small Business Financing; and State Enterprise Zone, Federal Empowerment Zone, and Renewal Community tax incentives.

Data are not available for purposes of quantifying diversion for this program. Materials targeted are already accounted for in other policies and programs in the material flow model.

Targeted generators include candidates for recycling market development projects.

5.2 Environmentally Preferred Purchasing Ordinance

This policy focuses on implementation of the Environmentally Preferred (EPP) Purchasing Ordinance that was adopted by the City Council on June 12, 2009.[10] The policy directs City Departments that need supplies to always purchase the available and appropriate product choices that are environmentally friendly, rather than choosing products based solely on a low-bid criteria. The goal of this policy is to select products that are recyclable and/or less toxic, and therefore minimize negative environmental impacts and reduce the amount of waste generated by the City's activities. In implementing this policy, the City conducts outreach and education of EPP principles to all City staff, especially those on the purchasing staff or making the decisions on purchases. The policy is intended to be broad enough so that even in atypical situations, City staff will be able to apply the EPP principles to make informed decisions.

Data are not available for purposes of quantifying diversion for this policy. Materials targeted are already accounted for in other policies and programs in the material flow model.

Targeted generators include City staff making purchasing decisions.

[10] City of Los Angeles Environmentally Preferred Purchasing Ordinance http://www.environmentla.org/pdf/2010/EPP_Ordinance.pdf (accessed August 30, 2013)

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Appendix B

Material Flow Model and Generation Projections

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Section 1 Overview

1.1 Purpose of the Model

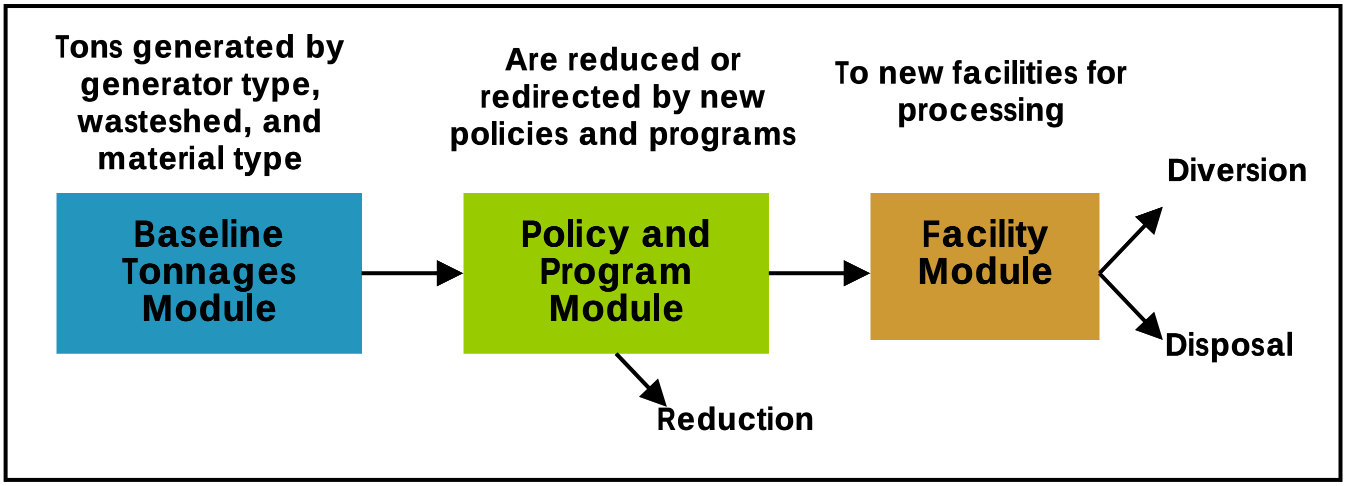
The Los Angeles Zero Waste Planning Model was developed to evaluate the effects of different Zero Waste strategies on disposal and diversion throughout the City of Los Angeles (City). The model includes a material flow analysis and generation projections that are critical for evaluating and selecting programs to be included in the Solid Waste Integrated Resources Plan (SWIRP) *Phase 2 Policy, Program, and Facility Plan*.

The spreadsheet-based model tracks the flow of materials in the waste stream as they originate from four generator types[1] in the City's six wastesheds;[2] are processed through various types of facilities; and are directed to commodity markets, transformation facilities, or final disposal in landfills. The model allows a trained user to program in diverse scenarios using a baseline case of the discarded materials; the expected effects of policies and programs on material generation and destinations; and the expected effects of various types of processing facilities and technologies on the discarded materials. Based on these inputs, the model calculates the overall disposal and diversion results.

1.2 Model Structure

The model is built in three separate modules in order to facilitate evaluation of the waste stream at different points in the material management process. The modules include the Baseline Tonnages Module, the Policy and Program Module, and the Facility Module. The user may review the inputs, revise the assumptions, and view the results in any individual module. Figure 1 presents an overview of the structure of the model.

Figure 1: Structure of the City of Los Angeles Zero Waste Planning Model



[1] Residential curbside, multi-family, commercial, and construction and demolition (C&D) sites. Residential curbside customers include generators in single-family residences and some multi-family residences, primarily with four units or less, serviced by the Bureau of Sanitation (LASAN).
[2] East Valley, Harbor, North Central, South LA, Western, and West Valley.

The Baseline Tonnages Module reports the amount of materials generated in the City in 2010 and projects the generation of discarded materials through 2030. For each year, the model estimates the tons of material disposed by four different types of generators: residential curbside, multi-family, commercial, and construction and demolition (C&D) sites. The materials are modeled based on the method of collection (i.e., whether they are commercially hauled, City-hauled, or self-hauled) and whether they are disposed or diverted. Finally, the tons are divided among the six wastesheds in the City (based on population and employment): East Valley, Harbor, North Central, South LA, Western, and West Valley. A map of the City's wastesheds is provided in Figure 2.

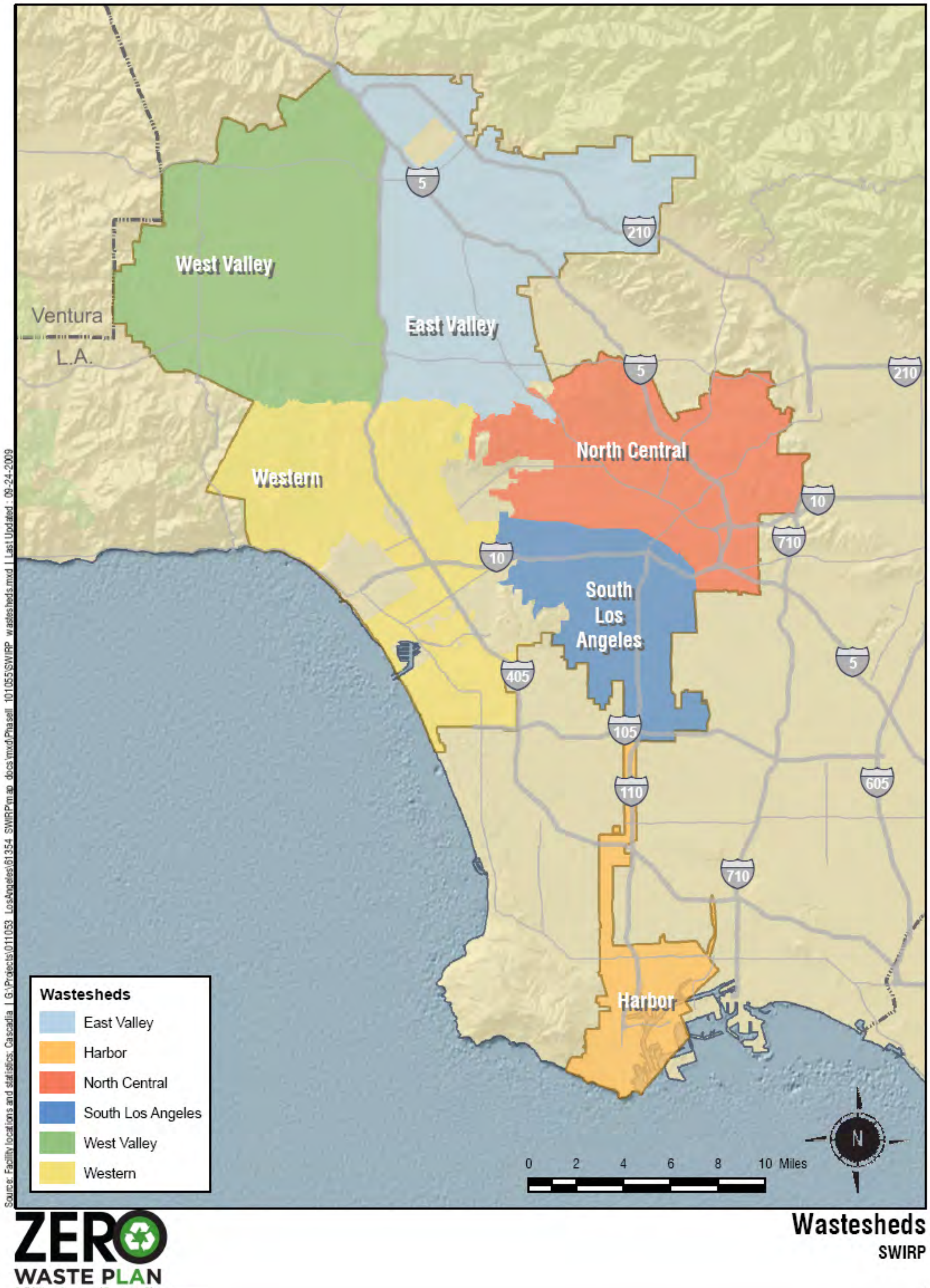
The Policy and Program Module reports the resulting tons of material in each generator sector after the implementation of each policy or program. The module also reports the change in tons of each material type sent to disposal, as well as the overall diversion rate for the generator.

In the Policy and Program Module, the user selects a year (within the planning period through 2030) and one of the four generator types to evaluate. Based on the selection, the Policy and Program Module references the appropriate data from the Baseline Tonnages Module. Next, the user selects policies and programs to apply to the generator sector in each of the six wastesheds. Each policy or program moves tons of material from one output stream to another. The user can view and adjust the underlying participation and efficiency assumptions for each policy or program.

The Facility Module allows the user to direct the tons from each generator sector to various types of facilities. The user can select a waste stream for a given year and has the option to model the processing of the materials at an initial facility. The user can also send the outputs from the first facility to additional facilities for subsequent processing to be modeled. The results of the output are based on facility profiles that can be viewed and modified in the module.

Sections 2 through 4 of this appendix describe the three modules in greater detail. Each section explains the inputs, user steps, outputs, and data sources for the relevant module. The Baseline Tonnages Module section also includes the generation, disposal, and diversion projections for the planning period through 2030.

Figure 2: Map of the City's Six Wastesheds



Section 2 Baseline Tonnages Module

This section describes the Baseline Tonnages Module, the first module of the City of Los Angeles Zero Waste Planning Model. It documents the methodology for estimating the baseline tonnages, composition, and projections in the module and reports the projected baseline tonnages in each waste stream for 2010 through 2030.

2.1 Using the Baseline Tonnages Module

In the Baseline Tonnages Module, the user can view the tons of each material type that flow out of a generator sector in a given waste stream from 2010 through 2030. For any given year, the user can view the tons that originate from residential curbside, multi-family, commercial, and C&D generators. The tons disposed by each generator type are tracked in the model based on: 1) the method of collection, (i.e., commercially hauled, City-hauled, or self-hauled); and 2) whether they are disposed or diverted.

The user can modify the data in this module as updated information becomes available. However, because of the level of detail required, it is recommended that the user avoid changing the data in this module unless the user has access to the fully detailed and accurate information.

The user can view the data for each generator sector citywide, or evaluate a specific wasteshed. Overall tonnage data, as well as detailed tonnage data within the 41 different material types, are provided as well. Table 1 provides a list of the 41 material types included in the model.

Table 1: Materials Tracked by the City of Los Angeles Zero Waste Planning Model

Cardboard, Paper Bags	Major Appliances	Asphalt Paving
Newspaper	Plastic #2 Containers	Asphalt Roofing
Mixed waste paper	Plastic #1 Containers	Lumber
Compostable paper	Other Containers	Gypsum Board
Remainder/Composite Paper	Expanded polystyrene	Rock, Soil, and Fines
Glass containers	Recyclable film	Remainder/Composite C&D
Flat Glass	Mixed plastic reusable/recyclable	HHW (Household Hazardous Waste)
Remainder/Composite Glass	Mixed plastic non reuse/recycle	Ash
Tin/Steel Cans	Food	Sewage Solids
Other Ferrous	Green Waste	Bulky Items
Aluminum Cans	Manures	Tires
Other Non-Ferrous	Textiles	Mixed Residue
Remainder/Composite Metal	Remainder/Composite Organic	Remainder/Composite Special
Electronics	Concrete	

2.2 Methodology

The following data sets were used in the analysis; at the time of the model development, they represented the best known information upon which to calculate the disposal and diversion estimates.

Documented Disposal

- Total 2010 solid waste disposed:[3] 2,849,237 tons
- Total 2010 residential curbside solid waste disposed:[4] 870,286 tons

Estimated Disposal

- Average amount of solid waste disposed per multi-family unit:[5] 0.9303 tons per multi-family unit per year
- Average amount of solid waste disposed per employee annually for each of nine industry groups,[6] excluding the construction industry: refer to Table 2
- Total self-hauled solid waste in 2006[7] and adjusted for 2010 disposal levels: 111,499 tons

Documented Diversion

- Total 2010 residential curbside yard trimmings composted or beneficially used:[8] 457,302 tons
- Total 2010 residential curbside recycling:[9] 209,535 tons
- Total 2010 multi-family residential recycling:[10] 14,366 tons

Estimated Diversion

- Total 2010 citywide diversion:[11] 7,223,809 tons
- Total commercial yard trimmings composted or beneficially used during 2006[12] and adjusted for 2010 diversion levels: 205,713 tons
- Total 2000 commercial recycling:[13] 2,260,000 tons

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[3] California Department of Resources Recycling and Recovery (CalRecycle), Disposal Reporting System.
[4] City of Los Angeles Bureau of Sanitation (LASAN),"Sanitation Refuse and Transfer Tonnage Calendar Year 2010."
[5] Department of Public Works, LASAN, Solid Resources Citywide Recycling Division, *City of Los Angeles Waste Characterization and Quantification Study Year 2000*, July 2002.
[6] Industry groups correspond to all of the top-level designations in the Standard Industrial Classification (SIC) system.
[7] Calculated from facility surveys in Attachments C-1 and C-2 of Appendix C, page C-1-1 and page C-2-1.
[8] Based on information from City database "Sanitation Commodities 2010."
[9] As reported by LASAN.
[10] As reported by LASAN.
[11] Derived from 2010 CalRecycle Senate Bill 1016 Per Capita Disposal Equivalent Draft Calculator.
[12] Documented in the facility surveys in Attachment C-5 of Appendix C, page C-5-1.
[13] City of Los Angeles LASAN, *City of Los Angeles Year 2000 AB 939 Annual Report*, August 2001.

- Total C&D materials recycled or beneficially used during 2006,[14] adjusted for 2010 diversion levels and estimated based on tons delivered to City-certified C&D facilities in 2010: 2,202,282 tons
- Total self-hauled yard trimmings composted or beneficially used during 2006:[15] 251,962 tons

Table 2 shows the average amount of materials disposed per employee annually for each of nine industry groups, corresponding to the industry groupings identified by the Standard Industrial Classification (SIC) system, excluding the construction industry.[16]

Table 2: Average Disposal per Employee by Industry Group

SIC Industry Group	Tons Disposed per Employee
Agriculture	4.49
Mining	0.59
Manufacturing	1.05
Transportation, Communication, and Utilities	0.54
Wholesale	1.58
Retail	1.91
Finance, Insurance, Real Estate	0.50
Services	0.61
Government	0.68

Source: CalRecycle *Statewide Waste Characterization Study,* December 2004

Population, housing, and employment figures were used to estimate the growth in disposal and recycling of discarded materials. More detailed figures were obtained from the Southern California Association of Governments (SCAG) at the level of individual Transportation Analysis Zones (TAZs);[17] these figures were aggregated to areas corresponding to the six wastesheds using Geographic Information System (GIS) maps.

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[14] Documented in the facility surveys in Attachment C-4 of Appendix C, page C-4-1.

[15] Documented in the facility surveys in Attachment C-5 of Appendix C, page C-5-1.

[16] The construction industry group was not included, since nearly all discarded materials from that industry group appear as "construction and demolition" materials, which were quantified separately.

[17] SCAG, *Integrated Growth Forecast by Transportation Analysis Zone*, 2010.

2.3 Disposal: Solid Waste

This section summarizes the sources and methodology for estimating the quantity, projections, and composition of residential and commercial solid waste, as well as C&D materials. The results of the 2010-2030 projections are also included.

2.3.1 Residential

2.3.1.1 Quantities

The citywide baseline estimate of City-hauled residential curbside disposal for the year 2010 was taken to be the sum of reported residential curbside disposed tons, as reflected in the City's database.

The citywide baseline estimate of self-hauled residential curbside disposal for the year 2010 was estimated by taking the ratio of residential self-haul to total self-haul, as calculated in the CalRecycle *Statewide Waste Characterization Study,* December 2004, to the total amount of self-hauled solid waste from the City of Los Angeles in 2010.[18] This calculation can be expressed by the equation:

City residential self-hauled tons = City total self-hauled tons x (Statewide residential self-hauled tons/ Statewide total self-hauled tons)

It was assumed that there is no multi-family self-haul; therefore, all of the residential self-haul tons were allocated to the residential curbside disposal.

The citywide baseline estimate of the multi-family commercially-hauled disposal was calculated for the year 2000 using the per-household disposal rate, multiplied by the number of occupied multi-family units that existed citywide in 2000. A disposal figure for the year 2010 was then estimated by projecting the 2000 estimate proportionate to the growth in multi-family population between 2000 and 2010.

The multi-family population was estimated as the total residential population multiplied by the ratio of multi-family households to all households. Similarly, the residential curbside population was estimated as the total population multiplied by the ratio of residential curbside households to all households.

Residential curbside and multi-family tons, associated with each of the City's six wastesheds, for each year were calculated based on the fraction of the City's total residential curbside or multi-family population that is projected to reside within each wasteshed based on data from SCAG.

2.3.1.2 Projections

For the years 2010 through 2030, residential curbside and multi-family disposal were projected to increase or decrease at the same per capita rate as the increases or decreases in residential curbside and multi-family population, based on the projections of population from SCAG.

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[18] Residential self-hauled solid waste represents 18.9 percent total self-hauled solid waste statewide according to the CalRecycle *Statewide Waste Characterization Study,* December 2004, Table ES-1, page 3.

In the absence of per capita disposal projection estimates, the most feasible approach was to assume a constant per capita disposal rate. This per capita disposal rate is multiplied by the residential curbside and multi-family population projections to calculate the total disposal for each sector. Note that for the residential curbside sector, solid waste disposal is projected to decline beginning in 2025. This is because the population projections provided by SCAG predict a decline in single-family households in certain areas of Los Angeles beginning in 2025.

2.3.1.3 Composition

For residential curbside and multi-family sectors, it was assumed that the composition of disposed waste remains constant between 2010 and 2030. Only the quantity of each material type is projected to change during this period of time. The composition profiles of City-hauled residential curbside waste and multi-family waste were obtained from findings reported in the *City of Los Angeles Waste Characterization and Quantification Study Year 2000*, July 2002. The composition profiles of self-hauled solid waste from residential curbside customers were based on results from the CalRecycle *Statewide Waste Characterization Study,* December 2004.

2.3.2 Commercial

2.3.2.1 Quantities

Estimates from the *City of Los Angeles Waste Characterization and Quantification Study Year 2000*, July 2002, reflecting annual per-employee disposal rates for each of 39 industry groups,[19] were aggregated to match the nine industry groups described in employment figures provided by SCAG. The nine aggregated industry groups corresponded to the major divisions of the SIC system and include the following:

1. Agriculture
2. Mining
3. Manufacturing
4. Transportation, Communication, and Utilities
5. Wholesale
6. Retail
7. Finance, Insurance, Real Estate
8. Services
9. Government

The construction industry group was not included, since nearly all discarded materials from that industry group appear as "construction and demolition" materials, which were quantified separately.

For each year, an estimate of commercially-hauled disposal for each of the nine remaining industry groups in each of the six wastesheds was calculated by multiplying the per-employee disposal figure for the group by

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[19] Industry groups were defined based on SIC codes. For each industry group, disposal composition data and per-employee disposal quantity data were obtained from the CalRecycle *Statewide Waste Characterization Study,* December 2004; *City of Los Angeles Waste Characterization and Quantification Study Year 2000,* July 2002; or the CalRecycle *Waste Disposal and Diversion Findings for Selected Industry Groups,* June 2006.

the estimated number of employees in the industry group of the wasteshed. The total citywide commercially-hauled solid waste disposed annually was calculated as the sum of solid waste disposed for each industry group citywide.

2.3.2.2 Projections

For the years 2010 through 2030, commercial disposal was projected to increase or decrease at the same rate as the increase or decrease in the number of employees in each industry group, based on the projections in employment from SCAG.

2.3.2.3 Composition

The composition of commercially-hauled solid waste was projected through a process that relied on a composition profile of discarded materials from each of 39 industry groups that collectively represent the population of employees working within the City, excluding the construction industry. The composition profile and average tons of disposed solid waste per employee per year was determined for each industry group.[20] The basis of the projected changes in commercial solid waste composition, between 2010 and 2030, include the number of employees in each industry group and for each wasteshed.

The citywide baseline estimate of self-hauled commercial disposal was calculated as a fraction of the total self-hauled solid waste in 2010. The total citywide commercial self-hauled solid waste was calculated based on the following equation:[21]

City commercial self-hauled tons = City total self-hauled tons x (Statewide commercial self-hauled tons/ Statewide total self-hauled tons)

The total self-hauled commercial disposal amount was segregated into the nine industry groups based on the percentage of commercially-hauled commercial disposal among the industry groups. Within each industry group, the self-hauled commercial disposal tons were separated into the six wastesheds, based on the estimated number of employees.

The composition of self-hauled commercial solid waste was calculated using the results of the CalRecycle *Statewide Waste Characterization Study,* December 2004. CalRecycle's waste composition profile for self-hauled commercial solid waste was applied to the overall amount of self-hauled commercial disposal described above.

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[20] Department of Public Works, LASAN, Solid Resources Citywide Recycling Division, *City of Los Angeles Waste Characterization and Quantification Study Year 2000,* July 2002.

[21] Commercial self-hauled solid waste represents 81.1 percent total self-hauled solid waste statewide according to the CalRecycle *Statewide Waste Characterization Study,* December 2004, Table ES-1, page 3.

2.3.3 Construction & Demolition

2.3.3.1 Quantities

For 2010, the amount of C&D materials disposed were calculated by subtracting the figures for residential and commercial solid waste from the total tons of disposed solid waste during that year. This calculation can be expressed by the following equation:

C&D disposed tons = Total disposed tons – (Residential disposed tons + Commercial disposed tons)

Those tons were further divided between commercially-hauled C&D and self-hauled C&D, based on proportions that were derived from surveys of 17 transfer stations, 15 solid waste landfills, and eight C&D and inert landfills conducted in 2006. The detailed information for these calculations is available in the transfer station and landfill facility surveys included in Attachments C-1 and C-2 in *Appendix C Infrastructure and Material Flows*, beginning on page C-1-1.

2.3.3.2 Projections

For the years 2010 through 2030, the increases or decreases in disposed C&D materials were projected using the same rate of increase or decrease as the combined residential and commercial projections.

2.3.3.3 Composition

The composition of disposed C&D material was assumed to remain constant between 2010 and 2030, but the quantity of each material is expected to increase in proportion to the projections of the total disposed C&D materials. The composition of C&D materials were calculated based on the findings reported in CalRecycle's C&D waste characterization study.[22]

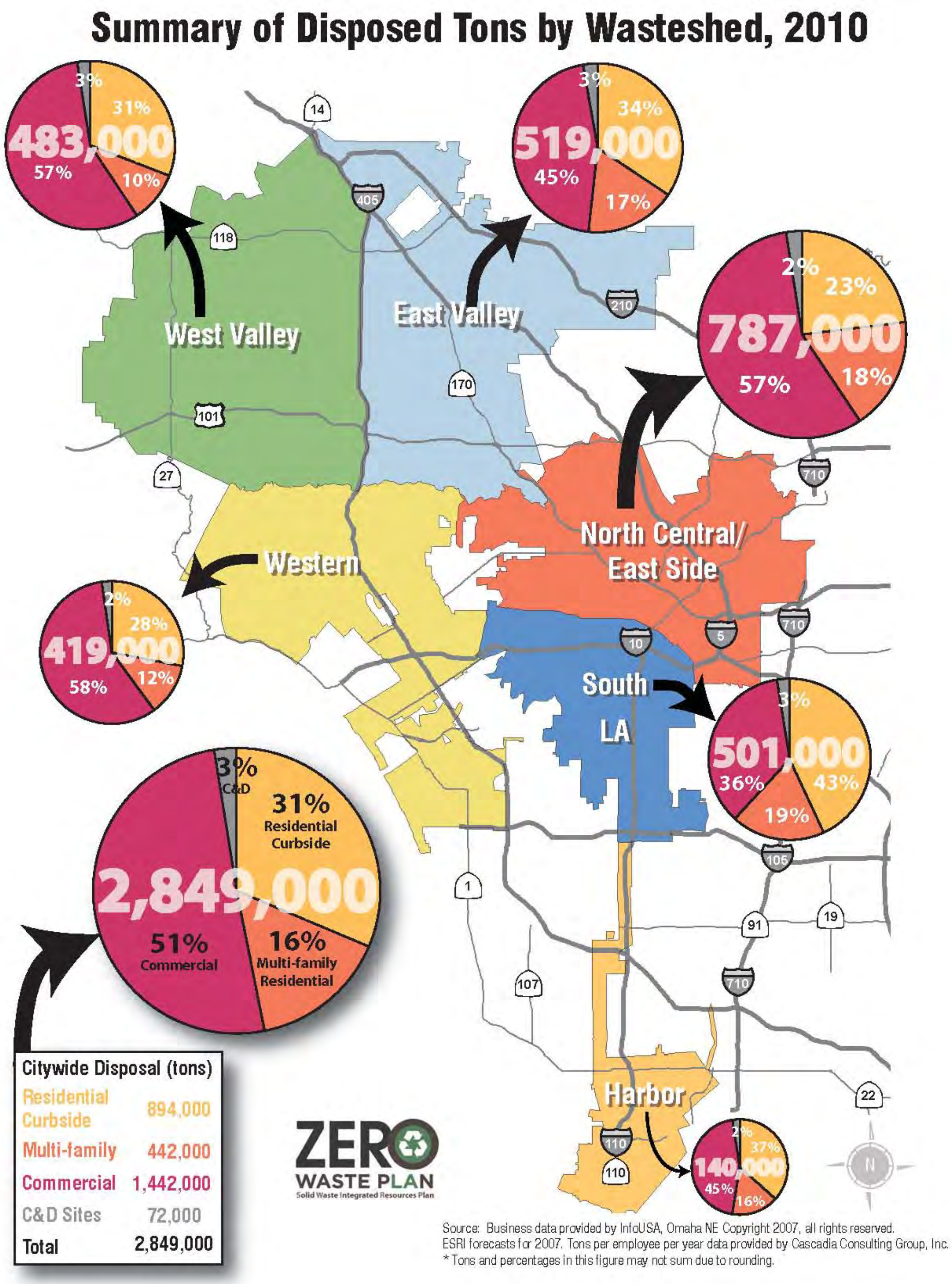
2.3.4 Projected Disposal Quantities by Sector

Based on the projection model described in Section 2, and assuming a continuation of the current level of diversion and waste reduction, the overall disposed solid waste from the City is expected to increase at an average rate of 1 percent annually between 2010 and 2030. The amount of disposed commercial solid waste is expected to increase at a higher rate than the amount of residential solid waste, which is driven largely by an expected increase in the number of service-sector employees.

A summary of the disposed tons by sector and wasteshed in 2010 is shown in Figure 3 and Table 3. The projected disposal quantities for each generator sector – residential curbside, multi-family, commercial, and C&D – are shown in Figure 4 and Table 4.

[22] CalRecycle *Detailed Characterization of Construction and Demolition Waste*, June 2006.

Figure 3: Summary of Disposed Tons by Wasteshed in 2010



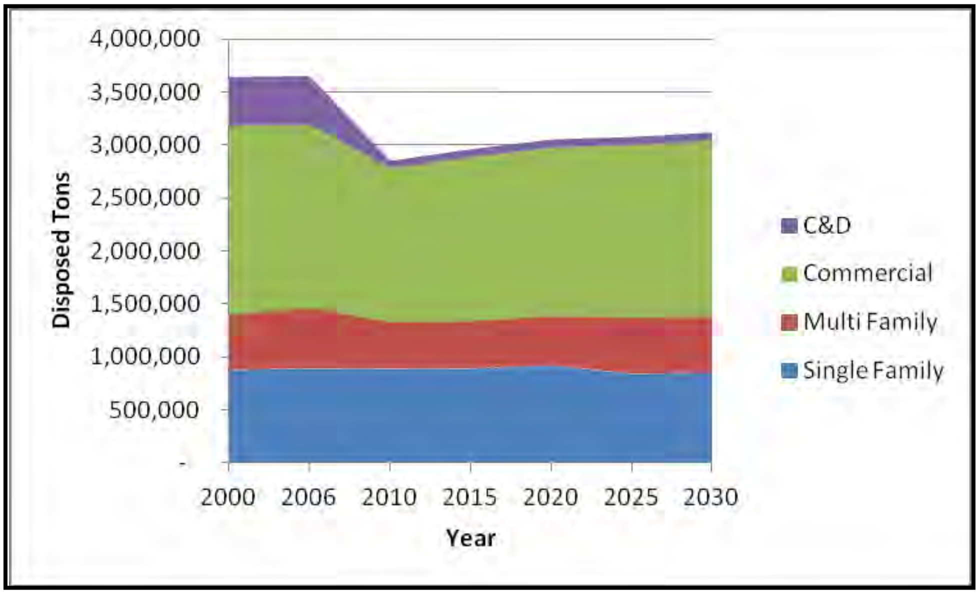
Source: City of Los Angeles Generation Projection Model, January 2013

Table 3: Annual Disposed Tons by Wasteshed and Sector (2010)

	Residential Curbside	Multi Family	Commercial	C&D	Totals
East Valley	178,465	90,254	236,253	14,408	**519,379**
Harbor	51,318	22,321	63,097	3,470	**140,205**
North Central	181,512	138,094	447,502	19,634	**786,742**
South Los Angeles	215,769	93,877	178,294	12,772	**500,712**
West Valley	149,179	47,422	274,385	12,105	**483,090**
Western	117,526	49,781	242,261	9,539	**419,107**
Totals	**893,769**	**441,749**	**1,441,792**	**71,928**	**2,849,237**

Source: City of Los Angeles Generation Projection Model, January 2013.
Totals may not sum due to rounding.

Figure 4: Anticipated Solid Waste Disposal, by Sector, Projected through 2030



Source: City of Los Angeles Generation Projection Model, January 2013

Table 4: Projected Annual Solid Waste Disposal by Generator Sector (Tons)

Year	Residential curbside	Multi-family	Commercial	C&D	Total
2010	893,771	441,749	1,441,790	71,927	2,849,237
2013	895,643	444,497	1,501,553	73,565	2,915,258
2020	924,252	465,415	1,584,306	76,977	3,050,949
2025	847,235	530,171	1,621,493	77,643	3,076,542
2030	856,944	537,190	1,649,062	78,741	3,121,937

Source: City of Los Angeles Generation Projection Model, January 2013. Tonnage projections based on SCAG population and employment projections, *Integrated Growth Forecast by Transportation Analysis Zone*, 2010.
Totals may not sum due to rounding.

2.3.5 Projected Disposal Composition by Sector

The solid waste composition was estimated for each generator sector and each wasteshed for the years 2010 and 2030. The differences in composition estimates between the two years are predominantly influenced by the following:

- Changes in residential population
- Changes in the population of residential curbside and multi-family households
- Changes in employment within each industry group

The original sources for the waste composition data that is included in the model were:

- Department of Public Works, LASAN, Solid Resources Citywide Recycling Division, *City of Los Angeles Waste Characterization and Quantification Study Year 2000,* July 2002
- CalRecycle, *Statewide Waste Characterization Study,* December 2004
- CalRecycle, *Waste Disposal and Diversion Findings for Selected Industry Groups,* June 2006
- CalRecycle, *Detailed Characterization of Construction and Demolition Waste*, June 2006

Table 5: 2010 Projected Solid Waste Composition, by Sector and Material Category

Category	Residential curbside		Multi-family		Commercial		C&D		Overall	
	Tons	Percent	Tons	Percent	Tons	Percent	Tons	Percent	Tons	Percent
Paper	194,599	21.8	142,742	32.3	499,782	34.7	2,244	3.1	839,367	29.5
Glass	18,445	2.1	24,364	5.5	30,298	2.1	885	1.2	73,992	2.6
Metal	38,550	4.3	17,367	3.9	54,760	3.8	4,063	5.6	114,741	4.0
Electronics	4,129	0.5	7,743	1.8	2,838	0.2	169	0.2	14,879	0.5
Plastic	86,257	9.7	42,677	9.7	166,124	11.5	567	0.8	295,624	10.4
Organics	400,684	44.8	179,778	40.7	525,578	36.5	2,142	3.0	1,108,182	38.9
C&D	91,367	10.2	9,533	2.2	131,213	9.1	60,841	84.6	292,954	10.3
Special[1]	59,738	6.7	17,545	4.0	31,197	2.2	1,017	1.4	109,496	3.8
Total	**893,769**	**100.0**	**441,749**	**100.0**	**1,441,790**	**100.0**	**71,927**	**100.0**	**2,849,235**	**100.0**

Source: City of Los Angeles Generation Projection Model, January 2013
[1]The category Special Waste includes household hazardous waste, ash, bulky items, tires, and mixed residue.
Totals may not sum due to rounding.

Table 6: 2030 Projected Solid Waste Composition, by Sector and Material Category

Category	Residential curbside		Multi-family		Commercial		C&D		Overall	
	Tons	Percent	Tons	Percent	Tons	Percent	Tons	Percent	Tons	Percent
Paper	186,309	21.7	173,582	32.3	567,331	34.4	2,456	3.1	929,678	29.8
Glass	17,678	2.1	29,628	5.5	34,426	2.1	968	1.2	82,700	2.6
Metal	37,008	4.3	21,119	3.9	62,231	3.8	4,448	5.6	124,807	4.0
Electronics	3,975	0.5	9,416	1.8	3,238	0.2	185	0.2	16,814	0.5
Plastic	82,608	9.6	51,897	9.7	187,455	11.4	621	0.8	322,581	10.3
Organics	383,628	44.8	218,620	40.7	610,266	37.0	2,345	3.0	1,214,860	38.9
C&D	88,258	10.3	11,592	2.2	148,855	9.0	66,605	84.6	315,310	10.1
Special	57,480	6.7	21,335	4.0	35,259	2.1	1,113	1.4	115,187	3.7
Total	**856,944**	**100.0**	**537,190**	**100.0**	**1,649,062**	**100.0**	**78,741**	**100.0**	**3,121,937**	**100.0**

Source: City of Los Angeles Generation Projection Model, January 2013
Totals may not sum due to rounding.

2.4 Diversion: Yard Trimmings, Recyclable Materials, and C&D

The following section describes the diversion estimates in the Baseline Tonnages Module. The materials diverted include the following categories: yard trimmings, recyclable materials, and diverted C&D.

2.4.1 Yard Trimmings

The sources and methodology for estimating the quantity, composition, and projections of residential and commercial yard trimmings are described in this section.

2.4.1.1 Residential

For 2010, the amount of City-hauled yard trimmings from residential curbside sources was estimated based on wasteshed-specific data provided by LASAN. For more details on the methodology, refer to *Appendix C Infrastructure and Material Flows*, page C-36.

The total amount of self-hauled yard trimmings was estimated based on surveys of 17 transfer stations, 15 solid waste landfills, and eight yard trimmings processors conducted in 2006. For more detailed results from the facility surveys, refer to Attachments C-1, C-2 and C-5 of *Appendix C Infrastructure and Material Flows*. Self-hauled yard trimmings originating from residential generators were split out from the total amount of self-hauled yard trimmings based on the ratio of residential to commercial yard trimmings in the waste stream from the *City of Los Angeles Waste Characterization and Quantification Study Year 2000,* July 2002. It was assumed that all residential self-hauled yard trimmings come from residential curbside households; no self-hauled yard trimmings were assigned to multi-family households.

The amount of City-hauled and self-hauled yard trimmings from residential curbside generators was calculated based on the 2006 figures for self-haul and 2010 figures for residential curbside, and the growth in subsequent years was projected at the same rate as overall residential curbside disposed solid waste, as described earlier in this report.

2.4.1.2 Commercial

For the year 2010, the amount of yard trimmings that originated in the commercial sector and was hauled by commercial haulers was estimated based on facility surveys of 17 transfer stations, 15 solid waste landfills, and eight yard trimmings processors conducted in 2006. For more details on the methodology, refer to Section 3.3 "Yard Trimmings Composting and Beneficial Use" in *Appendix C Infrastructure and Material Flows*, page C-34.

The total amount of self-hauled yard trimmings were estimated based on the facility surveys Attachments C-1, C-2, and C-5 in *Appendix C Infrastructure and Material Flows*. Self-hauled yard trimmings from commercial generators were derived from the total amount of self-hauled yard trimmings based on the ratio of residential to commercial yard trimmings in the waste stream from the *City of Los Angeles Waste Characterization and Quantification Study Year 2000,* July 2002.

The amount of commercial yard trimmings was calculated based on the 2006 surveys. The projected growth in subsequent years, due to new commercial development, was projected at the same rate as overall commercial disposed waste.

2.4.1.3 Projected Diverted Yard Trimmings by Sector

Assuming a continuation of the current level of diversion and waste reduction, the overall quantity of composted or beneficially used yard trimmings from the City is expected to increase by nearly 26,000 tons between 2010 and 2030.[23] Note that for the residential curbside sector, yard trimmings diversion is projected to decline beginning in 2025. This is because the population projections provided by SCAG predict a decline in single-family households across Los Angeles beginning in 2025.

The projected quantities of diverted (i.e., composted or beneficially used) yard trimmings from residential curbside and commercial sectors are shown in Table 7, with estimates provided in planning-year increments.

Table 7: Projected Annual Diverted Yard Trimmings Quantities by Sector (Tons)

Year	Residential curbside	Commercial	Total
2010	629,320	205,713	835,033
2013	650,266	213,614	863,880
2020	670,951	226,098	897,049
2025	619,557	232,053	851,610
2030	624,106	236,602	860,708

Source: City of Los Angeles Generation Projection Model, January 2013

2.4.2 Recyclable Materials

This section summarizes the sources and methodology for estimating the quantity, composition, and projections of residential and commercial recycling.

2.4.2.1 Residential

For 2010, the amount of curbside recycling from the residential curbside sector and the multi-family residential sector serviced by LASAN recycling contractors was documented based on wasteshed-specific data provided by LASAN. For more details on the methodology, refer to Section 3.1 "Commodity Recycling" in *Appendix C Infrastructure and Material Flows*, page C-17.

The amount of self-hauled recycling was estimated based on the amount of California Redemption Value (CRV) materials recycled in 2006 from data provided by the Division of Recycling at the California Department of Conservation (now part of CalRecycle). These 130,056 tons of CRV materials were assigned to the residential self-hauled recycling stream. It was assumed that none of this self-hauled recycling originated from multi-family generators.

[23] Based on projections using SCAG, *Integrated Growth Forecast by Transportation Analysis Zone,* 2010.

The amounts of City-hauled and self-hauled residential curbside recycling were calculated based on the 2006 and 2010 figures. The increase or decrease in subsequent years was projected at the same rate as overall residential curbside disposed solid waste. The amount of multi-family residential recycling in 2010 was provided by LASAN and its growth in subsequent years was projected at the same rate as overall multi-family disposed solid waste.

For residential curbside and multi-family sectors, it was assumed that the composition of recycling will be constant between 2010 and 2030; only the quantity in each material type is projected to change over this time span. The composition of City-hauled recycling from the residential curbside sector was estimated based on data provided by LASAN. The data included quantities of individual materials collected in each wasteshed's curbside recycling in 2010.

2.4.2.2 Commercial

For 2000, the amount of recycling that originated from the commercial sector was estimated based on the *City of Los Angeles Year 2000 AB 939 Report,* August 2001. For 2010, the estimated quantity of recyclable materials was calculated based on the assumption that it increased at the same rate as the commercial disposed solid waste. For subsequent years, the amount of commercial recycling was estimated based on the 2010 figure, with an assumption that the growth in commercial recycling will be the same as the growth of the commercial disposed solid waste. For more details on the methodology, refer to Section 3.1.3, "Overview of Commercial Recycling," in *Appendix C Infrastructure and Material Flows*, page C-21.

2.4.2.3 Projected Recycling by Sector

Assuming the current level of diversion and waste reduction continues, the overall quantity of recycling from the City is expected to increase by approximately 340,000 tons between 2010 and 2030. Commercial recycling is expected to grow by 328,000 tons, while residential recycling is expected to grow by 12,500 tons. Note that for the residential curbside sector, recycling is projected to decline beginning in 2025. This is because the population projections provided by SCAG predict a decline in single-family households in certain areas of Los Angeles beginning in 2025.

The projected recycling quantities for the residential curbside, multi-family, and commercial sectors are shown in Table 8, with estimates provided in planning year increments.

Table 8: Projected Annual Recycling Quantities by Sector (Tons)

Year	Residential curbside[1]	Multi-family	Commercial	Total
2010	339,591	14,366	2,260,000	2,613,957
2013	361,955	14,606	2,352,203	2,728,764
2020	373,520	15,317	2,488,242	2,877,079
2025	346,376	17,216	2,543,723	2,907,315
2030	348,992	17,447	2,587,974	2,954,412

Source: City of Los Angeles Generation Projection Model, January 2013
[1]Includes City-hauled recycling and self-hauled recycling from the residential curbside sector.

2.4.3 Diverted Construction and Demolition Materials

This section summarizes the sources and methodology for estimating the quantity, projections, and composition of diverted C&D materials.

2.4.3.1 Quantities

For 2006, the amount of C&D materials hauled and diverted by commercial haulers was estimated based on surveys of 17 transfer stations and 15 solid waste landfills. For more details on the methodology, refer to Section 3.2 "C&D Recycling and Beneficial Use" of *Appendix C Infrastructure and Material Flows*, page C-24. For purposes of modeling, the diverted C&D materials documented in Appendix C were adjusted to reflect additional materials recovered through C&D processing. However, C&D tons sent to inert landfills were not included in the model.

The total tons of diverted C&D materials were divided between the commercially-hauled and self-hauled sectors, based on proportions that were estimated from data reported by the transfer stations and landfills surveyed; refer to Attachments C-1 and C-2 of *Appendix C Infrastructure and Material Flows* beginning on page C-1-1.

2.4.3.2 Projections

The amount of commercial C&D materials diverted was calculated based on 2010 figures. The growth in subsequent years was estimated to be the same rate as the projected growth for overall C&D materials disposed.[24]

Note that the City's mandatory C&D ordinance was adopted by the City Council on December 17, 2010. All mixed C&D waste generated within City limits must be taken to City certified C&D waste processors.[25] The model takes this program into consideration in the diversion projections.

2.4.3.3 Composition

The composition of disposed C&D materials was assumed to remain constant between 2010 and 2030. The quantity of each material is expected to increase in proportion to the projected amount of C&D materials disposed. The C&D waste composition was calculated based on data from CalRecycle.[26]

2.4.3.4 Projected Diverted C&D by Sector

Assuming the current level of diversion and waste reduction continues, the quantity of C&D materials diverted within the City is expected to increase by more than 248,000 tons between 2010 and 2030. The projected diverted quantities are shown in Table 9, with estimates provided in planning year increments.

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[24] C&D materials are expected to increase based on growth population and new development projections identified in SCAG, *Integrated Growth Forecast by Transportation Analysis Zone*, 2010.

[25] Link to C&D ordinance, http://san.lacity.org/solid_resources/recycling/c&d.htm (accessed October 1, 2013).

[26] CalRecycle *Detailed Characterization of Construction and Demolition Waste,* June 2006.

Table 9: Projected Annual Diverted C&D Material Quantities (Tons)

Year	Total
2010	2,623,400[27]
2013	2,683,292
2020	2,809,048
2025	2,833,340
2030	2,871,920

Source: City of Los Angeles Generation Projection Model, January 2013

2.5 Total Generation

This section summarizes the total generation by sector. It combines materials from disposal, yard trimmings, recycling, and C&D. The total generation is expected to grow by over one million tons between 2010 and 2030. The projected generation tonnages are shown in Table 10, with estimates provided in planning year increments.

Table 10: Projected Total Annual Generation by Sector (Tons)

Year	Residential curbside	Multi-family	Commercial	C&D	Total
2010	2,164,991	573,058	4,639,669	2,695,327	10,073,047
2013	2,223,328	576,664	4,860,091	2,756,861	10,396,944
2020	2,304,402	603,980	5,105,464	2,886,065	10,899,911
2025	2,124,682	688,532	5,220,783	2,911,024	10,945,021
2030	2,141,329	696,846	5,311,109	2,950,661	11,099,945

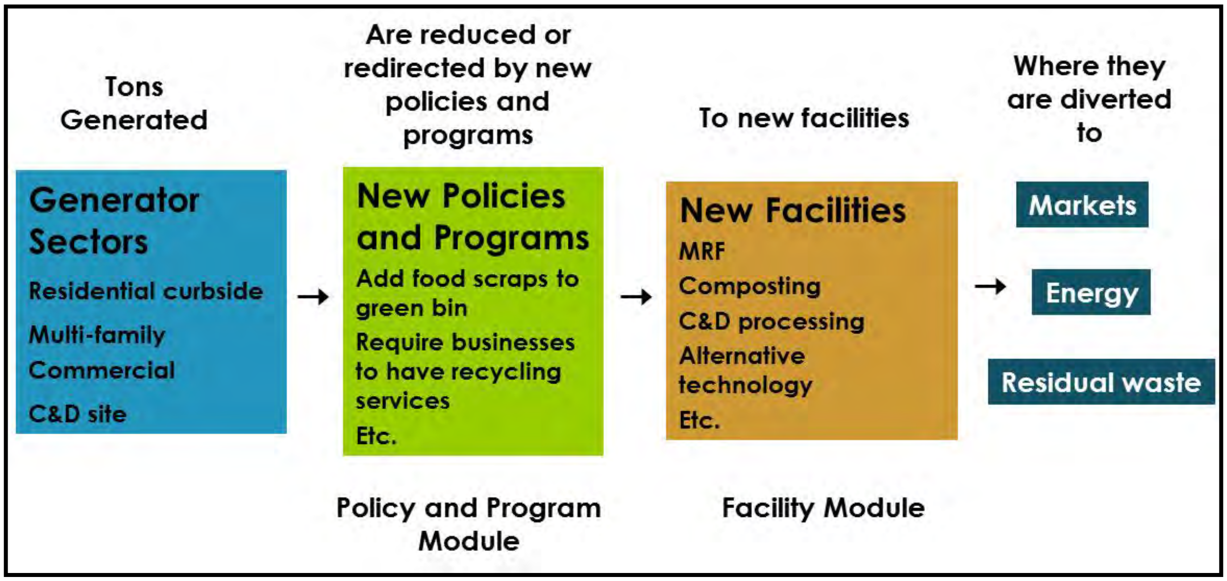
Source: City of Los Angeles Generation Projection Model, January 2013. Tonnage projections based on SCAG population and employment projections, *Integrated Growth Forecast by Transportation Analysis Zone*, 2010.
Totals may not sum due to rounding.

[27] This total varies from the total calculated in *Appendix C Infrastructure and Material Flows* due to adjustments reflecting tons handled by processing facilities and inert landfills. For purposes of modeling, the amount of diverted C&D materials documented in *Appendix C Infrastructure and Material Flows* was adjusted to reflect additional materials recovered through C&D processing. However, C&D tons sent to inert landfills were not included in the model.

Section 3 Policy and Program Module

The Policy and Program Module allows the user to evaluate how different policies and programs affect the baseline tons. The Policy and Program Module is based on data from the Baseline Tonnages Module and provides input to the New Facilities Module. Figure 5 illustrates how materials flow through the Policy and Program Module to the Facility Module.

Figure 5: Overview of the Policy and Program Module



To use the Policy and Program Module, the user first selects one of the four generator sectors to evaluate (i.e., residential curbside, multi-family, commercial, C&D), then chooses a year. Based on these two selections, the module imports the corresponding baseline tonnages into the model.

Next, the user can create or modify the programs or policy assumptions. Each program or policy is described in terms of participation and efficiency rates. The participation rate represents the fraction of households (for residential programs) or employees (for non-residential programs) expected to participate in the program. The efficiency rate represents the fraction of each material that is diverted from disposal by a program participant. The product of the participation rate and the efficiency rate results in the capture rate.

Participation and efficiency rates are specified for each material addressed by a program. The program assumptions also specify whether the material is diverted from disposal to recycling, organics, or another waste stream.

The module for each generator type contains policies and programs for which assumptions have been pre-populated. These program assumptions, and the process by which they were created, are discussed in more detail in *Appendix A Policy and Program Analysis*. The user can select an existing program as it appears in the model; use an existing program and modify assumptions; or create a new program. The module has the capacity for up to 14 different policies and programs.

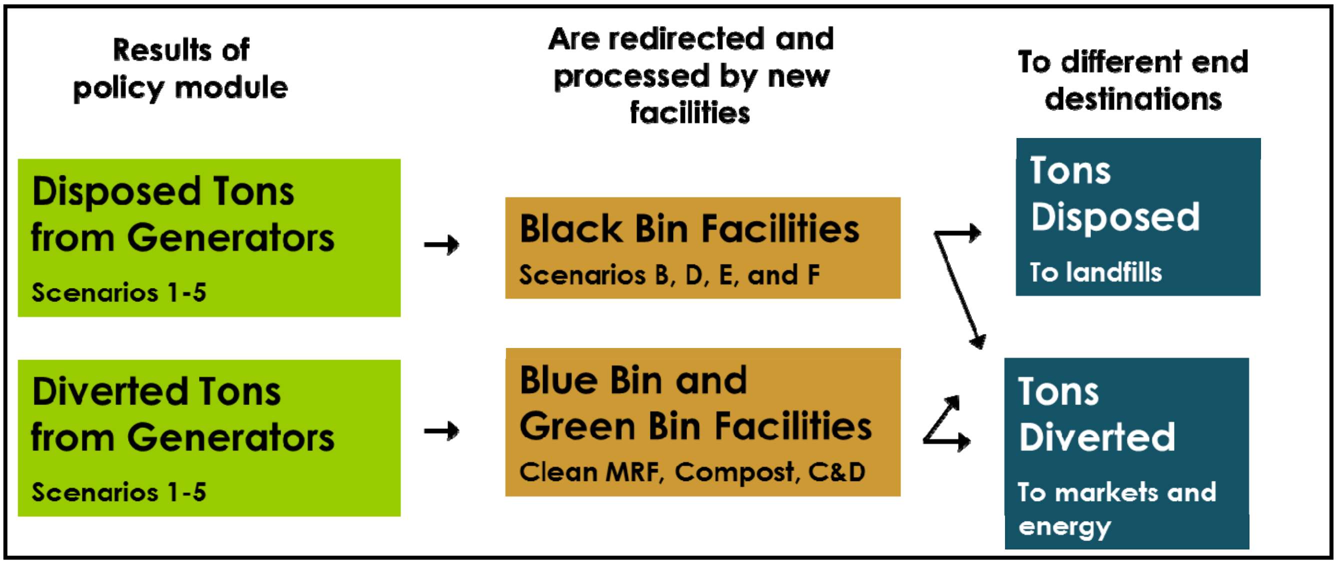
After the user has viewed or changed assumptions about the programs and policies, the user may select up to 14 policies and programs to apply to the generator sector in each of the wastesheds. The user can also apply the same set of policies and programs to all wastesheds, if applicable. Each program is run sequentially, therefore the resulting tonnage from one program becomes the input to the next program in the series. For example, Program 1 takes the entire baseline tons from the generator and diverts a certain amount of tons into City-hauled recycling. Then, Program 2 will run its calculations based on the tonnage results from Program 1.

The Policy and Program Module compiles the data from the Baseline Tonnages Module and the user's selections of policies and programs. The output of the model presents the tonnages that result from the selection of policies and programs. The user can view the number of tons of each material in a wasteshed that remain from each generator sector after each of the selected programs is implemented. The model aggregates the detailed data into the total tons and diversion rates that each program diverts as well as cumulatively, for the entire scenario.

Section 4 Facility Module

The Facility Module allows the user to view the diversion effects that a set of facilities has on the waste stream. Figure 6 illustrates how tons flow from the Policy and Program Module to the Facility Module.

Figure 6: Overview of the Facility Module

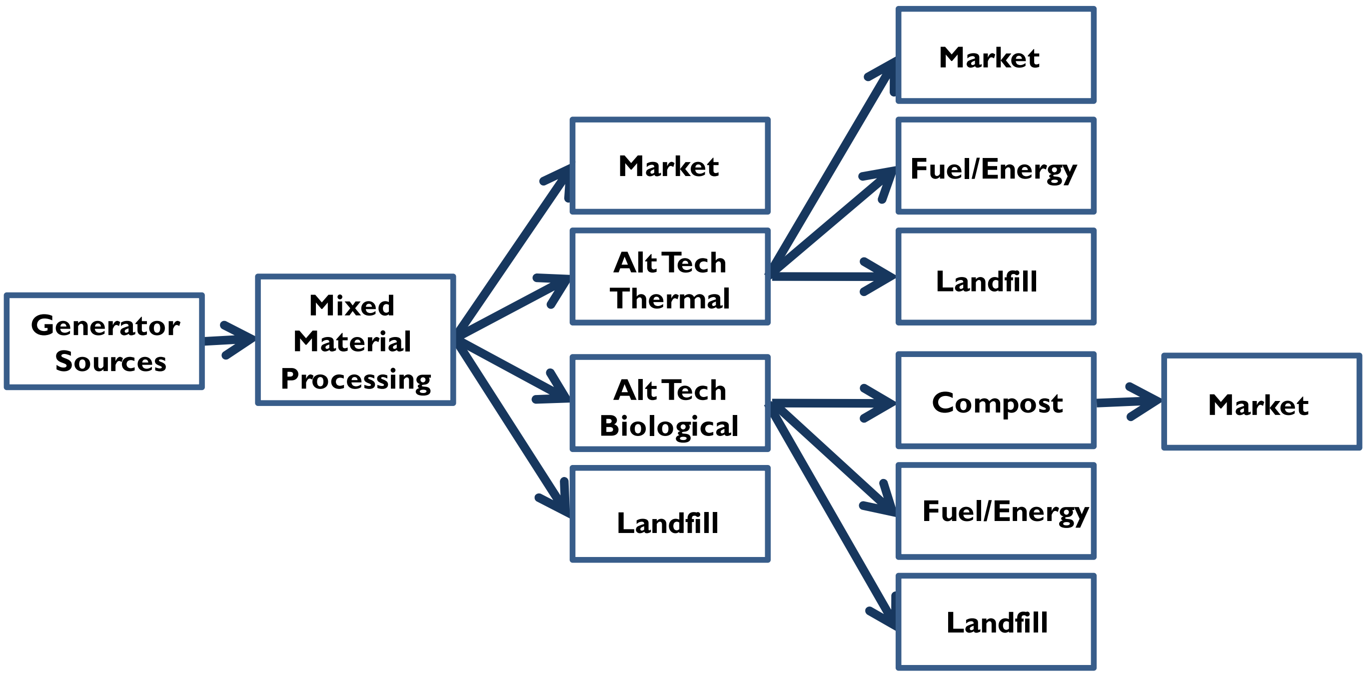


First, the user enters the tonnages from each generator into the input tables in the Facility Module. The user can copy and paste these tonnages either from the table at the end of the Policy and Program Module or from the Baseline Tonnages Module.

Next, the user can create or modify facility profiles. Each facility is described in terms of where it sends material and the quantity of each material type sent to each output destination. The module contains some facilities for which profiles have already been created. These pre-loaded profiles, and the process by which they were created, are documented in Attachment D-2 Facility Descriptions in *Appendix D Facility Analysis,* beginning on page D-2-1. The user can select an existing facility profile as it appears in the model; use an existing facility profile, but modify assumptions; or create a new facility profile. The module has the capacity for up to 20 different facility profiles.

After the facilities assumptions have been confirmed or modified, the user selects which waste streams (or portions of the waste streams) to send to each facility. The model has the capacity to build different scenarios by directing material up to three different facilities (layers) for processing. Figure 7 illustrates an example of a facility scenario.

Figure 7: Example of Facility Scenario Analyzed using the Facility Module



In Figure 7, all of the residual waste that came out of one of the scenarios in the Policy and Program Module were sent to a Mixed Materials Processing facility. The user can direct one or more of the output streams that come out of the Mixed Materials Processing facility to other facilities. Other facilities can include a thermal alternative technology (Alt Tech Thermal) facility, a biological alternative technology (Alt Tech Biological) facility, or a landfill.

The model has the capacity to evaluate three facilities that accept materials directly from generator sources (the first layer), five facilities that accept materials from facilities (second layer), and five facilities that accept materials from facilities (third layer).

Once the selections are made, the user can view the overall tons that are sent to landfill and the overall tons that are diverted as a result of the chosen facility scenario. The module reports the tons by material type in each facility layer that are sent to each output stream. The user can then combine the results from the Facility Module with the results from the Policy and Program Module to calculate the overall diversion results from the entire scenario.

The Facility Module was used to evaluate seven different facility scenarios, as described in Section 2 "Facility Scenarios" in *Appendix D Facility Analysis*, beginning on page D-17.

Appendix C

Infrastructure and Material Flows

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Section 1 Introduction and Overview

An understanding of the private and public materials management infrastructure and services used by generators in the City of Los Angeles (City) is essential to inform the planning and future development of the City's infrastructure. This report documents the flows of disposed materials, diverted materials, and household hazardous waste and electronics among all generators, transfer stations, processing and handling facilities, and landfills used by the City's businesses and residents.

This comprehensive inventory of the City's waste management system incorporates findings from interviews with personnel from transfer stations and landfills, and from recycling, construction and demolition (C&D) materials, yard trimmings, household hazardous waste, and electronics processing facilities that accept materials from City sources. The report also includes data from the California Department of Resources Recycling and Recovery (CalRecycle), the City Bureau of Sanitation (LASAN), and multiple City reports including the following:

- Department of Public Works, LASAN, Solid Resources Citywide Recycling Division, *City of Los Angeles Year 2000 AB 939 Annual Report*, August 2001
- Department of Public Works, LASAN, Solid Resources Citywide Recycling Division, *City of Los Angeles Waste Characterization and Quantification Study Year 2000*, July 2002
- *City of Los Angeles Solid Waste Planning Background Studies Summary Report*, January 2006
- CalRecycle *Statewide Waste Characterization Study*, December 2004
- CalRecycle *Detailed Characterization of Construction and Demolition Waste*, June 2006

Please note that when the facility surveys were conducted for this report, 2006 was the most recent year that complete waste management data were available. Consequently, nearly all data cited in this report are from 2006 with the exception of commercial recycling and C&D processor data from 2007.

This report covers details and flows of three major material streams, as follows:

Section 2: Materials Disposed describes material that was collected for disposal in the City, including overall quantities of waste disposed by three major substreams (residential curbside, commercial/multi-family, and self-haul/other) and four generator types (residential curbside, multi-family, commercial, and C&D).

Section 3: Materials Diverted from Landfill contains details regarding three major substreams:

- **Commodity Recycling**, which comprises paper, plastic, glass, and metal materials collected for recycling from residents and businesses within the City
- **C&D Recycling and Beneficial Use**, which comprises the material, including inert material, that was generated by C&D activities
- **Yard Trimmings Composting and Beneficial Use**, which comprises the collection of yard trimmings from residential curbside, commercial, and self-hauled sources within the City

Section 4: Household Hazardous Waste and Electronics contains information on the household hazardous waste and electronics that are collected from sources within the City.

Section 2 Materials Disposed

This section provides details on the disposed material management and infrastructure of the City of Los Angeles. This information is organized as follows:

- An overview of the City's disposed material system and waste flows, including overall quantities of disposed material generated by residential curbside, commercial/multi-family, and self-haul/other substreams (e.g., C&D)
- The overall quantities of disposed material that flowed through transfer stations and flowed to landfills
- The origins of disposed materials by generator type and wasteshed
- Maps and lists of the transfer stations and landfills that received disposed material from City sources
- Detailed descriptions of the services offered at each solid waste facility, as well as facility tonnage flows, by type and by substream, in 2006

2.1 Overview of Materials Disposed

Approximately 3.65[1] million tons of material were generated in 2006 by residents and businesses within the City.

