

California State University, Los Angeles
Zero Waste Plan

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Section 1 Introduction

California State University, Los Angeles (Cal State LA) has implemented waste reduction and recycling programs to achieve the policy goals of the California State University Sustainability Policy, which are:

- Reduce solid waste disposal by 50% by 2016
- Reduce solid waste disposal by 80% by 2020
- Move to Zero Waste

The State of California has established a goal that 75% of materials generated will be source reduced, recycled, or composted by the year 2020. State law requires that large generators of recyclable and compostable materials divert these materials from landfills and incinerators.

- Assembly Bill 341 (Chapter 476, Statutes of 2011) requires generators of four cubic yards or more of solid waste per week to arrange for recycling services.
- Assembly Bill 1826 (Chapter 727, Statutes of 2014) requires generators to recycle their compostable materials with a phase-in schedule depending on the amount of compostable materials or solid waste they generate per week. Cal State LA produces more than the first compliance tier (8 cubic yards of compostable materials per week), and was required to compost those materials as of April 1, 2016.

In addition to the statutory requirements, the University also has a responsibility to its students to ensure that they have the information and tools to become effective environmental stewards while they are at the University and as they enter the next phase of their lives.

This Zero Waste Plan documents the progress Cal State LA has made toward achieving these goals and identifies options that could move the campus toward the goal of Zero Waste.

The Plan describes the progress Cal State LA has made toward achieving the goal of 50 percent and identifies potential future waste reduction goals, new Zero Waste initiatives and the greenhouse gas emission reduction potential associated with the Zero Waste initiatives.

What is Zero Waste?

Zero Waste is part of the paradigm shift. Recyclables were what we used to keep out of the trash. Now, trash is what we have left over once we reduce, reuse, recycle, and compost.

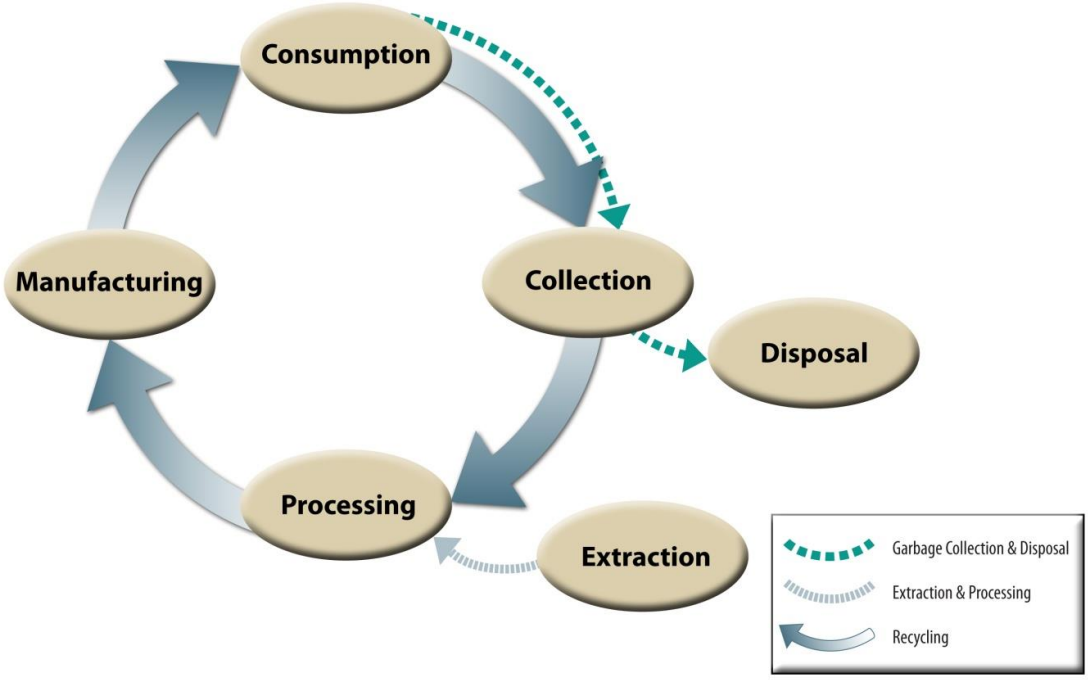
The Zero Waste International Alliance provides this internationally peer-reviewed definition:

> Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use.
>
> Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them.

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

This is the definition that is adopted in this Plan. This approach to Zero Waste will focus first on reducing waste at the source and maximizing diversion from landfills and incinerators, with the overall goal of striving for more sustainable materials management practices and a circular economy. The ultimate goal of Zero Waste means no materials will be discarded in landfills or incinerators.

Figure 1: The Circular Economy



Section 2 Existing Programs and Infrastructure

Facilities Services launched the current recycling program in 2008 with 36 recycling stations strategically distributed throughout campus. Departments and office areas are provided blue recycling containers that custodians do not intermingle with residual waste. Bags containing waste are placed inside waste bins located near the loading docks of buildings, while bags containing recyclables are placed on the ground beside the waste bins.

Recycling is collected every morning from loading docks at each building and placed in designated recycling containers. Twice weekly, the multi-stream recycling material is transported to the Corporation Yard, along with electronic waste (e-waste), ink and toner cartridges, tires, construction and demolition debris (C&D), wood, and metals.

Cal State LA contracts with Southland Disposal to collect consolidated waste on campus. The residual waste is sent to a mixed materials recovery facility, or “dirty MRF”, where it is separated between various recyclable and landfill materials through a combination of manual and mechanical sorting. A dirty MRF ensures that 100% of the waste stream is subjected to the sorting process, and recovers between 5 percent and 25 percent of the incoming material as recyclables.

The remaining residual waste is sent to two landfills. Chiquita Canyon Landfill receives 90 percent of the waste, and the other 10 percent is taken to Sunshine Canyon Landfill. Both landfills deploy a gas recovery system to collect methane which is then used to generate electricity for the equivalent of nearly 35,000 homes each year. Out of the 1,514 tons collected from Cal State LA in 2015-16, approximately 565 tons was sent to landfill.

In 2014-15, a Green Your Move Out fundraising program collected 3,077 pounds of surplus clothing and shoes with the help of USAgain, a for-profit textile recycler. USAgain places textile recycling bins in residence halls with instruction about what kinds of textiles are accepted. Collected items are shipped to thrift store chains, graders and wholesalers, in many cases to be worn as secondhand clothing. Non-reusable clothes are recycled into insulation, wiping rags, or are broken down to reclaim fiber.

2.1 Cal State LA Diversion Rates

According to the University’s collection contractor, Southland Disposal, Cal State LA currently diverts 63 percent of its discarded materials from landfills through source-separated recycling and mixed waste processing. Table 1 shows the overall diversion totals for Cal State LA for the past two years.

Table 1: Cal State LA Diversion Rates

Year	Tons Recycled	Tons Landfilled	Total Tons Collected	Diversion Rate
2014-15	627.12	509.36	1136.48	55%
2015-16	949.64	564.78	1,514.42	63%

What do we generate?

"Generation" is the sum of tons diverted plus tons disposed, and is used to determine the diversion rate. The "diversion rate" is the percent of materials that are diverted out of total materials generated.

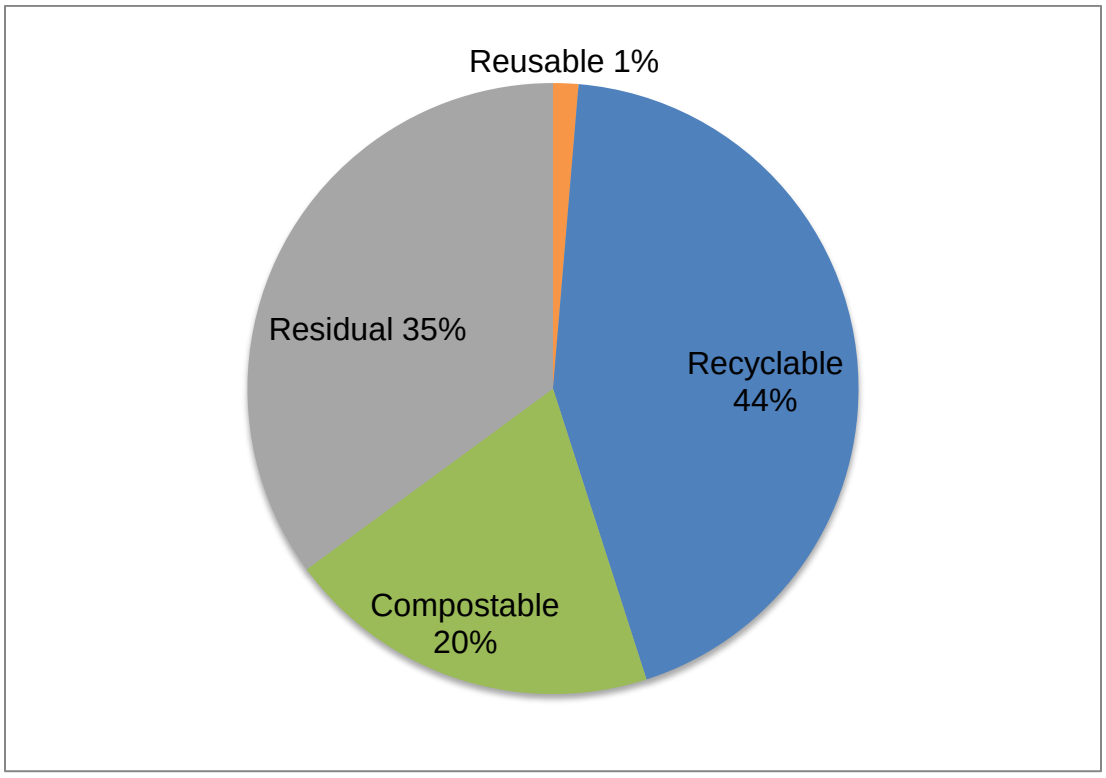
Generation = Disposal + Diversion
Diversion Rate = Diversion/Generation

During the Fiscal Year July 1, 2015 through June 30, 2016, Cal State LA generated over 1,514 tons of materials that were either diverted or disposed. Approximately 565 tons were disposed in landfills and 950 tons were diverted through source-separated recycling and mixed waste processing. According to Southland Disposal, this resulted in a 63 percent diversion rate.

