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Recycling in Michigan – Six Case Histories

State of Michigan – Clean Michigan Community Program

by

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for

**Michigan Department of Natural Resources
Waste Management Division**

With Case History Update

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CLEAN MICHIGAN COMMUNITY PROGRAM SUMMARY

INTRODUCTION

In 1993, six Michigan communities brought on-line various components of comprehensive recycling, composting and resource recovery education programs. The efforts of these six communities comprise the Clean Michigan Community (CMC) Program, a partnership between the Michigan Department of Natural Resources (DNR) and six communities to establish model recycling and composting programs that would help communities across the State plan and implement solid waste management alternatives.

This report provides an overview of the CMC Program, including a summary of the efforts of the six communities. It is part of an overall package of technology transfer materials that provide information about the CMCs that can be of assistance to other Michigan communities. Individual case studies for each community, as well as fact sheets on technical and policy issues common to the six communities, are also available.

BACKGROUND

The CMC Program began in 1990, when DNR selected six communities to receive grant funding through the Solid Waste Alternatives Program (SWAP). The CMC grants and its "parent" program, the Solid Waste Alternatives Program were established to move the State forward in meeting the solid waste management goals outlined in the Michigan Solid Waste Policy. Adopted by the Natural Resources Commission in 1988, the Solid Waste Policy outlined Michigan's strategy for moving away from disposal, primarily landfills, as the most common method for solid waste management.

The Policy established a hierarchy of preferred methods for solid waste management and goals for each method. The hierarchy is shown in Table 1. As can be seen from this table, through reduction,

reuse, recycling and composting, the Policy goals are to recover 50% of the waste stream and divert it from disposal.

Table 1: State Policy Goals for Solid Waste Management by the Year 2005

Waste Management Hierarchy	Percent of Waste Stream
Reduction	10%
Reuse	5%
Recycling	25%
Composting	10%
Waste to Energy	40%
Landfill	10%

While the Policy was intended to promote these goals statewide, it fostered local implementation. The Policy goals are voluntary and the Policy acknowledged that, accomplishments would vary from community to community, depending on local conditions and choices. The approach called for the development of collection and processing infrastructure by local governments and the private sector, encouraged through State financial assistance.

The Solid Waste Alternatives Program is one of the primary tools created to help achieve the diversion goals of the Solid Waste Policy. SWAP is funded by the Protecting Michigan's Future Bond issue approved by voters in 1988. The \$150 million program provides grants and loans for private and public sector projects that assist in diverting solid waste from disposal—landfilling or incineration.

SWAP provides grants under various categories, for projects involving the collection and processing of recyclables, composting of yard waste, resource recovery education, development of end markets and other resource recovery activities. SWAP also provided funding for the Clean Michigan Community demonstration projects.

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The CMC program was funded by a \$10 million legislative appropriation of SWAP funds. Over \$8.8 million of these funds were provided directly to the six communities as implementation grants.

This money financed:

- Consulting assistance to plan each of the six community programs
- Grants to the communities for recycling and composting facilities, equipment and educational and promotional materials
- A technology transfer program, to pass on the lessons learned from the six CMCs to other Michigan Communities.

Applications for CMC funding were accepted in 1989, and the notification of selection was made in 1990. The DNR applied three main criteria to the selection process. First, the applicant needed to demonstrate the ability to commit to all the CMC program requirements. Next, the project proposed by the community needed to include recycling and composting programs that targeted both single-family and multi-family households, as well as industrial, commercial and institutional (ICI) sectors. The location, size and demographic profile of the community needed to make it an effective model for other Michigan communities. The DNR sought six models to represent large, medium and small communities, both rural and urban areas, as well as communities with differing levels of prior experience in recycling and composting.

The primary goal of the Clean Michigan Community Program is to provide model recycling, composting and education programs to help increase acceptance of recycling and composting as community waste management options. The CMCs provide examples of these efforts for other Michigan communities to examine and learn from. The multi-year effort of each Clean Michigan Community provides a wealth of demonstrated success stories as well as the lessons learned from the trials and errors of six Michigan communities.

The six CMC projects have also helped develop Michigan-based leadership in community recycling and composting. In each of the six communities, many individuals devoted considerable time on the many efforts needed to mount a community resource recovery program, such as building community support, lining up markets for the collected recyclables, and procuring and maintaining equipment and facilities. These individuals have developed skills in many areas, making them an excellent source of information about the various components of recycling and composting programs in the state.

The six pilot communities are:

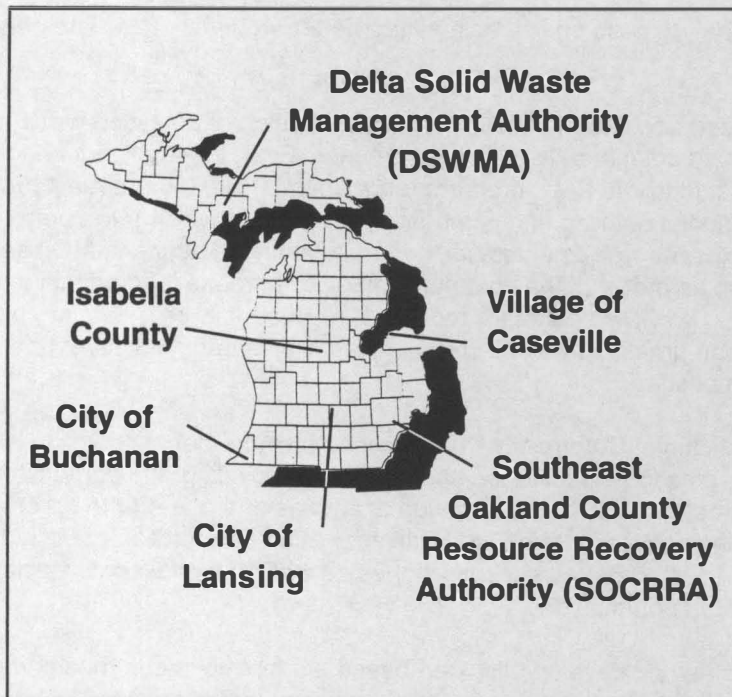
- City of Buchanan
- Village of Caseville
- Delta Solid Waste Management Authority (DSWMA)
- Isabella County
- City of Lansing
- Southeast Oakland County Resource Recovery Authority (SOCRRA).

The **City of Buchanan** is one of the small communities chosen for a CMC project. Buchanan has a population of 4,992 and is located in a rural area of southwest Michigan, in Berrien County. Buchanan is a member of the Southeast Berrien County Regional Landfill Authority, which provides landfill disposal for Buchanan and three other communities in the region. Prior to the CMC program, Buchanan provided municipal refuse collection, drop-off recycling service, leaf collection and composting.

The **Village of Caseville** is the other small community chosen for the CMC program. Caseville's population varies from 857 year-round to 2,857 in the summer. Caseville is a coastal resort town in Huron County, Michigan's thumb. Prior to the CMC program, Caseville had no recycling or composting programs in place, and it contracted for solid waste services. Caseville began its recycling collection by contracting with private haulers, and then switched to municipal collection of recyclables in March 1994.

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The DNR selected two medium sized CMCs: the **Delta Solid Waste Management Authority** serving all of Delta County in the Upper Peninsula and **Isabella County**, in the middle of the Lower Peninsula.



The **Delta Solid Waste Management Authority (DSWMA)** owns the County's only landfill and services the entire County population of 37,780. Prior to its CMC project, the cities of Escanaba and Gladstone, the Village of Garden and twelve townships in Delta County used a combination of public and private sector refuse collection and recycling drop-off services. Recycling services were provided through Lakestate Industries, a sheltered workshop, that employs persons with a handicap. Escanaba provided its residents with basic leaf composting.

The other medium sized CMC is **Isabella County**, population 54,624. The largest city in Isabella County is Mt. Pleasant, home to Central Michigan University. Prior to

designation as a CMC, Mt. Pleasant provided municipal collection of solid waste and the out-county area was served by private solid waste services. There was no significant composting except in the Village of Shepherd. Private and nonprofit drop-off recycling programs were in existence throughout the County.

The **City of Lansing**, with a population of 127,321, is a large-sized CMC. Lansing is the state capital and the 5th largest city in Michigan. Lansing has both public and private sector refuse collection. Public sector refuse collection is volume-based: residents buy specially identified City trash bags through local retailers. Area landfills are privately owned. Prior to the CMC project, both drop-off and pilot curbside recycling programs had been established by the nonprofit group, The Recyclers of Ingham, Eaton and Clinton Counties. A local solid waste hauler and landfill owner operated a drop-off center and small processing facility. Lansing collected leaves in the spring and the fall, composting the materials at a private facility.

The largest CMC is the **Southeast Oakland County Resource Recovery Authority (SOCRRA)** in Southeast Michigan. The Authority serves 326,062 persons in 14 of the 61 Oakland County municipalities. SOCRRA is an established public authority with a long history of owning and operating landfills, transfer stations and incinerators. There were public sector drop-off recycling depots in most of the member communities and curbside collection and composting of yard waste prior to the CMC project.

Developing the CMC Implementation Plans

The CMC project has been a team effort, with many people involved in planning and implementing the recycling and composting programs for the six communities. Overall management has been the responsibility of the Solid Waste Alternatives Program Unit of the DNR's Waste Management

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campaigns were implemented, programs were rolled-out and initial start-up problems were identified and addressed. Upon completion of the consultant team responsibilities in the CMC program, they developed an initial evaluation report for each project and a comparative report for the overall program. These reports were based on the experiences of the CMCs from the initial planning phase through the first few months of operation.

SUMMARY OF THE SIX CMC PROGRAMS

Key Features

Key features for each community project are listed on the following pages. These features include: the type and frequency of recycling and yard waste collection, type of recyclable processing facility, the start-up date and the types of recycling and yard waste-related ordinances adopted by the community. Tables 2 and 3 (see pages 7 and 8) provide a summary of the collection and processing methods used in each of the CMCs.

City of Buchanan

The recycling and composting program for the City of Buchanan features the following:

- Weekly municipal collection to single and multi family residential units, and twice weekly collection for 100 small commercial establishments. Source separation into two streams—old newspapers and containers.
- Recycling services provided by private haulers under contract to larger commercial and industrial establishments.
- Recycling drop-off depot operated by the South Berrien County Landfill Authority and volunteers.
- A small materials recovery facility (MRF) owned and operated by City of Buchanan, located at the Authority landfill, where vehicle operator-sorted materials are baled.
- Fall leaf collection by municipal crews, composted in windrows at the Authority landfill. Final compost is used in municipal projects.
- City recycling ordinances that require single family and multi-family source separation of recyclables, source separation of corrugated cardboard containers by commercial generators and a ban on burning yard waste.
- A ban on landfilling of recyclables and yard waste by the Southeast Berrien County Landfill Authority.
- Start-up in November 1992.

The CMC grant to Buchanan provided \$606,581 for:

- A recycling collection vehicle
- Recycling collection bins
- Processing facility and equipment
- A brush chipper
- Education and promotion.

Village of Caseville

The Village of Caseville's recycling and composting program features the following:

- Weekly, municipal curbside collection of source separated recyclables from single and multi-family residences and commercial establishments.
- A small MRF operated by the Village which performs minimal sorting and processing.
- Two recycling drop-off sites at public parks.
- Curbside collection of leaves and brush chipping, with storage in Department of Public Works yard and land application when sites are available.

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- Village ordinances that require source separation of specified recyclables by single family and multi-family residents and commercial establishments and bans the landfilling and open burning of yard waste.
- Start-up in December 1992.

To assist in implementing this program Caseville received \$333,541 in CMC grant funds for:

- A collection vehicle, curbside collection containers, and drop-off depot construction
- Construction of a MRF, processing equipment and storage containers for collected materials
- Yard waste collection equipment
- Education and promotion.