In order to track the generation and ultimate disposal of these materials, waste flows were tracked according to who brought the materials to the disposal facility, as follows:

- **Residential curbside material** is defined as disposed material collected by LASAN from residential curbside customers, including single-family residences and some multi-family complexes.
- **Commercial/multi-family material** is defined as disposed material collected by a private hauling company from businesses, institutions, public venues, and multi-family buildings such as apartments and condominiums.
- **Self-haul/other material** is defined as all disposed material that is brought to solid waste facilities by the resident or business that generated it. This includes all material other than that brought to the facility by LASAN or by commercial haulers whose primary business is hauling waste that is bound for disposal.

Existing data were used to distribute these 3.65 million tons of disposed material among the three substreams, as shown in Table 1. LASAN provided tonnages for the residential curbside substream. Estimates for the disposed material from commercial/multi-family and self-haul/other substreams were developed based on total 2006 tonnage figures from CalRecycle Disposal Reporting System, as well as on commercial per-employee and multi-family per-household disposal rates calculated in the *City of Los Angeles Waste Characterization and Quantification Study Year 2000*, July 2002.

[1] The total disposed tonnage for the City of Los Angeles was derived from the 2006 CalRecycle Disposal Reporting System.

Table 1: Estimated Disposed Material by Substream, City of Los Angeles 2006

Source	Disposed Material (tons)	Percentage
Residential curbside (LASAN)	963,000	26.4
Commercial/multi-family	2,183,000	59.7
Self-haul/other	508,000	13.9
Total	**3,655,000**	**100**

Sources: City of Los Angeles, Bureau of Sanitation and CalRecycle Disposal Reporting System, 2006
Assumptions: *City of Los Angeles Waste Characterization and Quantification Study Year 2000,* July 2002
Quantities may not sum due to rounding.

These 3.65 million tons of waste were transported by LASAN, commercial haulers, and self-haulers. Haulers brought material either directly to a landfill for final disposal or to an intermediary facility, such as a transfer station or waste processing facility, where the waste material was consolidated in transfer trailers and taken to the landfill for final disposal. The self-haul substream included residents and businesses bringing their own material for disposal to either a transfer station or landfill.

Figure 1 below depicts the relative size of the flows of disposed material from the City and presents the flow of material by major substream, through an intermediate facility (if applicable), to the site of final disposal.

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Figure 1: Solid Waste Flows by Substream, City of Los Angeles 2006[2]

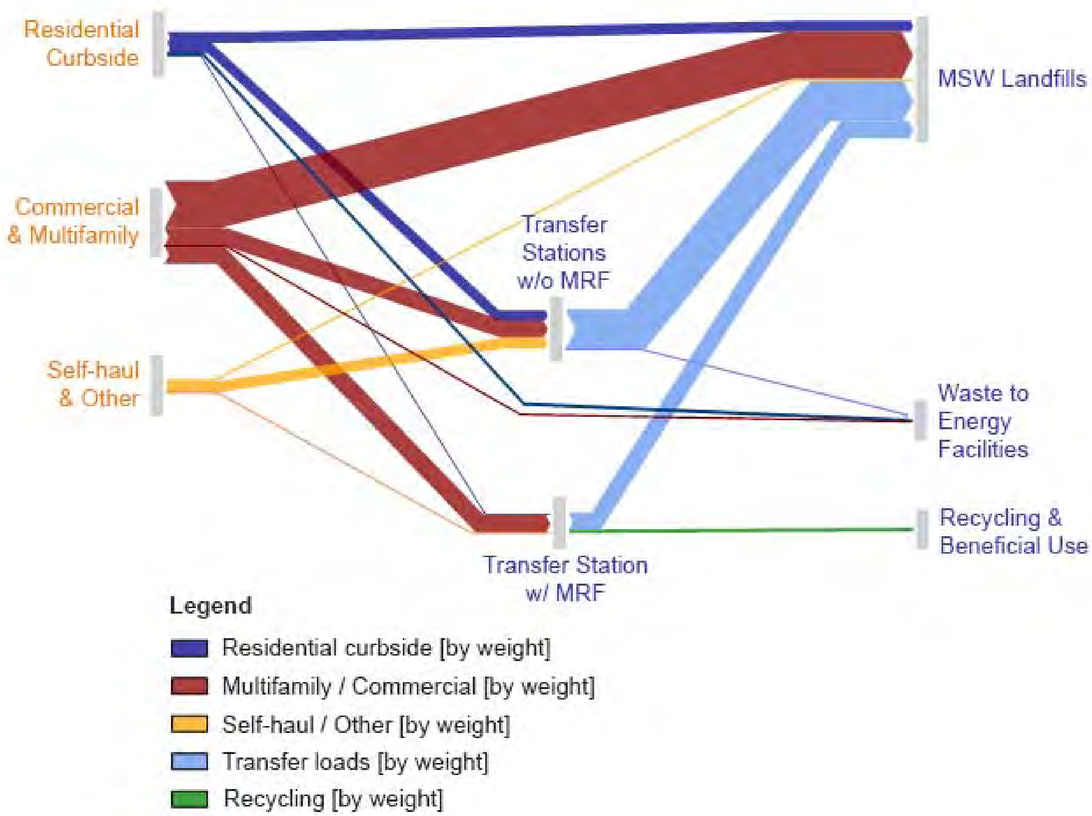


Figure 1 depicts the flow of solid waste from generators to the transfer stations and disposal facilities. This information was obtained by surveying the 17 transfer stations and 15 solid waste disposal facilities that receive material from City sources,[3] combined with data from LASAN[4] regarding residential curbside collection routes. Each facility's reported numbers were verified and calibrated using data from the CalRecycle Disposal Reporting System and quantity data documented in *Appendix B Material Flow Model and Generation Projections*. Facility-specific data can be found in Attachments C-1 and C-2 of this report. Survey forms used to collect data on solid waste facilities can be found in Attachment C-7.

2.2 Origins by Generator Type and Wasteshed

As described in Section 2.1, disposal tonnages are tracked by the three ***substreams*** based on who brought the materials to the processing facility or disposal facility (i.e., residential curbside, commercial/ multifamily, and self-haul/other substreams). For planning purposes, tonnage information can also be allocated by ***generator type*** (who generated the materials) and ***wasteshed*** (where the materials were generated within the City).

[2] MSW refers to Municipal Solid Waste facilities; MRF refers to Materials Recovery Facilities.

[3] The list of facilities is from the *City of Los Angeles Solid Waste Planning Background Studies Summary Report*, January 2006.

[4] LASAN provided 2006 tonnage of solid waste collected from residential curbside customers.

2.2.1 Estimating Tons by Generator Type

The ***generator types*** are:

- **Residential curbside** including residential curbside customers in detached homes and duplex, triplex, and four-unit dwellings and some multi-family complexes
- **Multi-family residential** including apartments, condominiums, mobile home parks, and townhouses with more than four units receiving commercial collection service
- **Commercial businesses** including small and large businesses, institutional and industrial generators, and public venues, all of which generate waste that is collected by a permitted private hauling company
- **Construction and demolition (C&D) sites** located throughout the City that are permitted for construction or demolition activities, including new developments and remodels

In addition, the residential and commercial generator types were divided into commercially hauled vs. self-hauled. Likewise, C&D was divided between disposal from C&D sites (transported by a commercial hauler) and self-haul. The detailed methodology for estimating tonnage by generator type is described in *Appendix B Material Flow Model and Generation Projections* (Section 2.2). In summary:

- Residential curbside tonnage was provided by LASAN
- Commercial and multi-family tonnages were based on employee and multi-family household disposal rates from *City of Los Angeles Solid Waste Planning Background Studies Summary Report,* January 2006
- C&D and self-haul estimates were based on facility interviews conducted with 17 transfer stations, 15 solid waste disposal facilities, and CalRecycle *Statewide Waste Characterization Study,* December 2004

Table 2 summarizes the estimated quantities from each substream that were assigned to each generator type.

Table 2: Estimated Disposed Material by Generator Type, City of Los Angeles 2006

Generator	Substream (see Table 1)	Tonnage
Residential curbside (LASAN)	Equal to residential curbside	963,000
Self-hauled from residents	Included in self-haul/other	25,000
Total residential curbside		988,000
Multi-family	Included in commercial/multi-family	542,000
Commercially hauled from businesses	Included in commercial/multi-family	1,641,000
Self-hauled from businesses	Included in self-haul/other	107,000
Total commercial		1,748,000
C&D sites	Included in self-haul/other	376,000
Total		**3,655,000**

Source: LASAN Database "Sanitation Refuse and Transfer Tonnage Calendar Year 2006" and CalRecycle Disposal Reporting System, 2006
Quantities may not sum due to rounding.

2.2.2 Allocating Tons to Wastesheds

Disposed material estimates presented in Table 2 were divided among the six ***wastesheds*** within the City:

- West Valley
- East Valley
- Western
- North Central/East Side
- South LA
- Harbor

The detailed methodology and background data for dividing the disposal from generator types among the six wastesheds is described in *Appendix B, Material Flow Model and Generation Projections* in Section 2 (page B-5).

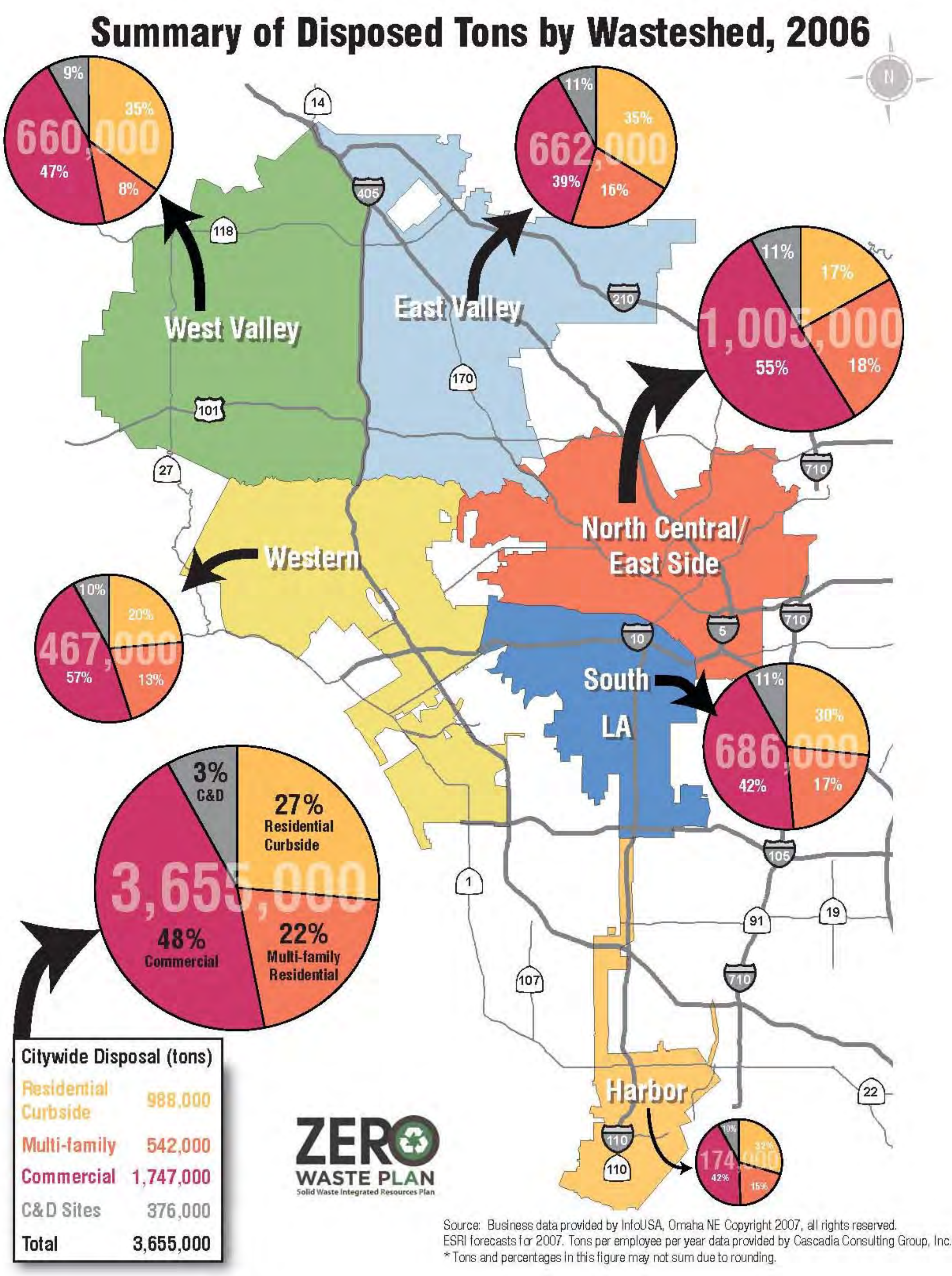
In summary, this distribution was based on each wasteshed's population in single-family households, population in multi-family households, and the number of employees in each wasteshed, belonging to each of nine aggregate employment categories, excluding the construction employment category. The employment categories were created by grouping Standard Industrial Codes to match employment categories for which waste composition profiles were available. Employment categories used are:

- Agriculture
- Mining
- Manufacturing
- Transportation, Communication, Utilities
- Wholesale
- Retail
- Financial, Insurance, Real Estate
- Services
- Government

The Harbor wasteshed generated the smallest amount of material among these wastesheds, approximately 175,000 tons. The North Central wasteshed generated the most material of all the wastesheds at just over 1.0 million tons, most of which was from commercial sources.

Figure 2 shows the estimated breakdown of waste by generator type and wasteshed.

Figure 2: Disposed Material by Generator Type and Wasteshed, City of Los Angeles 2006



2.3 Flow of Disposed Material

In 2006, over half of the disposed material from City sources was taken to a transfer station before reaching its final point of disposal. Figure 3 shows the general flows of material through local waste facilities. A few transfer stations that handle waste from City sources have sorting capabilities and were able to extract and divert an estimated 50,000 tons of material from the waste stream for recycling.

Flow quantities presented in Figure 3 were obtained from a survey of landfills and transfer stations that accepted solid waste from City sources in 2006, as well as data from the CalRecycle Disposal Reporting System.

Figure 3: Flow of Disposed Material, City of Los Angeles 2006

2.4 Disposal Facility Overview

This section includes information on the transfer stations, landfills, and waste-to-energy facilities that receive disposed material from City sources.

2.4.1 Transfer Stations

The locations of transfer stations that received disposed material from City sources in 2006 are shown in Figure 4. These facilities and their self-reported incoming tonnage for 2006 are listed in Table 3. As shown in Table 3, transfer stations handled over two million tons of the City's total disposed solid waste. This means that approximately 59 percent of the City's waste is transferred from collection trucks to larger transfer vehicles for delivery to final landfill disposal sites. In 2006, the Central Los Angeles Recycling & Transfer Station (CLARTS) accepted the largest quantities of residential curbside waste and self-hauled waste, as well as the most material overall from City sources (totaling 683,752 tons). American Waste Transfer Station received the largest quantity of commercial/multi-family waste from City sources in 2006 (totaling 274,291 tons).

The combined total estimated annual permitted capacity of these 17 transfer stations, based on a six-day week, one shift per day, is 12 million tons per year. Generators within the City used approximately 18 percent of the capacity of these facilities, and much of the remaining capacity is used by surrounding communities. Two of these facilities[5] were the process of expansion, and two were in the planning phase,[6] which would increase the available capacity by approximately 2,300 tons per day or 720,000 tons per year. One facility reported that it hoped to expand capacity by an additional 1,000 tons per day.[7] A full listing of expansion plans for transfer stations receiving material from City sources in 2006 is shown in Table 4.

[5] Community Recycling and Waste Resources Recovery
[6] Paramount Resource Recycling Facility and Southern California Disposal
[7] Compton Recycling and Transfer Station (Browning Ferris Industries)

Table 3: Disposed Material Received by Transfer Stations, City of Los Angeles 2006

Transfer Station	Disposed Material (tons)	Percentage
American Waste Transfer Station	274,291	12.8
Athens Services Transfer Station	112	0.0
Bel-Art Waste Transfer Station	54,005	2.5
Carson Transfer Station	76,468	3.6
Central Los Angeles Recycling & Transfer Station (CLARTS)	683,752	31.8
Community Recycling	270,004	12.6
Compton Recycling and Transfer Station (Browning Ferris Industries)	112,883	5.3
Downey Area Recycling and Transfer Station (DART)	26,604	1.2
East Los Angeles Recycling & Transfer Station (ELARTS)	48,531	2.3
Falcon Refuse	48,000	2.2
Innovative Waste Control	203,028	9.5
Mission Road Recycling and Transfer Station (Waste Management)	191,985	8.9
Paramount Resource Recycling Facility	6,000	0.3
South Gate Transfer Station – Los Angeles County Sanitation District	30,764	1.4
South Gate Transfer Station – Waste Management	19,433	0.9
Southern California Disposal	97,594	4.5
Waste Resources Recovery	3,696	0.2
Total	2,147,150	100

Source: Attachment C-1Transfer Stations – Facility Surveys, 2007

The tip fees[8] for solid waste at these transfer stations ranged from $31 per ton to $73 per ton, with an average tip fee of about $49 in 2006. The weighted average tip fee, based on the tons that each facility received, was about $38 per ton.

[8] "Tip fee" or "tipping fee" is the price charged to deliver materials to a solid waste or recycling facility.

Figure 4: Transfer Stations Receiving Disposed Material, City of Los Angeles 2006

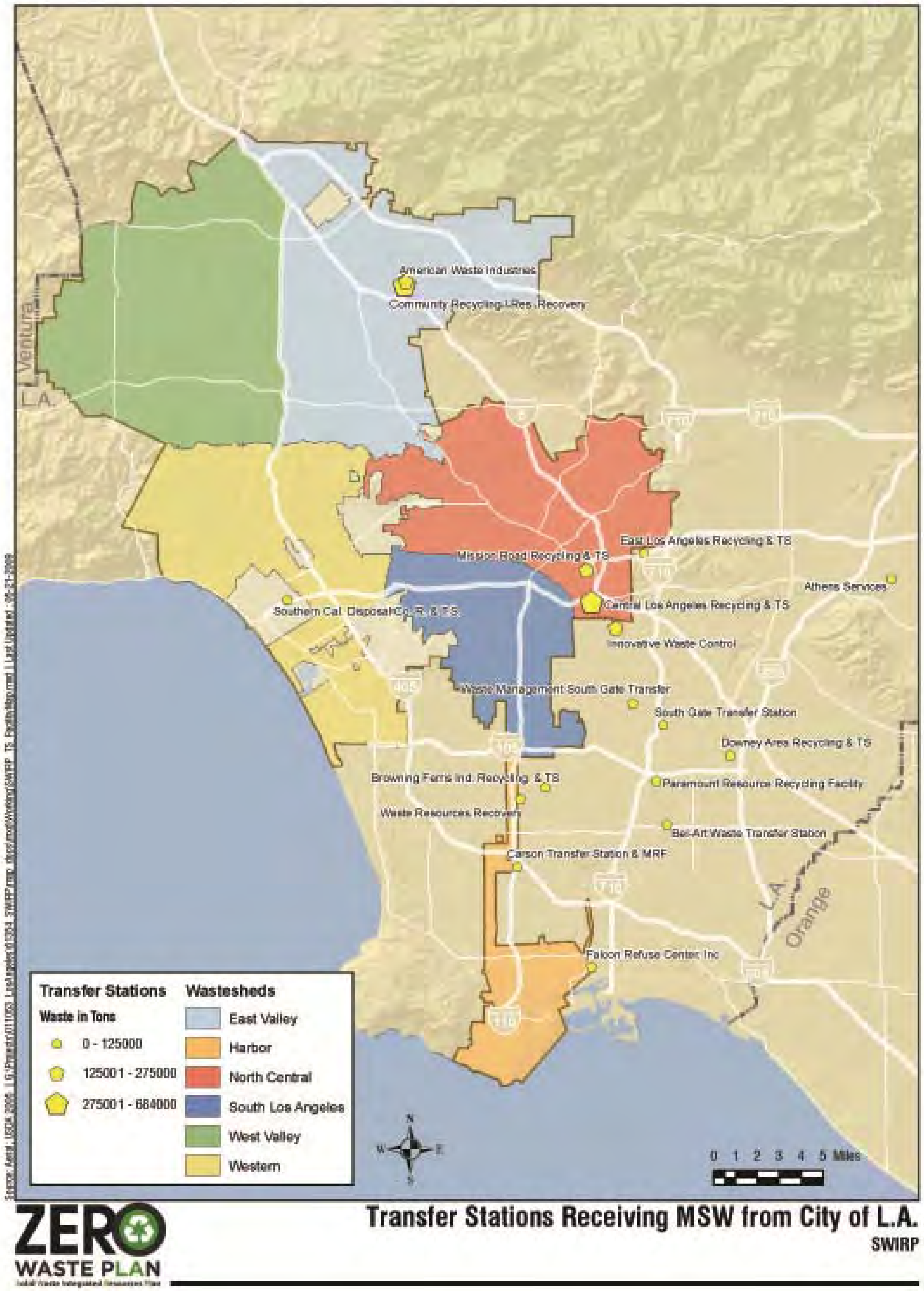


Table 4: Expansion Plans for Transfer Stations Receiving Disposed Material, City of Los Angeles 2006

Company	Plans to Expand?	Expansion Amount or Method of Expansion
American Waste Transfer Station	NO	
Athens Services Transfer Station	NO	Permitted capacity expanded significantly in 2007 from 1,920 to 4,000 tons per day.
Bel-Art Waste Transfer Station	NO	Has space to expand.
Carson Transfer Station	NO	
Central Los Angeles Recycling & Transfer Station	NO	Has the option of purchasing adjacent lands if needed to retrofit and improve the facility to serve rail haul and/or recycling.
Community Recycling	YES	The new permit would total 6,700 tons per day (adding 800 tons per day of solid waste). Expansion of infrastructure, including adding yard trimmings and food scraps processing.
Compton Recycling and Transfer Station (Browning Ferris Industries)	YES	Expanding up to 2,100-2,500 tons of waste per day. Plans to expand both permitted and infrastructure capacity.
Downey Area Recycling and Transfer Station	NO	
East Los Angeles Recycling &Transfer Station	NO	
Falcon Refuse Center, Inc.	NO	
Innovative Waste Control	NO	
Mission Road Recycling and Transfer Station (Waste Management)	NO	
Paramount Resource Recycling Facility	YES	Expansion will not exceed current permit for 2,400 tons per day. Plans to construct a separate MRF building on same acreage.
South Gate Transfer Station—Los Angeles County Sanitation Districts	NO	
South Gate Transfer Station—Waste Management	NO	
Southern California Disposal	YES	Working with the City of Santa Monica on footprint expansion with space for future material handling and recovery.
Waste Resources Recovery	YES	Increasing capacity from 500 to 2,000 tons per day, adding 5 acres of land, and possibly implementing conversion technology.

Source: Attachment C-1 Transfer Stations – Facility Surveys, 2007

2.4.2 Landfills and Waste-to-Energy Facilities

The locations of landfills and waste-to-energy facilities that received disposed material from City sources in 2006 are shown in Figure 5. These facilities and their self-reported incoming tonnage for 2006 are listed in Table 5. Sunshine Canyon accepted more solid waste than any other landfill or waste-to-energy facility receiving waste from City sources (totaling 1,599,344 tons in 2006). While Sunshine accepted the most residential curbside and commercial/multi-family waste from City sources, Bradley Landfill accepted the most self-haul/other waste (approximately 19,000 tons at Bradley compared to about 10,000 tons at Sunshine in 2006).[9] In 2006, Chiquita received more transfer tons than the other landfills.

The total estimated annual permitted capacity of these 15 disposal facilities, based on a six-day week, one shift per day, is 24.4 million tons. Generators within the City used approximately 15 percent of the capacity of these facilities. Six landfills were in the process of planning or requesting permits for expansions.[10] A full listing of expansion plans for landfills and waste-to-energy facilities receiving solid waste from City sources in 2006 is shown in Table 6.

Table 5: Disposed Material Received by Landfills and Waste-to-Energy Facilities, City of Los Angeles 2006

Landfill or Waste-to-Energy Facility	Disposed Material (tons)	Percentage
Antelope Valley Public Landfill	8,483	0.2
Bradley Landfill	350,059	9.6
Calabasas Sanitary Landfill	321,147	8.8
Chiquita Canyon Sanitary Landfill	764,300	20.9
El Sobrante Sanitary Landfill	85,235	2.3
Frank R. Bowerman Sanitary Landfill	41,173	1.1
Lancaster Landfill	133,433	3.7
Olinda Alpha Sanitary Landfill	130,473	3.6
Prima Deshecha Sanitary Landfill	24,047	0.7
Puente Hills Landfill	96,414	2.6
Scholl Canyon Sanitary Landfill	3,553	0.1
Simi Valley Landfill-Recycling Center	62,376	1.7
Sunshine Canyon Landfill	1,599,344	43.8
Commerce Refuse-to-Energy Facility	7,140	0.2
Southeast Resource Recovery Facility	27,380	0.7
Total	**3,654,557**	**100**

Source: Attachment C-2 Landfills and Waste-to-Energy Facilities – Facility Surveys, 2007

[9] As of April 2007, the Bradley facility ceased landfill operations and operated as a limited-volume transfer station accepting clean fill and yard trimmings.

[10] Antelope Valley Public Landfill, Chiquita Canyon Sanitary Landfill, Frank R. Bowerman Sanitary Landfill, Lancaster Landfill, Scholl Canyon Sanitary Landfill, and Simi Valley Landfill-Recycling Center.

The tip fees for solid waste at these landfills ranged from $26 per ton to $55 per ton, with an average tip fee of approximately $43 in 2006. The tip fees for solid waste at the waste-to-energy facilities ranged from $45 to $61. The weighted average tip fee for both landfills and waste-to-energy facilities, based on the tons that each facility received, was about $42 per ton.

Figure 5: Landfills and Waste-to-Energy Facilities Receiving Disposed Material, City of Los Angeles 2006

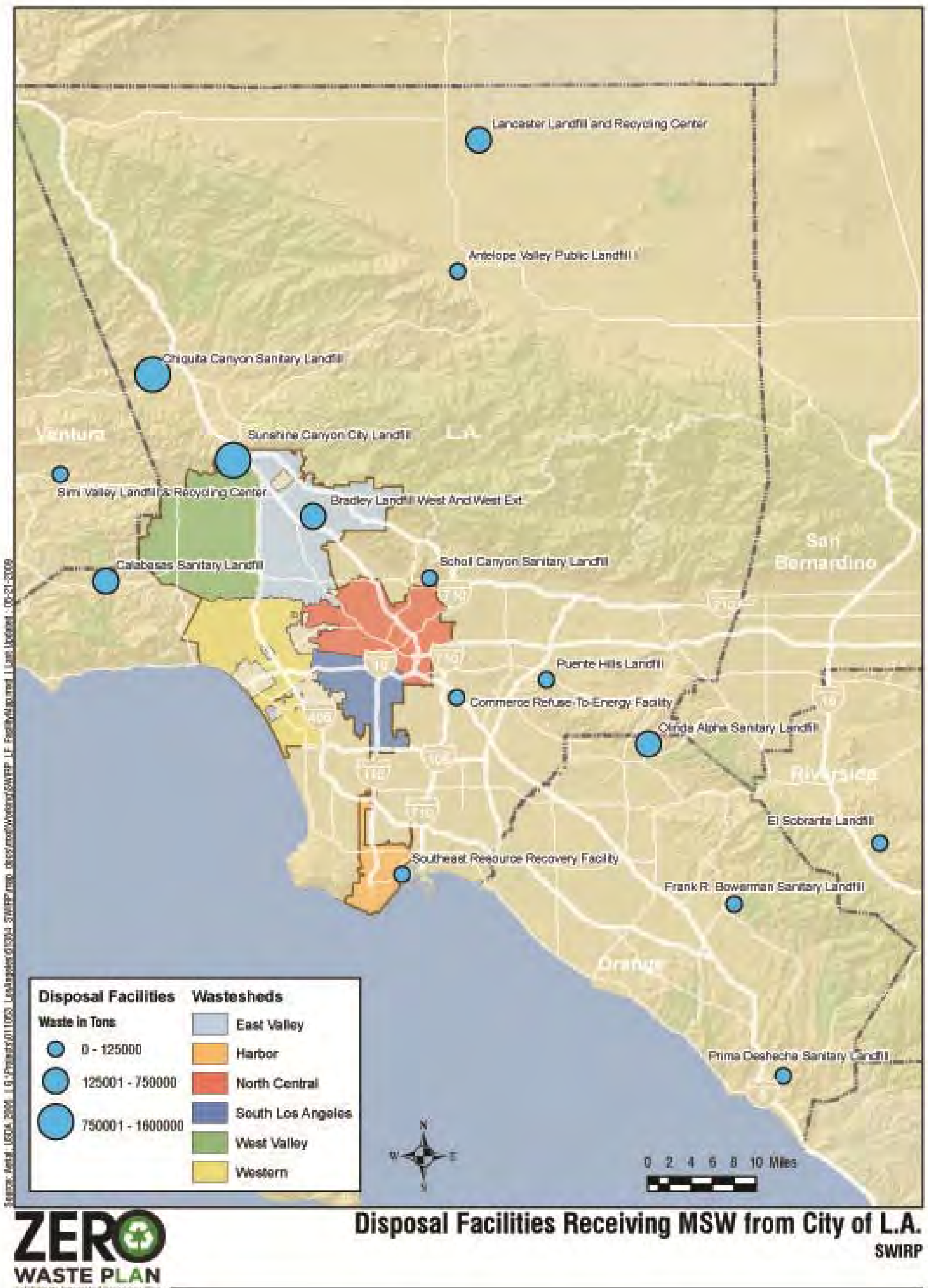


Table 6: Expansion Plans for Landfills and Waste-to-Energy Facilities Receiving Disposed Material, City of Los Angeles 2006

Company	Plans to Expand?	Expansion Amount or Method of Expansion
Antelope Valley Public Landfill	YES	Plans to double capacity. City of Palmdale to explore two different expansion scenarios either through a land purchase or a wedge expansion.
Bradley Landfill	NO	As of April 2007, the Bradley facility ceased landfill operations and operated as a limited-volume transfer station accepting clean fill and yard trimmings. WM was permitting a MRF/transfer station at the Bradley Landfill to handle up to 5,000 tons per day.
Calabasas Sanitary Landfill	NO	Is scheduled to close in 2028.
Chiquita Canyon Sanitary Landfill	YES	Is scheduled to close in November 2019. Filed a Notice of Preparation and applied for a Conditional Use Permit several years ago for a master plan revision to increase in both the volume and tenure of the landfill.
El Sobrante Sanitary Landfill	NO	
Frank R. Bowerman Sanitary Landfill	YES	In 2008, received a permit for a planned expansion to an increased permitted capacity of 11,500 tons per day. Scheduled to close in 2053.
Lancaster Landfill	YES	Has applied for a permit to expand daily capacity to 3,000 tons per day. The facility was projected to close in August 2012.
Olinda Alpha Sanitary Landfill	NO	
Prima Deshecha Sanitary Landfill	NO	
Puente Hills Landfill	NO	Is scheduled to close in 2013.
Scholl Canyon Sanitary Landfill	YES	Plans for two scenarios to add 12 to15 years to landfill life. Option of a vertical-only scenario or a vertical-horizontal scenario.
Simi Valley Landfill-Recycling Center	YES	Increasing capacity to 80 million cubic yards.[11]
Sunshine Canyon Landfill	NO	Sunshine Canyon has approximately 70 million tons of permitted capacity. While the potential exists for future facility expansion, there are no plans to do so at this time. Sunshine Canyon is scheduled to close in 2037.
Commerce Refuse-to-Energy	NO	
Southeast Resource Recovery Facility	NO	

Source: Attachment C-2 Landfills and Waste-to-Energy Facilities – Facility Surveys, 2007

[11] 24 million tons, using a conversion factor of 600 pounds per cubic yard

Section 3 Materials Diverted from Disposal

This section discusses major flows of materials that are diverted from disposal in landfills and waste-to-energy facilities. These flows include commodity recycling, C&D recycling and beneficial use, and yard trimming composting and beneficial use.

- **Commodity recycling** includes paper, plastic, glass, and metal collected from residential curbside, multi-family residential, and commercial sources.
- **C&D recycling and beneficial use** includes materials generated by construction and demolition activities that are recycled or put to beneficial use. Materials include concrete, asphalt, wood, metals, and drywall.
- **Yard trimming composting and beneficial use** includes yard trimmings and food scraps that are composted, mulched or put to beneficial use.

The estimated tonnage associated with each of these flows is presented in Table 7.

Table 7: Estimated Quantities of Diverted Materials, City of Los Angeles 2006

Generator	Tonnage
Commodity Recycling	2,457,000
C&D Recycling and Beneficial Use[12]	2,621,000
Yard Trimmings Composting and Beneficial Use	899,000
Total	**5,977,000**

Source: City of Los Angeles, Bureau of Sanitation and CalRecycle Disposal Reporting System, 2006 and *City of Los Angeles Year 2000 AB939 Report*, August 2001 and Attachments C-1 through C-5 – Facility Surveys 2007-2008

This section, describing the recycling infrastructure of the City, is organized as follows:

- An overview of the City's residential curbside recycling system and recycling flows
- The breakdown of curbside recyclables generated by residential curbside customers
- The overall quantities of residential curbside recyclables that flowed through material recovery facilities
- Maps and lists of the material recovery facilities that received residential curbside recyclables from City sources
- An overview of the City's multi-family recycling program
- An overview of the City's commercial recyclables hauled to major processors, including materials that are self-hauled
- Maps and lists of the major processors that received commercial recyclables from the City, including a table showing plans for expansion at these facilities

[12] Includes approximately 370,000 tons processed or disposed at inert landfills.

3.1 Commodity Recycling

Approximately 2.46 million tons of recyclable materials were collected from residential curbside customers and commercial generators within the City in 2006. As shown in Table 8, the 2.46 million tons of recyclables were divided into tonnages generated by each substream. LASAN provided tonnages for the residential curbside recycling. Estimates for commercial recycling were developed based on tonnages from a generator study reported in the *City of Los Angeles Year 2000 AB939 Report*, August 2001, scaled up by growth in employment.

Table 8: Estimated Recyclable Materials by Generator, City of Los Angeles 2006[13]

Generator	Tons	Percentage
Residential curbside (LASAN)	184,000	7.5
Multi-family	13,000	0.5
Commercial	2,260,000	92.0
Total	**2,457,000**	**100**

Sources: LASAN Database "Sanitation Commodities 2006", CalRecycle Disposal Reporting System, 2006 and *City of Los Angeles Year 2000 AB939 Report*, August 2001
Quantities may not sum due to rounding.

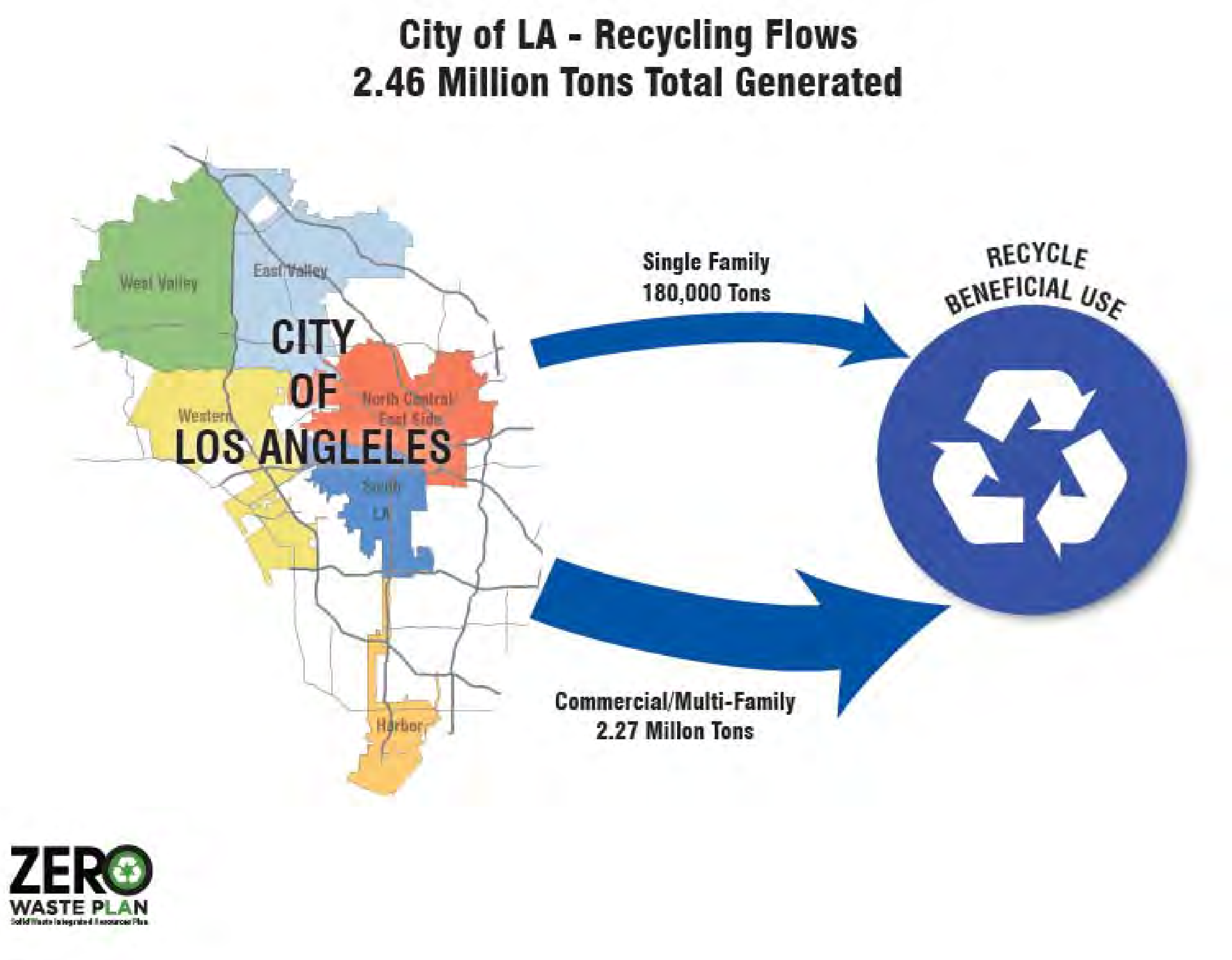
Recyclable materials from residential curbside customers were transported to processors by LASAN. Commercial recyclables were delivered by private recyclers.

The term "commercial recycling" refers to the recycling of materials originating from commercial and C&D activities. These materials are generally processed by private entities, and the materials are diverted from the landfill for economic reasons (e.g., saving tip fee costs). Approximately 2.27 million tons of material are generated through commercial/multi-family and C&D recycling; however, data are not available to proportion these 2.27 million tons between businesses and C&D activities. Thus, the estimates for commercial commodity recycling and for C&D recycling and beneficial use make up an unknown portion of these 2.27 million tons.

Figure 6 shows the general flows of recyclable materials in Los Angeles.

[13]The commercial substream may also include some unknown amount of source reduction, reuse (including food donations), and C&D diversion.

Figure 6: Recycling Flows to Recycling/Beneficial Use, City of Los Angeles 2006



3.1.1 Overview of Residential Curbside Recycling

Residential curbside recyclable materials are collected by LASAN from residential curbside customers in blue bins.

3.1.1.1 Origins by Wasteshed

In 2006, over 180,000 tons of materials were collected for recycling (excluding contamination) in blue bins from residential curbside customers.[14] Tonnages by wasteshed are presented in Table 9 with data for South Los Angeles and North Central wastesheds collected together. The Harbor wasteshed generated approximately 11,000 tons, the smallest amount of recyclables among these wastesheds. The West Valley generated the largest quantity of recyclables at over 50,000 tons.

[14] Data reported by the Los Angeles Bureau of Sanitation, 2006.

Table 9: Residential Curbside Recycling by Wasteshed, Excluding Contamination, City of Los Angeles 2006

Wasteshed	Tons	Percentage
South Los Angeles & North Central	37,508	20.4
West LA	42,259	23.0
East Valley	43,168	23.5
Harbor	10,874	5.9
West Valley	50,093	27.2
Total	**183,902**	**100**

Source: LASAN Database "Sanitation Commodities 2006"

The net tons of recyclables (excluding contamination) are presented by material category in Table 10.

Table 10: Residential Curbside Recycling by Commodity, City of Los Angeles 2006

Material Category	Tons Recycled	Percentage
Paper	**144,522**	**77.0**
Cardboard, Paper Bags	31,921	17.4
Newspaper	75,516	41.1
Mixed Waste Paper	34,085	18.5
Plastics	**9,760**	**5.3**
PET Containers	5,374	2.9
HDPE Containers	2,824	1.5
Other Containers	241	0.1
Recyclable Film	1,012	0.6
Mixed Plastic Reusable/Recyclable	309	0.2
Metal	**7,486**	**4.1**
Tin/Steel Cans	3,101	1.7
Aluminum Cans	680	0.4
Other Nonferrous	3,705	2.0
Glass	**25,120**	**13.7**
Glass Container	22,956	12.5
Flat Glass	2,164	1.2
Electronics	**14**	**0.0**
Total	**183,902**	**100.0**

Source: LASAN Database "Sanitation Commodities 2006"
Quantities may not sum due to rounding.

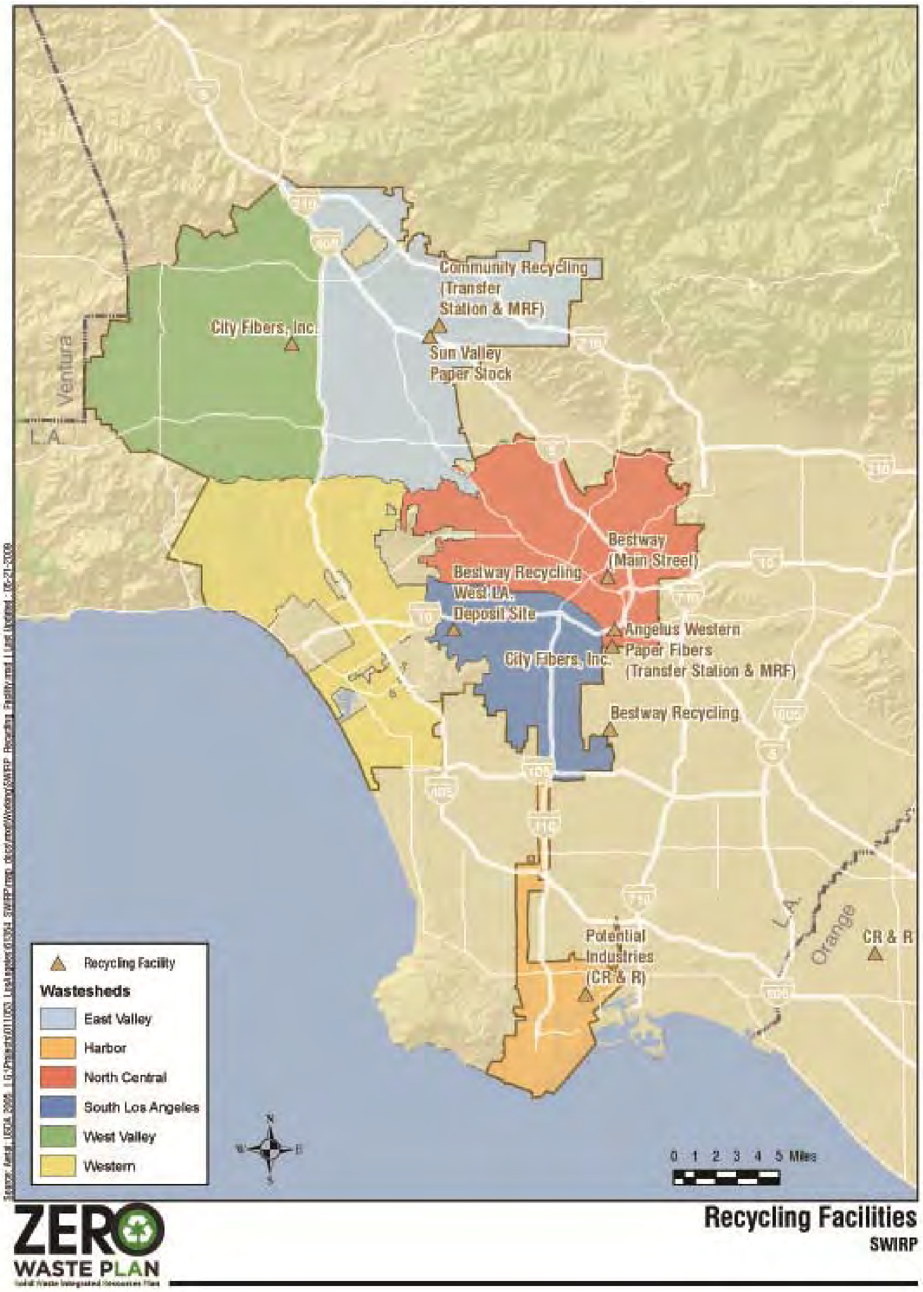
3.1.1.2 Recycling Facility Overview

This section includes information on the processing facilities that receive residential curbside recycling from City sources.

Processing Facilities

The locations of MRFs that receive residential curbside recycling from City sources are shown in Figure 7. These facilities include Angelus Western Paper Fibers, Bestway (Main St.), Bestway Recycling (Jefferson Blvd.), Bestway Recycling (Firestone Blvd.), City Fibers (Schoenborn St.), City Fibers, Inc. (Santa Fe Ave.), Community Recycling, Potential Industries (a CR&R subcontractor), and Sun Valley Paper Stock.[15]

Figure 7: Material Recovery Facilities Receiving Curbside Recycling, City of Los Angeles 2006



[15] *City of Los Angeles Solid Waste Planning Background Studies Summary Report.* January, 2006. p. 30, Table 3-6

3.1.2 Overview of Multi-Family Recycling

The City of Los Angeles initiated a pilot multi-family recycling program in 2004 and implemented a citywide multi-family recycling program in 2007. The program enrolls multi-family residential buildings of five units or more, and provides blue bins and weekly collection service at no cost to the property owners or residents. The program is funded through AB 939 Compliance Fees paid by haulers serving commercial generators in the City. In 2008, the multi-family recycling program diverted 13,095 tons of recyclable materials.

3.1.3 Overview of Commercial Recycling

Commercial recycling is all recycling that occurs in the private sector and is economically driven. Commercial recycling includes tonnages generated by businesses, institutions, and public venues that is collected and processed by private companies. It also includes the recycling of materials generated by C&D activities. Overall commercial recycling tonnages amounted to approximately 2.27 million tons in 2006.[16] This report includes a survey of eleven of the major commercial recycling processors, listed in Table 12, conducted mainly to understand present and future capacity. These processors receive approximately 472,000 of the 2.27 million tons. The remainder of the 2.27 million tons was processed by facilities that were not surveyed within the scope of this research.[17] This study does not attempt to document all recycling activities in the City. The last comprehensive diversion study was completed for the *City of Los Angeles Year 2000 Report,* August 2001. For that study over 1,200 facilities within the region were surveyed.

Flows were separated into two major substreams: commercially hauled and self-hauled. Tonnages by substream from surveyed processors are shown in Table 11.

- **Commercially hauled** is defined as recyclable material collected by a private hauling company from businesses (including some multi-family apartment complexes), institutions, and public venues. It typically arrives at the processing facility in packer trucks (e.g., front loaders) or in roll-off containers or compactor units.
- **Self-haul** is defined as recyclable material brought to processing facilities by the commercial establishment that generated it. This includes all commercial recycling other than that brought to the facility by private recycling companies.

Table 11: Estimated Recycling Quantities by Substream, City of Los Angeles 2007

Source	Recycling (tons)	Percentage
Commercially hauled	206,750	43.8
Self-hauled	203,125	43.0
Unspecified[18]	62,400	13.2
Total	**472,275**	**100**

Source: Attachment C-3 Recycling Facilities – Facility Surveys, 2008

[16] *City of Los Angeles Year 2000 AB939 Report*, August 2001, data extrapolated to 2006. This substream may also include some unknown amount of reuse, including food waste, and C&D diversion.

[17] Major processors were derived from a list provided by Clements Environmental Corporation of all recyclers serving Los Angeles County, with a focus on the larger fiber processers serving the City.

[18] Recycle America Alliance reported receiving 200 tons of recycled material per day from City sources (approximately 62,400 tons per year). However, they were not able to break out the tons by substream.

3.1.3.1 Recycling Facility Overview

The locations of major processors that received recyclable materials from sources within the City in 2007 are shown in Figure 8. These facilities and their self-reported incoming tonnage for 2007 are listed in Table 12. In 2007, Angelus Western Paper Fibers received the largest amount of recyclable material at an estimated 187,200 tons. All of Angelus' reported tons were generated by commercial establishments. Burbank Recycling received the smallest quantity of recyclables in 2007 at about 800 tons. All of those tons were generated by commercial establishments and hauled by private collectors.

Generators within the City used approximately 14 percent of the 2.88 million tons[19] of processing capacity at these facilities, based on the combined reported processing capacities of the facilities listed in Table 12 and based on a six-day work week with one shift per day. Much of the remaining capacity is used by surrounding communities. Four of these facilities reported being in the process of expanding, adding at least 888,000 tons per year of processing capacity.[20] Another three facilities reported excess capacity using existing facilities and equipment, though not specifying the exact amount of that excess capacity.[21] An additional two facilities reported having excess capacity if additional equipment is purchased.[22] A listing of expansion plans for all 11 facilities is shown in Table 13.

Table 12: Commercial Recycling Received by Major Processors, City of Los Angeles 2007

Processing Facility	Recycling (tons)	Percentage
The Allan Company (Santa Monica)	12,600	2.7
Angelus Western Paper Fibers	187,200	39.6
Bestway Recycling Co. Inc. (Firestone Facility)	3,600	0.8
Burbank Recycling	800	0.2
Los Angeles Recycling Center	17,700	3.7
Potential Industries	42,800	9.1
Recycle America Alliance	62,400	13.2
Smurfit Recycling	10,575	2.2
South Coast Recycling	104,000	22.0
Sun Valley Paper Stock Inc.	1,740	0.4
West Valley Fibres	28,860	6.1
Total	**472,275**	**100**

Source: Attachment C-3 Recycling Facilities – Facility Surveys, 2008

[19] As documented in the facility surveys included in Attachment C-3 Recycling Facilities. In 2007, 472,275 tons out of 2.27 million tons generated in the City were processed at the 11 surveyed facilities. These facilities have the capability of processing 2.88 million tons per year. Most of this remaining capacity is used by surrounding communities.

[20] The Allan Company, Angelus Western Paper Fibers, Potential Industries, and West Valley Fibres

[21] Recycle America Alliance, South Coast Recycling, and Sun Valley Paper Stock Inc.

[22] Bestway Recycling Co. Inc and Los Angeles Recycling Center

Figure 8: Major Processors Receiving Commercial Recycling, City of Los Angeles 2007

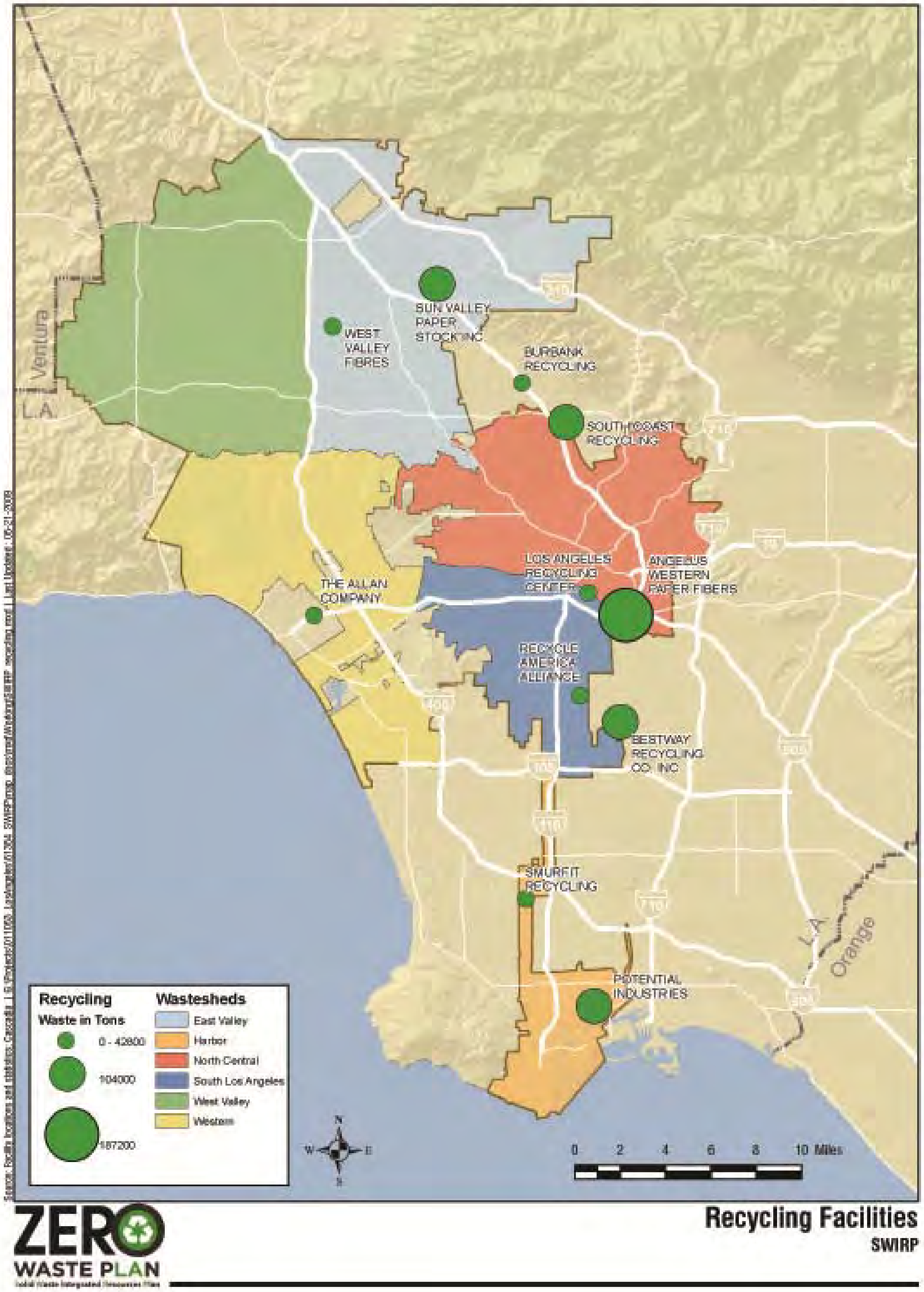


Table 13: Expansion Plans for Major Processing Facilities Receiving Recyclable Materials, City of Los Angeles 2007[23]

Company	Plans to Expand?	Expansion Amount or Method of Expansion
The Allan Company (Santa Monica)	YES	Additional capacity for 2,500-4,000 tons per month. Doubling of existing footprint. With expanded space anticipating more material and possibly more shifts.
Angelus Western Paper Fibers	YES	Additional capacity for 78,000 tons per year.[24]
Bestway Recycling Co. Inc. (Firestone Facility)	NO	Has capacity for additional 124,800 tons per year if additional equipment is purchased.
Burbank Recycling	NO	
Los Angeles Recycling Center	NO	Has capacity for additional 312,000 tons per year if additional equipment is purchased.
Potential Industries	YES	Additional capacity of 780,000 tons per year will be added. A permit application was submitted in September 2008 for this expansion.
Recycle America Alliance	NO	Has unspecified amount of additional capacity.
Smurfit Recycling	NO	
South Coast Recycling	NO	Has unspecified amount of additional capacity.
Sun Valley Paper Stock, Inc.	NO	Has unspecified amount of additional capacity.
West Valley Fibers	YES	Adding transloading capabilities – assessing adjacent sites for this expansion.

Source: Attachment C-3 Recycling Facilities – Facility Surveys, 2008

3.2 C&D Recycling and Beneficial Use

This section, which describes the C&D materials infrastructure of the City, is organized as follows:

- An overview of the City's C&D materials including the quantities of waste produced by the City in 2006, divided into commercial and self-haul/other substreams
- C&D materials flow from major substreams to ultimate destination
- The overall quantities of C&D materials received by transfer stations, waste-to-energy facilities, and landfills in 2006
- The overall C&D tonnages that major processors received from City sources in 2007, and plans for expansion at these major processing facilities

[23] See each facility's individual profile in Attachment C-3 for more details. Attachment C-8 shows survey forms used to collect data.

[24] Based on a 6-day work week.

3.2.1 Overview of C&D Materials

Approximately 2.62 million tons of C&D materials originating from residents and businesses within the City are beneficially used in solid waste landfills, disposed in inert landfills, or recycled each year.[25] Beneficial use of C&D materials includes using the material for on-site access roads, as alternative daily cover (ADC), or to construct wet-weather decking. In order to better analyze the generation and ultimate destination of these C&D materials, waste flows were separated into substreams, according to who brought the materials to the disposal facility. The two major substreams are commercially hauled and self-haul/other.

- **Commercially hauled** is defined as C&D materials collected by a private hauling company from businesses, institutions, and residences.
- **Self-haul/other** is defined as all C&D materials that are brought to solid waste or C&D facilities by the resident or business that generated them. This includes all C&D materials other than those brought to the facility by C&D haulers whose primary business is hauling, not construction or demolition.

The 2.62 million tons of C&D waste were divided into tonnages generated by each of these two waste substreams in 2006, as shown in Table 14. These materials are processed by transfer stations, solid waste landfills, inert landfills, and other processors, including those certified by the City. Estimates for the C&D materials from commercially hauled and self-haul/other substreams were based on interviews with personnel at the major solid waste landfills, inert landfills, and transfer stations that receive C&D materials from the City of Los Angeles.

Table 14: Estimated C&D Material Quantities by Substream, City of Los Angeles 2006

Source	C&D Materials (tons)	Percentage
Commercially hauled	2,303,000	87.9
Self-haul/other	319,000	12.1
Total	**2,622,000**	**100**

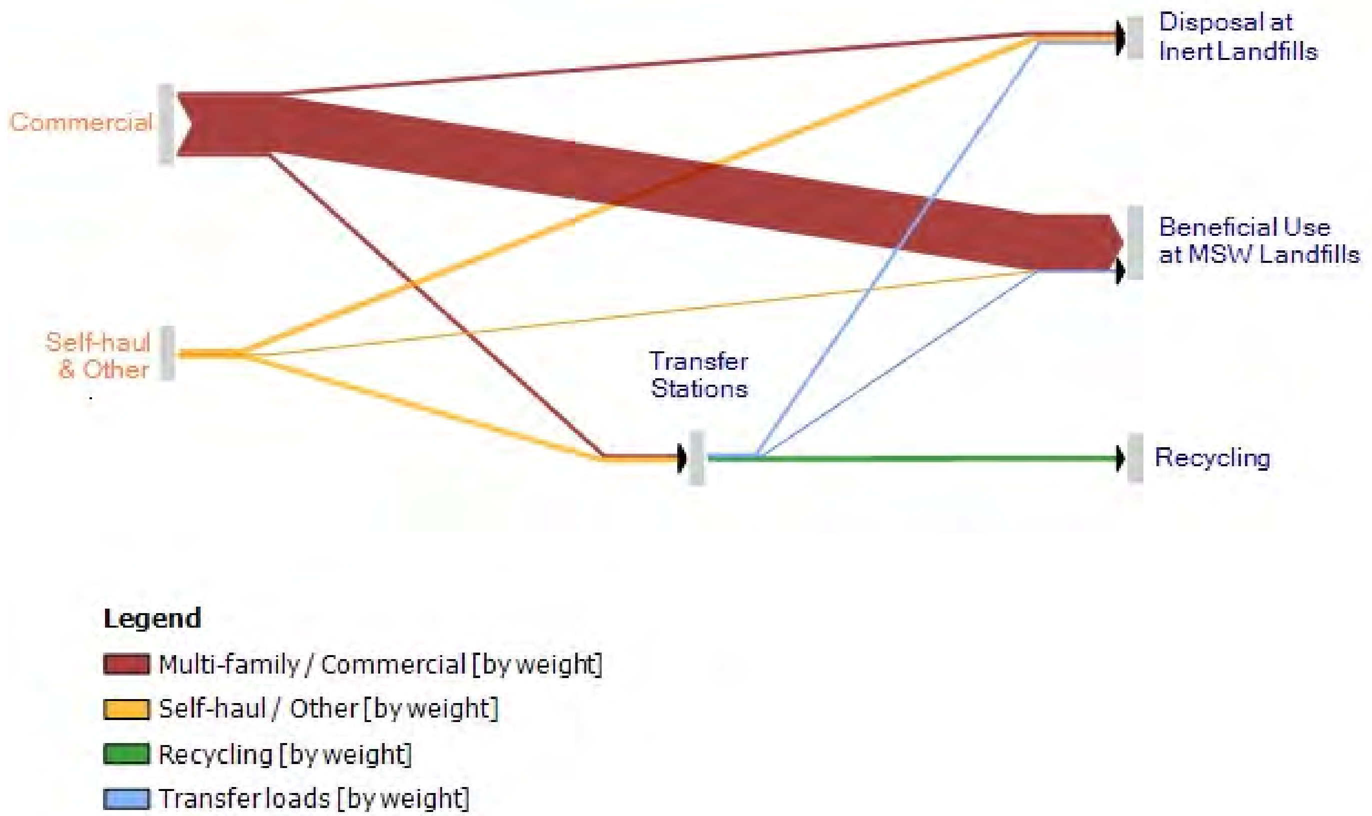
Source: Attachments C-1 Transfer Stations, C-2 Landfills and Waste-to-Energy Facilities and C-4 C&D Materials Processing Facilities – Facility Surveys, 2007-2008

Figure 9 shows the flow of C&D and inert materials by substream. The diagram presents the flow of C&D from its original source, through an intermediate facility if applicable, and to its ultimate destination. Most C&D materials, an estimated 2.06 million tons, were beneficially used at solid waste landfills. The remaining tons were disposed or processed at inert landfills (360,000 tons) or recycled (190,000 tons). Data for this diagram were collected by surveying the nine transfer stations, eight solid waste disposal facilities, and seven inert landfills that received C&D materials from City sources.[26]

[25] Based on surveys of nine transfer stations, eight solid waste disposal facilities, and seven inert landfills that reported receiving C&D materials from City sources. Tonnage information was not available from one landfill that is known to accept C&D materials. Personnel at the Lower Azusa facility estimated that it accepted between 60,000 and 100,000 tons of C&D and inert materials in 2006, but were unable to estimate the fraction that came from City sources.