What is waste?

To plan for Zero Waste, we first need to understand what we throw away. Figure 2 shows the recoverability of Cal State LA's discarded materials that were disposed as waste. This is based on the results of visual audits conducted by Facilities Services staff in April 2016. The auditors identified "food packaging" as the primary material type designated as "residual."

Figure 2: Cal State LA Visual Audit Results



2.2 Commodity Analysis

What are our Discarded Materials Worth?

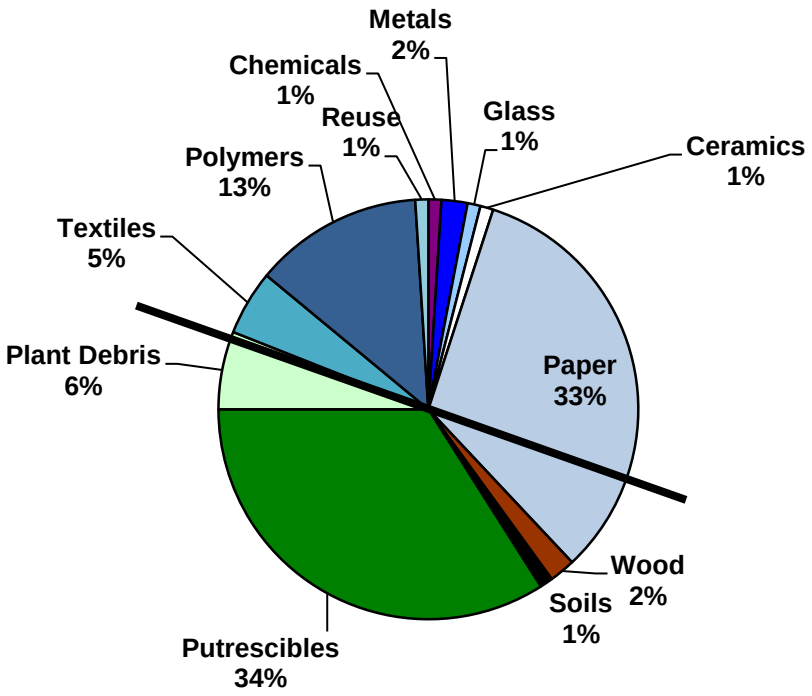
Cal State LA's discarded materials are comparable to those estimated in statewide studies of educational institutions conducted by CalRecycle. The majority of materials disposed in landfills are recyclable or compostable. The individual commodities (paper, metal, glass, etc.) also have value in the marketplace.

Using the detailed composition data for educational institutions from the CalRecycle 2014 California Commercial Generator Waste Study, Cal State LA's discarded materials can be divided into the 12 market categories.

1. Reuse
2. Textiles
3. Polymers
4. Metals
5. Glass
6. Paper
7. Putrescibles
8. Plant Debris
9. Wood
10. Soils
11. Ceramics
12. Chemicals

Figure 3 illustrates the composition of materials typically discarded from educational institutions divided into the 12 market categories. Note that half of the materials are suitable for composting.

Figure 3: Composition of Discarded Materials from Educational Institutions



Source: CalRecycle 2014 Generator-Based Characterization of Commercial Sector Disposal and Diversion in California (data from the study divided into 12 market categories)

If source-separated and collected and delivered to buyers, each of these material types (paper, metals, glass, etc.) can be marketed within Los Angeles County. Because of the commodity values, mixed recyclables have positive values at Materials Recovery Facilities within the region.

Once processed, composted materials (putrescibles, plant, debris and wood) can be sold to farms and landscapers for soil amendment.

Reusable items and textiles can be donated locally or sold by reuse facilities (Habitat for Humanity, Goodwill, etc.).

Table 2 estimates the value of discarded materials from Cal State LA that were landfilled in 2015-16.

Table 2: Estimated Value of Cal State LA Discarded Materials

Categories	%	Annual Tons	$/ton	Value
1. Reuse	1	6	$400	$2,259
2. Textiles	5	28	$80	$2,259
3. Polymers	13	73	$100	$7,342
4. Metals	2	11	$80	$904
5. Glass	1	6	$20	$113
6. Paper	33	186	$20	$3,728
7. Putrescibles	34	192	$7	$1,344
8. Plant Debris	6	34	$7	$237
9. Wood	2	11	$8	$90
10. Soils	1	6	$7	$40
11. Ceramics	1	6	$4	$23
12. Chemicals	1	6	$1	$6
	100	565		$18,344

Source: Richard Anthony Associates, Cal Recycle, Listed Commodity prices. Organic values are based on finished compost prices.

The university can receive rebates from recyclers for some material types or, as is the current practice, the revenues can offset the cost of collection and processing.

2.3 Cal State LA System Definition

Residual waste, recyclable materials and compostable materials are generated throughout the Cal State LA campus. Within each building materials are generated by Cal State LA students, employees and visitors at locations throughout the buildings, including offices, classrooms, conference rooms, kitchens and break rooms, and restrooms.

Most Cal State LA buildings have collection services for recycling (primarily paper products and bottles and cans from break room or kitchen areas).

Legacy containers for source-separated recycling are located throughout the campus. However, these containers have degraded over time and the recycling separation requirements have changed such that these containers are no longer appropriate for the current collection system.

Additional diversion and disposal is provided through roll-off containers for collection of large quantities of:

- Wood
- Mixed Paper
- Cardboard
- Metal
- Green Waste
- Inert (construction & demolition debris)
- Plastic
- Electronic waste
- Residual waste

Figure 7 depicts the flow of materials through a typical building at Cal State LA.

Figure 4: Legacy Containers



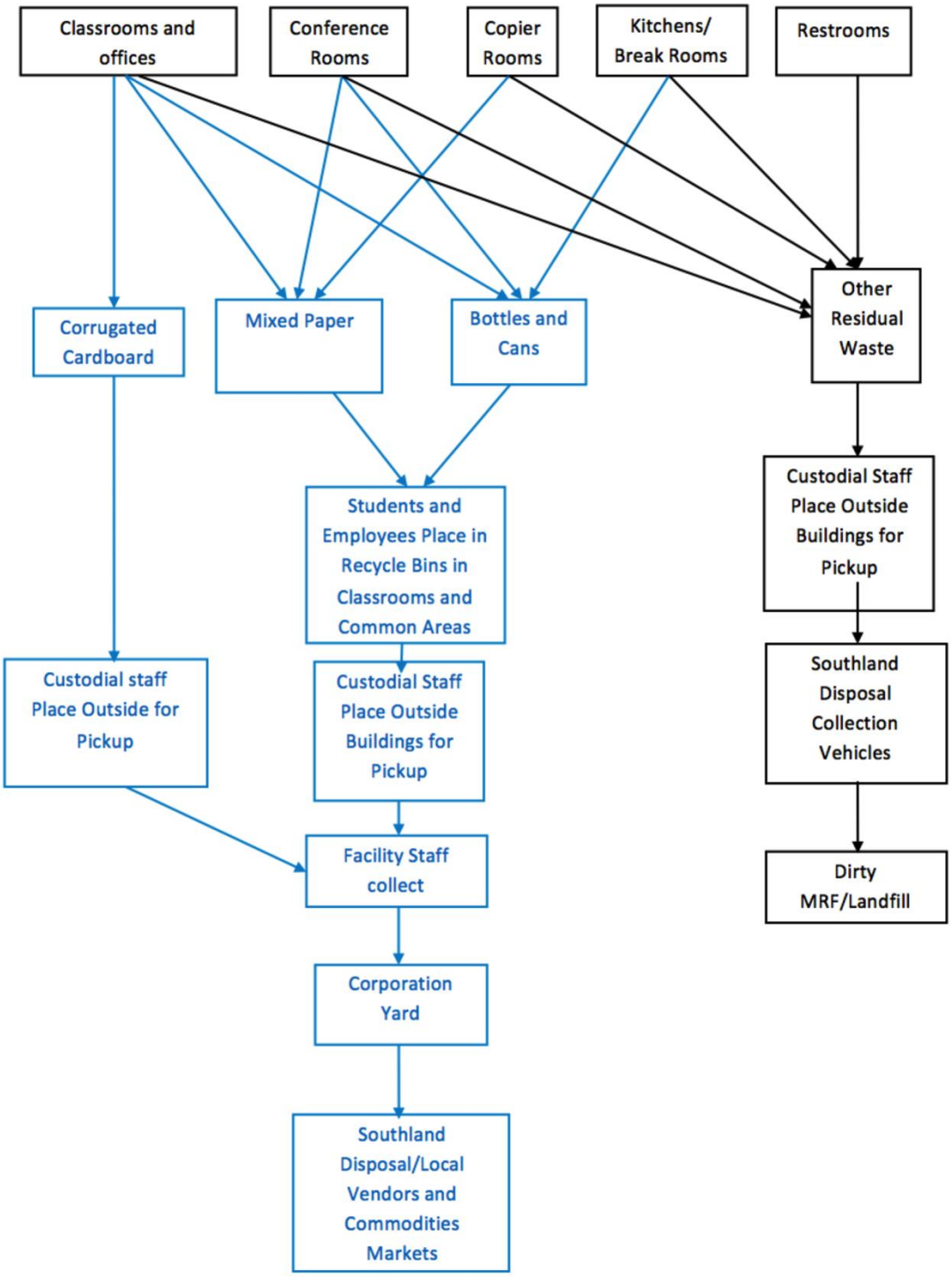
Figure 5: Rolloffs at Corp Yard



Figure 6: Green Waste Collection



Figure 7: Material Flows through Typical Building at Cal State LA



2.4 Service Opportunities

In a Zero Waste systems approach, another one of the first steps is an inventory of reuse, repair, recycling and composting facilities for materials currently discarded. The analysis identifies suitable locations for all materials generated. The analysis also evaluates whether there are any differences in services available by sources of materials, from residents, businesses, construction and demolition activities or self-hauled. The analysis also identifies both public and private services that are available.

