SOLID WASTE ADVISORY COMMITTEE (SWAC)
Meeting Summary of September 21, 1994

MEMBERS PRESENT:

Councilor Ruth McFarland, Chair
Merle Irvine, Willamette Resources
Kathy Kiwala, City of Lake Oswego
Doug Coenen, OWS
Bruce Broussard, Citizen
Ralph Gilbert, East County Recycling
Emilie Kroen, Washington County Cities
Tom Miller, Wash. Co. Haulers Assn.
Jeanne Roy, Citizen
Lynne Storz, Washington County
Gary Hansen, Multnomah County
Steve Miesen, BFI
Andrea Friedricksen, Clark County (Alt.)
Chris Boitano, East County Cities
Dean Kampfer, OSSI/Tri-C (Alt.)
Lex Johnson, Oregon Hydrocarbon, Inc.
Susan Keil, City of Portland

GUESTS:

Diana Godwin, Regional Disposal Co.
Joe Cassin, Sanifill of Oregon, Inc.

METRO

Terry Petersen, Solid Waste Planning and Technical Services Manager
Marie Nelson, Solid Waste Planning Supervisor
Scott Klag, Senior Solid Waste Planner
Doug Anderson, Senior Management Analyst
John Houser, Council Analyst
Roosevelt Carter, Solid Waste Budget and Finance Manager
Chuck Geyer, Senior Solid Waste Planner
Aletta Yantis, Administrative Assistant

The meeting was called to order by Councilor McFarland at 8:30 a.m.

1. Approval of Minutes

The minutes were of August 24, 1994 were approved as ammended. Page 3, agenda item 4 of the summary was corrected to reflect that local governments such as the Washington County Cooperative would like to have input into the criteria for delivering equitable household hazardous waste collection services.

2. Updates

A. Chuck Geyer, Metro, reviewed the contracts for operation of the Metro Central and South Transfer Stations.

B. Councilor McFarland reported on the upcoming considerations regarding the proposed construction tax, changes to the excise fee, and the solid waste tip fee.

3. Regional Solid Waste Management Plan

Terry Petersen described the report that he gave before the Council Solid Waste Committee regarding the discussion at the August SWAC meeting. The CSWC agreed with the SWAC recommendations that: (1) sufficient time be given to develope a new Regional Solid Waste Management Plan; (2) a status report on work-to-date be delivered to the Council in December that identifies key issues including those that might be relevant to the FY95-96 budget; and (3) careful attention be given to the future process for updating the plan.

SWAC discussed key issues that need to be addressed in the update of the RSWMP. Issues identified were:

1. Opportunities for co-collection of garbage and recyclables need to be examined. In particular, there might be opportunities to reduce system costs by co-collecting yard debris and garbage, acquiring yard debris handling capacity at or near existing transfer stations, and thereby reducing the overall system costs.

2. The plan update should be designed to help the Council make policy decisions. Councilor McFarland pointed out the example of the code variances regarding "vertical integration" that were granted as part of the ERI and WRI recovery facilities. She said these changes to Metro policy have been granted on a case-by-case basis and it would be timely to examine the entire policy to avoid more case-by-case variances.

3. There was considerable discussion on the role that benchmarks should play in the RSWMP. SWAC recommendations regarding benchmarks were:

   A. There should be more emphasis on what is being disposed, rather than trying to measure what is generated and recycled.

   B. Benchmarks beyond traditional tonnage measures should be considered. There are goals that are not best evaluated in terms of the amount of waste. An example is minimizing traffic impacts of the solid waste system. Vehicle miles might be an appropriate benchmark.

C. Before a measurement plan is developed, it is important to know what the appropriate benchmarks are. When existing information is inadequate to establish benchmarks, then the RSWMP should identify what steps will be taken in the future to acquire the information. It's OK to say we just don't have enough information at this time to set quantitative benchmarks for some goals and objectives.

D. There are certain goals that cannot be monitored in terms of quantitative measures.

E. Benchmarks should include economic impacts. In particular there should be some way of monitoring how well savings are being passed back to the ratepayers.

Report of the Planning Subcommittee: Goals and Objectives:

Jeanne Roy presented the revised draft goals and objectives that have been developed to date by the SWAC Planning Subcommittee. SWAC made several specific changes in the draft. These changes will be made by the Subcommittee and the revised goals and objectives will be distributed with the next SWAC agenda packet.

SWAC discussion included the following comments:

1. The RSWMP needs to describe how Metro and local government revenue systems should operate. The RSWMP should recognize the different authorities that have been granted to Metro and local governments. Local governments will decide how to collect revenue needed for collection.

Report of the Planning Subcommittee: Technical Analysis of Alternatives:

Merle Irvine reviewed the work the Planning Subcommittee has been doing on the development and analysis of alternative management practices. So far, the technical analysis of tonnage and cost has been used to help develop the specification of alternatives. The next task will be to combine the alternatives into comprehensive management "portfolios".

Doug Anderson, Metro, presented a status report on the technical approach for evaluating direct and indirect costs and benefits. There was discussion about whether the current analysis was overestimating the per ton costs of alternatives by only considering "commercial hauler" tonnage (GET SOME HELP FROM DOUG ON WORDING).

4. Other Business/Citizen Communication

Terry Petersen pointed out the article in Waste Age that featured United Disposal and the recently approved Willamette Resources recovery facility as "Facility of the Month".

The meeting was adjourned at 10:30 A.M.