[26] Tonnage information was not available from one landfill, Lower Azusa, which is known to accept C&D materials.

Figure 9: C&D Materials Flow, City of Los Angeles 2006



3.2.2 C&D Material Flows

Figure 10 depicts the general flow of C&D materials through local waste facilities, including the reported amount of C&D materials that are transported from the point of origin directly to a landfill or a transfer station and from a transfer facility to the final destination, a landfill or recycling facility.

Flow quantities presented in Figure 10 were obtained from a survey of solid waste landfills, inert landfills, and transfer stations that accepted C&D materials from City sources in 2006.

Please note that Figure 10 also includes an estimated 2.27 million tons of commercially recycled material, which contains some amount of recyclable material collected from C&D sites. The exact proportion of C&D materials was not documented in this analysis. Overall flows and quantities of privately collected commercial recyclables are more fully described in Section 3.1.

Figure 10: C&D Material Flow to Recycling, Beneficial Use, and Disposal in Inert Landfills, City of Los Angeles 2006

3.2.3 C&D Materials Facility Overview

This section includes information on the transfer stations, landfills, and four of the major C&D processing facilities that receive C&D materials from City sources.

3.2.3.1 Transfer Stations

The locations of transfer stations that received C&D materials from City sources in 2006 are shown in Figure 4. These facilities and their self-reported incoming tonnages for 2006 are listed in Table 15. In 2006, Community Recycling accepted the largest quantity of C&D materials from City sources, approximately 235,000 tons. Material received by transfer stations primarily came from the commercial substream, and most (approximately 250,000 tons) is processed for recycling or beneficial use at landfills.

The tip fees for C&D materials at these transfer stations ranged from $33 per ton to $58 per ton, with an average tip fee of about $43 in 2006. The weighted average tip fee, based on the tons that each facility received, was about $41 per ton.

Table 15: C&D Materials Received by Transfer Stations, City of Los Angeles 2006

Transfer Station	C&D and Inert Materials (tons)	Percentage
American Waste Transfer Station	2,075	0.8
Athens Services Transfer Station	22	0.0
Bel-Art Waste Transfer Station	283	0.1
Carson Transfer Station	5,281	2.1
Community Recycling	234,841	91.8
East Los Angeles Recycling &Transfer Station (ELARTS)	2,485	1.0
Falcon Refuse	10,000	3.9
Mission Road Recycling and Transfer Station (Waste Management)	202	0.1
Waste Resources Recovery	720	0.3
Total	**255,909**	**100**

Source: Attachment C-1 Transfer Stations – Facility Surveys, 2007
Quantities may not sum due to rounding.

3.2.3.2 Solid Waste Landfills

The locations of solid waste landfills that received C&D materials from City sources in 2006 are shown in Figure 5. These facilities and their self-reported incoming tonnages for 2006 are listed in Table 16. Virtually all of these C&D tons were beneficially used at the receiving landfills. In 2006, Puente Hills Landfill accepted more C&D materials from City sources than any other landfill, receiving a little less than 1.84 million tons, primarily comprised of soil and dirt, which were put to beneficial use.

The tip fees for C&D materials at these landfills ranged from $26 per ton to $62 per ton, with an average tip fee of about $44 in 2006. The weighted average tip fee, based on the tons that each facility received, was about $28 per ton.[27]

Table 16: C&D Materials Received by Solid Waste Landfills for Beneficial Reuse, City of Los Angeles 2006

Solid Waste Landfill	C&D and Inert Materials (tons)	Percentage
Antelope Valley Public Landfill	6	0.0
Bradley Landfill	64	0.0
Calabasas Sanitary Landfill	35,271	1.7
Chiquita Canyon Sanitary Landfill	6,800	0.3
Lancaster Landfill	50,455	2.4
Puente Hills Landfill	1,838,071	89.2
Scholl Canyon Sanitary Landfill	87,765	4.3
Sunshine Canyon Landfill	42,262	2.1
Total	**2,060,694**	**100**

Source: Attachment C-2 Landfills and Waste-to-Energy Facilities – Facility Surveys, 2007

[27] The weighted average is low because the tip fee at Puente Hills Landfill, which accepted the vast majority of C&D materials, is $26.21 for C&D materials.

3.2.3.3 Inert Landfills

The locations of inert landfills that received waste from City sources in 2006 are shown in Figure 11. These facilities and their self-reported incoming tonnage for 2006 are listed in Table 17. Overall, inert landfills reported that they accepted approximately 363,000 tons of C&D materials from City sources in 2006.[28] Most of these inert materials were disposed, but about 32,000 tons were reused or recycled. Sun Valley Landfill accepted more C&D materials from City sources than any other inert landfill receiving materials from within the City. Most inert landfills are classified as "Inert Debris Engineered Fill Operations" under state regulations[29] and inert materials disposed at an inert landfill are considered beneficially reused and are not considered disposed as solid waste. Several of these facilities are mine reclamation projects, where former mines are in the process of being filled with inert materials so that the land can be returned to a useful purpose.

The combined estimated annual permitted capacity of these inert C&D landfills, based on a six-day work week, is about 5.94 million tons.[30] Generators within the City used approximately six percent of the capacity of these facilities. None of the inert landfills are in the process of planning or obtaining permits for expansions. Only one of the inert landfills, Sun Valley, reported the possibility to expand capacity in the future.

The tip fees for C&D and inert materials at these inert landfills were typically assessed per load rather than per ton and ranged from no charge to $345 per load in 2006.

Table 17: C&D Materials Received by Inert Landfills, City of Los Angeles 2006

Inert Landfill	C&D and Inert Materials (tons)	Percentage
Azusa Landfill	43,499	12.0
Peck Road	25,659	7.1
Chandler's Landfill	12,679	3.5
Hanson Aggregates	916	0.3
Nu Way Arrow	85,950	23.7
Reliance Pit #2	625	0.2
Sun Valley Landfill	193,313	53.3
Total	**362,641**	**100**

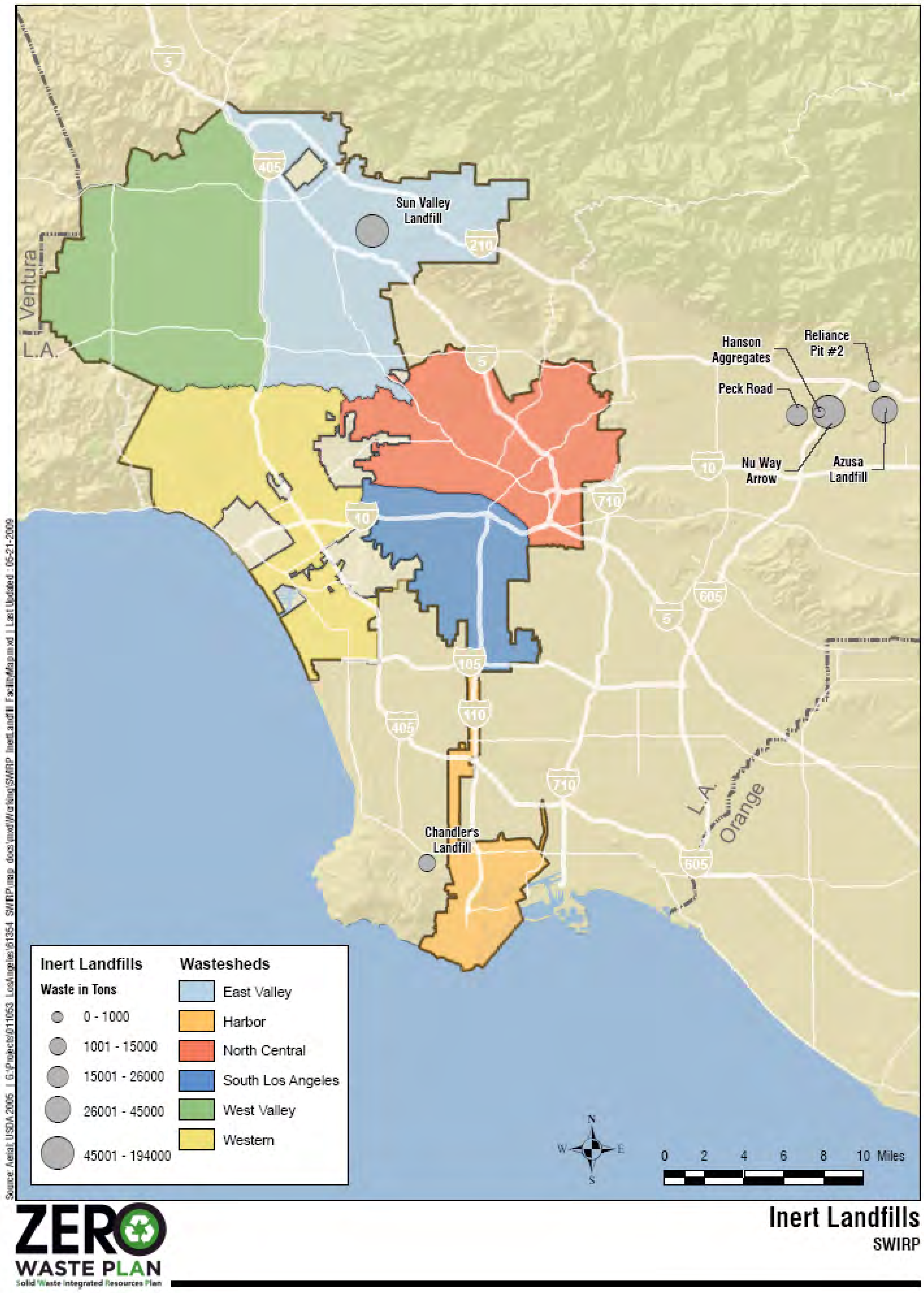
Source: Attachment C-2 Landfills and Waste-to-Energy Facilities – Facility Surveys, 2007
Quantities may not sum due to rounding.

[28] Tonnage information was not available from one landfill that is known to accept C&D materials. Personnel at Lower Azusa estimated that it accepted 60,000-100,000 tons of C&D and inert materials in 2006, but were unable to estimate the fraction that came from City sources. Transfer stations also reported sending an additional 10,000 tons to inert landfills.

[29] California Code of Regulations Title 14, Natural Resources-Division 7, Article 5.95, Section 17388 (l)

[30] Two landfills, Chandler and Reliance Pit #2, are mine reclamation projects, so they do not have a permitted capacity limit. Lower Azusa's capacity is included in this figure.

Figure 11: Inert Landfills Receiving C&D and Inert Materials, City of Los Angeles 2006



3.2.3.4 Processing Facilities

The locations of major processors that received C&D materials from commercial establishments in the City in 2007 are shown in Figure 12. These facilities and their self-reported incoming tonnage for 2007 are listed in Table 18. C&D materials are processed at these facilities and transferred to end-use markets including recycling markets (for cardboard, metal, and plastic), composting facilities (for yard trimmings and some wood waste), biomass-to-energy facilities (for some wood waste), reuse markets (for some reground aggregate materials,) inert landfills (for some clean soils, concrete, and asphalt), and solid waste landfills (for beneficial reuse of concrete and asphalt for roads and winter pads).

The tons reported in Table 18 represent only those tons received by the four major C&D processors surveyed for this report. Additional C&D processors likely receive C&D materials from the City of Los Angeles, including the other seven certified mixed-debris processors listed in Table 19. As previously mentioned, the transfer stations listed in Table 15, such as Community Recycling, also process C&D materials from the City. Note that tonnage information for transfer stations that also serve as C&D materials processing facilities is included in the transfer station section.

The 718,000 tons listed in Table 18 represent a portion of the total C&D recycling, which is included in the 2.27 million tons of commercially recycled C&D materials depicted in Figure 10 and also included in the privately collected commercial tonnage described in Section 3.1 above.

Generators within the City used approximately 58 percent of the 1.23 million tons of processing capacity at these facilities, based on a six-day work week with one shift per day. Much of the remaining capacity is used by surrounding communities. Two facilities reported that they have plans to expand their capacity[31]. The other two facilities reported that they do not have room to expand their operations, but do have at least 93,600 tons of excess capacity with existing operations.[32] A full listing of expansion plans for major C&D processing facilities receiving solid waste from the City of Los Angeles in 2006 is shown in Table 20.

Table 18: Major Processors Receiving C&D Materials, City of Los Angeles 2007[33]

Processing Facility	C&D Materials (tons)	Percentage
Athens Sun Valley	344,331	47.9
Downtown Diversion	360,000	50.1
Construction and Demolition Recycling	13,590	1.9
Madison Materials	250	0.0
Total	**718,171**	**100**

Source: Attachment C-4 Materials Processing Facilities – Facility Surveys, 2008
Quantities may not sum due to rounding.

[31] Athens Sun Valley and Madison Materials
[32] Downtown Diversion and Construction and Demolition Recycling
[33] Note that only four major processors were surveyed for this report. Madison Materials is a major processor operating in the region, but did not receive a significant number of tons from City sources in 2007.

Please see each facility's individual profile in Attachment C-4 for more details on per-ton fees or payments, individual expansion plans, and end markets. Attachment C-8 shows survey forms used to collect data.

Table 19: Other Certified Mixed Debris Processors Receiving C&D Materials, City of Los Angeles 2007

Processing Facility
Allied-Falcon Refuse Center
American Waste Pendleton Facility
California Waste Services
City Terrace Recycling
Community Recycling & Resource Recovery
Direct Disposal
Looney Bins/East Valley Diversion

Source: City of Los Angeles, Bureau of Sanitation – List of Certified Processors 2008

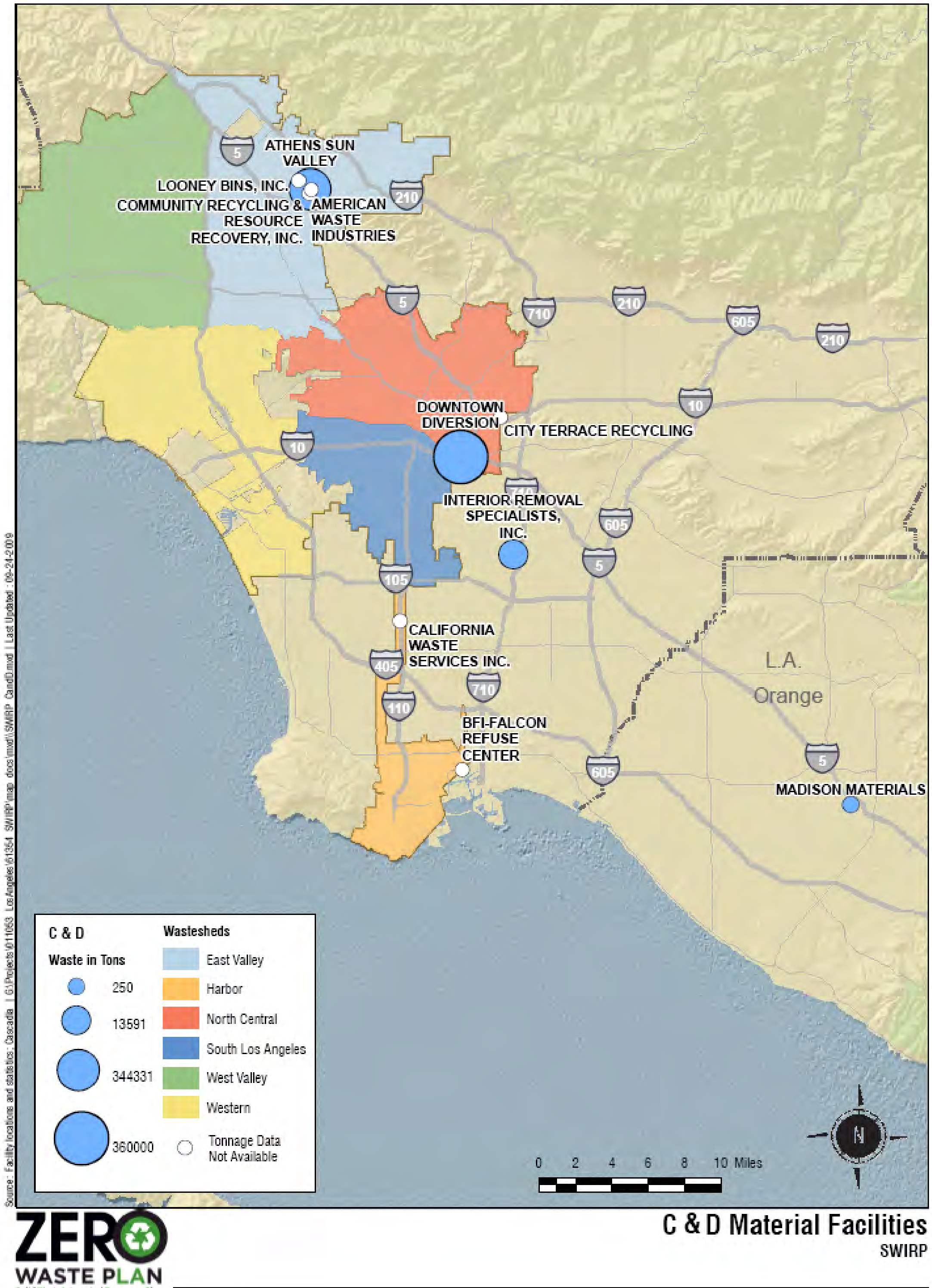
Table 20: Expansion Plans for Major Processing Facilities Receiving C&D Materials, City of Los Angeles 2007[34]

Company	Plans to Expand?	Expansion Amount or Method of Expansion
Athens Sun Valley	YES	Plans to increase by 156,000 tons per year. Expansion permit is being reviewed. Final environmental review was completed in 2009.
Downtown Diversion	NO	Has 93,600 tons per year excess capacity.
Construction and Demolition Recycling	NO	Has unspecified amount of additional capacity.
Madison Materials	YES	Could increase to 1,400 tons per day with a second shift. Looking into new conversion technology; would not impact processing throughput, but would minimize residual waste to disposal. Also working on installing a fueling station for compressed natural gas.

Source: Attachment C-4 Materials Processing Facilities – Facility Surveys, 2008

[34] Note that information for transfer stations that also serve as C&D materials processing facilities (including Community Recycling) is included in the transfer station section.

Figure 12: Major Processors Receiving C&D Materials, City of Los Angeles 2007



3.3 Yard Trimmings, Composting, and Beneficial Use

This section describes the yard trimmings infrastructure of the City and is organized as follows:

- An overview of the City's yard trimmings system and yard trimmings flows, including overall quantities of yard trimmings generated by three major substreams
- The origins of residential curbside yard trimmings by wasteshed
- Lists of the transfer stations and landfills that received yard trimmings from City sources
- The overall quantities of yard trimmings that flow through yard trimmings processing facilities

3.3.1 Overview of Yard Trimmings

Approximately 900,000 tons of yard trimmings are generated per year by residents and businesses within the City.[35] Organic flows were separated into multiple substreams, according to who generated the yard trimmings and who brought the materials to the processing facility. The three major substreams are residential curbside, commercial/multi-family, and self-haul/other.

- **Residential curbside** is defined as yard trimmings[36] collected by LASAN from residential curbside customers, including single-family residences and some multi-family complexes.
- **Commercial/multi-family** is defined as yard trimmings collected by a private hauling company from businesses, institutions, public venues, and multi-family buildings, with five units or more, such as apartments and condominiums.
- **Self-haul/other** is defined as all yard trimmings brought to processing facilities by the resident or business that generated it, including landscapers. This includes all yard trimmings other than that brought to the facility by LASAN or by private hauling companies.

The approximately 900,000 tons of yard trimmings were distributed among these three substreams. In Table 21 below, self-haul tons are apportioned to the residential curbside customers and commercial generators. LASAN provided tonnages for the residential curbside substream. Estimates for the yard trimmings from commercial/multi-family and self-haul/other substreams were developed based on surveys of landfills, transfer stations, and yard trimmings processors.

[35]Tonnage information was not available from two facilities, Greencycle and Norwalk Industries, which are known to accept yard trimmings from City sources.

[36] A portion of the residential yard trimmings collected from the East Valley, West Valley, and Western wastesheds contains horse manure (including bedding). Horse manure is either collected separately or commingled with yard trimmings. Horse manure collected in the East Valley and West Valley wastesheds is sent to contracted yard trimmings processors while in the Western wasteshed, the collected horse manure is brought to a non-profit community garden in Mar Vista, California.

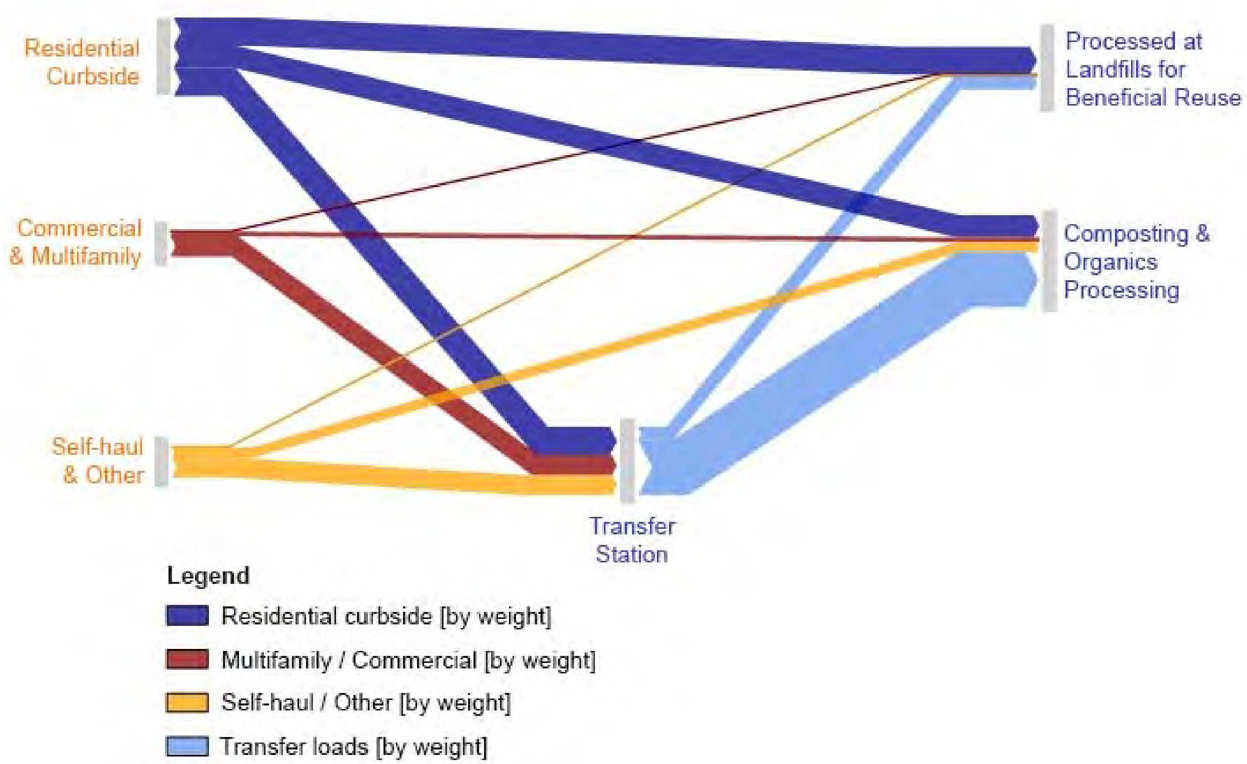
Table 21: Estimated Yard Trimming Quantities by Substream, City of Los Angeles 2006[37]

Source	Yard Trimmings (tons)	Percentage
Residential curbside (LASAN)	521,000	58.0
Residential (self-haul)	141,000	15.7
Commercial	171,000	19.0
Commercial (self-haul)	66,000	7.3
Total	**899,000**	**100**

Source: Attachments C-1 Transfer Stations, C-2 Landfills and Waste-to-Energy Facilities and C-5 Yard Trimmings Processing Facilities – Facility Surveys, 2007

In almost all cases, yard trimmings are beneficially used at a landfill for ADC, are composted, or are used to make organic products such as mulch. Figure 13, below, shows the flow of yard trimmings generated in the City. The diagram presents the flow of yard trimmings from its original source, through an intermediate facility if applicable, to processing or end-use.

Figure 13: Yard Trimmings Flow, City of Los Angeles 2006



[37] Tonnage information was not available from two facilities that are known to accept yard trimmings from City sources.

Information for this diagram was collected by surveying the eleven transfer stations,[38] seven solid waste disposal facilities,[39] and six yard trimmings processors[40] that received yard trimmings from City sources. LASAN data for collection from residential curbside customers were also used in this analysis.

3.3.2 Origins by Wasteshed

Table 22 displays estimated yard trimmings tons collected from residential curbside customers through the LASAN curbside program in each of the six wastesheds in the City in 2006: South LA, Harbor, North Central, Western, West Valley, and East Valley. The Harbor wasteshed generated the smallest amount, approximately 20,000 tons, of yard trimmings among these wastesheds. The East and West Valley wastesheds generated the most yard trimmings, approximately 147,000 and 144,000 tons, respectively.

Table 22: Residential Curbside Yard Trimmings, City of Los Angeles 2006

Wasteshed	Yard Trimmings (tons)	Percentage
South LA	54,010	10.4
North Central	63,249	12.1
Western	92,741	17.8
East Valley	147,366	28.3
Harbor	19,725	3.8
West Valley	144,114	27.6
Total	**521,205**	**100**

Source: LASAN Database "Sanitation Commodities 2006"

3.3.3 Yard Trimmings Flows

In 2006, about half of the yard trimmings generated in the City were taken to a transfer station before reaching a final destination. Ultimately, most of the yard trimmings generated in the City were transformed into products or beneficially used. City policy[41] requires that yard trimmings collected by LASAN should not be used as ADC at landfills. However, the City has no control over privately hauled yard trimmings delivered for beneficial reuse at landfills.

Figure 14 shows the general flow of yard trimmings through local processing facilities.

Flow quantities presented in Figure 14 were obtained from a survey of transfer stations, disposal facilities, and yard trimmings processors that accepted organic material from City sources in 2006, as well as from LASAN data that summarized residential curbside collection routes. This figure depicts the reported amount of yard trimmings that were transported from the City directly to a landfill, transfer station, or yard trimmings processor.

[38] American Waste Transfer Station, Bel-Art Waste Transfer Station, Central Los Angeles Recycling & Transfer Station, Community Recycling, Compton Recycling and Transfer Station (Browning Ferris Ind.), Downey Area Recycling and Transfer Station, East Los Angeles Recycling & Transfer Station, Falcon Refuse, Mission Road Recycling and Transfer Station (Waste Management), Southern California Disposal, Waste Resources Recovery

[39] Bradley Landfill, Calabasas Sanitary Landfill, Chiquita Canyon Sanitary Landfill, Puente Hills Landfill, Scholl Canyon, Sanitary Landfill, Sunshine Canyon Landfill, Southeast Resource Recovery Facility

[40] Eco-Logics, Griffith Park, Lopez Canyon (Lake View Terrace), North Hills, Harbor Mulching (San Pedro), Van Norman

[41] Public Works Board Report on Green Waste Processing Contingency Plan adopted on September 22, 2006.

Figure 14: Yard Trimmings Flow to Recycling/Beneficial Use, City of Los Angeles 2006[42]

3.3.4 Yard Trimmings Facility Overview

This section includes information on the transfer stations, landfills, and processing facilities that receive yard trimmings from City sources.

3.3.4.1 Transfer Stations

Transfer stations that received yard trimmings from City sources in 2006, along with their self-reported incoming tonnages, are listed in Table 23. Overall, transfer stations handled approximately 450,000 tons of yard trimmings in 2006. Community Recycling accepted the largest overall quantity, over 360,000 tons of yard trimmings.

The tip fees for yard trimmings at these transfer stations ranged from $28 per ton to $58 per ton, with an average tip fee of about $42 in 2006. LASAN pays approximately $37.50 per ton for organics processing at Community Recycling.

Several transfer stations did not have a specific tip fee for yard trimmings. Including the general tip fees at these transfer stations, an average tip fee was about $43 per ton.[43]

[42] Note that "organic processors" include both mulching and composting facilities.

Figure 4shows the location of these transfer stations. More information about these transfer stations can be found in Attachment C-1.

Table 23: Yard Trimmings Received by Transfer Stations, City of Los Angeles 2006

Transfer Station	Yard Trimmings (tons)	Percentage
American Waste Transfer Station	280	0.1
Bel-Art Waste Transfer Station	35	0.0
Central Los Angeles Recycling & Transfer Station	917	0.2
Community Recycling	363,652	80.0
Compton Recycling and Transfer Station (Browning Ferris Ind.)	283	0.1
Downey Area Recycling and Transfer Station	32	0.0
East Los Angeles Recycling & Transfer Station	296	0.1
Falcon Refuse	6,012	1.3
Mission Road Recycling and Transfer Station (Waste Management)	81,304	17.9
Southern California Disposal	1,088	0.2
Waste Resources Recovery	384	0.1
Total	**454,283**	**100**

Source: Attachment C-1 Transfer Stations – Facility Surveys, 2007

3.3.4.2 Landfills and Waste-to-Energy Facilities

Solid waste landfills that received yard trimmings from City sources in 2006, along with their self-reported incoming tonnages, are listed in Table 24. Overall, landfills directly received about 200,000 tons of organic materials from City sources in 2006. Bradley Landfill accepted the largest overall quantity of yard trimmings, approximately 180,000 tons, primarily from residential curbside customers, which was delivered by LASAN and was processed and delivered to farmers as mulch.[44] Chiquita Canyon Sanitary Landfill primarily accepted yard trimmings from transfer loads. Calabasas Sanitary Landfill accepted the largest quantity of yard trimmings from the commercial/multi-family substream.

Under state law,[45] materials such as yard trimmings are considered diverted from disposal if used as ADC in landfill operations, and count toward the diversion goals mandated by AB 939. City policy[46] does not allow yard trimmings collected by LASAN to be used as ADC. However, private haulers in the City can bring yard trimmings to landfills for use as ADC.

The tip fees for yard trimmings at these landfills ranged from $12 per ton to $35 per ton, with an average tip fee of about $20 in 2006. Southeast Resource Recovery Facility did not have a separate yard trimmings tip fee. Including the general tip fee at this facility, the average tip fee was approximately $24 per ton.

Figure 5 shows the location of these landfills and waste-to-energy facilities.

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[43] Not all transfer stations provided tip fees.

[44] As of April 2007, the Bradley facility ceased landfill operations and operated as a limited-volume transfer station accepting clean fill and yard trimmings.

[45] California Public Resources Code Section 41781.3

[46] Public Works Board Report on Green Waste Processing Contingency Plan adopted on September 22, 2006.

Table 24: Yard Trimmings Received by Solid Waste Landfills and Waste-to-Energy Facilities, City of Los Angeles 2006

Landfill or Waste-to-Energy Facility	Yard Trimmings (tons)	Percentage
Bradley Landfill	179,542	72.1
Calabasas Sanitary Landfill	15,602	6.3
Chiquita Canyon Sanitary Landfill	52,600	21.1
Puente Hills Landfill	63	0.0
Scholl Canyon Sanitary Landfill	2	0.0
Sunshine Canyon Landfill	1,287	0.5
Southeast Resource Recovery Facility	57	0.0
Total	**249,153**	**100**

Source: Attachment C-2 Landfills and Waste-to-Energy Facilities – Facility Surveys, 2007

3.3.4.3 Yard Trimmings Processing Facilities

The locations of yard trimmings processing facilities that received yard trimmings from City sources in 2006 are shown in Figure 15. Additionally, there are six composting facilities in Southern California permitted to accept food scraps, which are also shown in Figure 15.[47] The yard trimmings processing facilities and their self-reported incoming tonnages in 2006 are listed in Table 25. North Hills accepted the largest quantity of yard trimmings from City sources in 2006, at 80,000 tons. North Hills also accepted the largest quantities of yard trimmings from the commercial/multi-family and self-haul/other substreams. Eco-Logics accepted the largest quantity of yard trimmings from LASAN collected residential curbside materials in 2006. However, LASAN terminated its contract with Eco-Logics in 2007 and does not deliver residential curbside yard trimmings to the facility. The Griffith Park Compost Facility receives yard trimmings from City parks only, not residential curbside customers. None of the yard trimmings processing facilities interviewed have any plans for expansion. Most yard trimmings processors surveyed (including Griffith Park, Lopez Canyon, Harbor Mulching, and Van Norman) are owned and operated by LASAN and do not receive material from sources other than LASAN or other City-hauled sources. They do not charge a tip fee for City-hauled loads. North Hills reported charging $25 to $45 per ton.

Table 25: Yard Trimmings Received by Processing Facilities, City of Los Angeles 2006[48]

Yard Trimmings Processing Facility	Yard Trimmings (tons)	Percentage
Eco-Logics	48,820	18.2
Griffith Park	39,685	14.8
Lopez Canyon (Lake View Terrace)	31,301	11.7
North Hills	80,000	29.8
Harbor Mulching (San Pedro)	20,521	7.7
Van Norman	47,734	17.8
Total	**268,061**	**100**

Source: Attachment C-5 Yard Trimmings Processing Facilities – Facility Surveys, 2007
Note that tonnage information for transfer stations that also serve as yard trimmings processing facilities (including Community Recycling and Mission Road-Waste Management) is included in the transfer station section, Table 23.

[47] California Biomass Compost Facility, Community Recycling Lamont Compost Facility, Kochergan Farms Composting, Victor Valley Regional Composting Facility, Liberty Composting, and Miramar Greenery.

[48] Tonnage information was not available from two facilities, Greencycle and Norwalk Industries, which are known to accept green waste from City of Los Angeles sources.

Figure 15: Yard Trimmings Processing Facilities Receiving Organic Waste, City of Los Angeles 2006, and Compost Facilities in Southern California Permitted to Accept Food Scraps

Section 4 Household Hazardous Waste and Electronics

This section describes the household hazardous waste and electronics infrastructure of the City and is organized as follows:

- An overview of the City's household hazardous waste and electronics infrastructure
- The breakdown of household hazardous waste and electronics generated
- Information on tonnages received in 2006 by permanent hazardous waste collection facilities, collection and on-call collection programs, and tonnages received in 2007 by major electronics processors

4.1 Overview of Household Hazardous Waste and Electronics Collection

In total, approximately 3,600 tons of household hazardous waste were collected through the City's hazardous waste collection programs in 2006. As shown in Table 26, about 45 percent of these materials were electronics.

Table 26: Household Hazardous Waste and Electronics Collected for Processing and Disposal, City of Los Angeles 2006

Substream	Tons	Percentage
Electronics	1,599	44.8
Household hazardous waste (not electronics)	1,974	55.2
Total	**3,573**	**100**

Source: City of Los Angeles Lead Agency Form CalRecycle 303a Household Hazardous Waste Collection Information for Fiscal Year 2006-2007

Household hazardous waste and electronics are discussed separately due to the unique nature and collection methods of these materials. Nearly 2,500 tons of household hazardous waste and electronics were collected in 2006 at permanent hazardous waste collection facilities in and around the City. In addition, approximately 525 tons of household hazardous waste and electronics were collected through mobile collection events and an additional 575 tons of electronics were collected through an on-call collection program.

There are six permanent collection facilities for household hazardous waste, known as S.A.F.E. (Solvents, Automotive, Flammables, and Electronics) centers. They include:

- Gaffey S.A.F.E. Center (San Pedro)
- Hyperion S.A.F.E. Center (Playa del Rey)
- Los Angeles-Glendale S.A.F.E. Center (East Los Angeles)
- UCLA S.A.F.E. Center (West Los Angeles)
- Washington S.A.F.E. Center (South Los Angeles)
- Randall S.A.F.E. Center (Sun Valley)
- Nicole Bernson S.A.F.E. Center (Northridge)

The City also holds mobile collection events on Saturdays and Sundays in areas not served by S.A.F.E. centers. Each event is scheduled for one day (Saturday) from 9:00 a.m. to 3:00 p.m. A flyer is mailed to neighboring communities informing them of the event and the event is posted on the LASAN website. No reservation or appointment is required. All Los Angeles County residents can bring their household hazardous waste, free of charge, to the City's "Hazmobile" collection sites.

Additionally, the City collects electronics through an on-call collection program. City residents may contact the call center and request a pickup.

Total tonnages from these three sources in 2006 are shown in Table 27. For more detailed information about the quantities and types of materials collected at the permanent facilities, mobile events, and through on-call collection, refer to Attachment C-9.

Table 27: Household Hazardous Waste and Electronics Collection Methods, City of Los Angeles 2006

Collection Site	Tons	Percentage
Permanent hazardous waste collection facilities	2,473	69.2
Mobile collection events	525	14.7
On-call collection	575	16.1
Total	**3,573**	**100**

Source: City of Los Angeles Lead Agency Form CalRecycle 303a Household Hazardous Waste Collection Information for Fiscal Year 2006-2007

4.2 Major Electronics Collectors and Processors

In addition to the information provided by LASAN, the major electronics collectors and processors were also surveyed. Major processors provided information on electronics collected and processed from Los Angeles sources in 2007. The central collection sites are shown in Figure 16, and the tons collected by source, as reported by the processors, are listed in Table 28. The Randall S.A.F.E. Center in Sun Valley accepted the largest quantity of electronics from City sources in 2007 at nearly 200 tons.

Figure 16: Central Collection Sites Receiving HHW & Electronics, City of Los Angeles 2007

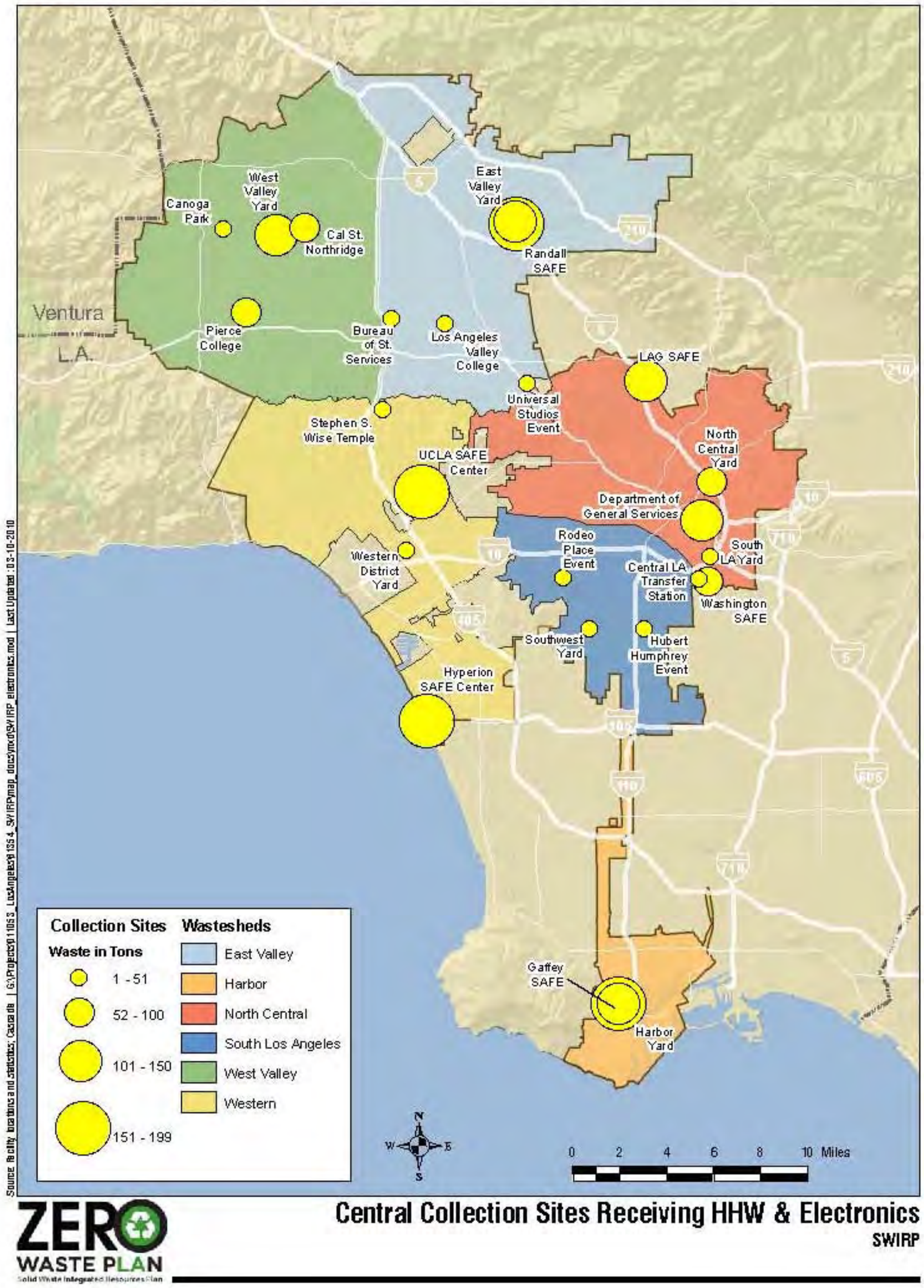


Table 28: Electronics Tonnages Collected by Source, City of Los Angeles 2007

Central Collection Site	Electronics (tons)	Percentage
West Valley Yard	115	6.3
East Valley Yard	123	6.7
Western Yard	41	2.2
Bureau of Street Services	13	0.7
Cal State Northridge	70	3.8
Canoga Park	37	2.0
Central LA Transfer Station	9	0.5
Department of General Services	119	6.5
Gaffey S.A.F.E. Center	110	6.0
Hubert Humphrey Event	8	0.4
Hyperion S.A.F.E. Center	156	8.5
IMS electronics collection[49]	49	2.7
Los Angeles Valley College	36	2.0
North Central Yard	79	4.3
Pierce College	51	2.8
Randall S.A.F.E. Center	199	10.9
Rodeo Place Event	14	0.8
Harbor Yard	151	8.2
South LA Yard	45	2.5
Southwest Yard	1	0.1
Stephen S. Wise Collection Event	1	0.1
UCLA S.A.F.E. Center	157	8.6
Universal Studios Event	21	1.1
Washington S.A.F.E. Center	84	4.6
LA Glendale S.A.F.E. Center	143	7.8
Total	**1,832**	**100**

Source: Attachment C-6: Electronics Processing Facilities – Facility Surveys, 2008
Quantities may not sum due to rounding.

The three largest major processors of electronics from City sources for 2007 are listed in Table 29 with self-reported incoming tonnages. Electronic Recyclers of America (ERA) processed 1,707 tons of electronics from the City, E-Recycling of California (ERC) processed 76.1 tons of electronics, and IMS Electronics Recycling processed 49 tons

[49] Due to scale of map, IMS is not included in Figure 16. For location refer to map in Figure 17.

of electronics in 2007.[50] The combined total estimated annual permitted capacity of these processors, based on a six-day work week with one shift per day, is 72,000 tons per year. Generators within the City used approximately three percent of the capacity of these facilities. Most of the remaining capacity is used by other Southern California communities. Each of the processors is interested in and able to expand its existing operations, as detailed in Table 30. For more detailed information about the electronics processing facilities, refer to Attachment C-6.

Table 29: Electronics Tonnages by Major Processor, City of Los Angeles 2007

Processing Facility	Electronics (tons)	Percentage
Electronics Recyclers of America	1,707	93.2
E-Recycling of California	76	4.2
IMS Electronics Recycling	49	2.7
Total	**1,832**	**100**

Source: Attachment C-6: Electronics Processing Facilities – Facility Surveys, 2008
Quantities may not sum due to rounding.

Table 30: Expansion Plans for Major Processing Facilities Receiving Electronics, City of Los Angeles 2007

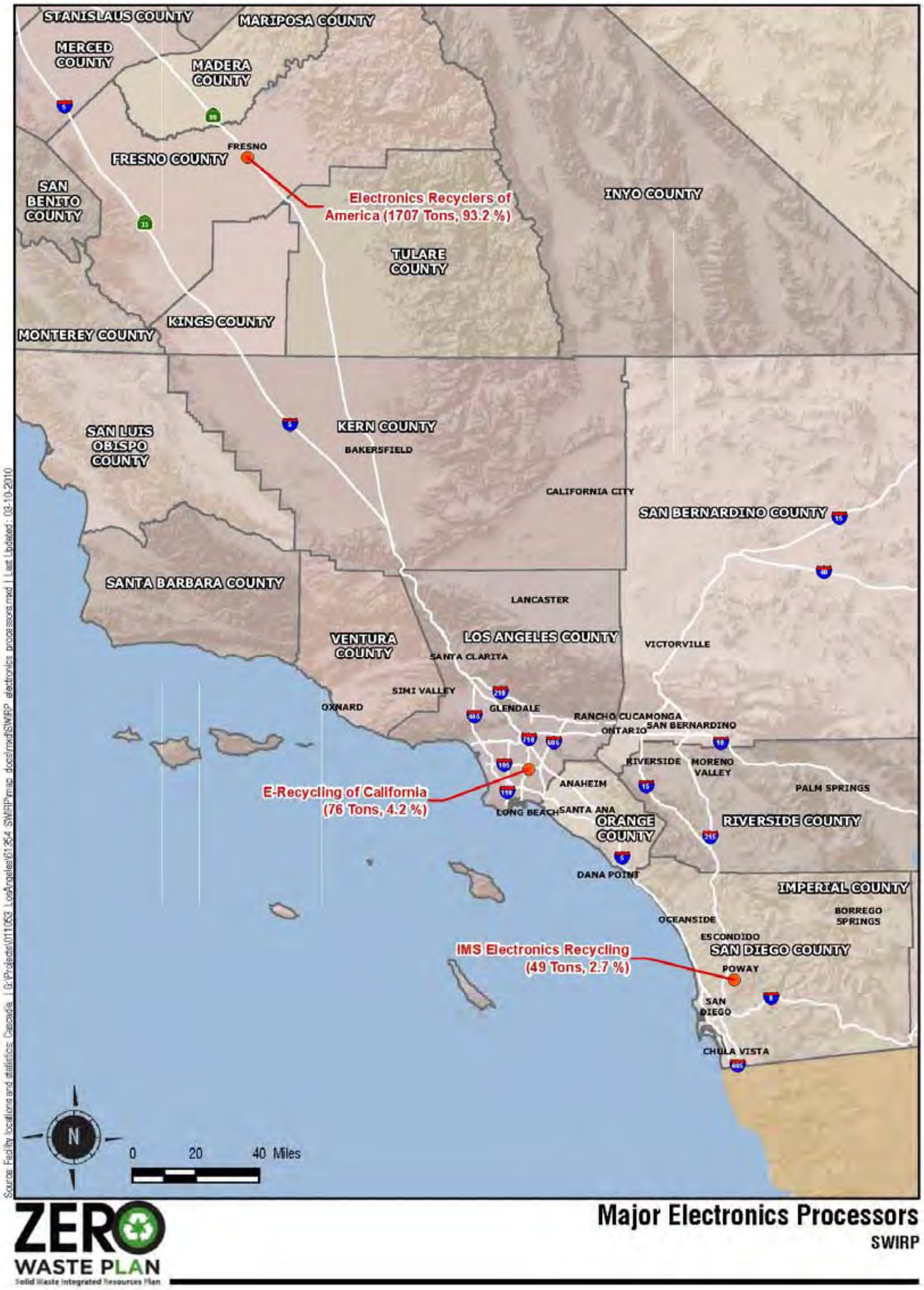
Company	Plans to Expand?	Expansion Amount or Expansion Method
Electronics Recyclers of America	YES	Additional 108,000 tons per year. Add more sophisticated processing equipment.
E-Recycling of California	YES	"Unlimited" additional capacity available at Paramount and Orange County facilities
IMS Electronics Recycling	YES	Additional 21,000 tons per year

Source: Attachment C-6: Electronics Processing Facilities – Facility Surveys, 2008

Each of the major processors operates a dismantling facility where electronics are disassembled and the component parts, including plastic, glass, and metal, are diverted for recycling. All of these processors are certified by the Basel Action Network as "e-Stewards" and are committed to the highest standard for globally responsible electronics recycling. The locations of major electronics processing facilities that received electronics from City sources in 2007 are shown in Figure 17.

[50] ERA processed 1,707 tons and ERC processed 76.1 tons collected at the central collection sites listed in Table 27. IMS accepts electronics from three major collection companies that service the City of Los Angeles. This company does not have permanent collection sites.

Figure 17: Major Electronics Processors Receiving Electronics, City of Los Angeles 2007



Attachment C-1: Transfer Stations[51]

American Waste Transfer Station

Overview

American Waste is a transfer facility located in the City of Gardena which, in 2006, received solid waste, yard trimmings, and C&D materials from the South Los Angeles wasteshed. The facility is permitted to accept up to 2,225 tons of waste per day, or 694,200 tons per year. In 2006, the facility received 274,291 tons of solid waste from Los Angeles, representing about eight percent of the City's 3.65 million tons of disposed solid waste.

Incoming City Tonnages by Generator Type

Both commercial haulers and self-haulers bring solid waste into the facility. Commercial haulers were the only source of yard trimmings and C&D materials.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	273,834	280	2,075
Residential curbside (LASAN)	-	-	-
Self-haul	457	-	-
Transfer	-	-	-
Total Tons	**274,291**	**280**	**2,075**

Tip Fees

The tip fees in 2006 for solid waste and C&D materials were $33 per ton, while the fee for yard trimmings was $35 per ton.

Ultimate Disposal

In 2006, American Waste sent 255,630 tons of the City's solid waste to Chiquita Canyon for disposal. The remaining 18,660 tons were sent either to the CVT Regional MRF and Transfer Station in Anaheim or the Southeast Resource Recovery Facility, depending on contract requirements with specific customers.

All 2,075 tons of C&D materials were sent to the Nu Way Arrow Inert Landfill. Under state regulations, materials sent to Inert Debris Engineered Fill Operations[52] are considered beneficially reused. The 280 tons of yard trimmings were composted on site.

Daily/Annual Capacity

American Waste has a total permitted capacity of 2,225 tons per day or 694,200 tons per year, assuming the facility is open six days a week.

Expansion Plans/Opportunities

American Waste reports that while it is possible to expand the facility, there are no plans to do so.

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[51] Note that the facility surveys were conducted in 2007 and 2008 and reflect the circumstances at the time of the survey. The information presented in these surveys, including tons and tip fees, was self-reported by the facility operators.

[52] California Code of Regulations Title 14, Natural Resources-Division 7, Article 5.95, Section 17388 (l)

Athens Services Transfer Station

Overview

Athens Services Transfer Station is a transfer facility located in the City of Industry. It is permitted to accept up to 5,000 tons of solid waste per day, or 1.56 million tons per year. Athens received a very small amount of waste from City sources in 2006—112 tons—all of which was from the North Central Los Angeles wasteshed.

Incoming City Tonnages by Generator Type

In 2006, commercial haulers brought a small quantity of solid waste from City sources to Athens.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	112	-	22
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	-	-	-
Total Tons	**112**	**-**	**22**

Tip Fees

Tip fees in 2006 for both solid waste and C&D materials were $49.25 per ton.

Ultimate Disposal

In 2006, all 134 tons received from Los Angeles at Athens were sent to Bradley Landfill for disposal. Athens operates a mixed-material recovery facility and any residual waste remaining after processing is disposed. In 2006, this residual waste was disposed at Bradley Landfill. After Bradley Landfill ceased landfill operations in April 2007, residual waste from Athens was disposed at El Sobrante Landfill in Riverside County.

Daily/Annual Capacity

Athens has a total permitted capacity of 5,000 tons per day, or 1.56 million tons per year, assuming the facility is open six days a week.

Expansion Plans/Opportunities

Athens' permitted capacity expanded significantly in 2007 from 1,920 tons per day to 5,000 tons per day. This growth has allowed them to expand both their processing and their transfer capabilities. Thus, by the end of 2007, Athens was accepting close to 130,000 tons of solid waste per year from City sources, a dramatic increase from the figures reported in 2006.

Bel-Art Waste Transfer Station

Overview

Bel-Art Waste Transfer Station is a transfer facility located in Long Beach that received 54,005 tons of solid waste from City sources in 2006, representing less than two percent of the City's solid waste. All solid waste received by Bel-Art came from the South Los Angeles wasteshed. Bel-Art is permitted to accept 1,500 tons per day, or 468,000 tons per year. The facility also received yard trimmings and C&D materials from City sources.

Incoming City Tonnages by Generator Type

Bel-Art received solid waste predominately from commercial sources in the South Los Angeles wasteshed. The facility received yard trimmings and C&D materials from both commercial haulers and self-haulers.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	54,005	3	216
Residential curbside (LASAN)	-	-	-
Self-haul	-	32	67
Transfer	-	-	-
Total Tons	**54,005**	**35**	**283**

Tip Fees

Tip fees at Bel-Art in 2006 were $31 per ton of solid waste, $53 per ton of yard trimmings, and $38 per ton of C&D materials.

Ultimate Disposal

In 2006, Bel-Art sent 29,163 tons of solid waste from City sources to the Chiquita Canyon Landfill and 24,842 tons to the Olinda Alpha Landfill. All 35 tons of yard trimmings were composted. The 67 tons of self-hauled C&D materials were sent to the Nu Way Arrow Inert Landfill, while the 216 tons of commercially hauled C&D materials were sent to a C&D processor.

Daily/Annual Capacity

Bel-Art Waste Transfer Station has a total permitted capacity of 1,500 tons per day, or 468,000 tons per year, assuming the facility is open six days a week.

Expansion Plans/Opportunities

Bel-Art reports that while they have space to expand, they have no expansion plans.

Carson Transfer Station

Overview

Carson Transfer Station, located just outside the Harbor wasteshed, is a transfer facility that is permitted to receive 5,300 tons per day, or 1.65 million tons per year. It handles solid waste and C&D materials from City sources. In 2006, Carson handled 76,468 tons of solid waste from Los Angeles, approximately two percent of the City's total solid waste.

Incoming City Tonnages by Generator Type

Both commercial haulers and self-haulers brought solid waste and C&D materials from City sources to the Carson facility.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	71,928	-	4,686
Residential curbside (LASAN)	-	-	-
Self-haul	4,540	-	595
Transfer	-	-	-
Total Tons	**76,468**	**-**	**5,281**

Tip Fees

The tip fee at Carson in 2006 was $73 per ton for solid waste and $37 per ton for C&D materials.

Ultimate Disposal

All the solid waste entering Carson Transfer Station in 2006 from Los Angeles was sent to regional landfills, including El Sobrante (68,621 tons), Lancaster, (4,173 tons), Bradley (2,271 tons), and Simi (1,220 tons).[53]

Carson sent 3,018 tons of the City's C&D material to the Nu Way Arrow Landfill, and 2,207 tons to Downtown Diversion, for a total of 5,225 tons.[54]

Daily/Annual Capacity

The facility has a total permitted capacity of 5,300 tons per day, or 1.65 million tons per year, assuming the facility is open six days a week.

Expansion Plans/Opportunities

There is no possibility for expansion at Carson Transfer Station.

[53] The reported outgoing solid waste tons are slightly less than the reported incoming tons.
[54] The reported outgoing C&D tons are slightly less than the reported incoming tons.

Central Los Angeles Recycling Center & Transfer Station (CLARTS)

Overview

CLARTS is a transfer facility operated by LASAN, located in the North Central wasteshed. CLARTS is permitted to receive up to 4,025 tons of waste per day, or 1.26 million tons per year. In 2006, CLARTS received 683,752 tons of solid waste from Los Angeles, representing nearly 20 percent of the City's solid waste stream. The facility also accepted a small amount of yard trimmings.

Incoming City Tonnages by Generator Type

The CLARTS facility received solid waste and a small amount of yard trimmings from City sources in 2006. Approximately two-thirds of this waste was collected from residential curbside routes. CLARTS also received over 71,000 tons of solid waste from self-haulers.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	201,793	-	-
Residential curbside (LASAN)	410,199	917	-
Self-haul	71,760	-	-
Transfer	-	-	-
Total Tons	**683,752**	**917**	**-**

Tip Fees

The tip fee in 2006 for solid waste at CLARTS was $44 per ton.

Ultimate Disposal

All the solid waste entering CLARTS from City sources was sent to regional landfills for disposal, including Sunshine Canyon (442,758 tons), El Sobrante (4,067 tons), Lancaster (70,788 tons), and Chiquita Canyon (137,525 tons).[55]

Daily/Annual Capacity

The facility is permitted to receive 4,025 tons of waste per day, or 1.26 million tons per year, assuming the facility is open six days a week.

Expansion Plans/Opportunities

While CLARTS was originally designed for a capacity of 5,500 tons per day, managers doubt that capacity could actually be reached. CLARTS has prepared a master plan to retrofit the facility for potential future reconfiguration and expansion.

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[55] The reported outgoing solid waste tons are less than the reported incoming tons. This was partially due to two factors. First, when Lancaster is closed for the day, CLARTS sends waste to other facilities, which is not always recorded. Second, some items like electronics, tires, and scrap metal are picked from the waste and diverted for recycling or reuse.

Community Recycling

Overview

Community Recycling is a transfer facility located in Sun Valley in the East Valley wasteshed of Los Angeles that received solid waste, yard trimmings, and C&D materials from City sources in 2006. They are permitted to receive 1,700 tons per day of solid waste, 1,200 tons per day of C&D recycling, and 1,900 tons per day of yard trimmings and other organics. This totals to 4,800 tons of materials per day of permitted capacity, or 1.50 million tons per year, including solid waste, yard trimmings and other organics, and C&D materials.

Community Recycling accepted 270,004 tons of solid waste from City sources in 2006, representing approximately seven percent of the City's solid waste. In 2006, Community Recycling also accepted 363,652 tons of yard trimmings and 234,841 tons of C&D materials from Los Angeles.

Incoming City Tonnages by Generator Type

Community Recycling received solid waste from commercial haulers, and yard trimmings, other organics, and C&D materials from commercial and self-haulers as well as LASAN.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings/ Organics (tons)	C&D (tons)
Commercial/multi-family	225,003[56]	62,000[57]	126,453
Residential curbside (LASAN)	45,001	153,701	-
Self-haul	-	147,951	108,388
Transfer	-	-	-
Total Tons	**270,004**	**363,652**	**234,841**

Tip Fees

LASAN pays approximately $37.50 per ton for organics processing at Community Recycling.

Ultimate Disposal

Community Recycling received 270,004 tons of solid waste in 2006 from City sources, all of which were run through a mixed-materials MRF for processing. Of the total 270,000 tons of solid waste received, 32,000 tons were separated for recycling. The remaining disposed tons were sent to the Bradley, Sunshine Canyon, and Chiquita Canyon landfills.[58]

Community Recycling grinds incoming yard trimmings and, in 2006, sent it to the Community Recycling Lamont Compost Facility and the Bradley, Sunshine Canyon, and Chiquita Canyon landfills to be reused.[59] They process

[56] Data were provided for all substreams combined; split based on estimates from industry experts.
[57] Data were provided for all substreams combined; tons reported by LASAN for residential curbside were subtracted from this total; remaining tons were assigned to commercial/multi-family and self-haul based on estimates from industry experts
[58] Data for the tons of waste sent to each landfill were not provided.
[59] Data for the tons of waste sent to each facility were not provided.

much of the C&D materials that they receive on site, and in 2006, diverted nearly 200,000 tons for recycling. In 2006, the remaining C&D materials were sent to the Bradley, Sunshine Canyon, and Chiquita Canyon landfills.