This inventory does not recognize landfills or incinerators as suitable facilities, and identifies voids or gaps in materials markets and services. These are considered to be "service opportunities" for someone to provide that service in the future. The inventory identifies specific programs and facilities that can repair, reuse, recycle or compost discarded materials. Once these service opportunities are identified, the Plan particularly makes sure that there are policies, programs and/or facilities that address the largest amounts of materials, the most valuable materials and the most toxic materials and products being discarded.

Discarded materials are identified by standard classifications (typical discard sort categories) and sorted into twelve market categories. For each classification, market options are identified. Products or packages that have unacceptable disposal options and/or require new services are identified through this process as well.

Issues of access, opportunity, availability and knowledge come next. In many cases (disposable diapers, for example), the inventory shows that there is no reuse, recycling or composting option. These items can be addressed as producer responsibility issues, and may include a decision being made about how a particular product could be redesigned or a new recovery system implemented.

A review of the service opportunities shows that there are a few areas where new policies and redesigned storage, collection and processing systems would allow the capture of more materials. Table 3 lists the key challenges.

Table 3: Marketing Challenges for Cal State LA Discarded Materials

Material	Challenge
Food scraps (including fish and meat)	Processing capacity is needed for Southern California to comply with AB1826
Used building materials	Source separation on site
Treated wood	No markets, these products require redesigning
Window and other glass	Need markets for window and other glass
#3-#7 and other plastic (e.g., plastic bags, expanded polystyrene)	Need better local markets for some; policies or ordinances to get producers to redesign or Cal State LA ban

The largest market opportunities exist for mixed containers, metal, paper and compostable material recovery systems. There is also a significant amount of work that needs to be done in the area of encouraging vendors on campus to take responsibility for products and packaging on campus that are not reusable, recyclable or compostable on campus.

Section 3 Policy and Program Analysis

3.1 Program Options

Reuse

Cal State LA has implemented significant programs for recycling discarded materials. However, some materials currently disposed are considered reusable. These materials include office supplies, furniture, and reusable equipment. Reusable materials are often discarded when employees or students move and need to discard materials quickly. In 2014-15, a Green Your Move Out fundraising program collected 3,077 pounds of surplus clothing and shoes with the help of USAgain, a for-profit textile recycler. The University has an office furniture storage and reuse program, which is operated on an ad hoc basis. Storage and transportation of potentially reusable items can be costly. However, disposal of potentially reusable items not only wastes landfill space, but also wastes valuable materials and resources.

Two additional strategies for increasing reuse of materials include:

- **Annual round-up for donating unwanted materials**. Facilities Services operates the corporation yard where recyclable materials, including scrap metal and electronic waste, are diverted from disposal, and hazardous materials are properly manifested and disposed. In addition to the Green Your Move Out program and reusable office equipment collection program, Facilities staff could sponsor an annual round-up of unwanted materials building on the framework of the existing programs. These could be aggregated at the corporation yard and donated to local schools and non-profits. Costs for the annual round-up would be fairly minimal, but would require some staff support for coordination.
- **On-line materials exchange**. Under this program, Cal State LA would sponsor an on-line materials exchange for unwanted reusable items generated on campus. This program could be as simple as an on-line posting to the employees-only page of the Cal State LA website or a dedicated “Freecycle@work” page. Freecycle@work is a free on-line exchange for employees to list and share unwanted reusable items generated at work with other faculty and staff employees. Costs for establishing an online materials exchange are minimal and do not typically require significant monitoring or updating.

Recycling and Composting in Offices and Classrooms

There are a few barriers to maximizing recycling at Cal State LA.

- **Waste container location convenience**. Currently, trash containers are distributed throughout the campus as part of legacy infrastructure and in every office, conference room, common areas, and outside of buildings. Custodial staff empty the trash containers five days per week. Depositing materials in trash containers is currently the most convenient option for all staff and is likely the default option in many cases when a recycling container cannot be located.
- **Recycling messages require reinforcement**. Cal State LA provides information about proper disposal of materials on its website and provides labels on the recycling

containers to indicate which materials can be recycled. However, many students, employees and visitors may not be certain about how materials should be appropriately recycled. There are variations between buildings about how to recycle and the materials recycled at Cal State LA may be different from those that employees are used to recycling at home. Reinforcement of the recycling message needs to be communicated frequently. A one-page recycling guide delivered to each new student, employee or visitor and a quarterly recycling article in an online newsletter, would strengthen the message of how to recycle appropriately at Cal State LA. Consistent labeling on all containers in all offices and buildings will also help employees to recycle appropriately.

Compostable materials are generated in all buildings and include: food scraps, food contaminated paper and compostable plastic, paper towels, and napkins.

There are a few barriers to implementing the compost program at Cal State LA.

- **Increased effort for custodial staff**. Adding on to the workload of the custodial staff without reducing their level of effort on other tasks, would increase their costs of providing services to Cal State LA.
- **Increased costs of collection**. Adding on to the collection system of the collection service provider without reducing their costs for providing other collection services, would increase their costs of diverting compostable materials at Cal State LA.
- **Ensuring separation of paper towels from other restroom waste**. Paper towels are compostable. However, some compost facilities cannot accept paper towels contaminated with other restroom waste. If paper towels are collected separately from other materials generated in the restrooms, those materials could be more reliably composted in most facilities in the region.

A pilot program could be implemented under the current contract with Southland Disposal to determine the actual impacts and benefits to consider implementing this campus-wide under the next contract to comply with AB1826.

Alternative Collection Models

The challenges faced by Cal State LA have been encountered by other institutional generators throughout California. There are several alternative approaches and best practices for increasing recycling and composting at classrooms, office buildings and other similar facilities.

Best practices include:

- Develop and clearly define program and custodial staff responsibilities with custodial staff input.
- Label and color-code containers.
- Locate centralized containers together.
- Do not “strand” recycling or trash cans (or they become the default container).
- Do not use plastic liners for small recyclables or trash containers and side caddies.
- Use compostable plastic liners for compost.

- Collect restroom paper towels for composting.
- Educate students, employees and visitors with easy to understand and informative materials and training sessions.
- Educate custodial staff with easy to understand and informative materials and training sessions.

Material Collection Procedures

To provide a cost-effective alternative for maximizing recycling and composting, Cal State LA will need to adjust its approach to how materials flow through the buildings. To reduce the level of effort of the custodial staff, Cal State LA could reduce the number of trash containers that are required to be emptied. Most trash containers located in classrooms, offices, conference rooms, and common areas are not filled each day. Reducing the number of trash containers serviced and the frequency of collection will reduce the level of effort of the custodial staff.

Providing the right equipment to the custodial staff and employees will also decrease their level of effort. Tandem dollies or janitorial carts will help custodians keep materials separate for collection and reduce the number of times that they have to visit each location for service. Deskside recycling containers and smaller trash caddies to make it easy for employees to keep materials separate in their offices (as shown below) will make it more convenient for them to separate materials correctly.



Figure 8: Deskside Recycling Container and Side Caddy

Each of the best practices listed above will support any of the model collection methods. Table 4 lists the model collection methods for maximizing recycling in office settings along with a list of advantages and disadvantages of each approach.

Table 4: Alternative Collection Methods for Maximizing Recycling

Collection Method	Key Features	Advantages	Disadvantages
Model A	No Deskside Collection Centralized Only, Recycling, Composting and Trash Collection	Reduces custodial labor Engages all generators in recycling programs	Requires generators to bring materials to centralized areas
Model B	Deskside Recycling Only Collection Centralized Recycling, Composting and Trash Collection (in addition to deskside recycling)	Provides convenience for recycling and inconvenience for trash	Requires more labor for custodial staff, as recyclables represent the majority of discarded materials at Cal State LA
Model C	Deskside Recycling and Trash Collection Centralized Recycling, Composting and Trash Collection (in addition to deskside recycling and trash collection)	Provides most convenience for recycling and trash collection	Requires more labor for custodial staff to remove two streams of materials from offices

To evaluate the alternative collection methods, representatives from the following organizations that have implemented variations on these models were surveyed.

- **City and County of San Francisco** – Property managers throughout San Francisco use each of the models described above. Typically no new costs are incurred for custodial support of the program. In many buildings, the new programs have resulted in less work for the custodial staff and their efforts have been directed to other tasks.
- **Lawrence Berkeley National Laboratory** – LBNL implemented compost collection in the cafeteria in 2008 and has expanded it to ten out of 100 buildings on campus over three years. LBNL uses a modified version of Model A where employees bring recyclables, compostables and trash to central locations. Some researchers prefer to have the custodial staff pick up the materials from their offices. These offices are marked with a red sticker. Overall the custodial staff has seen a reduction in their labor, injuries and workers compensation claims.
- **Lawrence Livermore National Laboratory** – LLNL initiated a commingled recycling and compost pilot program in 2011 in 15 out of 100 buildings on campus and at the two cafeterias. Employees bring recyclable and compostable materials to centralized locations and custodial staff continue to service the trash cans in common areas and offices. However, the centralized containers are emptied every evening and the other trash containers are emptied once per week. LLNL program staff recruited volunteer

Recycling Champions in each building to assist in communicating with the employees and trouble-shooting issues that arise.

- **University of California, San Francisco** – UCSF initiated its campus-wide recycling program in 1999 and expanded it to include compostables collection in 2008. The compostables collection was fully rolled out to all buildings and locations by the end of 2011. UCSF has greatly reduced collection of materials from the deskside and asks all employees to bring recyclables, compostables and trash to central locations (Model A). In some areas where employees continue to require collection of deskside recycling and trash containers (Model C). This is provided once per week.