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SWAC Discussion Material
10/19/94

DRAFT EVALUATION CRITERIA & BENCHMARKS

Goal	Evaluation Criteria	Current Benchmark Value	Example of Future Year Benchmark	Data Sources
1. Cost Effectiveness	Total System cost per ton	$145/ton	TBD*	Metro Simulation Model
2. Flexibility & Sustainability	1. Adaptability of transfer facilities 2. Stability of processing facilities	Limited ability to respond to changing conditions Compost facility siting issues	Expanded ability to respond to changing conditions No compost facility siting issues	
3. Prevent Waste	Regional per-capita waste generation	1.3 tons/person/year	1.0 tons/person/year	Recycling Level Survey Waste Characterization Metro Transaction Data
4. Recycle & Recover Waste	1. Regional recycling level 2. Amount of waste disposed by program 3. Ease of implementation	38% of waste generated 3.4 lbs yard debris/hh/wk	50% of waste generated 0 lbs yard debris/hh/wk	Recycling Level Survey Program Monitoring Waste Characterization Metro Transaction Data
5. Accessibility of Disposal Services	1. Average haul time per trip 2. Average haul time per ton	WA County: 25 min/trip WA County: 5 min/ton	WA County: 18 min/trip WA County: 3.5 min/ton	Metro Simulation Model
6. Availability of Recovery Facilities	Uniform geographic distribution	Dry waste recovery facilities serve only parts of the region	Dry waste recovery facilities serve entire region	Metro Transaction Data
7. Reduce Toxic Waste	Amount of toxic waste improperly delivered for disposal	1,000 tons/year	0 tons/year	Waste Characterization
8. Rate Equity (Metro fees)	Payments into system proportional to benefits			
9. Conserve natural resources	Proportion of waste managed by different parts of the State hierarchy	Prevention TBD Recycling 28.3% Composting 6.4% Recover Energy 7.9% Disposal 57.4%	Prevention 5% Recycling 50% Composting 10% Recover Energy 5% Disposal 30%	Recycling Level Survey Waste Characterization Metro Transaction Data
10. Conserve landfill space	Total tons landfilled	930,000 tons per year	700,000 tons per year	Metro Transaction Data
11. Reduce vehicle impacts	Total haul miles	TBD	TBD	Metro Simulation Model
12. Reduce illegal dumping	Number of illegal dump sites	32 major sites	5 major sites	Annual Illegal Dumping Survey

*TBD To be determined

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KEY PLANNING ISSUES

Through discussions with the Solid Waste Advisory Committee, Metro Council, and others, several key planning issues have emerged during the process of updating the Regional Solid Waste Management Plan.

The following papers give a brief background on five key issues, identify management options where appropriate, and list several questions that SWAC might want to address regarding each issue.

Metro staff, the SWAC Planning Subcommittee, and private consultants are continuing to conduct a technical analysis that will help evaluate policy and management options.

Before additional work is conducted, however, it would be helpful to make sure all parties agree on the key issues and questions that will be addressed in the updated Regional Solid Waste Management Plan.

The main issues identified so far are:

Issue #1: Regional Waste Reduction Priorities

Issue #2: Service Provision -- Transfer Stations

Issue #3: Service Provision -- Other Facilities

Issue #4: Revenue Equity and Stability

Issue #5: Role of Transfer Stations And Other Facilities As Collection Technology Changes

ISSUE #1:
REGIONAL WASTE REDUCTION PRIORITIES

Background

During 1994, about 930,000 tons of general solid waste will be landfilled by the region. If the regional recovery rate remains constant, population growth will cause the amount of waste landfilled to increase to about 1,040,000 tons by the year 2000. As shown below, if the region is to achieve a 50% recovery rate by that time, the amount of waste landfilled each year must decrease by 200,000 tons.

Year	Recovery Level	Population	Generated Tons	Recovered Tons**	Landfilled Tons
1994	38%	1,287,000	1,540,000	610,000	930,000
2000	38%	1,400,000	1,680,000*	640,000	1,040,000
2000	50%	1,400,000	1,680,000*	840,000	840,000

*Projection based on the assumption that the annual per capita generation rate remains at the 1994 level of 1.12 tons per person. Tonnages exclude petroleum contaminated soils and other special waste.
**Includes all management alternatives to landfilling: reduce, reuse, recycling, energy recovery, and composting.

Management Options

The following table summarizes the waste reduction alternatives examined to date by the SWAC Planning Subcommittee. Both tons and costs are dependent on specification details and are likely to change as the Subcommittee looks at different specifications.

Alternative	Disposal* (tons/year)	Potential Diversion (tons/year)	Program Cost (per ton)
1. Home Composting	139,000 to 152,000	7,000 to 16,000	<$18
2. Commercial Waste Prevention	43,000 to 47,000	5,000 to 10,000	$94 to $143
3. Expand Residential Curbside Recycling	24,000 to 27,000	9,000 to 20,000	$138 to $183
4. Commingled Plastics Collection	7,000 to 8,000	3,000 to 7,000	$332 to $588
5. Commercial Commingled Paper	102,000 to 112,000	40,000 to 65,000	$149 to $161
6. Commercial Commingled Paper & Containers	117,000 to 128,000	46,000 to 75,000	$116 to $120
7. On-Site Construction Recycling	133,000 to 146,000	70,000 to 90,000	$131 to $135
8. Dry Waste Recovery Facilities	203,000 to 223,000	150,000 to 165,000	$114 to $115
9. Commercial Organics Recovery	43,000 to 47,000	11,000 to 25,000	$226 to $269
10. Residential Organics Recovery	109,000 to 120,000	50,000 to 70,000	$334 to $343

*Tons currently landfilled that are targeted by the alternative.

Key Questions

1. What are the regional priorities for new or expanded waste reduction services?
2. What supporting actions are necessary for effective implementation of the recommendations? Supporting actions could include:
   - Disposal bans or mandatory participation.
   - Legislative resolution of the fair market value issue for commercial recyclables.
   - Changes in Metro or local government franchise requirements.
3. What are appropriate waste reduction goals for the region? How should progress be measured?
4. What changes in the solid waste system could reduce the costs of new waste reduction practices?