Daily/Annual Capacity

Community Recycling is permitted to process 1,700 tons of solid waste per day (530,400 tons per year). In addition, they receive up to 1,200 tons of C&D materials per day (374,400 tons per year) for recycling, and 1,900 tons of yard trimmings and other organics per day (592,800 tons per year) for beneficial reuse and composting from City sources and surrounding jurisdictions. Of the yard trimmings and other organics, 1,200 tons per day are allotted for yard trimmings (374,400 tons per year), 350 tons per day for food scraps (109,200 tons per year), and 150 tons per day for wood waste (46,800 tons per year). Annual figures are based on the assumption that the facility is open six days per week.

Expansion Plans/Opportunities

Community Recycling is working to expand their infrastructure and daily tonnage capacity. They have applied for a permit to consolidate all material recovery operations under one comprehensive permit with the following maximum daily capacities:

- Solid waste: 2,500 tons per day
- C&D materials: 2,000 tons per day
- Yard trimmings: 1,500 tons per day
- Food scraps: 500 tons per day
- Wood waste: 200 tons per day

The new permit would total 6,700 tons per day.

In addition, they plan to construct a 100,000-square-foot building over the receiving area for yard trimmings and other organics and construct a partial building or canopies over other areas to provide greater environmental control.

Compton Recycling and Transfer Station (Browning Ferris Industries)

Overview

Compton Recycling and Transfer Station, operated by Browning Ferris Industries (now merged with Republic Services, Inc.), is located just east of the Harbor wasteshed in the City of Compton. Compton is permitted to accept up to 1,500 tons of material per day, or 468,000 tons per year. In 2006, Compton received solid waste and yard trimmings from City sources. This facility handled an estimated 112,883 tons of solid waste from Los Angeles, or approximately three percent of the City's solid waste.

Incoming City Tonnages by Generator Type

Both commercial haulers and self-haulers brought waste from City sources to the Compton facility.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	107,239	212	-
Residential curbside (LASAN)	-	-	-
Self-haul	5,644	71	-
Transfer	-	-	-
Total Tons	**112,883**	**283**	**-**

Tip Fees

Compton's tip fees in 2006 were $59 per ton for solid waste and $40 per ton for yard trimmings.

Ultimate Disposal

In 2006, Compton sent all 112,883 tons of the City's solid waste to Sunshine Canyon Landfill. All 283 tons of yard trimmings received from City sources were sent to Puente Hills Landfill to be ground and used for ADC.

Daily/Annual Capacity

The facility's total permitted capacity is 1,500 tons per day or 468,000 tons per year, assuming the facility is open six days a week.

Expansion Plans/Opportunities

Compton operates at capacity on most days, and facility managers plan to expand both permitted and infrastructure capacity to be able to accept 2,100 to 2,500 tons of waste per day.

Downey Area Recycling and Transfer Station (DART)

Overview

Downey Area Recycling and Transfer Station (DART) is a transfer facility operated by the Los Angeles County Sanitation Districts, located approximately 10 miles east of the South LA wasteshed in the city of Downey. The facility is permitted to accept up to 5,000 tons of waste per day, or 1.56 million tons per year, and received solid waste and a small amount of yard trimmings from City sources in 2006. DART handled less than one percent of the City's total solid waste in 2006.

Incoming City Tonnages by Generator Type

In 2006, commercial haulers brought yard trimmings and solid waste to the DART facility from City sources. The DART facility also received solid waste from LASAN-hauled residential curbside sources.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	25,903	32	-
Residential curbside (LASAN)	701	-	-
Self-haul	-	-	-
Transfer		-	-
Total Tons	**26,604**	**32**	**-**

Tip Fees

DART's tip fee in 2006 for solid waste was $40.32 per ton; the fee for yard trimmings was $28.10 per ton.

Ultimate Disposal

While DART recycled 2,259 tons of solid waste received from City sources, the remaining solid waste and yard trimmings from City sources were sent to other facilities. DART transferred wastes to Puente Hills Landfill (24 tons of solid waste, 32 tons of yard trimmings used as ADC), Bowerman Landfill (19,161 tons of solid waste), and Prima Deshecha Landfill (828 tons of solid waste). Commerce Refuse-to-Energy received the remaining 4,332 tons of DART's Los Angeles solid waste, which were processed to produce energy.

Daily/Annual Capacity

DART has a total permitted capacity of 5,000 tons per day, or 1.56 million tons per year, assuming the facility is open six days a week.

Expansion Plans/Opportunities

DART reports that it is not feasible to expand the facility.

East Los Angeles Recycling &Transfer Station (ELARTS)

Overview

East Los Angeles Recycling & Transfer Station (ELARTS) is located in City Terrace just east of the North Central wasteshed in unincorporated Los Angeles County. It is permitted to receive up to 700 tons of waste per day, or 218,400 tons per year. ELARTS accepted 48,531 tons of solid waste from City sources in 2006, representing approximately one percent of the City's solid waste. All of the solid waste, yard trimmings, and C&D materials accepted at ELARTS were from the North Central wasteshed of Los Angeles.

Incoming City Tonnages by Generator Type

ELARTS received commercially hauled solid waste from residential curbside and commercial sources as well as yard trimmings and C&D materials from commercially hauled industrial sources.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	48,522	296	2,485
Residential curbside (LASAN)	9	-	-
Self-haul	-	-	-
Transfer	-	-	-
Total Tons	**48,531**	**296**	**2,485**

Tip Fees

Tip fees in 2006 were $41 per ton for solid waste or yard trimmings and $38 per ton of C&D materials.

Ultimate Disposal

ELARTS sent all 48,531 tons of solid waste to the Chiquita Canyon Landfill. They sent most of the C&D materials to Nu Way Landfill for disposal and less than 100 tons to a C&D processor. ELARTS sent all 296 tons of yard trimmings from City sources to the Falcon Refuse Center. In 2006, yard trimmings delivered to Falcon were transferred to the Bradley Landfill where the materials were ground and used as mulch for farmers.

Daily/Annual Capacity

ELARTS has a total permitted capacity of 700 tons per day, or 218,400 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

ELARTS reports that while it is possible to expand the facility, there are no plans to do so.

Falcon Refuse Center, Inc.

Overview

Falcon Refuse Center is located in Wilmington, which lies within the Harbor wasteshed of Los Angeles. Falcon Refuse is a transfer facility able to receive up to 1,850 tons of waste per day, or 577,200 tons per year. They received solid waste, yard trimmings, and C&D materials from City sources in 2006. This facility accepted 48,000 tons of solid waste from City sources in 2006, representing approximately one percent of the City's solid waste stream. Falcon Refuse also accepted 6,012 tons of yard trimmings and 10,000 tons of C&D materials from City sources.

Incoming City Tonnages by Generator Type

In 2006, Falcon Refuse received solid waste and a small amount of yard trimmings and C&D from the City of Los Angeles.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	9,568	3,055	10,000
Residential curbside (LASAN)	38,432	2,957	-
Self-haul	-	-	-
Transfer	-	-	-
Total Tons	**48,000**	**6,012**	**10,000**

Tip Fees

Falcon Refuse's tip fees in 2006 were $55 per ton of solid waste, $39 per ton of yard trimmings, and $45 per ton of C&D materials.

Ultimate Disposal

In 2006, Falcon Refuse sent all 48,000 tons of solid waste from City sources to Sunshine Canyon Landfill. They sent the 6,012 tons of yard trimmings waste to Bradley Landfill where it was ground and used as mulch for farmers. Falcon Refuse sorts C&D materials on site, sending concrete to Agua Mansa Landfill, scrap metal to Ecology Auto Parts, and wood to Colmac Energy.

Daily/Annual Capacity

Falcon Refuse has a total daily permitted capacity of 1,850 tons, or 577,200 tons per year, but has the physical capability of expanding to up to 5,600 tons per day.

Expansion Plans/Opportunities

Falcon Refuse has no plans to expand or increase their capacity.

Innovative Waste Control

Overview

Innovative Waste Control is a transfer facility located in the city of Vernon, just south of downtown Los Angeles. They can handle up to 1,250 tons of waste per day, or 390,000 tons per year, and received 203,028 tons of solid waste from City sources in 2006, representing approximately six percent of the City's solid waste stream.

Incoming City Tonnages by Generator Type

In 2006, Innovative Waste received solid waste from self-haulers and other transfer stations.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	13,619	-	-
Transfer	189,409	-	-
Total Tons	**203,028**	**-**	**-**

Tip Fees

The tip fee for solid waste at Innovative Waste Control in 2006 was $43 per ton.

Ultimate Disposal

Innovative Waste Control sent 684 tons of the City's solid waste to Commerce Refuse to Energy, which converts the waste to energy. A total of 122,016 tons were sent to Chiquita Canyon Landfill, 62,405 tons to Olinda Alpha Landfill, and 17,270 tons to Sunshine Canyon Landfill.[60]

Daily/Annual Capacity

The total permitted capacity is 1,250 tons per day, or 390,000 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

The facility operates at capacity and does not appear to be planning an expansion.

[60] The reported outgoing solid waste tons are slightly less than the reported incoming tons.

Mission Road Recycling and Transfer Station (Waste Management)

Overview

Mission Road Recycling and Transfer Station is a transfer facility located in the North Central wasteshed. Mission Road is permitted to receive up to 1,785 tons of waste per day, or 556,920 tons per year. In 2006, the facility accepted a total of 191,985 tons of solid waste, 81,304 tons of yard trimmings, and 202 tons of C&D materials from City sources, representing approximately five percent of the City's solid waste stream.

Incoming City Tonnages by Generator Type

Commercially hauled solid waste, yard trimmings, and C&D materials were sent from City sources to Mission Road Recycling and Transfer Station.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	191,985	81,304	202
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	-	-	-
Total Tons	**191,985**	**81,304**	**202**

Tip Fees

In 2006, Mission Road charged tip fees of $58 for solid waste, yard trimmings, and C&D materials.

Ultimate Disposal

Mission Road sent all solid waste generated in the City to regional landfills, including Bradley (152,577 tons), Lancaster (30,856 tons), Antelope Valley (2,610 tons), and Simi Valley (5,994 tons).[61] 9,612 tons of waste were separated from the yard trimmings and largely disposed of as solid waste to the Bradley, Lancaster, Antelope Valley, and Simi Valley landfills. The remaining 71,692 tons of yard trimmings were sent to Bradley Landfill as ADC. The 202 tons of incoming C&D materials from City sources, reportedly composed of 173 tons of cardboard and 29 tons of nonferrous metal, were recycled.

Daily/Annual Capacity

Mission Road has a total permitted capacity of 1,785 tons per day, or 556,920 tons per year, assuming the facility is open six days per week.

Expansion Plans/Opportunities

Mission Road reports that it is not feasible to expand the facility.

[61] The reported outgoing solid waste tons are slightly more than the reported incoming tons.

Paramount Resource Recycling Facility

Overview

Paramount Resource Recycling Facility is a transfer facility, permitted to receive up to 2,400 tons of waste per day, or 748,800 tons per year. Paramount is located approximately 10 miles south of Central Los Angeles and handles a very small portion of the City's solid waste; less than one percent.

Incoming City Tonnages by Generator Type

Paramount Resource Transfer Station received solid waste from commercial haulers and self-haulers in 2006.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	300	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	5,700	-	-
Transfer	-	-	-
Total Tons	**6,000**	**-**	**-**

Tip Fees

Paramount's tip fee in 2006 was $53 per ton for solid waste.

Ultimate Disposal

Paramount sent all 6,000 tons of solid waste received from City sources to the Prima Deshecha Landfill.

Daily/Annual Capacity

Paramount has a total permitted capacity of 2,400 tons per day, or 748,800 tons per year, assuming the facility is open six days per week.

Expansion Plans/Opportunities

Paramount plans to expand their MRF capacity, including constructing a separate MRF building. The facility's 4 acres and permitted 2,400 tons per day are adequate to support this planned growth.

South Gate Transfer Station—Los Angeles County Sanitation Districts

Overview

South Gate Transfer Station, operated by the Los Angeles Sanitation Districts, is in the City of South Gate, approximately six miles southeast of downtown Los Angeles. This transfer facility is permitted to accept 1,000 tons of solid waste per day, or 312,000 tons per year. The facility receives less than one percent of the City's solid waste.

Incoming City Tonnages by Generator Type

Commercial haulers brought solid waste originating from City sources to the facility in 2006.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	30,567	-	-
Residential curbside (LASAN)	197	-	-
Self-haul	-	-	-
Transfer	-	-	-
Total Tons	**30,764**	**-**	**-**

Tip Fees

The tip fee in 2006 for solid waste was $36.55 per ton.

Ultimate Disposal

The Sanitation Districts' South Gate Transfer Station reports sending 14,317 tons of solid waste to Puente Hills Landfill and 18,708 tons to Frank R. Bowerman Landfill.[62]

Daily/Annual Capacity

The Sanitation Districts' South Gate facility has a total permitted capacity of 1,000 tons per day, or 312,000 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

It is not possible to expand the Sanitation Districts' South Gate Transfer Station.

[62] The reported outgoing solid waste tons are slightly less than the reported incoming tons.

South Gate Transfer Station—Waste Management

Overview

Waste Management's South Gate Transfer Station is a transfer facility located in the City of South Gate approximately 6 miles southeast of downtown Los Angeles that received solid waste from City sources in 2006. The facility can handle up to 2,600 tons of waste per day, or 811,200 tons per year, and received a small portion (less than one percent) of solid waste from City sources.

Incoming City Tonnages by Generator Type

Commercial haulers and self-haulers transported solid waste from City sources to the Waste Management South Gate Transfer Station in 2006.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	19,145	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	288	-	-
Transfer	-	-	-
Total Tons	**19,433**	**-**	**-**

Tip Fees

The tip fee in 2006 for solid waste was approximately $73 per ton.

Ultimate Disposal

Waste Management's South Gate Transfer Station sent solid waste from City sources to El Sobrante Landfill (13,091 tons), Olinda Alpha Landfill (6,900 tons), and Bradley Landfill (830 tons).[63]

Daily/Annual Capacity

Waste Management' South Gate Transfer Station has a total permitted capacity of 2,600 tons per day, or 811,200 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

Waste Management's South Gate Transfer Station reports that it is not possible to expand the facility.

[63] The reported outgoing solid waste tons are slightly more than the reported incoming tons.

Southern California Disposal

Overview

Southern California Disposal Transfer Station is located in the City of Santa Monica, just west of the West LA wasteshed. It accepts residential curbside and commercial waste from the West LA wasteshed. The facility is permitted to accept 1,056 tons of solid waste per day, or 329,472 tons per year. Southern California Disposal handled 97,594 tons of solid waste from City sources, representing approximately three percent of the City's solid waste in 2006. The facility also accepted a small amount of yard trimmings from City sources.

Incoming City Tonnages by Generator Type

Data on residential curbside tonnages were obtained from LASAN.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	25,697	-	-
Residential curbside (LASAN)	71,897	1,088	-
Self-haul	-	-	-
Transfer	-	-	-
Total Tons	**97,594**	**1,088**	**-**

Tip Fees

LASAN pays approximately $24 per ton for solid waste transfer and disposal at Southern California Disposal.

Ultimate Disposal

Southern California Disposal sent all solid waste to Sunshine Canyon. Of the material that was brought in as waste, approximately 1,310 tons were diverted for recycling, including 64 tons of cardboard, 52 tons of ferrous metal, and 1,194 tons of mixed C&D. An additional 1,088 tons of yard trimmings were sent to North Hills Recycling.

Daily/Annual Capacity

Southern California Disposal is permitted to accept 1,056 tons of solid waste per day, or 329,472 tons per year, assuming a six-day week.

Expansion Plans/Opportunities

Southern California Disposal is working in partnership with the City of Santa Monica on an expansion of the facility that would provide more space for future material handling and recovery.

Waste Resources Recovery

Overview

Waste Resources Recovery is a transfer facility located in Gardena that receives a small portion of solid waste (less than one percent of the City's total), yard trimmings, and C&D materials from City sources. The facility is permitted to receive 500 tons per day, or 156,000 tons per year.

Incoming City Tonnages by Generator Type

Commercially hauled and self-hauled solid waste, yard trimmings, and C&D materials originating from City sources were brought to Waste Resources Recovery in 2006. The breakdown among the different substreams was not provided.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	3,696[64]	384[65]	720[66]
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	-	-	-
Total Tons	**3,696**	**384**	**720**

Tip Fees

The tip fee in 2006 for all materials was $48.96 per ton.

Ultimate Disposal

Waste Resources Recovery sent approximately 3,141 tons of solid waste, 384 tons of yard trimmings, and 180 tons of C&D residuals to Sunshine Canyon Landfill in 2006. The remaining 555 tons of solid waste and 540 tons of C&D materials were diverted into various recycling streams.

Daily/Annual Capacity

Waste Resources Recovery has a total permitted capacity of 500 tons per day, or 156,000 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

The facility is in the process of expanding operations and will increase incoming capacity from 500 to 2,000 tons per day. They will be adding an additional 5 acres of active land to their existing 2.5 acres. As part of the expansion, Waste Resources Recovery is looking into the implementation of various conversion technology strategies.

[64] Data were provided for all substreams combined.
[65] Data were provided for all substreams combined.
[66] Data were provided for all substreams combined.

Attachment C-2: Landfills and Waste-to-Energy Facilities[67]

Municipal Solid Waste Landfills

Antelope Valley Public Landfill

Overview

Antelope Valley Public Landfill is a disposal facility in Palmdale, California, approximately 50 miles north of the City in the Antelope Valley. The landfill is permitted to receive 1,400 tons daily or 436,800 tons per year, yet only a small portion of that comes from City sources.

Incoming City Tonnages by Generator Type

In 2006, all solid waste brought to Antelope Valley that originated in the City of Los Angeles was brought in via transfer trailer from intermediary facilities. Small quantities of yard trimmings were delivered to Antelope Valley; however, the facility was unable to provide tonnages attributed to Los Angeles.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	6
Transfer	8,483	-	-
Total Tons	**8,483**	**-**	**6**

Tip Fees

Tip fees in 2006 were $48 per ton for C&D or solid waste and $34 per ton for yard trimmings.

Ultimate Disposal

All solid waste received from City sources was landfilled as disposed waste. Limited amounts of yard trimmings were accepted, and all yard trimmings were converted to boiler fuel. Antelope Valley put the City's 6 tons of C&D materials to use as ADC.

Daily/Annual Capacity

The facility has a total permitted capacity of 1,400 tons per day, or 436,800 tons per year, assuming that the facility is open six days a week.

Expansion Plans/Opportunities

Antelope Valley is working with the City of Palmdale to explore two different expansion scenarios to double capacity and increase the life of the landfill. Additional capacity will likely occur either through a land purchase or an expansion of the existing disposal capacity.

[67] Note that the facility surveys were conducted in 2007 and 2008 and reflect the circumstances at the time of the survey. The information presented in these surveys, including tons and tip fees, was self-reported by the facility operators.

Bradley Landfill

Overview

Bradley Landfill was a disposal facility in Sun Valley, in the East Valley wasteshed of Los Angeles. As of April 2007, the Bradley facility ceased landfill operations and operated as a limited-volume transfer station accepting clean fill and yard trimmings. In 2006, the landfill received 350,059 tons of solid waste from City sources, an amount representing about 10 percent of the City's waste stream. The facility also accepted nearly 180,000 tons of yard trimmings from City sources in 2006.

Incoming City Tonnages by Generator Type

In 2006, Bradley Landfill received solid waste from both direct and transfer sources. Bradley also received yard trimmings and a small amount of C&D materials from City sources.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	190,725	-	-
Residential curbside (LASAN)	197	157,842	-
Self-haul	19,113	21,700	64
Transfer	140,024	-	-
Total Tons	**350,059**	**179,542**	**64**

Tip Fees

Not applicable.

Ultimate Disposal

In 2006, all 350,059 tons of solid waste received at Bradley Landfill was landfilled as disposed waste. C&D waste was processed to produce wood chips, and yard trimmings were used to produce a mulch product.

Daily/Annual Capacity

This facility is closed.

Expansion Plans/Opportunities

Waste Management, operator of this facility, is in the process of permitting a MRF/transfer station at Bradley Landfill to handle up to 5,000 tons per day.

Calabasas Sanitary Landfill

Overview

Calabasas Landfill is a disposal facility located just west of the West Valley wasteshed of the City. Calabasas is permitted to handle up to 3,500 tons of waste per day, or 1,092,000 tons per year. The facility receives solid waste, yard trimmings, and C&D materials from City sources. In 2006, Calabasas accepted over 320,000 tons of solid waste from City sources, representing almost 10 percent of the City's solid waste.

Incoming City Tonnages by Generator Type

Calabasas Landfill received solid waste from City sources from commercial haulers and residential curbside customers, as well as transfer loads from intermediary facilities. They also received large quantities of yard trimmings and C&D materials from commercial haulers.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	281,944	15,599	35,271
Residential curbside (LASAN)	2,260	-	-
Self-haul	-	-	-
Transfer	36,943	3	-
Total Tons	**321,147**	**15,602**	**35,271**

Tip Fees

In 2006, the fee for solid waste and C&D/inert at Calabasas was $33.38 per ton; the fee for yard trimmings was $13.20 per ton.

Ultimate Disposal

All solid waste received from City sources were landfilled as disposed waste; the yard trimmings and C&D materials (asphalt) were used as ADC.

Daily/Annual Capacity

The total permitted daily capacity at Calabasas is 3,500 tons per day, or 1,092,000 tons per year, assuming a six-day week.

Expansion Plans/Opportunities

Calabasas Landfill is scheduled to close in 2028 and has no plans for expansion.

Chiquita Canyon Sanitary Landfill

Overview

Chiquita Canyon Landfill is a disposal facility located just north of the City boundary. The landfill is permitted to handle as much as 6,000 tons of waste per day, or 1,872,000 tons per year. In 2006, the landfill received 764,300 tons of solid waste originating in the City, representing approximately 21 percent of the City's waste stream. Chiquita Canyon also accepted 52,600 tons of yard trimmings and 6,800 tons of C&D materials from City sources.

Incoming City Tonnages by Generator Type

All materials received from City sources in 2006 came via transfer loads from other facilities.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	764,300	52,600	6,800
Total Tons	**764,300**	**52,600**	**6,800**

Tip Fees

The tip fees in 2006 for solid waste and C&D materials at Chiquita Canyon were $55 per ton. The tip fee for yard trimmings was $25 per ton.

Ultimate Disposal

All solid waste received by Chiquita Canyon from City sources was landfilled as disposed waste. All yard trimmings that the facility received from City sources had been previously ground and were used for erosion control and other types of cover. Similarly, all C&D materials had been processed and were used for road bed and wet weather decking.

Daily/Annual Capacity

Chiquita Canyon has a total daily permitted capacity of 6,000 tons, or 1,872,000 tons per year, based on a six-day week.

Expansion Plans/Opportunities

Chiquita Canyon Landfill, scheduled to close in November 2019, filed a Notice of Preparation and applied for a Conditional Use Permit several years ago for a master plan revision to increase in both the volume and tenure of the landfill. The County Planning Department is reviewing an Administrative Draft Environmental Impact Report that was submitted in July 2007. The approval process is still pending.

El Sobrante Sanitary Landfill

Overview

El Sobrante Sanitary Landfill is a large-capacity disposal facility located in Riverside County, approximately 47 miles east of the City. It is permitted to receive up to 10,000 tons of waste per day, or 3,120,000 tons per year. The facility received 85,235 tons of solid waste from City sources in 2006, representing approximately two percent of the City's solid waste.

Incoming City Tonnages by Generator Type

In 2006, El Sobrante received solid waste from City sources that was transferred from other facilities.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	4,168	-	-
Self-haul	-	-	-
Transfer	81,067	-	-
Total Tons	**85,235**	**-**	**-**

Tip Fees

In 2006, the tip fee for solid waste was $33 per ton.

Ultimate Disposal

All solid waste received at El Sobrante from City sources was landfilled as disposed waste.

Daily/Annual Capacity

El Sobrante is permitted to receive 10,000 tons of total waste per day, or 3,120,000 tons per year, assuming a six-day week.

Expansion Plans/Opportunities

In August 2001, El Sobrante was granted permission to expand and now has 495 acres of active land and over 100 million cubic yards of disposal capacity remaining. The projected closing date is January 2030.

Frank R. Bowerman Sanitary Landfill

Overview

Frank R. Bowerman Sanitary Landfill is located in Irvine, Orange County, and is open to commercial customers only. It is a disposal facility with a permitted capacity of 8,500 tons of total waste per day, or 2,652,000 tons per year. The facility accepted a small portion of the solid waste generated in the City in 2006, just over one percent.

Incoming City Tonnages by Generator Type

Transfer trailers brought City solid waste to Bowerman Landfill. In 2006, the landfill accepted over 40,000 tons of solid waste from City sources.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	41,173	-	-
Total Tons	**41,173**	**-**	**-**

Tip Fees

The tip fee in 2006 for solid waste at Frank R. Bowerman Landfill was $46 per ton.

Ultimate Disposal

All of the solid waste received from City sources was landfilled as disposed waste.

Daily/Annual Capacity

In 2006, the facility had a permitted capacity to receive up to 8,500 tons of total waste per day, or 2,652,000 tons per year.

Expansion Plans/Opportunities

In 2008, Frank R. Bowerman Landfill received a permit for a planned expansion to increase its permitted capacity to 11,500 tons per day. Based on this expansion, the facility is scheduled to close in 2053.

Lancaster Landfill

Overview

Lancaster Landfill is located approximately 50 miles north of the City in the rapidly growing Antelope Valley. The facility has a permitted capacity of 1,700 tons per day, or 530,400 tons per year, with plans to increase incoming capacity. Lancaster Landfill received 133,433 tons of solid waste from City sources in 2006, representing about four percent of the City's waste stream. The facility also accepted 50,455 tons of C&D materials from City sources.

Incoming City Tonnages by Generator Type

All solid waste and C&D materials from City sources brought to Lancaster in 2006 were transferred from intermediate facilities.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	133,433	-	50,455
Total Tons	**133,433**	**-**	**50,455**

Tip Fees

Tip fees in 2006 were $48 per ton for solid waste, $34 per ton for yard trimmings, and $62 per ton for C&D materials.

Ultimate Disposal

All of the solid waste received from City sources was landfilled at Lancaster as disposed waste. The 50,455 tons of C&D materials are made up of aggregate from the Downtown Diversion facility. All 50,455 tons were used on site at Lancaster as ADC.

Daily/Annual Capacity

The facility is permitted to receive up to 1,700 tons of total waste per day, or 530,400 tons per year, assuming they are open six days per week.

Expansion Plans/Opportunities

Lancaster Landfill has applied for a permit that would expand its daily permitted capacity from 1,700 tons per day to 3,000 tons per day. The facility was projected to close in August, 2012, but is still in operation.

Olinda Alpha Sanitary Landfill

Overview

Olinda Alpha Sanitary Landfill is located in Brea, Orange County. It is a disposal facility with over 400 acres permitted for disposal and a permitted capacity of 8,000 tons per day, or 2,496,000 tons per year. In 2006, Olinda Alpha Landfill received almost four percent of the solid waste from City sources, or over 130,000 tons.

Incoming City Tonnages by Generator Type

In 2006, all solid waste entering the facility was transferred from intermediate facilities.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	130,473	-	-
Total Tons	**130,473**	**-**	**-**

Tip Fees

The tip fee in 2006 for solid waste was $46 per ton.

Ultimate Disposal

All of the solid waste received from City sources was landfilled as disposed waste.

Daily/Annual Capacity

Olinda Alpha Landfill is permitted to receive 8,000 tons per day, or 2,496,000 tons per year, assuming that the facility is open six days a week.

Expansion Plans/Opportunities

Originally scheduled to close in 2012, Olinda Alpha was given an extension to remain open until 2021. When the facility closes in 2021, the remaining South Orange County facilities will expand to handle the waste currently being accepted by Olinda Alpha.

Prima Deshecha Sanitary Landfill

Overview

Prima Deshecha Sanitary Landfill is a disposal facility located in San Juan Capistrano, Orange County. The facility is permitted to receive 4,000 tons per day, or 1,248,000 tons per year. Prima Deshecha received a small portion of the solid waste generated in the City in 2006, less than one percent.

Incoming City Tonnages by Generator Type

All City solid waste that arrived at Prima Deshecha in 2006 was transferred from intermediate facilities.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	24,047	-	-
Total Tons	**24,047**	**-**	**-**

Tip Fees

The tip fee in 2006 for solid waste at Prima Deshecha was $46 per ton.

Ultimate Disposal

All of the solid waste received from City sources was landfilled as disposed waste.

Daily/Annual Capacity

Prima Deshecha has a total permitted capacity of 4,000 tons per day or 1,248,000 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

Prima Deshecha Landfill is located on approximately 1,530 acres and is permitted to dispose solid waste on 699 acres. The landfill can be expanded to handle 7,500 tons per day. It is scheduled to close in 2067.

Puente Hills Landfill

Overview

Puente Hills Landfill is located next to the City of Whittier in unincorporated Los Angeles County, approximately 14 miles east of the City. It is a disposal facility permitted to accept up to 13,200 tons of waste per day, or 4,118,400 tons per year and is scheduled to close in October 2013. In 2006, Puente Hills Landfill received nearly 100,000 tons of solid waste from City sources, accounting for less than three percent of the City's solid waste. Puente Hills also accepted yard trimmings for ADC from City sources, including over 1.8 million tons of C&D materials primarily used for deck material or daily cover.

Incoming City Tonnages by Generator Type

In 2006, Puente Hills received City wastes via transfer vehicles and commercial haulers.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	51,713	28	1,838,071
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	44,701	34	-
Total Tons	**96,414**	**62**	**1,838,071**

Tip Fees

In 2006, the tip fees for solid waste and C&D materials were $26.21 per ton, while the fee for yard trimmings was $12.10 per ton.

Ultimate Disposal

Most of the solid waste entering Puente Hills from City sources was landfilled as disposed waste. In 2006, of the total 96,414 tons received, 28,865 tons were processed at Puente Hills MRF where 1,404 tons were separated for recycling and 2,794 were sent to the Commerce Refuse-to-Energy facility. Yard trimmings were used as ADC. Of the C&D materials received from City sources, 1,838,000 tons were made up of dirt and asphalt; these materials were beneficially reused for deck material or daily cover. The remaining 71 tons of C&D materials were landfilled.

Daily/Annual Capacity

Puente Hills has a total permitted capacity of 13,200 tons per day, or 4,118,400 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

There are no plans to expand the landfill, which is scheduled to close in October 2013.

Scholl Canyon Sanitary Landfill

Overview

Scholl Canyon Sanitary Landfill is located in the city of Glendale, just north of the 134 freeway. It is a disposal facility accepting up to 3,400 tons of waste per day, or 1,060,800 tons per year. Scholl Canyon Landfill received a small amount of solid waste from City sources in 2006, small amounts of yard trimmings, and some C&D materials.

Incoming City Tonnages by Generator Type

In 2006, Scholl Canyon received a small amount of solid waste and yard trimmings from City sources, as well as 87,765 tons of C&D materials.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	3,553	2	87,765
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	-	-	-
Total Tons	**3,553**	**2**	**87,765**

Tip Fees

The fees in 2006 for solid waste and C&D materials were $36.93 per ton, and the fee for yard trimmings was $13.75 per ton.

Ultimate Disposal

All 3,553 tons of solid waste received from City sources were landfilled as disposed waste. The negligible amount of yard trimmings was used for ADC, as were the 87,765 tons of dirt making up the C&D materials.

Daily/Annual Capacity

Scholl Canyon Landfill has a total daily permitted capacity of 3,400 tons per day, or 1,060,800 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

An Environmental Impact Report was submitted for public comment in December 2007 outlining two possible expansion proposals that would extend the life of the landfill beyond the 2019 closure date. The first is a vertical-only scenario that would allow for a 5 million-ton expansion and add approximately 12 years to the life of the landfill. The second proposal involves a vertical-horizontal scenario that would add 6 million tons of capacity and 15 years to the landfill life. The approval process is still pending.

Simi Valley Landfill & Recycling Center

Overview

Simi Valley Landfill & Recycling Center is located just northwest of the city of Simi Valley in Ventura County. Opened in 1970, this disposal facility is permitted to accept up to 3,000 tons of waste per day, or 936,000 tons per year. The facility received approximately two percent of the solid waste generated in the City.

Incoming City Tonnages by Generator Type

In 2006, all waste received by Simi Valley Landfill from City sources was solid waste transferred from intermediate facilities.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	62,376	-	-
Total Tons	**62,376**	**-**	**-**

Tip Fees

The tip fee in 2006 for solid waste was $45 per ton.

Ultimate Disposal

All of the solid waste received from City sources was landfilled as disposed waste.

Daily/Annual Capacity

Simi Valley Landfill has a permitted capacity of 3,000 tons per day for solid waste, or 936,000 tons per year. It is also permitted to receive 6,000 tons per day, or 1,872,000 tons per year, of recycling, inert material, wood, and organic material.

Expansion Plans/Opportunities

The facility would like to increase capacity from 30 million to 80 million cubic yards and has submitted an application for this expansion. Simi Valley Landfill & Recycling Center has a projected closure date of December 2033.

Sunshine Canyon Landfill

Overview

Sunshine Canyon Landfill is located in Granada Hills on the City border, in northeast San Fernando Valley. This facility receives and disposes of more solid waste from City sources than any other landfill, receiving approximately 44 percent of the City's solid waste, or nearly 1.6 million tons. More than 90 percent of the City's 2006 residential curbside waste was brought to Sunshine Canyon. The landfill is permitted to receive up to 12,100 tons of waste per day, or 3,775,200 tons per year. Sunshine Canyon also received over 42,000 tons of C&D materials and a small amount of yard trimmings from City sources.

Incoming City Tonnages by Generator Type

In 2006, Sunshine Canyon received waste from City sources from both direct and transferred sources. Commercial haulers brought waste from business, industrial, multi-family sources, and residential curbside sources, to Sunshine Canyon.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	406,075	712	42,262
Residential curbside (LASAN)	900,713	575	-
Self-haul	10,477	-	-
Transfer	282,079	-	-
Total Tons	**1,599,344**	**1,287**	**42,262**

Tip Fees

The gate rate in 2006 for solid waste and C&D materials was $48 per ton and the fee for yard trimmings was $35 per ton. LASAN pays a negotiated rate of approximately $30 per ton for solid waste disposal.

Ultimate Disposal

All solid waste received by Sunshine Canyon from City sources was landfilled as disposed waste. Sunshine Canyon sent yard trimmings to Falcon Transfer Station where it was ground and sent on to Colmac Energy to be burned for energy. The C&D materials were primarily inert debris and were used as wet weather decking and road base material.

Daily/Annual Capacity

The facility has a total permitted capacity of 12,100 tons per day, or 3,775,200 tons per year, assuming a six-day work week.

Expansion Plans/Opportunities

Sunshine Canyon has approximately 70 million tons of permitted capacity. While the potential exists for future facility expansion, there are no plans to do so at this time. Sunshine Canyon is scheduled to close in 2037.

Waste-to-Energy Facilities

Commerce Refuse-to-Energy

Overview

Commerce Refuse-to-Energy is located east of the South Los Angeles wasteshed in the City of Commerce. This facility receives and transforms solid waste and wood/textile waste. It received only a small portion of solid waste from City sources in 2006. It is permitted to receive up to 1,000 tons of waste per day, or 312,000 tons per year.

Incoming City Tonnages by Generator Type

Commercial haulers brought waste from business, industrial, and multi-family sources, as well as from transfer trailers, to Commerce Refuse-to-Energy.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	2,660	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	4,480	-	-
Total Tons	**7,140**	**-**	**-**

Tip Fees

The tip fee in 2006 for solid waste was $61 per ton and the tip fee for wood/textiles was $29 per ton.

Ultimate Disposal

Of the 7,140 tons of total incoming waste, all were transformed except for 819 tons that were rejected and sent to Puente Hills Landfill for disposal. Rejected materials include non-processable waste (materials that cannot be processed to produce energy) such as concrete and asphalt. Residual ash was sent to Puente Hills Landfill and used for subgrade material for the winter deck. Any unused ash is stockpiled for later use.

Daily/Annual Capacity

The facility has a total permitted capacity of 1,000 tons per day, or 328,500 tons per year, assuming 90 percent availability.

Expansion Plans/Opportunities

There are no plans for expansion of this facility.

Southeast Resource Recovery Facility (SERRF)

Overview

Southeast Resource Recovery Facility is located in the south end of the Harbor wasteshed in the city of Long Beach. This facility receives and transforms solid waste. It is permitted to receive up to 2,240 tons of waste per day, or 698,880 tons per year. SERRF received a small portion of solid waste from City sources in 2006. In 2006, the facility also received small amounts of yard trimmings.

Incoming City Tonnages by Generator Type

Commercial haulers brought waste from commercial and multi-family generators and LASAN brought waste from residential curbside customers to SERRF.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	9,829	-	
Residential curbside (LASAN)	16,519	57	-
Self-haul	-	-	-
Transfer	1,032	-	-
Total Tons	**27,380**	**57**	**-**

Tip Fees

The tip fee in 2006 for solid waste and C&D was $45 per ton.

Ultimate Disposal

The waste material was burned for energy. The remaining ash was turned into road base and used at Puente Hills Landfill.

Daily/Annual Capacity

The facility has a total permitted capacity of 2,240 tons per day, or 735,840 tons per year, assuming 90 percent availability.

Expansion Plans/Opportunities

There are no plans for expansion of this facility.

Inert Landfills[68]

Azusa Landfill

Overview

Azusa Landfill is located in the City of Azusa. This disposal facility accepts up to 6,500 tons of mixed C&D materials per day, or 2,028,000 tons per year. Azusa Landfill received 43,499 tons of C&D materials from City sources in 2006, in addition to a small amount of inert debris.

Incoming City Tonnages by Generator Type

In 2006, all 43,499 tons of C&D materials that Azusa received from City sources were brought in via self-haul.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	43,499
Transfer	-	-	-
Total Tons	**-**	**-**	**43,499**

Tip Fees

The fees for C&D and inert debris at Azusa in 2006 were $45 per pick-up truck, $80 per semi-truck, and $95 per bottom-dump truck.

Ultimate Disposal

All 42,974 tons of asbestos received from City sources were disposed at Azusa. Approximately 388 tons of rock, gravel, and soil were used for ADC, while 164 tons of tires were diverted to domestic recycling markets.

Daily/Annual Capacity

Azusa Landfill has a total daily permitted capacity of 6,500 tons per day, or 2,028,000 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

Azusa has no expansion plans or opportunities.

[68] Most inert landfills are classified as "Inert Debris Engineered Fill Operations" under state regulations and inert materials disposed at an inert landfill are considered beneficially reused and are not considered disposed as solid waste. California Code of Regulations Title 14, Natural Resources-Division 7, Article 5.95, Section 17388 (l)

Chandler's Landfill

Overview

Chandler's Landfill, located in the City of Rolling Hills Estates, is a 130-acre mine reclamation project that receives waste for disposal and recovery. However, it is different from other reclamation projects in that Chandler's Landfill also processes some recyclable material on site, grinding a portion of incoming concrete and road asphalt either for sale as road base or for use as ADC on site. Chandler's Landfill received 12,679 tons of C&D materials from City sources in 2006.

Incoming City Tonnages by Generator Type

In 2006, all C&D materials received by Chandler's Landfill that originated in Los Angeles came from commercial sources and were brought in via self-haul.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	12,679
Transfer	-	-	-
Total Tons	**-**	**-**	**12,679**

Tip Fees

In 2006, the fees for C&D and inert debris were $115 to $345 per load, depending on vehicle type.

Ultimate Disposal

Approximately 6,415 tons of C&D materials received from City sources were landfilled. Approximately 4,314 tons of material were used for ADC, while another 1,950 tons were diverted to domestic recycling markets.

Daily/Annual Capacity

Chandler's Landfill is a mine reclamation project and does not have a permitted capacity.

Expansion Plans/Opportunities

Chandler's Landfill has no expansion plans or opportunities.

Hanson Aggregates Landfill

Overview

Hanson Aggregates Landfill covers a 40-acre site in the City of Irwindale. It is a mine reclamation project that accepts up to 1,600 tons of mixed C&D materials per day, or 499,200 tons per year. Hanson Aggregates received 916 tons of C&D materials from City sources in 2006. They are not currently accepting waste because the County is prioritizing filling other former mines in the area. As a result, Hanson Aggregates is at less than one percent of its total capacity. The facility does not charge disposal fees because their primary interest is in reclaiming the mine to meet Surface Mining and Reclamation Act requirements, rather than in running a commercial landfill operation.

Incoming City Tonnages by Generator Type

In 2006, Hanson Aggregates received 733 tons of self-hauled waste and 183 tons of commercially hauled waste from commercial/multi-family sources in the City.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	183
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	733
Transfer	-	-	-
Total Tons	**-**	**-**	**916**

Tip Fees

In 2006, there was no tip fee for C&D materials and inert debris at Hanson Aggregates.

Ultimate Disposal

All 916 tons of C&D materials received from City sources were landfilled.

Daily/Annual Capacity

Hanson Aggregates Landfill has a total daily permitted capacity of 1,600 tons per day, or 499,200 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

Hanson Aggregates has no expansion plans or opportunities.

Lower Azusa (Arcadia)

Overview

Lower Azusa Landfill is located in the City of Arcadia. The facility accepts up to 4,000 cubic yards of inert materials per day, equivalent to approximately 1,720 tons per day or 536,640 tons per year. Lower Azusa received between 25,800 and 43,000 tons of inert materials in 2006, but was unable to estimate the amount that originated in the City.

Incoming City Tonnages by Generator Type

Not available.

Tip Fees

In 2006, Lower Azusa charged $70 to $130 per truck, depending on the size and type of vehicle.

Ultimate Disposal

Steel received by the landfill is recycled. Details on the final disposal of inert materials were not available.

Daily/Annual Capacity

Lower Azusa Landfill has a total daily permitted capacity of 4,000 cubic yards per day, or 1,248,000 cubic yards per year, assuming that the facility is open six days per week. Using a conversion factor of 860 pounds per cubic yard of inert material, the annual capacity is estimated to be 536,640 tons per year.

Expansion Plans/Opportunities

Lower Azusa has no expansion plans or opportunities.

Nu Way Arrow

Overview

Nu Way Arrow is an inert disposal facility located in the City of Irwindale. It accepted 85,950 tons of C&D material from City sources in 2006. The facility is permitted to accept up to 7,500 tons per day or up to 780,000 tons per year.

Incoming City Tonnages by Generator Type

In 2006, Nu Way Arrow received 85,951 tons of waste from City sources. Figures for tonnages from individual generator types were not available.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	-	-	-
Total Tons	**-**	**-**	**85,951**[69]

Tip Fees

The tip fee at Nu Way Arrow in 2006 ranged from $40 to $95 per ton, depending on the size and type of vehicle.

Ultimate Disposal

Not available.

Daily/Annual Capacity

Nu Way Arrow has a total daily permitted capacity of 7,500 tons per day and 780,000 tons per year.

Expansion Plans/Opportunities

Nu Way Arrow has no expansion plans or opportunities.

[69] Figures for tonnages from individual generator types were not available

Peck Road Landfill

Overview

Peck Road Landfill is located in the City of Monrovia. It is a disposal facility that accepts up to 1,210 tons of mixed C&D materials per day, or 377,520 tons per year. Peck Road Landfill received 25,659 tons of C&D materials from City sources in 2006.

Incoming City Tonnages by Generator Type

In 2006, all C&D materials received by Peck Road that originated in Los Angeles were brought in via self-haul.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	25,659
Transfer	-	-	-
Total Tons	**-**	**-**	**25,659**

Tip Fees

The fees in 2006 for C&D materials and inert debris were $15 to $75 per truck, depending on type.

Ultimate Disposal

All 25,659 tons of concrete and asphalt received from City sources in 2006 were recycled into road base.

Daily/Annual Capacity

Peck Road Landfill has a total daily permitted capacity of 1,210 tons per day, or 377,520 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

Peck Road has no expansion plans or opportunities.

Reliance Pit #2

Overview

Reliance Pit #2 is a mine reclamation project located in the City of Irwindale that receives inert C&D materials. Reliance received 625 tons of C&D materials from City sources in 2006. Following that year, it was temporarily shut down so that the material could be diverted to other mine reclamation projects in the area. The owner is applying to reopen, but for the immediate future remaining capacity is 12 million yards.

Incoming City Tonnages by Generator Type

In 2006, all C&D materials received by Reliance Pit #2 that originated in Los Angeles were commercially hauled.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	625[70]
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	-
Transfer	-	-	-
Total Tons	**-**	**-**	**625**

Tip Fees

In 2006, Reliance did not charge tip fees for C&D material.

Ultimate Disposal

All 625 tons of C&D materials received from City sources were landfilled on site.

Daily/Annual Capacity

Reliance Pit #2 is a mine reclamation project and does not have a permitted capacity.

Expansion Plans/Opportunities

Reliance has no expansion plans or opportunities.

[70] Reliance reported accepting 1,452 cubic yards of inert materials, which were converted to tons using a conversion factor of 860 pounds per cubic yard of inert material.

Sun Valley Landfill

Overview

Sun Valley Landfill receives dirt, concrete, and asphalt for disposal. Over 80 percent of the incoming tonnage is made up of dirt. Sun Valley received 193,313 tons of C&D materials from City sources in 2006. The landfill will fill its remaining capacity in 15 years at the current rate of fill.

Incoming City Tonnages by Generator Type

In 2006, approximately 60 percent of the C&D materials received by Sun Valley Landfill that originated in the City of Los Angeles came from commercial sources and the other 40 percent were brought in via self-haulers.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	115,988
Residential curbside (LASAN)	-	-	-
Self-haul	-	-	77,325
Transfer	-	-	-
Total Tons	**-**	**-**	**193,313[71]**

Tip Fees

The fee in 2006 for C&D materials was $45 to $135 per ton, depending on vehicle type.

Ultimate Disposal

All of the 193,313 tons of C&D material received from City sources were landfilled on site.

Daily/Annual Capacity

Sun Valley's permitted capacity is 1,720,700 tons per year.

Expansion Plans/Opportunities

Sun Valley has the potential to expand capacity, but there are no plans to do so at this time.

[71] Sun Valley reported accepting a total of 449,566 cubic yards of inert materials, which was converted to tons using a conversion factor of 860 pounds per cubic yard of inert material.

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Attachment C-3: Recycling Facilities[72]

The Allan Company, Santa Monica

Overview

The Allan Company, located in the City of Santa Monica, reported accepting 12,600 tons of recyclable materials from commercial sources in the City in 2007; 7,800 of those tons were hauled by private companies and 4,800 were self-hauled.

Incoming City Tonnages by Generator Type

This facility received commercially hauled and self-hauled recyclable materials from commercial sources.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	7,800
Self-haul	4,800
Residential curbside (LASAN)	0
Total Tons	**12,600**

Prices

The Allan Company provided price information after recycling commodity markets took a deep plunge in the fall of 2008. Their payments ranged from $0 for materials such as miscellaneous plastic containers and tin cans up to $300 per ton for aluminum cans.

Origin by Wasteshed

Approximately 90 percent of the recyclable materials received from City sources came from the West LA wasteshed. Another five percent came from the West Valley wasteshed, while the remaining five percent came from East Valley wasteshed.

Types of Materials Processed

Paper materials make up most of materials received by the Allan Company from City sources at 75 percent of the total, or 9,500 of the 12,600 tons. The facility also received plastic containers and film, metal, and glass containers.

End Markets

All 12,600 tons processed by the Allan Company are sent to recycling markets. This facility reported a zero percent residual waste rate. That is, none of the recyclable materials received from City sources are sent out to be disposed as waste.

Expansion Plans/Opportunities

The Allan Company reports plans to expand the facility, adding 2,500-4,000 tons per month. The only concern The Allan Company expressed about accepting additional materials from the City of Los Angeles is the environmental impact and subsequent regulations associated with additional vehicles entering the facility.

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[72] Note that the facility surveys were conducted in 2007 and 2008 and reflect the circumstances at the time of the survey. The information presented in these surveys, including tons and tip fees, was self-reported by the facility operators.

Angelus Western Paper Fibers

Overview

Angelus Western Paper Fibers, located in central Los Angeles, reported accepting 187,200 tons of recyclable materials from commercial sources in the City in 2007; 62,400 of those tons were hauled by commercial haulers and 124,800 were self-hauled.

Incoming City Tonnages by Generator Type

This facility received commercially hauled and self-hauled recyclable materials from commercial sources.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	62,400
Self-haul	124,800
Residential curbside (LASAN)	0
Total Tons	**187,200**

Prices

Angelus Western Paper Fibers provided price information after recycling commodity markets took a deep plunge in 2008. Their payments ranged from $10 for mixed waste paper to $30 per ton for cardboard.

Origin by Wasteshed

Approximately 70 percent of the recyclable materials received from City sources came from the North Central wasteshed. Another 20 percent came from the South LA wasteshed, while the remaining 10 percent came from the West LA wasteshed.

Types of Materials Processed

Paper materials were the only materials received by Angelus Western Paper Fibers from City sources. Cardboard, newsprint, and mixed paper were the commodities reported.

End Markets

All 187,200 tons processed by Angelus Western Paper Fibers are sent to recycling markets. This facility reported an overall four percent residual waste rate. That is, four percent of the recyclable materials received from City sources are sent out to be disposed as waste.

Expansion Plans/Opportunities

Angelus Western Paper Fibers reports plans to expand the facility, adding 250 tons per day, or approximately 78,000 per year (based on a six-day work week). Angelus Western Paper Fibers expressed two primary concerns with regard to the expansion: 1) the economic situation and its effect on commodity prices and 2) negotiating purchase of railroad land adjacent to their existing facility. However, they noted that additional recycling tons from the City of Los Angeles would help make the expansion viable.

Bestway Recycling Co. Inc. (Firestone Facility)

Overview

Bestway Recycling is located in south Los Angeles near the City of South Gate. They reported accepting 56,430 tons of recyclable materials from commercial and residential sources in the City in 2007. Of those tons, 1,600 were hauled by private companies, 2,000 tons were self-hauled, and 52,830 tons were hauled by LASAN. Some of the LASAN residential curbside tons are transferred to the Bestway Firestone Facility from the Bestway Jefferson Boulevard location (which serves as a transfer point and does not process the materials).

Incoming City Tonnages by Generator Type

The table below breaks out Bestway Recycling tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	1,600
Self-haul	2,000
Residential curbside (LASAN)	52,830
Total Tons	**56,430**

Prices

Price information was not available from Bestway Recycling for this report.

Origin by Wasteshed

Approximately 94 percent of the recyclable materials received from City sources came from the West LA wasteshed. Another four percent came from the South LA wasteshed, while the remaining two percent came from the North Central wasteshed.

Types of Materials Processed

Paper materials make up most of the material received by Bestway Recycling from the City at 58 percent of the total, or 32,840 of the 56,430 tons. The facility also received plastic containers and film, metal and glass containers.

End Markets

A total of 44,435 tons processed by Bestway Recycling are sent to recycling markets. This facility reported an overall 21 percent residual waste rate. That is, 21 percent of the recyclable materials received from City sources are sent out to be disposed as waste.

Expansion Plans/Opportunities

Bestway Recycling does not have plans to expand their facility, but has the space to process up to a total of 400 tons per day, or approximately 124,800 tons per year (based on a six-day work week). Bestway Recycling would need to purchase additional equipment to process the additional material.

Burbank Recycling

Overview

Burbank Recycling, located in the City of Burbank, reported accepting 800 tons of recyclable materials from commercial sources in the City in 2007. All of those tons were hauled by private companies.

Incoming City Tonnages by Generator Type

The table below breaks out Burbank Recycling tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	800
Self-haul	0
Residential curbside (LASAN)	0
Total Tons	**800**

Prices

Price information was not available from Burbank Recycling for this report.

Origin by Wasteshed

Half of the recyclable materials received by Burbank Recycling from City sources came from the North Central wasteshed and the other half came from the East Valley wasteshed.

Types of Materials Processed

Burbank Recycling reported that all recyclable materials that came from the City's commercial establishments were made up of cardboard (500 tons) and office paper (300 tons).

End Markets

All 800 tons of cardboard and office paper processed by Burbank Recycling were sent to recycling markets. This facility reported an overall zero percent residual waste rate. That is, none of all the recyclable materials received from City sources are sent out to be disposed as waste.

Expansion Plans/Opportunities

Burbank Recycling does not have plans to expand the facility, but may consider opening a new facility if there were enough feedstock materials to merit a new site and equipment.

City Fibers (Santa Fe Ave.)

Overview

City Fibers (Santa Fe Ave.), located near downtown Los Angeles, reported accepting 85,000 tons of residential curbside recyclable materials hauled by LASAN in 2007.

Incoming City Tonnages by Generator Type

The table below breaks out City Fibers (Santa Fe Ave.) tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	0
Self-haul	0
Residential curbside (LASAN)	85,000
Total Tons	**85,000**

Prices

LASAN receives an average of $12.20 per ton in revenues from City Fibers (Santa Fe Ave.) for blue bin materials.

Origin by Wasteshed

Approximately 50,000 tons, or 59 percent, of the recyclable materials received by City Fibers (Santa Fe Ave.) from City sources came from the North Central L.A. wasteshed, and 35,000 tons, or 41 percent, came from the South L.A. wasteshed.

Types of Materials Processed

Paper materials were the largest type of material received by City Fibers (Santa Fe Ave.) from the City at 44 percent of the total, or 37,500 tons. The facility also received plastic containers and film, metal and glass containers, and cardboard.

End Markets

Approximately 50,000 tons, or 59 percent, of recyclables processed by City Fibers (Santa Fe Ave.) were sent to recycling markets, and 35,000 tons of recyclable materials received from City sources were sent out to be disposed as waste.

Expansion Plans/Opportunities

City Fibers (Santa Fe Ave.) has plans to expand the facility, but the timing is uncertain.

City Fibers (Schoenborn St.)

Overview

City Fibers (Schoenborn St.), located in northwest Los Angeles, reported accepting 68,000 tons of residential curbside recyclable materials hauled by LASAN in 2007.

Incoming City Tonnages by Generator Type

The table below breaks out City Fibers (Schoenborn St.) tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	0
Self-haul	0
Residential curbside (LASAN)	68,000
Total Tons	**68,000**

Prices

LASAN receives an average of $12.20 per ton in revenues from City Fibers (Schoenborn St.) for blue bin materials.

Origin by Wasteshed

All of the recyclable materials received by City Fibers (Schoenborn St.) from City sources came from the West Valley wasteshed.

Types of Materials Processed

Paper materials comprised most of the material received by City Fibers (Schoenborn St.) from the City at 57 percent of the total, or 39,000 tons. The facility also received plastic containers and film, metal, and glass containers, and cardboard.

End Markets

Approximately 52,000 tons, or 76 percent, of recyclables processed by City Fibers (Schoenborn St.) were sent to recycling markets, and 16,000 tons of recyclable materials received from City sources were sent out to be disposed as waste.

Expansion Plans/Opportunities

City Fibers (Schoenborn St.) does not have plans to expand the facility, but adding a second shift would increase the facility's capacity from 400 tons per day to 800 tons per day.

Los Angeles Recycling Center

Overview

Los Angeles Recycling Center, located near downtown Los Angeles, reported accepting 17,700 tons of recyclable materials from commercial sources in the City in 2007. A total of 1,700 of those tons were hauled by private companies while 16,000 tons were self-hauled.

Incoming City Tonnages by Generator Type

The table below breaks out Los Angeles Recycling Center tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	1,700
Self-haul	16,000
Residential curbside (LASAN)	0
Total Tons	**17,700**

Prices

Price information was not available from Los Angeles Recycling Center for this report.

Origin by Wasteshed

All recyclable material received by Los Angeles Recycling Center from City sources came from the North Central wasteshed.

Types of Materials Processed

Paper materials comprised most of the material received by Los Angeles Recycling Center from the City at 89 percent of the total, or 15,760 of the 17,700 tons. The facility also received plastic containers and film, metal, and glass containers.

End Markets

All 17,700 tons processed by Los Angeles Recycling Center are sent to recycling markets. This facility reported an overall four percent residual waste rate. That is, four percent of all recyclable materials received from City sources are sent out to be disposed as waste.

Expansion Plans/Opportunities

Los Angeles Recycling Center does not have plans to expand the facility, but has the space to process up to a total of 1,000 tons per day, or approximately 312,000 per year (based on a six-day work week). Los Angeles Recycling Center would need to purchase additional equipment to process the additional material.

Potential Industries

Overview

Potential Industries, located in the Wilmington neighborhood of Los Angeles, reported accepting 55,400 tons of recyclable material from commercial and residential sources in the City in 2007, with 29,600 of those tons hauled by private companies, 13,200 tons self-hauled, and 12,600 tons hauled by LASAN.

Incoming City Tonnages by Generator Type

The table below breaks out Potential Industries tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	29,600
Self-haul	13,200
Residential curbside (LASAN)	12,600
Total Tons	**55,400**

Prices

Price information was not available from Potential Industries for this report.

Origin by Wasteshed

All recyclable materials from residential curbside customers hauled by LASAN, and approximately 80 percent of the commercial recyclable materials, came from the Harbor wasteshed. Another 10 percent of the commercial recyclable materials came from the South LA wasteshed, while the remaining 10 percent came from the West LA wasteshed.

Types of Materials Processed

Paper materials comprise most of the material received by Potential Industries from the City at 79 percent of the total, or 43,700 of the 55,400 tons. The facility also received plastic containers and film, metal, and glass containers.

End Markets

A total 52,900 tons processed by Potential Industries are sent to recycling markets. This facility reported an overall five percent residual waste rate. That is, five percent of the recyclable materials received from City sources are sent out to be disposed as waste.

Expansion Plans/Opportunities

Potential Industries reported plans to expand the facility. The facility has been working with the City of Los Angeles Department of Environmental Affairs to expand processing capabilities. A permit application was submitted in September 2008 for this expansion. The new permit would add a total of 2,500 tons per day, or approximately 780,000 tons per year (based on a six-day week). Potential Industries welcomes the opportunity to accept additional recyclables from residential or commercial sources located in the City of Los Angeles.

Recycle America Alliance

Overview

Recycle America Alliance, located in south Los Angeles near the City of Huntington Park, reported processing a total of 200 tons of recyclable materials from City sources per day or 62,400 tons per year in 2007.

Incoming City Tonnages by Generator Type

Information was not available to break out tons by substream for Recycle America Alliance.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	-
Self-haul	-
Residential curbside (LASAN)	-
Total Tons	**62,400**

Prices

Price information was not available from Recycle America Alliance.

Origin by Wasteshed

Information on the origins of recycling was not available from Recycle America Alliance.

Types of Materials Processed

Recycle America Alliance reported accepting cardboard, newsprint, and other paper for recycling. The facility also accepts plastic containers and film, metal, and glass containers for recycling. Quantities were not available from Recycle America Alliance for this report.

End Markets

Information on end markets for processed recyclables was not available from Recycle America Alliance for this report.

Expansion Plans/Opportunities

Recycle America Alliance reported no plans to expand the facility; however, they have an unspecified amount of excess capacity at their existing facility and therefore are open to accepting additional clean recyclables for processing.

Smurfit Recycling

Overview

Smurfit Recycling, located in the City of Torrance, reported accepting 10,575 tons of recyclable materials from commercial sources in the City in 2007. A total of 250 of those tons were hauled by commercial haulers while 10,325 tons were self-hauled.

Incoming City Tonnages by Generator Type

The table below breaks out Smurfit Recycling tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	250
Self-haul	10,325
Residential curbside (LASAN)	0
Total Tons	**10,575**

Prices

Price information was not available from Smurfit Recycling for this report.

Origin by Wasteshed

Information on the origin of recycling was not available from Smurfit Recycling for this report.

Types of Materials Processed

Paper materials comprise most of the material received by Smurfit Recycling from the City at 96 percent of the total, or 10,175 of the 10,575 tons. The facility also received plastic containers and film, as well as metal and glass containers.

End Markets

An estimated 10,375 tons processed by Smurfit Recycling are sent to recycling markets. This facility reported an overall two percent residual waste rate. That is, two percent of all recyclable materials received from City sources are sent out to be disposed as waste.

Expansion Plans/Opportunities

Smurfit Recycling does not have plans to expand the facility.

South Coast Recycling

Overview

South Coast Recycling, located in north Los Angeles near the City of Burbank, reported accepting 104,000 tons of recyclable material from commercial sources in the City in 2007. A total of 84,000 of those tons were hauled by commercial haulers while 20,000 tons were self-hauled.

Incoming City Tonnages by Generator Type

The table below breaks out South Coast Recycling tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	84,000
Self-haul	20,000
Residential curbside (LASAN)	0
Total Tons	**104,000**

Prices

South Coast Recycling provided price information before recycling commodity markets took a deep plunge in the fall of 2008. Their payments ranged from $20 for mixed recyclables or mixed paper to $100 for cardboard or newsprint and up to $4,000 per ton for scrap copper.

Origin by Wasteshed

About 40 percent of the commercial recycling from City sources came from the North Central wasteshed. The following wastesheds each contributed an additional 20 percent of the total tonnage: West Valley, East Valley, and West LA.