Delta Solid Waste Management Authority

The Delta Solid Waste Management Authority CMC program features the following:

- Weekly, curbside co-collection of recyclables and solid waste from single family and multi-family residences and some businesses on the same multi-compartment truck run with
- Municipal collection in Escanaba and Gladstone,
- Private co-collection in the out-county area (one of the private haulers makes two passes—i.e. does not co-collect).
- Purchase and expansion of the material recovery facility (MRF), now owned by DSWMA and operated by the private nonprofit Lakestate Industries, with primarily hand sorting of materials.
- Yard waste collection by the cities of Escanaba and Gladstone with out-county yard waste drop-off permitted in Gladstone.
- Compost sites in Gladstone and Escanaba drop-off permitted in Gladstone.
- Yard waste reduction program which provided 950 backyard composting bins to residents.
- Resolutions passed by the Authority to not accept specified recyclables at the landfill once the MRF became operational; to not accept yard waste at the landfill once curbside pick-up started; and to encourage the purchase of products made from recycled materials.
- Policy adopted by the County Board of Commissioners banning the open burning of yard waste.
- Start-up December 1992 - March 1993.

To assist in implementing this program, DSWMA was allocated over \$1 million in CMC grant funds for:

- Collection vehicles, drop-off site construction, and curbside bins
- MRF purchase and rehabilitation
- Processing and peripheral equipment
- Compost site work and equipment
- Promotion and education.

Isabella County

Following is a brief summary of the features of Isabella County's recycling and composting program:

- Weekly curbside collection of recyclables in the City of Mt. Pleasant by a private hauler with publicly owned equipment for single and multi-family residences. Private collection or drop-off for the institutional/commercial/industrial sector.
- Nine drop-off sites for out-county residents spread throughout the County and at the MRF.
- A publicly owned, privately operated MRF. Processing is a combination of hand and mechanical sorting.
- Yard waste collection (leaves and brush) in Mt. Pleasant and yard waste drop-off at the MRF for out-county residents.
- Land application of yard wastes on farm fields.
- The County and the City adopted local ordinances requiring recycling service in the City of Mt. Pleasant by a licensed private hauler which brings recyclables to the MRF, provision of drop-off sites for individuals to deposit recyclables and a County-wide ban on the landfilling or burning of yard waste.
- Start-up began in April 1993.

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To assist in implementing this program, Isabella County was allocated over \$1.7 million in CMC grant funds for:

- Collection vehicles, curbside and drop-off containers
- Construction of the MRF, including processing and peripheral equipment
- Education and promotion.

City of Lansing

Lansing's comprehensive recycling and composting program provides the following features:

- Weekly, municipal, curbside collection of source separated recyclables for single family residences (up to four units), multi-family collection for residences (five units and over) by private haulers and commercial collection by private haulers.
- A municipally owned and operated transfer station where recyclables are transferred from collection trucks to containers for shipping to end markets.
- Municipal yard waste collection of bagged grass, leaves and bundled branches during the growing season and composting of grass and leaves at a private facility.
- Recycling ordinance that requires source separation of recyclables, bans disposing of recyclables and yard waste in a landfill; and establishes an annual household fee of \$55 charged to the July property tax bill.
- Start-up (as dictated by local ordinance) as follows: November 1991—Single family residential collection, September 1992—Multi-family (five units and over) collection by private haulers, July 1994—Commercial sector collection by private haulers.
- A solid waste ordinance that bans the open burning of yard waste.

To assist in implementing this program Lansing was allocated \$2.3 million in CMC grant funds for:

- Eleven recycling vehicles and curbside recycling bins
- Funding of a portion of the transfer station and peripheral equipment
- Education and promotion.

SOCRRA

The SOCRRA recycling and composting program features the following:

- Curbside collection from single family and multi-family residences in all fourteen member communities, largely by private haulers.
- Industrial, commercial and institutional (ICI) collection by private haulers or delivery to drop-off sites.
- Processing of recyclables at a central MRF. Processing by hand and mechanical sorting.
- Curbside collection of yard wastes and composting of leaves and grass into a high quality compost through windrows at a publicly owned facility.
- Yard waste reduction program through education and refusal of three communities to collect grass clippings.
- Recycling ordinances passed by each member community requiring the separation of recyclables from the waste stream by single family and multi-family residents.
- Landfill and open burn bans on yard waste.
- Start-up began December 1992 to April 1993 for different communities. The recycling ordinances required recycling for the multi-family (5 units and over) residential sector beginning in 1992, and recycling of corrugated cardboard containers from the commercial sector beginning in 1993.

To assist in implementing this program SOCRRA was allocated over \$2,760,000 in CMC grant funds for:

- MRF construction and processing equipment
- Peripheral equipment such as a fork lift, skid loader, chutes, etc.
- Compost site improvements.

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Table 2: Recycling Collection and Processing Methods and Costs in Six Clean Michigan Communities

CMC Community & Collection Method	Processing Methods	Initial Grant Funded Capital Costs for Recycling	Annual Recycling Budget **	Collection Costs	Processing Cost	Annual Amount of Materials Collected	Revenues
CITY OF BUCHANAN Municipal curbside collection to SF, MF and ICI* with sort at vehicle by operator. 1 drop-off site.	Baling of pre-sorted materials at 6,000 sq ft public materials recovery facility (MRF)	\$536,481 MRF construction, purchase of collection bins and vehicles, baler and peripheral equipment.	\$110,000 FY 1994	\$110,000 Collection & processing costs combined	\$110,000 Collection & processing costs combined	212 tons (Residential only.) July 93 - June 94	\$30,000 Material revenues FY 1994
VILLAGE OF CASEVILLE Municipal curbside collection to SF, MF and ICI with sort at vehicle by operator. 2 drop-off sites.	Baling of pre-sorted materials at 6,000 sq ft MRF	\$273,000 MRF construction, purchase of baler, curbside containers and collection vehicles, and peripheral equipment.	\$45,000 FY 1994	\$45,000 Collection & processing costs combined	\$45,000 Collection & processing costs combined	157 tons March 93 - Feb. 94	\$2,000 Material revenues FY 1994
DSWMA Municipal and private sector curbside co-collection of recyclables and solid waste to SF, MF and ICI. Sorting by vehicle operator. 2 drop-off sites.	Hand and mechanical sorting at publicly owned and privately operated, 15,500 sq ft MRF	\$1,098,510 Purchase and improvements to MRF, purchase of collection vehicles, processing equipment, and drop-off site construction.	\$252,484 FY 1994	\$240,000 Escanaba Gladstone \$120,000	\$247,484 Includes drop-off collection	2,870 tons Jan 93 - Dec 93	\$187,000 Material revenues 1994 estimate
ISABELLA COUNTY Private curbside collection in Mt. Pleasant for SF and MF. ICI delivered to public MRF or drop-off. Out-county SF and MF deliver to 9 County drop-off sites.	Hand and mechanical sorting at 12,000 sq ft publicly owned and privately operated MRF.	\$2,636,000 MRF and drop-off site construction, purchase of collection vehicles, drop-off containers, processing and peripheral equipment.	\$420,700 FY 1994	\$44,000 Drop-off collection only FY 1994	\$359,454 FY 1994	4,553 tons April 93 - March 93	\$156,773 Material revenues \$91,517 in tipping fees FY 1994
CITY OF LANSING Municipal curbside collection for SF. Private collection for MF and ICI. Full sort at curb for single family by vehicle operator. Several private drop-offs in region.	Presorted materials stored at publicly owned and operated 38,232 sq ft transfer station until shipping.	\$2,030,000 Purchase of 11 recycling vehicles, curbside bins, peripheral equipment, and transfer station construction.	\$1,450,000 Jan - Dec 93	\$961,420 Jan - Dec 93	\$230,710 Jan - Dec 93	3,348 tons Mar 93 - Feb 94	\$54,995 Material revenues Jan - Dec 93
SOCRRA Mostly private curbside collection for SF and MF in 14 communities. Sort by vehicle operator. ICI collection through drop-off or private haulers. Drop-off at MRF and in many communities.	Hand and mechanical sorting at publicly owned and operated 28,500 sq ft MRF.	\$1,192,500 MRF construction, purchase of processing equipment, peripheral equipment.	\$1,210,000 FY 1994	Private collection for most member communities	\$420,000 FY 1994	21,301 tons July 93 - June 94	\$495,000 Estimated material revenues FY 1994

* SF = single family residential, MF = multi family residential, ICI = institutional, commercial and industrial

Sources: City of Buchanan, Village of Caseville, Delta Solid Waste Management Authority (DSWMA) and Central Upper Peninsula Planning and Development Region (CUPPAD), Isabella County, City of Lansing, and Southeast Oakland County Resource Recovery Authority (SOCRRA).

** Budgets for each community are defined differently. Both processing and collection costs may be included for some communities while for others, such as where there is collection by private haulers, it may only include processing costs.

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Table 3: Yard Waste Management Methods and Costs in Six Clean Michigan Communities

CMC Community and Collection Method	Composting Method	Public or Private Facility	Yard Waste Collected/ Collection Costs	Processing Cost	Compost Uses End Markets
City of Buchanan Fall bulk leaf collection (Oct -Nov) Weekly grass collection in kraft bags April - Nov. On-call curbside collection & brush chipping	Windrow with shared turner	Public, City of Buchanan	990 tons @ \$23.27 July 93 - Jan 94	\$35/ton	Municipal projects
Village of Caseville Bulk leaf collection fall & spring w/leaf loader & dump truck. Yard waste drop-off at MRF location, de-bagged by residents. On-call chipping	Land application	Public collection, private land application site	376.2 tons @ \$21.00 Sept 93 - Feb 94	\$19/ton	Land application
DSWMA Fall bulk leaf collection in Escanaba. Bagged yard waste collection in Gladstone. Drop-off sites Gladstone, Escanaba. Out-county, on-call chipping	Windrow	Public, City of Escanaba, Gladstone & out-county	Information not available	\$17.38/ton	Municipal projects, residents and nearby farmers
Isabella County Fall leaf curbside collection in Mt. Pleasant. On-call chipping. 2 drop-off sites—Shepherd & County MRF.	Land application, 1 farmer, 2 backups. Windrow composting in Village of Shepherd.	County owned, contracted operation, private land application site	2,146.65 tons @ \$5.13 April 93 - Mar 94	\$13.41/ton	Land application
City of Lansing Weekly curbside collection with City trash bags— unlimited, April-Nov. (bagged collection)	Trapezoidal Windrows	Public collection, private composting site	3,000 tons @ \$35.48 Mar 93 - Feb 94	Tip fee of \$4.50/ton at private facility	Private compost facility markets to commercial sector—landscape contractors, etc.
SOCRRA 14 communities bulk leaves-vacuum street sweeper, bagged grass - no plastic bags. Reduced brush generally used by the communities.	Windrows, 5 to 1 leaf to grass ratio.	Public composting site	34,051.6 tons @ \$3.94/ton July 93 - June 94	\$18.14/ton	Residents, municipal projects, landscapers

Sources: City of Buchanan FY 1994, Village of Caseville FY 1994, Delta Solid Waste Management Authority (DSWMA) FY 1994, Isabella County FY 1994, City of Lansing CY 1993, and Southeast Oakland County Resource Recovery Authority (SOCRRA) FY 1994.

Participation and Recovery Rates

It is useful to monitor the number of households that participate in recycling and composting programs and the quantities of materials recovered for a number of reasons:

- Determine where the program needs improvements
- Determine if program goals are being met
- Make end market arrangements
- Provide feedback to participants
- Target education and promotion to infrequent participants or problem areas.

Two important measurements are

- Recovery, which is generally measured in terms of total program recovery, such as tons or cubic yards of materials collected per month, or for curbside programs, the per household rate, such as the pounds of materials collected per residential unit per year. Recovery rates are determined through material measurements, such as weighing at the processing facility.
- Participation rates. For curbside programs, the participation rate is the percentage of households that set out a bin with materials for recycling collection. Generally this is recorded by the collection vehicle operator over a several week period.

