

RECYCLING-BY-OBJECTIVE

The government and 115,000 residents of Sunnyvale, Calif., think big when it comes to recycling.

Recycling is an activity that must go in many directions at once. There is promotion, collection, processing, marketing, personnel matters, equipment, and more.

The city of Sunnyvale, Calif. (population:

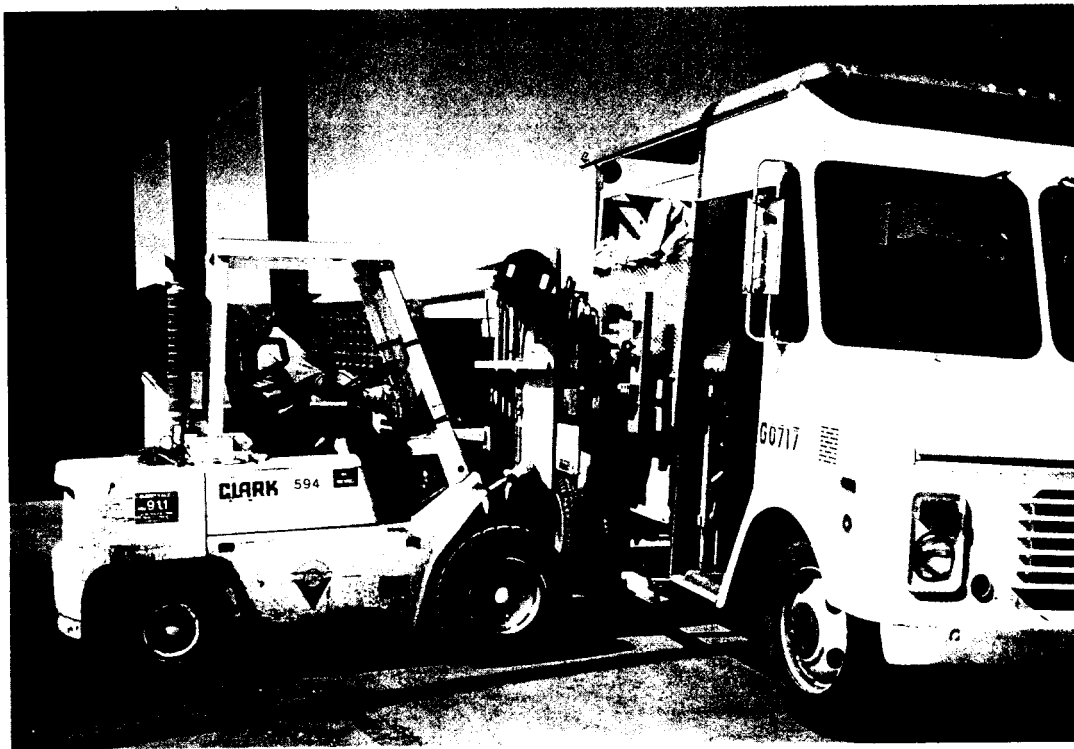
115,000), now in its sixth year of recycling, seems to have it all nailed down. A highly organized program, patterned somewhat after the approach in nearby Palo Alto (see September, 1987, *Waste Age* profile), collects and processes glass, aluminum, newspaper, cardboard, motor oil, and plastic (PET bottles).

But Sunnyvale has gone one better. To lower the unit costs of its processing facility, the city handles recyclables collected by the neighboring towns of Mountain View and Los Altos. This cost-sharing approach benefits all three cities.

"It's good for us, in that it helps us get more use out of our

equipment," says Gene Willroth, manager of the city's environmental division.

"We can spread costs out over a larger volume of recyclables. The city of Sunnyvale runs city operations with a modified management-by-objective approach, so the true



Collection bins, filled with recyclables, are emptied by a forklift throughout the day.

