The advent of high-rise apartment buildings, and particularly the condominium boom of the early 1980s, certainly has changed our culture. High-rises have had a similar effect on waste management in this country as well. Waste from these entities, while not significantly different than other residential sources, is arguably more complicated to dispose of. Moreover, recovery programs in high-rises, which are a fairly new phenomenon, have presented a new and sometimes difficult challenge to waste handlers and residents alike. As more and more cities pass waste reduction mandates, however, the waste stream from high-rise apartments is becoming more scrutinized.

Different towers, same wastes

Just as residential waste streams vary slightly from town to town, waste streams from high-rise apartments differ from complex to complex. For example, while one building may dispose of slightly more glass than another building, the difference is largely due to demographics—rather than the actual source of the waste. For the most part, the composition of waste from a given multi-story, high-rise apartment is the same as waste from a single-family unit in a typical neighborhood nearby. As one East Coast hauler, who handles waste from high-rise complexes, puts it, “Residents of high-rises are the same as residents anywhere; they produce the same type of garbage.”

This is fortunate, because analyzing waste from high-rises or apartment complexes has been a spotty endeavor, says Joan Edwards, director of the Integrated Solid Waste Management Office (ISWMO) for the city of Los Angeles. Besides area-specific case studies of waste from these structures, such as one conducted by ISWMO on solid waste generation from multi-family residential (MFR) units in L.A., not many studies have been done on waste from high-rises in general. As a result, it has been difficult for municipalities to come up with distinctive trends on the waste stream, she adds. Fortunately, waste composition from high-rises do follow some predictable patterns.

The material that appears to be most abundant in that composition, for both high-rise and single-family residents...
across the country, is paper, particularly old newspapers (ONP). According to a study by Franklin & Associates (Prairie Village, Kan.), paper comprised 38% of the municipal solid waste stream in 1989. Similarly, in the solid waste generation study of MFR units conducted by ISWMO, more than 40% of the waste make-up in MFR complexes in the city was found to consist of paper, particularly old newspaper.

The ISWMO study also found that MFR units in Los Angeles, like their single-family residential neighbors, threw away approximately 33,344 tons of plastic—representing 5.7%, by volume, of the waste stream—in 1990. Glass from MFR units accounted for approximately 5.3% of the waste stream. Organic waste, which in the ISWMO study includes food waste, rubber, wood waste, textiles and leather, as well as other miscellaneous organics, comprised 144,037 tons per year, or about 25% of the total waste stream. Metals accounted for 4.2% of the waste stream.

Surprisingly, yard waste from MFR units in Los Angeles accounts for approximately 8.6% of their total waste stream, the ISWMO study found. This figure is almost comparable to yard waste from single-family units. The figure, however, is not the norm for apartment complexes around the country, and is primarily due to the fact that apartment complexes in L.A. consist mainly of a series of low-level buildings, or garden-style apartments, that encompass larger-than-average tracts of land, the ISWMO study states. With the exception of yard waste created from landscaping by building groundskeepers, residents of high-rise buildings themselves do not produce any yard waste to speak of, and high-rises in particularly dense, urban areas may not produce any yard waste at all. This is the one category of the waste stream that can differ dramatically between high-rises and single-family dwellings.

Another major difference between waste from high-rises and waste from single-family units is the manner in which it is disposed of and collected. The physical nature of high-rises—defined as “multistoried and equipped with elevators,” according to Webster’s Dictionary—dictates this difference. Moreover, because high-rises are not all structurally uniform, as with the waste stream, disposal and collection systems vary from complex to complex.

**Down the chute**

For high-rise residents, disposing of waste can be a complicated affair, at least compared with residents from single-family units. Residents of high-rises, in most cases, have to haul their trash further distances than house-dwelling residents. In many high-rises today, for example, all residents must haul their household trash to a central location usually in the basement of the building where it is collected in roll-off or standard refuse containers. This common disposal method, still practiced in many of the taller-storied buildings in New York City, is the most labor intensive for the resident.

