Beverage Containers

Summary of the Stewardship Initiative for Minnesota and Wisconsin

Minnesota Pollution Control Agency

July 2009

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Introduction

In August 2008, the Minnesota Pollution Control Agency (MPCA), in collaboration with the Wisconsin Department of Natural Resources (WIDNR), began to pursue a voluntary product stewardship agreement with the beverage industry to fulfill the objectives of the *2007 Solid Waste Policy Report* (policy report, www.pca.state.mn.us/2007policyreport), which recommended a goal to recycle 80% of beverage containers by January 1, 2012. For these discussions, MPCA collaborated with WIDNR based on similarities between their respective recycling programs.

This report represents MPCA's summary of the discussions that took place. This report will also serve as background information for Minnesota's stakeholder process on integrated solid waste management (www.pca.state.mn.us/waste/swstakeholder.html).

Background

In the 2007 Solid Waste Policy Report (published February 2008), the MPCA committed to monitor progress toward the 80% goal for beverage containers by 2012 by collecting data from recycling and disposal facilities as well as a waste generation study. If progress is not satisfactory toward meeting the 80% goal, the MPCA will recommend stronger action be taken, and consider these options:

- A producer responsibility program for the collection and recycling of beverage containers. Such a program would place the financial and programmatic responsibility on beverage producers to attain the 80% recycling rate.
- A traditional container deposit program.
- A disposal ban on beverage containers that bears in mind the need for enforceability and fairness.

The policy report offered no analysis on the benefits or drawbacks of container deposits.

Process for stakeholder initiative

The MPCA and the WIDNR convened four stakeholder meetings between September 2008 and January 2009 to offer stakeholders an opportunity to identify and develop potential strategies to increase the recycling of beverage containers. Stakeholders invited to participate in the initiative included: beverage manufacturers, retailers, local government, and others with an interest in beverage container recycling. This collaboration was designed to develop a voluntary, but formal, shared responsibility approach that could be agreed upon. Resources from the stakeholder process were hosted on the MPCA web site: www.pca.state.mn.us/oea/stewardship/containers.cfm. The complete list of invited stakeholders is attached as Appendix A.

After the four large-group meetings were completed, four smaller working groups were organized around "generation" sectors to further formalize a plan to achieve higher recycling rates. These subgroups met in February 2009 with the charge to develop strategies that can move toward attaining the 80% recycling goal as well as identify their individual commitments to certain tasks. The subgroups were organized around four areas: residential curbside, multi-family, commercial/retail, and specialty (schools, parks, and events).

August 19, 2008 (Bloomington, Minn.)

At the first stakeholder meeting, there were 34 attendees, representing the Minnesota Beverage Association (MBA), Anheuser Busch, waste haulers, Wisconsin DNR, MPCA, Minnesota counties, and other organizations. This meeting set the framework for the discussions by providing brief updates about the recycling systems in Minnesota and Wisconsin, a review of the *2007 Solid Waste Policy Report*, and discussion of current initiatives such as RecycleBank (www.recyclebank.com), Message in a Bottle (www.recycleminnesota.org/htm/programs.htm), and Recycle More Minnesota (www.recyclemoreminnesota.org).

The MPCA provided a presentation on the economics of recycling to demonstrate that recycled material may provide more stable prices than raw materials. The afternoon was structured to begin a discussion about opportunities for stakeholder collaboration, but the discussion became centered on data. Certain parties were reluctant to accept the 80% collection goal due to the lack of agreed upon data to work from. To move the discussion forward, a data subgroup was formed to develop a methodology for measuring success.

October 3, 2008 (Madison, Wis.)

The meeting began with a recap of the first meeting with the most significant reminder being that the group agreed that there is a need to increase recycling in Minnesota and Wisconsin. The data subgroup reported on their work, which was focusing on collecting sources of data that would provide information regarding consumption, disposal, and recycling. Calculating an accurate recycling rate for beverage containers was determined to be difficult as consumption data may not be available based on current recordkeeping practices within parts of the beverage industry. Disposal and recycling data sources do not typically track beverage containers specifically, but the material type instead. The Minnesota Beverage Association offered to collect data from its members and share the information with the group to improve consumption data. As of the date of this report, MPCA has not received this data.

This update allowed the data discussion to move forward. The remainder of the meeting was devoted to brainstorming opportunities or gaps in the current system. The large stakeholder group split into three groups for this exercise: collection, processing/markets, and finance. The three subgroups were brought back together to report on their results and to allow people to comment on the groups that they did not participate in.

November 14, 2008 (Bloomington, Minn.)

The stakeholders were given an opportunity to discuss their progress regarding initiatives that are currently underway, including Message in a Bottle and multi-family efforts in western Wisconsin.

The data subgroup presented the data sources that have been identified and proposed a measurement tactic to the group. The subgroup suggested that individual initiatives should be measured at a project level, but to the extent possible we should also continue to track overall recycling and disposal data to ensure that the individual initiatives are making progress toward the statewide goal to increase the collection of beverage containers. The data subgroup wanted to ensure that the measurement is not just the number of bins provided, but goes to the collection of data regarding tons recycled and tons disposed of.

MPCA staff did an analysis about where beverage container waste is generated and presented that work to the stakeholders. The idea was to help focus discussions and focus efforts on those sectors that represent more opportunity to collect material. This presentation was accepted by the stakeholder group. The afternoon was structured toward developing the most effective strategies relative to the sectors that generate the most waste.

January 23, 2009 (Eau Claire, Wis.)

Between the third and fourth meetings, several press releases (see Appendix B) were issued from national trade associations regarding recycling goals for glass, plastic, and aluminum. MPCA staff invited members of those organizations to participate in the meeting to discuss their strategies for achieving those goals.

MPCA staff further refined the sectors into four main sectors: residential curbside, residential multi-family, commercial/retail, and specialty, which includes schools, parks and recreation, and events. The strategies were grouped into these sectors and presented to the group.

Following the presentation, facilitated discussion began to identify roles and responsibilities of the parties in attendance. Four sub-groups were formed to develop the most feasible strategies for each sector and identify those activities with strong commitments. See page 13 for a summary of recommended strategies. Finally, the MPCA submitted a measurement proposal to the stakeholder group that will be discussed in more detail in the data section of this report (page 11). As a result of these meetings, emphasis was placed on data development, measurement strategies, and developing strategies to improve the recycling rate in Wisconsin and Minnesota.

Data

Much of the stakeholder discussion focused on discrepancies among the data sets that include recycling and sales. Initial questions arose when data indicated that Minnesota recycles more beverage containers than the beverage association's data indicates were sold in Minnesota. This discrepancy led to the formation of a data team to develop the best plan for creating a baseline and annual measures to track progress. The available data in Wisconsin and Minnesota varies, so data presented in this report focuses on Minnesota.

The data team identified 9 sources of data: the Governor's Select Committee on Recycling and Environment (SCORE), material recovery facilities (MRF), the Container Recycling Institute (CRI), waste composition studies, curbside recycling rate studies (capture rate), city recycling data, waste-to-energy facility waste sorts, sales data from the beverage association, and liquor tax data. Each of these data sources has strengths and weaknesses, and none of them by themselves adequately track beverage container recovery in Minnesota.

The report first summarizes the data from the various sources and then describes each data source in more detail later in the section.

Summary of data

As a result of data collected for this process, Minnesota now has better information regarding beverage container sales, collection, and disposal. It has also led the state to improve its reporting requirements for material recovery facilities.

- The recycling data sources identify a few key trends. Minnesota's overall recycling rate for all materials has not changed significantly, between 40% and 45%, over the past 10 years. Collection of beverage containers has decreased since 1992 in Minnesota and nationally. Minneapolis curbside recycling rates of metal cans, plastic, and glass are 29%, 31%, and 51%, respectively, and Minneapolis has one of the most mature curbside programs in the state. In addition, the Minneapolis overall recycling rate of 44% for all materials falls within the 40% to 45% range of the statewide recycling rate from the past 10 years.
- **The post-recycling disposal data identify several things as well.** In 2007, Minnesota disposed of 3.56 million tons of municipal solid waste. Of that total, aluminum cans constitute about 0.6 to 0.7% of the post-recycling waste stream and all beverage containers are approximately 4% of the post-recycling waste stream. This equates to approximately 21,360 tons of aluminum cans and 142,000 tons of beverage containers disposed of each year.
- **Sales data indicate** that between 30,000 and 34,000 tons of aluminum cans, 35,000 to 50,000 tons of PET bottles, and 153,000 to 169,300 tons of glass bottles were sold in Minnesota in 2007. Liquor tax data indicate that beer sales have remained constant for the past five years, and liquor and wine sales have risen slightly.

Recycling rates can be calculated in several different ways with these three types of data. For the purposes of this report, MPCA calculated the Minnesota recycling rate using two methods: 1) using recycling and disposal data which together account for generation; 2) calculating sales and disposal data to determine the recycling rate. Data sets vary slightly, depending on the definition of material categories, so recycling rates vary as well. When all of the recycling rates are averaged together, the result is a 35% recycling rate for food and beverage containers (Table 1).

Table 1. Recycling rate comparison for containers					
Recycling and disposal					
	1992 waste composition and SCORE	1999 waste composition and SCORE	2006 EPA recycling rate (national)	2006 Minneapolis Capture Rate Study	Average rate by material
Aluminum	49%	45%	45%	29%	42%
Glass	54%	40%	31%	51%	44%
PET	11%	3%	31%	31%	19%
All containers	38%	29%	36%	37%	35%
Sales and disposal					
	CRI sales with 1999 waste comp	MBA sales with 1999 waste comp	CRI sales with Olmsted waste comp	MBA sales with Olmsted waste comp	Average rate by material
Aluminum	27%	17%	37%	29%	28%
Glass	58%	53%	53%	48%	53%
PET	57%	39%	19%	Disposal > sales	38%
All containers	47%	36%	36%	39%	40%
Overall average (all data sources)					
Aluminum	33%				
Glass	47%				
PET	24%				
All containers	35%				

Sales data

Minnesota Beverage Association survey

The Minnesota Beverage Association (MBA) funded a survey of its members to compile data on the bottles and cans sold in the state. Data were provided to Northbridge Environmental Management Consultants under confidentiality agreements. Survey results were extrapolated to account for private label brands based on Nielsen and IRI market share data for major retail channels provided to Northbridge by MBA members.

Carbonated beverage containers (beer and carbonated soft drinks or CSDs) accounted for 2.7 billion units sold in Minnesota in 2007—71% cans, 16% glass, and 13% PET (Table 2). Carbonated beverage containers of all types accounted for 136,000 tons of material produced annually. The sales data indicate that carbonated soft drink consumption in Minnesota is close to the national average on a per gallon basis. The package mix, however, shows a preference for cans, with about 80% of containers sold versus 71% nationally.

Rather than receive specific sales data for noncarbonated beverages such as bottled water, MBA estimated the tons of containers sold. As discussed in the stakeholder group meetings, sales data for beverage containers are not tracked by state because obtaining this information on a state level is very difficult.

Table 2. Beverage containers in Minnesota (MBA/Northbridge sales estimates 2007/2008)					
	Carbonated containers	**% of total sold**	**Carbonated (tons)***	**Non-carbonated (tons)****	**Total beverage (tons)**
Aluminum	1,928,000,000	71%	28,400	1,700	30,100
PET	356,000,000	13%	12,000	23,300	35,300
Glass	438,000,000	16%	95,100	57,900	153,000
Total	2,722,000,000	100%	135,500	82,900	218,400

** Minnesota survey of CSDs; state-specific beer data from Beer Institute. Sources: Northbridge survey of Minnesota Beverage Association members 4Q 2007 through 3Q 2008; Beer Institute data from Brewers Almanac for 2007.*
*** Aluminum NCB share from CMI and Beverage Marketing 2007 totals; glass from Beverage Marketing data on other glass beverage containers, Northbridge data on container weights, EPA on total containers; PET from CCI data on PET usage in 2007.*

Container Recycling Institute: Beverage market data analysis

The Container Recycling Institute's (CRI) Beverage Market Data Analysis is a study of beverage sales and container recycling (Figure 1). Sales data include all carbonated and non-carbonated beverages excluding dairy, champagne, and wine coolers. The sales data is based on national sales figures and is calculated into per capita sales for each state.