ISSUE #2:
SERVICE PROVISION -- TRANSFER STATIONS

Background

During FY94/95, the three existing transfer stations (Metro Central, Metro South, and Forest Grove) will receive about 800,000 tons. Under status quo conditions, population growth will cause this tonnage to increase during the next 10 years.

Maximum operating capacity of the three facilities is well above the current tonnage. However, there are several issues that need to be considered when planning for regional transfer capacity, including:

1. The agreement between Metro and Oregon City to make every reasonable effort to limit the tonnage at Metro South to 250,000 tons per year. The intent of this agreement is to mitigate impacts on the host neighborhood.

2. Metro's past policies have supported a concept of "uniform service levels" for disposal facilities. This had very specific implications for transfer station siting and setting of tip fees. This concept will continue to bump up against the question: how much investment in capacity is the region willing to bear in order to achieve a more uniform distribution of disposal facilities?

3. Improving the recovery capability of Metro South may require restrictions on tonnage in order to free up space for recovery equipment.

Management Options

1. The three existing facilities provide transfer services for the region through the year 2005. Haulers continue to be free to choose among these facilities. Modifications, if needed, in station design and operation are made to accommodate future tonnage.

2. No new facilities are built but haulers are directed by Metro from Metro South to Metro Central in order to reduce tonnage at Metro South.

3. Build new facilities, either full transfer stations or reload operations, to improve service in those parts of the region not conveniently served by the three existing stations.

4. Implement new waste reduction activities or new collection technologies (e.g. wet/dry systems) that reduce the demand for refuse transfer services during the next ten years.

Key Issues

1. How important is uniform access to transfer stations as a regional policy goal?

2. In general what criteria should be used to establish tonnage limitations, if any, at transfer stations. More specifically, should the expected delivery tonnage at Metro South be higher than 250,000 tons per year? If not, what is the plan for reducing tonnage?

3. If new stations are built, to what extent will reduced haul costs compensate for additional capital and operating costs of new stations?

ISSUE #3:
SERVICE PROVISION -- OTHER FACILITIES

Background

The RSWMP will identify roles of the private and public sectors in providing solid waste services during the next ten years. Several existing policies regarding facilities other than transfer stations need to be examined. These include:

1. Current Metro policy is to avoid vertical integration of collection, processing, and disposal. This policy is intended to prevent unfair advantages to those haulers that also own facilities.

2. Current practice is to rely on the private sector to provide most of the mixed waste processing and recovery capacity in the region (e.g. the WRI and ERI facilities) under franchises with Metro.

3. Metro does not currently franchise or license processors of yard debris. Given recent siting difficulties, this regulatory policy should be examined to see if there is a need for greater involvement by Metro or other governments.

Management Options

1. Allow private owners of mixed waste recovery facilities to engage in other parts of the system in order to expand the availability of the recovery service.

2. Public procurement of recovery facilities (e.g. Metro issues a Request for Franchise for a dry waste processing facility).

3. Public regulation or franchising of yard debris or other recovery facilities to stabilize service and mitigate any environmental impacts.

Key Questions

1. Should the region continue to depend on the private sector to provide recovery capacity for mixed dry waste?

2. What requirements regarding rates, recovery levels, and vertical integration should be included in franchise agreements with Metro?

3. Should Metro Central play a different role in the future in terms of waste recovery? For example, should Metro establish differential tip fees to encourage delivery of mixed loads that are more recoverable?

4. If recovery of food and other non-recyclable organic waste is a regional priority, what services will be provided by the public and private sectors?

5. Should access to disposal and processing services be made more uniform throughout the region, particularly services for hazardous waste, dry waste processing, and organics recovery? If so, how?

ISSUE #4:
REVENUE STABILITY AND EQUITY

Background

Metro's solid waste activities are funded almost entirely from tip fee revenues collected at transfer stations, landfills, designated facilities, and franchised waste recovery facilities. In addition to waste transfer and disposal, activities funded by these revenues include landfill closure, hazardous waste management, waste reduction, and solid waste planning.

Unlike waste transfer and disposal costs, the costs of these latter activities do not vary with the amount of waste delivered to transfer stations and landfills. Futhermore, these activities are all identified as having regional significance, suggesting that a broad revenue base is most appropriate.

There is an increasing number of management options for select waste types that are exempt from Metro fees. If this trend continues, the burden of paying for Metro's regional solid waste activities will increasingly fall on the narrower segment of ratepayers that continue to deliver waste to transfer stations and landfills.

Management Options

SWAC has previously recommended that Metro continue to examine several funding mechanisms, including:

1. Continue to make use of the tip fee as the primary funding mechanism for waste disposal operations and management.

2. Product fees for hazardous waste and other materials that have extraordinary disposal or management costs.

3. Billing generator fees through the property tax bill, utility bills, jurisdictions, or haulers.

4. A fee system (either as a surcharge or a license/franchise fee) for facilities to the extent that they benefit from Metro's activities, but do not currently contribute to the cost of the system.

Key Questions

1. How do RSWMP recommendations regarding new facilities, programs, and policies increase or decrease any inequities that exist in the current Metro solid waste revenue system?

2. If new or expanded solid waste activities are recommended, are they better funded through alternatives to the tip fee?

3. To counter the budgetary consequence of Metro's promotion of waste reduction and fee exemptions for certain classes of waste, Metro could expand its enterprise activities – for example, operating MRF's or processing special waste. By seeking fiscal stability in this manner, Metro may enter into competition with the private sector.

