Space Guidelines for Recycling, Organics and Refuse Services

for Designers of Multifamily & Commercial Buildings

STOPWASTE

Fact Sheet

SPACE GUIDELINES FOR RECYCLING, ORGANICS, AND REFUSE SERVICES

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This document provides guidelines to help designers of multifamily, commercial and mixed-use buildings plan for recycling collection when designing new buildings or major renovations.

Guidelines that apply only to multifamily buildings, or only to commercial buildings appear in their own sections, indicated with colored icons.

Some links and references are provided as resources. However, designers should research local requirements for their site and its uses to ensure that they have complete and current information.


MultiFamily

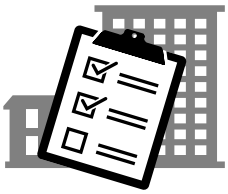

Commercial

1. WHY PROVIDE FOR WASTE DIVERSION SPACE IN BUILDINGS?

It's state and local policy

In California, State policy[1] has set a goal of 75% waste diversion by 2020, and there are new state laws (AB 341 and AB 1826), for diversion of multifamily and commercial recyclables and organic waste (such as food scraps and plant debris) that are being implemented. The Alameda County Waste Management Authority and Recycling Board (jointly known as StopWaste) have set higher standards, originally calling for 75% reduction by 2010 and currently setting a goal of no more than 10 percent[2] of compostables and recyclables to be disposed as refuse. To comply with these requirements, local policies and regulations[3] may require that property owners provide space for occupants to divert wastes for recycling or organics processing.

It's in building codes



California building designers have long been required to provide adequate space for recycling. The building code references a model space ordinance enacted by the State of California in 1991, which applies if there is no local ordinance to establish space requirements for waste diversion. Many Alameda County jurisdictions have adopted their own local ordinances with specific space and enclosure requirements that go beyond state requirements, so it's important to check local planning departments for their requirements. Also, CALGreen building code changes will require that starting in 2017, new buildings and building additions that add more than 30% of the building floor area must provide space for all occupants to recycle non-hazardous materials, including (at a minimum) paper, corrugated cardboard, glass, plastics, metals, and organic waste[4]. The building code also states that if locally-enacted ordinances are more restrictive, they must be complied with. Updates to the 2013 building code will be published in July 2016 and will be enforced beginning July 2017.

1 http://www.calrecycle.ca.gov/75Percent/

2 http://stopwaste.org/about/about-stopwaste/goals

3 http://www.recyclingrulesac.org/

4 Proposed changes to CALGreen Building Code, adding organic waste: Section 4.410.2, & Section 5.410.1

New California legislation requires more diversion

Recent State legislation adds requirements for the diversion of organic materials from multifamily solid waste. The threshold is 8 cubic yards (CY) of organics in April 2016, decreasing to four CY of organics in January 2017. These requirements also apply to businesses of any size.

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AB 1826, signed into law in September 2014, requires that 5+ unit multifamily dwellings generating certain threshold amounts of discards per week arrange for organics recycling services.

It's required throughout Alameda County

ALAMEDA COUNTY WASTE MANAGEMENT AUTHORITY

On the local level, most of StopWaste's member agencies have opted in to a countywide ordinance that makes **recycling and organics separation mandatory for businesses as well as multi-family buildings with 5 or more units**. Citations and fines are possible if recyclables and organics are not properly diverted. Requirements and implementation schedules vary by jurisdiction; see the RecyclingRulesAC.org[5] web site for specifics. Throughout all of Alameda County there has also been a landfill ban on plant debris in effect since 2009, which requires businesses and multifamily sites generating four or more cubic yards of discards per week to prevent plant debris from being disposed as refuse.

It saves resources and may reduce costs

In addition to legal requirements and policy goals, the environment benefits when discarded recyclables and organics are used as a resource. Waste diversion reduces the need to convert open space to landfill space, and it reduces greenhouse gas emissions in two ways: by substituting recyclables for new raw materials to make paper, plastic, metal, glass, etc., and by reducing methane production from organics in landfills. In locales where garbage and recycling rates create an incentive to divert waste, **waste diversion can save money for building owners**. Providing well-planned space for storing recyclables and compostables makes it easier for occupants to divert wastes while keeping the building owner's disposal costs down. Check with local jurisdictions or StopWaste[6] for your local rate information.