The CRI data indicate that approximately 3.4 billion carbonated beverage containers were sold in Minnesota in 2006. Of those containers, 2.2 billion were aluminum cans, 630 million were PET bottles, and 548 million were glass (Table 2). The aluminum figure is similar to the Beverage Association estimate, but there are large discrepancies in the PET and glass estimates. CRI estimates that 4.5 billion containers were sold in Minnesota when non-carbonated beverages are also included.

Figure 1. National sales, recycling, and disposal trends

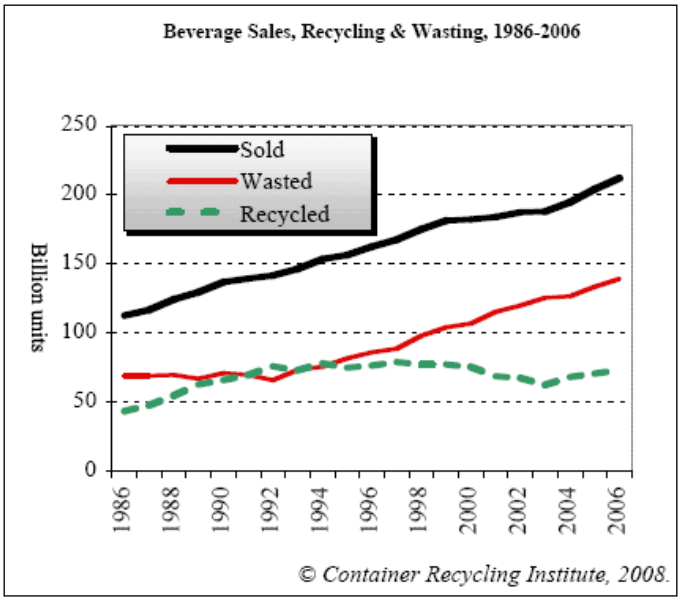


Table 3: Beverages sold in Minnesota in 2006

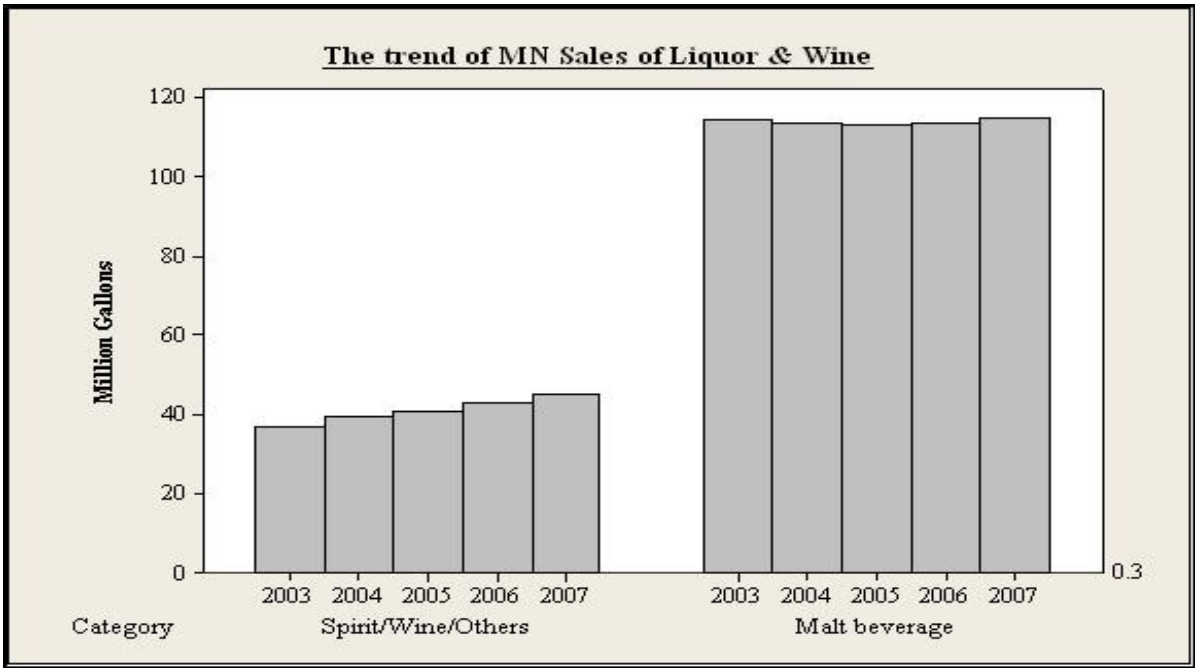
Beverage type	Aluminum cans	Steel cans	Plastic bottles			Glass	Subtotal, traditional materials
			PET	HDPE	Total plastic		
Carbonated (million units)	2,211	0	630	0	630	548	3,389
Carbonated (tons)	32,314	0	21,388	0	21,388	136,947	190,649
Non-carbonated (million units)	109	1	819	57	876	74	1,060
Non-carbonated (tons)	1,599	88	28,336	3,548	31,884	32,352	65,000
Total (million units)	2,320	1	1,464	57	1,521	677	4,520
Total (tons)	33,913	88	49,725	3,548	53,272	169,299	255,649

Summarized notes and sources: CRI, 2007. Source (for citation purposes): "2006 Beverage Market Data Analysis," The Container Recycling Institute, 2008.
Sales derived from: "Beverage Packaging in the U.S., 2007 Edition," Beverage Marketing Corp., December 2007; with additional data from BMC and the Beer Institute.
Data exclude milk; wine coolers, champagne and sparkling wine; frozen fruit concentrates.
2006 was the first year PET beer bottles were counted by the Beer Institute. About 222 million were sold in the U.S., or one third of 1% of all packaged beer sold.
U.S. Census Bureau, 2006 estimated Minnesota population: 5,167,101
Complete notes, sources, and assumptions are available on request from the Container Recycling Institute.

Liquor tax data

The Minnesota Department of Revenue data is broken down in units by fluid ounces. This data is collected annually as part of the state's process of collecting liquor tax revenues. This is another source of data to cross check the accuracy of the various data sources that provide sales volume by broken down by unit. The data can be used to check the accuracy of the Container Recycling Institute's data (Figure 2).

Figure 2. Sales trend for liquor and beer in Minnesota



Minnesota Department of Revenue, Special Taxes Division 2007

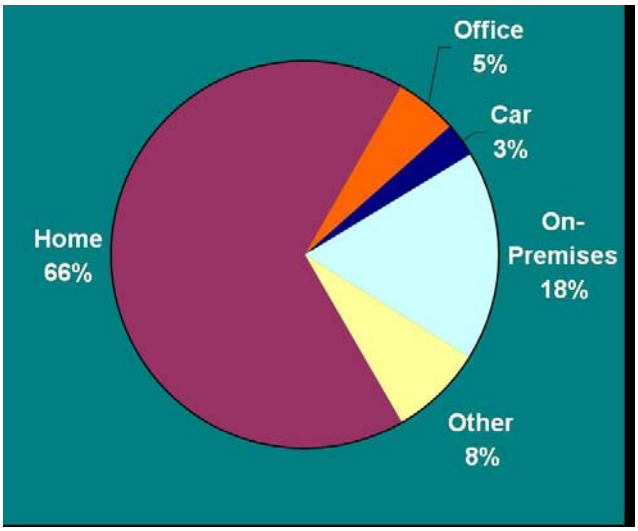
Generation data

Beverage Packaging Environmental Council report

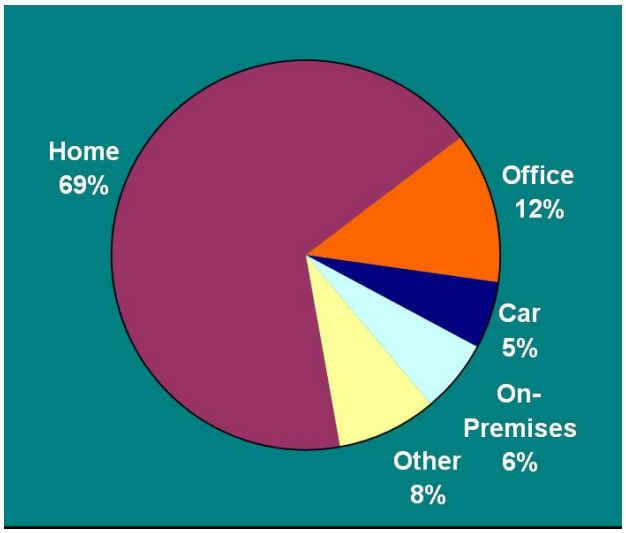
The Beverage Packaging Environmental Council (BPEC) gave a presentation to the National Recycling Coalition on August 29, 2005. This presentation detailed the point of consumption for beverage containers. The charts below show the breakdown for generation of beverage containers. The majority of beverage containers are generated at home (Figure 3).

Figure 3: Generation location of beverage containers

Percent of containers by weight (tons)



Number of containers generated

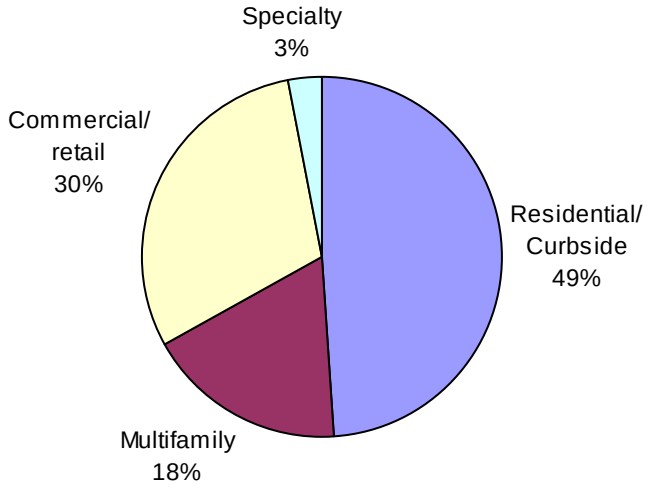


BPEC, NRC Presentation 2005

Minnesota Generation by Sector

Extrapolating the national data from the BPEC for Minnesota specific business sectors, beverage containers are generated in these major sectors.