Another, more popular disposal method for high-rise waste is the chute system. Using the principles of gravity as the heart of its technology, a chute system is sim-
ply a series of long tubes or tunnels that are used to carry waste to a central collection bin in a lower level of the building. Drawers that provide access to the chute are usually located on every floor and make for less walking for the resident. Although particular features of different chute systems vary, a compactor is usually attached to the collection bin to densify incoming material in order to maximize space.

Conserving space is of particular concern to residents and building managers alike. A 1979 resource recovery study conducted by SCS Engineers for the U.S. EPA, found that multi-unit residences produced 2.7 lbs. of waste per resident, per day. L.A.’s recent ISWMO study of MFR units reports a slightly lower disposal rate for apartment residents at 0.975 tons per unit, per year. Although there is nothing particularly out-of-the-ordinary about these figures, when multiplied by the amount of units in a particular building, a lot of waste can pile up quickly. If the disposal rooms are not properly managed, the large amount of waste being disposed of daily can lead to overflowing collection bins that can cause odor and rodent problems.

Because of the high waste generation rates in most high-rise buildings, collection of the material by haulers often must occur more than once a week, as is the norm with many single-family residential trash pick-ups. In addition, since high-rises have more specialized needs, buildings are often serviced by private haulers, as opposed to city collection vehicles. In L.A., for example, the ISWMO study found that commercially hauled MFR units comprise 45% of the city’s total housing stock. In New York City, however, collection from high-rise apartments has been incorporated into the city’s general curbside residential program.

Collecting trash from high-rise apartments can be a cumbersome or an easy affair, depending on who you talk to. One East Coast hauler believes collecting waste from high-rise buildings is more efficient than picking up waste from single-family residences because “the material, although [there is] a lot of it, is all in one place. You don’t have to make a lot of different stops.” Some buildings he collects from, he concedes, are more difficult to service because of their structural inaccessibility. Ease of collection, again, varies from complex to complex.

The last to go
While more and more states have enacted minimum recycling goals and increased curbside collection of recyclable material in the past decade, high-rise apartments—“the last hold-outs of recycling,” as one West Coast hauler put it—have remained somewhat immune to recycling. As these states scramble to meet their recycling goals, however, they are realizing that material from high-rises can increase those goals. It has only been in the last few years, though, that high-rises have begun to add recycling to their waste management plans. Recycling in high-rises still remains a fairly new phenomenon and faces challenges that are uniquely its own.

One of those challenges is getting high-rises to participate in recycling. Although several cities and municipalities across the country recently have mandated high-rise recycling, the impetus to recycle today still comes from individual buildings rather than local governments. Concern from residents is what started a recycling program at the Park Sutton condominium complex in Silver Spring, Md., according to Dr. Rena Johnson, a member of the board of directors of the complex and founder of its recycling committee. With recycling elevated to a national level, more and more apartment res-
idents are demanding recycling in their buildings, she adds.

In Dade County, Fla., however, a recycling ordinance required all multi-family and commercial establishments to begin recycling by July 1992. According to Metro-Dade Solid Waste Management (Miami), the county realized these sectors represent more than 50% of the total waste stream in Dade County and that multi-family unit participation in the county's recycling efforts is crucial to reach a state mandated goal to reduce waste 30% by 1994.

In New York City, which began what was probably one of the first high-rise apartment recycling pilot projects back in 1985, mandatory high-rise recycling has been implemented in most parts of the city to help achieve a state recycling goal of more than 40% by the end of the decade. Because high-rise residential units comprise a majority of the housing in the densely populated city, and thus a significant amount of recyclables, waste from these entities cannot be ignored.

Once a high-rise building has committed to recycling, one of the major challenges is coming up with a system that is convenient for residents as well as suitable for the particular building. "People are lazy; it's human nature," says Susan Fife of R.W. Beck and Associates (Seattle), who worked with Seattle's pilot high-rise recycling program. Apartment managers have to come up with efficient recycling programs that encourage people to participate. In addition, recycling systems must be implemented on a building-by-building basis, and not one single system is suitable for every building, adds Nancy Wolf, director of special projects for the Environmental Action Coalition (New York City), which helped start New York's pilot high-rise recycling project.

