

RECYCLING GUIDELINES FOR MULTIFAMILY HOUSING DESIGN



This document provides guidelines to help designers of multifamily buildings plan for recycling collection. Designers should also check City and County websites for recycling ordinances and guides. Some cities have adopted recycling ordinances that may have major design implications.

Why provide for recycling in multifamily housing?

In California, State regulations require cities to divert 50% of waste from landfills. In Alameda County, Measure D sets a higher standard, calling for 75% reduction by 2010. To comply with these requirements, local policies and regulations may suggest or require that property owners provide space in multifamily housing for commercial and/or residential tenants to recycle.

Besides reducing the amount of material entering landfills, **recycling can save money for building owners**. In many jurisdictions, it costs less to recycle discards than to throw them away. Providing well-planned space for recycling makes it easier for tenants to recycle, which may keep the building owner's waste disposal costs down.

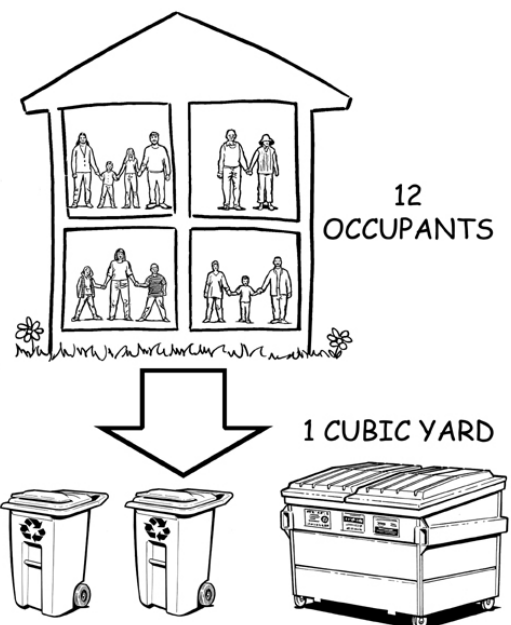
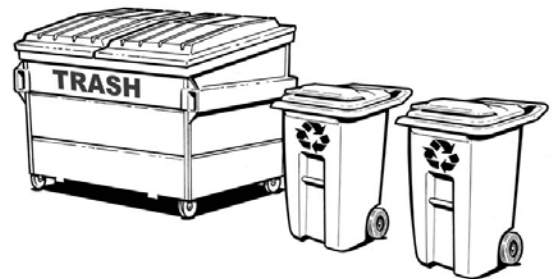
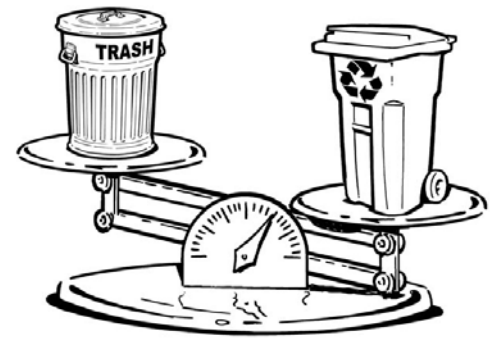
Are there general rules of thumb to plan for recycling?

Yes. Years of experience in Alameda County and elsewhere strongly suggests that to minimize costs and problems, designers should **make recycling and garbage services equally easy to use**. If garbage services are easier, some residents will toss their recyclables in the garbage. If recycling is much easier, some residents will contaminate the recyclables with garbage.

How much space is needed for the collection company's containers?

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 number of people or units in the project and possibly on the frequency of collection. For once-a-week collection (the norm), a reasonable rule of thumb is to



provide ¼ cubic yard (cy) of container capacity for every three residents. This can be a mix of garbage bins and recycling carts (or bins), with about half of the volume for garbage and half for recycling.

For example, a 60-unit complex with average occupancy of three people per unit would require 15 cubic yards of capacity (0.25 cy x 60). If the collection company uses 4-cubic-yard bins for garbage and 64-gallon carts for recyclables, this could be served by two bins and 22 carts. It is good practice to provide 20% to 35% excess capacity for seasonal variation, so in this example the design objective should be to accommodate three bins and 28 carts. Local demographics may change these assumptions; large or extended families will require more space, and senior citizens living alone may require less.

Storage Space Floor Area

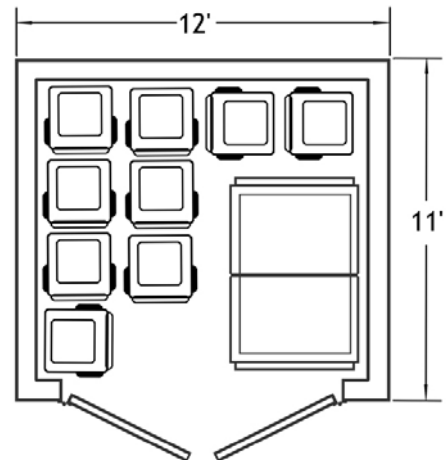
Bin sizes can vary in all dimensions; check with the local collection companies for exact dimensions. The typical footprint of a bin is about 7 feet wide and 4 feet deep. A 4-cy bin with these dimensions would be between four and five feet tall. Most 64-gallon carts fit snugly in a footprint that is 32x30 in.; they are about 42-in. 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. **An area that is 150% of the sum of bin and cart footprints should suffice**, unless the available area is unusually thin or oddly shaped; then more space may be needed.