5 http://recyclingrulesac.org

6 http://stopwaste.org

2. THE BASIC RULE FOR WASTE DIVERSION PLANNING

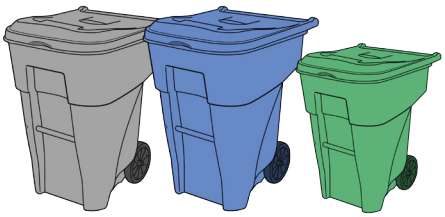
Experience in Alameda County and elsewhere strongly suggests that to minimize costs and problems, **designers should make recycling, organics and refuse services all equally easy to use.** If refuse services are easier, some occupants will toss their recyclables into the refuse container. If recycling is much easier, some occupants will contaminate the recyclables with refuse. It follows that collection containers (bins and carts) should be situated in groups that include one or more containers for each stream: refuse, organics and recycling.

3. ESTIMATING THE NECESSARY SPACE

Container Volume

The companies that collect garbage and recyclables will provide carts and/or bins to hold those materials prior to collection. The size and number of these containers will depend on the size of the project and possibly on the frequency of collection, as well as the types of containers used by the collection company.

The most common collection containers are carts with 20, 32, 64 or 96 gallons of capacity; and bins ("dumpsters") with 1 to 7 cubic yards of capacity. For very high volume customers, most collection companies can provide truck-size "rolloff boxes" that are typically 15 to 40 cubic yards in size. These require special design considerations that go beyond the scope of this document.



TRASH 64 gal | RECYCLING 64 gal | ORGANICS 32 gal

The 40-40-20 Rule

A general guideline for choosing container sizes is to follow the 40-40-20 rule. For weekly collection services, 40% will be trash, 40% will be recycling, and 20% will be organics.

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In a multifamily setting, for once-a-week collection (the norm), a reasonable rule of thumb is to **provide 50 gallons or ¼ cubic yard (cy) of container capacity for every three residents**. This would be the sum of the volumes of refuse, recycling and organics carts (or bins), with volumes **in the proportions of 40% for refuse, 40% for recyclables, and 20% for organics**. This does not include plant debris from landscape maintenance at the site; that volume is site-specific and will need to be estimated separately and added, unless the landscapers remove all of the solid waste that they generate.

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For example, a 60-unit multifamily complex with average occupancy of three people per unit would require 15 cubic yards of total capacity (¼ cy x 60), which, following the 40-40-20 rule, equates to 6 cubic yards each for refuse and recycling and 3 cubic yards of organics. If the collection company uses 6-cubic-yard bins for refuse, 96-gallon carts for recyclables, and 64-gallon carts for organics, this could be served by one refuse bin, 12 recycling carts and nine organics carts, if all collection takes place once a week. Alternatively, twice-a-week service (if available) could reduce the on-site storage volume significantly, but could cost more due to the need for more truck trips per week.

Another approach is to estimate the number of occupants by multiplying the number of bedrooms by 2, and allowing 15 to 18 gallons per occupant, then applying the 40% - 40% - 20% proportions cited above.

It is good practice to provide 20% to 35% excess capacity for seasonal variation and other surges in volume.

Occupants' convenience and the area needed for grouped containers should also be considered. As an example, if convenience dictates that four groups of containers should be used, our multifamily example would use clusters that each comprise a 2 cubic-yard refuse bin, three to four recycling carts, and three organics carts.

Commercial

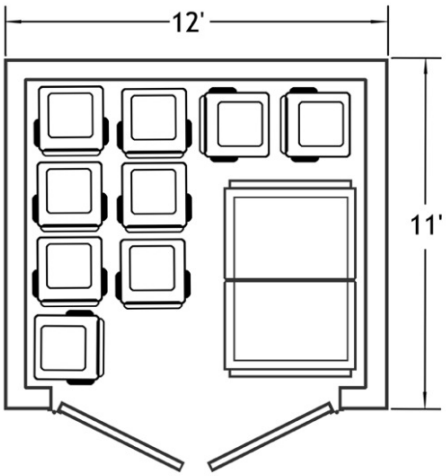
In a commercial setting, there is no rule of thumb for container volume; different types of commercial activities generate very different volumes of solid waste. The relative amounts of each stream (recyclables, organics and refuse) vary as well.