ISSUE #5
ROLE OF TRANSFER STATIONS AND OTHER FACILITIES AS COLLECTION TECHNOLOGY CHANGES

Background

As collection technologies evolve, transfer stations and other facilities could be used in new ways to increase efficiency and effectiveness and thereby reduce costs for the ratepayers of the region? For example, can recovery facilities serve "double-duty" as reload facilities and thereby capitalize on existing investment?

One emerging change in collection technology is the use of co-collection trucks that have separate compartments for different waste streams (see attached articles for more detail). While such systems have typically been used for the co-collection of refuse and recyclables, there might be opportunities for other combinations of materials, such as refuse and yard debris.

In addition to reducing on-route costs, there may be economies of "one-stop" dumping if transfer of refuse and co-collected materials were located at or near the same site.

Management Options:

1. Transfer stations continue to function primarily as transfer operations for refuse. Metro would scale back operations if demand for the transfer of refuse declines.

2. Transfer stations provide additional services if co-collection technology is implemented. Options could include:

   A. Co-collection of refuse and yard debris. Refuse transferred to landfill. Yard debris transferred to processor(s).

   B. Co-collection of refuse and organic waste (e.g. food). Refuse transferred to landfill. Organic waste either transferred to off-site processor(s) or composted on site.

3. Dry waste recovery facilities (e.g. WRI and ERI) provide additional services to the region. One option would be reload operations for consolidating refuse loads prior to delivery to a transfer station.

Key Questions

1. The emergence of co-collection technologies has implications for the future use of transfer stations and other facilities. How likely are those technologies to be adopted in the region? Are there barriers (besides cost) to adoption? What is the timing of adoption?

The next logical step in Rear Loader technology has finally arrived with the Pak-Mor RDG100 Dual Chamber Rear Loader.

The demands of separated refuse collection and recycling are quickly changing the solid waste collection industry. To meet the requirements of "recyclables" and "non-recyclables," Pak-Mor designed the RDG100 Dual Chamber Rear Loader to do both in one unit to eliminate duplicating collection routes with single purpose vehicles.

Various bins intended for curbside sorting and collection can be combined with the Load Liner II body to create a unit with an even greater degree of on-route separate collection capabilities.

Pak-Mor's RDG100 Dual Chamber Rear Loader also can handle several container or cart handling systems which are readily available to further increase your versatility.

As with all of Pak-Mor's Rear Loader family, the RDG100 Dual Chamber Rear Loader is designed around the same performance-proven concepts that keep us an industry leader.

If you envision a change in your waste collection business that gives you more versatility

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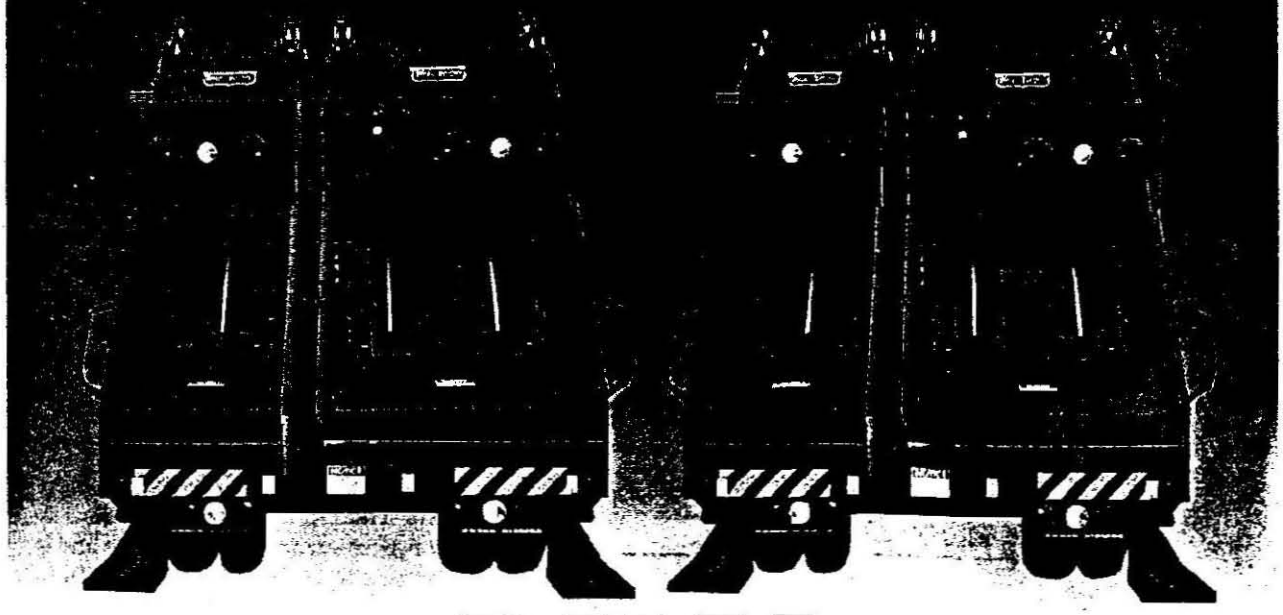

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Co-Collection: *Is it for you?*

"It would not be a stretch to see 25% of curbside collection...being [served] using co-collection [methods] within three to four years," predicts Ron Perkins, director of recycling operations with the American Plastics Council (Washington, D.C.). But with high-tech co-collection vehicles, blue bags, and even modified units, the debate continues as to which co-collection system answers three important questions: Which method is the most expedient?; which technique produces quality, contaminant-free recyclables?; and, bottom-line, which system is the most cost-effective?

Realizing the problems

Today, when a hauler is weighing the advantages and disadvantages of "traditional" versus co-collection service, the first items that need to be considered are the obstacles that the route presents—or may present—to a particular method of collection.