Figure 4: Minnesota generation by sector



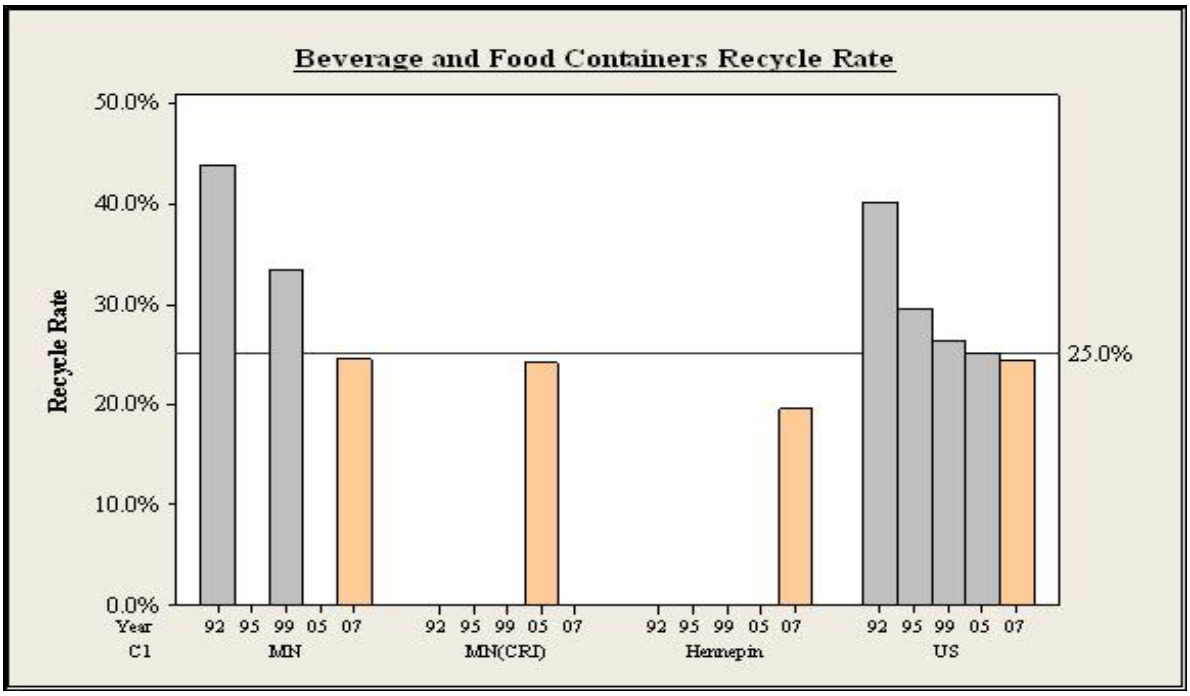
Source: MPCA 2009

Recycling data

Minnesota beverage/food containers recycling rate trend

Using recycling data, the estimated recycling rate in Minnesota for beverage and food containers is between 19.5 and 25% (2007). The national recycling rate has decreased since 1992 due mainly to the increase of soft drink sales; whereas tonnages of material recycled have not increased at a rate similar rate to sales (Figure 5)

Figure 5: Container recycling rate trends



MPCA, 2009 – Derived from 1992 & 1999 Waste Comp Study, CRI 2006, HERC 2007, and EPA National Recycling Data

Minnesota data: 24.5% – estimate applied annual average growth rate =-3.81% between 1992 and 1999 of Minnesota containers recycle rate.*

CRI data: 24.2% – CRI (Container Recycling Institute) estimate is based on non-deposit states average beverage containers recycling rate and regional factor in 2005. CRI glass recycle rate, 1.5% underestimates Minnesota glass recycling rate. When U.S. glass recycling rate 25.2% in 2005 is applied, four-material recycling rate is 24.2%

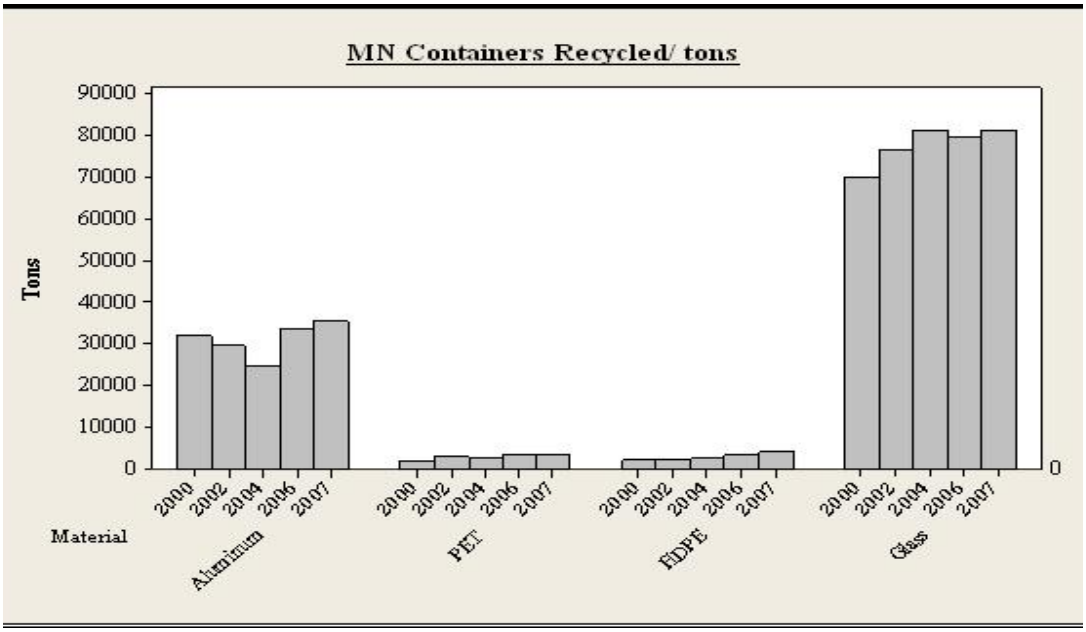
*Hennepin data: 19.5%*** – When nationwide plastic recycling rate (19.1%) is applied instead of PET recycling rate (0.6%), HDPE recycling rate:0.1% (It seems that Hennepin waste composition study 2007 has measuring and sampling errors in estimating plastic recycling rate.)*

County recycling data

In 1989, Minnesota adopted legislation to improve statewide recycling efforts. This act, also known as SCORE (Governor's Select Committee on Recycling and the Environment), created a stable source of funding for county recycling programs, household hazardous waste facilities, and waste reduction programs [Minn. Stat. § 115A.55 Subd.3. (b)(2)]. Counties are required to report their annual recycling numbers to the state so that the effectiveness of their programs can be tracked. SCORE data provide us with trends for the major material types that are recycled in the state and provides details by county (Figure 6).

Since the SCORE legislation was enacted in 1989, Minnesota's statewide recycling rate has climbed by over 25 percentage points; however, Minnesota has shown little improvement since 1999 (Figure 7).

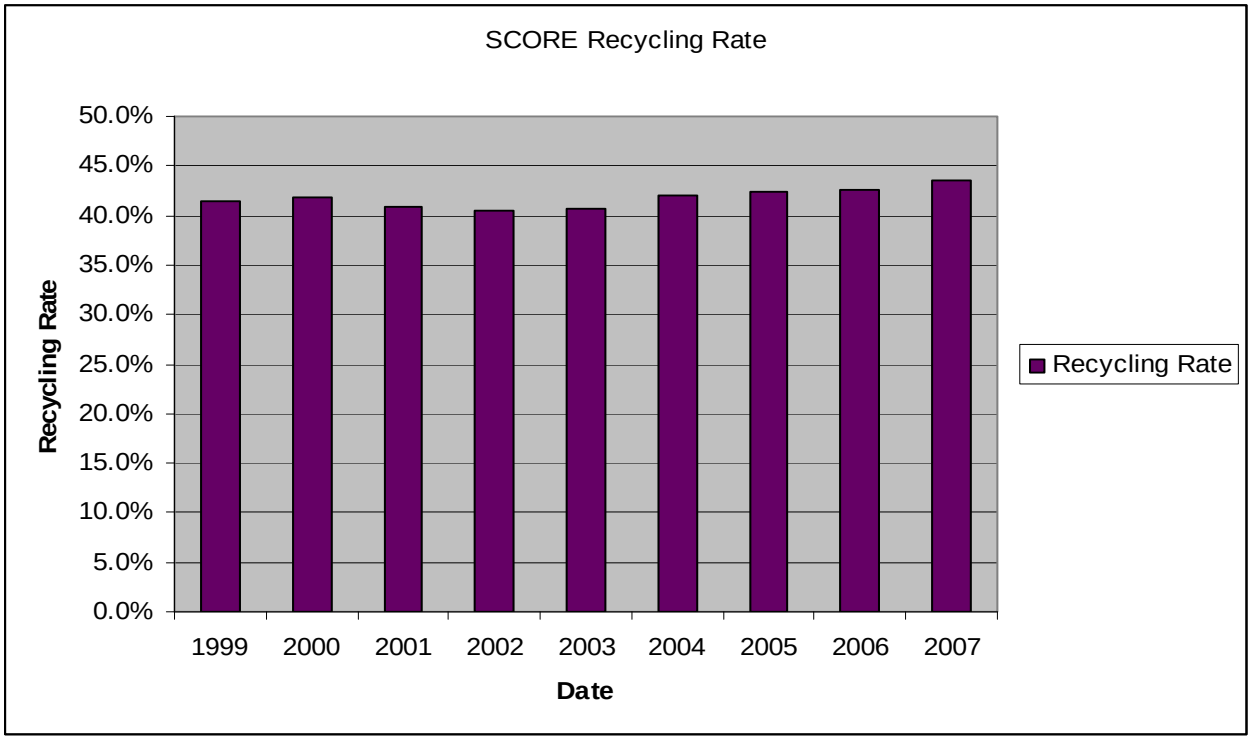
Figure 6: Minnesota container recycling tonnages



The amount of tons recycled as reported in SCORE under the various material categories has a flat to slight increase since the year 2000.

MPCA, SCORE 2007 – adjusted to reflect containers only.

Figure 7: Minnesota's recycling rate



MPCA, SCORE 2007

Curbside recycling rate data (capture rate)

The city of Minneapolis conducted a capture rate study in 2006 to analyze the effectiveness of the city's solid waste and recycling program. The study looked at waste generated at selected residences before and after an education campaign. Minneapolis selected 739 random addresses that included 870 dwelling units to participate in this study. The random sample included addresses from 69 of the 81 neighborhoods in the city. Carts and bins were collected and immediately replaced with new carts and explanations were provided to the residents that were selected. These bins and carts were then sorted to accurately assess the recycling rate of available materials coming from those homes. A full copy of the study is located in Appendix C.

The study did two sorts from the same addresses, one in May and the other in October. The city accurately gathered recycling rates for all major categories of recycling. The rates were calculated based on the total number of cans from recycling and from solid waste.

- The recycling rates for the major recyclables: metal cans (29.32%); plastic bottles (30.59%); glass (51.45%).
- The total recycling rate for recyclable materials was 44.47% (Table 4).

Table 4: Recycling rates for recovered materials in Minneapolis

	Recycling lbs. from waste cart	Recycling lbs. from recycling bin	Total recyclable material lbs.	Recycling recovery rate
Mail boxboard mix	6,104.8	1,363.8	7,468.6	18.26%
Metal cans	**1,373.3**	**569.7**	**1,943.0**	**29.32%**
Glass	**4,351.3**	**4,611.4**	**8,962.7**	**51.45%**
Plastic	**2,029.6**	**894.5**	**2,924.1**	**30.59%**
Newspaper	3,674.7	8,436.8	12,111.5	69.66%
Magazines	2,058.8	1,672.4	3,731.2	44.82%
Phone books	537.3	498.7	1,036.0	48.14%
Cardboard	2,494.7	1,017.2	3,511.9	28.96%
Batteries	85.7	22.8	108.5	21.02%
Electronics	1,130.1	1.9	1,132.0	NA
Total	23,840.1	19,089.3	42,929.3	44.47%

City of Minneapolis, Capture Rate Study 2006.

