

RECYCLING'S FUTURE Is Now . . .

... in Palo Alto . The city of 56,000 has won recycling awards in each of the past three years.

Small 75-pound bales of aluminum foil and pie plates are stacked to the left. At the right, near an above-ground storage tank, sit some one-gallon jugs of motor oil (most of them formerly milk containers), waiting to be emptied.

On a pallet just behind you sits a neat stack of used car batteries. A few yards away, there's a small stack of mostly treadless tires.

The irregularly loud and grinding noise you hear is coming from a can crusher, fed by a worker wearing ear protection and other equipment. When he stops for a second, you hear the sound of breaking glass; looking to your left, you see the source is a worker with a hammer.

Equipped with a hard hat, safety glasses, and thick gloves, this fellow stands over an open 1.5-yard container, knocking glass out of discarded storm windows and doors. Later, he'll strip insulation and plastic components out of refrigerators and washing machines.

A nearby roll-off truck picks up a 30-yard bin full of compacted cardboard. Not far from that action, a retired citizen-recycler—who is, it turns out, from another city—is taking newspaper, cans, and bottles from his car and placing them into clearly marked bins. Shortly after he drives away, a pick-up truck towing a unique-



Key For Coding System

- 1 = 2 bins for newspaper (on opposite sides of van)
- 2 = 1 bin for corrugated cardboard and scrap metal
- 3 = 2 bins for glass (on opposite sides of vehicle)
- 4 = 1 bin for aluminum and tin cans

looking trailer pulls in, stuffed to the hilt with recyclables collected at the curb, including more batteries and milk bottles.

In the near distance are several high, parallel rows of what looks like low- to high-class soil from the Indiana heartland. These, you are told, are rows of yard debris; each row is six months' worth, and the oldest (the high-grade stuff) dates to 1979.

Where are you? No, it's not the future. It's 1987, and you're on a small piece of the 150-acre landfill property owned by the city of Palo Alto, Calif. - home of one of the oldest and most comprehensive municipal recycling programs in the United States.

By JOE SALIMANDO

Improvements still being made

Vera Dahle of Palo Alto Public Works says that despite Palo Alto's 16-year recycling history, the program still has a ways to go.

"Participation in the curbside program is at 65%. The total volume we recycle is split 50-50, half what's picked up at the curb, half what's brought in to the drop-off center. Some percentage of material dropped off here actually comes from citizens from other nearby cities, where there is no curbside pick-up," she says.

Add it all together and Palo Alto, working through its refuse contractor, recycles an amount equal to about 22% of its residential waste; that figure includes some indeterminate amount, assumed to be minor, from outside the city. Even so, it amounts to only 9% of the total Palo Alto waste stream!

Every day, Palo Alto sees thousands of employees of high-tech and related companies report to work inside of city limits. The city's estimated permanent population of 56,000 is thought to nearly double, to roughly 110,000, on normal work days.

These workers and the companies that employ them discard a lot of material. Dahle thinks only 1% of the

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In FY'85-86, Palo Alto saved 20 days' landfill capacity.
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commercial/industrial non-hazardous waste stream is being recycled through city channels but with the help of another staffer, Ted Janus, the city is working to change that.

Recycling as a tool

Recycling began early in Palo Alto as a result of the Sixties' conservation ethic, according to Paul Madsen,



All that glitters may be recycled; that's why glass is stripped from window frames.

owner of Palo Alto Sanitation Co. PASCO, as his company is known works exclusively in Palo Alto and has been the city's refuse contractor since 1950.

"At the beginning, it was something that was pushed by people you could call hippies," says Madsen "Now, it is a part of the city's effort to preserve the landfill. We tell our employees that by preserving the landfill we are helping to ensure our jobs." PASCO employees are the ones doing the work at the drop/off center and processing facility. One such employee is Julio Saucedo, a 15-year veteran of recycling operations.

Madsen and Saucedo have seen it all in Palo Alto, whereas Dahle hired on with the city in 1985. Young or old, veteran or new blood, these Palo Alto solid waste professionals have a unique perspective.

Consider the following two snapshots, showing how recycling went from something that was pushed onto the city by enthusiastic activists to being an integral part of the solid waste management process:

Early Seventies: in the first year of the program, Madsen, dedicated to serving his only customer, told the city council PASCO would provide the service "for one dollar. People thought there was gold in the garbage, and I didn't want to invite competitors in here. Then I got into it, and discovered it was not cost-effective. The market for the materials was not good,

and we were just learning. It cost me \$26,000 that first year, which may not sound like much- but it was 10% of my gross revenue back then!"

Mid-Eighties: when public works staffers in 1986 won the city council's approval to raise the landfills height limit from 49 feet to 60, there were stipulations. The council gave its OK with the proviso that Public Works find ways to recycle more industrial/commercial corrugated, compost more yard waste, and expand existing multi-unit residential complex recycling efforts.

Markets and materials processing

With that height limit raised, Palo Alto figures its landfill will close sometime in 1999. This assumption factors in a good deal of recycling.

But the factors are not bogus: the city approaches recycling clinically. According to a report on recycling in fiscal 1985-86, "indirect benefits . . . included a savings of 20 days of landfill capacity." Materials sales raised \$230,900 in that 12-month period; another \$86,910 is credited for avoided disposal costs, to which the city adds \$170,190 in avoided collection costs.

So materials sales make up about half the program's financial gross. The city pays attention to market elements; the worker strips plastic and insulation out of the refrigerator to make the scrap metal more marketable.