Questions to ask:

- Location—Is it a rural, suburban, or urban route?
- Materials recovery facility (MRF) proximity—Is the MRF close to the landfill or transfer station?
- Wages—Are wage rates high?

Once you have the answers to these questions, it will be easier to customize your collection service to suit your route.

"There's no question that if you're on a rural route, you should definitely be co-collecting," asserts Jim McMahon, marketing director for May Manufacturing (Arvada, Colo.). "In a rural area, it makes more sense to have just one truck out there," concurs Jonathan Burgiel, director of materials recovery for R.W. Beck and Associates (Orlando, Fla.).

The advantages of co-collection in a rural area are numerous, according to McMahon, Burgiel, and Perkins. For one thing, "you're not sending two trucks down the street tearing up the roadway," Perkins says. You're also "reducing the amount of fuel usage, and when you really look at it, it's saving all the driving time of the two trucks."

As for urban settings, the advantages of co-collection require more careful analysis. Factors such as wage rates and tight streets may affect not only the cost-effectiveness of the system, but the overall service as well. "I wouldn't recommend [co-collection] for a major municipality [that] can send out a separate truck [to accommodate a high volume of recyclables]," McMahon admits.

On the other hand, most co-collection systems require only one or two employees to both operate the truck and collect the refuse and recyclables. Separate collection requires not only two trucks, but generally more personnel. Consequently, "in urban areas, you may want to put more money in the [co-collection] equipment if you have higher wage rates," Burgiel says.

Another logistical consideration for urban areas is the longer length of most co-collection vehicles. Most cities have narrow streets and tight corners that may be hard to manipulate. Still, with a little planning, this problem can be overcome as well. "Take a look at the chassis and attempt to compensate for a longer vehicle," McMahon says. "You need to make sure you have the same turning radius."

BY JENNIFER A. GOFF

We're in the money

In some ways, it is easier to determine the cost-effectiveness of co-collection for rural and urban routes, simply because factors such as driving time and wage rates are relatively easy to identify and measure.

In terms of the cost of collection, the suburban route presents a more complex set of issues and requires a more detailed investigation into the potential benefits of one system over another.

Granted, co-collection offers the aforementioned advantages such as the potential for reduced wages, reduced fuel costs, etc. At the same time, co-collection also means more time out on the route because of the time it takes to collect both the recyclables and refuse, as well as a greater investment in equipment.

As McMahon points out, haulers really have to do some comparison shopping. "You have to look at the cost of our unit [the Western Curbside Collector]; a half-hour extra on the route each day; and the cost of cab conversion, and compare it to the cost of separate collection."

R.W. Beck recently completed a comprehensive study that addressed collection costs of several co-collection pilot programs in South Florida.

Not surprisingly, the specific results, in terms of the cost-effectiveness of the individual systems, varied. Overall however, "The bottom line was that the co-collection systems were [generally] 13-15% more cost-effective," Burgiel says.

According to the study, "principal factors which affect the cost in the analyses when comparing total cost per household per month were found to be:

- Truck capacity by material;
- Number of employees used per truck and their salaries;
- Cycle time during collection;
- Household participation rate;
- Amount set out per household by material; and
- Off-route time."

Unproductive, off-route time is a critical issue when considering the economics of co-collection. "We try to oversize the recycling compartment in the truck...so that it's the trash, not the recyclables, that drives that truck off the route," McMahon explains.

Skeptics of co-collection are particularly concerned about plastics because of the amount of room plastics tend

Blue Bags: The Black Sheep of Co-collection?

Nowadays, haulers have several options when it comes to co-collection. They can buy new, high-tech equipment such as Oshkosh's (Neenah, Wis.), A-Series Sideloader Recycler, or they can build a co-collection vehicle using components such as May Manufacturing's (Arvada, Colo.) Western Curbside Collector. Or, they could use blue bags.

But as *Waste Age* reported in July 1993, controversy surrounding poor participation rates and dirty MRFs has some blue bag programs singin' the blues. The city of Wauwatosa, Wis., however, is singing its praises.

"Results demonstrate it as perhaps the most convenient, cost-effective, and efficient way to collect recyclables from the curb and alley," says Bill Tarman-Ramcheck, city recycling specialist for Wauwatosa. "More recyclables were diverted from the solid waste than any other similar blue bag co-collection system in the country."

In a pilot program that served approximately 3,900 Wauwatosa households, residents set out two blue bags for paper and non-paper recyclables. The bags were collected by city crews along with the refuse, and placed into the same collection vehicle. Browning-Ferris Industries, Inc. (Houston), the city's waste contractor, separated the waste and blue bags at the transfer station. Bags were pressed into two 30-yard roll-offs as they were separated: one roll-off for paper-containing bags, and the second for non-paper-containing bags," Ramcheck explains.

The average diversion rate was 16.9%, according to Ramcheck. The pilot program also reported a high participation rate of 84.8%. "Residents overwhelmingly like the program," Ramcheck says, while conceding that residents would not be as inclined toward blue bags if they had to purchase the bags themselves.

According to Ramcheck, the city also boasts low [illegible] rates, high-quality recyclables, and overall [illegible] costs of less than $[illegible] per month per household when the program [illegible] city-wide in the fall [illegible].

For more information on co-collection systems and equipment, see *Waste Age*, December 1992.

to require in the truck. But in the Lake Worth pilot program, plastics were "collected in an Oshkosh collection vehicle equipped with a 17-cubic-yard sideloading refuse compaction unit," according to the R.W. Beck study. "As it turned out...the refuse body filled up just about the same time as the recyclables section filled up," Perkins says. "I'll say, with a plastics compactor, you'll never have to go off route [specifically because of plastics] because it will hold 300-400 pounds of plastic."