Types of Materials Processed

Paper materials comprise most of the material received by South Coast Recycling from the City at 91 percent of the total, or 94,900 of the 104,000 tons. The facility also received plastic containers and film, metal and glass containers, and small amounts of scrap copper and brass.

End Markets

A total of 92,000 tons processed by South Coast Recycling are sent to recycling markets. This facility reported an overall 12 percent residual waste rate. That is, 12 percent of all recyclable materials received from City sources are sent out to be disposed as waste due to contamination.

Expansion Plans/Opportunities

South Coast Recycling does not have plans to expand the facility, but has the space to process an additional unspecified amount of recyclable materials.

Sun Valley Paper Stock, Inc.

Overview

Sun Valley Paper Stock, located in the Sun Valley area within the City of Los Angeles, reported accepting 87,302 tons of recyclable materials from commercial and residential sources in the City in 2007, with 1,740 of those tons hauled by commercial haulers and 85,562 tons hauled by LASAN.

Incoming City Tonnages by Generator Type

The table below breaks out Sun Valley Paper Stock tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	1,740
Self-haul	0
Residential curbside (LASAN)	85,562
Total Tons	**87,302**

Prices

Sun Valley Paper Stock provided price information before recycling commodity markets took a deep plunge in the fall of 2008. Their payments range from $0 for miscellaneous plastics to $80 for cardboard or tin cans to $200 for plastic film and up to $3,460 per ton for aluminum cans.

Origin by Wasteshed

All recyclable materials from City sources came from the East Valley wasteshed.

Types of Materials Processed

Paper materials comprise most of the material received by Sun Valley Paper Stock from City sources at 57 percent of the total, or 49,544 of the 87,302 tons. The facility also received plastic containers and film, metal and glass containers, and a small amount of scrap metals.

End Markets

A total 66,135 tons processed by Sun Valley Paper Stock are sent to recycling markets. This facility reported an overall 25 percent residual waste rate. That is, 25 percent of the recyclable materials received from City sources are sent out to be disposed as waste due to contamination.

Expansion Plans/Opportunities

Sun Valley Paper Stock does not have plans to expand the facility, but has the space to process an additional unspecified amount of recyclable materials.

West Valley Fibers

Overview

West Valley Fibers, located in the Van Nuys area of the City of Los Angeles, reported accepting 28,860 tons of recyclable materials from commercial sources in the City in 2007. A total of 16,860 of those tons were hauled by commercial haulers while 12,000 tons were self-hauled.

Incoming City Tonnages by Generator Type

The table below breaks out West Valley Fibers tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	16,860
Self-haul	12,000
Residential curbside (LASAN)	0
Total Tons	**28,860**

Prices

Price information was not available from West Valley Fibers for this report.

Origin by Wasteshed

About 85 percent of the commercial recycling from the City came from the West Valley wasteshed. The remaining 15 percent came from the East Valley wasteshed.

Types of Materials Processed

Paper materials comprise most of the material received by West Valley Fibers from City sources at 75 percent of the total, or 21,600 of the 28,860 tons. The facility also received plastic containers and film as well as aluminum and glass containers.

End Markets

A total of 28,710 tons processed by West Valley Fibers were sent to recycling markets. This facility reported less than a one percent residual waste rate. That is, less than one percent of all recyclable materials received from City sources are sent out to be disposed as waste.

Expansion Plans/Opportunities

West Valley Fibers reported plans to expand the facility. They are planning to add transloading capabilities to handle additional residential curbside recyclables, multi-family residential recyclables, and commingled commercial recyclable materials. West Valley Fibers is in the process of assessing possible adjacent or new sites for this expansion. Because a site is not yet decided on, they do not have a specific tonnage amount associated with the expansion. They would welcome any assistance the City of Los Angeles can provide to help facilitate the land acquisition and permitting process.

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Attachment C-4: C&D Materials Processing Facilities[73]

Note: transfer stations that also serve as C&D materials processing facilities are included in Attachment C-1.

Athens Sun Valley Material Recovery & Transfer Station

Overview

Athens Sun Valley Material Recovery & Transfer Station, located in Sun Valley, reported accepting 344,331 tons of C&D materials from commercial sources in the City in 2007, with all of those tons hauled by commercial haulers.

Incoming City Tonnages by Generator Type

The table below breaks out Athens Sun Valley tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	344,331
Self-haul	-
Total Tons	**344,331**

Prices

Price information was not available from Athens Sun Valley for this report.

Origin by Wasteshed

Athens Sun Valley did not provide information on the origin of C&D tons by wasteshed.

Types of Materials Processed

Athens Sun Valley primarily received lumber and engineered wood as well as scrap metals from City sources.

End Markets

All 333 tons of wood waste processed by Athens Sun Valley was sent to recycling markets. An additional 1,445 tons of aggregate were sent to an inert landfill. For the C&D materials processed, this facility reported a zero percent residual waste rate. That is, none of the recyclable materials received from City sources were sent out to be disposed as waste.

Daily/Annual Capacity

Athens Sun Valley's total permitted capacity is 1,500 tons per day.

Expansion Plans/Opportunities

Athens Sun Valley reported plans to expand the facility for processing additional C&D materials for recycling. They are in the process of finalizing permits and paperwork to accept 500 additional tons per day, or 156,000 tons per year. The Draft Environmental Impact Report (EIR) was circulated in July 2009 and the Final EIR was issued in November 2009.

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[73] Note that the facility surveys were conducted in 2007 and 2008 and reflect the circumstances at the time of the survey. The information presented in these surveys, including tons and tip fees, was self-reported by the facility operators.

Construction and Demolition Recycling

Overview

Construction and Demolition Recycling[74], located in the City of South Gate, reported accepting 13,590 tons of C&D materials from commercial sources in the City in 2007, with all tons delivered by self-haulers.

Incoming City Tonnages by Generator Type

The table below breaks out Construction and Demolition Recycling tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	-
Self-haul	13,590
Total Tons	**13,590**

Prices

Price information was not available from Construction and Demolition Recycling for this report.

Origin by Wasteshed

Information on the origin of C&D materials delivered to Construction and Demolition Recycling was not available for this report.

Types of Materials Processed

Most of the C&D materials Construction and Demolition Recycling received from City sources consisted of gypsum board (3,180 tons), mixed metals (2,758 tons), lumber and engineered wood (1,472 tons), aggregate (944 tons), carpet (667), cardboard (158 tons), ceiling tile (128 tons), and furniture for donations (96 tons).

End Markets

An estimated 9,600 tons of C&D materials processed by Construction and Demolition Recycling were sent to recycling markets. For the C&D materials processed, this facility reported an overall 29 percent residual waste rate. That is, approximately 29 percent of the C&D materials received from City sources are sent out to be disposed as waste.

Daily/Annual Capacity

Construction and Demolition Recycling's total permitted capacity is 3,000 tons per day.

Expansion Plans/Opportunities

Construction and Demolition Recycling reported no plans to expand the facility for processing additional C&D materials, but has an unspecified amount of existing excess capacity.

[74] Previously known as Interior Removal Specialists.

Downtown Diversion

Overview

Downtown Diversion is located near downtown Los Angeles and reported accepting 360,000 tons of C&D materials from commercial sources in the City in 2007, with 270,000 hauled by private companies and 90,000 from self-haulers.

Incoming City Tonnages by Generator Type

The table below breaks out Downtown Diversion tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	270,000
Self-haul	90,000
Total Tons	**360,000**

Prices

Price information was not available from Downtown Diversion for this report.

Origin by Wasteshed

Downtown Diversion received most of the C&D materials from the North Central wasteshed (60 percent of all tons), with an additional 30 percent coming from the South LA wasteshed, and the remaining 10 percent from the West LA wasteshed.

Types of Materials Processed

Most of the C&D materials Downtown Diversion received from the City consisted of lumber and engineered wood (108,000 tons), concrete (36,000 tons), aggregate (36,000 tons), asphalt paving and roofing (18,800 and 14,400 tons respectively), scrap ferrous metals (14,400 tons), cardboard and gypsum board (10,800 and 14,400 tons respectively). All cardboard, scrap ferrous metal, concrete, asphalt paving, and gypsum board were sent to recycling markets. Most of the wood waste went to hog fuel[75] markets (80,000 of the 108,000 tons), with the remaining to compost facilities. All asphalt roofing went to fuel/energy markets, while aggregates went out as ADC.

End Markets

A total of 270,000 tons of C&D materials processed by Downtown Diversion were sent to recycling, composting, fuel/energy, or ADC markets. For the C&D materials processed, this facility reported a 25 percent residual waste rate. That is, over 25 percent of the C&D materials received from City sources are sent out to be disposed as waste.

Daily/Annual Capacity

Downtown Diversion's total permitted capacity is 1,500 tons per day, or up to 525,000 tons per year.

Expansion Plans/Opportunities

Downtown Diversion reported no plans to expand the facility for processing additional C&D materials, but has approximately 300 tons per day, or 93,600 tons per year, of existing excess capacity.

[75] "Hog fuel" is chipped wood or sawmill residues used as fuel at biomass facilities.

Madison Materials

Overview

Madison Materials, located in Santa Ana, reported accepting 250 tons of C&D materials from commercial sources in the City in 2007, with all tons delivered by private haulers.

Incoming City Tonnages by Generator Type

The table below breaks out Madison Materials tonnages by substream.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	2007 Recycling (tons)
Commercial	250
Self-haul	-
Total Tons	**250**

Prices

Madison Materials provided price information before recycling commodity markets took a deep plunge in the fall of 2008. Madison Materials charged customers $25 per load for mixed C&D loads up to 800 pounds, and $50 per ton for mixed C&D loads weighing more than 800 pounds.

Origin by Wasteshed

All C&D materials delivered to Madison Materials came from the South LA wasteshed.

Types of Materials Processed

A breakdown of specific materials was not available from Madison Materials for this report.

End Markets

All 250 tons of C&D materials Madison Materials processed were sent to recycling markets.

Daily/Annual Capacity

Madison Material's total permitted capacity is 950 tons per day.

Expansion Plans/Opportunities

Madison Materials reported plans to expand the facility for processing additional C&D materials, but does not yet know how much additional capacity will be added through the expansion.

Attachment C-5: Yard Trimmings Processing Facilities[76]

Note: transfer stations that also serve as yard trimmings processing facilities are included in Attachment C-1.

Eco-Logics

Overview

Eco-Logics is a yard trimmings processing facility located in the unincorporated area of Ventura County near the city of Moorpark. In 2006, Eco-Logics received 48,820 tons of yard trimmings from City sources. All of the yard trimmings originated in the Western wasteshed and were hauled via LASAN trucks to the Culver City transfer facility and then to Eco-Logics. LASAN terminated its contract with Eco-Logics in 2007. Eco-Logics no longer receives yard trimmings from City sources.

Incoming City Tonnages by Generator Type

In 2006, all of the yard trimmings received by Eco-Logics that originated in Los Angeles came from residential curbside collection.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	48,820	-
Self-haul	-	-	-
Transfer	-	-	-
Total Tons	**-**	**48,820**	**-**

Tip Fees

Not available.

Ultimate Disposal

All yard trimmings were mulched and distributed to growers in Ventura County.

Daily/Annual Capacity

Not available.

Expansion Plans/Opportunities

Not available.

[76] Note that the facility surveys were conducted in 2007 and 2008 and reflect the circumstances at the time of the survey. The information presented in these surveys, including tons and tip fees, was self-reported by the facility operators.

Greencycle

Overview

Greencycle is a yard trimmings processing facility located in the City of Santa Fe Springs. Tonnage data for Greencycle in 2006 were not available.

Incoming City Tonnages by Generator Type

Not available.

Tip Fees

Not available.

Ultimate Disposal

Not available.

Daily/Annual Capacity

Greencycle has a total permitted capacity of 135 tons per day, or 30,000 tons per year.

Expansion Plans/Opportunities

Not available.

Griffith Park Composting Facility

Overview

Griffith Park Compost Facility is located in the North Central wasteshed within the City of Los Angeles and is owned and operated by the City. It accepted 39,685 tons of yard trimmings and other organics from City sources in 2006. This includes 2,550 tons of biosolids from the Hyperion treatment plant, 17,213 tons of "zoo doo" from the Los Angeles Zoo, and nearly 20,000 tons of yard trimmings from the Los Angeles Department of Recreation and Parks.

Incoming City Tonnages by Generator Type

In 2006, all of the yard trimmings and organics received by Griffith Park Compost Facility that originated in Los Angeles came from City-hauled sources which are quantified under the commercial/multi-family (Hyperion biosolids), self-haul (Los Angeles Zoo), and transfer (Recreation and Park) substreams.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings/ Organics (tons)	C&D (tons)
Commercial/multi-family	-	2,550	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	17,213[77]	-
Transfer	-	19,922[78]	-
Total Tons	**-**	**39,685**	**-**

Tip Fees

Griffith Park Compost Facility does not charge a tip fee for yard trimmings and other organics.

Ultimate Disposal

All organic materials received by Griffith Park Compost Facility are composted. TOPGRO®, the final compost product, is then used in Griffith Park, thus completing the full cycle of recycling. It is also available for retail sale to Los Angeles residents for their own urban landscaping projects.

Daily/Annual Capacity

Griffith Park Compost Facility's total permitted capacity is 156 tons per day.

Expansion Plans/Opportunities

Griffith Park Compost Facility has no expansion plans.

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[77] Griffith Park Compost Facility accepted 51,000 cubic yards of "zoo doo," which was converted to tons using the FEECO's conversion factor of 675 pounds per cubic yard of manure. These tons were considered self-haul tons as the Los Angeles Zoo hauled them directly to Griffith Park Compost Facility.

[78] Griffith Park Compost Facility accepted 127,500 cubic yards of yard trimmings (converted using EPA's conversion factor of 312.5 pounds per cubic yard of leaves and grass) from the City of Los Angeles Department of Recreation and Parks. These tons are considered 'transfer' tons because they were previously processed at a grinding facility and then transported to Griffith Park Compost Facility.

Harbor Mulching Facility (San Pedro Mulching Facility)

Overview

Harbor Mulching, also known as San Pedro Mulching Facility, is located in the San Pedro neighborhood within the City of Los Angeles and is owned and operated by the City. This yard trimmings processing facility accepts up to 100 tons of yard trimmings per day, or 31,200 tons per year. Harbor Mulching received 20,521 tons of yard trimmings from City sources in 2006.

Incoming City Tonnages by Generator Type

In 2006, most of the yard trimmings received by Harbor Mulching that originated in Los Angeles were brought in through LASAN, although some were self-hauled.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	15,785	-
Self-haul	-	4,736	-
Transfer	-	-	-
Total Tons	**-**	**20,521**	**-**

Tip Fees

Harbor Mulching does not charge a tip fee for yard trimmings.

Ultimate Disposal

All organic materials received by Harbor Mulching are recycled as mulch.

Daily/Annual Capacity

Harbor Mulching has a total daily permitted capacity of 100 tons per day, or 31,200 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

Harbor Mulching has no expansion plans.

Lopez Canyon Environmental Center (Lakeview Terrace)

Overview

Lopez Canyon Environmental Center, also known as Lakeview Terrace, is located in the East Valley wasteshed within the City of Los Angeles and is owned and operated by the City. It is a yard trimmings processing facility that accepts up to 1,000 tons of yard trimmings per day, or 312,000 tons per year. Lopez Canyon received 31,301 tons of yard trimmings from City sources in 2006.

Incoming City Tonnages by Generator Type

In 2006, most of the yard trimmings received by Lopez Canyon that originated in Los Angeles were brought in through LASAN from the East Valley wasteshed.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	24,078	-
Self-haul	-	7,223	-
Transfer	-	-	-
Total Tons	**-**	**31,301**	**-**

Tip Fees

Lopez Canyon does not charge a tip fee for yard trimmings.

Ultimate Disposal

All of the materials are mulched and composted.

Daily/Annual Capacity

The facility has a total permitted capacity of 1,000 tons of yard trimmings per day, or 312,000 tons per year, assuming a six-day work week.

Expansion Plans/Opportunities

Lopez Canyon has no expansion plans or opportunities.

North Hills Recycling Inc.

Overview

North Hills Recycling Inc. is a yard trimmings processing facility located in the Granada Hills area within the City of Los Angeles. North Hills accepts up to 500 tons of yard trimmings per day, or 156,000 tons per year.

Incoming City Tonnages by Generator Type

In 2006, 40,000 tons of the yard trimmings received by North Hills that originated in Los Angeles were brought in via commercial haulers, and 40,000 tons were self-hauled.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	40,000	-
Residential curbside (LASAN)	-	-	-
Self-haul	-	40,000	-
Transfer	-	-	-
Total Tons	-	80,000	-

Tip Fees

The fees for yard trimmings range from $25 to $45 per ton.

Ultimate Disposal

All 80,000 tons of yard trimmings received from City sources were sent to Covanta biomass plant in Delano, California to be used for biomass power.

Daily/Annual Capacity

North Hills has a total daily permitted capacity of 500 tons per day, or 156,000 tons per year, assuming that the facility is open six days per week.

Expansion Plans/Opportunities

North Hills has no expansion plans or opportunities.

Norwalk Industries

Overview

Norwalk is a yard trimmings processing facility located in the City of Santa Fe Springs. Tonnage data for Norwalk in 2006 were not available.

Incoming City Tonnages by Generator Type

Not available.

Tip Fees

Not available.

Ultimate Disposal

Not available.

Daily/Annual Capacity

Norwalk's total permitted capacity is 200 tons per day, or up to 70,000 tons per year.

Expansion Plans/Opportunities

Not available.

Van Norman Chipping and Grinding Facility

Overview

Van Norman is a yard trimmings processing facility located in the Granada Hills area within the City of Los Angeles. It is owned by the City of Los Angeles Department of Water and Power and operated by the Bureau of Street Services. Van Norman received 47,734 tons of yard trimmings from City sources in 2006.

Incoming City Tonnages by Generator Type

In 2006, Van Norman received yard trimmings originating in the City of Los Angeles through LASAN and self-haul customers, which were primarily limited to the Bureau of Street Services.

Incoming Tonnages from the City of Los Angeles, 2006

Generator Type	Solid Waste (tons)	Yard Trimmings (tons)	C&D (tons)
Commercial/multi-family	-	-	-
Residential curbside (LASAN)	-	36,718	-
Self-haul	-	11,016	-
Transfer	-	-	-
Total Tons	**-**	**47,734**	**-**

Tip Fees

Van Norman does not charge a tip fee for yard trimmings.

Ultimate Disposal

All materials received by Van Norman are chipped and mulched.

Daily/Annual Capacity

Van Norman's total permitted capacity is 499 tons per day, or up to 120,000 tons per year.

Expansion Plans/Opportunities

This facility ceased operations in 2008.

Food Scrap Composting Facilities

There are 48 composting facilities in California that are permitted to accept food scraps. Twelve commercial scale facilities are located in southern California. Table 14 lists the facilities in southern California permitted to accept food scraps. These facilities (except for Community Recycling) were not surveyed for this report because they did not receive tons from City sources in 2006, but are included as they are important for future planning.

The City is evaluating new diversion programs for food scraps for both residential and commercial generators. If organics processing facilities within or nearby the City cannot be permitted to receive food scraps, these materials may need to be transported to some of the more distant composting facilities that are permitted to receive food scraps. The following table lists the facilities in southern California permitted to receive food scraps and the distance each facility is from CLARTS.

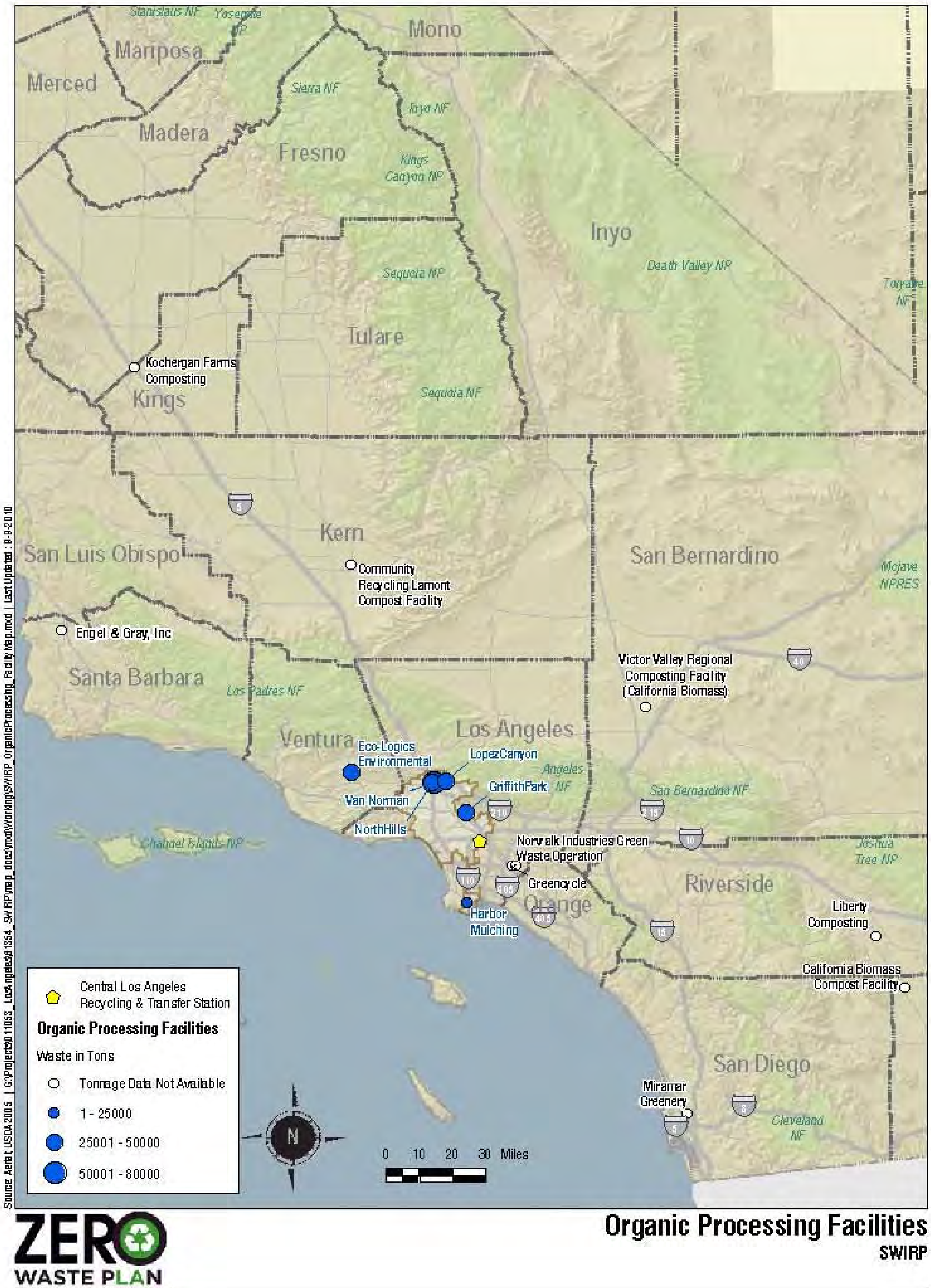
If food scraps are collected by LASAN trucks, they would need to be transferred to bigger capacity containers to be transported out of the City using the transfer station. The location of CLARTS, the composting facilities permitted to receive food scraps, and the organics processing facilities that received materials from City sources in 2006 are shown in Figure 18.

Facilities in Southern California Permitted to Accept Food Scraps

Food Scrap Composting Facilities[1]	*Location*	*Distance from CLARTS (miles one-way)*[2]	*Permitted Capacity (tons per day)*[1]
California Biomass Compost Facility	Thermal, Riverside County	137	700
Coachella Valley Composting Facility	Coachella, Riverside County	129	250
Community Recycling Lamont Compost Facility	Lamont, Kern County	97	3,692
California Biomass Victor Valley Regional Composting Facility	Victorville, San Bernardino County	92	700
Engel & Gray, Inc.	Santa Maria, Santa Barbara County	199	700[3]
El Corazon Compost Facility	Oceanside, San Diego County	83	500
Kochergan Farms Composting	Avenal, Kings County	188	1,000
Lancaster Reclaimable Anaerobic Composter	Lancaster, Los Angeles County	69	500
Liberty Composting (San Joaquin Composting)	Lost Hills, Kern County	160	2,620[4]
Miramar Greenery	San Diego, San Diego County	112	690
Ralphs Renewable Energy Facility	Compton, Los Angeles County	16	350
Tierra Verde Industries EcoCentre	Irvine, Orange County	40	3,000

[1]Source: CalRecycle Solid Waste Information System database (accessed March 25, 2013).
[2]Estimated using Google Maps.
[3]Based on permitted capacity of 208,800 tons per year (300 operating days per year).
[4]Based on permitted capacity of 786,000 tons per year (300 operating days per year).

Figure 18: Organics Processing Facilities that Received Materials from City Sources in 2006 and Southern California Composting Facilities Permitted to Receive Food Scraps



Attachment C-6: Electronics Processing Facilities[79]

Electronics Recyclers of America (ERA)

Overview

Electronics Recyclers of America (ERA) reported accepting 1,707 tons of electronics from City residents and businesses in 2007.

Incoming City Tonnages by Central Collection Site

The table below breaks out ERA tonnages by central collection site.

Central Collection Site	2007 Received Electronics (tons)	Percentage
West Valley Yard	115	7
East Valley Yard	123	7
Western Yard	41	2
Bureau of Street Services	13	1
Cal State Northridge	70	4
Canoga Park	37	2
Central LA Transfer Station	9	1
Department of General Services	119	7
Gaffey S.A.F.E. Center	110	6
Hubert Humphrey Event	8	0
Hyperion S.A.F.E. Center	156	9
Los Angeles Valley College	36	2
North Central Yard	79	5
Pierce College	51	3
Randall S.A.F.E. Center	199	12
Rodeo Place Event	14	1
Harbor Yard	151	9
South LA Yard	45	3
Southwest Yard	1	0
UCLA S.A.F.E. Center	82	5
Universal Studios Event	21	1
Washington S.A.F.E. Center	84	5
LA Glendale S.A.F.E. Center	143	8
Total	**1,707**	**100**

[79] Note that the facility surveys were conducted in 2007 and 2008 and reflect the circumstances at the time of the survey. The information presented in these surveys, including tons and tip fees, was self-reported by the facility operators.

Prices

Because of Senate Bill 20, the Electronic Waste Recycling Act of 2003 (which provides a funding mechanism for certain types of electronic waste), ERA does not charge for recycling monitors or cathode ray tubes (CRTs).

Origin by Wasteshed

ERA provided tons by central collection site.

Types of Materials Processed

ERA accepts all electronic devices and components.

End Markets

About 1,640 tons of the electronics ERA processed were sent to recycling markets, including the glass from monitors and CRTs, metals, and plastic components. All wood waste is sent to hog fuel markets. For the electronics processed, this facility reported an overall rate of four percent residual waste (which was sent to solid waste landfills). Residual waste includes electronic waste components that cannot be recycled and must be disposed, including composite materials (materials of different types fused or glued together) and treated wood.

Expansion Plans/Opportunities

Though ERA reported no expansion plans, the company could add nearly 108,000 tons per year at the existing facility location by adding more sophisticated processing equipment, including conveyor systems, shredders, and screening and granulating machines.

E-Recycling of California

Overview

E-Recycling of California (ERC) reported accepting 76.1 tons of electronics from City residents and businesses in 2007.

Incoming City Tonnages by Central Collection Site

The table below breaks out ERC tonnages by central collection site.

Central Collection Site	2007 Received Electronics (tons)	Percentage
UCLA S.A.F.E. Center	75	99
Stephen S. Wise Collection Event	1.1	1
Total	**76.1**	**100**

Prices

ERC rebates LASAN for Covered Electronic Waste that qualifies under the requirements of Senate Bill 20, the Electronic Waste Recycling Act of 2003.

Origin by Wasteshed

ERC provided tons by central collection site.

Types of Materials Processed

ERC accepts all electronic devices and components.

End Markets

Of the 76.1 tons of electronics recycled on behalf of the City, 98.9 percent were diverted from landfill to commodities markets including glass-to-glass, metals, plastics, circuit boards, and wiring. The resulting residual wood by-product is also recycled at ERC's green waste operation where it is manufactured for lined landfill ground cover.

Expansion Plans/Opportunities

ERC has the capacity to receive 83 to 85 tons per day at its Paramount facility, and has the ability to increase capacity if market conditions require more processing capability. In order to diversify its services, ERC is also opening a new facility in Orange County in 2010 and its operations can be expanded to serve market needs.

IMS Electronics Recycling

Overview

IMS Electronics Recycling reported accepting 49 tons of electronics, primarily from City residents in 2007.

Prices

IMS does not have information on prices for this report.

Origin by Wasteshed

IMS does not have information on the origin of electronics for this report.

Types of Materials Processed

IMS accepts all electronic devices and components.

End Markets

About 47 of the 49 tons of the electronics IMS processed were sent to recycling markets, including the glass from monitors and CRTs, metals, and plastic components. All wood waste is sent to hog fuel markets. For the electronics processed, this facility reported an overall rate of 3.5 percent residual waste (which was sent to solid waste landfills). Residual waste includes electronic waste components that cannot be recycled and must be disposed, including composite materials (materials of different types fused or glued together) and treated wood.

Expansion Plans/Opportunities

Though IMS reported no expansion plans, the company could add nearly 21,000 tons per year of processing at the existing facility.

Attachment C-7: Solid Waste Facility Survey Forms 2006

City of Los Angeles Zero Waste Plan:

Survey of Solid Waste Facility Operators[80]

Basic information

Name of facility:
Address:
Contact person:
Phone:

Description of services and activities at the facility:

(Please check all that apply for material received in **2006 from within the City of Los Angeles**)

MSW Disposal:

__ Transfer station that receives MSW from the City and sends material to disposal
__ Landfill that receives MSW for disposal
__ Other facility that receives MSW for disposal

Organics:

__ Organics composting facility
__ Organics facility that does processing other than composting

MSW Recycling:

__ Facility that recovers non-C&D recyclables.
__ Facility receives loads of commingled or single-stream recyclables
__ Facility receives loads of source-separated or dual-stream recyclables
__ Facility recovers recyclables from mixed MSW
__ Facility that offers recycling drop-off or buy-back services

C&D Disposal:

__ Transfer station that receives C&D loads and sends material to disposal
__ Landfill that receives C&D loads for disposal
__ Facility that recovers C&D recyclables from C&D loads

[80] This is the survey form used to conduct the facility surveys. The surveys were conducted in 2007 and 2008 for calendar year 2006.

Materials received

Please indicate the tons of each type of material received in **2006 from within the City of Los Angeles**. Tons should reflect the weight of incoming material prior to any recovery or diversion steps that are applied at your facility.

Origin:	Material type			
	MSW	**Organics**	**Recyclables (or MSW to be processed in a MRF)**	**C&D (or C&D to be processed in a MRF)**
Residential MSW				
Commercial & multifamily waste MSW				
Commercially hauled C&D				
Self-haul				
Totals				

Please indicate tip fees at your facility for the following:

MSW: $___________ / ton　　Recyclables: $___________ / ton

C&D: $___________ / ton　　Organics: $___________ / ton

<u>Origin by District</u>

Please estimate the portion of organics, recyclables, and C&D from each of the **Los Angeles districts**.

	MSW	Recyclables	Organics	C&D
West Valley				
East Valley				
West L.A.				
North Central L.A.				
South L.A.				
Harbor				

<u>For MSW</u> that was sent to disposal in **2006 from within the City of Los Angeles**, please indicate:

Total 2006 tons sent to landfills: ____________

List the landfills and tons for each:

1) _________________ landfill　___________ tons
2) _________________ landfill　___________ tons
3) _________________ landfill　___________ tons
4) _________________ landfill　___________ tons
5) _________________ landfill　___________ tons

<u>For C&D material or C&D MRF residuals</u> that were sent to disposal in **2006 from within the City of Los Angeles**, please indicate:

Total 2006 tons sent to landfills: ____________

List the landfills and tons for each:

1) _________________ landfill ___________ tons
2) _________________ landfill ___________ tons
3) _________________ landfill ___________ tons
4) _________________ landfill ___________ tons
5) _________________ landfill ___________ tons

Total 2006 tons sent to other destinations: ______________ (Please explain below.)

<u>For Residuals from MSW recycling or organics</u> processing operations that were sent to disposal in **2006 from within the City of Los Angeles**, please indicate.

Total 2006 tons sent to landfills: ____________

List the landfills and tons for each:

1) ______________ landfill ___________ tons
2) ______________ landfill ___________ tons
3) ______________ landfill ___________ tons
4) ______________ landfill ___________ tons
5) ______________ landfill ___________ tons

Total 2006 tons sent to other destinations: ______________ (Please explain below.)

Other information

Capacity

What is the facility's permitted capacity for receiving MSW?
_______________ tons/day

What is the facility's permitted capacity for receiving mixed C&D waste?
_______________ tons/day

What is the facility's permitted capacity for receiving recyclables?
_______________ tons/day

What is the facility's permitted capacity for receiving organics?
_______________ tons/day

Is it possible to expand the facility? ____________________

Are there plans to expand the facility? _______________________

If so, what is the status and how much capacity will be added? Please explain below.

Attachment C-8: Recycling, Green/Organic Waste Materials, and C&D Materials Facility Survey Forms 2007

City of Los Angeles Zero Waste Plan:

Survey of Recycling and C&D Processors[81]

Basic Information:

Name of facility:

Address:

Contact person:

Phone:

Email:

Description of Facility:

(Please check all that apply for material received in **2007 from within the City of Los Angeles**)

Recycling MRFs:

__ Facility that receives loads of source-separated recyclables from businesses and institutions

__ Facility that receives loads of mixed recyclables from businesses and institutions

__ Facility that receives loads of "blue bin" materials collected from residential curbside customers by LASAN

Green/Organic Waste Processors:

__ Facility that chips and grinds green/organic waste from businesses and institutions

__ Facility that composts green/organic waste from businesses and institutions

__ Facility that processes green/organic waste from businesses and institutions with methods other than composting

C&D Recyclables Processors:

__ Facility that recovers C&D recyclables from business and institutional loads

[81] This is the survey form used to conduct the facility surveys. The surveys were conducted in 2008 for calendar year 2007.

Materials Received and Fees:

Please indicate the tons of each type of material received in **2007 from within the City of Los Angeles**. Tons should reflect the weight of incoming material prior to any recovery or diversion process that occurs at your facility.

Hauler / origin	Material type (2007 tons)		
	Recyclables	Green/Organic Waste	C&D Recyclables
Commercially-hauled from businesses and institutions			
Self-hauled from businesses and institutions			
LASAN hauled from residential curbside customers		N/A	
Totals			

Please check materials that your facility receives, and indicate ***tip fees*** or ***(payment)*** at your facility for these materials:

Please √	Recyclables	$ / ton charged or (paid)
	LASAN "blue bin" recyclables	
	Uncoated corrugated cardboard	
	Newspaper	
	Mixed waste paper	
	Other paper	
	Glass	
	Tin/steel cans	
	Aluminum cans	

Please √	**Recyclables**	**$ / ton charged or (paid)**
	Appliances	
	Other ferrous metal	
	Other non-ferrous metal	
	HDPE plastic	
	PET plastic	
	#3-#7 plastic	
	Plastic film	
	Mixed/commingled recyclables	
	Electronics and televisions	
	Motor oil	
	Paint	
	Batteries	
	Textiles	
	Other materials (please list):	

Please √	Green/Organic Waste	$ / ton charged or (paid)
	Food	
	Green waste	
	Other materials (please list):	

Please √	C&D Recyclables	$ / ton charged or (paid)
	Lumber and engineered wood	
	Concrete	
	Asphalt paving	
	Asphalt roofing	
	Gypsum board	
	Rock, gravel and soil	
	Other materials (please list):	

Origin by Wasteshed:

If available, please estimate the percentage of recyclables, green/organic waste, and C&D recyclables from each of the **Los Angeles wastesheds**.

	Recyclables	Green/Organic Waste	C&D Recyclables
West Valley			
East Valley			
West LA			
North Central LA			
South LA			
Harbor			

End Market Destinations, by Material:

Please indicate the tons of each material **from within the City of Los Angeles** that were sent to each indicated destination **in 2007**.

Material	Recycling markets	Composting	Alternative daily cover (ADC)	Fuel / energy	Other destinations	Please specify "other destinations" below
Uncoated corrugated cardboard						
Newspaper						
Mixed waste paper						
Other paper						
Glass						
Tin/steel cans						
Aluminum cans						
Appliances						
Other ferrous metal						
Other non-ferrous metal						
HDPE plastic						
PET plastic						
#3-#7 plastic						
Plastic film						
Food						
Green waste						
Textiles						
Lumber and engineered wood						
Concrete						
Asphalt paving						
Asphalt roofing						
Gypsum board						
Rock, gravel and soil						
Electronics and televisions						
Motor oil						
Paint						
Batteries						
Other materials (please list):						

Disposal Destinations, Residual Waste:

Please indicate the total tons of residual waste **from City of Los Angeles recyclable loads** that were sent to disposal destinations **in 2007**.

	Material type (2007 tons)		
Type of Processor	**Tons disposed at Landfills**	**Tons disposed at other disposal facility**	**Specify "other disposal facility" below**
Recyclables MRF/Processor			
Green/Organic Waste Processor			
C&D Recyclables Processor			
Totals			

Capacity:

1. What is the facility's capacity for receiving recyclables?

_______________ tons/day

a. Source separated

_______________ tons/day

b. Mixed

_______________ tons/day

2. What is the facility's capacity for receiving green/organic waste?

_______________ tons/day

a. Source separated

_______________ tons/day

b. Mixed

_______________ tons/day

3. What is the facility's capacity for receiving C&D recyclables?

_______________ tons/day

a. Source separated

_______________ tons/day

b. Mixed

_______________ tons/day

4. Is it possible to expand the facility? ____________________

5. Are there plans to expand the facility? ________________________

a. If so, what is the status and how much capacity will be added? Please explain below.

b. What are the “drivers” for this expansion? Please explain below.

c. What are the barriers to future expansion? Please explain below.

6. If more recyclable materials were available from the City of Los Angeles Zero Waste program, would you be: a) willing, and b) able to process them? Please explain below.

7. If you are not able or willing to process recyclable materials from the City of Los Angeles Zero Waste program, under which conditions would you be: a) willing, or b) able to process additional materials? Please explain below.

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Attachment C-9: Household Hazardous Waste Program Information and Electronics Facility Survey Form

City of Los Angeles Household Hazardous Waste Program Information

Source: Lead Agency Form CalRecycle 303a Household Hazardous Waste Collection Information for FY 2006-2007

Material Type		Tons Collected by Program Type			
		Permanent Facility	Mobile Facility	Curbside Program* (other than oil)	Total Weight Collected (in tons)
1. Flammable and Poison					
	Flammable solids / liquids	0.88	0.40	-	1.28
	Bulked flammable liquids	0.55	-	-	0.55
	Oil - base paints	518.68	129.88	-	648.55
	Poisons	108.25	20.73	-	128.98
	Reactive and explosive	0.01	0.02	-	0.04
2. Acid					
	Inorganic and organic acid	23.10	3.51	-	26.61
3. Base					
	Inorganic and organic base	50.23	7.01	-	57.25
4. Oxidizer					
	Neutral oxidizers, Organic peroxides, Oxidizing acid, and Oxidizing base	5.41	2.44	-	7.85
5. PCB -containing					
Polychlorinated biphenyls	PCB - containing paint	-	-	-	-
	Other PCB waste (includes ballasts)	0.88	0.18	-	1.06
6. Reclaimable					
	Antifreeze	21.21	4.35	-	25.56
	Auto type batteries (motor vehicles)	43.38	30.40	-	73.78
	Latex paint	445.48	72.43	-	517.90
	Motor oil/oil products	98.60	29.54	-	128.14
	Used oil filters (recyclables only)	3.27	1.25	-	4.52

City of Los Angeles Household Hazardous Waste Program Information (cont.)					
Material Type		Tons Collected by Program Type			
		Permanent Facility	Mobile Facility	Curbside Program* (other than oil)	Total Weight Collected (in tons)
7. Asbestos					
	Asbestos	6.13	0.01	-	6.13
8. Universal Waste (UW)**					
	Mercury containing thermostats / automatic switches / thermometers / and novelties	0.61	0.06	-	0.67
	Mercury containing waste (other)	0.24	0.04	-	0.28
	Lamps	3.75	1.40	-	5.15
	Rechargeable batteries	1.58	0.65	-	2.23
	Other batteries	29.53	7.02	-	36.56
Electronic Waste (UW)					
	Covered Electronic Devices	511.18	78.50	490.20	1,079.87
	Universal Waste Electronic Devices	346.33	86.28	86.04	518.65
Aerosol Containers (UW)					
	Aerosol containers	-	-	-	-
9. Other HHW					
	Home - generated sharps	1.61	1.25	-	2.86
	Pharmaceutical Waste	1.72	1.25	-	2.97
	Compressed gas cylinders	26.57	6.57	-	33.14
	Treated wood	0.83	-	-	0.83
	Non - UW aerosol containers (corrosive, flammable, poison)	53.17	9.10	-	62.27
	Other (name) __________	169.09	30.09	-	199.17
10. Grand Total		2,472.22	524.32	576.24	3,572.79

*Electronics are collected by City crews on an on-call basis.
**Universal wastes must be recycled with the exception of batteries, novelty items with mercury, mercury thermostats, rubber flooring, Covered Electronic Devises, and aerosol cans (non-empty). Energy recovery or fuel incineration is not considered recycling. If the waste cannot be managed by recycling, then it must be managed as a hazardous waste.
Source: Lead Agency Form CalRecycle 303a Household Hazardous Waste Collection Information For FY 2006-2007.
Universal wastes are regulated through the US EPA
http://www.epa.gov/wastes/hazard/wastetypes/universal/index.htm (accessed March 29, 2010)

City of Los Angeles Household Hazardous Waste Program Information (cont.)									
Material Type		Tons Disposed / Diverted by Management Method***							
		Destructive Incineration	Fuel Incineration	Landfill	Neutralization / Treatment	Recycled	Reused	Stabiliz-ation	Total Pounds Disposed / Diverted
1. Flammable and Poison									
	Flammable solids / liquids	0.78	0.50	-	-	-	-	-	1.28
	Bulked flammable liquids	0.45	0.10	-	-	-	-	-	0.55
	Oil - base paints	628.08	20.48	-	-	-	-	-	648.55
	Poisons	127.48	1.50	-	-	-	-	-	128.98
	Reactive and explosive	0.04	-	-	-	-	-	-	0.04
2. Acid									
	Inorganic and organic acid	7.92	-	-	18.69	-	-	-	26.61
3. Base									
	Inorganic and organic base	-	-	-	44.12	-	13.13	-	57.25
4. Oxidizer									
	Neutral oxidizers, Organic peroxides, Oxidizing acid, and Oxidizing base	1.15	-	-	6.70	-	-	-	7.85
5. PCB -containing									
	PCB - containing paint	-	-	-	-	-	-	-	-
	Other PCB waste (includes ballasts)	0.53	-	0.40	-	0.13	-	-	1.06
6. Reclaimable									
	Antifreeze	2.72	-	-	-	22.84	-	-	25.56
	Auto type batteries (motor vehicles)	-	-	-	-	73.78	-	-	73.78
	Latex paint	-	-	3.90	-	514.00	-	-	517.90
	Motor oil/oil products	-	-	-	-	128.14	-	-	128.14
	Used oil filters (recyclables only)	-	-	-	-	4.52	-	-	4.52
7. Asbestos									
	Asbestos	-	5.31	-	-	0.83	-	-	6.13
8. Universal Waste (UW)									
	Mercury containing thermostats / automatic switches / thermometers / and novelties	-	-	-	-	0.67	-	-	0.67

City of Los Angeles Household Hazardous Waste Program Information (cont.)									
Material Type		Tons Disposed / Diverted by Management Method***							
		Destructive Incineration	Fuel Incineration	Landfill	Neutralization / Treatment	Recycled	Reused	Stabiliz-ation	Total Pounds Disposed / Diverted
8. Universal Waste (UW) Continued									
	Mercury containing waste (other)	-	-	-	-	0.28	-	-	0.28
	Lamps	-	-	0.15	-	5.00	-	-	5.15
	Rechargeable batteries	0.03	-	-	-	2.20	-	-	2.23
	Other batteries	0.26	31.99	-	-	4.30	-	-	36.56
Electronic Waste (UW)									
	Covered Electronic Devices	-	-	-	-	1,079.87	-	-	1,079.87
	Universal Waste Electronic Devices	-	-	-	-	518.65	-	-	518.65
Aerosol Containers (UW)									
	Aerosol containers	-	-	-	-	-	-	-	-
9. Other HHW									
	Home - generated sharps	2.86	-	-	-	-	-	-	2.86
	Pharmaceutical Waste	2.97	-	-	-	-	-	-	2.97
	Compressed gas cylinders	13.03	-	-	-	20.11	-	-	33.14
	Treated wood	0.43	-	0.40	-	-	-	-	0.83
	Non - UW aerosol containers (corrosive, flammable, poison)	19.07	41.79	-	1.40	-	-	-	62.27
	Other (name)__________	5.10	2.23	38.52	-	0.03	-	153.29	199.17
10. Grand Total		812.87	103.90	43.37	70.91	2,375.32	13.13	153.29	3,572.79

***The completed Disposed/Diverted Management Methods section indicates whether the universal waste types were managed as a universal waste or a hazardous waste. If they were recycled, they are considered universal waste. If they were incinerated or disposed, they were considered a hazardous waste.

Destructive Incineration - means the materials were destoyed in a hazardous waste incinerator.

Fuel Incineration – means the materials were combusted and used as a fuel.

Landfill – means the materials were disposed in a hazardous waste landfill

Neutralization/Treatment – means the materials were treated so that they were no longer considered hazardous.

Recycled – means the materials were processed into new products.

Reused – means the materials were reused in their current forms.

Stabilization – means the mateirals were treated so that they could be safely disposed.

City of Los Angeles Zero Waste Plan
Survey of E-Waste Processors[82]

Basic Information:

Name of facility:

Address:

Contact person:

Phone:

Email:

Materials Received & Fees:

Please indicate the tons of e-waste received in **2007 from within the City of Los Angeles**, by hauler and origin. Tons should reflect the weight of incoming material prior to any recovery or diversion process that occurs at your facility.

Hauler	Origin/Source	2007 tons
Totals		

[82] This is the survey form used to conduct the facility surveys. The surveys were conducted in 2008 for calendar year 2007.

Origin by Wasteshed:

If available, please estimate the portion of e-waste from each of the **Los Angeles wastesheds**.

Wasteshed	E-waste
West Valley	
East Valley	
West L.A.	
North Central L.A.	
South L.A.	
Harbor	

Please indicate ***tip fees*** or ***(payment)*** at your facility for each item received:

Item	$ / ton charged or (paid)

End Market Destinations, by Item:

For each item recycled, please indicate the tons **from within the City of Los Angeles** that were sent to each destination **in 2007**.

Item recycled	Recycling markets	Other destinations	Please specify "other destinations" below

Disposal Destinations, Residual Waste:

Please indicate the total tons of residual waste **from City of Los Angeles recyclable loads** that were sent to disposal destinations **in 2007**.

	2007 Tons Disposed		
Disposal Destination	**Tons disposed at Landfills**	**Tons disposed at other disposal facility**	**Specify "other disposal facility" below**
Landfill			
Other disposal facility (please specify below):			
Totals			

Capacity:

1. What is the facility's capacity for receiving e-waste?

_______________ tons/day

2. Is it possible to expand the facility? ____________________

3. Are there plans to expand the facility? _______________________

a. If so, what is the status and how much capacity will be added? Please explain below.

b. What are the "drivers" for this expansion? Please explain below.

c. What are the barriers to future expansion? Please explain below.

6. If more e-waste were available from the City of Los Angeles Zero Waste program, would you be: a) willing, and b) able to process them? Please explain below.

7. If you are not able or willing to process e-waste from the City of Los Angeles Zero Waste program, under which conditions would you be: a) willing, or b) able to process additional materials? Please explain below.

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Appendix D

Facility Analysis

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Section 1 Facility Assessment

1.1 Introduction

As part of a comprehensive strategy to meet the long-term goals of the City of Los Angeles (City), this report describes the approach and methods used to arrive at the number and types of facilities required for managing solid waste,[1] residual waste, recyclable and compostable materials, and construction and demolition debris.

The City generated about 10 million tons of solid waste, recyclable and compostable materials, and construction and demolition materials in 2010, and is expected to generate about 11 million tons in 2030.[2]

In order to meet the goals of the *Solid Waste Integrated Resources Plan* (SWIRP) as well as manage the volume of waste generated within the City through 2030, new programs and facilities will be needed. *Appendix A Policy and Program Analysis* analyzes different policies and programs the City could implement to reduce waste and increase recycling. These policies and programs are intended to reduce waste generation at households and businesses and increase the recovery of materials.

This report, *Appendix D Facility Analysis*, analyzes facilities or combinations of facilities that could be used to both process source-separated materials generated through new policies and programs implemented by the City, and manage waste that remains after recycling and composting. There are many different types of facilities that can be used to handle different waste streams, each targeting ways to recover more materials and/or convert the residual waste into energy, alternative fuels and/or useful by-products.

1.2 Facility Assessment Process

In this report, the waste stream is divided into four main categories:

- **Blue Bin** – Includes all source-separated recyclable materials (from residential, commercial, and self-haul sources)
- **Green Bin** – Includes all source-separated organics -- yard trimmings, food scraps, and compostable paper (from residential, commercial, and self-haul sources)
- **Black Bin** – Includes all residual waste collected (from residential, commercial, and self-haul sources) and residual waste from processing facilities
- **Construction and Demolition (C&D)** – Includes all C&D materials generated at C&D sites

[1] "Solid waste" is generally used to refer to materials that have not been segregated for reuse, recycling or composting. "Residual waste" is generally used to refer to materials that are left over after being separated from other reusable, recyclable or compostable materials (either through source-separation by a generator or through processing at a material recovery facility).
[2] *Appendix B Material Flow Model and Generation Projections* page B-20, Table 10.

The first three categories are based on the City of Los Angeles Bureau of Sanitation (LASAN) residential collection program in which materials are collected in three separate bins.[3] These terms can be used generically to describe the streams of materials flowing from commercial as well as residential generators in the City to processing and disposal facilities. The blue bin handles source separated recyclable material, such as: newspaper, mixed paper, cardboard, glass containers, plastics, and metals. The green bin handles yard trimmings, including grass clippings, tree trimmings, and other plant debris from yard maintenance. The black bin handles residual waste that is not placed in the other bins.

This source-separated collection system is a result of past policies and programs that govern the collection, transportation, and processing of materials in the City. The new policies and programs are designed to increase recycling by the generators. The specific collection system would be designed for each generator type. The fourth category, C&D materials, refers to debris which is generally collected in roll-off bins at construction sites or self-hauled by contractors or generators, and contains any material types associated with construction, demolition, renovation, and remodeling projects that take place throughout the City.

Based on the results of the policy and program analysis, the diversion potential of the policies and programs on the waste stream were determined using the material flow model described in *Appendix B Material Flow Model and Generation Projections*. Appropriate types of processing facilities were considered for each of the material streams[4] resulting from the new diversion programs. The facilities considered have several purposes: to process and extract readily recyclable material, prepare residual black bin waste for processing, convert residual waste to energy or other marketable by-products, and to otherwise prepare and consolidate materials for more efficient transportation and delivery to appropriate markets/end users. The following types of facilities for processing the various material streams and waste streams were evaluated:

- Landfills
- Mixed Material Processing (MPP)
- Clean Material Recovery Facility (Clean MRF)
- Aerobic Composting
- Mulching
- Alternative Technology:[5] Advanced Thermal Recycling (ATR)
- Alternative Technology: Thermal (gasification, pyrolysis, plasma arc gasification) (ATT)

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[3] Residents in the City may also subscribe to a fourth bin, a brown bin for horse manure.

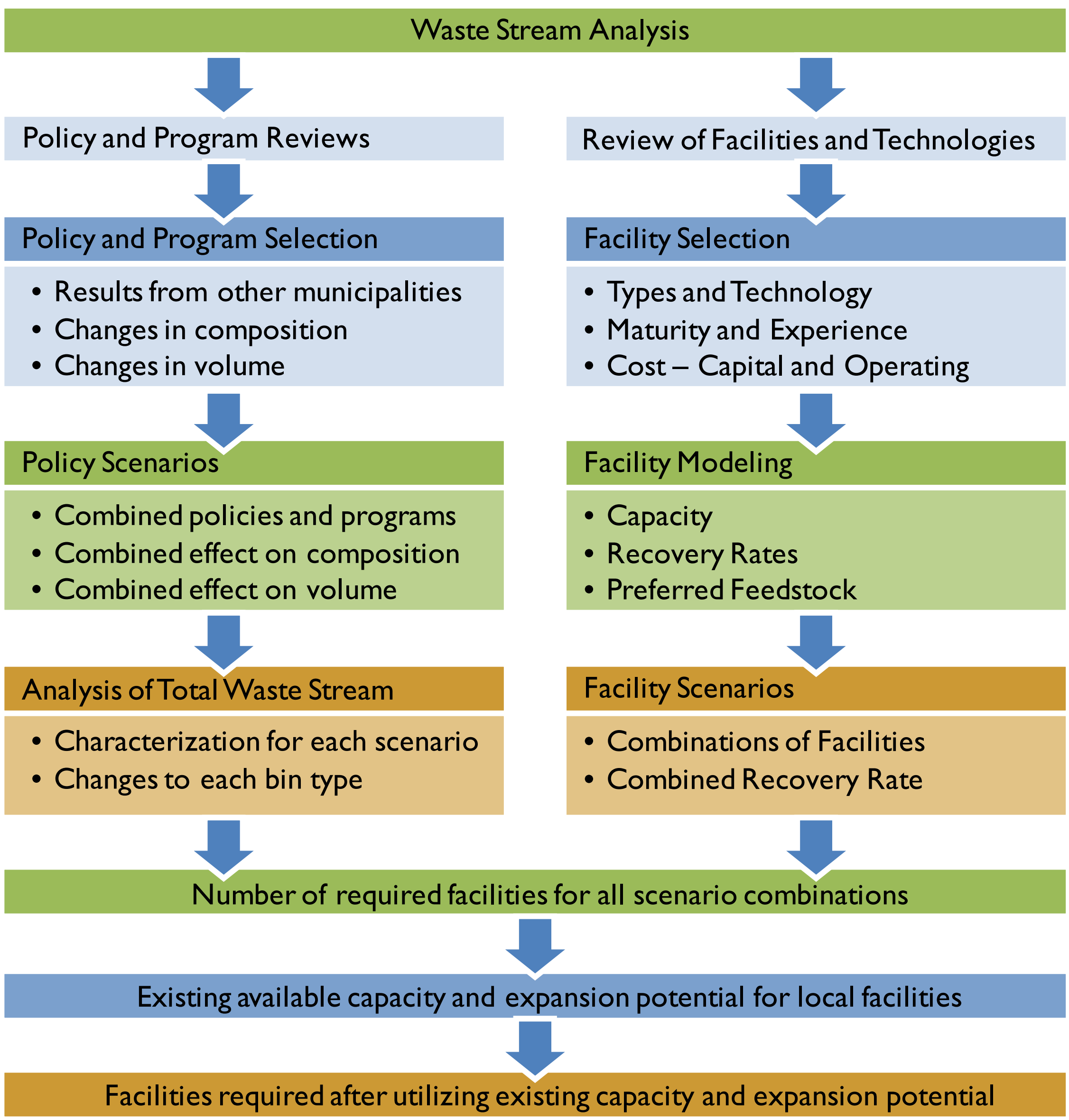
[4] "Material stream" is generally used to refer to materials that have been segregated from residual waste for recycling. "Waste stream" is generally used to refer to materials that have not been segregated for reuse, recycling and composting.

[5] The term "Alternative Technology" is all-inclusive. A subset of these black bin processing facility types is called "conversion technology"; the term used by CalRecycle to describe new and emerging non-combustion thermal, chemical, and biological technologies. Anaerobic digestion, which is sometimes included in the list of "conversion technologies," is regulated as composting under State law.

- Alternative Technology: Biological (anaerobic digestion) (ATB)
- C&D Processing

The material flow model details the tons of materials from generator sources, the tons and types of materials created by each generator source, and the method used to collect the materials. After determining tons and composition of the material streams, a two-step approach to determine the facility requirements was performed, and is illustrated in the Facility Assessment Flow Chart.

Facility Assessment Plan



Two paths are shown, which illustrate the required information for both the policy and program changes and the facility requirements to promote waste reduction and recycling. Based on stakeholder input obtained in Phase 1 of the SWIRP planning process, a set of policies and programs to be implemented by the City was identified.[6] These policies and programs were combined in five different scenarios, including the baseline scenario (which assumes no new policy or program changes), so the combined impact of various groupings of policies and programs could be analyzed.[7] Using the diversion potential associated with each policy or program as inputs to the material flow model, the total diversion associated with each of the scenarios was determined, as well as the tons and material types associated with each of the three material streams (blue bin, green bin, and black bin).

Simultaneously, different facilities and technologies which could handle residual waste were reviewed (refer to list on page D-2), and certain facilities and technologies were selected for their application to different material streams. The performance of these facilities and the desired feedstock for each black bin processing technology was then determined. These facilities were then combined based on different scenarios (e.g., mixed material processing followed by different alternative technologies) to determine their collective effects on the material stream.

Once the material stream was determined and the facilities were selected, they were combined to determine the total recovery rate and number of facilities that would be required, assuming a full build out. These facility requirements are called the "Projected Demand" (i.e., the facilities that would be needed if all materials were to be processed in the system not considering the capacity of existing blue bin, green bin, and black bin facilities). An assessment of the capacity of existing facilities was then performed to determine the gap between the existing solid waste infrastructure and the facilities needed to meet the goals of the SWIRP plan (Projected Demand). This assessment is referred to as the "Gap Analysis." The Gap Analysis was combined with the Projected Demand to determine the actual number of facilities that would be required.

1.3 Waste Characterization

A detailed profile of the City's waste stream was prepared using historic waste stream data. A model was developed to evaluate the impacts of different policies and programs in the first step. Because these policies and programs will alter the waste stream characteristics, the model was used to estimate the changes to the materials that would be placed in different collection bins and subsequently delivered to the various facilities. This information became the baseline data used to evaluate the types and numbers of facilities required for each scenario.

The City's disposed waste stream was divided into 41 types of waste, which were grouped into eight categories.[8] The eight categories of waste are: paper, glass, metal, electronics & appliances, plastic,

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[6] These policies and programs are described in detail in *Appendix A Policy and Program Analysis,* beginning on page A-3.
[7] The policy and program scenarios are described in the *Phase 2 Policy, Program, and Facility Plan*, beginning on page 31.
[8] Based on CalRecycle definitions included in http://www.calrecycle.ca.gov/Wastechar/MatCategory.htm (accessed October 1, 2013)

organics, C&D, and special waste. The paper category contains cardboard and paper bags, newspaper, mixed paper, compostable paper (such as paper towels and food-soiled paper packaging), and remainder/composite (R/C) paper. The glass category contains container glass, flat glass, and R/C glass. The metal category contains tin/steel cans, other ferrous, aluminum cans, other non-ferrous, and R/C metal. The electronics & appliances category contains electronics and major appliances. The plastic category contains #1 plastic containers, #2 plastic containers, other plastic containers (#3-7), expanded polystyrene, recyclable film, mixed plastic reusable/recyclable, and mixed plastic that is non-reusable/non-recyclable. The organics category contains food, yard trimmings, manures, textiles, and R/C organics. The C&D category contains concrete, asphalt paving, asphalt roofing, lumber, gypsum board, rock/soil/fines, and R/C C&D. The special waste category contains household hazardous waste (HHW), ash, sewage solids (including biosolids), bulky items, tires, R/C special, and mixed residue (material that cannot be further sorted and categorized). Though it is illegal to throw some special waste (including batteries) in the trash, small quantities of prohibited material continue to enter the waste stream.

As described in *Appendix A Policy and Program Analysis*, over 20 policies and programs were evaluated under five policy and program scenarios.

- Scenario 1 was the 2010 baseline case, which examined the waste stream if no new policies or programs were implemented.
- Scenario 2 included the following policies and programs:
  - Modify residential rate structure
  - Expand the Recycling Ambassador program (education and technical assistance)
  - Multi-family recycling (require all buildings to have service)
  - Multi-family green bin (phase in as appropriate)
  - Bulky item reuse and recycling
  - Add textiles to blue bin or partner with local non-governmental organizations
  - Add food scraps to green bin
  - Large scale media/social marketing/education
  - Require all commercial haulers to provide recycling services to their customers
  - Require all businesses to have recycling services
  - Provide more public area recycling (streets and parks)
  - Require all C&D loads to be processed
- Scenario 3 added the following requirements to Scenario 2:
  - Mandatory recycling separation
  - Mandatory organics separation
  - Ordinance requiring resource recovery centers at transfer stations
  - Increase diversion requirements at C&D facilities
  - Increased code enforcement

- Scenario 4 adds "extended producer responsibility" (EPR) for toxics and difficult to recycle materials, a single use bag ban, and State packaging legislation, including Blue Dot/Green Dot legislation,[9] to the policies and programs of Scenario 2.
- Scenario 5 adds EPR for toxics and difficult to recycle materials, a single use bag ban, and advocacy for State packaging legislation to the policies and programs of Scenario 3.