Table 4 shows the quantity of recyclables collected in each of the CMC programs. Each community measures and reports the materials by different means, and in some cases, these measurements can be compared to the projected rates made by the CMC consultant team when the community programs were planned.

Village Caseville

A measurement of recycling participation rates in Caseville was completed in July 1993. The results show that a recycling bin was left at the curb at least once in six weeks for 45 percent of the households. Village officials believe that the low participation is due, in part, to resident objection to paying the program fee.

Table 4 illustrates that recovery of recyclables is less than the amount projected. This is primarily due to low participation. Of the 157 total tons collected, less than 8 tons was marketed during the same period. Caseville is required to store materials until there are sufficient quantities to ship to market.

A review of month by month recovery data for Caseville indicates that while the population increases by a factor of three in the summer season, recycling collection does not dramatically increase during this period. This may be due to a lack of promotional efforts to reach the temporary population, and a low level of participation among seasonal residents.

Caseville collected about 376 tons of yard waste between September 1993 to February 1994. This was primarily comprised of leaves, and Caseville delivered this to a farmer for land application. The acidity of the primarily oak leaves required the application of lime to the land, at a high cost to the farmer.

Isabella County

The Isabella County recycling program began in April 1993. At that point the weekly set-out rate averaged 54%. The set-out rate, was recorded by collection vehicle operators. It has not been recorded since April 1993.

Table 4: Comparison of Actual with Projected Recovery of Recyclables in CMC Communities

CMC Community	City of Buchanan Materials Collected SF & MF Sectors Only Actual is year projection based on Jan. 1994-Mar. 1994 data		Village of Caseville Materials Collected All Sectors March 93 - Feb 94		DSWMA All Sectors (which deliver to the MRF) Materials Marketed Jan - Dec 1993		Isabella County All Sectors Materials Marketed April 93 - March 94		City of Lansing Materials Collected Single Family Households March 93 - Feb 94		SOCRRA All Sectors Materials Collected July 93 - June 94	
	Actual tons	Projected* tons/yr	All sectors Actual tons	Projected* tons/yr	Actual tons	Projected* tons/yr	Actual tons	Projected* tons/yr	Actual tons	Projected* tons/yr	Actual tons	Projected* tons/yr
ONP	119.08	180.00	36.66	58.40	402.00	1,114.00	1,145.00	1,120.00	2,230.00	5,778.70	→	→
OCC	17.00	120.00	63.83	130.00	596.00	742.00	1,820.00	970.00	NC	NP	→	→
OMG	NC	NP	NC	NP	NC	NP	9.00	NP	90.10	NP	→	→
Other paper (office, colored and computer)	NC	NP	9.34	4.00	included in ONP	included in ONP	97.00	238.00	NC	NP	→	→
Boxboard	NC	NP	NC	NP	NC	NP	163.00	NP	NC	NP	All fibers 13,276.00	All fibers 16,965.00
Glass	46.40	81.60	32.05	46.10	795.00	492.00	369.00	446.00	601.69	1,576.00	3,251.00	3,513.00
Plastic	12.12	12.80	4.14	4.20	154.00	80.00	83.00	73.00	145.10	252.10	750.00	731.00
Aluminum	2.00	2.00	NC	NP	8.00	12.00	2.00	NP	3.90	NP	NC	NP
Steel/tin cans	18.16	22.40	11.65	12.60	111.00	133.00	177.00	134.00	276.80	420.30	2,319.00	1,200.00
Total	214.76	418.80	157.67	255.30	2,066.00	2,573.00	3,865.00	2,981.00	3,347.59	8,027.10	19,596.00	22,409.00

Sources of Actual Amounts: City of Buchanan, Village of Caseville, for Delta County - Central Upper Peninsula Planning and Development Region, Isabella County, City of Lansing, Southeast Oakland County Resource Recovery Authority (SOCRRA)

*Projections made by CMC consultant team during planning phase.

NC = Material not collected in that community at the time period for which recovery measured.

NP = An estimate for recovery of this material was not made by the CMC consultant team when implementation plans were developed.

ONP = Old newspapers

OCC = Old corrugated cardboard containers

OMG = Old Magazines

DSWMA = Delta Solid Waste Management Authority.

SOCRRA = Southeast Oakland County Resource Recovery Authority.

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Actual total amount of recyclable materials marketed in Isabella County was 3,865 tons, between April 93 - March 94. This was above the amount expected, 2,981 tons. This is primarily due to significantly higher commercial collection. Out-county collection through drop-offs is lower than projected. This may be because the projections were based on thirteen drop-off locations when only nine sites were constructed. As can be seen by Table 4, much of the increase can be attributed to corrugated cardboard containers.

Actual yard waste collection in Isabella County is 2,146.65 tons, with 2,087.4 tons of leaves collected by Mt. Pleasant and 59.25 tons of grass, leaves, and brush dropped off at the MRF.

The amount of leaves collected is twice the amount projected, probably due to the large number of trees in the City, and because pick-up is free. The amount of grass and brush collected is lower, which can be tied to the fact that the City first charged for this service, and then stopped collecting grass. In addition, home composting was promoted, with 900 bins provided free.

In the City, recycling has been successful in diverting materials from the solid waste disposal stream. In the period, 1989 to 1994, in which recycling has been promoted, the City has experienced a 300% reduction in solid waste collection.

City of Buchanan

Participation was surveyed in 1993, and it was found that 50% of single family households participated on a weekly basis, and about 80% on a monthly basis although this varied among neighborhoods. Collection vehicle drivers recorded participation over a six week period.

As can be seen from table 4, recovery from the residential sector was below estimate. Lower residential recovery may be due to a lack of on-going education and promotion. Buchanan receives a significant contribution of recyclables from the commercial sector, which is not included in the table. It is difficult to determine the degree to which Buchanan's ICIs generated these materials because Buchanan only separately measures materials from municipal collection and that from private haulers.

The projection for the amount of yard waste that would be collected annually, as prepared by the CMC consultant team, was 948 tons. Buchanan reports collecting 990 tons of yard waste, primarily leaves.

DSWMA

While participation rates are not kept by the Authority for out-county areas, there has been some measurement within the two cities. Participation, measured by collection vehicle operators over a one month period in the fall of 1993 showed that Escanaba and Gladstone, had an 80% set out rate once per month.

The Authority measures the total tons of collected recyclables. This is a simple operation because the trucks carrying both solid waste and recyclables weigh in at the landfill on arrival, dump the solid waste, and weigh again, providing the total weight of recyclables.

Delta County collects more recyclables than estimated. As Table 4 indicates, much of the difference between actual and projected can be attributed to greater amounts of glass, magazines and plastics.

Yard waste measurements were not available for this report.

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City of Lansing

As is shown in Table 4, Lansing collects less than half the amount of recyclables than was expected. This is likely due to the low participation of Lansing residents. The only participation survey completed in Lansing was in the fall of 1993. This survey was conducted over one month and results indicated that 60 to 65 percent of single family households were setting out a recycling bin. The City believes a primary reason for low participation is the availability and use of private sector hauling services. While by City ordinance, residents are required to recycle, encouraging recycling among residents who contract with private haulers is difficult. Residents using alternative collection opportunities may not readily identify with the City program. These residents also receive fewer promotional materials such as recycling bin inserts or flyers packaged with City refuse bags.

For households using private haulers, the City must rely on the hauler to monitor compliance with the local ordinance prohibiting the inclusion of solid waste recyclables and yard waste. In addition, private haulers provide large curb carts and contract refuse collection for a monthly fee, so there is not the incentive to recycle that the volume-based City bag system provides.

It was projected that Lansing would collect 16,858 tons of yard waste a year. Lansing delivered 17,104 cubic yards, about 3,000 tons, to the compost facility in 1993. This smaller quantity may be due to the same difficulties presented by the large portion of residents opting for private refuse collection over City collection service. The City's yard waste reduction campaign may contribute to reduced yard waste collection compared to estimates.

SOCRRA

SOCRRA communities experience a high participation rate, which is observed and recorded by collection vehicle operators. SOCRRA participation rates average 91% of those single family households provided recycling services set out bins of recyclables each week. The rate for multi-family households is 67%.

The figures in Table 4 are for single family and multi-family collection. A small amount of corrugated cardboard containers from a pilot ICI program is included in the actual figures. These figures show that actual recyclables collected is lower than the amount expected by only 15%. This is not unexpected because the projections are for a mature program, and the recovery figures are for the first year of operation.

The yard waste estimate for SOCRRA, prepared by the CMC consultant team was 50,502 tons per year. Actual collection for July 1993 to June 1994 was 34,051.6 tons. The difference between actual and expected collection may be due to yard waste reduction efforts. These efforts include a refusal by three member communities to accept grass clippings, a ban by the Authority on accepting grass clippings in plastic bags (kraft bags are accepted), and yard waste reduction education.

With the implementation of recycling and composting programs in all the SOCRRA communities, diversion of solid waste from landfills is 32 to 35%.

FINANCING

Table 5 (see page 15) summarizes the different financing methods used by each of the CMCs. These methods vary due to the differences in type of entity, such as municipality or landfill authority, responsibility for the recycling and composting program, and funding mechanisms they each had in place before implementing the CMC project.

City of Buchanan

The Buchanan solid waste and recycling collection programs are financed by the general fund of the City through a separate recycling fund. Revenues from the sale of materials are returned to the recycling fund. In 1994, the budget for all aspects of the comprehensive program is \$130,000, and market revenues return about \$30,000 to the fund. The recycling fund also pays for fall leaf collection. Buchanan adjusted its solid waste and leaf collection appropriations to handle the increased costs of recycling. The City charges for yard waste collection, requiring residents to purchase special kraft paper bags for grass clippings for \$1.50.

Village of Caseville

Caseville finances its recycling, composting, and education programs through fees assessed to residents and businesses. All households are assessed \$3 per month, which for billing purposes is sent with quarterly water bills. Commercial establishments are assessed monthly fees from \$3 to either \$15, \$40 or \$100 depending on the amount of recyclable materials they are capable of generating. Examples of small size generators are gas stations and beauty salons; medium size generators could be a gift shop or clothing store; and large size generators a restaurant or bar. The assessed fees provide the primary source of operating revenue, \$50,000 in 1994, for the recycling and composting program. This supports all but \$3,000 of the program, which the Village provides from the general fund. The Village sets aside \$16,000 of the annual budget for equipment replacement.

DSWMA

As a landfill owner, DSWMA was able to finance their recycling program through an increase in landfill tip fees. The landfill rate went up by \$3 per ton to cover recycling and other expenses. The private haulers passed on this increase to their customers as a rate increase of about \$15 per year. This approach was a more politically acceptable solution than a mandatory household fee. DSWMA has a contractual arrangement with Lakestate Industries for operation of the MRF, based on a set fee for each fiscal year.

While the price of materials to end markets is occasionally high, the volume does not always provide enough income for the program to pay for itself. However, in the first six months of 1994, revenues of the recycling program exceeded expenses. Usually the Authority subsidizes the program, diverting money from the Authority general fund.

Both Escanaba and Gladstone supports municipal collection of recyclables through its solid waste collection program funded by the general funds of the Cities. This financing method reflects the combined (co-collection) recycling and solid waste collection system.

Isabella County

Recycling in Isabella County is paid for through a variety of sources. The drop-off program for County residents is subsidized from the general fund, while City of Mt. Pleasant residents pay a fee. The charge is \$2 per month per household, and residents are billed monthly with their water bill. Residents living within the County deliver recyclables to either an out-county drop-off site or the drop-off site at the MRF free of charge. There is a fee at the MRF for the drop-off used motor oil,

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\$0.25 per gallon, and yard wastes, \$1 per bag, \$10 per cubic yard of leaves and grass, and \$12.50 per cubic yard of brush. The cost for recyclables from commercial establishments is \$44 per ton, as of May, 1994.