Figure 8: Recovery rates by material in Minneapolis

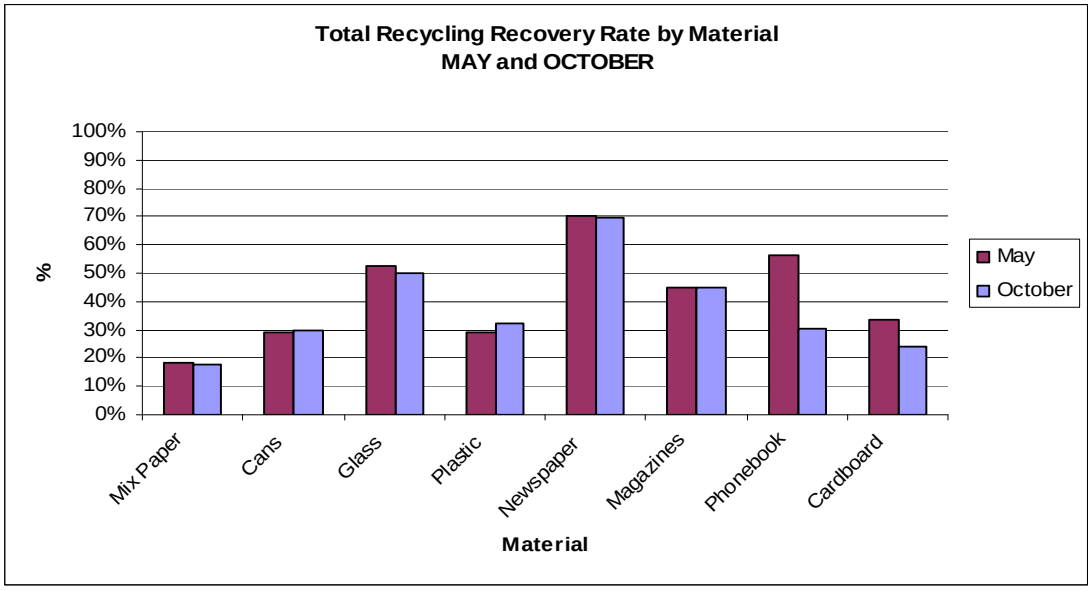
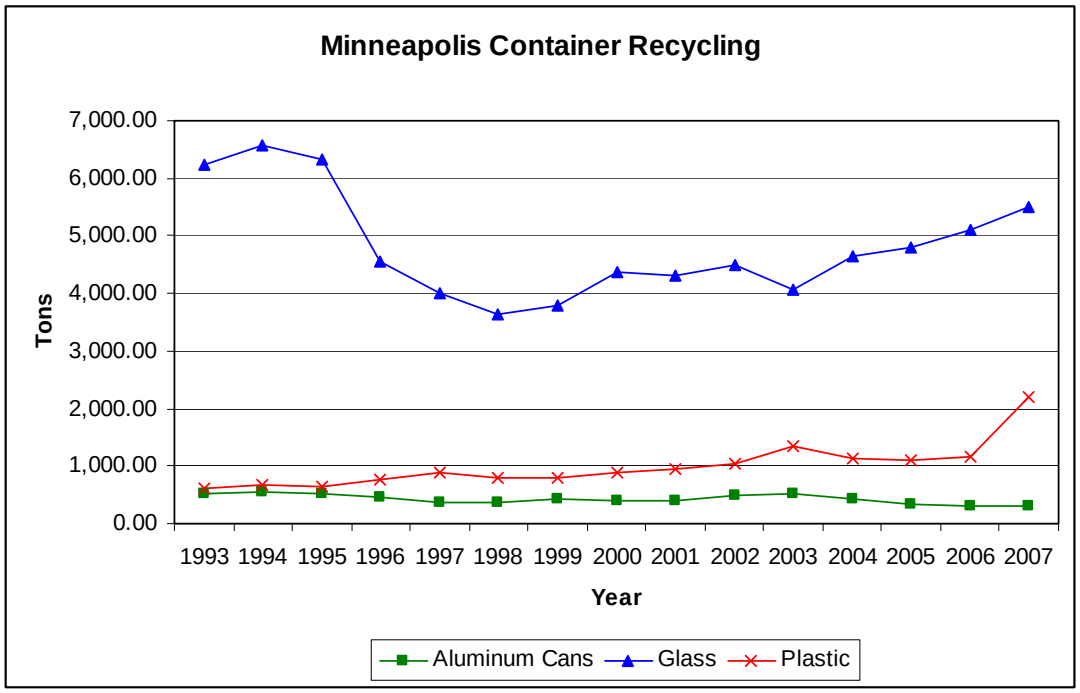


Figure 8 shows almost no difference between the baseline measurements (May) and measurements when the education effort ended in October.

City of Minneapolis, Capture Rate Study 2006

Figure 9: Trends in recycling tonnages in Minneapolis



The city of Minneapolis has recycling tonnages dating back to 1993. The data indicate that Minneapolis recycled less glass by 800 tons, less aluminum by 130 tons, and more plastic by 1,400 tons since 1993.

City of Minneapolis website 1993-2007

Disposal data

Waste composition study

R.W. Beck completed a statewide waste composition study for Minnesota for 1999. The study estimated the composition of Minnesota's municipal solid waste (MSW). The waste composition study identified 59 material categories, including aluminum beverage containers, PET bottles and jars, natural-colored HDPE, and clear, green, and brown glass. This study provides the most detailed post-recycling waste composition and provides an assessment of beverage containers remaining in the system.

The statewide composition results, by weight, indicate that aluminum is 1.2% of the post-recycling waste stream. Of that 1.2%, nearly 60% is aluminum cans (0.7% of the total waste stream). PET makes up 0.7% of the post-recycling waste stream. PET bottles constitute 0.6% of the overall waste stream. Natural-colored HDPE is 0.3% of the post-recycling waste stream and glass (not including other glass) is 2.0% of the post-recycling waste stream. This means that 3.6% of the post-diversion waste stream was beverage containers in 1999 (Table 5).

Table 5: 1999 waste composition study (statewide aggregate composition)

Material categories	% composition
PET bottles/jars – clear	0.4%
PET bottles/jars – colored	0.2%
HDPE bottles – natural	0.3%
Aluminum beverage containers	0.7%
Clear containers	1.3%
Green containers	0.3%
Brown containers	0.4%
Total	3.6%

Hennepin Energy Resource Company

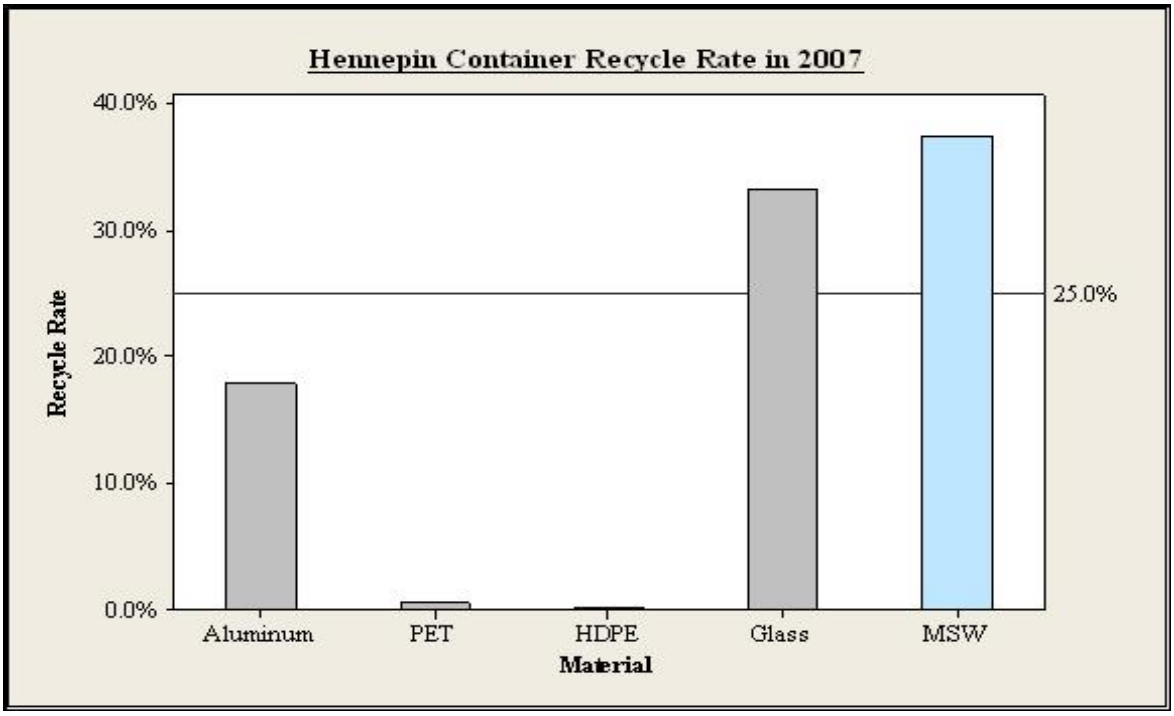
In September 2007, the Hennepin Energy Resource Company (HERC) completed a waste composition study of the material that was arriving at its facility in Minneapolis. The company is required by Minnesota Rule (Minn. R. 7011.1270, Item A) to conduct a waste composition at its facility every five years. The study analyzed 60 samples of municipal sold waste (MSW).

The study indicates what material is still in the waste stream after composting and recycling efforts. Of the remaining waste by weight, 4.2% is HDPE, 3.2% is PET, 1.7% is aluminum, and 4.4% is glass. (Table 6) Recycling rates were calculated based on these residual percentages (Figure 9). This means that of the 19,874 pounds of MSW, 13.5% or 2,683 pounds were easy-to-recycle HDPE, PET, aluminum, and glass. It is also noteworthy that the percentage of aluminum in the disposal stream increased by 0.5% over the 2000 statewide waste composition study. The HERC data do not split out beverage containers in the same manner as the 2000 solid waste composition study.

Table 6: 2007 HERC study

Material categories	% composition
Plastic – HDPE	4.2%
Plastic – PET	3.2%
Non-ferrous metals – aluminum	1.7%
Glass	4.4%
Total	13.5%

Figure 10: Recycling rates based on HERC data



MPCA analysis 2009 based on data from HERC 2007.

Olmsted County waste-to-energy facility

In January 2004, the Olmsted County Waste-to-Energy Facility completed a waste composition study of the material that was arriving at its facility. The facility is also required by Minnesota Rule (Minn. R. 7011.1270, Item A) to conduct a waste composition at its facility every five years.

The study indicates what material is still in the waste stream after composting and recycling efforts. Of the remaining waste by weight, 0.68% is HDPE with necks, 1.13% is PET with necks, 0.6% is aluminum cans, and 2.24% is food and beverage glass. (Table 7).

The glass and aluminum can percentages are very similar to the 1999 statewide composition study.

Table 7: 2004 Olmsted study

Material categories	% composition
Plastic – HDPE w/neck	0.68%
Plastic – PET w/neck	1.13%
Aluminum Cans	0.6%
Food and Beverage Glass	2.24%
Total	4.65%

Measurement strategy

The MPCA developed a measurement strategy for tracking the progress of beverage container recycling. Different measurement strategies were adopted for the four sectors, and three measures are designed to continue tracking progress at the statewide level. Specific roles and responsibilities for this strategy are addressed in the Outcomes of strategy groups section. Beverage container generation by sector was calculated using the Beverage Packaging Environment Council (BPEC) study and was combined with sector generation data from the state of California and employment data from the state of Minnesota. Residential generation was divided into curbside and multi-family using state of Minnesota estimates that show approximately 26.5% of the population live in multi-family buildings. The California data were used to estimate the relative percentage generated by commercial, schools, parks, events, and retail.

Residential curbside

Residential curbside collection generates approximately 49% of the beverage containers in the waste stream. The measurement strategy for this sector includes:

- Participation rate studies should be used to determine how many people are participating in the curbside program. (Allied Waste estimates that there is about a 75% participation rate among residents that have access to curbside programs).
- Track the number of communities that provide organics collections. A Twin Cities hauler has numbers that show recycling rates improve by 20% when they begin organics collection in residential areas. It is probably due to residents being more conscientious when separating their materials for the curb.
- Monitor tons collected from curbside recycling programs with the MRF data and do capture rate studies when possible to continue to monitor recycling rates within targeted communities.
- Keep track of incentives offered to customers such as RecycleBank. How many people have access to incentive programs through their haulers?

Commercial/retail

The commercial/retail sector generates approximately 30% of the beverage containers in the waste stream. The measurement strategy for this sector includes:

- Opportunity to recycle. Are there bins available and are they paired with garbage cans?
- Does the business have a contract for recycling services? Are there more businesses signing up?
- Does the organization have organics collection? This is an indicator of higher recycling rates.
- Does the retailer offer point-of-sale education to customers about recycling?

Residential multi-family

Residential multi-family generates approximately 18% of the beverage containers in the waste stream. The measurement strategy for this sector includes:

- Opportunity to recycle. Are bins available to residents?
- Participation rate. What percentage of multi-family buildings have contracts for recycling services? What percentage of multi-family buildings offers organics collection?
- Measure tons of recyclables collected and do capture rate studies when possible.

Specialty

The specialty sectors generate approximately 3% of the beverage containers in the waste stream. The measurement strategies for these sectors include:

- Opportunity to recycle. Are bins available?
- Participation rate. What percentage of schools and events have recycling contracts? What percentage offer organics collection?

- Recycling rate and tons of recyclables collected for the project.
- Do they offer point-of-sale education to consumers?

Statewide measures

Some measures are needed to continue tracking our statewide recycling rate and to track the overall success of this initiative. The state will continue to track recycling and disposal rates, and will try to do capture rate studies where feasible.