By JOE SALIMANDO

Table One
Recyclables Collected in Sunnyvale, Two Periods¹
(Total households served: 28,000)

	May 31 - June 30 1987	Jan. 10 - Feb. 6 1988
	(tons)	
Newspaper	237.88	223.95
Glass	72.30	72.83
Mixed Cans	19.42	16.17
Cardboard	n.a.	2.51
Total:	329.60	315.46

¹ Each period is 28 days long.

costs of the recycling program can be carefully tracked. The fact that Mountain View and Los Altos share the processing of materials provides a cost-effective operation for all three communities.

"Of course, our program makes sense for those two cities. They don't have to make the major investments in equipment, and they don't have to hire additional personnel to run it. And we split revenues from sales of materials with them right down the line, according to volumes.

"Best of all, for all three cities, together we have a larger volume of recyclables to take to the market. We can, hopefully, get a better price."

Cash crop gets careful harvesting

Aluminum cans are any recycler's cash crop, and even with the recent implementation of the California recycling law this material is a key to Sunnyvale's financial success in materials processing and marketing.

Explains Willroth: "With the management-by-objective approach, you have goals, and you

do your darnedest to meet them. We have a goal here of averaging net prices 10% higher than the going market quotes. So for aluminum, which is our highest-priced item, we focus on putting a very, very clean product in the Reynolds Aluminum trailer. We also concentrate on maximizing the amount of aluminum we can get."

Sunnyvale's primary goal in aluminum processing, then, is to make sure there are no ferrous or bi-metal cans mixed in with the aluminum; a secondary goal is to make sure there is no aluminum mixed in with the steel cans. One way to do this, Willroth says, is to train your workers carefully. Another key: double-sorting of cans.

Double-sorting is accomplished with the use of a gravity-fed double-sided can hopper and custom sorting table (designed by and obtained from Recycling Equipment Manufacturing, Spokane, Wash). Mixed cans from the three cities are fed into the top of one side of the hopper and pass by a worker, who picks out the material that's not aluminum. At the same time, he's also sorting out plastic bottles — and removing the aluminum caps from these!

The worker can adjust the machine's controls to have the cans he's already picked go into the other side of the hopper. When he's done with the initial sort, he can go through them again — picking the aluminum clean, so to speak.

Perhaps the most arduous task in all of this is twisting those metal tops off of the plastic bottles. This is done not for the relatively light aluminum volume, Willroth says, but to ensure a clean plastic product.

"We've been collecting plastic beverage bottles since 1985, and we haven't had much success in marketing them," he says. "Right now, we fill up a roll-off box every three weeks to a month and, basically, give it away to Re-



Motor Oil In Milk Jugs

Sunnyvale doesn't make money on the used motor oil it recycles, but, as Gene Willroth says, "recycling doesn't have to make money to be of benefit to the community."

Collection of waste oil is unusual in most curbside recycling programs. It's not too hard, though: Sunnyvale workers carry empty city gallon jugs on the truck, and when they come to a residence that has a

full one they simply exchange.

On the truck, the oil jugs are placed on a specially designed system. If anything is leaking, it leaks into a pan below the jugs which is filled with absorbent material. No motor oil should leak off of a Sunnyvale truck with this system.

"We get peaks and valleys in motor oil, as you do with all recyclables," says Willroth.

— J.A.S.

RECYCLE YOUR USED OIL



- Please place motor oil in this 1-gallon plastic jug.
- Set at curbside on your regular collection day.
- Your container will be replaced.
- Sorry, we cannot collect oil that is not properly containerized.



730-7262

Sunnyvale Curbside Recycling

Table Two
Data on Collection Effort
(28-day periods, 1987 & 1988)

	Jan. 10 - Feb. 6 1988	Comparable '87 Period
Total Tons Collected	315.46	293.92
Eligible Households	28,000	28,000
Pick-ups	25,435	22,586
Average Weekly Participation Rate	22.71%	20.17%
Work Hours In Period	633	447
Pounds Per Work Hour	997	1,315
Total Miles	2,564	2,686
Average Miles Per Route Per Day	32	34
Pounds Per Pick Up	25	26
Pick-Ups Per Work Hour	40	51
Pick-Ups Per Mile	9.92	8.41

Note: Sunnyvale collects recyclables with three trucks each day, five days a week. Each truck has one driver-collector.

cycle America in San Jose (a Waste Management, Inc., subsidiary), which takes them at no charge to us. By the way, a 40-yard roll-off filled with uncompacted plastic bottles contains only one ton of plastic.