Isabella County contracts with a private company for operation of the MRF. The contract is based on a set cost per ton of material processed, which is periodically negotiated between the County and the private company.

City of Lansing

The Lansing Public Services Department provides both volume-based refuse bag service with financing through a user pay program, and recyclable and yard waste collection with financing through a household fee of \$55 per year. The \$55 per household fee was added in 1991 to cover costs of the expanded recycling and composting programs undertaken as part of the CMC project. The fee is collected through the July property tax bill. In addition, residents can opt out of the City's program, and waive payment of the \$55 per household fee if they can document that they receive recycling service from a private hauler.

Refuse collection bags cost \$1 each in 1989 to April of 1991. This cost was then increased to \$1.50, timed with implementation of the recycling program, in part to encourage recycling. The increase in refuse bag cost also helps pay for increased landfill tip fees, which rose 42% in 1990 and 21% in 1991.

SOCRRA

For the most part, the cost for recycling collection is paid for out of the general fund of each SOCRRA member municipality. Depending on the individual municipalities pay between \$0.23 to 0.33 per stop per week to the private haulers to collect recyclables.

The cities are paid \$9.50 per ton for recyclables brought to the MRF for processing. SOCRRA and the member communities cover the cost of processing recyclables through material revenues. SOCRRA is able to return market revenues to the communities because of the large population base from which to collect materials for market, and to the Authority's success in lining up long-term contracts with end markets. A high price for plastics and a large volume of paper contribute substantially to the income of the program. The member communities share the revenue based on the amount of material they deliver and its selling price. In addition to recyclables, member communities pay the Authority to accept yard waste. The fee is \$16 per ton for leaves and \$26 per ton for grass clippings.

KEY LESSONS

As a result of five years experience with planning and implementing community recycling and composting programs, the CMC communities have learned valuable lessons. Communities across Michigan can learn from this experience. There are lessons for communities not yet recycling and composting on a large scale as well as lessons for communities that have begun recycling and or composting but wish to expand these programs. Following is a brief summary of some of these lessons. More detailed information is available in other CMC program informational materials.

Lesson One: Community Involvement—Involving residents and stakeholders early in program planning, implementation and evaluation is critical to success. One way many of the CMCs did this was through an advisory committee made up of local officials, citizens and business representatives. The committee should represent many community interests and stakeholder groups, such as neighborhood associations, multi-family residents and managers, environmental groups, private solid waste management companies and managers of institutional, commercial and industrial establishments. The committee can provide advice on appropriate policies or ordinances

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Table 5: Financing and Budgets for Six Clean Michigan Community Projects

Community Financing Method	Total Annual Budget *	Annual Revenues **	Annual Processing Costs	Annual Collection Costs	Annual Education Costs
City of Buchanan General funds pay for curbside collection, MRF operations and fall leaf collection. During growing season, purchase of kraft bags required for grass clippings at \$1.50 each.	\$130,000 FY 1994	\$30,000 Material sales FY 1994	\$130,000 Recyclables and yard waste collection and processing combined FY 1994	\$130,000 Recyclables and yard waste collection and processing combined FY 1994	Separate budget amount not available
Village of Caseville Fee-based. Households at \$3 per month. Commercial establishments at either \$3, \$15, \$40, or \$100 depending on size. Includes fall leaf pick-up.	\$53,000 FY 1994	\$50,000 Fee revenues FY 1994	\$53,000 collection and processing combined FY 1994	\$53,000 collection and processing combined FY 1994	Separate budget amount not available
DSWMA MRF operation and composting paid for through \$3/ton increase in landfill tip fees, passed on to customers by private haulers. Some subsidy from Authority General Fund. Revenues returned to Authority General Fund.	Authority: \$252,484 FY 1994 Escanaba: \$240,000 FY 1994 Gladstone: \$120,000 FY 1994	To Authority only: \$187,000 Material sales estimate FY 1994	Authority only: \$247,484 FY 1994	Escanaba \$240,000 FY 1994 co-collection. Gladstone \$120,000 FY 1994 co-collection	Authority only: \$5,000 FY 1994
Isabella County MRF operations and drop-off service to county residents for recycling and yard waste paid for from County General Fund. City residents pay \$2 per month for private curbside service and City leaf pick-up. Private landowner paid for land application of yard waste.	\$403,454 FY 1994	\$115,125 Material sales \$91,517 tipping fees FY 1994	\$395,454 FY 1994	\$44,000 FY 1994 (County drop-off program only)	\$25,000 FY 1994
City of Lansing Single family residents pay \$55 household fee through property tax bill for recycling and yard waste collection. Multi-family residents and businesses pay private haulers for service.	\$2,100,000 Jan - Dec 1993	\$55,000 Material sales Jan - Dec 1993	\$230,710 recycling \$105,250 composting Jan - Dec 1993	\$961,420 recycling \$570,280 yard waste Jan - Dec 1993	\$350,100 Jan - Dec 1993
SOCRRA General funds of each member municipality pay for collection. Municipalities (one does its own collection) pay private haulers \$0.23 to \$0.33 per stop per week. Composting and MRF operations funded through tip fees paid by each community.	\$1,345,000 FY 1994	\$420,700 Material sales estimate FY 1994	\$420,700 MRF \$134,300 composting FY 1994	Primarily private collection	Primarily a function of each of 14 member communities

Sources: City of Buchanan, Village of Caseville, Delta Solid Waste Management Authority (DSWMA), Isabella County, City of Lansing, and Southeast Oakland County Resource Recovery Authority (SOCRRA) and Central Upper Peninsula Planning and Development Region (CUPPAD).

* Each community calculates its annual budget differently. Some budgets include collection and processing of recyclables while others do not include collection.

** Annual revenues are from different sources depending on the community.

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including participation mandates, enforcement mechanisms, education and information programs, facility site selection, collection methods and other issues. An advisory committee can also help keep programs on track, by providing feedback to decision-makers and helping to develop solutions to problems hindering program success.

The advisory committee may also be a forum for resolving conflicts among stakeholders. Incorporating stakeholder opinions can help to build political and community support. Many of the CMC communities found that community consensus was necessary to proceed. As each of the CMC programs evolved, there were a number of times that problems or obstacles arose that threatened project progress. In these situations, often changes in the program were required to meet the needs of the different stakeholders and to build ownership.

The involvement of community groups not only educates those planning the recycling and composting program, but a discussion of the issues also educates the community about recycling and composting, and provides much-needed promotion for the program when it is eventually implemented.

Lesson Two: Institutional, Legal and Financial Arrangements—The early focus of the community needs to be on institutional legal and financial arrangements rather than merely on what materials to recycle and what kind of facility to build. The process of adopting policies and ordinances and developing appropriate funding mechanisms can be very complex, time-consuming and often controversial. While planning for programs and facilities should go on at the same time as that for legal and financial arrangements, communities tend to get distracted by the nuts and bolts decisions and as such the other issues can go unattended.

The CMC experience emphasized the need for policies and ordinances to be clear and well written. Language must be specific to the particular waste stream and target audience. Also, local ordinances should be written to include realistic and workable enforcement provisions so that the ordinances can be effectively implemented. The CMCs recommend adopting or amending ordinances well in advance of initiating the programs, and ensuring that all local interests have an opportunity to provide input during the development of the ordinances.

The decision on how to pay for the program needs to be made early in the planning process. Some of the choices include general fund monies, local bond issues, assessing residents through property taxes or user fees, and landfill surcharges. Individual community situations and politics will dictate what funding mechanisms are most appropriate. An important factor that needs to be considered is how the funding mechanism will be administered. A funding option can become more complicated when new administrative procedures for billing and collecting fees are required. Additional time and effort will be needed to establish appropriate procedures and often extra effort will be needed to educate residents and businesses about the new fees and the new billing methods.

Lansing faced difficulties in financing a comprehensive program. With growth trends away from the City, the resultant loss of tax base made starting a recycling program difficult. The apparent added costs of the recycling program generated vocal opposition. This opposition may have also reduced public support for recycling and contributed to low participation rates.

Lesson Three: Education and Promotion—It is especially important to provide residents with information in the months directly preceding program start-up so that they are aware of collection schedules, acceptable materials and proper preparation, locations, and costs. The City of Lansing attributed some of the early confusion surrounding their program to the need for more promotion prior to start-up, recommending that promotion begin six months to a year in advance. Timing for initial education and promotion is critical. For example, distribution of curbside bins is often used as a start-up educational tool. But in the case of both Lansing and DSWMA, some or all bins were distributed too far in advance. Residents began using curbside bins for other storage purposes. Careful coordination is needed to insure that the steps needed to begin start-up, such as the

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delivery of collection equipment or completion of the MRF. When unforeseen changes in the schedule occur, flexibility is needed so that all components fall into place at the proper time, such as delaying bin distribution until within a week or so of start up.

Education prior to start-up can be important if there are special needs among the residents. In Caseville, many of the seasonal residents had permanent homes in communities that recycled a different set of materials. This can lead to dissatisfaction of the residents when they set out materials that are left in the bins after pickup by the collection crew.

Lesson Four: Administration—The administrative challenge of planning and implementing a community recycling and composting program relates to community size. Large communities are more likely to have past experience in solid waste collection and management that can assist them with recycling and composting programs. Large communities can also find that their large volumes of collected materials makes marketing easier and program operations more cost effective. Small communities often find it easiest to form intergovernmental partnerships to share processing facilities. This can be particularly effective when there are existing intergovernmental relationships.

Lesson Five: Technical Expertise—It is important to obtain technical expertise beyond the assistance provided by a single consultant. The communities found it useful to review equipment specifications and engineering plans with their own engineering staff or equipment manufacturers to ensure that equipment would function properly or fit into the spaces allocated inside MRFs. Outside expertise was valuable on every phase, from program design to implementation. Checking with outside consultants or experts can help the community move more quickly through difficult issues by resolving differences of opinion or heading off mistakes. This expertise can come from many sources, including, staff, volunteers, other consultants, and neighboring governments.

Lesson Six: Yard Waste Collection—The CMC experience is that smaller communities benefit from bulk leaf collection but larger communities, because of the complexity of streets, find it easier to collect material in bags and more recently, in labeled containers. Participation in yard waste collection programs correlates directly with the convenience of collection services and education provided to residents.

Lesson Seven: Drop-Off Recycling—Drop-off programs are generally cost effective methods of collecting materials from multi-family residences and from rural areas where residents are accustomed to delivering their trash to a central drop-off site. Small businesses often prefer a convenient drop-off location over an increase in collection costs. Depot sites can be staffed or un-staffed. Staff at a depot site will ensure a high quality of material is collected, and that materials are placed in their proper location.

Lesson Eight: Recycling Collection Convenience—Recycling collection should be at least as convenient as solid waste collection. There are benefits beyond customer satisfaction. The more convenient it is, the more materials will be collected. Once the community has made the large capital investment for collection equipment and processing facilities, it is in the community's best interest to maximize recovery to reduce the per-ton costs.

Lesson Nine: Collection Vehicles—The volume of the collection truck, the size of the compartments, the miles of collection route, and the volume and composition of materials collected should be considered when choosing the appropriate technology for your community.

Lesson Ten: Collection Standards—The community must *clearly* communicate to residents what materials are accepted for recycling. Quality control should begin with program participants, and continue during collection and processing. Contaminants increase costs because extra labor is spent sorting, and valuable space on the truck was used for transporting solid waste. The collection of inappropriate materials results in added disposal costs. In addition, extensive contamination can

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cost the program in terms of lost revenues if it prevents materials from being marketed or lowers the market value.

Continuation of the Lessons

Nearly all CMCs are striving to increase waste diversion rates, and to be more responsible, both fiscally and environmentally. However, each community is different, and the CMCs have demonstrated that there can be varied programs tailored to the size and location of the community as well as to market characteristics and still achieve success. Table 6 illustrates the differences with a summary of the basic facts about the six communities and their projects.