Waste-to-energy facilities

Hennepin Energy Resource Company and Olmsted County waste composition studies are summarized in the data discussion. There are also waste-to-energy facilities in Perham, Polk County, and Pope/Douglas County that can provide the MPCA with similar data. The data from these facilities are expected within the next calendar year. These facilities will also be valuable sources of disposal data in the future.

Material recycling facilities (MRF)

According to Minnesota Administrative Rule 7035.2845, Subpart 4a, recycling facilities must submit an annual report that identifies the name of the facility, the year the report covers, the types and weights of materials received, and the distribution of those materials. The reporting has been inconsistent and of varying quality up until now. There are currently no data that can be used for this analysis. The need for beverage container data highlights the need for quality MRF data and has prompted a change in the reporting form to require more specific information about weights of materials and material types. The MPCA has recently initiated improved reporting for this rule to ensure that annual recycling data are available when needed. It is anticipated that this will become a good source of data for tracking progress in the near future.

Outcomes of strategy groups

Members of the four strategy subgroups committed to activities that were suggested as part of the larger stakeholder process. Subgroup commitments are described below and the group's original detailed comments are included in Appendix D.

These strategies were not prioritized as part of this process. The subgroups also did not assess these strategies based on feasibility, cost, or impact with regard to the amount of material collected. Consensus was not attempted as part of these groups, instead it was a brainstorming process. It is also important to note that some stakeholder groups were not represented during this part of the process. Those stakeholders that participated and supported each individual strategy are listed.

Residential curbside (49% of generation)

Financial incentives to encourage people to recycle may be one of the best methods of getting higher participation. There are many programs such as RecycleBank (a residential-based incentive program that rewards curbside recycling), rebates, carbon trading, and pay as you throw. They all have their unique attributes, but all encourage recycling through cost incentives or disincentives for throwing recyclables into the garbage. Waste haulers and government typically institute these programs. All parties involved in the conference call support this, but several suggested that they don't have the resources needed to make it happen.

Subgroup participants that indicated support:

- Minnesota Beverage Association
- Hilltopper Refuse and Recycling, a Wisconsin-based waste hauling company
- Local government entities

Same day collection. Recycling is more convenient for residents if recycling and garbage are collected on the same day. Counties and cities are able to pass ordinances that section the cities to have collection on dedicated days.

Subgroup participants that indicated support:

- Association of Recycling Managers (ARM)
- Solid Waste Administrators

Organics collection to improve curbside sorting. Randy's Sanitation has numbers that show improved recycling tonnages in communities where they have begun curbside organics programs. Advancing curbside organics from pilot to common practice would likely impact the recycling rate.

Subgroup participants that indicated support:

- Minnesota Beverage Association
- Association of Recycling Managers
- Solid Waste Administrators
- Hilltopper Refuse and Recycling

Improve communication between government and haulers. The Association of Recycling Managers and MPCA are willing to have workshops, forums, and stakeholder processes as needed to improve communication with the waste hauling community. Proper coordination could lead to more instances of same-day collection.

Multi-family (18% of generation)

Promote "Best Practices for Multi-Family Recycling" (Eureka Recycling, June 2004). ARM is willing to promote this study to their members in order to promote the best management practices.

Some of the practices included in the study the following:

- Carts need to be in a consistent, convenient place for residents. Communicate with residents about where the carts are located. Residents need to know a recycling system exists in their building.
- Carts must be at least as convenient to residents as the trash containers.
- Recycling carts must be easily distinguished from trash containers.
- The first line of defense against contamination is in the setup. Trash begets trash. Haulers and cart monitors need to regularly service carts to keep them clear of unwanted material.
- Carts must have easy-to-understand labels and signage. This sets the stage for effective basic education and more complex outreach messages.

Change building codes to require recycling space. ARM is willing to promote this to their members. The Minnesota Beverage Association is willing to support statewide legislation to change the building codes.

Dedicated container collection. The Recycling Association of Minnesota (RAM) and the Minnesota Beverage Association (MBA) will continue to provide bins through the Message in a Bottle program. Currently this program is only being tested at metro area convenience stores, but funding is the only barrier preventing further implementation at other venues and businesses.

Extend opportunity to recycle to multi-family and non-residential. Under Minnesota law, counties must ensure that residents have the opportunity to recycle (Minn. Stat. § 115A.552). Expanding this language to include commercial entities would lead to an increase in recycled materials. Wisconsin law already requires recycling by multi-family and non-residential entities.

Subgroup participants that indicated support:

- Minnesota Beverage Association
- Hilltopper Refuse and Recycling
- Association of Recycling Managers
- St. Croix County, Wisconsin

Commercial/retail (30% of generation)

Dedicated container collection. The Recycling Association of Minnesota (RAM) and the MBA will continue to provide bins through the Message in a Bottle program. Currently this program is only being tested at Twin Cities area convenience stores, but funding is the only barrier preventing further implementation at other venues and businesses.

Financial incentives. Developing financial incentives for businesses to recycle could be very effective. Developing cost structures that encourage recycling, providing tax breaks for organizations that recycle, and providing rebates would lead to changes in behavior.

Subgroup participants that indicated support:

- Recycling Association of Minnesota
- Minnesota Beverage Association
- Minnesota Pollution Control Agency
- Wisconsin DNR

Subgroup participants that support tax breaks for businesses that recycle:

- Minnesota Beverage Association

SCORE funding for businesses. Counties could pass some of the recycling funding they receive from the state to businesses within their jurisdictions to help those businesses develop strong recycling programs. The counties do not support this idea, so it is unlikely to occur.

Organics collection could have the same benefits at commercial sites that it has with curbside. There are no studies that verify this.

Subgroup participants that indicated support:

- Association of Recycling Managers
- Minnesota Beverage Association

Specialty (schools, parks, and events) (3% of generation)

Schools

Enforce the public entity law. Minnesota's public entity law states that public entities such as public schools "shall aggressively pursue procurement practices that encourage solid waste reduction, recycling, and development of markets for recyclable materials and compost and shall, whenever practical, procure products containing recycled materials" (Minn. Stat. § 115A.48). Schools that aggressively pursue recycling and the development of markets for those materials, likely have higher recycling rates than those that don't.

Subgroup participants that indicated support:

- Solid Waste Administrators
- Minnesota Pollution Control Agency

Incorporate 3Rs into school curriculum. Incorporating reuse, reuse, and recycle into school curriculum educates the next generation about the importance of this issue. This is likely to be most effective if incorporated into science, math, social science, English, and other programs rather than having it stand alone. This allows the teacher to instill two ideas at the same time without taking valuable time away from the core curriculum.

Subgroup participants that indicated support:

- Recycling Association of Minnesota
- Minnesota Beverage Association
- Minnesota Pollution Control Agency
- Wisconsin Department of Natural Resources
- Solid Waste Administrators

Solid waste plan. Schools should develop detailed solid waste plans.

Subgroup participants that indicated support:

- Minnesota Pollution Control Agency
- Solid Waste Administrators
- Minnesota Beverage Association

School success report cards. Provide a grading system using average criteria to show schools that are not doing the basic recycling requirements that they are not complying with easy to implement ideas. Showcasing average recycling instead of the highest performers makes recycling appear to be more feasible.

Subgroup participants that indicated support:

- Minnesota Beverage Association
- Wisconsin Department of Natural Resources

Events

Dedicated container collection. RAM and the MBA will continue to provide bins through the Message in a Bottle program. Currently this program is only being tested at metro area convenience stores, but funding is the only barrier preventing further implementation at other venues and businesses. The MBA wants to work with the local units of government to store bins that they provide for events to be made available for multiple events throughout the year.

Subgroup participants that indicated support:

- Association of Recycling Managers
- Minnesota Beverage Association
- Recycling Association of Minnesota
- St. Croix County, Wisconsin
- Wisconsin Department of Natural Resources

Enlist volunteers for recycling stations. Volunteers at recycling stations greatly reduce the amount of contamination in recycling bins from events.

Subgroup participants that indicated support:

- Minnesota Pollution Control Agency
- Wisconsin Department of Natural Resources
- Minnesota Beverage Association
- Association of Recycling Managers

Require recycling plans in event permits. In Wisconsin, St. Croix County and the city of Madison are among a number of local governments that currently require their events to have recycling plans prior to getting a permit. The event should show its plan and its contract with the waste hauler to demonstrate its recycling effort.

Subgroup participants that indicated support:

- St. Croix County, Wisconsin
- City of Madison, Wisconsin
- Association of Recycling Managers

Fundraising (Cans for Kids). Having school groups or troops collect cans at events for the money can improve recycling rates at events. It also provides good public marketing for the group raising money.

Subgroup participants that support:

- Association of Recycling Mangers

Parks

Adopt a park. Similar in concept to the Adopt a Highway Program, the Adopt a Park Program encourages people to adopt a park to clean up litter.

Subgroup participants that support:

- Association of Recycling Managers
- Minnesota Beverage Association
- Recycling Association of Minnesota
- Wisconsin Department of Natural Resources

Provide infrastructure. Parks need to provide container recycling bins and pair them with all garbage receptacles. Visitors to parks do not have an alternative to disposal if bins are not available. Collaboration needs to occur in this area due to the high cost of providing bins to parks.

Subgroup participants that support:

- Association of Recycling Managers
- Minnesota Beverage Association
- Recycling Association of Minnesota
- Minnesota Pollution Control Agency

Enforce the public entity law. Minnesota's public entity law (Minn. Stat. § 115A.48) states that public entities such as public schools "shall aggressively pursue procurement practices that encourage solid waste reduction, recycling, and development of markets for recyclable materials and compost and shall, whenever practical, procure products containing recycled materials". Parks are public property when owned by cities and by the state. They should be held to the same standard as the schools and public offices.

Subgroup participants that support:

- Minnesota Pollution Control Agency
- Wisconsin Department of Natural Resources

Multi-sector strategies

Disposal ban. This would require legislation to ban beverage containers from disposal at solid waste facilities and landfills. This is very difficult to enforce but would indirectly require businesses and commercial entities to provide recycling opportunities so that those containers do not end up in the waste stream. Wisconsin has a disposal ban with an exception if the community or responsible entity has an effective recycling program (i.e., a local recycling ordinance and collection system conforming to state standards; all communities in the state currently meet these standards).

Subgroup participants that support:

- Hilltopper Refuse and Recycling
- Association of Recycling Managers

Education for curbside recycling needs to occur in two main locations: point of sale and point of disposal. Everyone that participated in this group agreed to some type of educational campaign, ranging from social ethics to peer pressure. Everyone also talked about the need to pool resources to make all of our limited resources go further.

Subgroup participants that support:

- Minnesota Beverage Association
- Minnesota Pollution Control Agency
- Association of Recycling Mangers
- Hilltopper Refuse and Recycling

Measurement strategy. The cities, counties, MPCA, and the beverage association are all willing to measure the results of projects that they are implementing. MPCA is willing to continue to track progress at the state scale to ensure that the smaller projects are having a measurable difference at the state scale.

Wisconsin has contracted to conduct a statewide waste composition study later in 2009, and will use findings from this study as well as information reported by local communities as indicators of recycling performance.

If you sell a beverage container, you must provide a recycling container. (A requirement similar to newly enacted legislation in North Carolina.) Recycling containers should be available at any location where beverages are sold. It provides an excellent opportunity for point-of-sale education. Many places don't do this, so there is an opportunity to collect more containers in those areas. Cities or the state of Minnesota could pass a provision requiring this. Wisconsin requires this already, but local enforcement is inconsistent. Many stakeholders do not support this because they feel that recycling containers are better utilized at the point of consumption rather than the point of sale.

Subgroup participants that support:

- Association of Recycling Managers
- Wisconsin Department of Natural Resources

Resource management contracts are written with incentives to reduce waste and increase recycling. They have disincentives to decrease disposal. These incentives and disincentives are usually financial and they have proven to be effective. The resource management contracts should also have transparency in their pricing structure.