At the state level, in 2005 CalRecycle researched the volumes and types of materials[7] in wastes disposed by many kinds of businesses, and this can provide some indication of how services should be apportioned. Obviously, one can expect retail establishments to produce a significant amount of cardboard boxes, and restaurants will likely require at least 50% of their volume to be organics service. Less obviously, churches and schools with active kitchens (but not all schools, or churches) can also require a substantial amount of organics service; and many health care facilities discard very little office paper, because they use electronic medical records and send discarded documents to a shredding service. For a more accurate estimate, an owner or designer can consider the type of occupants that they are expecting, and look into service levels at comparable locations, keeping in mind that these "comps" may not be fully diverting recyclables and organics from their refuse stream.

7 http://www.calrecycle.ca.gov/wastechar/wastestudies.htm#2006Industry

Storage Space Floor Area

Bin sizes can vary in all dimensions; check with the local collection companies for exact dimensions. The typical space needed for a 6 cubic yard bin is about 8’ wide, 6’ deep (front to back) and 6’ tall at the back, sloping down to 4 feet tall at the front[8]. Generally, 4 cubic yard or smaller bins can be provided with wheels, and larger bins cannot, for safety reasons. Bins without wheels will need to be situated so that the collection truck can service them head-on, without moving them. Most 96-gallon carts fit comfortably in a footprint that is 28x36”; they are around 46” tall. Most 64-gallon carts require a 26x30” footprint and are around 42” tall.



Bins and carts typically have hinged lids that must be lifted; these can damage low ceilings. In addition to space for the containers themselves, space is needed to walk among them and shift them around.

Where an enclosure will contain both carts and bins, an area that is 150% of the sum of bin and cart footprints will probably be needed. Enclosures that contain only carts or only bins will require less extra space because the containers fit together more easily.

Continuing with the example above for a multifamily setting, if the 60 units are in three buildings, each with an outdoor enclosure for discards, then each enclosure should hold one 4-cubic yard bin, five 96-gallon recycling carts and four 64-gallon organics carts. The total comes to 128 sq. ft., or less than one standard parking space.

28 sq. ft.	+	5 * 7 sq. ft.	+	4 * 5.5 sq. ft.	=	85 sq. ft.
One 4-Cubic yard garbage bin		Five 96-gallon recycling carts		Four 64-gallon recycling carts		Total Container Footprint

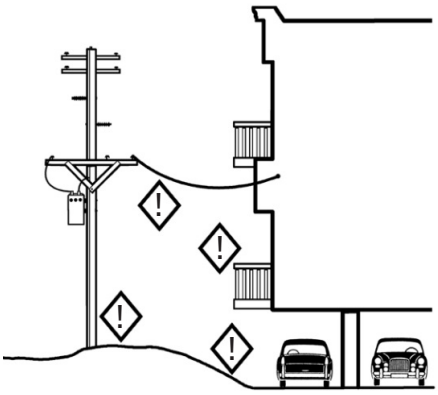
85 sq. ft.	*	1.5	=	128 sq. ft
Total Container Footprint		150% Additional Operation Space		Total Allocated Space

Average Container Footprints

64-gallon cart	5½ sq. ft.
96-gallon cart	7 sq. ft.
4-cubic yard bin	28 sq. ft.
6-cubic yard bin	48 sq. ft.

8 Example Bin Sizes: http://www.tigersanitationutah.com/services/commercial/sizes-and-dimensions/
Example Cart Sizes: http://www.sanjoseca.gov/index.aspx?nid=2372
Examples do not consitute an endorsement of any service provider. Sizes vary, check locally.