The CMC program was just a pilot. To succeed in achieving a 50% reduction in solid waste, many more communities will need to implement recycling and composting programs. It is hoped these materials will assist other communities establishing recycling and composting programs by reducing the time to get informed, avoiding preventable mistakes, and networking with CMCs for first hand information and experiences.

This report was prepared by Planning & Zoning Center, Inc. for the DNR, Waste Management Division, with the assistance of the six CMC communities and the DNR. A series of Community Evaluation Reports, prepared by Resource Integration Systems, Ltd. as lead consultant with Resource Recycling Systems, Inc., Fishbeck Thompson Carr and Huber, and Franklin Associates Ltd. were also utilized.

August 1994

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Table 6: Basic Facts Summary of the Six Clean Michigan Community Projects.

	Buchanan	Caseville	DSWMA	Isabella	Lansing	SOCRRA
Service area in square miles	2.5	1.1	1,177	572	36	81.62
Population	4,992	857 permanent and 2,857 summer	38,200	54,624	127,321	326,062
Number of households	1,550 single family, 440 multi-family, 1,990 total	789	11,453	18,000 county-wide	38,000	131,441
Percent households provided curbside collection	100%	100%	100%	19% (3,800 households)	99%	100%
Number of ICIs provided with service	100	91	240	280 (200 by private hauler, 80 self haul)	not required until July 1994	20% of all ICIs
Materials collected	ONP, glass, steel cans, plastic from residences, and high grade paper and OCC from commercial	OCC, ONP, HDPE plastics, glass, steel cans, and office paper from businesses	ONP, OCC, OMG, glass, steel cans, aluminum cans, HDPE plastic	ONP, OCC, HDPE plastic, steel cans, 3 colors glass, steel, used oil at MRF drop-off	ONP, OMG and catalogues, glass, cans, aluminum, HDPE natural and colored from single family	OCC, ONP, OMG, phone books, kraft bags, HDPE natural and colored, PET, steel cans, glass, aluminum
Annual amount of recyclables collected	212 tons (residential sources) July 93 - June 94	157 tons April 93 - Mar 94	2,870 tons Jan 93 - Dec 93	4,553 tons April 93 - Mar 94	3,347.59 tons Mar 93 - Feb 94	21,181 tons July 93 - June 94
Annual amount of recyclables marketed	816.6 tons (includes materials from ICI and sources outside city) July 93 - June 94	7.71 tons April 93 - Mar 94	2,870 tons marketed or stored until shipping Jan 93 - Dec 93	3,865 tons (includes materials collected from outside the County) April 93 - Mar 94	3,347.59 tons Mar 93 - Feb 94	approximately 98% of amount collected July 93 - June 94
Annual amount of yard waste collected	990 tons July 93 - June 94	376.2 tons, primarily leaves Sept 93 - Feb 94	Data not available	2,146.65 tons April 93 - Mar 94	3,000 tons Mar 93 - Feb 94	34,052 tons July 93 - June 94
Number of collection vehicles	1 curbside recycling vehicle, 1 leaf loader, 1 leaf vacuum trailer towed behind City dump truck	1 curbside	Recycling/solid waste co-collection vehicles, 1 leaf packer, 1 leaf loader	1 for rural drop-off collection, 1 curbside for Mt. Pleasant (additional vehicle provided by private hauler as needed) and 1 leaf packer	11 recycling trucks, 3 yard waste packer trucks	Amount varies among the many private hauling companies
Number of drop-off depot sites	1 at landfill	2	2	9	4 private or nonprofit, within city limits	2
MRF Throughput	Varies, MRF only runs on selected days	Varies, MRF only runs on selected days	2.7 tons/hour	1.5 tons/hour commingled, 5.5 tons/hour paper baling	Not applicable (transfer station)	10.65 tons per hour

	Buchanan	Caseville	DSWMA	Isabella	Lansing	SOCRIRA
Processing facility size	6,000 square foot MRF, plus 1,800 square foot storage building	6,000 square feet	Three buildings totaling 15,500 square feet	12,000 sq ft	38,232 square feet (transfer station)	28,500 square feet
Date collection began	December 1992	November 1992	Out-county area and Gladstone-October 1992. Escanaba, March 1993	April 1993	November 1991 for single family, July 1994 for multi-family and 1994 for commercial	November 1992
Participation	50% weekly, 80% monthly	45% once in six weeks	80% in Escanaba and Gladstone	54% weekly	60-65% weekly	91% single family and 67% multi-family
Number of staff	1 operator, 2 vehicle operators/collectors who also work at MRF, and one supervisor 1/2 time in recycling	1-3/4 time permanent and 1-2 seasonal	Administrative: 2, collection: varies, MRF staff of 25	County: 1 1/2 FTEs Administrative and Education, private operator: 5 sorters, 1 working supervisor, 1 scale attendant, plus other special or additional help as needed	1 solid waste supervisor, 10 collection operators. 1 transfer station operator. 3 education/administration and 4-8 seasonal yard waste collectors	1 administrative and 17 MRF laborers (Authority only)
CMC grant amount	\$606, 581	\$331,500	\$1,098,510.	\$1,717,154	\$2,300,000	\$2,769,309
Funding mechanism	City General Fund into Recycling Fund. Market revenues returned to Recycling Fund	Monthly fee of \$3/month for residents and \$3 to \$100/month for businesses. Supplemented by general fund.	Tip fees at landfill. Sale of recyclables and DSWMA General Fund subsidy. Escanaba and Gladstone from general funds	City curbside collection, \$2 per month. County subsidy for out-county drop-offs. \$44 per ton fee at MRF for commercial haulers. Small fee for residents at MRF drop-off	Household fee of \$55. Voter approved Environmental Bond (City) added \$1.3 million for capital expenditures	Tip fees at compost site. Sale of recycled materials for MRF operation. Community general funds for collection.

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Recycling

Beginning in January, 1997 the only change in SOCRRA's recycling program was the elimination of the collection of "junk mail" at the Authority's MRF/dropoff center (see two-sided flyer entitled "Curbside Recycling Instructions 1997").

The six pages that follow, titled "Recyclables Tonnage-1997" summarize the operation of the MRF for the '97 calendar year. A total of 21,200 tons of recyclables were processed, with 85% coming from curbside collection and the remaining from commercial establishments and non-member communities. This volume equates to a 0.1% decrease from 1996 (21,228 tons). Considering only curbside collected material, the recycling truck drawing on page 4 indicates the relative weights of materials collected. From the 115,000 residential units served with weekly curbside service, the following collection rates were obtained:

19.6 lb/hh/mo. of fiber products (news, magazines, phone books, OCC, boxboard)
2.6 lb/hh/mo. of clear glass
0.6 lb/hh/mo of brown glass
1.1 lb/hh/mo. of green glass
0.9 lb/hh/mo. of HDPE/PETE narrow-necked plastic bottles
1.5 lb/hh/mo. of metal (food, beverage, paint aerosol cans and small scrap metal items)
26.3 lb/hh/mo total

Excluding the price paid to our members for receipt of their recyclables, the operation and maintenance cost for the MRF averaged \$26.24 per ton, while \$37.86 per ton was average revenue. As the table on page 5 indicates, the tonnage received allowed for avoided disposal costs in the amount of \$946,145. Direct tip fee credits of \$186,482 were paid out for material received from members while a surplus of \$59,859 accumulated in a Cash Flow & Equipment Reserve Account. The total direct calculated "value" of the recycling effort in '97 was \$1,192,486 while direct collection costs for weekly curbside recycling service totaled \$1,782,629.

The last page of the MRF report highlights the market trends for the calendar year, with our #8 baled news (amounting to 63% of total tonnage processed) achieving a high of only \$32/ton.

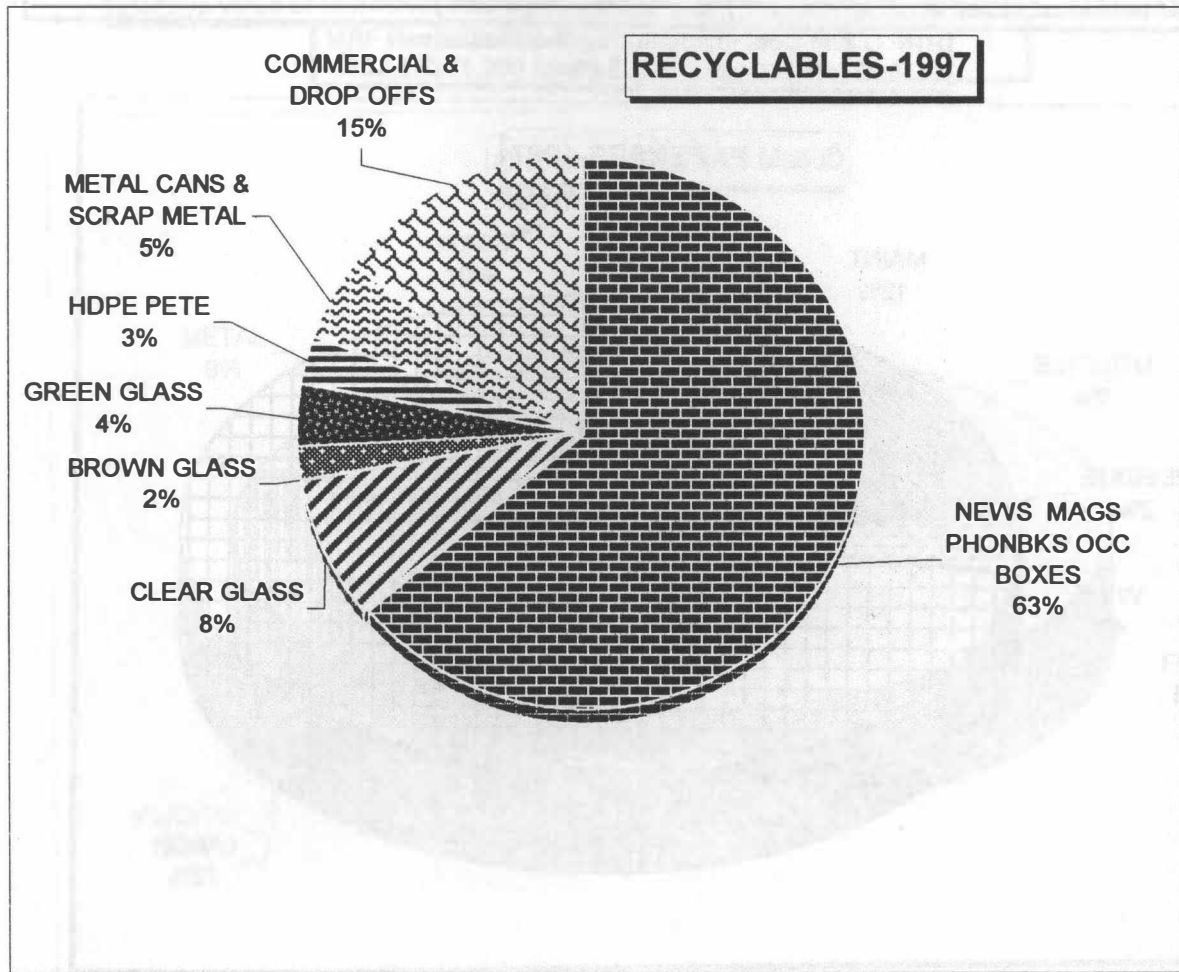
HDPE plastic bottle prices steadily declined during the latter part of the year as PETE did just the opposite.

The prices paid for baled metal cans remained very attractive, after a new contract was consummated last year which allowed for variable rates tied to the monthly market.

Glass prices were also stable, as one contract ended in June and another began.