Subgroup participants that support:

- Minnesota Pollution Control Agency
- Association of Recycling Managers
- Solid Waste Administrators
- Minnesota Beverage Association

Recycling markets for beverage containers

In 2007, recycling programs in Minnesota collected approximately 2.6 million tons of recyclable materials (paper, metals, glass, plastic, food, problem materials, etc.), an increase of over 70,000 tons (2.8%) from the previous year. It is important to look at the capacity of the markets to handle the material generated by increased recycling. The current markets have the ability to absorb the additional material generated by increased recycling rates.

Local end markets

The local value-added recycling industry for beverage containers is made up of manufacturers who use post-consumer HDPE and glass. A phone survey to the HDPE plastic and glass markets indicates strong demand for the materials.

Aluminum

Minnesota currently bales and ships all aluminum that is collected for recycling.

According to the Aluminum Association, consumption by major markets in 2007 included building and construction, transportation, consumer, durables, electrical, machinery and equipment, containers and packaging. The transportation sector is the largest North American market for aluminum, accounting for 3.95 million tons. During 2007, the aluminum industry melted an estimated 790,000 tons of used beverage cans, accounting for 53.8% of beverage can shipments.

PET

Minnesota currently bales and ships all PET containers collected for recycling. MPCA's market development staff is currently working on one project to use PET in Minnesota.

NAPCOR (National Association for PET Container Resources) *Report on Post Consumer PET Container Recycling Activity* (2007) states that the market for the material includes carpet, strapping, bottles, and sheet.

NAPCOR stated at the end of 2006, there were 14 reclamation plants producing clean flake from post-consumer bottles or dirty flake in the United States, with a total capacity of 408,500 tons gross weight in. By the end of 2007, the same 14 plants were operating with an increased total capacity of 421,000 tons, the result of some minor de-bottlenecking. Three others operated sporadically and are not included in the above. Of the 421,000 tons capacity, about 66% was vertically integrated, producing material for internal company consumption. Five reclaimers have the ability to manufacture recycled PET suitable for direct contact in food and beverage bottles (FDA LNO RPET).

Coca-Cola opened the world's largest PET recycling plant in Spartanburg, South Carolina. The facility is a $60 million joint venture of Coca-Cola and the United Resource Recovery Corporation. The plant will have the capacity, when fully operational, to produce 50,000 tons of recycled PET plastic chips—enough to produce 2 billion 20-ounce bottles.

HDPE

Minnesota has one of the largest concentrations of plastic lumber/sheet manufacturers in the country: Master Mark Plastic (Albany), Bedford Technology (Worthington), Recycled Plastic, Inc. (Garfield), and Advanced Extrusion (Anoka). Minnesota also has several drain tile manufacturers, including Prinsco, Hancock, and Century.

The total annual capacity for HDPE end markets in Minnesota is approximately 30,000 to 35,000 tons.

Glass

Anchor Glass Container (Shakopee) is the major market for recycled glass in the state. Other markets are sand-blast media and Class 7 road aggregate. The majority of glass processed at MRFs in the metro comes out in the form of a mixed-glass stream (an estimated 53,000 tons annually) according to the *MPCA Regional Optical Sorter for Mixed Glass Feasibility Study* (May 2007). There is currently one optical sorter with a capacity of 10,000 tons per year. MPCA staff is working to locate a larger scale optical sorter project that will handle the additional generation.

Anchor Glass has the capacity to process 75,000 tons of glass annually.

Table 8: 2004 impact of Minnesota's recycling manufacturers: Jobs and dollars

Economic activity indicator associated with Minnesota's value-added recycling manufacturers	Based on reported employment	Based on total estimated employment
Direct jobs at the companies	6,499	9,003
Estimated indirect jobs Impacts on local suppliers statewide, unadjusted for displacement effects.	2,595	3,057
Estimated induced jobs Long-term effects on personal income and consumer spending, localized and statewide.	5,475	7,200
Total estimated jobs	14,870	19,260
Total estimated wages and salary disbursements The monetary remuneration of employees, including compensation of officers, commissions, tips, and bonus and receipts-in-kind that represent income to the recipient.	$560 million	$760 million
Total estimated tax revenue on direct jobs Business/personal state income taxes, sales tax, excise tax and miscellaneous taxes, real estate taxes and business taxes.	$46 million	$64 million
Total estimated value-added activity Contribution to Gross State Product analogous to GDP (gross domestic product), output excluding the intermediate inputs (primarily compensation and profit).	$1.09 billion	$1.29 billion
Total estimated gross economic activity Amount of production in total sales, includes intermediate goods purchased as well as value-added (compensation plus profit).	$2.35 billion	$2.98 billion

Source scenarios calculated using the Regional Economic Models, Inc. (REMI) Minnesota Forecasting and Simulation Model, December 2004, Minnesota Office of Environmental Assistance, Wayne Gjerde.

Economic impact

The value-added recycling manufacturing industry directly and indirectly supports approximately 20,000 jobs; paying an estimated $760 million in wages and adding nearly $3 billion to Minnesota's economy. By using recycled materials (materials that would otherwise be landfilled or incinerated), these businesses increase profits, develop new products, and reduce waste in Minnesota. (Table 8)

The largest segment of the value-added recycling industry is made up of manufacturers who use recycled paper, post-consumer paper, old corrugated cardboard (OCC) and newspaper as a raw material source. RockTenn (St. Paul), Liberty Paper (Becker), New Page (Duluth), and Pactiv (Moorhead) are major companies using this feedstock. Much of their raw material—recycled paper and OCC—comes from Minnesota curbside and business recycling programs.

China and Far East markets, 2009

China is gradually re-entering the market after acquisition of material for the Olympic Games shutdown. A variety of industries including those in the China market left the market temporarily as they utilized the high-priced feedstock purchased before the market dropped in October.

Reliance on China by some local recyclers

Some recyclers put a great deal of reliance on the China market due to increased upward pricing opportunity. This caused the local end users to bring in raw material from other sources because they were unable to source enough material locally. The evaporation of the China market for the recyclers has left them with little to no opportunity with the local market due to the long term supply contracts. The local market has indicated they would engage local recyclers if they are willing to sign long-term supply contracts, but they are concerned about losing raw material to China from local suppliers once the market recovers.

Outside economic indicators affecting markets

Many outside factors affect recycled material markets. The biggest is the 2008-2009 global economic recession, which has caused the price and demand for virgin materials to drop. Prices for recycled material closely track virgin material markets. There was a similar drop for recycled material in Minnesota in 1997, when prices for recycled materials were lower than the cost to recycle the original products. Since that time, Minnesota has added capacity in plastic processing, and the local glass plant has invested million of dollars to upgrade their furnaces.

- 2009 forecast for oil: $50 to $80/barrel, down from a high of $147/barrel
- 2009 forecast for natural gas: $6 to $9/mmt, down from $10 to $13/mmt
- Forecast for economic recovery: middle of 2009 to first half of 2010

Conclusion

Minnesota is currently recycling 35% of the beverage and food containers in the state. Wisconsin reports marginally higher numbers based on less firm data sources. In order to achieve the 80% beverage container recycling goal by 2012 identified in the MPCA *Solid Waste Policy Report*, the collection rate of these materials would need to more than double. Many of the strategies identified in this report would require legislative action and expanded financial input from local government, Minnesota and Wisconsin state governments, and the business community. Due to the complexity and cost of these strategies, along with the need for substantive stakeholder commitments, MPCA staff contends that the state is unlikely to achieve the 80% goal. Although the stakeholder meetings were informative, offered an opportunity for discussion, and demonstrated the interest in addressing the issue, a clear path with specific commitments has not been developed.

The Minnesota Pollution Control Agency received comments on the draft version of this report. These comments highlight the wide variety of stakeholder views. While agreement was reached on the need for increased recycling of beverage containers, consensus on an overall strategy was not achieved. The stakeholder comments are attached in Appendix E.

The MPCA will use the data that was provided as part of this initiative to inform future discussions about options to increase the recycling of beverage containers.

Appendix A: List of Attendees

Prefix	First Name	Last Name	Company
Mr.	Steve	Alexander	Association of Post-Consumer Plastics Recyclers
Mr.	Buzz	Anderson	Minnesota Retailers Association
Ms.	Joan	Archer	Minnesota Beverage Association
Mr.	Michael	Ayers	Allied Waste
Ms.	Suzanne	Bangert	WIDNR
Mr.	Russ	Barto	Anchor Glass
Mr.	David	Benke	MPCA
Ms.	Beth	Bier	State Senator Mark Miller
Mr.	Paul	Boykas	Pepsi
Mr.	Tim	Brownell	Eureka Recycling
Mr.	Steve	Campbell	Anheuser Busch
Mr.	David	Cera	MPCA
Ms.	Pam	Christenson	WI Petroleum Marketers & Convenience Store Assn.
Mr	Wess	Damro	Associated Recyclers of Wisconsin
Mr.	Dave	Dempsey	Minnesota Environmental Partnership
Ms.	Elise	Diedrich	Supervalu
Mr.	Kevin	Dietly	Northbridge Environmental
Mr.	Art	Dunn	MPCA
Mr.	Ron	Dyer	Nestle Waters
Mr.	Dean	Elstad	City of Minnetonka (ARM)
Mr.	Jeff	Fielkow	Strategic Materials
Mr.	Mark	Gamm	Solid Waste Administrators Association
Mr.	Steve	Gardner	Aluminum Association
Ms.	Kimberly	Gasow	Anchor Glass
Mr.	Steve	Giddings	MPCA
Mr.	Wayne	Gjerde	MPCA
Ms.	Jennifer	Havens	St. Croix County
Mr.	Garth	Hickle	MPCA
Mr.	Steve	Hogden	WCSWMA member from the Town of Caledonia
Ms.	Susan	Hubbard	Eureka Recycling
Mr.	Brett	Hullsey	Better Environmental Solutions
Mr.	John	Imes	Wisconsin Environmental Initiative
Mr.	Charles	Johnson	Aluminum Association
Ms.	Julie	Ketchum	Waste Management
Mr.	Bob	Krogman	MN Petroleum Marketers
Ms.	Rebecca	Kulas	Solid Waste Administrators Association
Mr.	Steve	LaBarge	Nestle Waters
Mr.	Chuck	Larscheid	WI County SW Managers Association
Ms.	Meredith	Leahy	Alcoa
Mr.	Paul	Lucas	Miller SAB
Mr.	Michael	Madigan	
Ms.	Kelly	McDowell	Wisconsin Beverage Association
Ms.	Betty	McLaughlin	The Container Recycling Institute
Mr.	Rick	Meyers	City of Milwaukee
Ms.	Cynthia	Moore	WIDNR
Ms.	Lynn	Morgan	Broydrick & Associates

Mr.	Kevin	Morris	Coca-Cola
Ms.	Anne	Morse	Winona County
Mr.	Dan	Oleary	Anheuser Busch
Mr.	Pat	Perry	Target
Ms.	Pennie	Pierce	Hilltopper Refuse and Recycling Service
Mr.	Tim	Pratt	Association of Recycling Managers
Mr.	Scott	Reed	Target for Pat Perry
Mr.	John	Reindl	WI Council on Recycling
Mr.	Keith	Reopelle	Clean Wisconsin
Mr.	Chuck	Riegle	TOMRA
Mr.	Peder	Sandhei	MPCA
Mr.	Michael	Schedler	NAPCOR
Mr.	Tim	Scherkenbach	MPCA
Mr.	Brandon	Scholz	Wisconsin Grocers Association
Ms.	Karin	Sieg	Associated Recyclers of Wisconsin
Ms.	Karin	Sieg	Wisconsin Be SMART Coalition
Ms.	Genise	Smith-Watkins	Pepsi
Mr.	Mark	Stoltman	Randy's Sanitation for J. Wollschlager
Ms.	Ellen	Telander	Recycling Association of Minnesota
Mr.	Milt	Thomas	MPCA
Mr.	Bryan	Ukena	Eureka Recycling
Mr.	Eric	Uram	Sierra Club - John Muir Chapter
Mr.	Joe	Van Rossum	UW-Extension Solid & Hazardous Waste Education Center
Mr.	Brian	Vickers	Glass Packaging Institute
Mr.	Scott	Vitters	Coca-Cola
Mr.	Todd	Watermolen	Veolia Environmental Services
Mr.	Mike	Wenholz	WIDNR
Mr.	Paul	Wiegner	WIDNR
Ms.	Leslie	Wilson	Carver County
Mr.	Greg	Wittbecker	Alcoa
Mr.	Brad	Wolbert	WIDNR
Mr.	Jim	Wollschlager	Randy's Sanitation
Ms.	Carla	Wright	WIDNR
Mr	Darryl	Young	Summit Foundation

News Release

COCA-COLA SETS GOAL TO RECYCLE OR REUSE 100 PERCENT OF ITS PLASTIC BOTTLES IN THE U.S.