"What is Recycle America doing with it? According to my information, they are holding onto all of the plastic they are getting, waiting for a market. They've got more space for this than we do, and we appreciate the service."

Collection: minimizing worker injuries

Sunnyvale's collection vehicle looks virtually identical to that used by Palo Alto. Three-yard bins are filled with recyclables, and a Clark forklift with rotating elevating forks picks the bins up and empties them.

"At the end of the day the bins are emptied directly from the trucks," says Willroth. "But in mid-day, we keep a set of empty bins in the yard. The forklift changes out the empties for the full ones, and the truck can get right back to work in minutes."

Sunnyvale employs seven workers full-time in recycling, with several temporaries. Four recycling trucks are on the road every day, serving 28,000 dwelling units once a week. Refuse is collected separately by the city's contractor, on the

Table Three
Recyclables Processed in Sunnyvale,
Recent 28-Day Period

	Total Tons Processed	Tons From Sunnyvale
Newspaper	345.71	228.45
Glass	160.86	74.38
Mixed Cans	35.78	16.50
White Ledger	1.45	1.45
Cardboard	10.38	6.13
Oil	2,631 gallons	2,065 gallons

same day as recycling.

Sunnyvale residents (of dwelling units of up to three families) put cans and bottles out in city-supplied gunnysacks: one for cans and PET bottles, the other for glass bottles only. Newspaper is to be tied with string or placed inside of a paper grocery bag; cardboard must be flattened and tied. Waste oil can also be placed at the curb, in sealable plastic containers or in one-gallon milk jugs that the city supplies (See accompanying story).

"This work can be quite a strain on workers' backs," says Willroth. "For instance, our average newspaper bundle weighs about 22.5 pounds. Our trucks average 42 pickups per hour. Toward the end of the route, the worker has to pick the paper bundle up and lift it over his head to stack it in the truck."

That's one reason we have worked with a firm that specializes in ergonomics. This firm studied the job that we have to do in collecting recyclables and designed a test, part of a pre-employment physical, which we use to screen out workers who are most susceptible to back injuries.

"Our goal is to avoid placing an employee in a job that has the potential to hurt the employee on the job. It's not that the job is that strenuous: According to the company we hired, 98% of males and 88% of females in the U.S. can do this job."

Tracking costs and quotes

Sunnyvale tracks its costs, tonnages, revenues, and the like with the use of a computer. A recent print-out for a 28-day period showed that the city sold its aluminum for \$1,020 per ton vs. an average market quote for the period of \$940. For newspaper, the city averaged \$59 per ton, vs. the \$50 per ton reported market quote.

The net-net: Over that four-week period, Sunnyvale's net revenue for all recyclables was \$24,936 vs. \$21,670 for the same tonnage sold at the lower market quote prices.

Statistics supplied by the city for two periods show that the volume does not vary all that much. Table One shows figures for two 28-day periods (the city divides its year into 13 28-day periods for management-by-objective purposes). Table Two yields data on collection hours, pick-ups per hour, etc. Table Three provides perspective on the contribution of Mountain View and Los Altos to the total processing load at the Sunnyvale Recycling Center.

According to the city's data, the recycling program is making a profit. This figures into the "profit" side a \$30 per ton avoided cost credit. "That covers the cost of landfilling, including the tipping fee," says Willroth. "But it doesn't take into account what might be an even greater cost, the cost of replacing the landfill. Available landfill space is running out in this area just like it is all over the country." ■