RECYCLABLES TONNAGE- 1997

	NEWS MAGS PHONBKS OCC BOXES	CLEAR GLASS	BROWN GLASS	GREEN GLASS	HDPE PETE	METAL CANS & SCRAP METAL	COMMER CIAL & DROP OFFS	TOTAL (tons)	TONS PER WORK DAY
JAN	1,124	129	32	75	48	83	283	1,774	77
FEB	1,000	120	28	66	44	75	270	1,603	80
MAR	1,091	134	32	74	48	84	281	1,744	83
APRIL	1,233	168	35	67	58	91	316	1,968	89
MAY	1,239	165	36	67	58	93	292	1,950	89
JUNE	1,111	153	32	61	53	84	250	1,744	83
JULY	1,065	145	31	55	46	82	247	1,671	73
AUG	992	138	29	51	43	78	234	1,565	74
SEPT	1,116	153	32	58	48	86	221	1,714	72
OCT	1,143	156	34	60	49	89	235	1,766	80
NOV	1,102	150	31	57	47	86	218	1,691	76
DEC	1,313	182	38	68	56	101	252	2,010	87
	13,529	1,793	390	759	598	1,032	3,099	21,200	

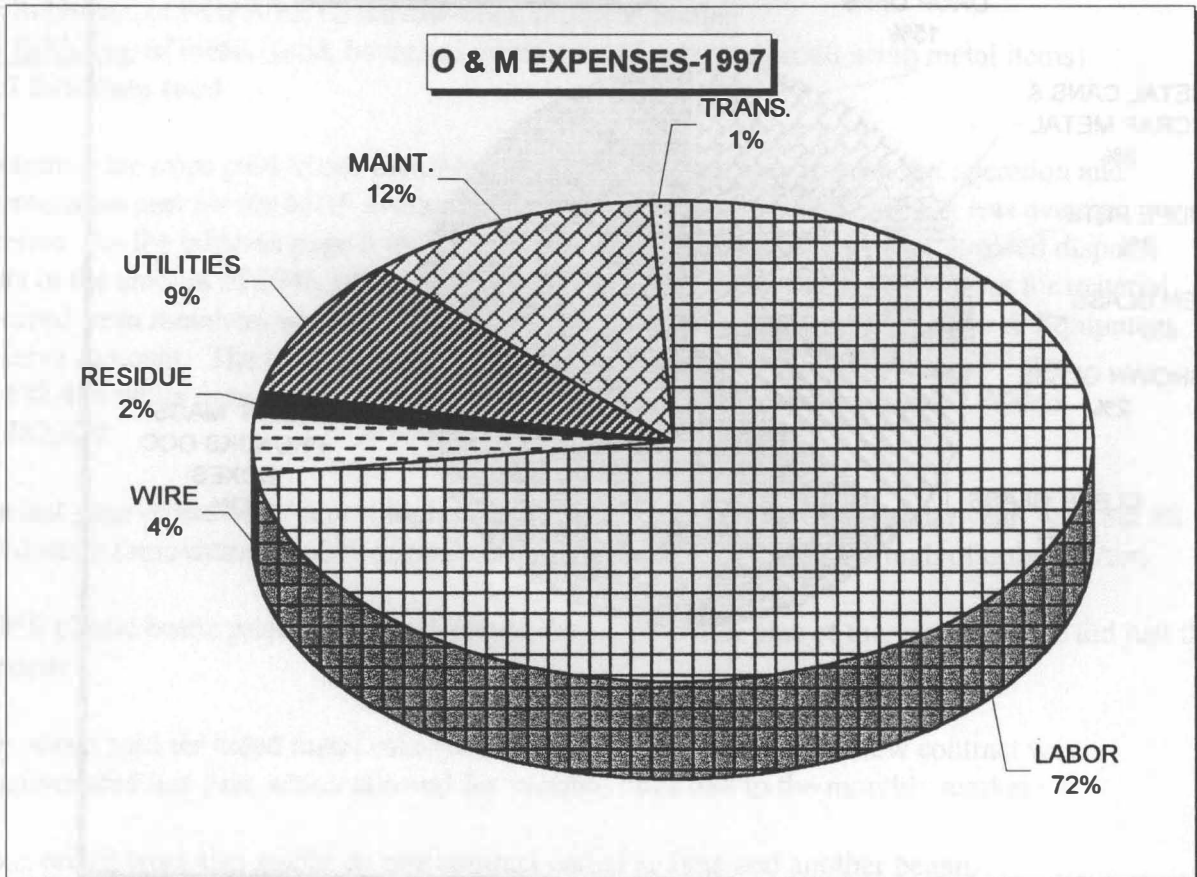


EXPENSES

	LABOR	WIRE	RESIDUE	UTILITIES	MAINT.	TRANS.	TIP FEE CREDITS	TOTAL \$
JAN	\$35,217	\$2,768	\$1,690	\$3,765	\$2,502	\$416	\$18,225	\$64,583
FEB	\$31,428	\$2,524	\$1,530	\$5,851	\$1,557	\$416	\$16,375	\$59,681
MARCH	\$31,290	\$2,524	\$1,665	\$5,249	\$3,234	\$312	\$18,050	\$62,324
APRIL	\$30,659	\$2,524	\$1,880	\$3,368	\$7,270	\$416	\$20,575	\$66,692
MAY	\$36,813	\$0	\$1,870	\$5,370	\$4,050	\$312	\$20,645	\$69,060
JUNE	\$34,296	\$0	\$0	\$3,660	\$5,334	\$312	\$18,660	\$62,262
JULY	\$25,898	\$2,159	\$0	\$3,270	\$14,325	\$300	\$11,665	\$57,617
AUG	\$31,781	\$2,159	\$0	\$2,852	\$3,452	\$300	\$11,004	\$51,548
SEPT	\$41,563	\$2,159	\$0	\$3,726	\$5,603	\$300	\$12,237	\$65,588
OCT	\$32,075	\$0	\$0	\$3,831	\$7,072	\$300	\$12,561	\$55,839
NOV	\$36,475	\$2,123	\$0	\$5,266	\$5,140	\$300	\$12,064	\$61,368
DEC	\$37,893	\$2,123	\$0	\$6,591	\$5,029	\$200	\$14,421	\$66,257
	\$405,388	\$21,063	\$8,635	\$52,799	\$64,568	\$3,884	\$186,482	\$742,819
\$/21,200 tons:	\$19.12	\$0.99	\$0.41	\$2.49	\$3.05	\$0.18	\$8.80	\$35.04

(defines cost of individual expense categories per ton processed thru MRF)

MRF O & M Cost (excluding tip fee credits)=
\$556,337/21,200 tons= \$26.24/ton



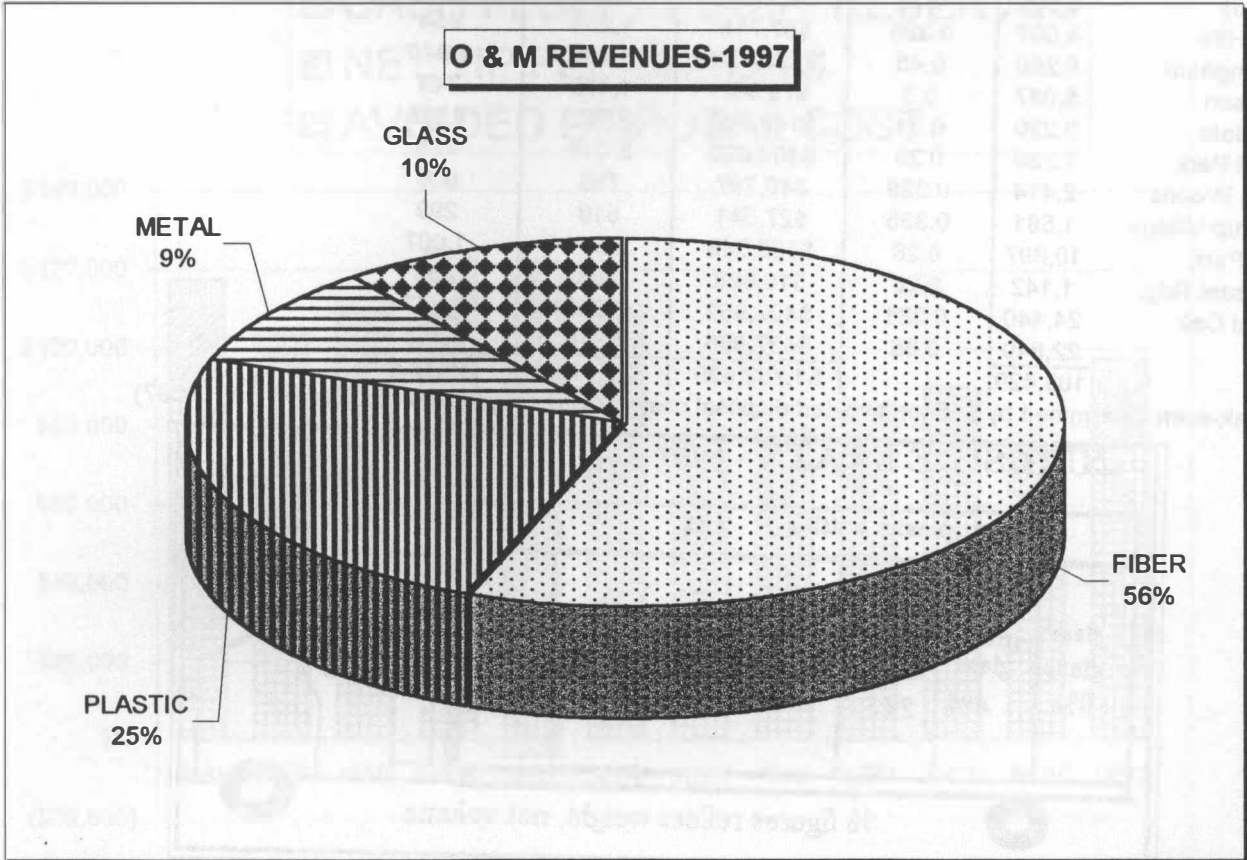
REVENUES

	FIBER	PLASTIC	METAL	GLASS	TIP FEES	TOTAL \$
JAN	\$35,492	\$20,543	\$7,901	\$7,473	\$0	\$71,409
FEB	\$31,443	\$18,550	\$7,749	\$5,627	\$0	\$63,369
MARCH	\$32,039	\$17,446	\$8,835	\$7,837	\$0	\$66,157
APRIL	\$32,435	\$22,437	\$5,906	\$7,606	\$0	\$68,384
MAY	\$37,086	\$14,991	\$4,752	\$7,715	\$0	\$64,544
JUNE	\$33,482	\$19,168	\$5,536	\$5,407	\$0	\$63,593
JULY	\$29,157	\$17,701	\$4,918	\$8,649	\$0	\$60,425
AUG	\$36,135	\$14,300	\$3,872	\$7,075	\$0	\$61,382
SEPT	\$46,808	\$16,374	\$6,018	\$6,391	\$0	\$75,591
OCT	\$43,739	\$14,791	\$3,420	\$6,156	\$0	\$68,106
NOV	\$37,722	\$14,374	\$5,531	\$7,190	\$0	\$64,817
DEC	\$53,238	\$7,661	\$7,009	\$6,994	\$0	\$74,902
	\$448,776	\$198,336	\$71,447	\$84,120	\$0	\$802,679