Company Invests More Than $60 Million to Support Recycling
Investment Includes World's Largest Bottle-to-Bottle Recycling Plant

ATLANTA, September 5, 2007 - Coca-Cola today announced it is investing more than $60 million to build the world's largest plastic-bottle-to-bottle recycling plant and support recycling in the U.S. These investments are part of a comprehensive goal to recycle or reuse 100 percent of the Company's PET (polyethylene terephthalate) plastic bottles in the U.S.

"We have set an ambitious goal to recycle or reuse all the plastic bottles we use in the U.S. market," said Sandy Douglas, president Coca-Cola North America. "Our investments in recycling infrastructure, coupled with our work on sustainable package design, will help us reach this target."

World's Largest Bottle-to-Bottle Recycling Plant
The Coca-Cola Company and United Resource Recovery Corporation (URRC) will build the world's largest plastic bottle-to-bottle recycling plant in Spartanburg, S.C. The plant will produce approximately 100 million pounds of food-grade recycled PET (polyethylene terephthalate) plastic for reuse each year – the equivalent of producing nearly two billion 20-ounce Coca-Cola bottles.

"The long-term sustainability of our business depends on our ability to ensure the sustainability of our packaging," said Mr. Douglas. "This new recycling facility represents a significant milestone as we work to advance recycling in the U.S. and ensure a strong end-market for our PET packaging."

The new 30-acre Spartanburg plant will open in 2008 and will be fully operational in 2009. It is part of a continuing effort by Coca-Cola to support recycling in key markets. Coca-Cola also has invested in recycling facilities in Switzerland, Mexico, Austria and the Philippines.

Recycling plastic for reuse yields financial benefits, requires less energy than producing bottles with virgin materials, and reduces waste and greenhouse gases. Over the next ten years, the Spartanburg recycling plant is expected to eliminate the production of one million metric tons of carbon dioxide emissions – the equivalent of removing 215,000 cars from the road.

Coca-Cola has been focused on PET recycling and reuse since introducing the first beverage bottle made with recycled material in 1991. Since then, Coca-Cola has worked with URRC and other partners to accelerate the development and commercialization of environmentally-efficient and sustainable recycling technologies throughout the world. Today, The Coca-Cola Company uses recycled content in more than 17 countries, including the United States.

"Coca-Cola has staked a clear leadership position in its approach to sustainable packaging," said Kate Krebs, executive director, National Recycling Coalition (NRC). "The new Spartanburg plant represents an end-to-end recycling model that is world class and that I hope other industries will follow."

For a video overview of the plant, visit http://www.eventstreams.com/recycling/

Coca-Cola Recycling
While PET has a high value as a recyclable in the marketplace, not enough material is recovered to meet the increasing demand for recycled content. To help bridge this gap and ensure ready access to recycled

material, Coca-Cola Enterprises, Inc., the largest Coca-Cola bottler in North America, and The Coca-Cola Company formed Coca-Cola Recycling LLC (CCR) in November 2006.

CCR is dedicated to recovering and recycling Coca-Cola packaging materials used within the Coca-Cola system in the U.S. – including PET, aluminum, cardboard and plastic film. CCR will be developing cost-efficient solutions for reclaiming used beverage containers and will establish centralized recycling centers throughout the U.S.

Expanded Partnership with RecycleBank
Coca-Cola also continues to expand its relationship with curbside collection organizations. Today, the Company announced an expanded partnership and investment in RecycleBank. RecycleBank currently operates in southern New Jersey, Delaware and Pennsylvania and will be launching service in upstate New York, Vermont and Massachusetts in the fall of 2007. RecycleBank plans to be in 100,000 homes by the end of 2007. The additional investment will support a national rollout of the RecycleBank program by 2009.

RecycleBank leverages new technology and innovative consumer incentives to substantially increase household recycling participation and rates. Since its launch in 2003, RecycleBank has driven recycling rates in Philadelphia from 15 percent to more than 50 percent, and household participation from 30 percent to 90 percent.

“RecycleBank makes recycling easier and more convenient for consumers,” said Scott Vitters, director of sustainable packaging, The Coca-Cola Company. “While consumers reap the rewards of recycling through RecycleBank incentives, businesses also benefit through the increased collection of valuable, reusable materials like PET.”

Recycled PET Merchandise Program
Coca-Cola also has introduced a line of merchandise made out of recycled PET bottles. The products feature playful, pithy slogans such as “I’m wearing post-consumer waste,” and “My white t-shirt is green”, and is designed to inspire action by making every bottle count. Coca-Cola apparel and consumer products made with recycled PET are available online at www.cokestore.com and at the New World of Coca-Cola in Atlanta. The line will be available in retail locations across the United States later this year.

Sustainable Package Design
Coca-Cola has a long history of designing packages with the environment in mind. It commissioned the first study to examine whole environmental impact of a package in 1969 and introduced the first food grade plastic bottle made with recycled material in 1991.

Since then, Coca-Cola has continued to improve the resource efficiency of its packages. For example:

- Aluminum cans, glass and plastic bottles have been reduced by 33 percent, 57 percent and 32 percent respectively since their introductions.
- In 2007, the DASANI bottle was redesigned to be lighter weight, reducing plastic use by 30 percent.
- The new 20-ounce contour bottle has been reduced by five percent across all Coca-Cola brands.
- Light weighting and bottle closure design efforts across all Coca-Cola products in PET packages will save 100 million pounds of plastic this year in the U.S.

The majority of Coca-Cola packages are not only recyclable; they are among the most recycled in the world thanks to their high end-use value.

- The DASANI bottle has a cap that can be recycled and is a light blue color compatible with recycling.
- Approximately 70 percent of the primary packaging used to deliver the Company's beverages in the U.S. is made from aluminum, PET plastic and glass – all of which are recyclable.
- The remaining 30 percent of beverage volume delivered is largely through highly efficient bulk packages such as refillable steel tanks or concentrated bag-in-box containers for fountain syrup.

About The Coca-Cola Company
The Coca-Cola Company is the world's largest beverage company. Along with Coca-Cola®, recognized as the world's most valuable brand, the Company markets four of the world's top five nonalcoholic sparkling beverage brands, including the Diet Coke®, Fanta® and Sprite® brands, and a wide range of other beverages, including diet and light beverages, waters, juices and juice drinks, teas, coffees, energy and sports drinks. Through the world's largest beverage distribution system, consumers in more than 200 countries enjoy the Company's beverages at a rate exceeding 1.4 billion servings each day. For more information about The Coca-Cola Company, please visit our website at www.thecoca-colacompany.com.

About URRC
United Resource Recovery Corporation (URRC), headquartered in Spartanburg, S.C., is a leader in PET recycling technology. In 1994, URRC completely revolutionized the PET recycling industry by developing and patenting the world renown Hybrid UnPET process for chemically super-cleaning PET flake for cost efficient food grade packaging. In 1996, the company entered into a 5-year development program with The Coca-Cola Company to commercialize the process by producing food-grade quality PET chip for bottle-to-bottle recycling.

URRC provides manufacturing in the United States and offers licensing opportunities and engineering services for clients world wide.

About RecycleBank
RecycleBank is a rewards program that motivates people to recycle. It does this by quickly and easily measuring the amount of material each home recycles and then converting that activity into RecycleBank reward dollars that can be used at hundreds of local and national rewards partners. RecycleBank is simple to implement, market-driven and proven to work, saving municipalities money and rewarding citizens for their environmental stewardship. Visit www.recyclebank.com for more information.

FOR IMMEDIATE RELEASE
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The Aluminum Association Announces Recycling Target

Industry to work toward 75% recycling rate for used aluminum beverage containers by 2015

ARLINGTON, Va., November 18, 2008 — The Aluminum Association today announced an industry wide effort to increase the industry's recycling rate for used aluminum beverage containers to 75% by 2015. Today, the aluminum industry recovers approximately 54% of the aluminum containers produced in the U.S. While aluminum cans are already the most widely recycled beverage container in the country, each year Americans still discard over 50 billion aluminum cans which end up in landfills.

Recycling plays a critical role in maintaining the aluminum can as an environmentally sustainable package. Every can that is recovered is turned back into a new beverage can, saving energy, reducing greenhouse gas emissions and decreasing the use of natural resources.

Raising the recycling rate of aluminum cans to 75% would:

• Result in an energy savings of 139.7 million MBTUs in avoided energy.
• Result in the avoidance of nearly 9 million tonnes of greenhouse gases, which is equivalent to removing more than 1.6 million cars from the road over a year.

Martha Finn Brooks, President and Chief Operating Officer of Novelis Inc., described the recycling goal as, "a vital leadership initiative for the aluminum industry."

"It is time," said Brooks, "that we aggressively advance a multi-tiered approach and work with other stakeholders to achieve higher recycling rates. This metal is too valuable, from both an economic and environmental point of view, not to recover."

To achieve the recycling target, the Aluminum Association will work in partnership with other stakeholders to increase public education, grow the recycling infrastructure, and explore new policy initiatives. The Association will encourage and assist local and state governments to consider a range of options, including:

1. Growing and strengthening voluntary recycling programs, such as curbside recycling initiatives. The aluminum industry's Curbside Value Partnership® will continue to be a valuable support mechanism for such programs.
2. Considering deposit legislation as an option for all beverage containers. Container deposit programs are a proven, sustainable method of capturing beverage cans for recycling. States that have deposit programs have the highest can recycling rates, on average at 74% or higher, while the recycling rate in non-deposit states is around 38%.
3. Exploring the role that mandatory recycling programs and landfill bans can play as part of the solution.
4. Recognizing the benefits of recycling in any potential climate change policies.

Pat Franc, President of Arco Aluminum and past chairman of the Aluminum Association, touted the new recycling goal as being good for the environment, consumers and the aluminum industry.

“Aluminum is infinitely recyclable and the more aluminum that consumers recycle, the better it is for everyone,” said Franc. “Educating the consumer about the economic and environmental benefits of aluminum can recycling is key to getting them to recycle more.”

The U.S. aluminum industry’s recycling rate peaked at 68% in 1992, but in the following years declined to as low as 50%. More recently the recycling rate has been gradually increasing again, growing by 2.2 percentage points in 2007.

“Alcoa announced this as a company goal and target date in January, and we're pleased that the Association is united behind the goal," said Kevin Anton, vice president of Alcoa, President of Alcoa Materials Management and Chairman of the Aluminum Association. “The infinitely recyclable can is synonymous with recycling. We must work to recover the remaining 46% of cans which still could be recycled. Joining forces as an industry to support this initiative is the first step to reaching this important goal.”

# # #

The Aluminum Association based in Arlington, Virginia, works globally to aggressively promote aluminum as the most sustainable and recyclable automotive, packaging and construction material in today’s market. The Association represents U.S. and foreign-based primary producers of aluminum, aluminum recyclers and producers of fabricated products, as well as industry suppliers. Member companies operate more than 200 plants in the United States, with many conducting business worldwide.

American Beverage Association and The Climate Group Announce Partnership

Press Release

December 16, 2008

The Coca-Cola Company, Dr Pepper Snapple Group, Nestle Waters NA and Pepsi-Cola North America join The Climate Group as part of innovative recycling initiative

America's non-alcoholic beverage industry and The Climate Group are joining forces in a powerful new partnership to dramatically increase recycling as one way to reduce climate change and protect the environment. With this agreement, the **American Beverage Association** and its **Full Circle Plan** becomes a founding member of The Climate Group's ***Recycle Together*** initiative.