The collection option for maximizing recycling and composting which minimizes custodial staff effort at Cal State LA is Model A - provide recycling, compost and trash collection stations at central locations and require students, employees and visitors to bring materials that they generate in their offices to these centralized locations. Cal State LA could also consider a modified approach where some deskside collection is provided once per week (instead of five times per week). The approach can be modified on a building by building basis, as needed or required by Cal State LA employees.

Reducing the total number of trash-only stations (in conference rooms, common areas and outside of buildings) will also reduce the number of containers that are required to be emptied by the custodial staff. Providing recycling and compost containers wherever trash containers are located will reduce the amount of recyclables and compostables placed in the trash by default.

In modifying its collection system to maximize diversion, Cal State LA must balance student and employee convenience and custodial labor impact.

The building owners and managers in San Francisco anticipated that the mandatory recycling and composting ordinance would increase custodial work effort and costs. However, program managers in San Francisco have seen the opposite result. As buildings transition to more efficient means of moving materials out to loading docks and centralized collection areas, the work of the custodial staff has been reduced. As a result, many building managers have reassigned custodial staff duties to conduct more high cleaning tasks or other efforts. In one building, custodial staff spend their extra time separating recyclables and compostables that have been placed by mistake in the trash, resulting in very high diversion rates for the building.

Cal State LA could consider some or all of the following changes which would increase diversion and reduce (or maintain) custodial effort:

- Collecting trash from offices on a less frequent basis as described in the case studies:
  - LBNL (Model A) – no collection from offices,
  - LLNL (reduced service from status quo) – trash collection from offices once per week, or
  - UCSF (Model A and Model C) – no collection from offices in some areas; and trash and recycling collection from some offices once per week.

- Reducing the total number of trash containers requiring service on campus (eliminating trash containers in classrooms, hallways, common areas, conference rooms, and outside of buildings).
- Relabeling the paper towel trash containers as “paper towels only”. Hygiene products generated in the restrooms would continue to be collected in the restroom stalls.
- Adding compostables collection containers at centralized areas in kitchens and break rooms and eliminating more of the trash containers in these areas.
- Using clear plastic bags for collecting compostable materials and emptying these bags into the compost dumpsters and disposing the empty bags in the trash dumpster. This process would eliminate the need for purchasing more expensive compostable plastic bags. A modified approach would be to use this process for paper towel collection and use compostable bags for compost generated in the kitchens (which could include messier materials such as coffee grounds).

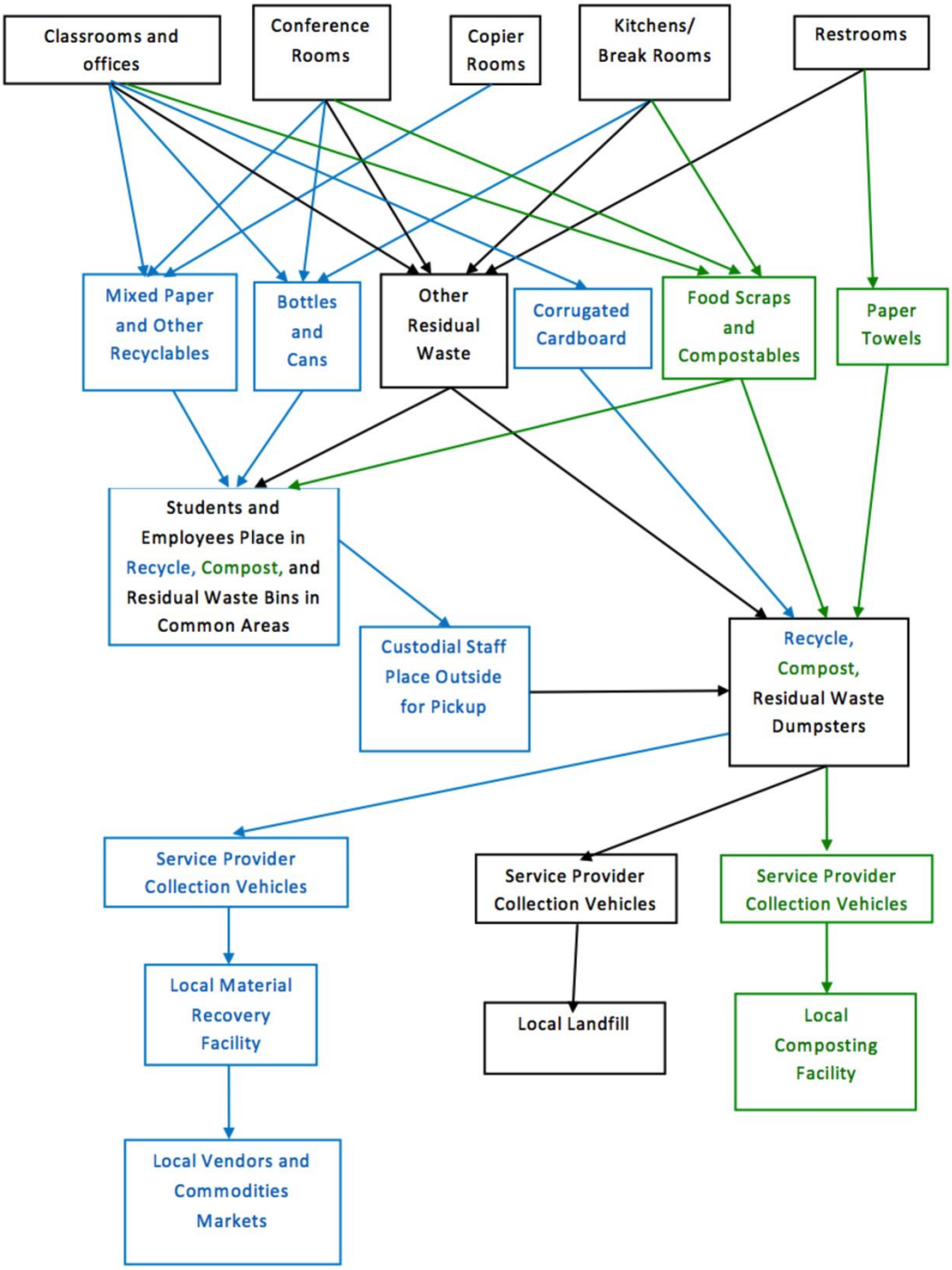
To determine the best method for modifying its collection system, Cal State LA may wish to conduct a pilot program at one or more buildings and test the different methods for convenience and cost. At LBNL, the pilot programs were initiated in the buildings (Environmental Services and Facilities) where employee support was anticipated. To identify the buildings that would be good candidates for the pilot program, Cal State LA could conduct outreach to recruit Recycling Champions and assist them in conducting surveys of the employees. Cal State LA could then test the different models to ascertain levels of employee acceptance and changes to custodial work effort.



Figure 9: Centralized Recycling Stations in Hallways

Figure 10 illustrates how materials would flow through a typical building at Cal State LA using the Model A alternative collection method.

Figure 10: Alternative Collection Method Material Flows (Model A)



Recycling and Composting at Special Events

Special events offer the opportunity to educate students, employees and visitors about the recycling and composting program and provide consistency across the campus. Providing recycling and composting at all special events can increase diversion at the events themselves and can reinforce these practices throughout the campus.

Key strategies for increasing recycling and composting at special events include:

- Automatically providing all three streams (recycling, compost, and trash) whenever one is ordered.
- Distributing a one-page special event guide to all departments and event planners listing all of the best practices for ensuring a green event.
- Providing consistent signage that illustrates specifically what can be recycled and composted at the event with pictures of the specific items (recyclable cans and bottles, compostable plates and utensils, etc.).
- Providing information to event planners about serviceware that can be recycled or composted through the University's collection system and requiring all vendors to use only reusable, recyclable or compostable products.[1]
- Encouraging event planners to have volunteer monitors at each recycling and composting station to direct attendees about what should be recycled and composted.

Recycling and Composting at the Golden Eagle and Student Union

The Golden Eagle and Student Union house the majority of dining areas on campus and are prime locations for enhancing the recycling program and implementing compost collection.

Some additional enhancements could be made to the dining area including:

- Providing consistent signage that illustrates specifically what can be recycled and composted with pictures of the specific items (recyclable cans and bottles, compostable plates and utensils, etc.).
- Placing recycling and composting containers wherever there are trash containers and eliminating stranded trash containers. For example, providing a small compost bin adjacent to the coffee station would encourage students and employees to compost sugar packets, wooden stir sticks, and used coffee cups.
- Offering a discount (e.g., 10 or 25 cents) for students and employees that bring in their own reusable container or coffee cup for refilling.
- Eliminating any serviceware or packaging that is not recyclable or compostable (ketchup packets, chip bags), so that very little of what is generated in the food service area is required to be disposed.

[1] The San Francisco Department of the Environment maintains a database of "SF Approved" products (including compostable or recyclable foodware, straws, and napkins) that meet the City's environmental requirements. http://www.sfapproved.org/compostable-or-recyclable-foodware-straws-and-napkins

- Providing large containers for condiments and consider eliminating single-serve items (e.g., sugar packets, honey packets).
- Using napkin dispensers that provide one napkin at a time.

3.2 Policy Options

Policy directives can support the successful implementation of waste minimization, recycling and composting programs by setting the bar and ensuring that program implementation is identified as important to the organization.

Cal State LA could benefit from campus-specific policy directives, including.