\$/21,200 tons:	\$21.17	\$9.36	\$3.37	\$3.97	\$0.00	\$37.86
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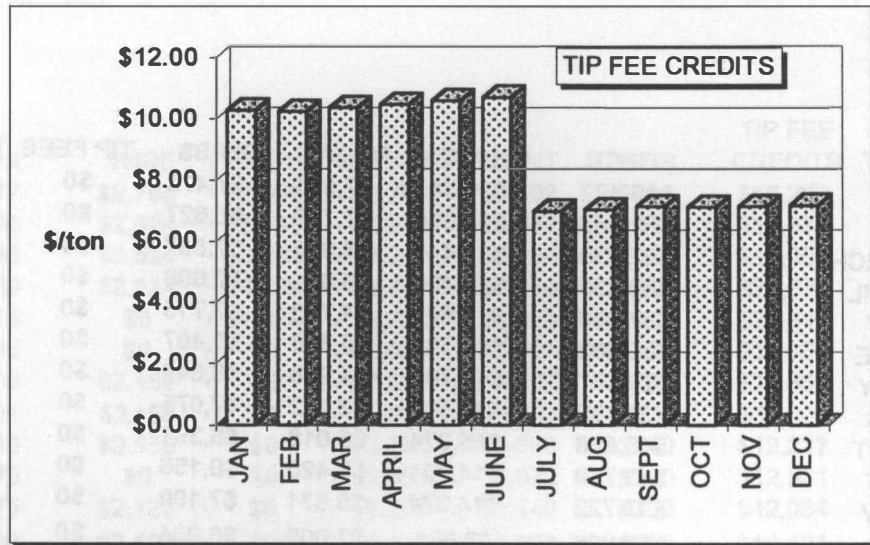
(defines value of individual revenue categories per ton processed thru MRF)

MRF Revenue Summary (excluding tip fees)=
 $\$802,679 / 21,200 \text{ tons} = \$37.86/\text{ton}$



TIP FEE CREDIT (\$/ton)

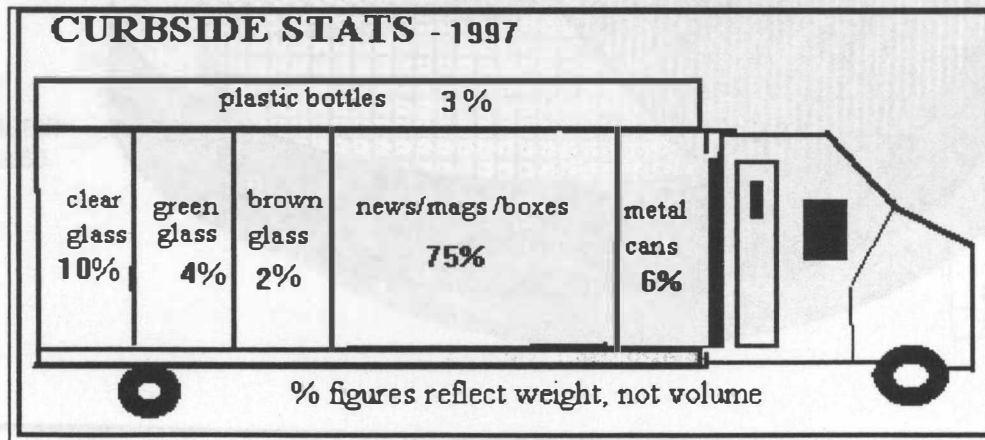
JAN	\$10.27
FEB	\$10.22
MAR	\$10.35
APRIL	\$10.45
MAY	\$10.59
JUNE	\$10.70
JULY	\$6.98
AUG	\$7.03
SEPT	\$7.14
OCT	\$7.11
NOV	\$7.13
DEC	\$7.17
Avg.	\$8.76



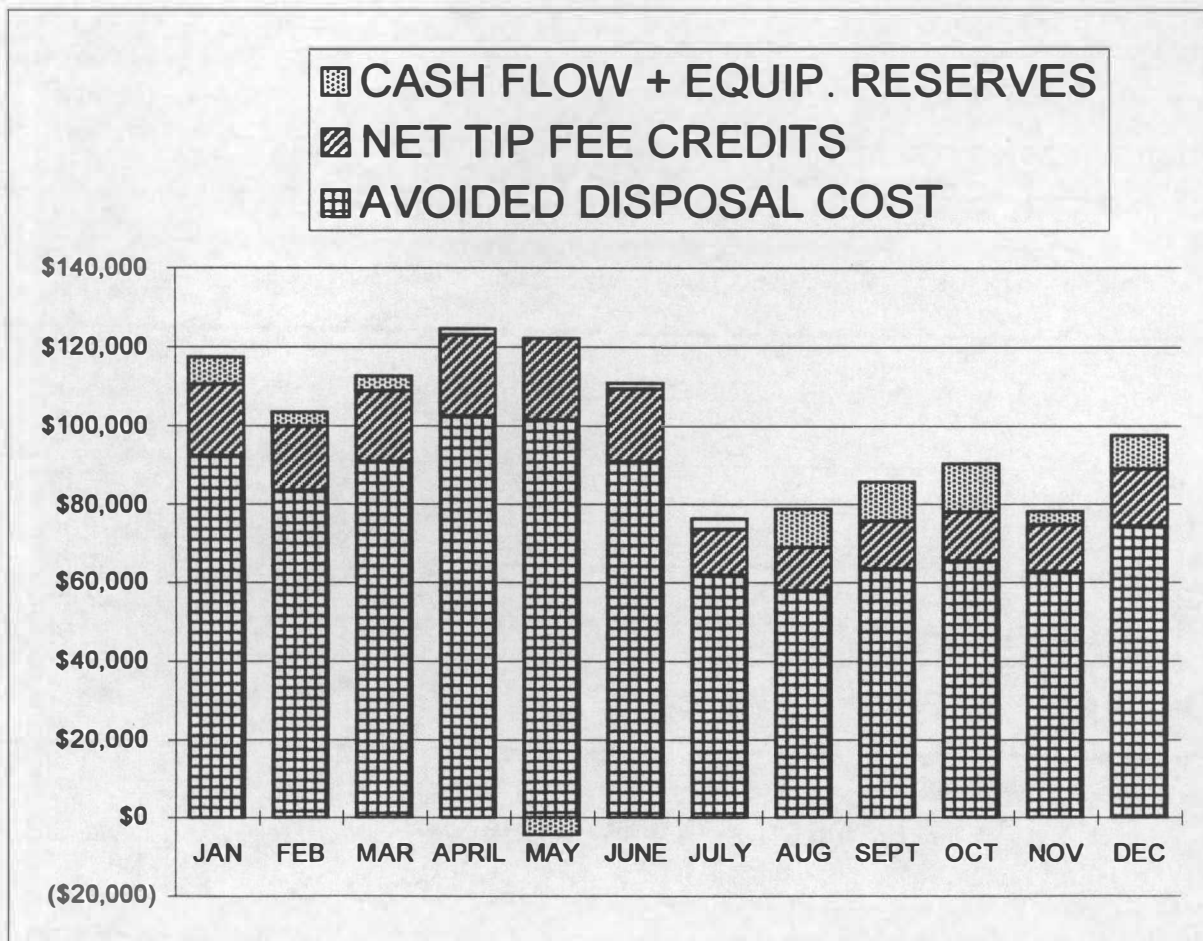
SOCRRA MEMBERS RECYCLABLES COLLECTION COSTS

	Units Served	weekly cost (\$/unit)	total/year (weekly x 52)	Break-even tons/year*	ACTUAL TONS (FY96/97)
Berkley	6,505	0.32	\$108,243	2,005	1,107
Bev. Hills	4,007	0.325	\$67,718	1,254	954
Birmingham	8,266	0.45	\$193,424	3,582	1,945
Clawson	5,087	0.3	\$79,357	1,470	743
Ferndale	9,220	0.31	\$148,626	2,752	1,268
Hazel Park	7,230	0.29	\$109,028	2,019	625
Hunt. Woods	2,414	0.325	\$40,797	755	608
Lathrup Village	1,581	0.335	\$27,541	510	299
Oak Park	10,697	0.28	\$155,748	2,884	1,007
Pleasant Rdg.	1,142	0.28	\$16,628	308	255
Royal Oak	24,440	0.321	\$407,952	7,555	4,247
Troy	22,840	0.36	\$427,565	7,918	5,125
Total	103,429		\$1,782,629	33,012	18,183

*break-even determined by \$45/ton avoided disposal cost + \$9/ton recyclables credit (averages for '97)



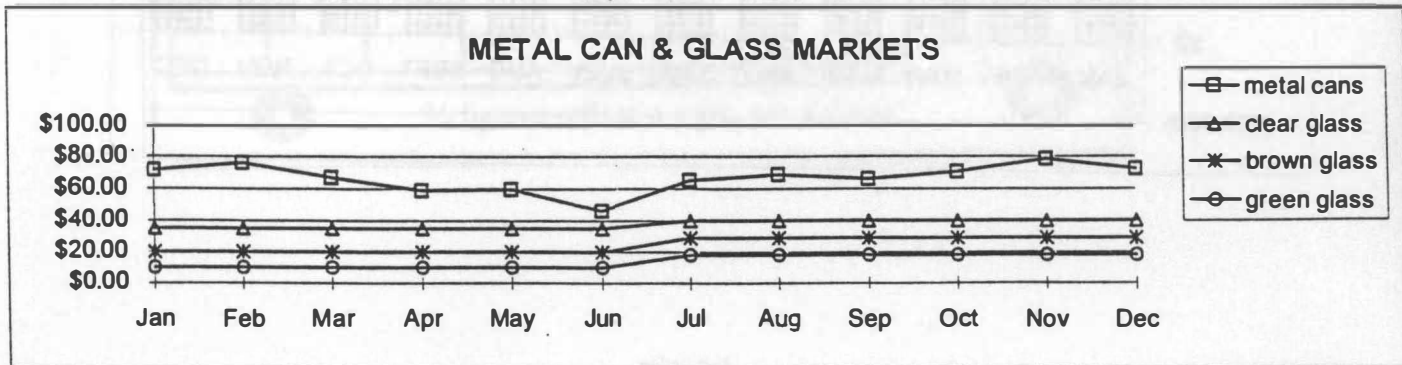
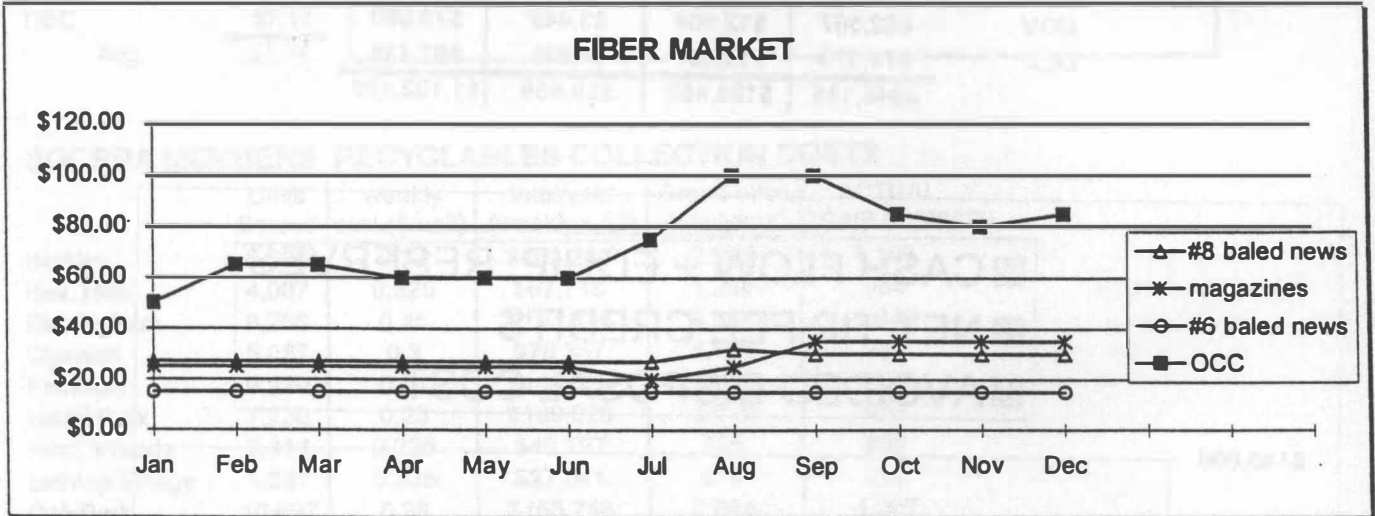
	AVOIDED DISPOSAL COST	NET TIP FEE CREDITS	CASH FLOW + EQUIP. RESERVES	TOTAL
JAN	\$92,248	\$18,225	\$6,826	\$117,299
FEB	\$83,356	\$16,375	\$3,688	\$103,419
MAR	\$90,688	\$18,050	\$3,833	\$112,571
APRIL	\$102,336	\$20,575	\$1,691	\$124,602
MAY	\$101,400	\$20,645	(\$4,516)	\$117,529
JUNE	\$90,688	\$18,660	\$1,331	\$110,679
JULY	\$61,827	\$11,665	\$2,808	\$76,300
AUG	\$57,905	\$11,004	\$9,834	\$78,743
SEPT	\$63,418	\$12,237	\$10,003	\$85,658
OCT	\$65,342	\$12,561	\$12,267	\$90,170
NOV	\$62,567	\$12,064	\$3,449	\$78,080
DEC	\$74,370	\$14,421	\$8,645	\$97,436
	\$946,145	\$186,482	\$59,859	\$1,192,486