4. PLANNING THE COLLECTION LOCATION



In properties with **exterior parking lots**, the typical practice is to provide walled enclosures that contain bins and carts. These are more attractive and help confine discards to a specific area. Many cities have specific, highly detailed enclosure ordinances that govern size, appearance, access, durability, and other factors[9].

In commercial or residential complexes with **parking beneath buildings**, storing bins or carts beneath buildings can pose serious difficulties for the collection company. Some trucks need up to 20 feet of vertical clearance to empty a bin. Driveways that slope down to the parking garage can make bin handling very difficult. A situation that requires the truck driver to roll out bins or carts for more than a few feet takes time and increases the risk of injury or property damage. Many collection companies charge substantial extra fees in these situations. In short, when there is parking beneath the building, try to provide space that is adjacent to the parking area but outside the building envelope and at ground level.

These requirements vary widely among jurisdictions; be sure to consult City planning staff. At present, some ordinances may not fully address recycling needs, especially with regard to organics diversion. However, building designers should include these spaces to enable owners to increase diversion rates, comply with state and local requirements, and potentially reduce operating costs.

A well-designed exterior enclosure system will have:

- A pedestrian entrance
- Lever-style door handle that can be operated with hands full
- Wall space for instructional signage
- Smooth floor that can be swept or mopped if necessary
- Sufficient space to move bins and carts as needed for easy access by users
- Wheel stops near walls to prevent damage to walls
- Adequate lighting to read signs and sort materials
- Architectural features that match the main building

9 Example enclosure requirements:
City of San Jose: https://www.sanjoseca.gov/DocumentCenter/Home/View/437
City of Chula Vista: http://www.chulavistaca.gov/home/showdocument?id=5108

In addition, local jurisdictions often have requirements to protect water quality, such as requiring that an enclosure roof or canopy prevents rainwater from contacting solid waste/waste containers; and/or requiring that enclosures drain inward and have a floor drain that connects to the sanitary sewer system.

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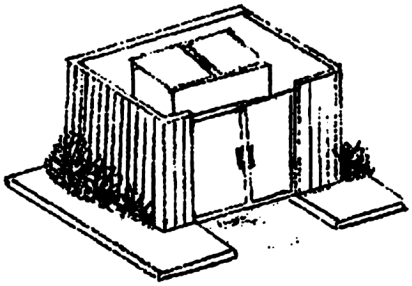
For low-rise multi-unit residential buildings, there are several common configurations, typically located in or near parking areas to enable residents to recycle or dispose of their materials when they are going to their cars. Complexes with townhome or duplex configurations may have space for three carts at each building. Multifamily buildings with four or more stories have in the past been built with chute systems leading to ground-floor trash rooms. However, these chute systems, discussed in detail below, present major impediments to properly segregating materials, and are best avoided all together. Providing collection bins in a clean, well-ventilated, ground-floor room is the best way to maximize composting and recycling in multistory buildings.

Commercial

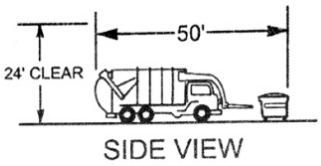
Commercial buildings don't typically use chutes; rather, janitors are responsible for bringing discards from individual suites and floors to a loading dock or central enclosure, typically via a freight elevator. A janitor closet on each floor, large enough to store a two or three barrel dolly, will help facilitiate collection and/or separation of discards around the building. Additionally, a small work room near the loading dock for additional sorting may prove useful, should the building management choose to sort discards at the dock. Spillage of liquids and discarded food might occur in this room. A wash station for cleaning organics carts and bins, connected to a sanitary sewer and valved off when not in use (to prevent seepage from inflow of rain water), would be a useful feature.

5. CONSIDERATIONS FOR EXTERIOR ENCLOSURES

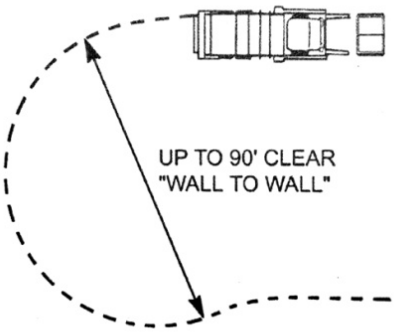
From the occupants' perspective, trash enclosures should not be right below the window, but should be within a **reasonable walking distance**. One California city has an ordinance limiting this distance to 205 feet or less from all units served by the enclosure. Local fire codes may require a minimum air gap between enclosures and building walls. Enclosures that are located away from the perimeter of the property reduce the possibility of illegal dumping by non-residents. Also, the collector may have access requirements; these are discussed further below.