- Adopt Target Year for achieving 90% waste diversion by 2026 and moving toward Zero Waste by 2036.
- Adopt the policy that no reusable, recyclable or compostable materials should go to landfill.
- Require that all generators participate in Cal State LA's reuse, recycling and composting programs.
- Ensure that managers of buildings and facilities receive training on Cal State LA reuse, recycling and composting programs.
- Encourage or require deconstruction, salvage, and reuse of materials from C&D projects in addition to existing recycling requirements.
- Encourage or require on-site reuse of C&D materials, soil and mulch generated from landscape projects.
- Require vendors to take back any wasteful packaging and require them to use returnable shipping containers and pallets.
- Require all new copiers and printers to have duplex printing capability as a default setting and adopt a policy that ensures that setting is used.
- Adopt "Precautionary Principle" for all purchases. The precautionary approach seeks to minimize harm by using the best available science to identify safer, cost-effective alternatives.[2]
- Adopt an Environmentally Preferable Purchasing policy that addresses Zero Waste issues and sets preferences for: durables over disposables; used and refurbished goods and equipment, minimum recycled content standards, and renting/leasing instead of buying. Develop and/or distribute resources to support adherence to the policy such as catalogs that highlight products and services. Environmentally responsible supply chain management or environmentally preferable purchasing is the practice of choosing environmentally-friendly products and services. Environmentally preferable purchasing

[2] Mendocino County and the cities of Berkeley, Portland and San Francisco have adopted precautionary principle ordinances.

helps reduce greenhouse gas emissions, reduce waste and conserve energy. It can also improve an organization's bottom line by cutting costs, enhancing the public image and improving employee health.

- Require suppliers and concessions to eliminate non-recyclable packaging, take responsibility for products/packaging by taking them back, and implement 100% reusable, recyclable or compostable packaging.
- Where possible, take responsibility for products and packaging sold on campus with takeback systems, bans (sales, collection, disposal), and minimum recycled content requirements.

3.3 Outreach, Education and Training Options

Enhancing outreach, education and training will be critical to accomplishing the culture change needed to achieve Zero Waste.

- Train incoming and existing university staff and student workers on how to reduce, reuse, recycle and compost on campus and buy environmentally preferable products. Integrate training on waste reduction, reuse, recycling and composting programs into new student and housing orientations. Integrate training on waste reduction, reuse, recycling and composting programs and environmentally preferable products into new faculty orientation. Provide training to all building and facility managers. Develop educational materials for all student, employees and visitors. Develop signs that illustrate the materials that are targeted for recycling and composting.
- Reinforce and promote culture change by developing marketing materials and conducting ongoing awareness campaigns, education and training programs that tie in with the Zero Waste Goal.
- Provide regular updates on progress toward Zero Waste to campus leadership including administration, faculty, staff, and student leadership
- Add Zero Waste topics, classes and certification programs to academic curriculum (including professional development and job training).
- Provide opportunities for students to participate in program development and implementation, including contributing to ongoing outreach efforts, data tracking, waste analyses, and researching issues and potential solutions.
- Engage faculty and students in research, development & demonstration (including issues related to supply chain, material use reduction, materials flow, improved operations, recycled content product development, Zero Waste technologies development & testing, analysis of best practices and demonstrations of new technologies).

Section 4 Diversion Results and Greenhouse Gas Reduction Potential

This section describes the recommended approach for increasing diversion at Cal State LA. It also provides the estimated diversion results and GHG emissions reduction potential.

4.1 Recommended Approach

Cal State LA should consider implementing the best practices identified in Section 3. These can be categorized under four program areas:

- **Reduce wasteful practices and enhance reuse programs** – through review of purchasing practices and waste and recyclables audits, evaluate how to reduce wasteful practices and right-size waste and recycling collection programs. Expand existing reuse programs to all campus buildings and implement reusable shipping containers and reusable pallet programs wherever possible.
- **Enhance existing recycling program**—provide recycling containers wherever there are trash containers, eliminate stranded trash containers, and direct students and employees to bring recyclables and trash to central locations.
- **Implement composting program**—provide compost containers wherever there are trash and recycling containers, direct students and employees to bring compostables to central locations, and have custodial staff divert paper towels from restrooms.
- **Enhance education and consider new requirements**—provide training to all building and facility managers, develop educational materials for all student, employees and visitors, develop signs that illustrate the materials that are targeted for recycling and composting, and consider implementing a policy requiring all generators to participate in recycling and composting programs.

Table 5 provides the diversion results based on the four program recommendations which build upon each other.

Table 5: Diversion Estimates by Program

	Baseline (existing programs)	Reduce and reuse	Enhance recycling	Implement composting	Enhance education and rules
Diversion (tons)	950	1,006	1,189	1,250	1,303
Disposal (tons)	565	508	325	264	211
Diversion rate	63%	66%	79%	83%	86%

The diversion rates are presented as a snapshot in time assuming full implementation of all programs. In reality, programs will be developed over time through additional research, testing, and pilot programs. Based on this analysis, Cal State LA can achieve approximately 85 percent diversion, a very high rate of diversion, by implementing these programs.

Zero Waste is a design framework for reducing generation of waste and maximizing diversion, not a strict tonnage goal. By implementing the program recommendations identified in this report, Cal State LA will be striving towards Zero Waste. However, there will still be some residual wastes that will need to be disposed because either the materials are not recyclable or compostable or they were placed in the trash by mistake.

4.2 Greenhouse Gas Reduction Potential

The programs recommended in this plan can reduce the Cal State LA's greenhouse gas (GHG) emissions by as much as 761 metric tons of carbon dioxide equivalent.

Using the estimated diversion rates discussed above, Table 6 presents the GHG reduction potential of the recommended programs using the U.S. EPA WAste Reduction Model (WARM) Version 14 to estimate GHG reduction based on material types and amounts diverted.

EPA created WARM to help solid waste planners and organizations track and voluntarily report GHG emissions reductions from several different waste management practices.

WARM calculates and totals GHG emissions of baseline and alternative waste management practices—source reduction, recycling, combustion, composting, and landfilling. The model calculates emissions in metric tons of carbon equivalent (MTCE), metric tons of carbon dioxide equivalent ($MTCO_2E$), and energy units (million BTU) across a wide range of material types commonly found in municipal waste.

Energy efficiency from recycling and methane reduction at landfills are considered in the WARM calculations. Table 8 provides the estimated net new GHG emissions reductions measured based on the projected new tons of diversion over baseline levels.

Table 6: GHG Reduction Estimates by Program

	Baseline[1]	Reduce and reuse	Enhance recycling	Expanded composting	Enhance education and rules
$MTCO_2E$[2] emissions	196	65	(516)	(547)	(661)
Net $MTCO_2E$ reduction from baseline disposal		(115)	(640)	(662)	(761)

[1]Does not Include Baseline Diversion.

[2]Metric Tons of Carbon Dioxide Equivalent; negative numbers are shown in parentheses.

Section 5 Implementation Plan

Expanding and enhancing the existing programs and undertaking new practices will require concurrence from Cal State LA administrators. Cal State LA program managers will also need to undertake specific tasks related to each of the recommended programs.

This section describes the decision-making process and the tasks to be undertaken to implement the new and expanded programs.

5.1 Decision Making Process

The analysis included in this plan indicates that Cal State LA can reach significantly higher diversion levels by expanding and enhancing existing programs. Some new costs, including the costs of containers, outreach materials and signs, will be incurred. Coordination time from Cal State LA program managers and volunteer student and employee Recycling Champions will also be needed. Volunteer Recycling Champions would be recruited in each building on campus to assist in communicating with the employees and trouble-shooting issues that arise.[3]

This plan identifies some strategies and best practices that can reduce the cost impacts to the custodial staff and collection service providers. To move forward with the implementation tasks, Cal State LA staff will need to seek support from Cal State LA administrators. Cal State LA will also need to issue a Request for Proposals for implementing the recycling, compost and trash collection program. As described in Sections 3 and 5, strategies for reducing cost impacts could include:

- Modifying the number of containers serviced by the custodial staff and/or the frequency of collection. Trash is removed from office and classroom buildings five days per week. Cal State LA could develop a tailored approach to custodial services, similar to that being considered for LLNL.
- Modifying the size and frequency of collection of the trash dumpsters (“right-sizing”). Currently Southland services the trash dumpsters five days per week. As compost dumpsters are added to the collection system, Cal State LA could reduce the size of some trash dumpsters and the frequency of collection. Servicing compost dumpsters one or two days per week and trash dumpsters one or two days per week would reduce the cost impacts for Cal State LA. The size of some of the trash dumpsters could also be increased to allow for the reduction in frequency of collection.

Expanding the existing programs is anticipated to be an iterative process. During the procurement stage for new recycling, compost and trash collection services, Cal State LA will confirm assumptions about employee participation and custodial cost impacts. Based on the results of the procurement, Cal State LA program managers will recommend strategies for implementing the expanded programs throughout the campus. Cal State LA program managers and the Recycling Champions can evaluate the potential for the employees in each building

[3] At Lawrence Livermore National Labs 13 Recycling Champions volunteered right away and two needed to be recruited. Recycling Champions volunteer about one hour per week on the program.

comply with the new requirements. Some offices and classrooms can continue to be serviced as is and this can be determined on a case-by-case basis, as it is at LBNL and UCSF.

5.2 Implementation Tasks

Cal State LA program managers in Facilities Services will need to undertake specific tasks related to each program recommendation. Table 7 lists the major recommended tasks necessary to undertake the programs recommendations, and the potential lead group with and other additional key participants in the task, and a potential time table for implementation.