Another related, off-route problem is the location of the MRF. "You lose the economies of one-stop dumping if the MRF is not close to the landfill," Burgiel says. However, "if you have a longer-term view, and you can locate the MRF next to the waste disposal facility, [co-collection] really makes sense."

So, what's the problem?

Based on the studies that have been conducted so far, co-collection would seem to be the answer for haulers who are trying to cut costs, as well as the solution for those trying to make recycling work in the midst of plummeting markets. So why isn't it catching on?

"The obstacles are resistance to try something new," McMahon explains. "We talk to cities and private haulers all the time. ...Although they don't like the cost of separate collection...you have 'rules of thumb' in separate collection. In co-collection, the trick to building the truck is to size all of the compartments so that they fill simultaneously. That requires really thinking about the routes ahead of time. People just want to order a truck."

Another reason, according to Perkins, is that recycling really only started to boom in the late 1980s. "There's a lot of equipment out there that's still relatively new. When that equipment wears out...[co-collection] will definitely catch on." ■

Packers join the recycling team

by Steve Apotheker
Resource Recycling

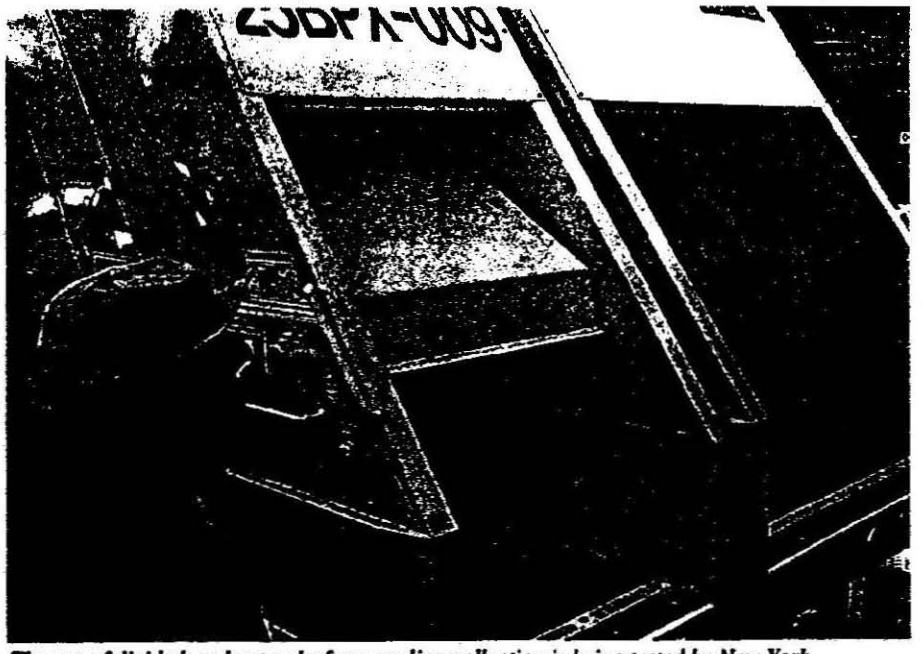
Traditional packer trucks and new recycling compactor trucks, in all shapes and sizes, are being drafted for recycling collection programs.

If someone says they have the answer, stay away from them. There is no one right answer, but some answers are more right than others," says a manager with one national waste hauling firm.

Five years ago, one might have predicted residential recycling collection was going to take a serious toll on the numbers of garbage packer trucks. However, a funny thing happened on the way to the wake. In a quest to cut recycling collection costs, traffic congestion and air pollution, recycling collection programs are exploring different equipment strategies, several of which involve the workhorse of waste collection — the packer trucks.

As more communities adopt a two-stream commingled curbside recycling collection system paired with a materials recovery facility, they consider existing packer trucks as potential recycling collection vehicles, instead of purchasing dedicated multi-compartment recycling vehicles. Recycling collection can offer a new lease on life for older packer trucks.

Some truck manufacturers have gone one step further and modified the traditional packer design into a two-compartment, compacting vehicle with greater payload, ease of operation and better material handling features for recycling collection. Of the over 500 communities served with curbside recycling collection by Browning-Ferris Industries, about 25 percent are having commingled recyclables picked up with these compacting trucks.



The use of divided packer trucks for recycling collection is being tested by New York City's Department of Sanitation.

A few pilot projects are also investigating the use of packers as a multi-purpose collection vehicle to handle a combination of garbage, recyclables and yard debris on the same truck, but in separate chambers. Instead of three separate weekly truck collections for recyclables, yard debris and garbage, a divided packer can accommodate three material streams with two weekly collections.

This article illustrates ways that communities and companies are using packers in try-

ng to keep the lid on costs as they grapple with the challenge of integrating recycling and waste collection programs.

A truck for all seasons

With the daunting challenge of implementing citywide recycling collection in the nation's largest and most densely populated city at a time of fiscal stress, ease of implementation and low costs have been of paramount concern. For Steve Lawitts, assistant commissioner of operations and planning for the New York City Department of Sanitation, that means maintaining the interchangeability of recycling and waste collection vehicles.

The versatility of a rear loading packer in collecting garbage has withstood the test of time in New York City. The truck's capacious hopper can handle typical single-family waste loads, including bulky furniture discards, as well as service higher density housing that produces the wide plastic bags of compacted refuse, dubbed "sausage bags." Two-person crews are used for all rear loader collection activities.

The city converted its 25-cubic-yard rear loaders to recycling collection duty by designating one truck for paper and one for commingled containers. Collection is weekly in areas of high participaton; in areas of lower participation, paper is collected one week, followed by commingled containers the next week.