Catching on like curbside

Just as the types of high-rises vary, so do the different ways in which people recycle in them. Many high-rises simply set up centrally located recycling bins next to regular trash containers or trash chute doors. A few high-rises, such as a retirement community in Montgomery County, Md., have residents place their recyclables in blue boxes and leave them right outside their apartment doors. The boxes are then collected by building workers or haulers themselves.

In Vancouver, B.C., which boasts a 91% participation rate for recycling in multi-family units, apartment residents are given blue tote-like bags to carry their recyclables to centrally located, material-specific carts, says Peggy Trendell-Whittaker, promotions coordinator for the North Shore Recycling Program.

Still other high-rises are turning to new technology to solve their recycling needs. The Park Sutton recently installed an automated recycling system from Hi-Rise Recycling Systems, Inc. (Miami), which allows residents to source separate at least four different recyclables using existing floor trash chutes, because "the system adapted to our current trash disposal system without any structural re-doing," Johnson says. The new recycling system is also convenient for residents since they don't have to go out of their way to recycle, Johnson adds. By simply pressing a button for a certain material, residents can drop recyclables down their trash chutes and into various revolving, material-specific, roll-away containers. Sales of the systems were up 300% last year, the company claims.

Flexibility and convenience for the high-rise resident are also at the heart of Nu-Recycling Technology, Inc.'s (Aurora, Ill.) NuReTec 3100 recycling system, which is also adaptable to existing trash chutes in buildings. Currently in use at the Park Terrace, an 11-story apartment building in Aurora, the system directs trash or commingled recyclables to one of two bins at the push of a button. Concurrent with the city's curbside recycling program, residents of the Park Terrace use blue bags for their recyclables, which they are able to drop down the trash chute.

Although these new automated recycling systems are convenient to use, they are also costly. According to Johnson, the Park Sutton's new recycling system cost the apartment complex at least $40,000, or $150 per unit. This, however, is a one time cost, she points out, and will save the complex money in the long run through avoided landfill disposal fees. Moreover, because the Park Sutton is a condominium, residents were more inclined to incur this one-time cost, she adds.

In general, condominiums are more prone to recycle than rental apartments, says Tom Wheeler, president of Full Circle Recycling, an independent hauling and recycling company that services more than 100 high-rise apartment complexes in Los Angeles. "Condo associations are much easier to sell recycling to. Because of the single ownership [of units], the association is able to spread the cost to all residents," he says. "Rental apartments are much harder to sell recycling to because the owners of these buildings generally don't like to raise rent. The owners have to pay the recycling fee themselves."

And, he adds, "Not too many complexes are willing to pay a lot more than their rubbish service for recycling." According to the ISWMO MFR study, one West Los
Angeles apartment building manager side-stepped this issue by incorporating a requirement to recycle as part of the lease.

Owners of condominiums also appear to make better recyclers than apartment renters because they are more static than renters, Wheeler says. For high-rise residents in general, however, “in terms of educating people about recycling [in high-rises vs. single-family units] it’s harder because people in high-rise apartments tend to be more transitory,” Fife adds. Contamination of recyclables, though the severity varies from complex to complex, is not a major problem for high-rises and for the most part is not distinguishable from single-family dwellings.

From a marketing standpoint, the larger the high-rise, the more recyclables generated, which makes it more profitable to recycle, says Steve MacDonald, business specialist for the ISWMO. “It gets real difficult to recycle when there are smaller apartment buildings. The small amount of [recyclables] generated makes it difficult to store up enough material to make it economically feasible to recycle,” he says. The large amount of material generated at the Park La Brea in L.A.—the city’s largest apartment complex with 8,000 residents—has allowed the complex to run a successful recycling program. In conjunction with the Salvation Army, the complex also recently set up bins to collect used textiles, furniture, and other household items for recycling.

With the push to recycle finally starting to hit high-rises, the opportunities for equipment manufacturers and haulers alike are starting to be realized. According to Wheeler, “Apartment buildings are the most untouched resource there is.” His hauling company is now starting to more actively pursue condominiums and apartments for recycling.

“Apartments are getting more motivated to recycle,” Wheeler adds. “We’re finding tenants that are willing to recycle and not enough people to collect and recycle from them. I think we’re going to see a lot more of this in the future.”