Research was performed and data was collected about similar programs in other communities to evaluate the impact and effectiveness that each program or policy would potentially have on the City's waste stream. Using this data, the waste flow model was created to estimate diversion using both expected participation rates and expected efficiency rates. As described in *Appendix B Material Flow Model and Generation Projections*, this model estimates both the change in total tons of discarded materials and the composition of the material that is discarded. Using the diversion assumptions developed for the model, the diversion rates by policy and program were estimated. The results of the policy and program analysis are included in **Attachment D-1: Waste Stream Analysis**. Table 1 summarizes the results from Attachment D-1 and provides the estimated disposed and diverted tons by policy and program scenario. Table 1 summarizes these results using baseline tonnages for 2010. The model can also estimate tons by generator type, by wasteshed, and by material type for each year through 2030.

Table 1: Projected Diversion Potential by Scenario

Scenario	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1 No New Policies or Programs (2010 Baseline)	3,121,937	7,978,008	72%
Scenario 2 New Policies and Programs	2,317,771	8,782,174	79%
Scenario 3 Add Mandatory Requirements to Scenario 2	1,620,029	9,479,916	85%
Scenario 4 Add Upstream Policies to Scenario 2	2,201,847	8,898,098	80%
Scenario 5 Add Upstream Policies to Scenario 3 (Full Implementation of SWIRP)	1,547,799	9,552,146	86%

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January, 2013. Refer to Attachment D-1.

To conduct the facility analysis and determine the number and types of facilities that will be needed in the future, the model was used to estimate black bin, green bin, and blue bin tons, by policy and program

[9] "Blue Dot/Green Dot" legislation would require all products and packaging to be labeled as recyclable or compostable.

scenario, in 2030. Tables 2, 3, and 4 summarize the total amount of materials estimated for each bin type by scenario and by wasteshed in 2030, as projected by the material flow model.

Table 2: Projected Annual Tons of Black Bin Materials in 2030

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
East Valley	580,440	435,163	308,689	413,197	293,877
Harbor	147,682	110,361	78,337	104,806	74,628
North Central	839,041	639,689	441,766	605,767	423,905
South LA	479,533	360,708	255,732	342,056	243,011
West Valley	576,870	430,145	304,171	409,500	290,552
Western	419,630	307,688	214,861	292,504	205,353
Overall	**3,043,196**	**2,283,754**	**1,603,556**	**2,167,830**	**1,531,326**

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013
Note: Projections include all residual waste from residential, commercial, institutional, and industrial sources.

Table 3: Projected Annual Tons of Green Bin Materials in 2030

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
East Valley	216,916	255,861	321,272	255,861	321,272
Harbor	34,754	44,393	60,803	44,393	60,803
North Central	146,846	194,948	287,334	194,948	287,334
South LA	90,377	122,466	176,340	122,466	176,340
West Valley	223,220	262,087	328,956	262,087	328,956
Western	148,595	172,169	217,446	172,169	217,446
Overall	**860,708**	**1,051,924**	**1,392,151**	**1,051,924**	**1,392,151**

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013Note: Projections include all organics from residential, commercial, institutional, and industrial sources.

Table 4: Projected Annual Tons of Blue Bin Materials in 2030

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
East Valley	514,467	594,718	655,685	584,671	638,562
Harbor	124,937	145,950	161,538	143,295	157,059
North Central	858,928	972,232	1,077,587	988,026	1,077,353
South LA	354,387	420,287	471,310	412,291	457,446
West Valley	612,572	693,374	752,382	682,818	734,879
Western	489,122	558,758	606,202	549,663	734,879
Overall	**2,954,412**	**3,385,319**	**3,724,704**	**3,360,764**	**3,800,179**

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013
Note: Projections include all recycling from residential, commercial, institutional, and industrial sources.

After determining the tonnages of these material streams, different facilities and combinations of facilities were analyzed to determine the City's options for processing the three material streams in order to maximize recycling and diversion. The facility analysis focused on determining the types of facilities to be used, the combinations of these facilities, and the performance of each type of facility. Generic facility descriptions and scenarios for combinations of facilities are presented in the following sections of this report, and more detailed profiles and performance estimates for each facility type are included in **Attachment D-2: Facility Descriptions**.

1.4 Facility Types

A variety of solid waste processing facilities are needed to manage the City's black bin, blue bin, and green bin material streams. These facilities can be somewhat independent, but are likely to be built as part of a holistic system aimed at achieving certain results. In order to maximize diversion, various disposal, material processing, and alternative technology facilities were considered. The type of facilities being considered include typical processing plants, proven commercial processing technologies, and emerging processing technologies from around the world. Alternative technology facilities are designed to process residual waste directly into energy or fuel and/or recoverable by-products.

After the review and analysis of various types of facilities suitable for handling the materials that will be generated through the City's new policies and programs, the following facilities were used in the material flow model to estimate the diversion potential of different facility approaches:

- Clean Material Recovery Facility (Clean MRF)
- Mixed Material Processing Facility (a.k.a. Dirty MRF or Wet MRF)
- C&D Processing Facility
- Aerobic Composting Facility for yard trimmings and other organics
- Anaerobic Digestion for source-separated organics
- Mulching Facility
- Alternative Technology Facilities including (but not limited to):
  - Alternative Technology: Advanced Thermal Recycling
  - Alternative Technology: Biological (Anaerobic Digestion)
  - Alternative Technology: Thermal (gasification, pyrolysis, plasma arc)
- Biomass-to-energy (wood waste, wood plus other biomass)

Profiles were created for each of these facility types. Additional facility types considered for the model, including additional types of alternative technology facilities, resource recovery centers, and transfer stations are described. Each profile includes information detailing the recovery rates for materials, capacity, performance, operating cost, capital cost, and overall diversion rates. These profiles also include information on processing operations, local examples of facilities, and the amount of experience and maturity that exists for each of these facilities. These profiles can be found in **Attachment D-2: Facility Descriptions**.

1.4.1 Landfills

Landfills are assumed to be included in each scenario, as the final disposal option to handle the residue that cannot be recycled, composted, recovered for electricity or fuels. Specific information on the performance, capacity, and location of landfills was not considered in detail because this report focuses on recycling and diverting waste from landfills. Table 5 provides the permitted capacities of the landfills in the Los Angeles region. Alternative daily cover (ADC) and other beneficial use at landfills are considered for bottom ash[10] from thermal treatment facilities. Bottom ash from thermal facilities can potentially be marketed and beneficially reused in construction projects (as is commonly practiced in Europe). However, because of the strict regulatory environment in California, it is anticipated that ash residues will need to pass established standards prior to being beneficially reused at landfills for ADC or in landfill road construction (as is commonly practiced in the U.S. and in southern California[11]). The existing waste-to-energy facilities in southern California are able to reuse the ash they generate in road construction and for wet-weather pads at a local landfill.[12] However, the ash processing facilities[13] at the existing waste-to-energy facilities are grandfathered under State regulations. The Department of Toxics Substances Control may restrict the reuse of ash or require special handling of ash from new facilities in the future if the ash contains toxic materials, such as heavy metals. Solid waste landfills and inert landfills may also be end-markets for C&D and other inert debris that can be beneficially reused at landfills as ADC, and in construction of roads and wet-weather pads. City policy[14] does not allow yard trimmings collected by LASAN to be used as ADC. However, use of yard trimmings as ADC is part of LASAN's contingency plans if no processing capacity for yard trimmings is available.

[10] All thermal treatment facilities recover metals and create ash and other non-combustible residues leftover from the treatment process. Many new thermal facilities separate fly ash (the air pollutants that are mixed with the exhaust air and removed by the air pollution control system) from bottom ash (the ash or vitrified ash that remains in the chamber after the residual waste is treated).

[11] Ash from the Commerce-Refuse-to-Energy Facility and the Southeast Resource Recovery Facility is treated and used for road construction and for constructing the wet-weather pad at the Puente Hills Landfill.

[12] With the closure of the Puente Hills Landfill in October 2013, these facilities will need to find another landfill for this material.

[13] The on-site ash processing facilities treat the ash with Portland cement to control the leaching of heavy metals.

[14] Public Works Board Report on Green Waste Processing Contingency Plan adopted on September 22, 2006.

Table 5: Los Angeles Region Landfill Permitted Capacity[1]

Facility	Permitted Daily Capacity (Tons)	2012 Average Yearly/Daily Tonnage (Tons)[2]	Anticipated Closure Date
Antelope Valley Landfill	3,564	252,000/966	2042
Puente Hills Landfill	13,200	2,144,000/8,215	2013
Sunshine Canyon City/County Landfill	12,100	2,217,000/8,500	2037
Chiquita Canyon Landfill	5,000	906,000/3,470	2019
Calabasas Landfill	3,500	187,000/716	2025
Scholl Canyon Landfill	3,400	211,000/808	2030
Lancaster Landfill	1,700	208,000/800	2044
Savage Canyon Landfill	350	78,000/300	2048
City of Burbank Landfill	240	33,000/126	2053
Pebbly Beach Landfill	49	3,000/11	2020
San Clemente Landfill	10	400/1.5	2032
El Sobrante[3]	16,054	1,928,000/7,400	2045
Simi Valley[3]	9,250	663,000/2,500	2052
Frank R. Bowerman Sanitary Landfill[3]	11,500	Not available	2053
Olinda Alpha Sanitary Landfill[3]	8,000	Not available	2021
Mesquite Canyon Landfill[3]	20,000	Not available	2097

[1] Source: County of Los Angeles Countywide Integrated Waste Management Plan: 2012 Annual Report
[2] Based on 5-days/week landfill operation (261 days/year)
[3] Source: www.calrecycle.ca.gov/SWFacilities/Landfills/Tonnages/

1.4.2 Mixed Material Processing (MMP)

A mixed material processing (MMP) facility, also referred to as a dirty MRF, is a facility that sorts recyclable material from residual waste. These facilities can also be adapted to sort or remove different materials to prepare residual waste for composting, advanced thermal recycling, and other alternative technologies. Preferred loads include residual waste from residential and commercial generators, and undesirable loads include concentrated amounts of C&D materials or concentrated amounts of wet materials, such as restaurant food scraps (in the case of thermal technologies). The primary waste to be targeted at these facilities is residual waste from residential or commercial sources.

To determine the size and number of MMP facilities needed for each scenario, certain assumptions were made. The assumptions are based on several factors. First, the effectiveness for material recovery is based on the operational experience of other local MMPs. Second, it is assumed that the capacity or processing rate will be slightly higher than the processing rates of existing facilities (which are merchant facilities that have been developed based on open market conditions without a guaranteed flow of materials). Third, it is assumed that facilities will need to be located conveniently throughout the service area.

Using these criteria, the assessment assumed that all new facilities will be able to process about 200,000 tons per year (tpy) or 500 to 750 tons per day (tpd) based on 300 operating days per year, which will be handled by two different lines. One sorting line will run two 8-hour shifts per weekday, while the other runs one 8-hour shift per weekday. Each sorting line will only run one 8-hour shift per day on Saturdays. Materials are typically unloaded onto the tipping floor, where larger pieces of metal, wood, cardboard, and plastic are removed. Materials are then loaded into a hopper or conveyor, where equipment is used to break bags and screen materials. Materials are then typically processed through a series of rotating screens to separate fiber, containers, and small contaminants. Numerous sort stations are located along a conveyor to pick off various materials, either to be sent to market or to be used by alternative technologies to produce electricity and/or fuels and by-products. Separated commodities are typically dropped into storage bunkers and later conveyed to a baler or loaded into roll-off containers to prepare for shipping.

Residue that cannot be processed further is shipped to landfills. Small quantities of electronic waste (e-waste) and HHW (less than 1 percent of the total waste stream) may be received by MMP facilities, which should attempt to remove this material and send it for proper handling and disposal. Marketable recyclable materials include commodities, such as glass, newspaper (ONP), cardboard (OCC), mixed paper, ferrous metal, aluminum, plastics #1 (PET), #2 (HDPE), #6 (HDPS), and mixed plastic. Inert material may be screened for size separation, and delivered to an inert landfill or used as ADC at a landfill. A simple MMP facility that only separates for recycling considers a high diversion rate to be about 30 percent, an average diversion rate to be between 15 percent and 20 percent, and a poor diversion rate to be around 10 percent. New, emerging technology at MMP facilities using more mechanical separation and optical sorting may be able to achieve higher diversion rates (50 to 65 percent). Higher diversion rates may also be achieved by targeting more materials, such as film plastic, wood, inert materials (concrete, bricks), textiles, cartons and soils. These types of facilities are currently under development in California.[15]

1.4.3 Alternative Technology: Advanced Thermal Recycling

Advanced Thermal Recycling (ATR) is a technology that uses complete combustion of organic carbon-based materials in an oxygen-rich environment, producing an exhaust gas composed primarily of carbon dioxide and water with inorganic materials converted to bottom ash and fly ash. ATR facilities use residual waste from residential or commercial generators, or residual waste from other solid waste facilities, to produce an uninterruptible source of energy and by-products. ATR facilities produce energy, recover metals from the bottom ash, and reduce waste volume by combusting the waste and injecting air at atmospheric pressure to reach the chemically balanced air-fuel ratio for combustion. The hot exhaust gases flow through a boiler, where steam is produced for driving a steam turbine-generator, producing electricity. Exhaust air is treated with advanced pollution control technologies that remove air pollutants to meet stringent clean air emissions standards from environmental regulatory agencies. Some of the air pollutants that are monitored and treated include: mercury, lead, furans, dioxins, nitrogen oxides, sulfur oxides, particulate matter, volatile organic compounds, carbon monoxide, and hydrogen chloride. Cooled exhaust gas flows through emissions control systems before being exhausted through stacks into the

[15] Examples of newer facilities with new processing technology, targeting new materials include Republic Services' Newby Island Processing Facility in Milpitas, and Waste Management's Davis Street Transfer Station in Oakland.

atmosphere. Common by-products for controlling air quality of plant emissions include gypsum and hydrochloric acid. Other products include the recovery of ferrous and non-ferrous metals from the bottom ash. The fly ash and bottom ash are separated and the bottom ash can be reused as landfill cover, processed for road base, or possibly used for other beneficial uses. The amount of ash produced by ATR facilities depends on the level of processing and the composition of waste processed. Typically, the volume of waste is reduced by 75 to 90 percent through ATR. Highly processed, homogenous dry organic waste with negligible levels of glass, metal, ash, and other inerts is the most efficient feedstock, both for volume reduction and energy production. ATR facilities should not be used for inert materials, industrial waste, ashes, and liquids.

Typical ATR facilities have processing capacities that range from 500 - 2,000 tpd (168,000 - 672,000 tpy at 92 percent availability). For the facility analysis, the capacity of new ATR facilities is based on a facility processing capacity of 1,000 tpd (336,000 tpy at 92 percent availability). This represents a single advanced thermal unit, and some facilities may be scaled to include multiple advanced thermal units. The volume of waste is reduced to 10 to 30 percent, depending on the technology and the composition of the feedstock. In many cases, the ash can be diverted from disposal and beneficially reused. However, stricter regulations may make beneficial reuse more challenging. Advanced Thermal Recycling is a proven technology, with plants throughout Europe and Japan. Currently, no facility of its type exists in the United States.

1.4.4 Alternative Technology: Thermal (Alt Tech Thermal or ATT)

Alternative Technology Thermal (ATT) is a general term used to describe thermal technologies, such as pyrolysis, gasification, plasma arc gasification, and other technologies that produce synthesis (syngas) gas to generate electricity from waste using thermal or chemical reactions. The energy source is found in organic waste, such as paper, plastic, and wood. ATT facilities use an external heat source to heat the feedstock to high temperatures without the need to introduce air into the heat chamber. The external heating causes the waste to react and produce syngas. Syngas consists primarily of hydrogen, carbon monoxide, and carbon dioxide. With a proper feedstock, these reactions can reduce the volume of waste by 85 percent, and are intended to produce more energy than is required for the process. Ideal feedstock for an ATT facility would be mostly mixed paper, plastics, and other dry organics.

A capacity of 500 tpd (162,000 tpy at 90 percent availability) was selected for potential ATT units because it reflects a small capacity unit. ATT facilities can have several modules on site, each with a 500 tpd capacity, operating efficiently, while maintaining continuous and uninterruptible energy production and by-products. This also allows the facilities to scale-up by adding more units as needed. The actual performance, by-products, efficiency, and desired feedstock for ATT facilities vary by different technologies and manufacturers. Several ATT facilities using supplemental fuel and high heating value feedstocks have been operational in Japan for the past 10 years. However, there are currently no commercial scale ATT facilities in the US using residual waste as a feedstock.

1.4.5 Alternative Technology: Biological (Alt Tech Bio or ATB)

Alternative Technology Biological is a general term used to describe various technologies that use micro-organisms in biological processes to produce biogas to generate electricity or alternative fuels from waste.

The leading example of this technology is anaerobic digestion (AD). These technologies convert organic waste to energy using bacteria to break down waste to produce biogas. This type of biogas consists primarily of methane and carbon dioxide. These facilities process paper, food scraps, and other organics. Although the first phase of the biological process (hydrolysis phase) of these facilities often operate in batch-type processes, methane generating and subsequent electrical generation phases of these facilities are designed to operate continuously and provide uninterruptible power. With a proper feedstock, biological degradation can reduce the volume of waste by 70 percent, provide energy or transportation fuels, and digestate can be sent to a compost facility. A capacity of 500 tpd (162,000 tpy at approximately 90 percent availability) was selected for potential ATB facilities because it reflected a mid-range capacity facility. The actual performance, by-products, efficiency, and desired feedstock for ATB facilities vary with different technologies and manufacturers.

1.4.6 Alternative Technology: Physical

Physical technologies alter the physical characteristics of the residual waste feedstock. Examples of physical technologies include Refuse-Derived Fuel (RDF) facilities and autoclave facilities. RDF facilities separate, shred, and/or dry materials to produce a homogeneous fuel. The materials may be densified or pelletized into fuel pellets and transported and combusted as a supplementary fuel in utility boilers or waste-to-energy facilities. Autoclave facilities process residual waste and subject it to low or medium pressure steam in a closed, rotating pressure vessel. The high-temperature steam breaks down cellulosic materials and sterilizes the entire feed stream. Cans and bottles are de-labeled. Plastics typically are slightly melted, resulting in significant volume reduction. The residual waste stream is reduced in volume by about one-third. The product material exits the steam pressure vessel or autoclave as a recyclable or usable fiber that can potentially be marketed for paper manufacturing, burned for energy or used to create a transportation fuel.

1.4.7 Clean Material Recovery Facilities (Clean MRFs)

Clean MRFs (Material Recovery Facilities) receive and process source separated recyclables, often referred to as commingled materials or blue bin recyclables. Clean MRFs use various technologies and methods to sort, bale, and ship material by commodity type to market. Capacity for Clean MRFs typically ranges from 50-600 tpd (15,000-180,000 tpy), with some facilities capable of handling up to 1,000 tpd (300,000 tpy). For this analysis, the assumption is that a new facility would operate at about 200,000 tpy (500 to 750 tpd based on 300 operating days per year), which represents a large-sized facility. On weekdays, one sorting line could operate for two 8-hour shifts per day, while the other sorting line would run for one 8-hour shift per day. Each sorting line would run between 25 and 30 tons per hour while in operation.

Clean MRFs typically recover traditional commodity recyclable materials, including ONP, OCC, mixed paper, aluminum cans, bi-metal cans, PET, HDPE, mixed plastics, HDPS, and container glass. Typical residues include food scraps, auto parts, yard trimmings, wood, dirt and other inerts, glass shards, and other residue. Residue levels for Clean MRFs are strongly tied to the performance of the curbside recycling programs to eliminate contamination, which depends on education and enforcement. Clean MRFs have been in operation in the US and internationally for over 25 years and are considered to be mature, proven technologies. Several Clean MRFs are already used to process blue bin materials generated in the City, and additional Clean MRFs will be needed to process additional blue bin materials generated through new policies and programs. The size of the facility is generally determined by the amount of commingled materials that can be practically and cost effectively transported to the site.

1.4.8 Aerobic Composting

Aerobic composting is one of two options examined as an alternative to disposal for green bin materials. All new composting facilities are assumed to have a variety of operations on site, including chipping and grinding, mulching, and composting. Compost facilities can vary greatly in size, and compost facilities designed for processing residual waste are typically in the range of 100-1,000 tpd (26,000-260,000 tpy), with some facilities capable of handling up to 3,000 tpd (780,000 tpy), based on 260 operating days per year. There are various methods of aerobic composting; the new facilities in this report are assumed to use windrow composting, in-vessel processing, or aerated static pile systems.

- **Windrow** – compostable material is piled in long rows and regularly turned and watered to enhance aerobic activity and control temperature and moisture.
- **In-vessel** – compostable material is placed in enclosed reactors (metal tanks, concrete bunkers or plastic tubes or "ag bags") where airflow and temperature can be controlled through perforated pipes buried in the material.
- **Aerated static pile** – compostable material is placed in piles on perforated pipes under removable covers, and fans are used to push or pull air through the pipes to control the composting process.

Composting facilities can release emissions, including odors and volatile organic compounds, regulated through CARB and SCAQMD. To address emissions and concerns about siting, new composting facilities are being designed using more emission control technologies, making them more suitable for urban environments. Operators of composting and mulching facilities must register with SCAQMD.[16] Depending on the emissions of the operation, SCAQMD may require the facility to be enclosed.

Two different sizes of compost facilities were also examined in this analysis. The first facility considered was a large facility capable of processing 260,000 tpy. This facility would accept an average of 1,000 tpd of waste, operate six days per week, and would be difficult to site in urban areas, due to the acreage requirements. A smaller facility, one that processes about 60,000 tpy, could be suitable for more urban areas, particularly if designed with more emission controls and good management practices. A facility this size would accept about 200 tpd of material and would operate six days per week.

For windrow composting, ground up yard trimmings are piled into long windrows, where the material is periodically turned and moistened to allow it to compost for a period of 60 to as much as 120 days. After this period, the resulting material is screened to remove any contaminants and the compost is placed in

[16] South Coast Air Quality Management District, Rule 1133, Composting and Related Operations – General Administrative Requirements.

curing piles. Residue that is removed is sent to landfill. Oversized materials can be reprocessed and composted. Preparation for market may include blending compost with additives to create a soil amendment. Markets for compost may include contractors, farmers, gardeners, landscapers, the public, and nurseries for soil amendment. Typical residues include plastic film and glass and plastic shards. The amount of residue from composting operations depends on the success of the feedstock, especially curbside programs.

Facilities that accept only 'clean green' material, such as materials from landscapers, gardeners, and nurseries, produce a higher quality product that requires less screening and is more suitable for commercial sales. Compost facilities were also analyzed with the assumption they would accept compostable organic materials from food scrap collections, MMP residues, and possibly from Alt Tech Biological operations.

1.4.9 Mulching

The other type of facility considered to handle yard trimmings was a chip-and-grind/mulching facility. This type of facility typically includes minimal processing (chipping, grinding, and possibly screening) of the feedstock to produce a mulch product or to prepare wood as fuel for biomass power plants. This type of facility was not included in the black bin facility analysis because policy scenarios 2 through 5 include adding food scraps to the green bin system, which would contaminate the mulch or biomass products. Mulching facilities were only analyzed for green bin waste that does not include food scraps, and would preferably be reserved for yard trimmings from residential yard trimmings collection programs, commercial sources, such as gardeners, landscapers, and nurseries.

1.4.10 S.A.F.E (Solvents/Automotive/Flammables/Electronics) Centers

S.A.F.E. Centers are permanent HHW collection facilities located throughout the City. Seven of these centers currently operate throughout the City. These centers accept paints and solvents, used motor oil and filters, anti-freeze, automotive products, cleaning products, pool and garden chemicals, aerosol cans, medicine, auto batteries, household batteries and e-waste. These facilities are provided as a service to the residents, and as a way to keep harmful and potentially dangerous chemicals and hazardous materials out of the waste stream. Stakeholders identified the need for more facilities located throughout the City to enhance accessibility and convenience.

1.4.11 C&D Mixed Processing

C&D Mixed Processing facilities are facilities that receive and process construction and demolition materials. These types of facilities provide different levels of processing depending on acceptable materials they receive, and may produce a variety of commodities at each facility. Typical commodities recycled include gypsum, clean wood, ferrous metal, aluminum, inert material (including engineered fill) and ADC. The volume of C&D materials produced in the City, including any potential increases from different policy scenarios through 2030, is lower than existing C&D processing capacity in the City and local area, so no additional C&D processing capacity is calculated.

1.4.12 Resource Recovery Centers

Resource Recovery Centers are facilities open to the public that receive certain recoverable materials that typically are contained in self-hauled loads delivered by residents or businesses to a disposal site for disposal. The materials received at Resource Recovery Centers are processed and marketed as recyclables, or made available for reuse/resale (either at the Resource Recovery Centers or off-site at other related reuse stores or resale facilities). At some facilities, the diversion activity takes place after customers enter through the fee gate and the public is required to separate materials for recycling and reuse. If they would like to proceed directly to the disposal area, they are required to pay an extra fee. Diversion levels and costs at Resource Recovery Centers can vary widely depending on the extent of the diversion activities. These activities can include public area drop-off for traditional recyclables (cans, bottles, and paper), salvaging materials from the tipping area at a transfer station or landfill (large pieces of metal, cardboard or wood), diverting reusable items (furniture, building materials, and household goods), and providing retail sales on site. Some activities may be co-located at a transfer station or landfill, but others may be off-site. The concept of using off-site facilities has been described as a "serial MRF," where multiple salvage, processing, and sales activities happen in a variety of locations in close proximity that are cross-promoted.

1.4.13 Transfer Stations

Transfer stations are facilities where solid waste or other materials (such as recyclables, yard trimmings and food scraps) are transferred from route trucks or self-haul vehicles to larger trucks or rail cars for longer distance transport. Transfer stations can host many activities on-site including: material recovery or recyclable processing; drop-off and buyback centers for recyclables, C&D recovery, bulky item salvage, and Resource Recovery Centers. Capacity for transfer stations typically ranges from 50-1,000 tpd (15,000-300,000 tpy), with some facilities capable of handling up to 5,000 tpd (1.5 million tpy), based on 300 operating days per year.

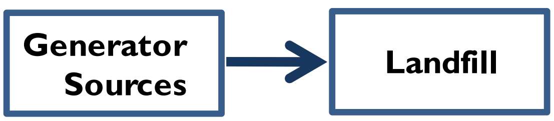
Section 2 Facility Scenarios

After the waste stream characteristics were determined through modeling, the number of facilities required to process materials from each bin type was estimated. This facility model included different combinations of material flows from one type of facility to another. Materials collected from blue bins would continue to be sent to a Clean MRF. After reviewing the policy and program scenarios, it was determined that green bin materials would be sent to an aerobic composting facility, because a mulching facility would be unable to process food scraps. Green bin materials are assumed to be sent to an organic processing facility that is capable of performing an assortment of functions on-site, including chipping and grinding, composting, and mulching.

Black bin materials include a wide variety of material types. It is the least uniform of the three material streams (blue, green, black), and has the most types of facilities that can process it. For these reasons, different scenarios were examined using various combinations of facilities to process materials from black bins. These eight facility scenarios are shown below:

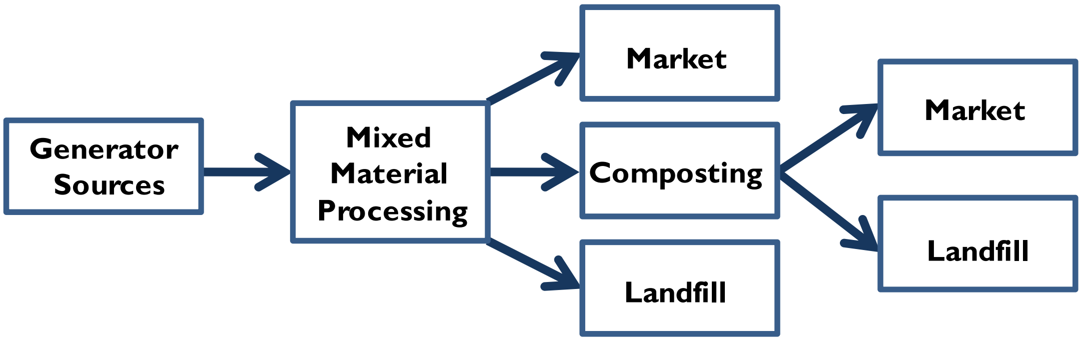
Facility Scenario A: Under this scenario, all black bin materials are sent directly to landfill. This scenario was evaluated to provide a baseline scenario to compare recovery rates and costs to other black bin scenario options. Figure 1 illustrates this scenario.

Figure 1: Facility Scenario A



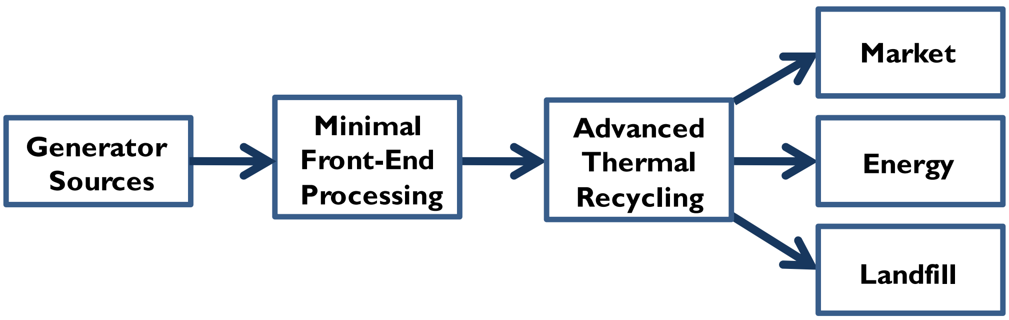
Facility Scenario B: Under this scenario, MMP receives all residual waste and processes it to recover recyclables for market and compostable materials for composting. Materials that are not recyclable or compostable are sent to landfill. Compost facilities process compostable materials for market and send non-compostable residues to landfill. This scenario separates all organics and materials that have markets for diversion. Figure 2 illustrates this scenario.

Figure 2: Facility Scenario B



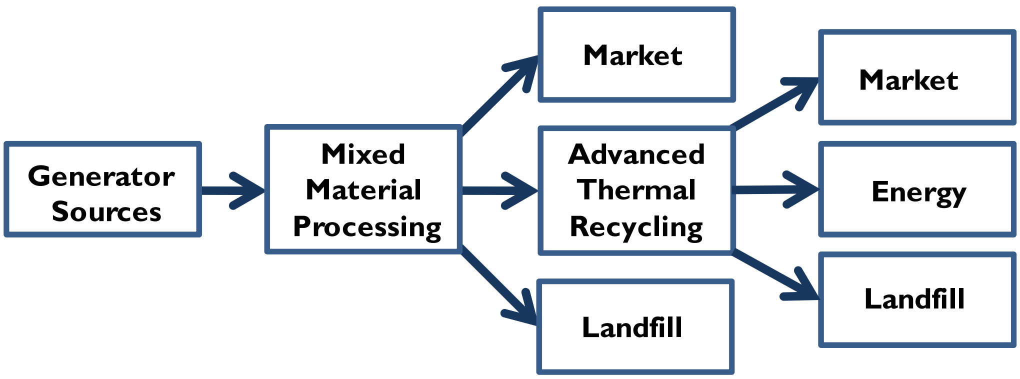
Facility Scenario C: ATR receives all residual waste and converts it to energy and by-products. Minimal processing by ATR would include screening to remove glass, C&D, soil, and other inert materials and would use magnets and eddy currents to remove metal. For this scenario, all residual waste is sent to ATR where minimal front-end processing is required (unless the system relies on an RDF technology in which case front-end processing at MMP would be required to process the materials to create the RDF). Figure 3 illustrates this scenario.

Figure 3: Facility Scenario C



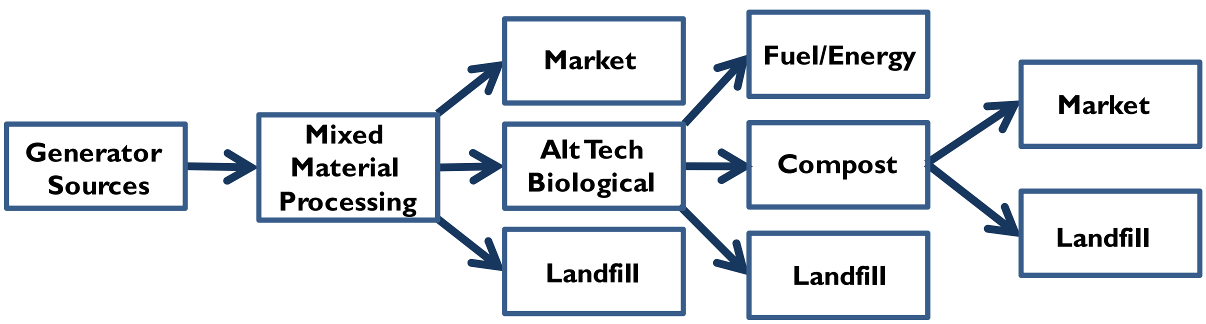
Facility Scenario D: MMP receives all residual waste and processes it to separate marketable materials from materials acceptable for conversion at an ATR facility and non-processable residue (which is sent to landfill). The ATR facility receives residual materials from MMP for conversion to energy and by-products. This scenario assumes that it is more desirable to recover material for recycling than convert it to energy at an ATR facility. MMP would remove all marketable materials, and would prepare non-marketable residual materials for ATR. Preparation for ATR would include screening waste to remove glass, C&D, metals, soil, and other inert materials which would increase conversion efficiency. This scenario represents a situation where recycling is preferred over ATR, but post-processing residual materials are still sent to ATR. Figure 4 illustrates this scenario.

Figure 4: Facility Scenario D



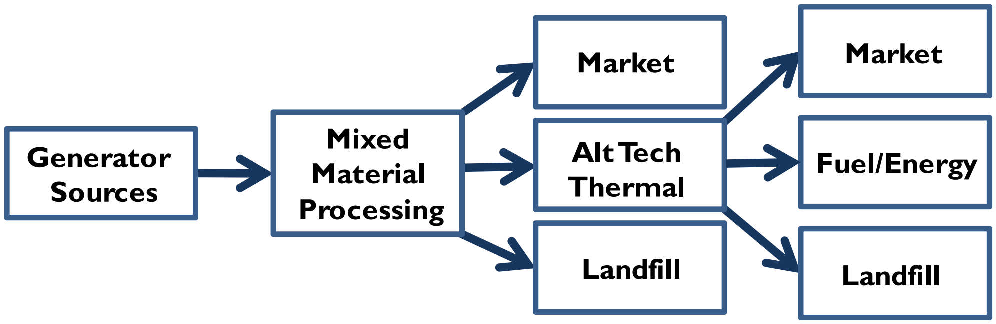
Facility Scenario E: MMP receives all residual waste and processes it to separate marketable materials from organic materials (food, food-soiled paper, and other organics) and non-processable residue (which is sent to landfill). ATB converts the organic materials into fuel or energy, and post-processing residual materials are composted or sent to landfill. MMP would thus provide a feedstock of food, food-soiled paper, and other organics. This scenario represents a situation where recycling is prioritized, organic materials are sent to ATB prior to composting, and materials which cannot be recycled, digested or composted are sent to landfill. Figure 5 illustrates this scenario.

Figure 5: Facility Scenario E



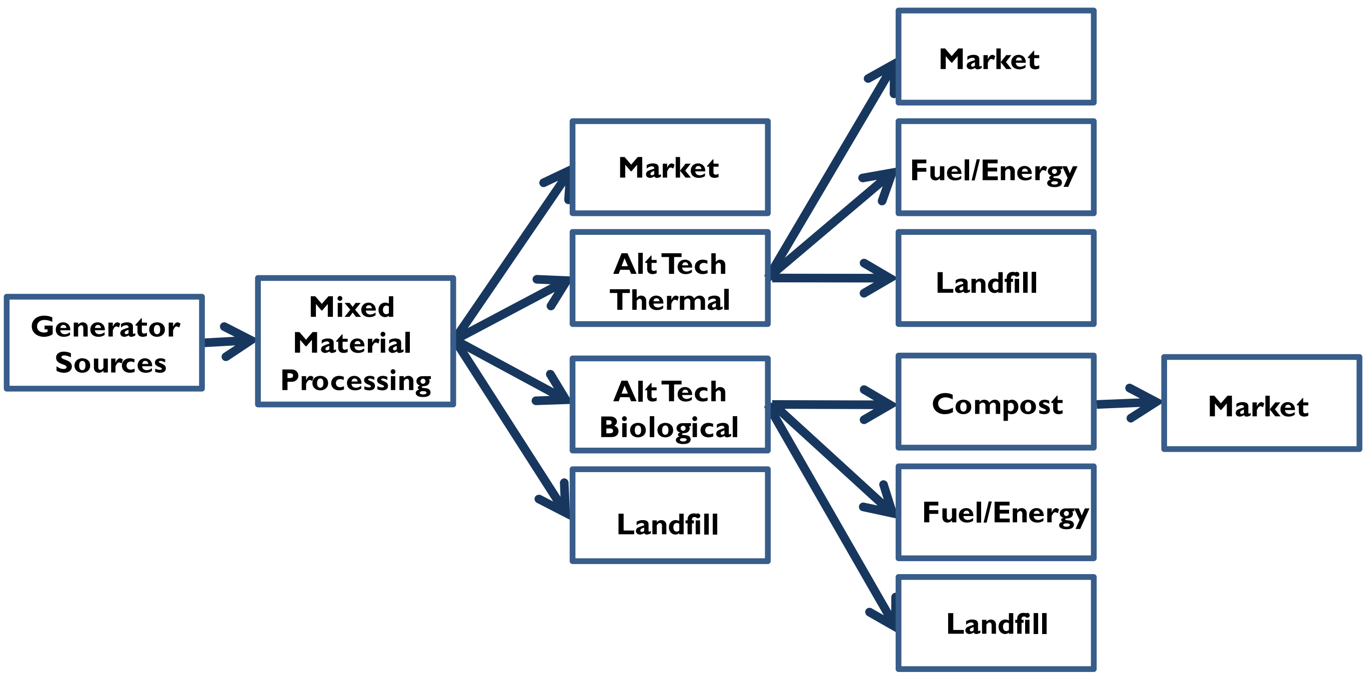
Facility Scenario F: MMP receives all residual waste and processes it to separate marketable materials from materials acceptable for processing at an ATT facility and non-processable residue (which is sent to landfill). ATT converts materials into energy or fuel, and creates ash and other by-products. Marketable by-products are sold to markets and non-marketable residues are sent to landfill. MMP would create a feedstock of paper, plastics, dry organics, and other material that would be desirable for ATT. This scenario represents a situation where recycling is prioritized, materials that cannot be recycled are sent to ATT, and materials that cannot be converted or recycled are sent to landfill. Figure 6 illustrates this scenario.

Figure 6: Facility Scenario F



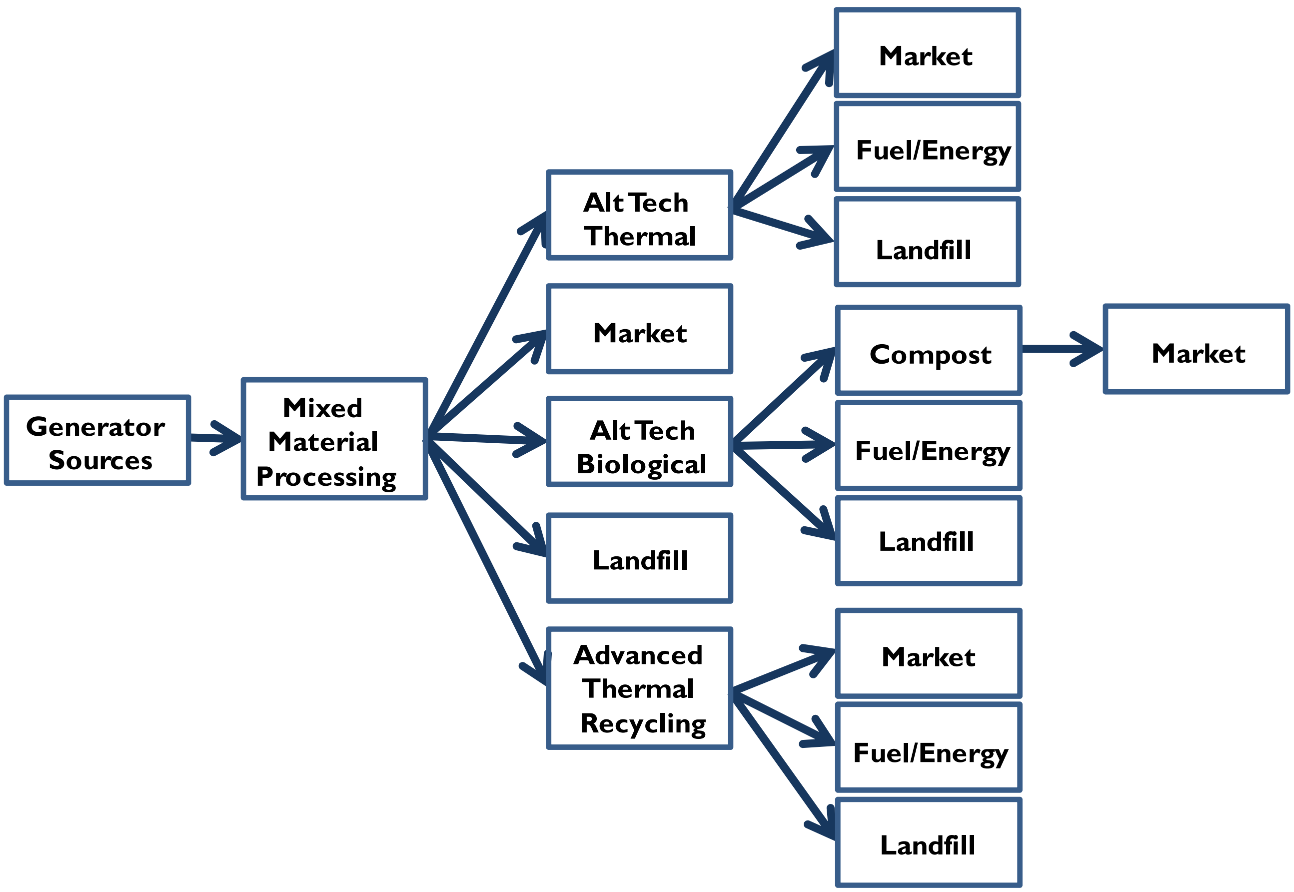
Facility Scenario G: MMP receives all residual waste and processes it to separate marketable materials from materials acceptable for processing at an ATT or ATB facility, and non-processable residue (which is sent to landfill). Food, food-soiled paper, and other organic materials are sent to ATB. Paper, plastics, and other processable materials are sent to ATT. ATT converts waste into fuel or energy, and post-processing residual materials are sold to market or sent to landfill. ATB converts organic materials into fuel or energy, and post-processing residual materials are composted or sent to landfill. This scenario was chosen to represent a situation where recycling is prioritized, and non-recyclable materials are divided between ATT and ATB, based on where the materials are best suited to be converted. Materials that cannot be converted or recycled are sent to landfill. Figure 7 illustrates this scenario.

Figure 7: Facility Scenario G



Facility Scenario H: MMP receives all residual waste and processes it to separate marketable materials from materials acceptable for processing at ATT, ATB, and ATR facilities, and non-processable residue (which is sent to landfill). Food, food-soiled paper and other organics are sent to ATB. Paper, plastics, and other processable materials are sent to ATT. Other materials that are not appropriate for ATT or ATB are sent to ATR. ATT converts waste into fuel or energy, and residual materials are sold to market or sent to landfill. ATB converts organic materials into fuel or energy, and residual materials are composted or sent to landfill. ATR converts waste to energy, and residual materials are sent to market or landfill. Figure 8 illustrates this scenario.

Figure 8: Facility Scenario H



After these facility scenarios were identified, preliminary tests were run on each facility scenario, including basic cost estimates and diversion results. The initial results are shown in Table 6. These preliminary results were presented to the stakeholders during Workshop 9 in March 2009.

Table 6: Preliminary Diversion Results by Policy and Facility Scenario

"Black Bin" Scenario	Cost Per Ton	Policy Scenario 1 Baseline	Policy Scenario 2 SWIRP	Policy Scenario 3 Mandatory	Policy Scenario 4 EPR+2	Policy Scenario 5 EPR+3
(A) Landfill	$50-80	62%	72%	80%	73%	81%
(B) MMP, Compost	$50-80	88%	91%	93%	92%	94%
(C) ATR	$120-150	97%	98%	98%	98%	98%
(D) MMP, ATR	$120-150	97%	98%	98%	98%	98%
(E) MMP, ATB	$100-130	88%	91%	93%	92%	93%
(F) MMP, ATT	$120-150	94%	96%	97%	96%	97%
(G) MMP, ATT, ATB	$120-150	93%	94%	95%	94%	95%
(H) MMP, ATB, ATT, ATR	$120-150	93%	94%	95%	94%	95%

Source: City of Los Angeles Zero Waste Planning Model - Preliminary Results, March 2009

Each of the facility scenarios B through H could achieve very high diversion rates, between 93 and 98 percent diversion assuming all policies and programs are implemented. Since many of the facility scenarios yielded comparable results, the analysis was simplified and the number of facility scenarios evaluated was reduced.

After running the preliminary tests and discussing the facility scenarios with the stakeholders at the March 2009 workshops, it was determined that facility scenarios B, D, E, and F provide the clearest comparison between the technologies. Each of these scenarios assumes that the City will implement pre-processing through an MMP and that the technology (whether thermal or biological) will be co-located with the MMP. The MMP can prepare different feedstocks for different technologies (thermal and biological) and additional technologies can be co-located at the same facility (as described in facility scenarios G and H). However, the addition of multiple technologies will not necessarily increase diversion. In some cases (such as in facility scenarios G and H), adding technologies reduces efficiency. Costs could increase by including multiple technologies, depending on the technologies and process.

In selecting a specific technology or combination of technologies, the City will likely weigh multiple factors including cost, efficiency, diversion potential, reliability, and "highest and best" use of materials.

Section 3 Projected Demand and Gap Analysis

After the facility scenarios were identified, additional performance data was created for the new facility types. New MMP performance was identified for scenarios where MMP was diverting waste to different technologies. Preliminary models were run and it was determined that facility scenarios B, D, E, and F would be used to estimate the number of facilities that would be required in 2030. Each of the scenarios involves MMP facilities recovering recyclables for market and preparing a feedstock for alternative technology or compost.

The projected demand of black bin facilities is the number of facilities that would be required to process all black bin waste generated in the City in 2030 if no solid waste infrastructure already existed. Section 3.4 Existing Facility Capacity and Expansion Potential details the number of facilities that would be required after existing available processing capacity is considered.

3.1 Black Bin Facility Requirements

The number of required black bin facilities was calculated by putting the future waste characterization through the different facility scenarios using the expected facility performances to determine how each waste type would be treated through the facility scenario. The facility scenarios were used as a guide to determine which facilities would be required for each scenario. Using the facility performance expectations, the amount of waste that would need to be handled by each facility type was determined. These tonnage volumes are shown in Table 7.

Table 7: Processing Requirements in 2030 – Additional Annual Tons by Facility Type

Facility Scenario	Facility Type	Tons received by each facility type in 2030, by policy scenario				
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
B	MMP	3,043,196	2,283,754	1,603,556	2,167,830	1,531,326
	Compost	1,697,094	1,275,375	863,645	1,248,719	854,019
D	MMP	3,043,196	2,283,754	1,603,556	2,167,830	1,531,326
	ATR	2,367,430	1,794,942	1,277,985	1,704,628	1,219,510
E	MMP	3,043,196	2,283,754	1,603,556	2,167,830	1,531,326
	ATT	2,030,548	1,522,253	1,051,143	1,441,188	998,653
F	MMP	3,043,196	2,283,754	1,603,556	2,167,830	1,531,326
	ATB	1,559,308	1,173,993	785,261	1,147,337	775,636

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013

As shown in Table 7, the City is expected to generate between approximately 1.5 and 3 million tons of residual waste in 2030 that will require processing. This range is based on the generation projections (described in *Appendix B Material Flow Model and Generation Projections*) and varies based on the program and policy scenarios implemented (described in *Appendix A Policy and Program Analysis*). The siting of a limited number of very large-scale solid waste processing facilities within the City limits to handle that amount of residual waste, as indicated in Table 7, would be extremely difficult, due to potential environmental impacts and anticipated community resistance. Alternatively, direct hauling and/or using transfer stations in order to deliver the residual waste to remote processing sites would be extremely costly and impractical. Consequently, the number of smaller ("community scale") facilities that would be needed to process the residual waste generated within the City was determined. Table 8 summarizes the number of required smaller scale facilities that would be suitable for siting throughout the City to process all the black bin materials in 2030 by scenario.

Table 8: Total Projected Black Bin MMP Facility Demand by 2030

Facility Scenario	Facility Type	Number of facilities required by policy scenario				
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
B	MMP	15	11	8	11	8
	Compost (large)	7	5	3	5	3
B	MMP	15	11	8	11	8
	Compost (small)	28	21	14	21	14
D	MMP	15	11	8	11	8
	ATR	6	5	4	5	3
E	MMP	15	11	8	11	8
	ATT	11	8	6	8	5
F	MMP	15	11	8	11	8
	ATB	9	6	4	6	4

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013

As shown in Table 8, depending on the scenario of policies and programs implemented in the City, anywhere from 8 to 15 black bin facilities (which could include MMP facilities and additional processing technologies) may be required to process all black bin materials generated in 2030. The number of black bin facilities required by wasteshed to process black bin materials is presented in Table 9.

Table 9: Projected Black Bin MMP Facilities Required by Wasteshed

Wasteshed	Total black bin facilities required in 2030 by wasteshed				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Overall	15	11	8	11	8
East Valley	3	2	2	2	2
Harbor	1	1	<1	1	<1
North Central	4	3	2	3	2
South LA	2	2	1	2	1
West Valley	3	2	2	2	1
Western	2	2	1	1	2

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013

The number of black bin MMP facilities by wasteshed indicated in Table 9 may not add up to the total number of facilities required per scenario, due to rounding. In some columns in Table 9, the number of facilities by wasteshed is less than one (<1). This indicates that there is not enough tonnage generated in this wasteshed for a whole new facility. In this case, tons from one wasteshed can be transferred to another wasteshed for processing. In some cases, use of transfer stations may be required to help efficiently transfer materials between wastesheds in order to maximize the capacity of a facility.

3.2 Green Bin Facility Requirements

The projected number of facilities that would be required to process all new green bin materials is calculated in this section. Existing infrastructure, a portion of which is controlled by private industry, currently processes all green bin materials that are generated in the City at this time. As the City expands its food scrap program (where food scraps and compostable paper are co-collected with yard trimmings), some of the existing composting/mulching facilities will need to be re-permitted to accept food scraps. In addition to this infrastructure, new facilities would also need to be constructed to process increases in the generation of green bin materials between 2010 and 2030.

The projected demand of green bin facilities is the number of facilities that would be required to process the additional tons of green bin materials generated in the City in 2030 if no processing infrastructure already existed. Section 3.4 details the number of facilities that would be required after existing available processing capacity is considered.

The increase in tonnage for green bin materials between 2010 and 2030 are shown in Table 10 for each of the five policy scenarios:

Table 10: Increase in Annual Tons of Green Bin Materials between 2010 and 2030

Wasteshed	Additional tons of green bin materials in 2030 by wasteshed				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Overall	26,460	216,890	557,118	216,890	557,118
East Valley	29,669	68,615	134,025	68,615	134,025
Harbor	1,173	10,026	26,436	10,026	26,436
North Central	(7,316)	40,786	133,172	40,786	133,172
South LA	(19,608)	12,481	66,356	12,481	66,356
West Valley	60,825	99,692	166,561	99,692	166,561
Western	(38,283)	(14,710)	30,568	(14,710)	30,568

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013
Note that totals may not sum due to rounding.

Table 10 shows that only about 26,000 tons of new green bin materials (under Scenario 1) are expected to be generated from population increases and generation increase per capita. However, in scenarios 2 through 5, policies and programs are capable of increasing green bin materials by an additional 220,000 to 560,000 tons, based on new programs including food scrap diversion and mandatory source-separation. Note that for some of the wastesheds, the green bin materials decline in 2030 from the base year of 2010. This is because the population projections provided by the Southern California Association of Governments predict a decline in single-family households across Los Angeles beginning in 2025.

Two options for green bin facilities are shown below. Table 11 shows the number of green bin facilities that would be required if small capacity 60,000 tpy (200 tpd) facilities are used. Table 12 shows the number of green bin facilities that would be required if larger capacity 260,000 tpy (1,000 tpd) facilities are used.

Table 11: Projected Green Bin Facility Demands (60,000 TPY)

Wasteshed	Additional small green bin facilities needed in 2030 by wasteshed				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Overall	<1	4	9	4	9
East Valley	<1	1	2	1	2
Harbor	<1	<1	<1	<1	<1
North Central	<1	1	2	1	2
South LA	<1	<1	1	<1	1
West Valley	1	2	3	2	3
Western	<1	<1	1	<1	1

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013
Note that totals may not sum due to rounding.

Table 12: Projected Green Bin Facility Demands (260,000 TPY)

Wasteshed	Additional large green bin facilities needed in 2030 by wasteshed				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Overall	<1	1	2	1	2
East Valley	<1	<1	1	<1	<1
Harbor	<1	<1	<1	<1	<1
North Central	<1	<1	1	<1	1
South LA	<1	<1	<1	<1	<1
West Valley	<1	<1	1	<1	1
Western	<1	<1	<1	<1	<1

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013
Note that totals may not sum due to rounding.

In some columns in Tables 11 and 12, the number of green bin facilities by wasteshed is less than one. This suggests that some facilities may be able to serve multiple wastesheds in the City. Transfer stations may be utilized in some wastesheds to help efficiently haul green bin materials to the facilities. Some combination of large and small facilities will likely be desired, which will depend on the availability of land, permitting conditions, and the requirements and availability of markets. Large capacity compost facilities may need to be sited outside the City limits, in which case transfer stations will be required to efficiently transport green bin materials to these facilities.

3.3 Blue Bin Facility Requirements

As with green bin facilities above, the projected number of facilities that would be required to process all blue bin materials is calculated in this section. Existing infrastructure, much of which is controlled by private industry, currently processes all blue bin materials that are generated in the City at this time. In addition to this infrastructure, new facilities would also need to be constructed to process increases in the generation of blue bin materials between 2010 and 2030.

The projected demand of blue bin facilities is the number of facilities that would be required to process the additional tons of blue bin materials generated in the City in 2030 if no processing infrastructure already existed. Section 3.4 details the number of facilities that would be required after existing available processing capacity is considered.

The increase in tonnage for blue bin materials between 2010 and 2030 is shown in Table 13 for each of the five policy scenarios:

Table 13: Increase in Annual Tons of Blue Bin Materials between 2010 and 2030

Wasteshed	Additional tons of blue bin materials in 2030 by wasteshed				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Overall	340,455	771,362	1,110,746	746,807	1,042,859
East Valley	65,870	146,121	207,087	136,074	189,965
Harbor	13,999	35,011	50,599	32,357	46,120
North Central	93,917	207,221	312,576	223,014	312,341
South LA	28,841	94,742	145,764	86,746	131,901
West Valley	98,155	178,957	237,965	168,401	220,462
Western	39,674	109,310	156,755	100,216	142,069

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013
Note that totals may not sum due to rounding.

As shown in Table 13, the increase in generation from population growth and other changes not related to new policies and programs will increase the number of tons generated in the City by over 340,000 tpy, while different policy scenarios can increase the production of blue bin tonnage to over 1 million tpy.[17] The number of Clean MRFs that would be required to process the projected increases is shown in Table 14.

[17] The number of tons of blue bin materials was calculated using the material flow model and estimating the policy and program participation rates and efficiencies. Based on these assumptions, diversion tons were estimated by scenario.

Table 14: Projected Blue Bin Facility Demands (200,000 TPY)

Wasteshed	Additional Blue Bin Facilities needed in 2030 by Wasteshed				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Overall	2	4	6	4	5
East Valley	<1	1	1	1	1
Harbor	<1	<1	<1	<1	<1
North Central	<1	1	2	1	2
South LA	<1	<1	1	<1	<1
West Valley	<1	1	1	1	1
Western	<1	1	1	1	1

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013
Note that totals may not sum due to rounding.

In the wastesheds listed in Table 14, less than one facility is indicated by "<1," and suggests that in those cases some facilities may be able to serve multiple wastesheds. In each scenario, transfer station capacity may be desired in certain districts, such as Harbor, to make transportation of blue bin materials to Clean MRFs more efficient and environmentally friendly.

3.4 Existing Facility Capacity and Expansion Potential

As described in Sections 3.1, 3.2, and 3.3, the projected demand or total number of facilities required was determined, assuming full build-out of all desired facilities and assuming that no facilities currently exist to process waste. This section discusses existing solid waste facilities in and around the City and identifies the existing available capacity and the potential for expansion capacity using published information and/or surveys of existing facilities. This section does not address possible institutional obstacles, permitting and/or jurisdictional constraints for utilizing the available capacity, but is intended to identify potential capacity realizing that additional research and more detailed analysis would be needed to confirm the possible use of the available capacity.

Detailed information on the facilities, their processing capacity, and the methods used to determine existing and potential expanded capacity is provided in **Attachment D-3 Existing Facility Capacity Analysis.** A summary of the results of the analysis is shown in Table 15, which gives a range of available processing capacity and expansion potential for different facility types.

Table 15: Available Processing Capacity Expansion Capacity by Facility Type

Facility Type	Available Processing Capacity (tons per day)
MMP	1,750 - 3,600
Clean MRF	1,200 - 2,600
Composting	550 - 1,100
Chipping & Grinding	900 - 2,300
C&D Processing Facilities	2,300 - 4,850
Transfer Stations	4,800 - 8,150
Food scraps	150 - 300
Waste-to-Energy Facilities	Approx. 1,200
Landfills	25,000 - 28,000

Sources: Attachment D-3 Existing Facility Capacity Analysis
County of Los Angeles Countywide Integrated Waste Management Plan: 2012 Annual Report

Available C&D processing capacity is between 2,300 tpd and 4,850 tpd (717,600-1,513,200 tpy), but C&D generation is only expected to increase by 62,000 tpy by 2030, including all the changes in policies and programs. The number of MMP facilities, Clean MRFs, and compost facilities that would be required by the City for full implementation of policy and program scenarios (assuming utilization of existing facility capacity takes place first), is discussed below. Table 16 shows the projected number of MMP facilities that will be required to process all the black bin waste in each scenario. The number of MMP facilities required by wasteshed was not broken out because existing facilities, both inside and outside the City, will likely accept waste from multiple wastesheds, and some facilities may not be able to receive waste from the City because of jurisdictional or other agreements or obligations. Each new MMP facility will have the capacity to process about 200,000 tpy of black bin waste.

Table 16: Black Bin Facility Requirements by 2030

Facility Type	Number of Black Bin Facilities Required				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Projected Demand					
MMP	15	11	8	11	8
Net New Facilities Needed					
MMP	12	8	5	8	5

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013

The actual number of green bin facilities, which will be required to process green bin materials, is shown in Table 17. This number includes the anticipated and existing green bin capacity from existing facilities to be between 550 and 1,100 tpd. Assuming each facility operates six days per week, and using the conservative end of the range at 550 tpd, existing green bin facilities could process about 172,000 tpy. Table 17 details the overall expected number of green bin facilities required in the City.

Table 17: Green Bin Facility Requirements by 2030

Facility Type	Number of green bin facilities required				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Projected Demand					
Compost (large)	<1	1	2	1	2
Compost (small)	<1	4	9	4	9
Net New Facilities Needed					
Compost (large)	0	0	1	0	1
Compost (small)	0	1	6	1	6

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013

The actual number of Clean MRFs, which will be required to process blue bin materials, is shown in Table 18. This number includes the anticipated existing Clean MRF capacity from existing facilities to be between 1,200 and 2,600 tpd (assuming each facility will receive waste 300 days per year, and the facilities will receive a total of 1,200 tpd). With these assumptions, existing Clean MRFs could process about 360,000 tpy of source separated recyclables generated in the City. Table 18 details the expected number of Clean MRFs that will be required in the City after existing Clean MRF capacity is considered.