Returning to the example of the 60-unit, three-building complex with one enclosure per building (see page 7): If each 20-unit building has three occupied stories, then the footprint of this building could have dimensions of about 200 feet by 50 feet. Locating the enclosure behind the building near the center of the structure would be ideal, because this would minimize its distance from the living units and hide it from public view, while providing reasonable access (less than 150 feet) for all residents.



SIDE VIEW



PLAN VIEW

In addition, check with the local Planning Department for guidance on codes and design features. At a minimum, each enclosure needs to accommodate sufficient trash, recycling and organics carts or bins to facilitate their use and reduce contamination. The same is true if the building includes collection from a loading dock; be sure there is adequate room for multiple carts on a flat surface (to keep them upright) while still accommodating the trucks that collect from the building.

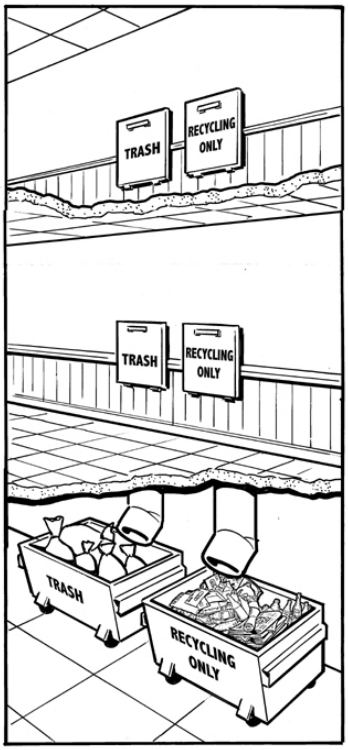
The collector's needs can introduce additional design constraints. Collection trucks are typically ten-wheeled trucks, 8 feet wide and 30 to 35 feet in length, requiring a minimum turning radius of 40 feet. Depending on their design, trucks may lift containers at the front, rear or side of the vehicle. Local ordinances (and truck plus container dimensions) may require 15 to 25 feet of vertical clearance for container handling. When backing up, drivers of these trucks have limited visibility behind them; access that requires backing up should be avoided if possible. When enclosures are placed in parking areas, all of these factors need to be taken into account as the layout is designed. Asking the franchise collector to review your site design prior to construction may avoid future problems; in fact, some jursidictions require it.

6. CHUTES AND TALLER BUILDINGS

The best way to maximize composting and recycling in multistory buildings is to provide centralized collection bins in a well-ventilated, clean, ground-floor room. For residential complexes, a common recycling area that serves multiple buildings may save maintenance staff labor, as well as provide more program visibility and education opportunities to residents, leading to higher participation. Developments of three or more stories have often included chutes to convey garbage from each floor down to a collection bin in a ground-floor trash room. Chutes became popular for their convenience and because they helped keep stairwells and elevators clean, since residents did not need to carry discards down themselves.

However, with the spread of composting and recycling collection, chutes are now a major impediment to providing equal access to all three streams, and particularly to compost, which often causes problems in chutes. The best way to avoid these problems is in the design phase, where chutes can be kept out of the picture.

In cases where chutes cannot be avoided, one solution could be to use a "carousel" or "diverter chute" system such as those developed by Wilkinson Hi-Rise, LLC (www.whrise.com). However, this should be done with full awareness of the maintenance requirements of such systems, especially when used for source separated organics.