- ✔ Commingled recycling collection favors the use of partitioned compacting vehicles.
- ✔ Compacting trucks are valued because of large payloads and the flexibility to collect recyclables and waste.
- ✔ Glass breakage can be a significant problem, depending on vehicle design and operation.

For much of 1993, the department evaluated 30 prototype split-body trucks. These rear loading, compacting trucks have two separate compartments of 10 and 15 cubic yards each. The trucks collected paper in one compartment and containers in the other. They were operated in 17 of the 59 community districts across the entire range of housing density and income levels to see if there were savings in collection truck shifts when compared to the number of conventional trucks operated in the same districts.

In most cases, use of the split-body truck required more truck shifts than did the use of conventional rear loaders. The split-body truck was constrained from completing its assigned routes by the volume capacities of the smaller compartment or by the additional time required to collect both materials at each stop. The split-body trucks resulted in collection savings only in high-income, low-density districts, which compose only about 12 percent of the current recycling truck shifts. When these marginal collection savings were offset by the higher maintenance and capital cost of the split-body trucks, the negligible remaining savings were not enough to outweigh the other benefits of having a uniform collection truck fleet.

However, since August 1993, the city has been conducting an experiment in the Bronx to see if commingling of all recyclables in one truck might be more cost effective in areas with a variety of participation rates and housing densities. The initial result has been a gratifying 20 to 25 percent reduction in operating costs because setouts of paper and containers mean that trucks are returning with bigger payloads than previously.

Lawitts points out that further investigation is being done on how commingled collection affects the marketability of the paper and the cost of processing. Samples of paper collected from both the new commingled collection test area and the standard separated collection program have been sent to a laboratory for a quality analysis. An advisory

group of paper processors is evaluating the quality of the commingled paper.

If the paper appears to be of sufficiently high quality, the city will compare collection cost savings versus any increased processing costs that might be incurred. This might not be an issue if the economics of the pilot project hold up. The processor handling the commingled recyclables is charging $22 per ton for the mixed containers, about half the cost now paid to processors handling containers from the citywide program. The commingled paper from the pilot program is also handled at a slightly lower cost than is currently being paid to process most of the paper from the regular recycling collection program.

With recycling collection and processing costing about $240 per ton and refuse collection and disposal averaging closer to $145 per ton, the city is keen to realize cost reductions where it can. However, the program is still in flux, with citywide recycling collection service being reached only last September (see "Curbside recycling collection trends in the 40 largest U.S. cities" in the December 1993 issue).

It has not been until this year that a citywide public education outreach on recycling collection could be conducted through the media. A successful outreach effort could yield higher participation and more setouts, making the city's original collection approach cost effective in more areas of the city.

The City of Houston, along with the American Plastics Council, is testing the efficiency of collecting recyclables with a modified side-loading garbage truck.

One other recycling collection study is targeted for the Big Apple later this year. A two-month pilot project will be used to study the recovery of loose recyclables from mixed wastes collected by the rear loaders. An area of low recycling participation will be selected so that the waste has a high percentage of recyclables available for potential recovery.

Autoload

The City of Milwaukee is taking an integrated approach to its waste management and

recycling programs. And like New York City, it decided that the rear loader should be the standard bearer of its program. However, that is where the similarities end.

After conducting several different collection projects for waste and recyclables, the city solid waste management staff selected semi-automated collection with 90-gallon containers as the way to go for both material streams. The city selected a tandem-axle rear loader with a capacity of 25 cubic yards, and for recycling, split the truck from side to side into two chambers with a ratio of 60 to 40.

Residents are provided with a 90-gallon recycling collection cart that is divided to match the truck's partition. Paper and commingled containers are accepted.

A special lifting mechanism tips the cart into the big hopper. The average setout of recyclables is almost 50 pounds, or about three times that of a traditional bin or bag program. It is this large volume at each stop, argues Steve Brachman, Milwaukee's resource recovery manager, that makes the rear loader cost effective in this application.

The city currently has 75,000 carts distributed, with another 108,000 to go out before the end of 1996. Cost of the carts, which have 25 percent post-consumer recycled plastic content, is $56 with the divider. The collection trucks are $127,000. The city was able to bring costs down by bidding out all the trucks and carts at one time, but requesting a phased-in delivery.

The main problem to date has been glass breakage, averaging over 25 percent during collection and 35 percent at the materials recovery facility. A new processing facility will open this summer that Brachman expects will be reduce glass breakage at the back end. During collection, the breakage seems to come more from residents dropping recyclables into the four-foot-tall cart and from emptying the cart into the truck hopper, than from compacting the containers.

Plastics packing

The American Plastics Council (Washington, D.C.) has conducted a number of pilot projects to test the effectiveness of different curbside recycling collection systems, especially with regard to plastics recovery. One test in Palm Beach County, Florida involved the co-collection of waste and recyclables in a specially designed side loader (see "Co-collection: Is it a viable technique" in the June 1993 issue).

In the co-collection vehicle, garbage is compacted in the rear compartment of the truck, plastics go into a separate compacting bin, and paper and commingled containers are placed into separate, noncompacting bins.

Preliminary results indicated a 20 percent savings of the cost of two conventional trucks.

Since that test, the truck manufacturer has split the paper and container bins for multiple curbside sorting. The truck can also be obtained without a plastics compactor, which increases the size of the paper and container bins by almost 50 percent, to 11 cubic yards of loading capacity for each bin. The company will have 21 trucks in various size communities by summer.

In Houston, APC is testing the efficiency of collecting recyclables with a modified side-loading garbage truck. The truck has been split vertically down the middle, with 11 cubic yards in each part of the truck. The single-axle side loader has an estimated payload of five tons. The experiment will evaluate the effect of compaction on collection and test some processing equipment.