Table 18: Blue Bin Facility Requirements by 2030

Facility Type	Number of Blue Bin Facilities Required				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Projected Demand					
Clean MRF	2	4	6	4	5
Net New Facilities Needed					
Clean MRF	0	2	4	2	3

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013

3.5 Transfer Station Capacity Requirements

The facility scenarios assume that the City will be successful in siting the needed number of blue bin, green bin, and black bins facilities throughout the City and within each wasteshed. The stakeholders who participated in the SWIRP planning process supported the development of community scale facilities within each wasteshed to handle the materials generated within each wasteshed. However, because of the difficulties of siting new or expanding existing facilities, it is likely that the City will need to transfer some materials between wastesheds for processing, or transfer materials outside of the City for composting or ultimate disposal. As described in Sections 3.5.1 and 3.5.2, up to 7,000 tpd of black bin and green bin materials generated citywide may need to be transferred between wastesheds or outside of the City if the City or private sector operators are unsuccessful in siting new black bin and green bin facilities within the City.

3.5.1 Black Bin Material Transfer

As described in Section 3.4, five new black bin processing facilities are anticipated to be needed in the City by 2030, assuming full implementation of programs. As described in Section 3.1, the City is expected to generate between approximately 1.5 and 3 million tons of residual waste per year (or 5,000 to 10,000 tpd based on 300 operating days per year) by the year 2030 that will require processing. If the City or the private sector operators are unsuccessful in siting these facilities, they may have to transfer these tons to remote black bin processing facilities or remote landfills.

Attachment D-3 Existing Facility Capacity Analysis describes the excess capacity currently available at existing transfer stations within the region. The analysis concluded that there was between 4,800 and 8,150 tpd of available or planned capacity at existing transfer stations. Table 19 summarizes this analysis.

Table 19: Existing and Planned Transfer Station Capacity

Transfer Stations	Permitted Capacity (tpd)	Estimated Additional Transfer Capacity (tpd)
American Waste Transfer Station	2,225	100-200
Athens Services Transfer Station	5,000	--
Athens (Sun Valley)	1,500	500-1,000
Bel-Art Waste Transfer Station	1,500	--
Carson Transfer Station	5,300	--
Central Los Angeles Recycling and Transfer Station (CLARTS)	4,025	1,000-2,500
Community Recycling	1,700	500-800
Compton Recycling & Transfer Station (Browning Ferris Industries)	1,500	600-1,000
Downey Area Recycling & Transfer Station (DART)	5,000	--
East Los Angeles Recycling and Transfer Station (ELARTS)	700	100-150
Falcon Refuse	1,850	--
Innovative Waste Control	1,250	--
Mission Road Recycling and Transfer Station (Waste Management)	1,785	--
Paramount Resource Recycling Facility	2,400	200-500
South Gate Transfer Station – Los Angeles County Sanitation District	1,000	--
South Gate Transfer Station – Waste Management	2,000	--
Southern California Disposal	1,056	300-500
Waste Resources Recovery	500	1,500
Total	**40,291**	**4,800-8,150**

Data based on surveys conducted for SWIRP in 2007 and 2008. Refer to Attachment D-3 Existing Facility Capacity Analysis, beginning on page D-3-1.

Note: Falcon Refuse has the physical capability of expanding from 1,850 tpd to 5,600 tpd and Bradley Transfer Station is pursuing an expansion from 1,500 tpd to 5,000 tpd.

The additional transfer capacity was estimated, using the information developed from the Facility Surveys included in Attachment C-1 in *Appendix C Infrastructure and Materials Flows*, beginning on page C-1-1. Each facility was asked about its current expansion plans and expansion potential. Several facilities, including Athens (Sun Valley), Community Recycling, Compton, Paramount, Southern California Disposal and Waste Resources Recovery are actively engaged in pursuing permits for expansion. CLARTS has developed a master plan to evaluate the feasibility of increasing its processing capacity. Several facilities are known to have some excess capacity or are operating at less than their permit limits including American Waste, CLARTS, and ELARTS. Falcon has no current plans to expand its facility. However, it reported that it has the physical capability of expanding from 1,850 tpd to 5,600 tpd. In addition, the Bradley Transfer Station (which was not operating in 2006 during the timeframe of the facility surveys) currently operates at 1,500 tpd and is pursuing an expansion to 5,000 tpd. Based on this information, there is potentially as much as 15,400 tpd of excess or potential new transfer capacity in the region that could be available to generators in the City. LASAN may wish to secure long-term agreements for some transfer capacity. However, it appears that the private sector operators are investing in sufficient capacity to meet the needs of the generators in the City.

3.5.2 Green Bin Material Transfer

As described in Section 3.4, one large or six small green bin processing facilities will need to be developed in the region by 2030 to handle the materials expected to be generated through the full implementation of the policies and programs. Since compost facilities may be difficult to site and permit in the urban areas, the City may need to transfer green bin materials to remote facilities. As described in Section 3.2, residents and businesses in the City are expected to generate up to 560,000 tpy or 18,000 tpd (based on 300 operating days per year) of green bin materials citywide in 2030 at full implementation of programs. If the City or private sector operators are unsuccessful in siting new green bin processing capacity, at least some additional transfer station capacity will need to be secured by 2030 in order to meet the City's needs.

3.5.3 Blue Bin Material Transfer

Blue bin materials are generally delivered to Clean MRFs by route trucks and are not typically transferred or double-handled. However, as described in *Appendix C Infrastructure and Material Flows*, Attachment C-3 Recycling Facility Surveys, some of the LASAN residential curbside tons are transferred to the Bestway Firestone Facility from the Bestway Jefferson Boulevard location (which serves as a transfer point and does not process the materials). West Valley Fibers reported plans to expand its facility. They are planning to add transloading capabilities to handle additional residential curbside recyclables, multi-family residential recyclables, and commingled commercial recyclable materials. Depending on where new blue bin processing capacity is developed, some transloading capabilities may continue to be needed in the future.

3.6 Landfill Capacity Requirements

As described in Section 3.1, the City is expected to generate between approximately 1.5 and 3 million tons of residual waste per year (or 5,000 to 10,000 tpd based on 300 operating days per year) by the year 2030 that will require processing. Assuming that the City or private sector operators are successful in siting new black bin processing facilities within the City and these facilities are capable of diverting 70 to 90 percent of the residual waste from disposal, as much as 150,000 to 900,000 tpy (500 to 3,000 tpd (based on 300 operating days per year) will still require landfilling. Table 20 provides an estimate of the potential excess daily capacities of the landfills in the Los Angeles region that are expected to remain operational through 2030.

Table 20: Potential Excess Daily Capacity of Landfills within the Los Angeles Region through 2030[1]

Facilities	Permitted Daily Capacity (tons)	2012 Average Daily Tonnage (tons)[2]	Potential Excess Daily Capacity (tons)	Anticipated Closure Date
Antelope Valley Landfill	3,564	966	2,598	2042
Sunshine Canyon City/County Landfill	12,100	8,500	3,600	2037
Scholl Canyon Landfill	3,400	808	2,592	2030
Lancaster Landfill	1,700	800	900	2044
Savage Canyon Landfill	350	300	50	2048
City of Burbank Landfill	240	126	114	2053
San Clemente Landfill	10	1.5	9	2032
El Sobrante[3]	16,054	7,400	8,654	2045
Simi Valley[3]	9,250	2,500	6,750	2052
Total	**46,668**	**21,402**	**25,267**	

[1] Source: County of Los Angeles Countywide Integrated Waste Management Plan: 2012 Annual Report
[2] Based on 5-days/week landfill operation (261 days/year)
[3] Source: www.calrecycle.ca.gov/SWFacilities/Landfills/Tonnages/

Section 4 Market Assessment

4.1 Introduction

This section assesses the current status of recycling markets for the primary and secondary materials expected to be diverted through implementation of the various SWIRP programs, policies, and facilities. Opportunities for enhancing the quality of recovered materials and encouraging creation and expansion of market development for recyclers, manufacturers and end-users in the Los Angeles region are also discussed.

Recycling markets are a necessary component for any Zero Waste system. Intermediate and end markets provide the vehicle for beneficial reuse of the diverted materials by returning them to the manufacturing and production of new products. Markets also provide an important revenue source to help sustain diversion programs; create new green jobs; and reduce greenhouse gas emissions. Without sufficient markets even the best diversion programs will fail.

4.1.1 Traditional Commodity Recyclables

Markets vary widely in terms of the role that dealers and brokers play in selling and purchasing materials recovered through material collection programs or from material recovery facilities (MRFs) or mixed material processing (MMP) facilities. Recovered materials can be broken into two major categories: traditional commodity recyclables (bottles, cans, fiber paper, plastic), and organics. There are important differences between the types of markets available for these two broad categories.

There are basically three types of potential buyers for the recovered materials: processors or dealers, brokers, and end-user manufacturers. Dealers purchase recyclable materials, process them to end-user specifications, and transport them to market. These firms include paper packers, paper stock dealers, scrap metal dealers, and intermediate processors that handle a wide variety of recyclables. A broker generally purchases materials directly from a number of suppliers and resells them to an end-user manufacturer without any processing. Brokers provide transportation arrangements to deliver the materials to market, and can provide advantages to the end-user because they can ensure a reliable supply of materials, usually at steadier prices. End-user manufacturers (such as paper mills, steel and aluminum smelters, glass, or plastic manufacturing plants) use the recyclable material as an alternative or supplemental feedstock to virgin materials in the manufacturing process to create new products that will be sold to consumers.

4.1.2 Local Market Development for Recyclables

For materials that do not have sufficient markets or infrastructure, government intervention has helped create markets, such as implementing a bottle bill or requiring the use of recycled content products such as requiring all newspapers sold or printed to contain a minimum amount of recycled fiber.

In the past, bottle bills have been introduced to encourage recycling, discourage litter, and generate revenue on unclaimed deposits. The California Beverage Container Recycling and Litter Reduction Act (AB 2020) enacted in 1986, helped foster collection infrastructure by establishing redemption values on beverage containers and requiring the establishment of certified recycling centers within convenience zones where the public could return beverage containers to redeem them for cash when the containers were recycled. The program includes plastic, glass and metal beverage containers, with California being the first state in the nation to include plastic containers. The redemption value is 5 cents on containers less than 24 ounces and 10 cents on containers 24 ounces or larger.

Another program to foster collection and recycling infrastructure was established in California through passage of the Electronic Waste Recycling Act of 2003 (SB 20). This legislation affects product retailers and consumers, and establishes an Electronic Waste Recycling Fee for some types of e-waste in order to divert hazardous products from the waste stream and support an emerging market for the electronic components. Under this program, consumers pay a fee at the point of sale of certain electronics, such as televisions and computer monitors. Fees are based on screen size measured diagonally, and the most recent revised fees are: $8.00 for screens greater than 4 inches and less than 15 inches, $16.00 for screens equal to or greater than 15 inches and less than 35 inches, and $25.00 for 35 inches and larger. Retailers remit these fees to the Board of Equalization (BOE). The funds are then distributed to State approved recyclers at the fixed rate per pound for collection and a separate rate for recycling, or a combined rate for collection and recycling. The State approved recyclers (if they have not collected the material) in turn pay the established fixed rate to State approved collectors. This program has dramatically increased e-waste recycling in California.

All recycling markets operate under a true supply and demand economy that is impacted by global politics, population and economic growth, and human behavior and changing attitudes about consumption and climate change. Market prices fluctuate and are occasionally volatile since they are susceptible to external market forces.

Materials that have existing markets include cardboard (old corrugated containers/OCC), newspaper (old newspaper/ONP), glass, #1 plastic (polyethylene terephthalate/PET), #2 plastic (high density polyethylene/HDPE), ferrous metal, aluminum, and more, but few are local or domestic markets. Recyclable commodities are traded on a worldwide basis and there is greater demand for these commodities in Asia where many of the products (and packaging) that are purchased in the US (and throughout the world) are manufactured. Local market demand is dependent on the local manufacturing economy, which has historically decreased in the Los Angeles region due to a declining industrial base and increased demand for residential and commercial development. If more products and packaging were produced locally, there will be more demand for purchasing these commodities locally. Development of local markets for non-commodity recyclables (organics, C&D, building materials, and reusable items) is an important focus of the City.

Recyclables are delivered to processing facilities in source separated form (such as loads from curbside blue bin collection routes), in "clean" (e.g., minimally contaminated by wet waste) loads of commercial materials. The resultant "products" after processing will include the following recyclables:

- OCC
- ONP
- Mixed paper

- Clear, amber, and green glass containers; and mixed glass cutlet
- PET, HDPE and all #3 - 7 plastic containers
- Mixed plastics and film plastic
- Ferrous and nonferrous scrap metal
- Aluminum, steel, and bi-metal cans
- Textiles (for reuse, rags, and export)

The unprecedented rise of market prices between 2006 and 2008 was due to the increased demand in the Pacific Rim markets and burgeoning gross national products of China, India, and other fast growing economies globally. The dramatic fall (late 2008) in prices was due to the global recession. The mill price for OCC during 2006 - 2008 rose to $200 per ton, then declined rapidly in the latter half of 2008 to below $40 per ton and rebounded in mid-2009 to roughly $95 per ton. When markets are down, recyclers will store or stockpile commodities that have value. The last time commodity markets plunged (in the 1990s) it took ten years for prices to fully recover. However, veteran recyclers understand that commodity prices are dictated by the laws of supply and demand and will never be static.

According to surveys of local processors, since the economy has recovered from the recent global economic recession, it is expected that capacity for recycled material will continue to expand beyond previous levels, domestically and/or internationally.

Southern California has lost several recycled fiber paper mills since the early 2000s, as product manufacturing and paper production have moved overseas. It is reasonable to assume that mill capacity will be developed overseas (for material such as fiber and plastic) and domestically (for materials such as glass and aluminum) as needed to consume the additional tonnage generated by SWIRP policies, programs, and facilities. This has been the case historically and should continue in the future, as long as the demand for the final products (such as cardboard boxes, glass containers, and aluminum cans) continues. The City is able to efficiently and quickly ship resources overseas due to the proximity of the Port of Los Angeles and Port of Long Beach, which combined are the third largest port complex in the world.

China's "Green Fence" policy went into effect in February 2013. Under this policy, the Chinese government has put stricter controls on the recyclable materials imported into the country and has rejected over 800,000 metric tons of poorly sorted or dirty shipments of materials from foreign exporters.[18] This has required local processors to more carefully prepare their materials for export, increasing the cost of recycling.

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[18] The Guardian, "Could China's 'green fence' prompt a global recycling innovation?" August 27, 2013, http://www.theguardian.com/sustainable-business/china-green-fence-global-recycling-innovation (accessed October 1, 2013).

In summary, capacity should be available both domestically and overseas to consume the City's additional recyclables. Market deficiencies exist only for those fringe commodities such as textiles (and perhaps low grade mixed plastics or poorly sorted materials). Opportunities for domestic market development exist for some textiles. Some carpeting is being recycled back to the carpet mills; natural fiber materials are remanufactured into wiping cloths and rags and some synthetic materials are reused in carpet underlay pad. However, source-separated textiles will need sustainable end-user markets in addition to the export market

It may be desirable to provide economic or other incentives to help create commodity markets locally. By developing local markets, the City may be able to create a sustainable local economy for recyclables to help reduce reliance on overseas markets, improve the local economy and create new local jobs.

4.1.3 Organics

California has been a pioneer in the recovery and treatment of materials in the organic waste stream (yard trimmings, food scraps, biosolids). Some organics recycling programs have been operating in the Los Angeles area for generations. While formalized curbside collection of residential and commercial organics (yard trimmings, food scraps, food soiled paper) substantially increased in California after 1995, recent waste characterization studies have shown that organics are currently the largest material type still present in the waste stream, even 20 years after the passage of AB 939 (Assembly Bill 939, The California Integrated Waste Management Act of 1989).

In Southern California, many landfills accept yard trimmings (processed or unprocessed) for use as ADC. Under current statute, this is considered "recycling" and counts as diversion credit under AB 939. City policy[19] does not allow yard trimmings collected by LASAN to be used as ADC. Recent legislative and regulatory action may change that definition in the future. The closure of the Puente Hills Landfill in October 2013 will also have a tremendous impact on the ADC markets. CalRecycle is currently reviewing the regulations and policies relating to the use of yard trimmings as ADC. In addition to ADC, yard trimmings are used for direct land application (typically to orchard crops like lemons and/or avocados); as fuel for wood waste to energy (biomass) plants, to make compost or as a bulking agent for sewage sludge composting.

The following sections discuss the market conditions for organics that are or will be produced by SWIRP policies, programs, and facilities.

4.2 Market Development – Organics (yard trimmings, food scraps, and other organics)

SWIRP and other Zero Waste plans across the U.S. and Canada are placing new emphasis on the diversion of organics remaining in the waste stream, estimated to comprise about 30 percent of the City's total disposal tonnage.

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[19] Public Works Board Report on Green Waste Processing Contingency Plan adopted on September 22, 2006.

4.2.1 Yard Trimmings

Until very recently, the LASAN organics diversion program consisted of residential yard trimmings collection (green bin), horse manure (brown bin) and a minimal amount of yard trimmings and manure diverted by the Los Angeles Zoo. In addition, a significant tonnage of source-separated yard trimmings are collected and delivered to chipping and grinding facilities by the private sector (tree trimmers, landscapers, and others).

In recent years, the City has launched pilot collection programs targeting supermarkets, restaurants, and residential curbside customers to divert food scraps. Given the emphasis on organic diversion by SWIRP, and the expected increase in recovered quantities of between 400,000 and 700,000 tons per year, it is imperative that sustainable markets be found.

The processing of typical yard trimmings from the residential sector consists of contaminant removal, grinding, and screening which results in three main products: mulch (chips and fines together), fines for composting, and wood chips for landscaping or biomass power.

Markets for recovered organic products (like compost and mulch) have been slow to develop in Southern California for a number of reasons. Many observers believe that the abundance of free or very low cost ADC "markets" eliminated both the need to develop non-ADC markets and the need to maintain feedstock quality.[20] In most cases, the contamination levels in curbside yard trimmings are unimportant if they are to be used for landfill cover. In order to access agricultural markets, yard trimmings would need to be transported north or east to agricultural markets. This is also currently true of accessing the wood waste-to-energy (biomass) markets and has not proven to be a substantial barrier. Urban wood waste can be marketed to biomass facilities located in the agricultural areas. However, the City needs to strive for local markets and accessibility. This could be achieved by siting facilities locally that can process urban wood waste, including alternative technologies such as gasification (wood waste to energy) and acid hydrolysis (wood waste to ethanol).

CalRecycle has spent over $1 million demonstrating the use of urban-derived yard trimmings as a feedstock for compost used on agriculture. Due to their efforts since the 1990s, as well as market development by the few composters able to compete with ADC, some agriculture markets do exist. Agriculture is currently the single biggest market for finished compost in California. The recent rise in fertilizer prices (which tend to track with natural gas prices) has also contributed to good agricultural markets for compost. The ability of compost and mulch to retain moisture in the soil (allowing a grower to use less water and less energy to pump it) may also be a future driver in the agricultural use of compost.

CalRecycle is developing a Life Cycle Analysis of Organics Diversion Alternatives. A study that was completed as part of that larger study documented that there are significant greenhouse gas (GHG) benefits from using compost on agricultural soils.

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[20] Note that City policy does not allow yard trimmings collected by LASAN to be used as ADC.

The local market situation will be further stressed by two future events: 1) the continuing pressure at CalRecycle to minimize and eventually eliminate the diversion credit for the use of yard trimmings as ADC in landfill operations and 2) the closure of the Puente Hills Landfill. The former will place another 2,800 tpd of yard trimmings and mulch on the open market for Los Angeles County, 1,500 tpd for Orange County, 690 tpd for Riverside County, 460 tpd for San Bernardino County, and 145 tpd for Ventura County.[21] The closure of Puente Hills alone will release 1,200 tpd of yard trimmings to the open market. In total, approximately 5,600 tpd of yard trimmings will be available for a market that has been slow to expand in the past, due in part to the prevalence of cheap and available ADC markets. It is likely that region-wide market development efforts will be needed to ease the transition from reliance on ADC. Jurisdictions in areas without access to ADC markets do not report difficulty marketing recovered organic products. However, the development of steady agricultural markets for yard trimmings and mulch, and yard trimmings containing food scraps for compost may take years to fully develop.

4.2.1.1 Market Development - Yard Trimmings

Opportunities for development of markets for yard trimmings must include the following:

1. **Reduce Contamination.** Increase outreach efforts to educate City residents about acceptable and unacceptable materials for the green bin program. This effort will lead to a reduction in contamination, improved handling of the material during processing, a better compost product, improved marketability, and lower production cost.
2. **Support Ongoing Outreach Efforts.** CalRecycle has been holding a number of workshops highlighting the benefits of recovered organics on agricultural soils. To support the ongoing outreach efforts, the City can work with CalRecycle, the local Resource Conservation Districts, and University Extension agents to support and expand these efforts.
3. **Enhanced Organics Marketing Plan.** To enhance its marketing efforts, the City can undertake a written organics marketing plan that provides a detailed strategy for managing the increased volumes of organics to be diverted. The City can continue investigating how to access agricultural and horticultural markets for compost and mulch.
4. **Adopt Compost Use Specifications.** The City can adopt or adapt existing CalTrans specifications for using compost and mulch in all City public works projects (such as erosion control and stormwater management).
5. **Compost Use in New Development.** The City can also consider adopting a compost use requirement for any new residential or commercial development or re-development.

[21] Source: CalRecycle Disposal Reporting System, 2007.

6. **Increased use by residents.** Enhanced outreach and education of the residents of Los Angeles related to free pick-up of mulch and compost at the City's eleven mulch give-away sites.[22]

4.2.2 Food Scraps with Yard Trimmings

Food scraps are one of the largest untapped materials in the California waste stream. How food scraps are diverted and processed depends on the source. Many jurisdictions are adding residential food scraps to their residential curbside yard trimmings collection programs. Co-collected food scraps and yard trimmings must go to a composting facility that is permitted to accept food scraps. Currently, only about 10 to 15 percent of the existing composting facilities in California are permitted to accept food scraps, but this is changing rapidly. In addition, CalRecycle is currently examining the scientific basis for requiring food scraps to be processed at the highest tier-composting permit.[23] A number of Notification-tier facilities are successfully using a Research Notification to allow them to accept food scraps while they process the higher tier permit. The addition of residential food scraps to residential yard trimmings would have a significant diversion potential (for the residential sector).

4.2.2.1 Market Development – Food Scraps with Yard Trimmings

Once food scraps are added to residential curbside collection, they can no longer be used as ADC or mulch. If they are to be composted, they typically need to be received at a composting facility with a permit to accept food scraps. As mentioned in Section 4.2.2 Food Scrap with Yard Trimmings, only about 10 to 15 percent of the facilities in California are currently permitted to accept food scraps.

The recommended market development required to accommodate the addition of residential food scraps to residential yard trimmings collection are similar as those listed in Section 4.2.1.1 for overall yard trimmings market development, with the following additions:

1. If the addition of food scraps in the green bin is implemented citywide, the City must undertake a comprehensive outreach and education program to encourage residents to reduce contamination and increase participation. This will result in a cleaner feedstock material for processing and a better final product for the markets.

2. The City should support efforts at the State level to allow all composting facilities to accept food scraps for composting (not only those permitted at the highest tier). This will increase the options for City-collected organics.

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[22] Boyle Heights, East Los Angeles, Elysian Valley, Lakeview Terrance, Lincoln Heights, North Hills, North Hollywood, San Pedro, Sun Valley, Van Nuys, West Los Angeles.

[23] CalRecycle permits composting facilities according to different "tiers", based on the throughput of the facility and the types of materials processed. The lowest tier (requiring the least regulation) is the "Exempt" tier, followed (with increasing regulation) by the "Notification," "Registration," and "Full Solid Waste Facility Permit" tiers. "Research Notification" is a special designation for facilities permitted under the Notification tier that are testing composting methods. These provisions are described in the California Code of Regulations, Title 14, beginning with Section 17850.

4.2.3 Food Scraps

The addition of food scraps to yard trimmings-only composting facilities is seen by some as improving the quality of the final compost product. Adding food scraps may also reduce the amount of water required during the composting process.

This improved compost quality by the introduction of food scraps as feedstock has been documented by two of the largest composters of food scraps in the State: Jepson Prairie Organics (a division of Recology, formerly Norcal Waste Systems, Vacaville) and Community Recycling and Resource Recovery (Lamont). Community Recycling has been successfully using their compost product on a variety of agricultural crops in the San Joaquin Valley including cotton, citrus, strawberries, almonds, and alfalfa.

Some food scraps (predominantly commercial, industrial, or institutional) may be collected separately in great enough quantities to be used for anaerobic digestion. In some cases, the food scraps may be co-digested using existing digester capacity at wastewater treatment plants, or it may be digested by stand-alone digesters or through the wastewater collection system through residential garbage disposal units. It is unclear whether or not the "residue" from anaerobic digestion (often called "digestate"[24]) will need to be composted or will be able to be directly applied to agricultural land or otherwise beneficially reused. The end use of material that has been anaerobically digested will depend on the quality of the material (source separated or commingled) and the specific type of digester (high solids versus low, mesophilic versus thermophilic, etc.).

4.2.3.1 Market Development – Food Scraps

The required market development strategies for food scraps are similar to the recommendations for yard trimmings discussed in Section 4.2.2.1 with the following additions:

1. The City can advocate for additional markets for foods scraps by participating in CalRecycle's discussions on anaerobic digestion.
2. The City is studying the potential to include pre-processed food scraps at its wastewater treatment plants.

[24] Digestate is solid material remaining after the anaerobic digestion of a biodegradable feedstock.

The following chart describes the different organic feedstocks, processing techniques and end uses.

Feedstock	How Processed	End Use
Yard Trimmings	Chipped and/or ground; Composted	Biomass Fuel ADC Colored Mulch[25] Direct Land Application Mulch Compost Feedstock Co-compost Bulking Agent
Yard Trimmings co-collected with Food Scraps	Chipped and/or ground; Composted	Compost
Food Scraps	Composted Digested	Compost Biogas and Digestate

4.3 Additional Commodities Produced by New Policies and Programs

The policy, program, and facility scenarios under consideration for SWIRP are predicted to generate a significant increase in diverted material that must find adequate markets in order for the master plan to be successful. Market capacity to accommodate the increased supply of diverted materials will come from utilizing the existing markets, expanding the markets already in place, or from creating new markets, and likely will include all three.

The following additional tonnages associated with implementation of SWIRP policies, programs, and facilities will need to find or develop markets:

- Approximately 800,000 to 1,000,000 tons per year of additional traditional commodity recyclables (paper, glass, metals, plastic, and similar products)
- Approximately 200,000 to 550,000 tons per year of additional organics (yard trimmings, food scraps, and similar materials)
- Approximately 60,000 tons per year of additional inerts

These materials will be processed by a variety of facilities including Clean MRFs, MMP facilities, C&D MRFs, yard trimmings chipping and grinding, yard trimmings (with food scraps) composting, and alternative technologies.

[25] Colored mulch is created from wood waste that has been dyed for use in decorative landscaping.

Section 5 Facility Aesthetics

It is important to integrate each facility into the community it serves, both functionally and aesthetically. Further studies will be required to design, permit, and construct facilities, but certain design and operation philosophies and considerations can be applied to help integrate any structure into its neighborhood. Some communities and jurisdictions even have a set of aesthetic guidelines for new buildings to promote a sense of community and harmony among buildings. The following are typical design philosophies used to integrate solid waste facilities within the community and neighborhood they are to be built in:

- **Traffic** – Site location, off-site routes, and ingress and egress plans should be chosen to work with existing traffic patterns and limit the potential traffic burden. Facilities should also be designed to screen large scale operations from public view and to provide efficient design and operation to minimize the amount of vehicles waiting in queue and to ensure that queuing does not occur on public roadways.
- **Building size** – Solid waste facilities generally require a large clear floor space with a high roof clearance, so several design approaches are used to minimize or reduce the visual impact of the facility. These approaches can include designing the facility to blend in with nearby buildings, identifying highways, roads and other important vantage points, and using landscape and other screens to protect the neighbor's view of the facilities.
- **Noise** – Sites should be arranged to minimize the time trucks spend idling in queue, to provide screens and landscaping that diffuse sound, and provide onsite parking as a buffer zone for sound. Operation and process noises that occur inside the facilities can be minimized by fully enclosing the building, orienting openings to face screens, and lining or insulating buildings to reduce sound.
- **Odor, dust, litter, and animal control** – Building design should include controls for reducing dust, while site design should consider prevailing wind conditions and sensitive neighbors. Proper material storage and cleaning can prevent odor and reduce the possibility of vermin (rodents and birds).
- **Community Involvement** – Projects can also increase their appeal to the community by including an education/information center, which would be capable of holding community meetings, educating citizens about recycling, and providing tours to schools. Providing a sustainable site, which may include Leadership in Energy and Environmental Design (LEED) certification, may also help promote the facility in the community.

Currently, there are several solid waste facilities designed to blend into the surrounding land uses that are operating successfully within the region, including the Rainbow Disposal MRF in Huntington Beach and the Puente Hills MRF in Los Angeles County. As existing facilities show, including desired design features and considering neighborhood aesthetics for solid waste facilities can help ensure that they become an asset to the community. A detailed discussion concerning aesthetics and community integration and a description of the Rainbow Disposal and Puente Hills facilities can be found in **Attachment D-4: Facility Aesthetics**.

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Attachment D-1 Waste Stream Analysis

Policy and Program Scenario Diversion and Disposal Estimates Using 2010 Projected Tonnage

Source: City of Los Angeles Zero Waste Planning Model – Final Results, January 2013

Tons Diverted and Disposed in Each Scenario - 2030

Results

	Single Family		
	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1	856,944	1,284,385	60%
Scenario 2	650,256	1,491,073	70%
Scenario 3	478,312	1,663,018	78%
Scenario 4	611,073	1,530,256	71%
Scenario 5	448,636	1,692,694	79%

	Multi Family		
	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1	537,190	159,656	23%
Scenario 2	415,566	281,280	40%
Scenario 3	290,718	406,128	58%
Scenario 4	387,505	309,341	44%
Scenario 5	270,493	426,354	61%

	Commercial		
	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1	1,649,062	3,662,047	69%
Scenario 2	1,217,933	4,093,176	77%
Scenario 3	834,526	4,476,582	84%
Scenario 4	1,169,252	4,141,857	78%
Scenario 5	812,197	4,498,911	85%

	Total (w/o C&D)		
	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1	3,043,196	5,106,088	63%
Scenario 2	2,283,754	5,865,530	72%
Scenario 3	1,603,556	6,545,728	80%
Scenario 4	2,167,830	5,981,454	73%
Scenario 5	1,531,326	6,617,959	81%

	C&D		
	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1	78,741	2,871,920	97%
Scenario 2	34,017	2,916,644	99%
Scenario 3	16,473	2,934,188	99%
Scenario 4	34,017	2,916,644	99%
Scenario 5	16,473	2,934,188	99%

	Total		
	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1	3,121,937	7,978,008	72%
Scenario 2	2,317,771	8,782,174	79%
Scenario 3	1,620,029	9,479,916	85%
Scenario 4	2,201,847	8,898,098	80%
Scenario 5	1,547,799	9,552,146	86%

Rounded Results

	Single Family		
	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1	857,000	1,284,000	60%
Scenario 2	650,000	1,491,000	70%
Scenario 3	478,000	1,663,000	78%
Scenario 4	611,000	1,530,000	71%
Scenario 5	449,000	1,693,000	79%

	Multi Family		
	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1	537,000	160,000	23%
Scenario 2	416,000	281,000	40%
Scenario 3	291,000	406,000	58%
Scenario 4	388,000	309,000	44%
Scenario 5	270,000	426,000	61%

	Commercial		
	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1	1,649,000	3,662,000	69%
Scenario 2	1,218,000	4,093,000	77%
Scenario 3	835,000	4,477,000	84%
Scenario 4	1,169,000	4,142,000	78%
Scenario 5	812,000	4,499,000	85%

	Total (w/o C&D)		
	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1	3,043,000	5,106,000	63%
Scenario 2	2,284,000	5,866,000	72%
Scenario 3	1,604,000	6,546,000	80%
Scenario 4	2,168,000	5,981,000	73%
Scenario 5	1,531,000	6,618,000	81%

	C&D		
	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1	79,000	2,872,000	97%
Scenario 2	34,000	2,917,000	99%
Scenario 3	16,000	2,934,000	99%
Scenario 4	34,000	2,917,000	99%
Scenario 5	16,000	2,934,000	99%

	Total		
	Tons Disposed	Tons Diverted	Diversion Rate
Scenario 1	3,122,000	7,978,000	72%
Scenario 2	2,318,000	8,782,000	79%
Scenario 3	1,620,000	9,480,000	85%
Scenario 4	2,202,000	8,898,000	80%
Scenario 5	1,548,000	9,552,000	86%

Note: The diversion potential of each policy and program was estimated based on data from comparable policies and programs implemented in other communities, research based on national studies and City pilot data, and educated estimates based on experiences with other similar programs. The diversion rates presented in this waste stream analysis assume full implementation of the policies and programs all at once. However, new policies and programs will be developed over time through additional research, testing, and pilot programs before full-scale implementation. Several policies will require new ordinances which will require City Council action and time to implement. This table presents the tons disposed, tons diverted, and the diversion rate by scenario. Descriptions and diversion assumptions for each of the policies and programs included in each scenario are included in *Appendix A Policy and Program Analysis*.

Attachment D-2 Facility Descriptions

Facility Types

During the SWIRP model planning meeting held in August 2008, the preliminary list of facility types to be profiled in the material flow model was identified. Based on the discussion at the model planning meeting held on January 29, 2009, a final list of facilities was selected for inclusion in the model. These facility types are highlighted in yellow. Facilities were categorized by major facility type.

Preliminary List (August 2008)
MRFs:
1. Clean
2. Mixed Materials Processing (dirty wet MRF)
3. Dirty dry MRF
C&D Processing:
4. C&D Mixed Processing
5. Inerts (also final destination)
Composting:
6. Mulching (current—yard trimmings only)
7. Aerobic composting of yard trimmings
8. Aerobic composting of yard trimmings and other organics
9. Composting
Anaerobic digestion:
10. Clean organics
11. Wet residual waste
12. Dry residual waste
Alternative Technology:
13. Advanced thermal recycling
14. Gasification
15. Plasma arc gasification
16. Pyrolysis
17. Hyrdolysis
18. Biomass-to-energy
Wood waste
Wood plus other biomass

Preliminary List (August 2008)- continued
HHW:
19. S.A.F.E. Centers
Reuse centers:
20. Reuse/Resource recovery center (small scale self-haul MRF with reuse)
21. Used item stores (e.g., Goodwill)
Transfer stations:
22. Residual waste
End-use markets:
23. Compost markets
24. Energy markets – gas or electricity
25. Commodities markets
26. Beneficial reuse of ash
27. Building materials (road base)
Additional Facilities added to the Model (January 2009)
Preprocessing prior to Alt Tech ATR
Preprocessing prior to Alt Tech Bio
Preprocessing prior to Alt Tech Thermal
Preprocessing prior to Alt Tech Chemical
Preprocessing prior to Alt Tech Bio and Alt Tech Thermal
Preprocessing prior to Alt Tech Bio, Alt Tech Thermal and Alt Tech ATR
Dismantling facility

Facility Descriptions

After the final list of facilities was determined, profiles for each of the facilities were made. These profiles include examples of other facilities of this type. These descriptions are not intended to provide definitive evidence of what is feasible in the City and the surrounding area, but are included to provide information and background for these facility types. Cost information was provided, when possible, to allow for comparison, and actual costs, processing capacities, and performance might vary significantly from what is presented below. Further information was collected on these facilities after their selection and initial descriptions were determined.

Type: Clean MRF

Examples:
1. Sun Valley Paper Stock, Sun Valley, CA, USA
2. City Fibers, North Hills, CA, USA
3. Bestway, Los Angeles (downtown), CA, USA

Feedstock: Source separated recyclables, especially curbside (Blue Bin)

Description: Sorts recyclable materials into commodities, consolidates or bales them, and sells and ships to markets. Contaminants trucked to local landfills.

Capacity Range: 50-600 tpd

Process: Material is dumped on a tipping floor, and then pushed by loaders to feed conveyors. Material is processed through dual stage screens to separate two dimensional items, typically fiber (OCC, ONP, mixed paper), containers, and small contaminants. Fiber is hand sorted off elevated conveyor platforms into commodities and dropped in bunkers below. Containers are processed through ferrous magnets, eddy-current magnets, and hand sorting. The small contaminant stream (dirt, rocks, broken glass and ceramics, bottle caps) may be further processed by optical/pneumatic sorting to recover broken glass. Sorted material is moved from bunkers and baled (fiber, plastic, metal) or loaded directly into roll-off trucks (glass).

Residues: Garbage, food scraps, auto parts, yard trimmings, wood, dirt and other inerts, glass shards

Products: Traditional commodity recyclables (OCC, ONP, mixed paper, aluminum cans, bi-metal cans, HDPE, PET, mixed plastics, HDPS, glass beverage bottles)

Markets: Domestic and overseas mills and manufacturing plants (i.e., paper mills, bottle manufacturing plants, aluminum smelters)

Landfill Diversion:

	Optimal	Average	Poor
Overall Diversion (%)	90+	80	70-

Level of Commercialization/Industry Experience:
- Approximately 25 years operational experience
- Hundreds of plants in U.S. alone
- High level of commercialization and refinements

Status of Development:
Mature: **X** Growth: Infancy: Demonstration:

Economics:
Capital Cost: $25,000 per ton of capacity
Tipping Fee: pays $10-20/ton (depending on quality of feed stock and revenue share)

Reliability/Confidence in Data:
High: **X** Medium: Low:

Caveats/Comments:
- Facility performance intimately tied to performance of curbside program and education of residents.
- Cost of program all in containers and collection.

Type: Mixed Material Processing Facility (Dirty MRF, MMP)

Examples:

1. Athens MRF, City of Industry, CA, USA
2. Rainbow Disposal, Huntington Beach, CA, USA
3. CVT, Anaheim, CA, USA
4. Community Recycling, Sun Valley, CA, USA
5. City Terrace Recycling, Los Angeles, CA, USA

Feedstock: Residual waste from residential and commercial generators
Materials Desired: Residual waste from residential and commercial sources
Problem Material: Concentrated loads of wet materials such as restaurant food scraps, construction and demolition materials

Delivery Assumptions: Local collection vehicles, rear loading, side-loading and front-loading, vehicles deliver residual waste directly to site

Description: Removes recyclable material from residual waste. Commodities that are removed are stored in boxes or bunkers and then baled or consolidated and sold and shipped to markets. Residues are shipped to local landfills.

Capacity Range: 200 – 400 tpd

Process: Residual waste from residential and commercial collection vehicles is tipped onto a floor. Material is sorted on the floor to remove larger items such as dimensional wood, metal, or large pieces of plastics that might clog or interrupt sort lines. Loaders or grapples then load a conveyor or surge hopper. In most cases, a mechanical device is used to open bags and containers prior to screening and sorting. Material is processed through dual stage screens to separate fiber (OCC, ONP, and mixed paper), containers, and small contaminants. Fiber is hand sorted off elevated conveyor platforms into commodities and dropped into bunkers below. Containers are processed through ferrous magnets, eddy-current magnets, and hand sorting. The small contaminant stream (dirt, rocks, broken glass and ceramics, bottle caps) may be further processed by optical/pneumatic sorting. Sorted material is moved from bunkers and baled (fiber, plastic, metal) or loaded directly into roll-off trucks (glass). The remaining material is shipped to a local landfill.

Residues: Garbage, food scraps, yard trimmings, electronic scrap, hazardous waste, wood, dirt and other inerts

Products: Traditional commodity recyclables (OCC, ONP, mixed paper, aluminum cans, metal cans, HDPE, PET, mixed plastics, HDPS, glass bottles) and ADC.

Markets: Domestic and overseas mills and manufacturing plants (i.e. paper mills, bottle recycling plants, smelters)

Landfill Diversion:

	Optimal	Average	Poor
Overall Diversion (%)	30	15	5
Overall Disposal (%)	70	85	95

Level of Commercialization/Industry Experience:

- Approximately 20 years operation experience
- Hundreds of plants in U.S. alone
- High level of commercialization and refinements

Status of Development:
Mature: **X** Growth: Infancy: Demonstration:

Economics:
Capital Cost: $30,000 to $50,000 per ton of capacity
Tipping Fee: $40 - $60 Varies depending on quality of feedstock, revenue from recyclables, transportation cost

Reliability/Confidence in Data:
High: **X** Medium: Low:

Caveats/Comments:

- Facility performance tied to collection and delivery system.
- City offers a certification program for mixed material processors.

Type: C&D Mixed Processing

Examples:

1. Bradley Landfill and Recycling Center, Sun Valley, CA, USA
2. Construction & Demolition Recycling, South Gate, CA, USA
3. Direct Disposal, Los Angeles, CA USA
4. Downtown Diversion, Los Angeles, CA, USA
5. Looney Bins, Sun Valley, CA, USA

Feedstock: Mixed construction and demolition materials from construction sites or remodels
Materials Desired: Loads with wood, cardboard, plastics, dry wall, concrete, dirt, asphalt shingles or other roofing materials
Problem materials: Asphalt shingles, roofing with tar paper and wood attached, wet/dry wall material

Delivery Assumptions: Receives drop-box/roll-off containers and contractor delivered materials; self haulers

Description: Removes recyclable and reusable material from mixed construction and demolition debris, including OCC, mixed paper, plastics, wood, gypsum board, scrap metals, soil, asphalt, brick, and concrete

Capacity Range: 50 - 500 tpd

Process: Mixed C&D loads are delivered to processing yards for sorting of the recyclable materials. Materials are tipped and floor sorted to remove bulky or large items (such as carpet, plastic pipe, large pieces of dimensional wood and steel). Large pieces of OCC and metals may also be removed at this time. Material then may be processed through screens to remove inert debris, including rocks, dirt, grit, glass, soil, and small items. The screened material may pass under a magnetic separator and crusher to create a uniform size. The material passing over the screens is conveyed to sorting lines to remove contaminants and separate materials; primarily wood, paper, plastic, and metal. Materials including gypsum board, soil and rock, and concrete may be ground for conversion into ADC for landfills. Remaining residual waste and contaminants are shipped to landfills. Sorted material is baled (fiber, plastic, metal) or can be loaded directly into trucks for transportation to recycling facilities.

Residues: Residual waste, small plastics, paper, other organics

Products: Steel, aluminum, construction inerts, soil and stone, asphalt, concrete, glass, cardboard, plastic, tile, brick, and possibly gypsum board

Markets: Construction (aggregate or fill, asphalt, concrete, soil and stone, brick, tile), foreign and domestic manufacturing (steel, aluminum, paper, cardboard, glass), landfills for ADC.

Landfill Diversion:

	Optimal	Average	Poor
Overall Diversion (%)	80	70	50-
Overall Disposal (%)	20	30	50+

Level of Commercialization/Industry Experience:

- Over 30 years operation experience
- Hundreds of plants in U.S. alone
- High level of commercialization and refinements

Status of Development:
Mature: **X** Growth: Infancy: Demonstration:

Economics:
Capital Cost: $15,000 to $30,000 per ton of capacity
Tipping Fee: $30 to $50/ton (depending on quality of feed stock and revenue)

Reliability/Confidence in Data:
High: **X** Medium: Low:

Caveats/Comments:

- C&D materials composition can vary depending on demographics
- Some areas charge more for C&D materials to be landfilled to encourage recycling
- Cost of program covered by cost to contractors and developers
- The City offers a certification program to mixed C&D recyclers

Type: Aerobic Yard Trimmings Composting/Aerobic Organics Composting

Examples:

1. Victor Valley Regional Compost Facility (formerly California Biomass), Victorville, CA, USA
2. Community Recycling, Lamont, CA, USA
3. Griffith Park Composting, Los Angeles, CA, USA
4. Tierra Verde Industries, Irvine, CA, USA

Feedstock: Depending on facility permit requirements, feedstocks can include: yard Trimmings (residential green bin or source separated); food scraps; manures; biosolids

Description: Biological decomposition of organic materials (i.e., yard trimmings, food scraps, and animal manure) by microorganisms in an aerated environment to produce a compost product which is beneficially reused as a soil amendment.

Capacity Range: 100-3,000 tpd

Process: *Traditional Windrow Method*: Composting is carried out in windrows with periodic turning for about 120 days. A compost pile requires proper nutrients, aeration, moisture, and temperature to carry out the decomposition process.
Aerated Static Piles (ASP): An enhanced composting method in which the windrow piles are aerated from a pipe gallery below. These operations may be enclosed in a building with the air emissions from the windrow piles are treated via a biofilter.
Covered Aerated Static Piles: A variation on the traditional ASP involves covering the piles with a textile blanket to allow collection and treatment of air emissions through a biofilter.

Residues: Primarily film plastic, glass shards, paper scraps, and other contaminants from the green bin program

Products: Soil Amendments

Markets: Local nurseries, building contractors, gardeners, landscapers, and the public

Landfill Diversion:

	Optimal	Average	Poor
Overall Diversion (%)			
Clean Green	99	95	90
Curbside	95	90	≤80

Level of Commercialization/Industry Experience:

- Approximately 30 years operational experience
- Hundreds of plants in U.S. alone
- High level of commercialization and refinements

Status of Development:
Mature: **X** Growth: Infancy: Demonstration:

Economics:
Capital Cost: $3,000 to $17,000 per ton of capacity
Tipping Fee: $40-60/ton (low end for traditional windrows, high end for covered ASP)

Reliability/Confidence in Data:
High: **X** Medium: Low:

Caveats/Comments:

- Traditional windrow composting is a mature method to process yard trimmings. Covered ASP is growing due to pending regulations requiring air emission control[26]
- LASAN green bin materials are prohibited from being used as ADC and must be composted or mulched

[26] South Coast Air Quality Management District Rules 1133, 1133.1 and 1133.2 (accessed October 1, 2013):
http://www.arb.ca.gov/DRDB/SC/CURHTML/R1133.PDF
http://www.arb.ca.gov/DRDB/SC/CURHTML/R1133-1.PDF
http://www.arb.ca.gov/DRDB/SC/CURHTML/R1133-2.PDF

Type: Yard Trimmings Chipping, Grinding and Mulching

Examples:
1. Community Recycling, Sun Valley, CA, USA
2. Harbor Mulching Facility, CA, USA
3. Lopez Canyon Environmental Center, Los Angeles, CA, USA
4. North Hills Recycling, Granada Hills, CA, USA

Feedstock: Source separated yard trimmings from residential green bins, landscapers, gardeners, tree trimmers

Description: Chips and grinds material to create mulch. Curbside yard trimmings often sorted to remove contamination prior to grinding

Capacity Range: 100-1,000 tpd

Process: Yard trimmings received and processed, typically in outdoor facilities, contaminants are pulled out by workers on the deck. Clean materials from landscapers, gardeners, and tree trimmers are ground in tub grinders, screened and stored pending sale or distribution. Curbside yard trimmings, which may have more contamination, are often screened, sorted for contaminant removal on an elevated sorting line, then ground and screened again.

Residues: Contamination in curbside material: plastic, rubber hoses, paper, residual waste, metal, glass, palm fronds

Products: Wood chips, the larger woody materials created by the grinding process, are sold or distributed for use as ground cover or sold as boiler fuel for biomass facilities. "Fines", the smaller materials screened out from the wood chips, are used for composting.

Markets: Local biomass power plants, composting operations, nurseries, developers, residential consumers

Landfill Diversion: Closely related to amount of curbside yard trimmings vs. "Clean Green"

	Optimal	Average	Poor
Overall Diversion (%)	99	95	<90

Level of Commercialization/Industry Experience:
- Over 30 years of experience
- Over 20 permitted facilities in the region

Status of Development:
Mature: **X** Growth: Infancy: Demonstration:

Economics:
Capital Cost: $2,600 to $3,600 per ton of capacity
Tipping Fee: $20-40/ton (depending on source and quality of feedstock)

Reliability/Confidence in Data:
High: **X** Medium: Low:

Caveats/Comments:
- Mulch from the LASAN curbside yard trimmings program is provided free to residents at mulch give away sites throughout the City

Type: Reuse Centers and Recovery Parks

Examples:
1. Cold Canyon Resource Recovery Park, San Luis Obispo, CA, USA
2. Recycle Town, Sonoma County, CA, USA
3. Urban Ore, Berkeley, CA, USA
4. Last Chance Mercantile, Monterey County, CA, USA
5. CHaRM (Center for Hard to Recycle Materials), Boulder, Colorado, USA

Feedstock: Varied, but typically: furniture, appliances, electronics, lumber, yard trimmings, recyclables, bicycles, clothing, inerts

Description: Typically an open area and/or warehouse where the public can drop-off and pick-up items for reuse or further processing for recycling

Capacity Range: 1-10 tpd

Process: Sites are designed with multiple drop-off areas or roll-off containers where the public places materials. Once truck-size lots accumulate, material is trucked to processing facilities or disposed if no markets exist. Users may also pick up items or material such as used furniture, mulch, or lumber.

Residues: Material and items without markets

Products: Items for reuse and recycling

Markets: Yard trimmings processors, e-waste processors, the public, thrift stores, building contractors

Landfill Diversion:

	Optimal	Average	Poor
Overall Diversion (%)	100	95	<90

Level of Commercialization/Industry Experience:
- o Decades of experience at the more significant facilities

Status of Development:
Mature: **X**[27] Growth: Infancy: Demonstration:

Economics:
Capital Cost: $50,000 per ton of capacity
Tipping Fee: $0/ton (Generally offered free to the public through subsidy by local jurisdiction; costs $50-100/ton)

Reliability/Confidence in Data:
High: **X** Medium: Low:

Caveats/Comments:
- Addresses self-haul loads, reuse and "hard to recycle" materials
- Favored in rural areas where there are more self-haulers, and traditional recycling and reuse programs are not available

[27] Resource Recovery Centers located at disposal facilities have existed in California for over 20 years. However, there are relatively few of these facilities in the Los Angeles area. The Allan Company operates the recycling facility at the City of Santa Monica Transfer Station. This facility includes a drop-off area for recyclable materials from the public (including metals, plastic, glass, and paper). It is more common for salvage operations in Los Angeles to be located off-site from disposal facilities. There are several architectural salvage facilities operating in the Los Angeles region, including Silverlake Architectural Salvage, Pasadena Architectural Salvage, Freeway Building Materials, Santa Fe Wrecking & Salvage, Habitat for Humanity, and Cleveland Wrecking. Materials, such as doors, windows, tubs, sinks, brick, tile and other salvaged items can be delivered by the public for drop-off, buy-back or consignment.

Type: Biomass Power Plant

Examples:

1. Madera Power LLC, Madera, CA, USA
2. Colmac Energy, Mecca, CA, USA
3. AES Delano, Delano, CA, USA

Feedstock: Ground wood waste, and yard trimmings, contaminated paper

Description: Power plants, typically in the 20-30 megawatt (MW) size that utilize wood chips and other biomass materials as a fuel to generate steam. Steam produced in the boiler is used in a steam turbine to produce electricity.

Capacity Range: 200-1,000 tpd

Process: Wood chips and other biomass materials are received in transfer trucks, dumped and stored in large open yards covering several acres. The material is then metered into the gasification or combustion units by feed conveyors. Heat from the combustion unit (such as a fluidized bed boiler) or gasifier unit is used to heat water to produce steam. Steam produced in the boiler is used in a steam turbine to produce electricity that is sold into the local power grid.

Residues: Ash, if unacceptable for soil conditioner

Products: Electricity, ash used for soil conditioner

Markets: Power utilities or large industrial users of energy. Local farms that use the ash as a soil conditioner.

Landfill Diversion:

	Optimal	Average	Poor
Overall Diversion (%)	99+	98	95

Level of Commercialization/Industry Experience:

- Over 40 years of experience
- 28 plants statewide
- Two facilities in Southern California

Status of Development:
Mature: **X** Growth: Infancy: Demonstration:

Economics:
Capital Cost: $100,000 per ton of capacity
Tipping Fee: pays $25 bone dry/ton ($15-20/ton "as received" depending on moisture content of feedstock)

Reliability/Confidence in Data:
High: **X** Medium: Low:

Caveats/Comments:

- Older facilities may need major retrofits – many facilities built in the 1970s
- Rising fuel cost for long haul to these remote plants impacts economics
- Typically, payment by the plant ($25 per bone dry tons) offsets trucking so suppliers usually break even
- Beneficial use of ash as soil conditioners provide near 100% diversion. Biomass facilities are able to market their ash. However, if no market exists and ash must be landfilled, this results in residues of approximately 7% by weight.

Type: Anaerobic Digestion (dry residual waste)

Examples:

1. DRANCO, Belgium
2. Valorga, Spain

Feedstock: Organics and residual waste

Description: Controlled, in-vessel decomposition of organic material by microbes producing biogas for heating and power generation, and a semi-solid digestate residual that can be used as compost feedstock. Solids are as high as 40% in the digester, hence the term "high solids" digesters.

Capacity Range: 200-500 tpd

Process: Material is typically screened or otherwise processed for contaminant removal, then metered into digester tanks where microbes digest the organics in the absence of oxygen and produce biogas which is collected off the top of the tank. The semi-solid digestate, comprised of less digestible material, is collected and used as compost feedstock in an aerobic composting operation. The biogas may be converted into a vehicle fuel or used to produce electricity.

Residues: Contaminants sorted out of feedstock; and digestate if no market exists.

Products: Biogas for heating and power production; and digestate for compost feedstock

Markets: Utility companies, large industrial gas or steam users, composting operations, truck fleets

Landfill Diversion:

	Optimal	Average	Poor
Overall Diversion (%)	80	70	60

Level of Commercialization/Industry Experience:

- o 10 years+ of experience at the more significant facilities

Status of Development:

Mature: Growth: **X** Infancy: Demonstration:

Economics:

Capital Cost: $100,000 to $200,000 per ton of capacity

Tipping Fee: $100-130/ton (varies depending on market for digestate, and value of electricity)

Reliability/Confidence in Data:

High: Medium: **X** Low:

Caveats/Comments:

- Mature technology for organic materials; emerging technology for residual waste
- Quality of feedstock important in overall facility performance
- Creates less gas and more digestate than the clean organics and wet residual waste digester

Type: Anaerobic Digestion (Organics and wet residual waste)

Examples:

1. UC Davis (Onsite Power), Davis, CA, USA
2. East Bay Municipal Utility District, Oakland, CA, USA
3. ArrowBio, Tel Aviv, Israel

Feedstock: Food scraps, yard trimmings, wet residual waste (from wet/dry collection programs)

Description: Controlled, in-vessel decomposition of organic material by microbes producing biogas for heating and power generation, and a semi-solid digestate residual that can be used as compost feedstock

Capacity Range: 200-500 tpd

Process: Material is typically screened or otherwise processed for contaminant removal, then metered into digester tanks where microbes digest the organics in the absence of oxygen and produce biogas which is collected off the top of the tank. The semi-solid digestate, comprised of less digestible material, is collected and used as compost feedstock in an aerobic composting operation. The biogas may be converted into a vehicle fuel or used to produce electricity.

Residues: Contaminants sorted out of feedstock; and digestate if no market exists

Products: Biogas for heating and power production; and digestate for compost feedstock

Markets: Utility companies, large industrial gas or steam users, composting operations, truck fleets

Landfill Diversion:

	Optimal	Average	Poor
Overall Diversion (%)	90	80	70

Level of Commercialization/Industry Experience:

- Decades of experience at the more significant facilities for biosolids
- Emerging for organics and residual waste

Status of Development:

Mature: Growth: **X** Infancy: Demonstration:

Economics:

Capital Cost: $100,000 to $200,000 per ton of capacity

Tipping Fee: $100-130/ton (varies depending on market for digestate, and value of electricity)

Reliability/Confidence in Data:

High: Medium: **X** Low:

Caveats/Comments:

- Mature technology for organic materials; emerging technology for residual waste
- Quality of feedstock important in overall facility performance

Type: Gasification/Plasma Arc Gasification

Examples:

1. Thermoselect, Chiba, Japan
2. Plasco (pilot plant), Ottawa, Ontario, Canada

Feedstock: Residual waste; industrial waste

Description: Thermal technology that converts residual waste into a synthesis gas which can then be sold as gas or converted to electricity

Capacity Range: 100-500 tpd

Process: Residual waste (sometimes supplemented with industrial waste and high Btu materials, such as plastics) is typically ground and fed to the converter units where heat breaks the material down to individual molecules (the synthesis or "syngas"). This gas is then cleaned and either sold to the local gas company or large industrial user or combusted in engines or turbines to generate electricity. The exhaust from the boiler is treated through a sophisticated air pollution control system.

Residues: Heavy metals and other contaminants from gas cleaning equipment

Products: Ferrous metal (salvaged up front by magnets), electricity or fuel, sulfur (agricultural grade), aggregate/ash (for construction industry or cement manufacturing)

Markets: Utility Companies, Construction industry, agriculture

Landfill Diversion:

	Optimal	Average	Poor
Overall Diversion (%)	100	99	75

Level of Commercialization/Industry Experience:

- Low – first North American demonstration plant just now coming online
- Experience over the last 10 years all overseas

Status of Development:

Mature: Growth: Infancy: **X** Demonstration:

Economics:

Capital Cost: $200,000 per ton of capacity

Tipping Fee: $120-200/ton (depending on fuel value of residual waste feedstock, technology, plant size, and value of electricity)

Reliability/Confidence in Data:

High: Medium: Low: **X**

Caveats/Comments:

- Opposition from environmental groups regarding potential health risks and environmental impacts still an issue
- If aggregate can be sold as cement additive or construction product, diversion can approach 100%; if not, diversion will be closer to 75-80%
- Tip fee heavily reliant on electricity value because plants achieve high levels of power output per ton of feedstock
- Data and experience will be stronger when Plasco's Ottawa plant is fully operational and can substantiate gas quality, power output, aggregate sale, and emissions control

Type: Hydrolysis (ethanol production)
Examples: 1. BlueFire Ethanol (under development), Lancaster, CA, USA
Feedstock: Yard trimmings and wood waste (C&D, residential green bin or source separated)
Description: Chemical or biological conversion of cellulose via hydrolysis to produce sugars, which are then fermented and distilled to produce fuel-grade ethanol
Capacity Range: 100-500 tpd
Process: Incoming yard trimmings and wood waste is ground and fed into the hydrolysis process where the cellulose and hemicellulosic[28] portions of the feedstock are converted to sugars via an acid process or an enzymatic process. The sugar water is then fermented (like beer) and finally distilled to pure alcohol (ethanol). The alcohol is then denatured by adding a small amount of gasoline and sold as fuel-grade ethanol. In some processes, the portion of the feedstock that will not hydrolyze (primarily plant lignin) is captured, dried, and used as fuel in a boiler to generate a substantial portion of the energy consumed by the facility. Ash from the boiler is used as a soil amendment. In the concentrated acid hydrolysis method, the acid is recovered and reused. Final neutralization of the sugar water results in the production of gypsum, which is sold into agricultural markets as soil conditioner. One ton of incoming yard trimmings produces roughly 70 gallons of ethanol.
Residues: Primarily film plastic, paper, and other contaminants from the green bin programs
Products: Transportation fuel, soil amendments
Markets: Fuel blenders (that blend the ethanol roughly 1:10 with gasoline for the local market), Local farmers
Landfill Diversion:

	Optimal	Average	Poor
Overall Diversion (%)			
Yard trimmings	99	95	90
Wood waste	99	97	95

Level of Commercialization/Industry Experience:

- No commercial plants in the world to date
- First projects now in development in the U.S. supported by the US Department of Energy
- BlueFire project in Lancaster, California likely to be the first one in operation

Status of Development:
Mature: Growth: Infancy: **X** Demonstration:

[28] Any of several polysaccharides that are more complex than a sugar and less complex than cellulose, found in plant cell walls and produced commercially from corn grain hulls. Source: The American Heritage® Dictionary of the English Language, Fourth Edition copyright ©2000 by Houghton Mifflin Company. Updated in 2009. Published by Houghton Mifflin Company.

Type: Hydrolysis (ethanol production)
Economics: **Capital Cost:** Not available **Tipping Fee:** $0-10/ton (plants looking for free feedstock or to pay marginal price; costs not available)
Reliability/Confidence in Data: High: Medium: Low: **X**
Caveats/Comments: • Facility performance and economics look very promising giving rising costs of transportation fuel and need for domestic supplies of renewable fuel • Plants taking source separated material do not need a Solid Waste Facility Permit from CalRecycle if they can pass the 3-part test.[29] BlueFire was not required to obtain such a permit. However, in the future, if hydrolysis plants can accept organic residues as feedstock, then they will need this permit • Provides as alternative and very strong market for yard trimmings beyond the traditional compost markets • Tip fee heavily reliant on electricity value because plants achieve high levels of power output per ton of feedstock

[29] The "3-part test" requires that the materials be: 1) separated for reuse; 2) have less than 10% contamination; and 3) have less than 1% putrescible material. California Code of Regulations, Title 14, (14 CCR) Division 7, Chapter 3, Article 6.0 et seq. (commencing at section 17400).