Table 7: Implementation Tasks 2016 through 2020

Task	Lead	Participants
2016 – Year 1 Activities		
Reuse		
Expand existing reuse programs to all campus buildings and implement reusable shipping containers and reusable pallet programs wherever possible		
1) Reuse program	1) Annie Ekshian	Facilities: Dana Twedell and Brad Haydel
2) Shipping containers	2) Tom Johnson	
3) Pallets for Facilities	3) Kirby Williams	
4) Pallets for Procurement	4) Tom Johnson	
Sign on with LA Shares' existing on-line exchange for unwanted reusable items to be redistributed to non-profit organizations in Los Angeles and establish on FreeCycle site for the Cal State LA campus	Brad Haydel	Communications: Robert Lopez, Property Management Office: Annie Ekshian, Facilities: Kirby Williams, Admin Tech: Karen Melick
Recycling and Composting		
Issue Request for Proposals for recycling, compost and trash collection	Brad Haydel	Facilities: Kirby Williams and Dana Twedell
Conduct outreach to recruit a Recycling Champions in each building throughout campus. Recycling Champions in each building: ▪ Are the liaisons to Facilities Services ▪ Receive training on recycling and composting from Facilities Services ▪ Communicate with employees on recycling issues ▪ Volunteer about one hour per week	Kirby Williams	Building Administrators and Center for Student Involvement
Develop implementation schedule for rolling out new recycling, compost and trash collection (as a component of the Request for Proposals process)	Collection Services Provider	Brad Haydel, Kirby Williams, Recycling Champions
Order equipment and services (Samples included in Appendix B)	Kirby Williams	Brad Haydel, Tom Johnson, UAS, Self-

Task	Lead	Participants
		support groups
Prepare signs and recycling guide (Samples included in Appendix B)	Joni Shimotsu	Brad Haydel, Kirby Williams, Peter Diaz
Initiate program implementation activities (as described in the implementation schedule – to be developed as a component of the Request for Proposals)	Dana Twedell	Brad Haydel, Kirby Williams, Recycling Champions, UAS, Self-support groups
Special Events		
Initiate discussion with Special Events about automatically ordering recycling and compost collection whenever trash collection is ordered for special events (Sources included in Appendix B)	Brad Haydel	Special Events: Susan Tsuji Facilities: Kirby Williams Procurement: Tom Johnson
Prepare special event recycling guide (Samples included in Appendix B)	Brad Haydel	Susan Tsuji and Kirby Williams
Environmentally Preferable Purchasing		
Initiate discussions with Purchasing Department about Environmentally Preferable Purchasing Policies, Precautionary Principle and requirements for vendors to take-back packaging and transport containers (Samples included in Appendix B)	Brad Haydel	Tom Johnson and Daniel Keenan
Review model policies and discuss applicability for Cal State LA Purchasing	Brad Haydel	Kirby Williams and Tom Johnson
Develop Cal State LA-specific policy recommendations	Brad Haydel	Kirby Williams and Tom Johnson
C&D		
Initiate discussions with construction project managers about requirements for deconstruction, salvage, and reuse of materials from C&D projects in addition to existing recycling requirements (Samples included in Appendix B)	Barbara Queen	Construction Project Managers: Sarab Singh, Radell Hutchen, Mark Moya
Initiate discussions with construction project managers about requirements for on-site reuse of C&D materials, soil and mulch generated from landscape projects	Dana Twedell	Construction Project Managers: Sarab Singh, Radell Hutchen, Mark Moya
2017 – Year 2 Activities		
Reuse		
Based on feedback from the Property Management Office and Communications, expand the reuse program for unwanted reusable materials through either an Annual Roundup or	Annie Ekshian	Kirby Williams

Task	Lead	Participants
on-line exchange		
Recycling and composting		
Based on the results of the procurement process, rollout new recycling, compost and trash collection services to all buildings	Kirby Williams	Dana Twedell and Building Administrators
Order additional equipment and services	Kirby Williams	Brad Haydel, Tom Johnson
Recruit new or replacement Recycling Champions	Brad Haydel	Building Managers and Center for Student Involvement
Conduct training and education activities (through Facilities staff or outside contractors)	Brad Haydel	Recycling Champions, Center for Student Involvement, and potential new hire
Track progress and report on results	Brad Haydel	Recycling Champions, Center for Student Involvement, and potential new hire
Conduct survey of employees	Brad Haydel	Kirby Williams and potential new hire
Food Services		
Initiate discussions with all food service vendors to review best practices for reducing waste in the cafeterias and food courts to comply with AB1826 (Samples included in Appendix B)	Brad Haydel	Daniel Keenan, Kirby Williams, Dana Twedell, Alma Singh, Betty Kennedy
Provide additional signs and containers as needed	Joni Shimotsu	Kirby Williams, Peter Diaz
Provide additional training to cafeteria staff and evaluate levels of trash, recycling and compost	Daniel Keenan	Kirby Williams, Betty Kennedy
2018 – Year 3 Activities		
Mandatory Requirements		
Evaluate level of participation in Cal State LA recycling and composting programs	Brad Haydel	Kirby Williams
Consider adopting the policy that no recyclables or compostables should go to landfill	Cal State LA administrators	Facilities Services
Consider requiring that all generators participate in Cal State LA's recycling and composting programs	Cal State LA administrators	Facilities Services

Appendix A Baseline Needs Assessment

A baseline needs assessment of current waste and recycling practices and programs was performed using the criteria of the US Zero Waste Business Council's Zero Waste Facility Scorecard Certification System as a general framework.

A survey was conducted of the members of the Cal State LA departments. The questions were based on the US Zero Waste Business Council (USZWBC) Scorecard and provided a tool for getting information from all over the campus about current operations, policies, and procedures. The information from the surveys was summarized into a service opportunities analysis based on the USZWBC Scorecard that identified which of the USZWBC credits were implemented, and which *could* be implemented to help achieve the Zero Waste goals of this Plan.

A Menu of Policies, Programs and Infrastructure most appropriate for Cal State LA was then prepared based on this service opportunity analysis. The complete Menu is included in Appendix A and the initiatives are further described in Section 3.

Many of the USZWBC credits are focused on helping to build a Zero Waste Economy, and are not just focused on amount of tons diverted from landfills, incinerators and the environment. Most of the USZWBC credits are designed to reduce costs to entities getting certified by USZWBC. There is more than one way to get to Zero Waste, so this Table highlights those approaches that appear to be most applicable for Cal State LA. Cal State LA could also seek certification of 1 or more buildings, before the whole campus qualifies for Zero Waste Certification. For example, the UAS, USU and Luckman Arts Complex might achieve 90% waste diversion sooner than other buildings on the campus due to the nature of their operations, once composting programs are put into place.

Zero Waste Associates (ZWA) reviewed all materials provided by Cal State LA to conduct a baseline needs assessment of current waste and recycling practices and programs using the criteria of the US Zero Waste Business Council's Zero Waste Facility Scorecard Certification System as a general framework.

ZWA provided questions for a Survey that Cal State LA did of all involved Cal State LA campus stakeholders. The questions were based on the USZWBC Scorecard and provided a tool for getting information from all over the campus about current operations, policies, and procedures. The Survey was sent to the following individuals:

Department/Building	Name	Title
Administration Building	Troy Allen	Director Strategic Planning & Quality Improvement
Anna Bing Arnold Children's Center	Patricia Ramirez-Ulloa	Director
Athletics	Eugene Hutchinson	Interim Facilities and Event Manager
Biological Sciences	Scott Bowman	Health & Human Services
Career Center	Christopher Lenz	Director
Corporation Yard	Warren Jacobs	AVP, Facilities, Planning, Design & Construction
E&T Building/Hydrogen Station	Michael Dray	Hydrogen Station Manager

Department/Building	Name	Title
Fine Arts	Luz Solis	Program Management Specialist
Fleet Services	Kirby Williams	General Facilities Manager, Facilities Services
Grounds & Public Works	Michael Rodriguez	Assistant Director, Facilities Services
Hertzberg-Davis Forensic Science Center	Katherine Roberts	Interim Exec Director
High School, LACHSA	Mitzi Lizarraga	Principal
High School, MASS Stern	Kirsten Woo	Principal
Information Technology Services	Peter Quan	Chief Technology Officer
King Hall	Rosa Cessna	Resource Manager
Library	Scott Breivold	Associate University Librarian
Luckman Arts Complex	Wendy Baker	Executive Director
Manufacturing/Trades	Michael Murray	Operations Manager, Facilities Services
Parking and Transportation Services	Carmen Gachupin	Director, Parking and Transportation Services
Planning, Design & Construction	Barbara Queen	Director, Planning, Design and Construction
Property Management	Thomas Leung	University Controller
Public Safety	Rick Wall	Director of Public Safety / Chief of Police
Shipping & Receiving	Albert Frias	Lead, Shipping & Receiving
Simpson Tower/Salazar Hall	Elsa Henriquez	Fiscal Officer
Special Events	Susan Tsuji	Facilities Use Coordinator
Student Affairs	Nancy Wada-McKee	Vice President for Student Life
Student Health Center	Monica Jazzabi	Director, Student Health Center
Student Housing Services	Betty Kennedy	Associate Director of Operations
Television Film & Media Center	Karm Cooper	Administrative Support Coordinator
UAS Food Services	Alma Sahagun	Executive Director, UAS
USU/ASI	Stephen Fleischer	Executive Director, USU

Cal State LA had a response rate of 70.9%, which is very good for this detailed of a survey.

ZWA then prepared a Draft Service Opportunity Analysis based on the information from the Surveys, followed by a Menu of Policies, Programs and Infrastructure Checklist based on the USZWBC Scorecard (see below). ZWA then analyzed which of the policies, programs and infrastructure of the USZWBC Scorecard would be easiest and most likely for Cal State LA to achieve.

This analysis does not analyze how and when Cal State LA could get to 90% waste diversion. That is part of the analysis of recommended policies, programs and infrastructure to determine what is needed to divert over 90% of discarded materials from landfills, incinerators and the environment.

Table A-1 has 3 categories of items that are:

- Already done
- Easier to obtain UZWBC credits
- Harder to achieve USZWBC credits

The following are descriptions of the 3 categories.

Already done

- Would achieve 5 USZWBC credits once Cal State LA also achieve 90% waste diversion
- First identified by ZWA review of existing system, including review of key documents provided from Cal State LA, discussions with Cal State LA staff, and tour of Cal State LA. Compared to USZWBC Scorecard 80 credits and addressed which had been implemented already at Cal State LA.