The test project started last October. Old newspapers are set out in paper bags, and commingled metal cans, glass and plastic bottles (all resin types) are placed into plastic bags. Residents in the test area are provided with the 30-gallon plastic bags. One advantage of the bags is to help keep the plastic bottles next to the glass bottles, thus providing some cushioning in the light compaction process. With a pile of loose, commingled containers, glass bottles tend to sink and plastic bottles to float to the top of the pile.

About 500 daily pickups are being made on a route that contains about 1,100 homes. Setouts seem to consist of fairly full bags, leading observers to speculate that residents do not feel the need to set out recyclables as frequently. (For more information on bag collection and set-out intervals, see "Improving the efficiency of curbside recycling collection" in this issue.)

The average time from the beginning of one stop to the next, including collection, is about 33 seconds. Side loaders are increasingly favored for residential waste collection because drivers have to take only a few steps to the hopper instead of walking all the way to the back of a rear loader. This can save several miles of walking a day for the driver.

So far, the truck and one-person crew have been able to complete the routes without reaching capacity. Payloads of four to five tons have been recorded in the Houston recycling collection study. The paper chamber often reaches capacity at 7,000 pounds. The commingled container section, holding about 2,400 pounds at the end of the route, still has space available.

One tradeoff of compaction is breakage of glass bottles, with one estimate putting the loss at 25 percent or more. Additional work is being done in the pilot program to measure the level of breakage and to test modifications that might reduce glass loss.

The Houston study is also testing the efficiency of a screw-augur debagger to remove the commingled containers from the plastic bag. The pilot project will conclude in October 1994.

Seizing the container

One of the main drawbacks to most packers or specially designed compacting recycling collection trucks is glass container breakage. However, some programs, are seizing the bull by the horns, or in this case, the glass container by the neck.

Rumpke Waste (Circleville, Ohio) has retrofitted old side loaders with a special bin, located between the cab and packing body, that can hold three colors of glass. The bin slides in and out of the truck on rails. Hinged doors release the broken, color-sorted glass into different bunkers or roll-off containers. A forklift is used to remove and replace full glass collection bins if there isn't time to empty them.

Rumpke buys the used side loaders for about $15,000 to $20,000 and spends another $10,000 to renovate them with glass bins and dividers. The 25-cubic-yard side loaders are divided into two equal sections with a fixed divider. A second compacting blade is added, but both blades are operated together.

Old newspapers and commingled metal and plastic containers are put into the two chambers. Without the glass, the trucks can be operated with full compaction. Big pay-

loads are critical to Rumpke because trucks have to make a one-hour, one-way trip to the beginning of the route in Westerville, outside of Columbus.

One vehicle will drive by 100 houses per hour, of which 90 percent will set out recyclables. In a 10-hour day on route, the truck will make 800 to 900 stops, or one pickup every 40 seconds.

Recycling payloads average six to seven tons, and the trucks still have capacity available at the end of the day. By comparison, loose fill recycling collection trucks get a payload of only two to three tons and will make two trips to the the processing facility to unload.

The recycling compactor

In the quest for a more material-friendly and efficient recycling compactor, Waste Management, Inc. (Oak Brook, Illinois) worked with a major truck manufacturer to build a front loading packer with recycling collection in mind. Waste Management has "more than a handful of these [front loader] trucks in service at more than a handful of locations," according to a company representative.

Instead of a sweeping compacting blade to move materials into the chamber, usually associated with trough-type side loaders, the front loader uses a horizontal packer blade that results in less breakage. The truck also features a heavier-built body, which is divided by a removable partition for two-stream commingled recycling collection. A divided carry can container, two to three cubic yards in volume, is located in front of the truck and provides a low-access hopper for recyclables.

The big payoff is the payload of five tons in the truck with a capacity of 30 cubic yards. Operators could cram more material into the truck, but at the cost of losing more glass to breakage.

The cost of a front loader recycling truck is about one-fifth more than a compacting side loader and almost double that of a multi-sort curbside recycling collection truck priced at $80,000. However, the new breed of compacting trucks delivers a payload that is twice as large as the multi-sort truck, allowing the driver to stay out on the route for the entire work day.

One of the main reasons to justify the front loader's premium price was the flexibility of having one truck do both recycling and waste collection efficiently. In the Chicago area, a Waste Management operation is using the trucks for solid waste collection by removing the partition and changing the 30-cubic-yard recycling body to a 22-cubic-yard solid waste one. The entire change takes about 20 minutes and can be done by one person.

Some other advantages of a front loader recycling truck over a side loader are fewer steps by the driver to the loading can, a bigger charging area and lower sill height. One disadvantage is the front loader height of 13.0 feet, one foot taller than side loaders. Emptying the carry can container over the top of the truck requires another two feet of clearance, headroom that may not be available in certain communities.

One stone, three birds

Browning-Ferris Industries (Houston, Texas) is testing a multi-purpose compacting vehicle to handle recyclables, yard debris and garbage. The experiment, which started in February 1994, will go for one year and involve 1,700 homes on two routes in West Houston.

A conventional rear loader, with a capacity of 25 cubic yards, is divided end-to-end by a vertical, fixed partition into about 15 cubic yards and 10 cubic yards. The truck will collect garbage and yard debris on one pass, then pick up old newspapers and commingled containers on the second weekly collection.

Several modifications have been made based on the company's experience collecting recyclables in packer trucks in Cleveland and other service areas. There are two compaction blades, with handles on each side of the truck, so that different materials can receive independent compaction treatment. Dribble-in troughs help minimize glass breakage as the containers slide into the body of the truck. Also, independent tailgates for each chamber have been fabricated allowing the two materials to be dumped separately. **RR**