Continuing with the example above, if the 60 units are in three buildings, each with an outdoor enclosure for discards, then each enclosure should accommodate one bin plus nine carts, having a total footprint of:

$$(7 \times 4) + 9 \times (32 \times 30) / 144 = 88 \text{ square feet}$$

Each enclosure should provide 150% of 88 square feet, or 132 square feet (inside dimensions). A pair of 9-foot-wide parking spaces can provide this capacity.

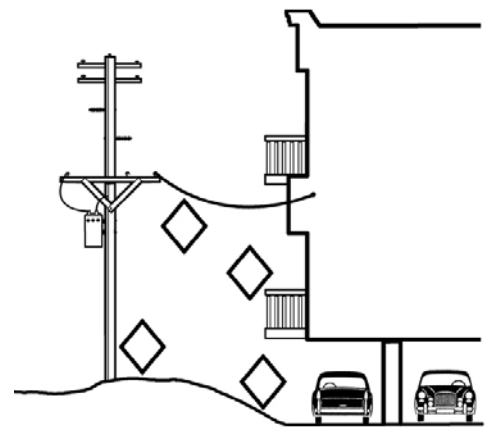


Where should space for collection be located? Should it be indoors or outdoors?

Buildings with four or more stories typically have chute systems with ground-floor trash rooms. Chute systems are discussed in a separate section below. Complexes with townhome or duplex configurations may have space for discards at each unit (space for two carts is essential and space for three carts is ideal). For low-rise multi-unit buildings, there are several generic configurations, and each has unique needs for recycling and garbage service. In all cases, the general approach is to convert one or more potential parking spaces to a storage area for discards. This enables residents to recycle or dispose of their materials when they are going to their cars.

In 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.

In complexes 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.¹ A thorough sampling of many ordinances is available from the California Integrated Waste Management Board.² These requirements vary widely among jurisdictions; be sure to consult City planning staff. At present, some ordinances may not address recycling needs. However, building designers should include recycling space to enable owners to increase recycling rates and reduce operating costs.



¹ For example, the City of Fremont has published its Waste Handling & Recycling Requirements and Policies, available from their Environmental Services Division (but not via the Internet). Although not in the Bay Area, a useful example on the Web from a California city is Chula Vista's Recycling and Solid Waste Plan Guide, at: www.ci.chulavista.ca.us/City_Services/Administrative_Services/City_Admin_Manager/Recycling/PDFs/Recycling%20and%20Solid%20Waste%20Plan%20Guide%20revised%208-16-02.pdf.

² CIWMB Recycling Space Allocation Guide; see www.ciwmb.ca.gov/Publications/default.asp?pubid=832 for the 44-page publication, or search the Web for CIWMB Recycling Space Allocation Guide.

A well-designed exterior enclosure system will have:

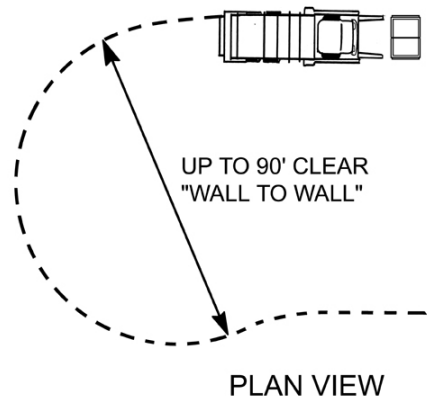
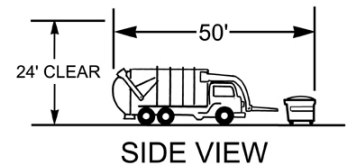
- Sufficient space to move among bins and carts
- Lever-style door handle that can be operated with hands full
- Wall space for instructional signage
- Smooth floor that can be swept or mopped if necessary
- Wheel stops near walls to prevent damage to walls
- Adequate lighting to read signs and sort materials

Where should exterior enclosures be situated?

From the residents' perspective, trash enclosures should not be right below the window, but should be within a **reasonable walking distance** from their door. 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. 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: If each 20-unit building has three occupied stories, then a simple rectangular plan for 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.

The collector's needs can introduce other 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. 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 enclosures are placed in parking areas, all of these factors need to be taken into account as the layout is designed.



What about yard trimmings and other organics?

Most communities are finding that to exceed 50% diversion of residential waste, **it is necessary to recycle yard trimmings** and, in some 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.

What are the considerations for mixed-use developments?