Easier to achieve

- Need to get to 31 USZWBC credits as the minimum needed to get certified as a Bronze Zero Waste Facility once Cal State LA also achieves 90% waste diversion
- If achieved all 40 Easier to Achieve credits, that would place Cal State LA in Silver level of certification by USZWBC if the whole campus were to be certified once Cal State LA also achieves 90% waste diversion

Harder to achieve

- Could achieve total of 66 USZWBC credits including both Easier to Achieve and Harder to Achieve credits. That would place Cal State LA in Platinum level of certification by USZWBC if the whole campus were to be certified once Cal State LA also achieves 90% waste diversion

Table A-1 Key Zero Waste Policies, Programs & Infrastructure

Easier to Fill Service Gap | Harder to Fill Service Gap | Already Done

Policies, Programs, Infrastructure	USZWBC Easier Credits	USZWBC Harder Credits	USZWBC Total Credits
Requirements			
1. Zero Waste policy in place	X		X
2. 90% overall diversion from landfill and incineration for non-hazardous wastes[4]		X	X
3. Meet all federal, state/provincial, and local solid waste and recycling regulations	X		X
4. Data provided to USZWBC has been published formally	X		X
5. Data documents a base year and measurements since the base year	X		X
6. Commit to submit 12 months of data to USZWBC annually (Data submitted will be public and published on the USZWBC website)	X		X
7. Case Study of Zero Waste initiatives can be published on USZWBC website	X		X
8. Recertification is required every three years	X		X
9. Contamination is not to exceed 10% of each material once it leaves the site	X		X

[4] Discarded materials are reduced, reused, recycled, composted or recovered for productive use in nature or the economy at biological temperatures and pressures. Materials can be processed above ambient biological temperatures (>200° F) to recover energy from the 10% residual, but they do not count as part of the 90% diversion. Reused materials (office furniture, pallets, paper, etc.) are eligible to count as part of the 90% diversion requirement.

Policies, Programs, Infrastructure	USZWBC Easier Credits	USZWBC Harder Credits	USZWBC Total Credits
Credits			
Credit Redesign			
Credit 1 Right size collection containers	X		X
Credit 2 Restructure waste collection agreements		X	X
Credit 3 Reviewed all 9 points of generation (Warehousing & Distribution, Offices, Food Services, Grounds, Construction, Manufacturing, Vehicular Maintenance, Retail, Housing & Hospitality) to design out or eliminate wasting and/or upcycle materials into highest and best uses.			
Credit 4 Review supply chain		X	X
Credit Reduce			
Credit 1 Document materials reduced			
Credit 2 Track material flows to eliminate waste		X	X
Credit 3 Goals in place to reduce size/amount of product packaging		X	X
Credit 4 Implemented paperless-office program	X		X
Credit 5 Duplex printing is default setting on all printers with capability		X	X
Credit 6 Grasscycling is standard practice	X		X
Credit 7 Native landscaping, xeriscaping and grasscycling		X	X
Credit Reuse			
Credit 1 Implement reuse systems	X		X
Credit 2 Document reused pallets and shipping containers	X		X
Credit 3 Implement reusable transportation options through an assessment tool		X	X
Credit 4 Reuse office supplies	X		X
Credit 5 Reuse durables for service ware	X		X
Credit 6 Donate edible food	X		X
Credit 7 Donate remaining food to animals			
Credit Compost (ReEarth)			
Credit 1 Collect compostables separately	X		X
Credit 2 Compost, digest or reuse yard trimmings	X		X
Credit 3 Compost food scraps & soiled paper onsite			
Credit 4 Compost food scraps & soiled paper offsite	X		X
Credit 5 Use compost or mulch onsite	X		X
Credit 6 Digest food scraps			
Credit 7 Grow food onsite for use onsite	X		X
Credit Recycle			
Credit 1 80% of recyclables marketed for Highest and Best Use according to 12 Market Categories (Reuse, Paper, Plant trimmings, Putrescible/food, Wood, Ceramics, Soils, Metals, Glass, Polymers, Textiles & Chemicals)		X	X
Credit 1.2 100% of recyclables marketed for Highest and Best Use			

Policies, Programs, Infrastructure	USZWBC Easier Credits	USZWBC Harder Credits	USZWBC Total Credits
Credit 2 Document where recyclables are taken	X		X
Credit Zero Waste Reporting			
Credit 1 Document 90% diversion or better		X	X
Credit 2 Track landfill costs, avoided costs and recycling revenue	X		X
Credit 3 Include Zero Waste in Climate Change Report	X		X
Credit 4 USEPA WasteWise member	X		X
Credit Diversion from landfill, incineration, and environment			
Credit 1 Diversion is 90.1-94.9%		X	X
Credit 2 Diversion is 95%-96.9%		X	X
Credit 3 Diversion is 97%-98.9%		X	X
Credit 4 Diversion is 98-99.9%		X	X
Credit 5 Diversion is 100%		X	X
Credit Zero Waste Purchasing			
Credit 1 Environmentally Preferred Purchasing (EPP) policy that addresses Zero Waste	X		X
Credit 2 Durable goods are preferred over disposables	X		X
Credit 3 Buy sustainably produced paper and wood products	X		X
Credit 4 Purchasing identifies EPP products		X	X
Credit 5 Purchasing tracks environmentally preferred products		X	X
Credit 6 Used, refurbished, goods are preferred	X		X
Credit 7.1 Other EPP practices			
Credit 7.2 Other EPP practices			
Credit 7.3 Other EPP practices			
Credit Leadership			
Credit 1 Adopted Zero Waste goal	X		X
Credit 2 Upper management reviews Zero Waste reports	X		X
Credit 3 Encourage and reward Zero Waste recommendations	X		X
Credit 4 Take responsibility for products and packaging	X		X
Credit 5 Suppliers take responsibility for products/packaging	X		X
Credit 6 Promote Zero Waste beyond internal operations	X		X
Credit Training			
Credit 1 Public distribution of Zero Waste goal	X		X
Credit 2 Orientation includes ZW	X		X
Credit 3 Quarterly communicate with associates about ZW	X		X
Credit 4 Receptacles are labeled and staff is trained	X		X
Credit 5 Train Purchasing to ID environmentally preferred products		X	X
Credit 6 Zero Waste considered for evaluations or bonuses		X	X
Credit 7 Dedicated roles for Zero Waste leadership		X	X

Policies, Programs, Infrastructure	USZWBC Easier Credits	USZWBC Harder Credits	USZWBC Total Credits
Credit 8 Internal website has Zero Waste training information	X		X
Credit Zero Waste Analysis			
Credit 1 Annual physical waste analysis	X		X
Credit 2 Complete recommendations from analysis		X	X
Credit 3 Annual audit of recyclables contamination		X	X
Credit 4 Include rejected recyclables as waste	X		X
Credit 5 Staff engaged in waste and recycling analyses		X	X
Credit Upstream Management			
Credit 1 Suppliers eliminate non-recyclable packaging			
Credit 2 Request vendors to adopt Zero Waste	X		X
Credit 3 Implement 100% recyclable packaging		X	X
Credit 4 Suppliers redesign to increase reusability or recyclability			
Credit Hazardous Waste Prevention			
Credit 1 Hazardous materials training provided	X		X
Credit 2 Maintain hazardous waste manifests for 3 years	X		X
Credit 3 Universal wastes reused or recycled	X		X
Credit 4 Reduce hazardous chemicals/materials used			
Credit 5 Collect universal wastes from employees and customers			
Credit Closed Loop			
Credit 1 Require 30% post-consumer recycled paper	X		X
Credit 2 Use 20% post-consumer recycled for janitorial products	X		X
Credit 3 Purchase compost from facility that composts your materials		X	X
Credit 4 Materials remain in local markets		X	X
Credit Innovation			
Credit 1 Upcycle non-traditional recyclable materials		X	X
Credit 2 Continuously reduce at least 1% more each year			
Credit 3 Additional innovation			
Total USZWBC credits currently	5		
Total USZWBC credits with easier items implemented (including existing)	40		
USZWBC credits for harder items implemented		26	
Total USZWBC credits with easier and harder items implemented			66

Menu of Policies, Programs & Infrastructure Checklist based on USZWBC Scorecard for Cal State LA

Items checked have been implemented already; if not checked, they are a menu of policies, programs and infrastructure that could be pursued.

	Policies	Programs	Infrastructure/Operations
USZWBC Required	☐Zero Waste policy adopted	☐Data has been published formally ☐Data documents a base year and since ☐Have 12 months of data over 90% diversion ☐Will submit Zero Waste Case Study	☐Divert >90% from landfill, Incineration and environment ☒Meet all federal, state & local solid waste & recycling laws ☐Contamination <10% once shipped off-site
USZWBC Credits	Zero Waste Purchasing ☐Environmentally Preferred Purchasing (EPP) policy ☐Durable goods are preferred over disposables ☐Purchasing identifies EPP products in catalogs ☒Used, refurbished, goods are preferred Leadership ☐Zero Waste goal to all employees ☐Require suppliers to take responsibility for products/packaging ☐Mission statement with Zero Waste to all employees Upstream ☐Policy to ask vendors to implement 100% recyclable packaging Closed Loop ☐Policy requires 30% post-consumer recycled for office paper ☐Policy requires 20% post-consumer recycled for janitorial products Innovation ☐Commit to continuously reduce at least 1% more each year	Redesign ☐Restructure collection agreements ☐Eliminate wasting at 9 points of generation ☐Review supply chain agreements & purchasing records to eliminate wasting, redesign, and takeback wasteful materials Reduce ☐Document materials reduced ☐Track material flows to eliminate waste ☐Reduce size/amount of product packaging ☒Implemented paperless-office for 1 function ☐Duplex printing is default setting Recycle ☐80% of recyclables Highest and Best Use ☐100% of recyclables Highest and Best Use ☐Document where recyclables are taken Zero Waste Reporting ☐Document 90% diversion or better ☐Track landfill costs, avoided costs and recycling revenue ☐Zero Waste in Climate Change Report ☐USEPA Waste Wise member Diversion from landfill, incineration & envt. ☐Diversion is 90.1-94.9% ☐Diversion is 95%-96.9% ☐Diversion is 97%-98.9% ☐Diversion is 98-99.9% ☐Diversion is 100% Purchasing ☒Buy sustainably produced paper & wood ☐Purchasing tracks EPP Leadership	Redesign ☐Right size collection containers Reduce ☐Grass-cycling is standard practice ☐Native landscaping, xeriscaping and grasscycling Reuse ☐Implement reuse systems ☐Document reused pallets and shipping containers ☐Implement reusable transportation options ☐Reuse office supplies ☐Reuse durables for service ware ☐Donate edible food ☐Donate remaining food to animals Compost (ReEarth) ☐Collect compostables separately ☒Compost, digest or reuse yard trimmings ☐Compost food scraps & soiled paper onsite ☐Compost food scraps & soiled paper offsite ☒Use compost or mulch onsite ☐Digest food scraps ☐Grow food onsite for company use Training ☐Receptacles are labeled and staff is trained Zero Waste Analysis ☐Annual physical waste analysis ☐Annual audit of recyclables contamination ☐Staff engaged in waste and recycling analyses Hazardous Waste Prevention ☐Universal wastes reused or recycled