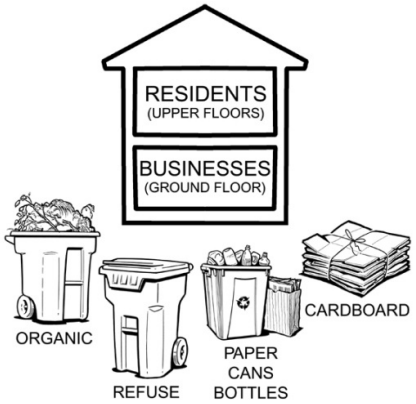
7. YARD TRIMMINGS AND OTHER ORGANICS

Most communities are finding that to exceed 50% diversion of waste, it is necessary to recycle yard trimmings and, in many cases, food waste. For enclosure placement and design that will meet this need, the key is to place an enclosure at a location that is convenient for landscapers. This could be a smaller, lockable enclosure (for use by landscapers, not residents) holding large carts or other yard-trimmings containers provided by the collection company.

Xeriscaping or other low-waste landscape design will also save money for the owner by reducing maintenance and disposal needs.

8. MIXED-USE DEVELOPMENT

These developments may have retail and/or office space on the ground floor and several stories of residences above, with frontage on a commercial street and parking behind (or, sometimes, in an underground garage). Businesses' needs for garbage and recycling space depend on the types of activities they are engaged in. Note that garbage compactors can hinder recycling by preventing the monitoring of discarded materials, and by providing too much capacity for what should be the lowest volume discard stream.



If a compactor is already in use, consider using it for recyclables instead!

In mixed-use building design, it is important to allow sufficient space to keep residents' discards and those from businesses separate, to simplify monitoring for contamination.

9. COMMON AREAS

To prevent identity theft, recycling in mail areas should be behind a wall with a slot for access, if possible.

In laundry areas, large plastic jugs and cardboard boxes will require space for several large carts (96-gallon), or space for maintenance staff to keep empty carts nearby to exchange for full ones.

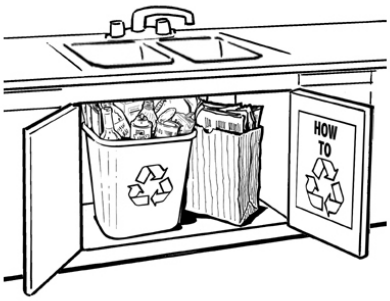
For any common areas used for food-related purposes, organics carts or bins should be added to the stations as well. Organics, recycling and refuse bins must be visible, well labeled and equally accessible.

MultiFamily

In a residential setting, recyclables and refuse are generated in common areas such as the mail area and laundry room, so it is important to locate both recycling and refuse containers in these areas.

10. PROVIDING FOR IN-UNIT RECYCLING

In-unit receptacles and storage spaces are just as important as their external counterparts, because these receptacles encourage occupants to recycle[10]. This applies to apartment kitchens and to commercial kitchenettes and conference rooms, where substantial amounts of organic discards may be generated. In some jurisdictions, receptacles are provided by the local government or the collection company. If possible, take into account any predetermined sizes and shapes of containers.



If space below a sink is designated for this purpose, provide additional cupboard space for items commonly stored below the sink, such as cleansers and cleaning utensils. Also consider convenient roll-out shelving for recycling tubs or bags.

10 For example, an Illinois study of 148 multifamily dwellings found that "the perceived presence of adequate interior space for sorting and storing recyclables is a strong predictor of high recycling rates." Ando and Gosselin, "Recycling in multi-family dwellings: Does convenience matter?" University of Illinois, 1999 .

In commercial settings, the typical receptacles range in size from 13 to 23 gallons, are exposed to view or within a cabinet, and have lids that prevent flying insects from gaining access.

Label the space designated for internal receptacles. The best approach is an 8-1/2 x 11-in. frame for an instruction sheet on the inside of the cupboard door or above the receptacle, but a simple “Recycling” or “Organics” label in embossed plastic will also encourage proper discard management.

MultiFamily

In multi-family settings, residents often must provide their own in-unit receptacles. As a rule of thumb, provide three cubic feet in the kitchen for recyclables, three cubic feet for refuse, and one cubic foot for organics.

Commercial

In commercial settings, the typical receptacles range in size from 13 to 23 gallons, are exposed to view or within a cabinet, and have lids that prevent flying insects from gaining access.