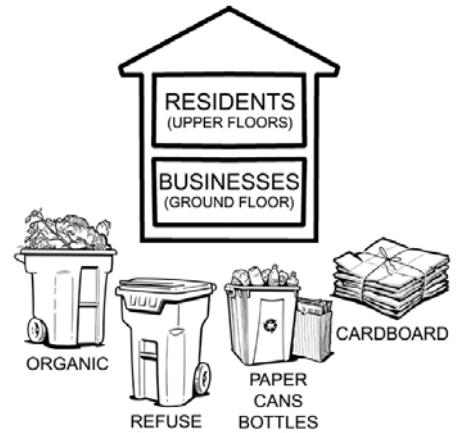
These developments may have retail and/or office space on the ground floor and several stories of residences above, with frontage on a commercial street and parking behind (or, sometimes, in an underground garage). Businesses' needs for garbage and recycling space depend on the types of activities they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

There may be opportunities for residents to make use of recycling amenities installed for businesses. For example, if the businesses use a cardboard baler and have a cage where cardboard is accumulated, residents may add their cardboard to the cage if they have access. Or, if food outlets use a special container for food waste recycling, it could be upsized to handle food waste from residents as well. Even the smallest cafes can generate significant quantities of food waste — coffee shops and juice bars in particular — so it could be well worth planning for food waste collection to serve both the building's commercial and residential occupants.

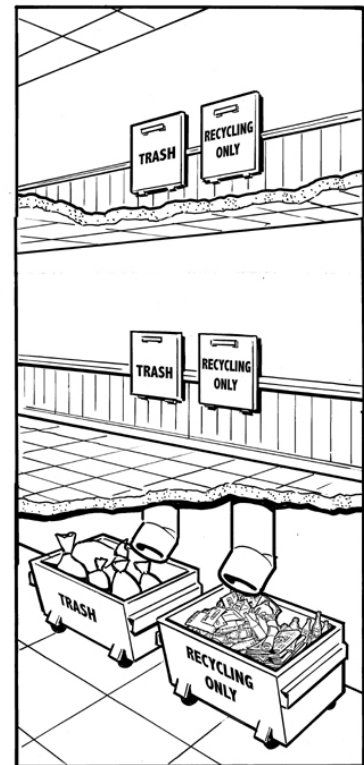
Do taller buildings need chutes?

Developments of three or more stories often use chutes to convey garbage from each floor down to a ground-floor trash room where it lands in a metal bin. Residents use chutes rather than taking out garbage via stairwells and elevators, which stay cleaner as a result. The bins in the trash room are either wheeled to a pick-up point by maintenance staff or are rolled to the collection truck by the driver.

The best way to maximize recycling in this situation is to provide a separate chute for recyclables. Position the trash and recycling chutes side by side for equal accessibility. The recycling chute or chutes should be clearly marked "Recycling Only." In jurisdictions with single-stream recycling, all recyclables may be mixed together and easily handled with a single chute. In jurisdictions that require two or more recycling streams, such as "all paper" and



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“containers,” the potential number of chutes may become unwieldy. One solution could be to use a carousel-style system such as that developed by Wilkinson Hi-Rise, LLC (www.hiri.com).

What is needed in the common areas?

Recyclables and garbage are generated in common areas such as the mail area and laundry room, so it is important to locate both recycling and garbage containers in these areas. Recycling and garbage bins must be visible, well labeled and equally accessible. To prevent identity theft, recycling in mail areas should be behind a wall with a slot for access, if possible.

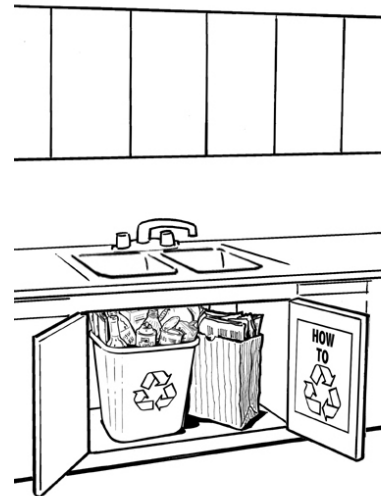
In laundry areas, large plastic jugs and cardboard boxes will require space for several large carts (96-gallon), or space for maintenance staff to keep empty carts nearby to exchange full carts for empty carts.

What should be provided for in-unit recycling?

In-unit receptacles and storage spaces are just as important as their external counterparts, because these receptacles encourage residents to recycle.³ 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.

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 and another three cubic feet for refuse.⁴ If space below a double sink is designated for this purpose, provide additional cupboard space for items commonly stored below the kitchen sink, such as cleansers and cleaning utensils. Also consider convenient roll-out shelving for recycling tubs or bags.

Label the space designated for internal receptacles. The best approach is an 8-1/2x11-in. frame for an instruction sheet on the inside of the cupboard door, but a simple “Recycling” label in embossed plastic will also encourage recycling.



³ 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 .

⁴ The City of Fremont requires this much space in its Conditions of Approval for residential development.