Policies	Programs	Infrastructure/Operations
	☐Upper mgt. reviews Zero Waste reports ☐Encourage and reward Zero Waste recommendations ☐Take responsibility for products and packaging sold on campus ☐Promote ZW beyond internal operations Training ☐Orientation includes ZW ☐Quarterly communicate about ZW ☐Train Purchasing to ID EPP ☐Zero Waste in evaluations or bonuses ☐Dedicated roles for Zero Waste leadership ☐Internal website has ZW training information Zero Waste Analysis ☐Complete waste analysis recommendations ☐Include rejected recyclables as waste Upstream Management ☐Suppliers eliminate non-recyclable packaging ☐Request vendors to adopt Zero Waste ☐Suppliers redesign to increase reusability or recyclability Hazardous Waste Prevention ☐Hazardous materials training provided ☐Maintain hazardous manifests for 3 years ☐Reduce hazardous chemicals/materials used	☐Collect from employees and customers Closed Loop ☐Purchase compost from facility that composts your materials ☐Materials remain in local markets Innovation ☐Upcycle non-traditional recyclable materials

Appendix B Sample Documents

- Infrastructure and materials
- Signs and recycling guide
- Special event recycling guide
- Environmentally Preferable Purchasing Policies
- Precautionary Principle
- Requirements for deconstruction, salvage, and reuse of materials from C&D projects
- Best practices for reducing waste in the cafeterias and food courts

Infrastructure and Materials

Outdoor Containers

Landmark: 55 Gallon Triple High-Traffic Recycling Station





Source over 75% of our raw materials within 150 miles of their facility

Closed Loop Production: Any waste from the manufacturing process is collected and reintroduced into the recycling stream to be reformulated into new material.

Reducing Paper Usage: To promote sustainable forest management, SFI Certified paper is used for shipping materials and office administration.

LEED-Certified Materials: EasyCare products are made of the purest grade of type-2 HDPE recycled plastic, 98% recycled content. The average Landmark enclosure reclaims over 2300 milk jugs.

Max·R: Oxford 22 Gallon Quad Recycling Station



Earth friendly: recycled and can be recycled again

Recycled: 97% pure recycled HDPE plastics

UV inhibitors: 10 fade resistant rich colors

Longevity: engineered commercial-grade furnishings

Maintenance: impervious to insects and mold; never needs paint

Bigbelly: CLEAN Management Console



The bin has a capacity of 567 litres, compaction mechanism increases effective capacity by five and runs on a standard 12 volt battery which is kept charged by the solar panel

Wireless technology-enabled units report their status into the CLEAN (Collection, Logistics, Efficiency and Notification system) dashboard that gives waste management and administration insights for monitoring and route optimization.

Managed Services: one monthly fee provides a turnkey enterprise wide system for better management of your waste collection

Compost needs to be collected EOD; reduced labor create 6 year ROI ($12,000/year)

Clean River Recycling Stations



Transition recycling bins allow you to change streams as needed

The Chesterfield Quadruple Recycling Station



Manufactured from pure high-grade of recycled HDPE, and unlike other plastic recycling centers, contains no foam fillers.

Top-of-the-line pigments and UV inhibitors are used to maintain consistent in the most demanding outdoor environments.

Each unit comes with heavy duty liners with handles for easy servicing and lifting.

Designed for both indoor and outdoor use, and meets all LEED requirements for recycled content, are ADA-compliant and fire safe.

Restrictive openings and hinge flap doors to accommodate multiple material streams, including Cans/Bottles, Paper and Organic material, Waste, etc.

Eco Pop Designs

All metal, vandal-resistant, fire resistant

Can be painted to conform to university specifications



ECO-POP DESIGNS®



Outdoor Waste Diversion Station

Made from a minimum 25% recycled content steel
Hot dipped zinc galvanized coating
40" wide x 24" deep x 49" tall

650-728-9220 / P.O. BOX 269, PACIFICA, CA 94044 / ECOPOP@EARTHLINK.NET / ECOPOPDESIGNS.COM



Round Tri-Bins (from **MaxR**) are used indoors and outdoors, and are made out of recycled milk jugs.



Indoor Containers/Materials

Materials
1 Lunch station recycling bins – 32 gallon (blue)
2 Lunch station compost bins – 32 gallon (green)
3 Slop bucket – 5 gallon (red)
4 Classroom recycling bins – 14 gallon square (blue)
5 Classroom/restroom compost bins – 7 or 10 gallon (green)
6 Rolling carts (for staging recyclables) – 50 gallon (blue)
7 Tall compost bin for kitchen or teachers' lounge – 23 (green)
8 Tall recycling bin for copy rooms or teachers' lounge – 23 gallon (blue)
9 Deskside recycling containers for offices – 7 or 10 gallon (blue)
10 Trash pickers for Compost Monitors/Custodians
11 Recycling Monitor aprons
12 Sidecars for trash – 1 gallon (black)



We see this a lot in office settings. It is a bit unwieldy for going in and out of portables and services multiple floors.





Many custodians prefer just to use a flat bed cart. Multiple 23 gallon slim jims or 32 gallon containers can be moved around. We would just need to make sure that she has the right colored containers (green, blue, gray).



This configuration might also be a bit unwieldy and could fill up fast. We are using these containers at centralized locations, but it might be best just to use a flat bed (see below).



A lot of the custodians prefer these individual dollies that they put on the bottom of each container and then bungee-cord them together. That way, they can have one, two or three containers to drag around with them.



Here is a two-stream system that has been made into a three-stream system.

Signs and Recycling Guide








RECYCLE
Clean paper, plastic containers marked 1-7, aluminum foil, all bottles, cans
milk cartons, cardboard, magazines and newspapers.
NO FOOD
Poster Paper


COMPOST
Food scraps including fruits & vegetables (peels, pits & rinds), meat & bread,
& dirty paper including paper towels, napkins, tissues, cups & plates.
NO PLASTIC - PLASTICO
NO GLASS - VIDRIO
NO TRASH - BASURA
NO METAL
NO STYROFOAM


LANDFILL
Plastic wrappers, snack bags, drink pouches, utensils, straws, & styrofoam
NO FOOD
Mars
CUP NOODLES


Recycling Guide
Recycle Smart
Central Contra Costa Solid Waste Authority
Gray Bin
Landfill
pens & pencils
glue sticks
latex gloves
drink pouch
plastic wrap
ketchup packet
snack trash
straw
plastic utensils
plastic bag
foil with paper
styrofoam
Green Bin
Compost
food & food-soiled paper
paper towels
tissues
pizza
paper plate
carrots
napkins
fruit
raisin box
dirty paper
sandwich
paper cup
chicken
Blue Bin
Recycling
cardboard & clean paper
juice box
water bottle
plastic tray
glass bottle
plastic container
aluminum can and foil
clean paper
aluminum tray
milk carton

Links to Special Event Recycling Guides and Resources

Stanford University
http://bgm.stanford.edu/pssi_special_events

StopWaste – Alameda County Waste Management Authority
http://www.stopwaste.org/sites/default/files/Documents/specialevents-swp.pdf

Napa Recycling
http://naparecycling.com/special-events/

San Francisco - SF Approved Recyclable and Compostable Foodware
http://www.sfapproved.org/compostable-or-recyclable-foodware-straws-and-napkins

Links to Environmentally Preferable Purchasing Policies

Responsible Purchasing Network
http://www.responsiblepurchasing.org/purchasing_guides/all/policies/

CalRecycle
http://www.calrecycle.ca.gov/epp/LawPolicy/

StopWaste – Alameda County Waste Management Authority
http://www.stopwaste.org/preventing-waste/fact-sheets-guides-and-model-policy/model-policy
http://www.stopwaste.org/preventing-waste/business/green-purchasing

Links to Precautionary Principle Ordinance

San Francisco
http://sfgov.org/sites/sfgov.org.sffood/files/migrated/ftp/uploadedfiles/sffood/policy_reports/Precautionary%20Principle%20r0129-03.pdf

Overview
https://www.stmarys-ca.edu/sites/default/files/attachments/files/cre-precautionary-principle_0.pdf

Links to Requirements for deconstruction, salvage, and reuse of materials from C&D projects

City of Berkeley
http://www.ci.berkeley.ca.us/citycouncil/2006citycouncil/packet/061306/2006-06-13%20Item%2010%20Construction%20Demolition.pdf

City of Millbrae
http://www.recycleworks.org/pdf/Millbrae_Reuse_and_Recycling_Requirements.pdf

Links to best practices for reducing waste in the cafeterias and food courts

Western Michigan University
https://wmich.edu/sites/default/files/attachments/ENVS%204100%20Final%20Project%20Report%20-%20Merrow,%20Penzien,%20Dubats.pdf

StopWaste – Alameda County Waste Management Authority
http://www.stopwaste.org/preventing-waste/tips-for-reducing-wasted-food

Cal Dining Case Study
http://www.stopwaste.org/resource/cal-dining-food-waste-prevention