SOCRRA'S MARKET PRICES FOR RECYCLABLES-1997

(\$ per ton)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
#8 baled news	\$27.00	\$27.00	\$27.00	\$27.00	\$27.00	\$27.00	\$27.00	\$32.00	\$30.00	\$30.00	\$30.00	\$30.00
magazines	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$20.00	\$25.00	\$35.00	\$35.00	\$35.00	\$35.00
#6 baled news	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00
OCC	\$50.00	\$65.00	\$65.00	\$60.00	\$60.00	\$60.00	\$60.00	\$75.00	\$100.00	\$100.00	\$85.00	\$85.00
HDPE (dairy)	\$380.00	\$400.00	\$400.00	\$400.00	\$400.00	\$420.00	\$400.00	\$400.00	\$380.00	\$360.00	\$340.00	\$320.00
HDPE (light)	\$240.00	\$240.00	\$240.00	\$260.00	\$280.00	\$300.00	\$300.00	\$280.00	\$280.00	\$240.00	\$220.00	\$200.00
HDPE (dark)	\$140.00	\$140.00	\$140.00	\$160.00	\$180.00	\$260.00	\$240.00	\$240.00	\$240.00	\$200.00	\$180.00	\$160.00
PETE	\$20.00	\$60.00	\$80.00	\$80.00	\$100.00	\$100.00	\$100.00	\$110.00	\$110.00	\$130.00	\$150.00	\$170.00
metal cans	\$71.43	\$75.89	\$66.96	\$58.93	\$59.82	\$46.29	\$65.18	\$68.75	\$66.07	\$70.54	\$78.57	\$72.32
clear glass	\$35.00	\$35.00	\$35.00	\$35.00	\$35.00	\$35.00	\$40.10	\$40.10	\$40.10	\$40.10	\$40.10	\$40.10
brown glass	\$20.00	\$20.00	\$20.00	\$20.00	\$20.00	\$20.00	\$29.00	\$29.00	\$29.00	\$29.00	\$29.00	\$29.00
green glass	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00



SOCRRA

MATERIAL RECOVERY FACILITY

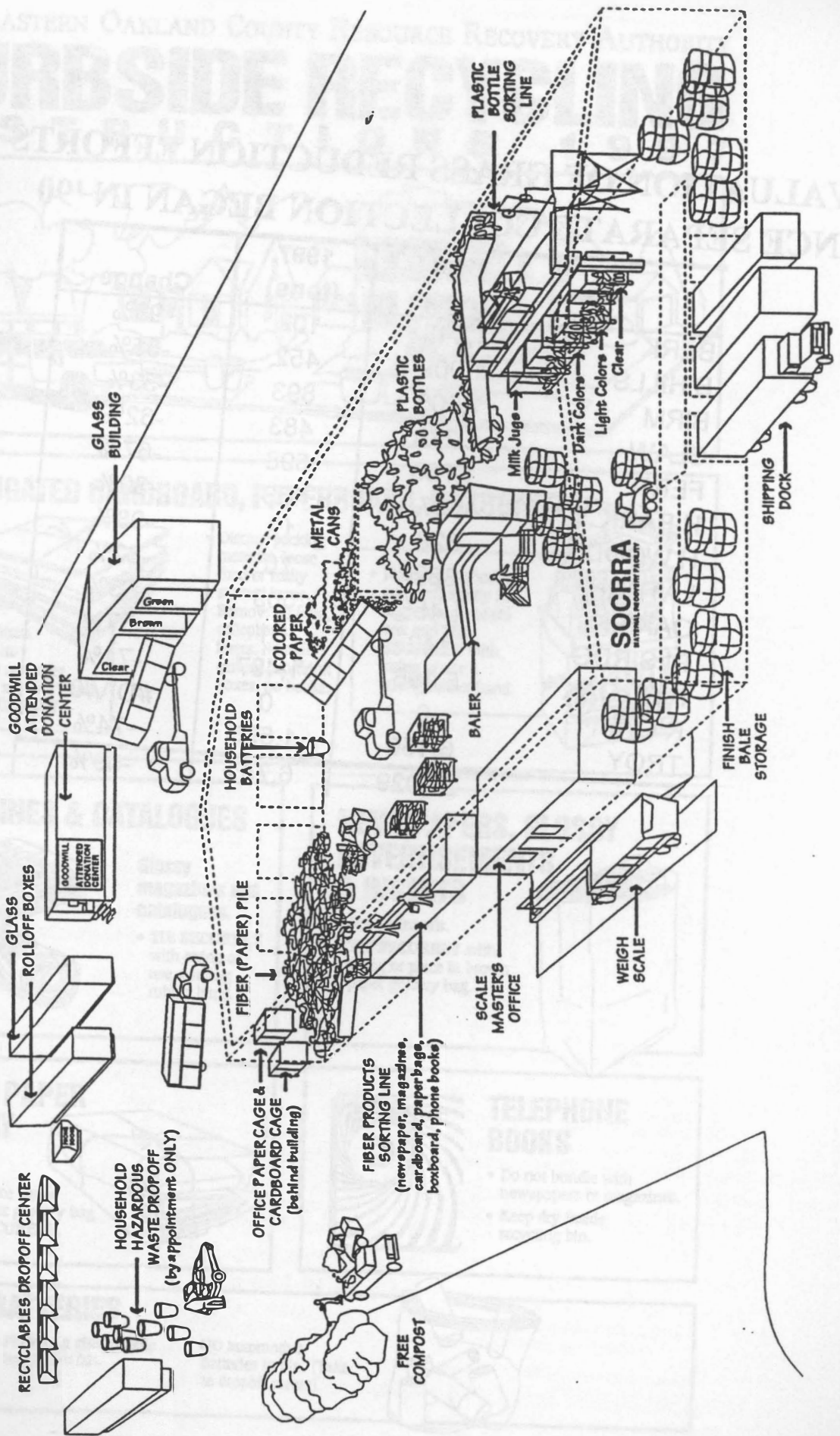
 *Recycle Today...for Tomorrow*

995 COOLIDGE
(Between 14 & 15 Mile Roads)

GROUP TOURS AVAILABLE

Monday—Friday: 9:00 am—3:00 pm

Call: 810-288-5150



COOLIDGE ROAD

**EVALUATION OF GRASS REDUCTION EFFORTS
SINCE SEPARATE COLLECTION BEGAN IN '90**

	1990 (tons)	1997 (tons)	Change
BERK	1,448	102	-93%
B HILLS	1,009	452	-55%
BIRM	1,906	893	-53%
CLAW	1,270	483	-62%
FERN	1,786	598	-67%
H PARK	657	463	-30%
H WOODS	628	12	-98%
LATHRP	382	70	-82%
OAK PK	1,455	505	-65%
PLS RDG	142	61	-57%
RYL OAK	5,196	1,497	-71%
R O T	0	0	#DIV/0!
TROY	6,150	1,595	-74%
	22,029	6,731	-69%

CURBSIDE RECYCLING INSTRUCTIONS 1997



CORRUGATED CARDBOARD, PAPERBOARD, BOXBOARD



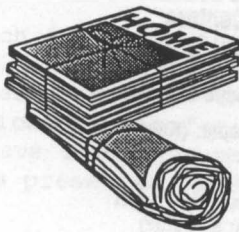
- Fold, flatten or cut into bundles no larger than 2' x 2' x 3', and **TIE SECURELY**.

- Discard packing material, loose food or badly stained items. Remove all food, cellophane, liners. No milk cartons, no drink boxes, no books.

- Flatten paperboard and stuff tightly in biggest paperboard box and **TIE SECURELY** with string or use a strong rubber band.



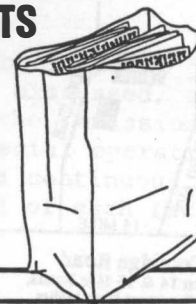
MAGAZINES & CATALOGUES



- Glossy magazines and catalogues.
- **TIE SECURELY** with string or use a strong rubber band.

NEWSPAPERS, GLOSSY ADVERTISEMENTS & INSERTS

- Newsprint ads.
- **TIE SECURELY** with string or place in brown paper grocery bag.



BROWN PAPER GROCERY BAGS

- Fold and place inside another paper grocery bag and **TIE SECURELY**.



TELEPHONE BOOKS

- Do not bundle with newspapers or magazines.
- Keep dry inside recycling bin.

BATTERIES

- Place in a clear plastic bag inside bin.
- **NO** automotive batteries in bin. (Take to dropoff center).



PLASTIC

Jugs & Bottles

- Clean.
- No caps.
- Narrow-neck bottles marked 1 or 2 on bottom ONLY.



GLASS

Bottles & Jars

- Clear, brown, green and blue only.
- Clean.
- Remove metal lids and place securely in a metal can.



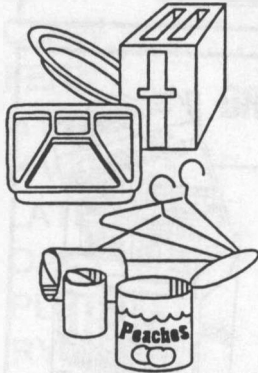
METAL

Cans, pie tins, metal lids, aluminum trays, small metal items, metal clothes hangers, pots & pans, toasters, faucets, silverware, pipe, and other small metal items

- Must fit in recycling bin.
- Place loose metal lids inside cans and bend so lids don't fall out.

Paint & Aerosol Cans

- Must be empty.
- Recycle metal lids. No plastic lids.
- Aerosols – do not puncture or remove ends.



FREE SOCRRA RECYCLING DROPOFF CENTERS

15 MILE		
MONROE AVE.	MRF DROPOFF CENTER	COOLIDGE
		CROOKS
		14 MILE

995 Coolidge Road
between 14 & 15 Mile Roads,
across the street from Meijer.

HOURS:
Monday thru Friday: 8 a.m. — 4 p.m.
Saturday 8 a.m. — Noon

13 MILE	RED OAKS GOLF COURSE	
STEPHENSON HIGHWAY	JOHN R.	DROPOFF CENTER
		DEQUINDRE
		SENIOR CITIZENS CENTER
	12 MILE	

29470 John R.
north of 12 Mile Road

HOURS:
Monday thru Friday: 8 a.m. — 6 p.m.
Saturday: Closed

Materials accepted at both Dropoff Centers

All curbside items listed PLUS:

- Automotive batteries
- Office paper. (Keep each kind separate).
- White paper
- Computer bar paper (green and blue)
- Colored paper.
- Clothing & textiles for Goodwill

Paints, garden chemicals, automotive products, oils, household cleaners, solvents, insulin syringes, fluorescent light bulbs, and other hazardous materials from homes accepted.

By Appointment Only!

Call: 810-288-5153

ONLY for residents of: Berkley, Beverly Hills, Birmingham, Clawson, Ferndale, Hazel Park, Huntington Woods, Lathrup Village, Madison Heights, Oak Park, Pleasant Ridge, Royal Oak, Royal Oak Township and Troy.

QUESTIONS? Telephone your local Public Works Office or SOCRRA (288-5150).