Type: Pyrolysis
Examples: 1. IES (pilot plant), Romoland, CA, USA 2. Balboa Pacific (proposed pilot plant), San Diego, CA USA
Feedstock: Residual waste
Description: Thermal conversion process that, in the absence of oxygen, converts residual waste into a synthesis gas and a solid "char" product
Capacity Range: 100-500 tpd
Process: Residual waste is typically ground, dried to less than 10% moisture, and fed into the pyrolysis chamber through an air lock to keep air from entering the chamber. The resulting gas is combusted in a thermal oxidizer and the heat used to generate steam in a boiler. The steam can either be used for heat or injected into a turbine to generate electricity. The exhaust from the boiler is treated through a sophisticated air pollution control system.
Residues: Inert material, heavy metals, and other contaminants from gas cleaning equipment
Products: Electricity, char, gypsum
Markets: Utility companies, carbon black[30] manufacturers, asphalt paving, agriculture
Landfill Diversion:

	Optimal	**Average**	**Poor**
Overall Diversion (%)	90	85	80

Level of Commercialization/Industry Experience: • Low. First demonstration plant in U.S. is performing test runs (IES – 50 tpd)
Status of Development: Mature: Growth: Infancy: **X** Demonstration:
Economics: **Capital Cost:** $200,000 per ton of capacity **Tipping Fee:** $120-200/ton (depending on fuel value of residual waste feedstock, technology, plant size, and value of electricity)
Reliability/Confidence in Data: High: Medium: Low: **X**
Caveats/Comments: • Syngas has higher CH_4 content than gasification syngas and therefore can more easily be converted to fuel (liquefied natural gas (LNG) or compressed natural gas (CNG)) • Requires time to substantiate gas quality, power output, aggregate sale, and emissions control

[30] Any of a group of intensely black, finely divided forms of amorphous carbon, usually obtained as soot from partial combustion of hydrocarbons, used principally as reinforcing agents in automobile tires and other rubber products, but also as extremely black pigments of high hiding power in printing ink, paint, and carbon paper. Source: www.britannica.com (accessed October 1, 2013).

Type: Refuse-Derived Fuel Facility

Examples:

1. Honolulu, HI, USA (prepares feedstock for on-site combustion)
2. West Palm Beach, FL, USA (prepares feedstock for on-site combustion)
3. Hartford, CT, USA (prepares feedstock for on-site combustion)

Feedstock: Residual waste

Description: Physical technology which alters the physical characteristics of the residual waste feedstock. These materials may be separated, shredded, and/or dried in a processing facility. The resulting material is referred to as refuse-derived fuel (RDF). It may be densified or pelletized into homogeneous fuel pellets and transported and combusted as a supplementary fuel in utility boilers.

Capacity Range: 500 to 2000 tpd per processing line

Process: The RDF process typically includes thorough pre-separation of recyclables, shredding, drying, and densification to make a product that is easily handled. Initial processing includes field-based manual sorting and removal of white goods and other large ferrous materials. Glass and plastics are removed through manual sorting and by commercially available separation devices commonly found in MRFs or MMPs. This is followed by shredding to reduce the size of the remaining feedstock to about eight inches or less, for further processing and handling. Magnetic separators are used to remove ferrous metals. Eddy-current separators are used for aluminum and other non-ferrous metals. The resulting material contains mostly food scraps, non-separated paper, some plastics (recyclable and non-recyclable), yard trimmings, wood, and other materials. Reduction of about 10-20% of the incoming residual waste feedstock can be accomplished through initial RDF processes.

Residues: Non-processable materials, inerts, glass, and plastics.

Products: Shredded or pelletized fuel for combustion.

Markets: Waste-to-energy facilities, power plants, or other utility boilers.

Landfill Diversion: (assuming combustion included)

	Optimal	Average	Poor
Overall Diversion (%)	90	85	80-

Level of Commercialization/Industry Experience:

- Over 20 years of experience.

Status of Development:
Mature: **X** Growth: Infancy: Demonstration:

Economics: (assuming combustion included)
Capital Cost: $200,000 to $250,000 per ton per day of design capacity
Tipping Fee: $120 to $200/ton (depending on feedstock and revenues from energy sales)

Reliability/Confidence in Data:
High: **X** Medium: Low:

Caveats/Comments:

- Requires market for combustion.

Type: Steam Processing/Autoclaving

Examples:
1. Salinas Valley Solid Waste Authority CR3 Autoclave Pilot Facility (1-2 tpd), Salinas, CA, USA
2. World Waste of Anaheim Steam Classification (no longer operating), Anaheim, CA, USA
3. Sterecycle, Yorkshire, England (100,000 tpy)

Feedstock: Residual waste

Description: Physical technology which alters the physical characteristics of the residual waste feedstock. The materials are broken down into three (3) components which are easily separated through typical screening processes. The components include a "fine" fibrous biomass, slightly larger biomass materials mixed with contaminants and large materials including recyclables such as cans, melted bottles mixed with some large contaminants. Each component has diversion potential.

Capacity Range: 25 to 30 tons per load, potentially 150 tpd

Process: Steam processing takes raw residual waste (or residual waste with minimal processing) and subjects it to low or medium pressure steam in a closed, rotating pressure vessel. The high-temperature steam breaks down cellulosic materials and sterilizes the entire feed stream. Cans and bottles are de-labeled. Plastics typically are slightly melted, resulting in significant volume reduction. The residual waste stream is reduced in volume by about one third. The product material exits the steam pressure vessel or autoclave as a recyclable or usable fiber that can potentially be burned for energy or used to create a transportation fuel.

Residues: In-organic materials, small plastic, metals & glass.

Products: Cans and bottles for recycling; fiber for further processing through biomass-to-energy facilities, creation of biogas through anaerobic digestion or through a developing technology to produce bio-ethanol using a chemical/distillation process.

Markets: Domestic and oversees mills and manufacturing plants (i.e., bottle recycling plants, smelters) for recyclables; power utilities or industrial users for power produced; potential ethanol distributors for developing technology creating bio-ethanol products.

Landfill Diversion:

	Optimal	**Average**	**Poor**
Overall Diversion (%)	80 (based on biomass energy conversion & recycling)	50+ (based on volume reduction & recycling)	50-

Level of Commercialization/Industry Experience:
- Emerging technology for residual waste

Status of Development:
Mature: Growth: Infancy: Demonstration: **X**

Economics:
Capital Cost: Not enough information available.
Tipping Fee:

Reliability/Confidence in Data:
High: **X** Medium: Low:

Caveats/Comments:
- Requires market for combustion, anaerobic digestion or chemical/distillation process to handle and create marketable/divertible materials.

Type: Waste-to-Energy

Examples:

1. Commerce Refuse to Energy, City of Commerce, CA, USA
2. Southeast Resource Recovery Facility (SERRF), Long Beach, CA, USA

Feedstock: Unsorted/mixed residential (black bin), and commercial residual waste hauled directly from collection routes and/or residual waste from MRFs, MMPs, residual organic waste from other processes
Desired Materials: Residual waste from residential and commercial sources
Problem Materials: Inert materials; industrial waste; ashes and liquids

Delivery Assumptions: Material delivered from front and side loading trucks or transfer trailers

Description: Waste-to-energy facility using combustion of carbon based material to produce energy. Inorganic material will be contained in the ash residue. Exhaust gas is treated in emission control systems before being released into the atmosphere.

Capacity Range: 500 – 2000 tpd

Process: Materials are conveyed or loaded into feed hoppers that complete combustion of carbon based material in an oxygen rich atmosphere (oxygen level above chemically balanced air-fuel requirement for combustion) with high air to fuel ratios. Inorganic material is converted to ash and flue-gas is composed primarily of carbon dioxide and water. The hot flue gas flows through a boiler, where steam is produced. Steam may be used directly or for driving a steam turbine generator to generate electricity. Cooled exhaust gas flows through emissions control systems before being exhausted through stacks into the atmosphere. The fly ash and bottom ash are often mixed. After treatment, the remaining ash is typically disposed in landfills or can be reused as landfill cover, processed for road base or possibly other beneficial uses.

Residues: Bottom ash, fly ash, heavy metals and other contaminants from gas cleaning equipment

Products: Steam, electricity, bottom ash/fly ash, iron, steel, non-ferrous metal, metal oxides.

Markets: Construction (bottom ash as road aggregate), domestic and foreign industry (steel, iron, other metal)

Landfill Diversion:

	Optimal	Average	Poor
Overall Diversion (%)	95-96	90	80-
Overall Disposal (%)	4-5	10	20+

Level of Commercialization/Industry Experience:

- Began operating in the US in 1975
- 86 plants in 25 states
-

Status of Development:
Mature: **X** Growth: Infancy: Demonstration:

Economics:
Capital Cost: $200,000-250,000 per ton capacity
Tipping Fee: $120 to $200/ton (depends on feedstock, revenues from sale of energy by products)

Reliability/Confidence in Data:
High: **X** Medium: Low:

Type: Advanced Thermal Recycling

Examples:

1. TREA Breisgau Advanced Thermal Recycling Facility, Freiberg, Germany
2. Müllverwertung Rugenberger Damm Advanced Thermal Recycling Facility, Hamburg, Germany

Feedstock: Unsorted/mixed residential (black bin), and commercial residual waste hauled directly from collection routes and/or residual waste from MRFs, MMPs, residual organic waste from other processes
Desired Materials: Residual waste from residential and commercial sources
Problem Materials: Inert materials; industrial waste; ashes and liquids

Delivery Assumptions: Material delivered from front and side loading trucks or transfer trailers

Description: Advanced Thermal Recycling facility using combustion of carbon based material to produce energy and steam and recovery metals. Inorganic material will be contained in the ash residue. Exhaust gas is treated in advance of emission control systems before being released into the atmosphere.

Capacity Range: 500 – 2000 tpd

Process: Materials are conveyed or loaded into feed hoppers that complete combustion of carbon based material in an oxygen rich atmosphere (oxygen level above chemically balanced air-fuel requirement for combustion) with high air to fuel ratios. Inorganic material is converted to ash and flue-gas is composed primarily of carbon dioxide and water. The hot flue gas flows through a boiler, where steam is produced. Steam may be used directly or for driving a steam turbine generator to generate electricity. Cooled exhaust gas flows through emissions control systems for the removal of pollutants before being exhausted through stacks into the atmosphere. Common by-products for controlling air quality of plant emissions include gypsum and hydrochloric acid (HCl). Other products include the recovery of ferrous and non-ferrous metals from the bottom ash. The fly ash and bottom ash are typically separated and the bottom ash can be reused as landfill cover, processed for road base or possibly other beneficial uses.

Residues: Bottom ash, fly ash, heavy metals and other contaminants from gas cleaning equipment

Products: Steam, electricity, bottom ash/fly ash, iron, steel, non-ferrous metal, metal oxides. Many plants also produce hydrochloric acid and gypsum.

Markets: Construction (bottom ash as road aggregate, Gypsum for wallboard), domestic and foreign industry (steel, iron, other metal), chemical industry (HCl)

Landfill Diversion:

	Optimal	Average	Poor
Overall Diversion (%)	95-96	90	80-
Overall Disposal (%)	4-5	10	20+

Level of Commercialization/Industry Experience:

- High level of commercialization in Europe and Japan
- Primary method of managing and reducing solid waste disposed in landfills for material that cannot be recycled in Japan and parts of Europe[31]

Status of Development:
Mature: **X** Growth: Infancy: Demonstration:

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[31] In 1994 74.4 percent of household waste in Japan was incinerated. Source: Clark, J.F.M., *The Burning Issue: Historical Reflections on Municipal Waste Incineration*, University of St. Andrews, page 4. http://www.stir.ac.uk/media/wwwstiracuk/cehp/images/burning-issue.pdf (accessed October 1, 2013). Map of Waste-to-Energy Plants, 2010, Confederation of European Waste-to-Energy Plants, http://www.cewep.eu/information/data/studies/m_960 (accessed October 1, 2013)

Type: Advanced Thermal Recycling	
Economics:	
Capital Cost:	$200,000-250,000 per ton capacity
Tipping Fee:	$120 to $200/ton (depends on feedstock, revenues from sale of energy by products)
Reliability/Confidence in Data:	
High: **X** Medium: Low:	

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Attachment D-3 Existing Facility Capacity Analysis

Introduction

This section provides an overview of the existing solid waste management infrastructure and an estimate of the excess capacity available. This analysis is general in nature as it is often difficult to truly assess the excess capacity of existing facilities. It was beyond the scope of this report to visit each facility and perform an "on the ground" assessment of their equipment capacity, shifts, ability to physically expand, etc. The SWIRP team relied on the following to come to our conclusions:

- Personal knowledge of the facilities and their operation;
- CalRecycle permit capacity data vs. actual known throughput;
- Cascadia Consulting Group and Clements Environmental Corp. data gathered during SWIRP Phase 1 and Phase 2 facility survey; and
- Aerial photos showing structures and potentially available open space for expansion within the existing site boundaries.

It was beyond the scope of this study to determine purchase possibility for any adjacent parcels. However, the aerials do show if adjacent properties are built-out or not.

In order for second or third shifts of workers at MMPs and TSs to be fully effective, it may be necessary for landfills to extend their hours, even up to receiving materials 24 hours a day.

Due to the "overview" level of the data, when assessing excess capacity the team looked only for significant projects in the hundreds of tons per day range and expressed potential increased capacity as ranges rather than a fixed number.

The following facility types were included in this assessment:

- Mixed Material Processing (MMP);
- Clean MRF;
- Composting Facilities;
- Chipping and Grinding Facilities;
- C&D MRFs;
- Food scraps Processing Facilities; and,
- Transfer Stations.

Mixed Material Processors (MMP) and Transfer Stations (TS)

Of the 20 MMP or TS facilities used for recyclable material or residual waste generated within the City of Los Angeles, seven are estimated to have the existing excess capacity for mixed material processing, through the ability to add shifts or equipment to accommodate a significant increase in recyclable material throughput. In addition, of these 20 facilities, 10 transfer stations are estimated to have existing excess transfer capacity.

As shown in **Table D-3-1** "Estimated Excess Capacity at Existing MMP and TS Facilities," the seven MMP facilities have an additional total capacity of 1,750 - 3,600 tpd. The 10 transfer stations have additional total capacity of 4,800-8,150 tpd. Highlighted in yellow are those facilities located in the City of Los Angeles.

Aerial photos of the 20 facilities are provided with the facilities outlined to highlight the availability, or lack thereof, of space for potential expansion either on-site or adjacent.

TABLE D-3-1 ESTIMATED EXCESS CAPACITY AT EXISTING MMP AND TS FACILITIES[32]					
Facility/Location		Permitted Capacity (TPD)	Discussion	Estimated Additional Capacity (TPD) MMP	Estimated Additional Capacity (TPD) TS
1.	American Waste TS 1449 W. Rosecrans Av. Gardena, CA 90247	2,225	Transfer only. No expansion plans.	0	100-200
2.	Athens TS – Industry 14048 E. Valley Bl. Industry, CA 91746	5,000	Major dirty MRF/MMP system in place.	200-500	0
3.	Athens (Sun Valley) 11121 Pendleton St. Sun Valley, CA 91352	400	New 1,500 SWFP in process for full MMP/Transfer.	250-500	500-1,000
4.	Bel-Art TS 2501 E. 68th St. Long Beach, CA 90805	1,500	Transfer only. No expansion plans.	0	0
5.	Carson TS & MRF 321 W. Francisco St. Carson, CA 90745	5,300	No expansion plans.	0	0
6.	CLARTS 2201 E. Washington Bl. Los Angeles, CA 90034	4,025	Existing permit 4,025 tpd, operating at approx. 3,000 tpd. Could add new MMP equipment although MMP space constrained. Could add a second shift to transfer operation.	200-500	1,000-2,500

[32] Data based on surveys conducted for SWIRP in 2007 and 2008.

TABLE D-3-1 ESTIMATED EXCESS CAPACITY AT EXISTING MMP AND TS FACILITIES[32]					
	Facility/Location	**Permitted Capacity (TPD)**	**Discussion**	**Estimated Additional Capacity (TPD) MMP**	**Estimated Additional Capacity (TPD) TS**
7.	Community Recycling 9147 De Garmo Ave, Sun Valley, CA 91352	1,700	Existing permit 1,700 tpd, applying for 2,500 tpd.	500-800	500-800
8.	Compton Recycling and TS/BFI 2509 W. Rosecrans Av. Compton, CA 90059	1,500	2,100 tpd with plans to increase to 2,500 tpd.	0	600-1,000
9.	Culver City T.S. 9255 W. Jefferson Bl. Culver City, CA 90232	500	Transfer only.	0	0
10.	DART 9770 Washburn Rd. Downey, CA 90241	5,000	No expansion possibility.	0	0
11.	ELARTS 1512 E. Bonnie Beach Pl. City Terrace, CA 90063	700	No expansion plans. Transfer only.	0	100-150
12.	Falcon Refuse Center 3031 "I" Street Wilmington, CA 90744	1,850	No expansion plans. Physical capability of expanding to 5,600 tpd	0	0
13.	Innovative Waste Control 4133 Bandini Bl. Vernon, CA 90023	1,250	Transfer only. No expansion plans. Space constrained.	0	0
14.	Mission Road 840 S. Mission Rd. Los Angeles, CA 90023	1,785	No expansion possibility. Space severely constrained.	0	0

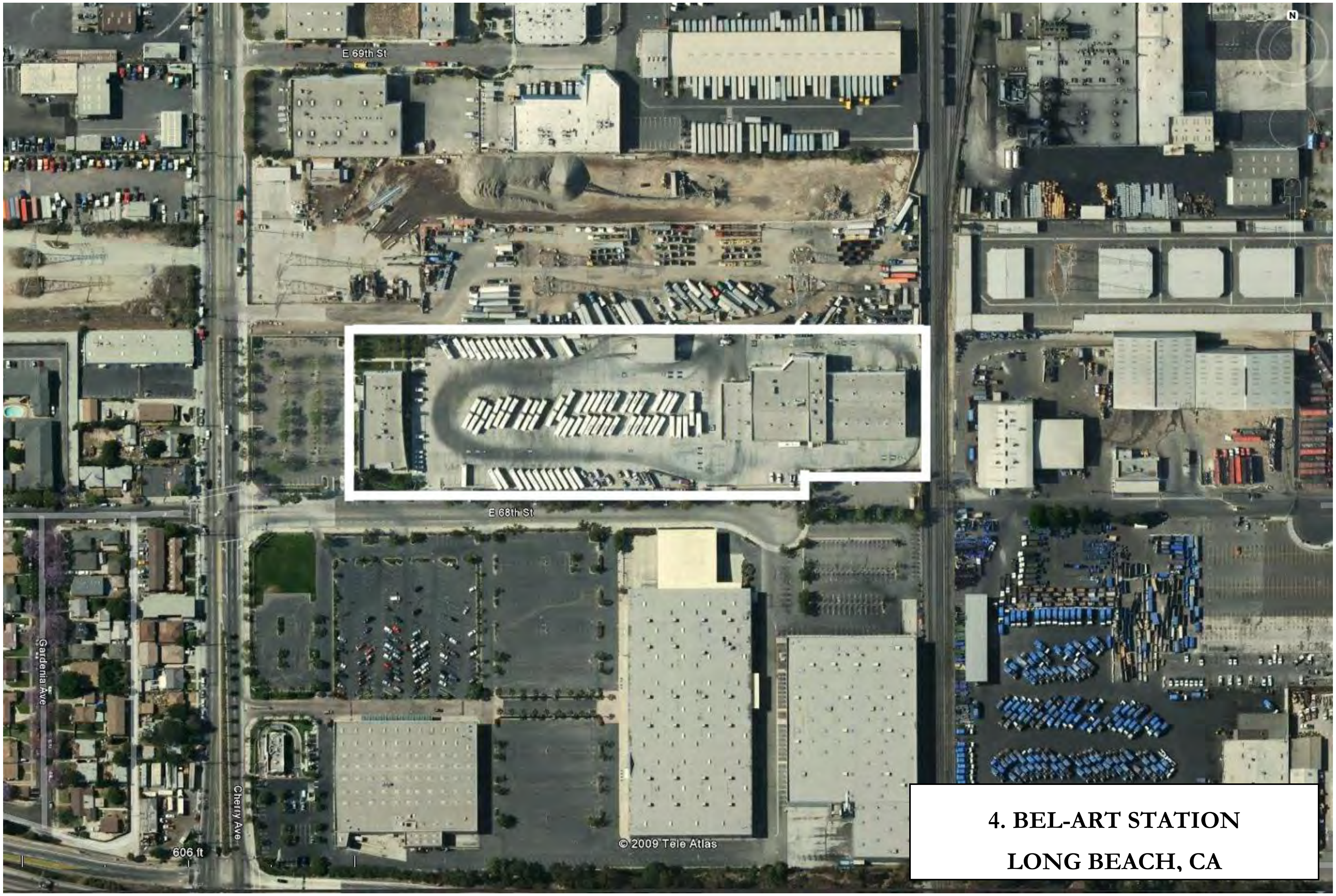
TABLE D-3-1 ESTIMATED EXCESS CAPACITY AT EXISTING MMP AND TS FACILITIES[32]					
Facility/Location		**Permitted Capacity (TPD)**	**Discussion**	**Estimated Additional Capacity (TPD) MMP**	**Estimated Additional Capacity (TPD) TS**
15.	Paramount Resource 7230 Petterson Ln. Paramount, CA 90723	2,400	Expanded MMP proposed. Current throughput is less than 500 tons per day.	200-500	200-500
16.	South Gate San District 9530 S. Garfield Av. South Gate, CA 90280	1,000	Transfer only. No expansion possibility.	0	0
17.	South Gate TS (WM) 4489 Ardine St. South Gate, CA 90280	2,000	Transfer only. No expansion possibility.	0	0
18.	Southern California Disposal 1908 Frank St. Santa Monica, CA 90404	1,056	Transfer only. No existing MMP. Physical expansion in permitting process.	0	300-500
19.	Sun Valley Paper Stock 8701 San Fernando Rd. Sun Valley, CA 91352	750	New in-building MMP in planning process.	200-300	
20.	Waste Resources Recovery 357 W. Compton Bl. Gardena, CA 90247	500	Expansion from 500 tpd to 2,000 tpd	200-500	1,500
TOTAL ADDITIONAL CAPACITY				**1,750-3,600 TPD**	**4,800-8,150 TPD**

1. AMERICAN WASTE TRANSFER STATION

GARDENA, CA


Workman Mill Rd
Proctor Ave
Willow Ave
Valley Blvd
Long Ln
Nelson Ave
N Orange Ave
Sunkist Ave
Moccasin St
Prichard St
Flagstaff St
Sandia Ave
S 3rd Ave
Arlista St
Granit Ln
Melville Dr
S Siesta Ave
S 4th Ave
S 5th Ave
S 6th Ave
Don Julian Rd
1341 ft
© 2009 Tele Atlas
Imagery Date: Oct 23, 2007
34°02'23.04" N 117°59'05.65" W elev 300 ft
Eye alt 5062 ft
2. ATHENS TRANSFER STATION
INDUSTRY, CA

3. ATHENS SUN VALLEY
SUN VALLEY, CA


E 69th St
E 68th St
Gardenia Ave
Cherry Ave
606 ft
© 2009 Tele Atlas
N
4. BEL-ART STATION
LONG BEACH, CA


Knox St
Hamilton Ave
Harbor Fwy
110
Francisco St
Figueroa St
W Francisco St
Main St
W Knox St
San Diego Fwy
S Main St
405
998 ft
© 2009 Tele Atlas
N
5. CARSON TRANSFER STATION
CARSON, CA

6. CLARTS

LOS ANGELES, CA


enoaks Blvd
Exile Cycle
De Garmo Ave
Randall St
Pendleton St
Norris Ave
Tuxford St
© 2009 Tele Atlas
674 ft
7. COMMUNITY RECYCLING
SUN VALLEY, CA

8. COMPTON TS

COMPTON, CA

9. CULVER CITY TS

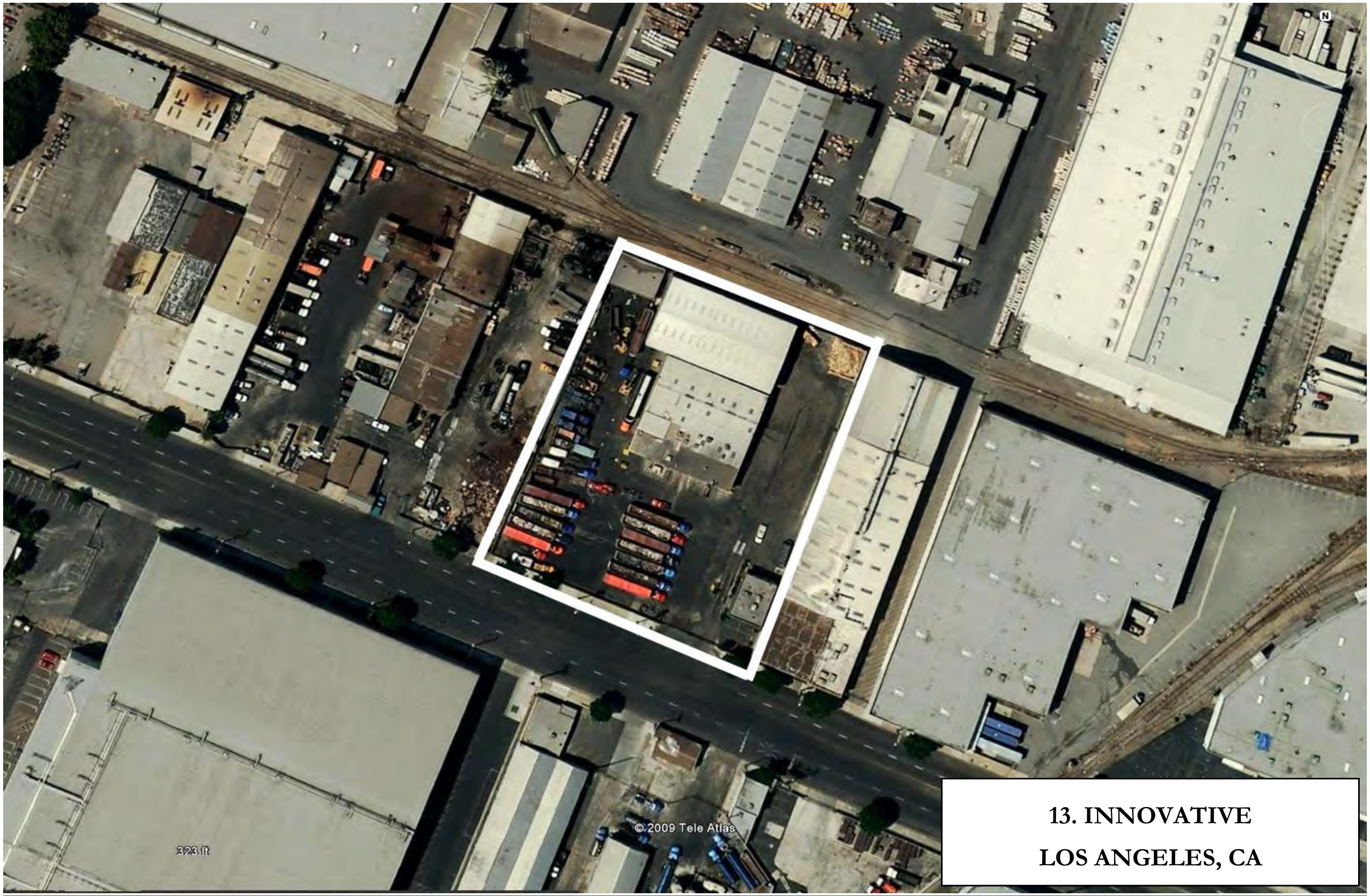
CULVER CITY, CA

10. DART
DOWNEY, CA

11. ELARTS

LOS ANGELES, CA


12. BFI FALCON
COMMERCE, CA
E Grant St
E Opp St
Perry Ave
47
Lawrence Av
Paul Jones Ave
W Gaylord St
Judson Ave
W 15th
Nicholson Ave
Hobson Ave
Farragut Ave
708 ft
© 2009 Tele Atlas
N



13. INNOVATIVE
LOS ANGELES, CA

N
60
10
Pomona Fwy
Santa Monica Fwy
E 8th St
© 2009 Tele Atlas
14. MISSION ROAD TS
LOS ANGELES, CA


Consuelo St
Serenidad St
Pacifico St
Fiesta St
Felicidad St
Encanto St
Contento St
Buena Vida Pl
Petterson Ln
Quimby Ave
Garfield Ave
573 ft
© 2009 Tele Atlas
N
15. PARAMOUNT RESOURCE AND RECYCLING
LOS ANGELES, CA


710
Long Beach Fwy
Southern Ave
W Frontage Rd
E Frontage Rd
Miller Way
Garfield Ave
712 ft
© 2009 Tele Atlas
N
16. SOUTH GATE SANITATION DISTRICT
SOUTH GATE, CA

17. SOUTH GATE WASTE MANAGEMENT
SOUTH GATE, CA


Michigan Ave
24th St
Santa Monica Fwy
10
Virginia Ave
Frank St
Cloverfield Blvd
High Pl
© 2009 Tele Atlas
18. SCD
SANTA MONICA, CA


19. SUN VALLEY PAPER STOCK
LOS ANGELES, CA
© 2009 Tele Atlas
Imagery Date: Jul 31, 2007
34°13'38.42" N 118°22'56.04" W elev 856 ft
Eye alt 2160 ft
N

20. WRR

LOS ANGELES, CA

Existing Clean Material Recovery Facilities (MRF)

As shown in **Table D-3-2** "Estimated Excess Capacity at Existing Clean MRF Facilities," of the 14 clean MRF facilities currently being utilized for commercial recyclables and residential blue bin materials, 10 facilities have a total additional capacity of 1,200-2,600 tpd. Highlighted in yellow are those facilities located in the City of Los Angeles. Aerial photos of these facilities follow the table.

TABLE D-3-2

ESTIMATED EXCESS CAPACITY AT EXISTING CLEAN MRF FACILITIES[33]

	Facility	Permitted Capacity (TPD)	Discussion	Additional Capacity (TPD)
1.	Allan Company 2411 Delaware Av. Santa Monica, CA 90404	150	Opening a new MRF with City of Santa Monica.	100-300
2.	Angelus Western 2474 Porter St. Los Angeles, CA 90021	750	Solid waste permit for 700 tpd capacity – space constrained.	0
3.	Bestway (Firestone) 2268 E. Firestone Av. Los Angeles, CA 90002	1,200	Capacity available. New 1,200 tpd Solid Waste Permit. Currently processing curbside material of WLA.	200-400
4.	Bestway WLA 6001 W. Jefferson Bl. Culver City , CA 90232	No Permit.	Trans-load only.	0
5.	Bestway (LA) 960 N. Main Street Los Angeles, CA 90012	No Permit.	Current City contractor for N. Central LA curbside.	0
6.	Burbank Recycling Center 500 S. Flower St. Burbank, CA 91502	No Permit.	Add shift.	100-200
7.	City Fibers (Plant No. 2) 2545 E. 25th St.	500	Add second shift. New parcel available to expand facility. Current city contractor for South LA curbside.	200-300

[33] Data based on surveys conducted for SWIRP in 2007 and 2008.

TABLE D-3-2 ESTIMATED EXCESS CAPACITY AT EXISTING CLEAN MRF FACILITIES[33]				
Facility		Permitted Capacity (TPD)	Discussion	Additional Capacity (TPD)
	Los Angeles, CA 90058			
8.	City Fibers (W. Valley) 16714 Schoenborn St. Los Angeles, CA 91343	350	Add second shift. Current city contractor for West Valley LA curbside.	100-200
9.	Community Recycling 9147 DeGarmo Av. Sun Valley, CA 91352	1,700	At capacity.	0
10.	CR&R 11232 Knott Av. Stanton, CA 90680	1,800	Capacity available.	100-400
11.	Potential Industries 922 East E Street Wilmington, CA 90744	No permit	Major clean MRF. Expansion plans being proposed.	200-400
12.	Recycle America Alliance 7100 Stanford Avenue Los Angeles, CA 90001	No Permit.	Add shift.	50-100
13.	South Coast Recycling 4560 Doran St. Los Angeles, CA 90039	No Permit	Limited MRF.	50-100
14.	Sun Valley Paper Stock 8701 San Fernando Rd. Sun Valley, CA 91352	750	Could add 2nd shift.	100-200
TOTAL ADDITIONAL CAPACITY				**1,200-2,600 TPD**

1. ALLAN CO. MRF

SANTA MONICA, CA

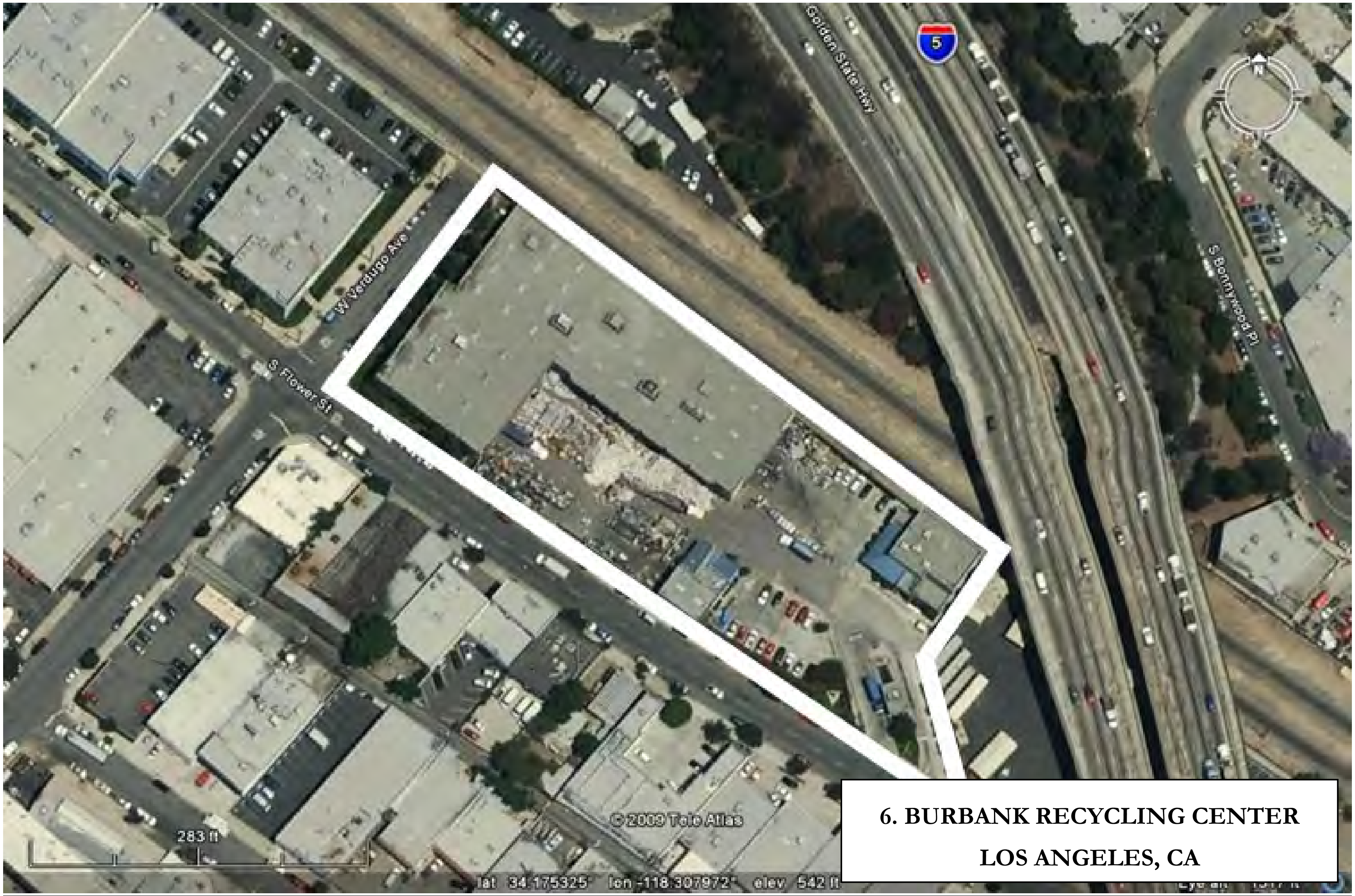
2. ANGELUS WESTERN
LOS ANGELES, CA


E 87th St
Firestone Blvd
S Alameda St
Ivy St
42
E 88th St
© 2009 Tele Atlas
435 ft
Imagery Date: Jul 31, 2007
lat 33.957532° lon -118.231553° elev 127 ft
3. BESTWAY FIRESTONE
LOS ANGELES, CA

4. BESTWAY WLA

CULVER CITY, CA


W College St
S Roundout St
Bruno St
Alhambra Ave
Naud Junction
N Main St & Alpine St, Los Angeles, CA 90012
N Vignes St
E College St
Bauchet St
© 2009 Tele Atlas
371 ft
Imagery Date: Oct 8, 2007
lat 34.063509° lon -118.234858° elev 293 ft
5. BESTWAY MAIN STREET
LOS ANGELES, CA



6. BURBANK RECYCLING CENTER
LOS ANGELES, CA

7. CITY FIBERS. PLANT NO. 2
LOS ANGELES, CA

8. CITY FIBERS. VALLEY PLANT
LOS ANGELES, CA


Pendleton St
Norris Ave
Randall St
De Garmo Ave
Exile Cycle
Tuxford St
© 2009 Tele Atlas
674 ft
9. COMMUNITY RECYCLING
SUN VALLEY, CA


Windemere Way
Dover Way
Kent Way
Carie Ln
Lincoln Way
Western Ave
Santa Rosalia St
Santa Maria St
Mario Ln
© 2009 Tele Atlas
591 ft
10. CR&R
STANTON, CA


E E St
McFarlan
Eubank Ave
Sanford Ave
Alameda St
© 2009 Tele Atlas
502 ft
Imagery Date: Jul 31, 2007
lat 33.775506° lon -118.252234° elev 17 ft
Eye alt 1758 ft
11. POTENTIAL INDUSTRIES
WILMINGTON, CA

12. RECYCLE AMERICA ALLIANCE
LOS ANGELES, CA


Ventura Fwy
134
N
Doran St
W San Fernando Rd
380 ft
© 2009 Tele Atlas
Image © 2009 City of Glendale
Imagery Date: 2003
lat 34.152288° lon -118.277962° elev 457 ft
13. SOUTH COAST RECYCLING
LOS ANGELES, CA


14. SUN VALLEY PAPER STOCK
LOS ANGELES, CA
© 2009 Tele Atlas
Imagery Date: Jul 31, 2007
34°13'38.42" N 118°22'56.04" W elev 856 ft
Eye alt 2160 ft

Existing Composting Facilities

As shown in **Table D-3-3** "Estimated Excess Capacity at Existing Composting Facilities," of the four composting facilities currently being utilized, three facilities have a total additional capacity of 550-1,100 tpd. Highlighted in yellow are those facilities located in the City of Los Angeles. Aerial photos of these facilities follow the table.

TABLE D-3-3

ESTIMATED EXCESS CAPACITY AT EXISTING COMPOSTING FACILITIES[34]

	Facility	Permitted Capacity (TPD)	Discussion	Estimated Additional Capacity (TPD)
1.	California Biomass 20055 Shay Road Victorville, CA 92394	700	Recently purchased by Athens.	50-100
2.	Community Recycling 1261 North Wheeler Ridge Rd. Lamont, CA 93203	3,692	3,692 tpd total permitted capacity at Lamont.	400-700
3.	Griffith Park 5400 Griffith Park Dr. Los Angeles CA 90027	1,000 cubic yards/day	No expansion plans.	0
4.	Lopez Canyon Environmental Center 11950 Lopez Canyon Road Los Angeles, CA 91342	1,000	Space available, but limited	100-300
TOTAL ADDITIONAL CAPACITY				**550-1,100 TPD**

[34] Data based on surveys conducted for SWIRP in 2007 and 2008.

1. CALIFORNIA BIOMASS
ADELANTO, CA

2. COMMUNITY RECYCLING LAMONT, CA

3. GRIFFITH PARK
LOS ANGELES, CA


N
©2009 Tele Atlas
Imagery Date: Oct 23, 2007
lat 34.294857° lon -118.388117° elev 1743 ft
4. LOPEZ CANYON
LOS ANGELES, CA

Existing Chipping and Grinding Facilities

As shown in **Table D-3-4** "Existing Chipping and Grinding Facilities," of the 11 chipping and grinding facilities currently being utilized, five facilities have additional capacity for 900-2,300 tpd. Yellow highlighted facilities are located within the City of Los Angeles.

Aerial photos of these facilities follow the table.

TABLE D-3-4

ESTIMATED EXCESS CAPACITY AT EXISTING CHIPPING AND GRINDING FACILITIES[35]

	Facility	Permitted Capacity (TPD)	Discussion	Estimated Additional Capacity (TPD)
1.	Athens (Sun Valley) 11121 Pendleton St. Sun Valley, CA 91352	400	New 1,500 tpd permit in permit process.	100-200
2.	Community Recycling 11300 Pendleton Street Sun Valley, CA 91352	1,200	Permits in progress to increase capacity from 1,200 to 1,500 tpd.	200-300
3.	Eco Logics 8255 Grimes Canyon Rd. Moorpark, CA 93021		No expansion plans.	0
4.	Greencycle 12815 East Imperial Hwy. Santa Fe Springs, CA 90670	135 tpd	No data available.	0
5.	Griffith Park 5400 Griffith Park Dr. Los Angeles CA 90027	1,000 cubic yards/day	No expansion plans.	0
6.	Harbor Mulching		100 tpd capacity - no	

[35] Data based on surveys conducted for SWIRP in 2007 and 2008.

TABLE D-3-4 ESTIMATED EXCESS CAPACITY AT EXISTING CHIPPING AND GRINDING FACILITIES[35]				
Facility		Permitted Capacity (TPD)	Discussion	Estimated Additional Capacity (TPD)
	1400 North Gaffey Street San Pedro, CA 90731	120 tpd	expansion possibility.	0
7.	Lopez Canyon Environmental Center 11950 Lopez Canyon Road Los Angeles, CA 9134	1,000	Space available – City owned and controlled.	200-500
8.	North Hills 11700 Blucher Av. Granada Hills, CA 91345	1,000	500 tpd capacity – no expansion plans or opportunities.	0
9.	Norwalk Industries 13780 East Imperial Highway Santa Fe Springs, CA 90670	200	No data available.	0
10.	Van Norman Chipping 15751 Rinaldi St. Granada Hills, CA 91344	499	Limited expanded throughput.	100-300
11.	WMI Bradley 9227 Tujunga Bl. Los Angeles, CA 91352	No permit - 1,260	Expansion space available at landfill.	300-1,000
TOTAL ADDITIONAL CAPACITY				**1,000-2,400 TPD**

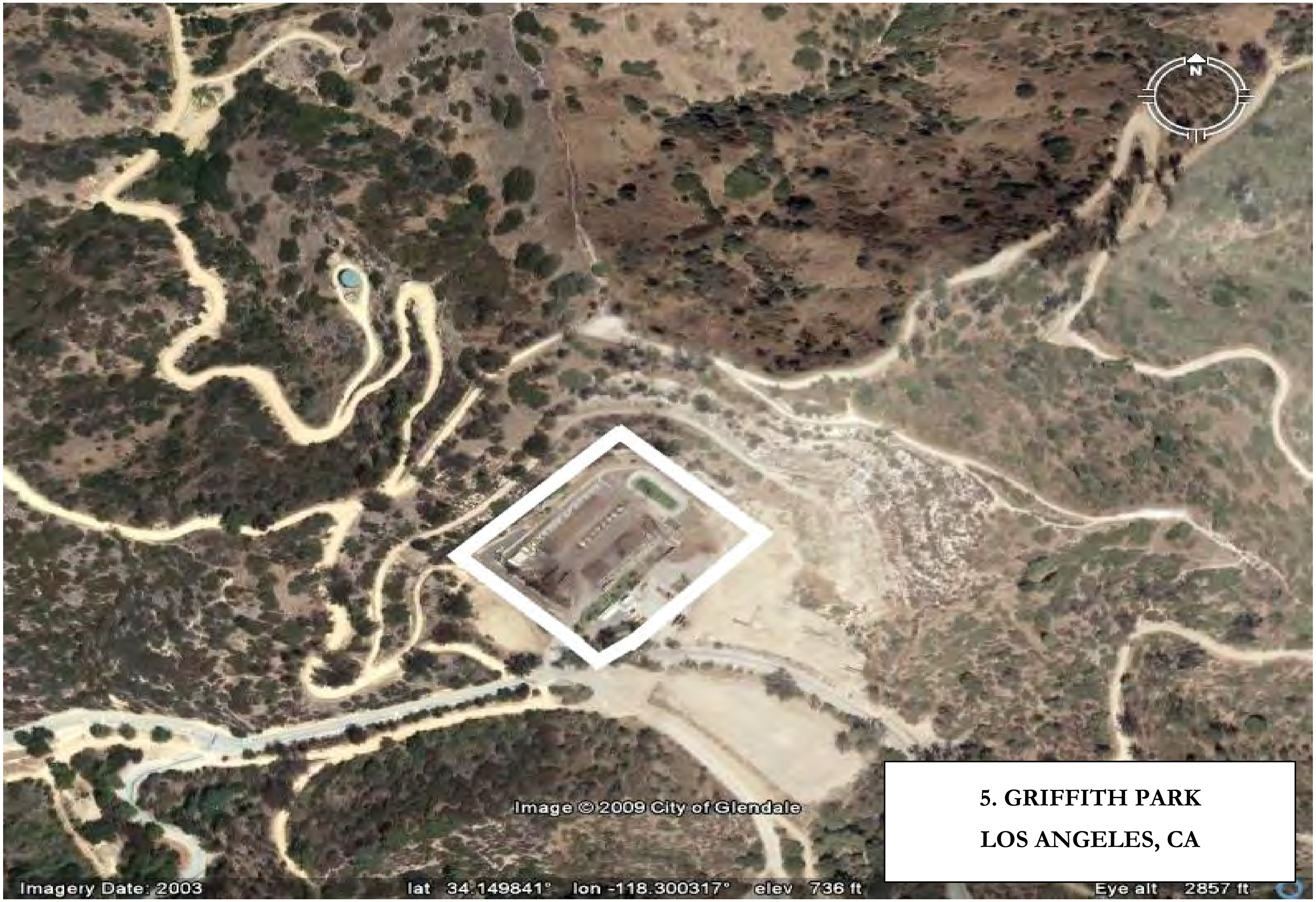
1. ATHENS SUN VALLEY
SUN VALLEY, CA


Exile Cycle
De Garmo Ave
Randall St
Pendleton St
Norris Ave
Tuxford St
© 2009 Tele Atlas
674 ft
2. COMMUNITY CHIP AND GRIND
LOS ANGELES, CA


© 2009 Tele Atlas
Image © 2009 DigitalGlobe
Imagery Date: Jan 28, 2006
lat 34.321252° lon -118.904960° elev 979 ft
3. ECO LOGICS
MOORPARK, CA

4. GREENCYCLE

SANTA FE SPRINGS, CA



5. GRIFFITH PARK

LOS ANGELES, CA

6. HARBOR MULCHING

LOS ANGLES, CA

7. LOPEZ CANYON

LOS ANGELES, CA


405
San Diego Fwy
Mt Ephraim Circle
514 ft
© 2009 Tele Atlas
Imagery Date: Oct 23, 2007
lat 34.285352° lon -118.469066° elev 1161 ft
Eye alt 3844 ft
8. NORTH HILLS
GRANADA HILLS, CA

9. NORWALK INDUSTRIES
SANTA FE SPRINGS, CA

10. VAN NORMAN
GRANADA HILLS, CA


Glenoaks Blvd
Peoria St
Bradley Landfill & Recycling Center a Waste Management
11. WMI BRADLEY
LOS ANGELS, CA
© 2009 Tele Atlas
Imagery Date: Jul 31, 2007
lat 34.239544° lon -118.379879° elev 925 ft
Eye alt 3218 ft

Existing C&D MRFs

As shown in **Table D-3-5**, "Estimated Excess Capacity at Existing C&D MRFs," of the eight (8) C&D facilities currently being utilized, all have potential to increase their processing capacity. The eight facilities have a total additional capacity of 2,300-4,850 tpd. Yellow highlighted facilities are located within the City of Los Angeles.

TABLE D-3-5
ESTIMATED EXCESS CAPACITY AT EXISTING C&D MRFs[36]

	Facility	Permitted Capacity (TPD)	Discussion	Estimated Additional Capacity(TPD)
1.	Athens (Sun Valley) 11121 Pendleton St. Sun Valley, CA 91352	400	New 1,500 tpd permit in process.	200-500
2.	Athens TS (Industry) 14048 E. Valley Bl. Industry, CA 91746	5,000	C&D sort line installed in 2007	200-500
3.	Community Recycling 9147 De Garmo Ave, Sun Valley, CA 91352	1,200	Apply for new permit to increase C&D from 1,200 to 2,000 tpd.	400-800
4.	CWS 621 W. 152 St. Gardena, CA 90247	1,500	Limited expansion capability	50- 100
5.	Direct Disposal 3720 Noakes St. Los Angeles, CA 90023	200 cubic yards./day.	Space limited.	200-300
6.	Downtown Diversion 2424 East Olympic Blvd. Los Angeles, CA 90021	1,500	Full MRF in operation. Extended shift operations possible.	200-500

[36] Data based on surveys conducted for SWIRP in 2007 and 2008.

TABLE D-3-5 ESTIMATED EXCESS CAPACITY AT EXISTING C&D MRFs[36]				
Facility		**Permitted Capacity (TPD)**	**Discussion**	**Estimated Additional Capacity(TPD)**
7.	IRS/Construction and Demolition Recycling 9309 Rayo Ave. South Gate, CA 90280	3,000	New Permit in 2008.	500-1,500
8.	Looney Bins 11616 Sheldon St. Sun Valley, CA 91352	750	Limited space available.	100-200
9.	Madison Materials 1034 East 4th Street Santa Ana, CA 92701	950	Could increase to 1,400 tpd by adding a second shift	450
TOTAL ADDITIONAL CAPACITY				**2,300-4,850TPD**

1. ATHENS SUN VALLEY
SUN VALLEY, CA

2. ATHENS INDUSTRY
INDUSTRY, CA

3. COMMUNITY RECYCLING
SUN VALLEY, CA

4. CWS

GARDENA, CA


5. DIRECT DISPOSAL
LOS ANGELES, CA
© 2009 Tele Atlas
Imagery Date: Jul 31, 2007
lat 34.014118° lon -118.196156° elev 181 ft

6. DOWNTOWN DIVERSION
SUN VALLEY, CA


Firestone Blvd
42
N
Kendall Ave
Branyon Ave
Rayo Ave
Corva St
© 2009 Tele Atlas
Imagery Date: Jul 31, 2007
lat 33.949299° lon -118.179209° elev 109 ft
7. IRS
SOUTHGATE, CA

8. LOONEY BINS
SUN VALLEY, CA

9. MADISON MATERIALS

SANTA ANA, CA

Existing Food Scraps Processing Facilities

As shown in **Table D-3-6**, "Estimated Excess Capacity at Existing Food scraps Processing Facilities," each of the two facilities currently being utilized has potential to increase its processing capacity. The two facilities have a total additional capacity of 150-300 tpd.

TABLE D-3-6

ESTIMATED EXCESS CPACITY AT EXISTING FOOD SCRAPS PROCESSING FACILITIES[37]

	Facility	Permitted Capacity	Discussion	Additional Capacity
1.	California Biomass 20055 Shay Road Victorville, CA 92394	700	Purchased by Athens.	50-100 TPD
2.	Community Recycling 1261 North Wheeler Ridge Rd. Lamont, CA 93203	3,692	Currently in permitting to increase produce trim and cull and food scraps by 200 tpd at their Sun Valley Transfer Station. Lamont Composting operation has excess capacity to handle this increase.	100-200 TPD
TOTAL ADDITIONAL CAPACITY (Food scraps)				**150-300 TPD**

[37] Data based on surveys conducted for SWIRP in 2007 and 2008.


Select date
Image © 2009 DigitalGlobe
© 2009 Tele Atlas
938 ft
Imagery Date: 2006
lat 34.613290° lon -117.357512° elev 2639 ft
1. CALIFORNIA BIOMASS
ADELANTO, CA


S Fairfax
Weedpatch
N
E Bear Mountain Blvd
Image © 2009 DigitalGlobe
© 2009 Tele Atlas
lat 35.201610° lon -118.925640° elev 353 ft
2. COMMUNITY COMPOSTING
LAMONT, CA

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Attachment D-4 Facility Aesthetics

Section 1 Introduction

A key element for meeting the goals of SWIRP will be to provide the necessary infrastructure to support collection programs and to process and transform residual waste into usable products and a source of renewable energy. Even with the new initiatives being considered, many new facilities will be needed to process the waste stream. Basic transportation economics demand these facilities be located throughout each of the wastesheds to best serve the residences and businesses and to reduce travel time for route trucks. Therefore, facilities need to be designed and operated to be an asset to the neighborhood and contribute to the overall aesthetics of the local environment.

Planning and design of solid waste facilities that blend into the local neighborhoods is underway in the Los Angeles area. Many facilities are being retrofitted to add services and in the process are making investments to provide facelifts to improve appearances and operations. The purpose of this section of the report is to describe the aesthetic features and the operating practices used to make these facilities good neighbors.

Section 2 Background - Facility Types

There are currently over forty solid waste facilities that are operating in and around the City that receive, process, and transport recyclables material and solid waste to markets and landfills. These include:

- Material Recovery Facilities –MRF (dirty and clean)
- Transfer Stations
- Compost Facilities
- Advanced Thermal Recycling
- Landfills

Most of these facilities have been operating and providing service over many years. But many more MRFs and other types of facilities, including alternative technologies, will be needed to meet the future goals of the City. Examples of the alternative technology facilities currently considered feasible are:

- Advanced Thermal Recycling
- Alternative technology thermal – i.e., gasification, pyrolysis
- Alternative technology bioconversion
- Alternative technology chemical conversion

Further analysis and evaluation of these and other specific alternatives will be needed before decisions are made on which facilities will be built and where they will be located. The City is very urbanized and developed; therefore, all facilities to be built must be designed to become an asset to the surrounding neighborhood. Although each type of facility and each site have unique requirements and conditions, there are standard design and operational philosophies that can be established to maximize the functional and aesthetic value of every facility.

Section 3 How Solid Waste Facilities are Designed to Be Good Neighbors

For any constructed project to be a good neighbor, it is essential to understand the functional and aesthetic issues inherent in the project requirements (from site selection through daily operation management) and the functional and aesthetic sensitivities of the selected site and community. The issues are identified as those aspects inherent in the project's construction and operations that could have an impact on surrounding businesses, residents, and infrastructure such as the facility's traffic volume, tonnage of material to be handled, and hours of operation. Community sensitivities are identified by understanding the conditions which are location dependent such as the site's zoning requirements as well as the surrounding zoning designations and current infrastructure. Aesthetic style guidelines, often dictated and regulated by the local jurisdiction, are used to promote a feel of community.

Typically, solid waste facilities are located within industrial or commercial zones with easy connection routes to main highways and/or arterial roads.[38] Good access routes will impact residential or retail zones so the facility design and operation must be sensitive to the greater community.

3.1 Typical Design Issues and Design Mitigation

3.1.1 Traffic

With any new facility there will be an increase in the number of trucks that deliver materials and transport materials. If the facility includes services for public or self-haul vehicles to drop-off solid waste and recyclables, additional traffic may be experienced. Key site and building design elements can limit any intrusion on the community conscience. Traffic design issues include:

1. **Site location and off-site routes-** Selected to minimize area traffic changes Environmental Affairs Department, Planning Department, and Transportation Department will work together with facility designers to locate sites with good access.

2. **Site configuration** – Site ingress and egress is designed to work within existing traffic patterns. Traffic signals are considered at certain ingress and egress points. Building access orientation is planned in order to screen large scale operations from street frontages and sensitive neighbors.

3. **On-site traffic design** – Provides clear routes for all users: commercial, industrial, employees, public, and visitors. Offers clear separation of truck as well as small vehicular traffic and clear directional and area destination signage, which will minimize wait time and queuing through efficient design and operation. Grants maneuvering space and circulation for efficient delivery

[38] The City adopted an ordinance amending its municipal code to allow alternative technology facilities within M2 (light industrial), M3 (heavy industrial), and PF (public facility) zones.

and a sufficient number of stalls for peak traffic times. It also includes staffing for direction assistance and load pre-sorting, and enough on-site space so queuing does not occur on public roadways. Addresses the location of scales from point of ingress and stacked queue lanes to increase on-site capacity.

3.1.2 Building size

A lot of activity takes place within the walls of solid waste facility buildings which require large clear floor space and high roof clearances. Even in industrial zones solid waste facilities may be larger and taller than surrounding structures. Several design approaches are used to reduce impacts, including:

1. **Site Line Studies** – Determines the view of the site from surrounding highways, roads, and neighbors, and identifies critical views for aesthetics, screening, and sensitive neighbors.
2. **Architectural design to reduce the bulk of the structures** – Achieves an aesthetic style which will not only blend into the community, but will enhance the neighborhood. Design can vary the horizontal position of the wall, height of eave lines or parapets, material textures, and select color aesthetic themes or neutral appearances.
3. **Architectural design to blend in the neighborhood** – Design to fit the local community aesthetic philosophy. Provides adequate setbacks from public roadways, visual screen walls, and fences to reduce visual impact. Offers landscaping to screen views, and soften and naturalize the appearance of the site and structures.

3.1.3 Noise

Most of the operational noise is contained inside the buildings. However, the daily activity of vehicles entering and leaving the site as well as use of on-site mobile equipment creates noise that needs to be considered in the design and operational plans. These include:

1. **Site noise** – Design to minimize truck routes and idling in queue to reduce sound. Provides solid screen walls and landscaping to deflect and diffuse sound. On-site parking can be used as buffer zones for noise impacts.
2. **Operations and process noise** – Design to ensure that operations occur within fully enclosed buildings. Included in the design are the orientation of the building, location of the openings, and building materials which may include lined or insulated panels to further reduce the noise.

3.1.4 Odor, Dust, Litter, and Animal Control

The nature of the material handled at solid waste facilities can create adverse environmental conditions. These situations can be avoided through good design and proper operations, and may include:

1. **Building design** –These are controls for reducing fugitive dust inside the building, and include: misting systems, natural and power ventilation, and routine housekeeping measures.
2. **Site design and operations/maintenance** – Design to control materials outside of structures. Considers prevailing wind, sensitive neighbors, daily maintenance, and cleaning schedules.

3. **Design and operations** – Is used to avoid excessive material storage stockpiling to reduce the impacts of blown litter, odor, and vermin (rodent and bird) populations.

3.1.5 Additional Design Features

Eliminating potential intrusions of facilities on the neighborhood is only part of being a good neighbor. Projects can also add real value and advantage to the neighborhood when they include:

1. **Education / information centers** – Provide knowledge and community space for school education tours, public recycling and awareness courses, and community meetings.
2. **Sustainability** – Local facilities reduce environmental impacts and provide more convenience for public services. Sustainability features include: LEED certification for new construction, LEED values included even if budgets will not allow full certification, and onsite recycling centers. Sustainability benefits include: reduced truck routes from source to facility and reduced truck traffic.

Section 4 Examples of Modern Solid Waste Facilities

This section presents three projects in California. Two of them represent expansions and remodels of existing facilities, and one represents a new, ground-up project. Factors contributing to the need for expansion of existing facilities and the development of new facilities are:

- **Increase in volume of incoming material** – Due to population growth or volume per capita growth.
- **Increase needs to recycle and process residual waste** – Because of mandated recycling goals or marketing opportunities.
- **Safety and efficiency** – Based on the need to handle increased traffic or diverse traffic (commercial, public, industrial, construction) and the need to develop new technology.

1. **Rainbow Disposal, Huntington Beach –** MRF/ MMP/ Yard trimmings /Education/Transfer Station

Existing Site Prior to Upgrades

New Upgraded Design

Upgrades include:

Expanded Capacity

- MRF
- Transfer station
- Yard trimmings processing
- Operational improvements

Community enhancements

- Street facades
- Landscaping
- Education center

2. **Shoreway Environmental Center, San Carlos -** MRF/ Transfer Station/Yard trimmings/ Recycle Center/ Education

Existing Site Prior to Upgrades

New Upgraded Design

Upgrades include:

Expanded Capacity

- MRF
- Transfer station
- Yard trimmings processing
- Operational improvements

Community enhancements

- Street facades
- Landscaping
- Education center

Shoreway Environmental Center

3. **Puente Hills Material Recovery Facility, Los Angeles County** - MRF/ Yard trimmings /C&D Processing/ Education Center/ Transfer Station /Rail-haul

New State-of-the-Art Design

Features include:

- Near entrance to existing landfill site means no regional traffic changes
- New state of the art MRF and Transfer Station
- Rail-haul transfer station
- Education Center

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