In addition to aluminum cans, bottles, newspaper, corrugated, waste oil, yard waste, glass, tires, and batteries, Palo Alto recycles mattresses. "We pick these up separately and sell them to a reconditioner," says Dahle.

Yard waste is not collected. Gardeners and residents bring it to the landfill, typically in pick-up trucks, landfill employees direct them to dump it in a specified 6.2-acre location. The wastes are fed to a WHO tub grinder from Fuel Harvester, which reduces the size of large tree limbs (six inches in diameter maximum) and branches and mixes the materials together. From here it is stockpiled and turned regularly, using a track-type dozer.

"We believe we are getting a three-to-one reduction in volume, so the 6,000 cubic yards of yard waste we now have in place from calendar 1986 represents incoming volume of 24,000 yards," says Dahle. The city does not market the compost; the plan is to use it for final cover landscaping.



Forklift with rotating tines makes dumping bins easier'

Collection at curb

Curbside collection is accomplished using a three-bin Midway trailer system (pictured). Bins for glass, newspaper, and cans (aluminum and tin) are provided on the vehicle. Flattened cardboard and lightweight scrap metal are placed in the bed of the van behind the fifth wheel.

Used motor oil must be packaged by residents in unbreakable containers with tight-fitting lids; these are placed in the space between the wheels of the trailer (near the hydraulics). In 1986 Palo Alto's recycling efforts kept 12,000 gallons of used oil out of the land and sewer system.

Residents put other recyclables out in city-supplied burlap sacks. Each dwelling unit gets two: one for aluminum and tin, the other for glass.

Aside from the recycling ethic and peer pressure to separate materials placed at the curb, Palo Alto citizens are motivated to recycle by a discount. Landfill passes are given to those meeting minimal volume requirements; these allow the citizens to use the landfill at no charge for a carload of debris.

Three trailers are sent out each day, and each returns with full bins three times. A Caterpillar forklift with rotating tines picks up the loaded bins and turns them upside down for unloading into roll-off boxes or

other larger containers.

Says Madsen: "The toughest part of the recycling effort was probably at the beginning, when we were losing money. What made it worse was that, because the public thought there was gold in the garbage, there was talk of us *paying* for the recyclables!

"My approach to the recycling is the same as the way we approach refuse service: I'm a captive of the city, and I will do whatever Palo Alto wants done. I spend my time making sure that my company does a good job of whatever we are doing."

Jawboning via phone

Dahle estimates that as much as 20% of what's going into the landfill today is corrugated cardboard, with perhaps 75% of that coming from commercial and industrial accounts within the city's limits.

What can be done? Palo Alto is taking what might be called the "Presidential Approach," jawboning com-

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Palo Alto reclaims mattresses, selling them to a reconditioner.

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panies in the city into increasing their on-site efforts to recycle materials.

Ted Janus, the management assistant for Public Works, spends a good deal of his time on the phone. In front of him sits a computer, on which he has listed each company in the city's limits, the key waste contact, and notes from initial and subsequent conversations.

An example (not necessarily typical) of one company's screen, as assembled by Janus:

Initial meeting notes: April 2, 1986--met with Doe regarding cardboard system. Cardboard is currently thrown into 40-yard box, loose, and hauled to market by (a broker). XYZ Company is being charged approximately \$50 per load to have it removed. Doe's main concern is to not pay money. No cardboard recycling going on at the production facility. He estimates that 80% of waste going to compactor is old corrugated

cardboard. No recycling as production because there is; too much cardboard to haul to broker's bin.

Subsequent communications notes: 4/9/86--letter to Doe. 5/16/86--called Doe. He said they have decided not to implement desk-top collection for white paper

Doe does not seem to want to follow our recommendation of baling their cardboard and having PASCO haul it to a different company than their present broker.

8/5/86--met Doe. He said the paper and cardboard would be sold to a local youth group. They will pick up the materials at each facility. Labor cost savings.

Materials currently being recycled: white paper, computer paper, corrugated cardboard, glass, pallets.

Materials that could potentially be recycled: more white paper through desk-top collection; bale their cardboard and sell it to a different broker.

Long-term plan: keep in touch

For a number of the companies, the "long-term plan" section will list a specific date on which Janus will re-contact the individual company. This use of the computer provides Janus a weekly list of non-recyclers at which he must keep plugging away.

The bottom line

Palo Alto's yeoman-like efforts comprise removing both high-volume items (such as newsprint and beverage containers) and low-volume, high-polluting items (batteries and waste oil) from the waste stream.

Vera Dahle points out that the benefits are chiefly seen in prolonging the day when the landfill will no longer be available to handle the city's waste. Some time after the year 1999, the city will have to have another solution for refuse disposal; the exact date, she notes, is being postponed with every ton of cardboard shipped from the recycling center.

Bottom-line figures: the city figures its composting efforts, even in the current low-volume mode, will save it \$500,000 over the landfill's life on the purchase of soil for cover uses. The 1985-86 net benefit for the city (using the \$490,000 total of materials sales, savings in refuse collection, and savings in landfill tipping fee at \$12.50/ton) is estimated at \$145,000.

But perhaps more importantly for those not living in Palo Alto, the city's recycling program has been held up as a model by recyclers in California and nationwide. In each of the past three years, the city was honored by the National Recycling Coalition (Best Compost Program, 1984; Best Curbside Recycling Program, 1986) and the *California* Resource Recovery Association (Best Comprehensive Recycling Program, 1985). ■