"We're proud of this new partnership with The Climate Group. Through Recycle Together we hope to see more beverage containers recycled and we also want to encourage more businesses and industries to partner with us to improve recycling across the country and reduce the impact on the environment," **American Beverage Association President and CEO Susan Neely** said.

Recycling grew quickly in its early years, but has since leveled off, and now shows signs of increasing with the deployment of best practices. The objective of Recycle Together is to identify and promote effective and efficient methods of increasing the volume of containers that are actually recycled.

"The beverage industry has done a lot to ensure that its packages can be recycled," said **Chris Walker, director of North America for The Climate Group**. "Almost all the packages made today are recyclable. But once the container reaches the consumers' hands it leaves the beverage industry's sphere of influence."

The Climate Group was created in 2004 to bring together business and government to develop solutions to tackle climate change. The Climate Group's partnership with the American Beverage Association and the launch of Recycle Together marks another major U.S. initiative designed to create public-private partnerships that deliver tangible greenhouse gas emissions reductions.

Recycling already makes a significant contribution to greenhouse gas (GHG) reductions in the U.S. The 85 million tons of municipal solid waste recycled in 2007 reduced GHG emissions by 193 million metric tons of CO_2 equivalents.[1] That contribution is the same as removing 35 million cars from the roads.

The Climate Group's work on Recycle Together will be driven by its newly opened office in Washington, D.C., headed by **Kate Krebs**, who also recently joined The Climate Group as **Director of Sustainable Resources**. Ms. Krebs will lead Recycle Together and will actively seek new partners to join, among other responsibilities.

Recycle Together members will work together to reach out to city leaders, state leaders and recycling officials to create and promote new approaches to recycling that will dramatically increase its uptake. This powerful partnership of brands and non-profits will also seek to inspire other consumer products industries to join Recycle Together.

"Our industry already has led the way in reducing the environmental impact of our packaging, from lightweighting and using more post-consumer recycled material, to ongoing efforts to reduce waste," said **Larry Young, president and CEO of Dr Pepper Snapple Group** and chairman of the ABA Board of Directors. "As a founding partner in The Climate Group's Recycle Together initiative, we look forward to playing an even bigger role in promoting recycling awareness and action among consumers who enjoy our beverages each and every day."

"Coca-Cola is proud to play a part in this national effort," said **Sandy Douglas, president, Coca-Cola North America.** "Our Company has a long history of supporting recycling and conservation, and this campaign continues our progress toward our commitment to recycle and reuse 100 percent of our cans and bottles in the U.S."

“Plastic is not the enemy in our society, the failure to recycle is,” said **Kim Jeffrey, CEO Nestlé Waters North America**. “Our industry, through our relationship with the Climate Group, believes it is time to elevate this issue as an important way to reduce green house gas emissions and impact climate change.”

“PepsiCo has a long history of support for recycling and we recognize its vital importance to our industry and our environment,” said **Hugh Johnston, president of Pepsi-Cola North America Beverages.** “We are proud to be a partner in this coalition, bringing business, government and environmental groups together to foster effective and efficient approaches to recycling in our communities.”

The American Beverage Association’s recycling initiative, the Full Circle Plan, is the founding member of Recycle Together. The Full Circle Plan is a comprehensive plan launched in the summer of 2008. As part of the Full Circle Plan, the industry has worked to make lighter containers, to use higher percentages of recycled materials and to make nearly all of its containers 100 percent recyclable. To help ensure that the packaging that is carefully designed to be readily recycled actually is recycled, the second prong of the Full Circle Plan seeks to support community programs that make recycling easier for consumers. The industry believes that the most efficient and effective way to recycle is through comprehensive single-stream curbside recycling.

The Climate Group and Recycle Together will be most active in this component of the Full Circle Plan. Specifically, Recycle Together will support a model city pilot program. This pilot program will help determine best recycling practices for communities. The Recycle Together initiative will take those best practices and develop a web-based tool kit that will provide information to municipal leaders and interested citizens who are looking to improve recycling in their communities.

The third component of Full Circle is motivating consumers to ‘Think Inside the Bin’ and recycle their empty beverage containers. To promote this, America’s non-alcoholic beverage companies will use their marketing expertise to encourage consumers to recycle.

“The beverage industry is doing its part so consumers can do theirs to increase recycling,” Ms. Neely said. “Nearly all of our packaging is made from completely recyclable material – and we want every container to be recycled. We look forward to working with The Climate Group to encourage consumers across the nation to ‘Think Inside the Bin’ and recycle their empty beverage containers.”

“Waste is essentially a design flaw,” said Kate Krebs, Director of Sustainable Resources with The Climate Group. “The beverage industry has come a long way by designing its packaging to be easily recycled, and is the only industry to make a public commitment to doing so. With this initiative, the industry is pledging to use its marketing power to encourage consumers to recycle. We call on consumers, state and city governments to seize this opportunity to make a step-change in recycling in the U.S. – we also call on other industries to follow the beverage companies’ lead and join Recycle Together. Without the active participation of all consumer products sectors, America won’t fully maximize the potential of recycling.”

News Release

For Immediate Release
December 1, 2008

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Glass Container Industry Sets Recycling Goal; Seeks 50% or Higher Recycled Content for Glass by 2013

Goal is to continue to improve Cradle-to-Cradle Footprint of Glass

Alexandria, Virginia, December 1, 2008 – The glass container industry, its companies, and thousands of employees, recognize the growing importance of protecting the environment and conserving valuable energy resources. In recognition of the environmental value of post-consumer cullet, or recycled glass, member companies of the Glass Packaging Institute (GPI) have agreed to the goal of using at least 50% recycled glass in the manufacture of new glass bottles and jars by 2013.

New U.S. EPA data shows the glass recycling rate has already jumped to 28.1% in 2007, up three percentage points from 2006 (25.3%). With this new momentum, an estimated 3.2 million tons were recovered compared to 2.9 million in 2006. Using the EPA's benefits calculator, GPI estimates energy savings from using 50% recycled content in all glass packages manufactured in the U.S. could save enough energy to power over 45,000 households for a year.

"This is certainly a powerful statement by the glass industry about its intent to work with other stakeholders to improve cradle-to-cradle recycling," said Rich Crawford, GPI's Board Chairman, and President of Global Glass Operations, O-I. "Like glass itself, this recycling goal is good for consumers and families as well as the environment."

GPI has long been committed to and engaged in promoting recycling in the U.S. Its member companies were early proponents of drop off collection centers and then later, curbside recycling. The industry has actively supported efforts to improve single stream curbside best practices that maintain glass containers as a viable commodity grade product suitable for bottle-to-bottle recycling. GPI plans to accelerate support of legislative and regulatory measures that will dramatically improve glass recycling systems in order to reach these environmental goals.

"The glass container industry has been a leading advocate of improved recycling in California," says Mark Murray, Executive Director of Californians Against Waste. "We applaud GPI for setting an ambitious goal to take comprehensive, pro-active steps to achieve a higher recovery rate nationally."

GPI and its members actively support on-premise bar, restaurant, and hotel recycling initiatives. More than 28% of beverages packaged in glass are sold in restaurants and other away-from-home venues. Glass container manufacturers also support innovative

curbside collection practices and will continue to work with policymakers to improve and expand state beverage deposit programs.

“One of the outstanding environmental benefits of glass containers is that they are endlessly recyclable, and can be made with up to 100% recycled content,” said Joseph Cattaneo, President of the Glass Packaging Institute. “Reuse of post-consumer recycled container glass is critical to our glass container industry and its environmental and energy efficiency goals. This cullet use is also an integral part of the cradle-to-cradle aspects of glass manufacturing. We are prepared to embrace all measures that efficiently and cost-effectively improve glass recovery.”

About GPI

The Glass Packaging Institute (GPI) is the trade association representing the North American glass container industry. Through GPI, glass container manufacturers speak with one voice to advocate industry standards, promote sound environmental policies and educate packaging professionals. GPI members include Anchor Glass Container Corporation; Cameron Family Glass Packaging, LLC; Gallo Glass; Kelman Bottles, LLC; Leone Industries; Longhorn Glass Corporation; Owens-Illinois, Inc. (O-I); Rocky Mountain Bottle Company (RMBC); Saint-Gobain Containers, Inc. (SGCI); and Vitro Packaging. For more information, visit http://www.gpi.org.

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For Immediate Release

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Nestle Waters Sets 60% Industry Recycling Goal for PET Plastic Bottles

SAN FRANCISCO—October 23, 2008—As You Sow congratulates Nestle Waters North America which today announced a commitment to an industry-wide 60% PET plastic bottle recycling rate for U.S. beverage makers who use PET by 2018. Nestle Waters, the largest bottled water company in the US, is the first beverage company to commit to an industry-wide bottle recovery goal. Less than 25% of US PET plastic bottle waste is recycled; the rest goes to landfills and incinerators.

For several years, As You Sow and Walden Asset Management have led an investor dialogue and filed shareholder proposals with Coca-Cola Co. and PepsiCo on beverage container recycling. As a result, last year Coca-Cola Co. pledged to recycle the equivalent of 50% of all plastic and aluminum containers it sells by 2015. Nestle's commitment may be more ambitious because it has proposed an industry goal rather than a company goal but other beverage makers will need to participate for it to be successful.

"We recognize Nestle Waters' leadership in proposing a beverage industry goal when no other beverage company has been willing to do so," said Conrad MacKerron, director of the Corporate Social Responsibility Program at As You Sow. "CEO Kim Jeffery has said the beverage industry needs a more comprehensive, 21st century solution to container waste. We agree. However, it is important for the company to follow up and provide sufficient stakeholder engagement to get buy-in from the rest of the industry. Also, we hope the 10-year time frame to get to 60% can be reduced."

The company says As You Sow's engagement helped make it more responsive on container recycling**.** An AYS report card ranking companies on container recovery gave the company, which did not submit a response, a failing grade two years ago. "Over the past two years, AYS engaged Nestle Waters North America in a respectful but insistent dialogue on container recycling," said Alex McIntosh, director of corporate citizenship for Nestle Waters. "Its 2006 container recycling report and scorecard got our attention, and encouraged us to look at the recycling challenge more broadly. As a result, our company has developed a deeper understanding of the challenges and opportunities of improving container recycling rates and recycled content, and has helped us adopt a bolder vision and commitment to comprehensive recycling in the US."

Last fall Mr. Jeffrey broke with decades of industry opposition to container deposit legislation by calling for a low cost, high-impact legislative solution aimed at providing more benefit than current deposit laws.

The company says it wants a proposal that would be fairer to consumers, retailers, manufacturers and recyclers. As You Sow hopes other beverage industry leaders will follow Mr. Jeffrey's lead and work together towards agreement on a new legislative model for state container redemption programs.

AYS was disappointed that Nestle Waters did not announce a near term-goal on recycled content. AYS and Walden's efforts in 2004 resulted in commitments by Coke and Pepsi to use 10% recycled content PET in their plastic bottles by the end of 2005. Both companies met the goal. Nestle Waters, a subsidiary of publicly traded Nestle SA (Switzerland), has set a goal to put at least 25% recycled PET into one of its brands of water but the company says it will take five years.

Nestle Waters' release may be accessed at **http://www.csrwire.com/News/13531.html**.

As You Sow is a non-profit organization that utilizes capital markets, shareholder leverage, innovative legal strategies and grantmaking to transform corporate behavior to create a more socially and environmentally just society. www.asyousow.org

Field Study Protocol

From December 2005 through April 2006, the project team was formed, led by Hennepin County Department of Environmental Services (DES); the study design was developed and finalized; and preparations for the collection and sorting began. An outline for the education outreach, including a communications strategy (see Appendix C), required staff, proposed communication pieces, and budget, was created. During that time, the County also solicited a proposal from HDR Engineering, Inc. for review of DES's Sorting Protocol and Methodology, creation of a Health and Safety Plan (see Appendix G), oversight of sorting operations for achievement of material quality objectives, and to assist with overall site management.

A. Site Selection and Study Schedule

The project team considered several public facilities as possible sites for the sorting operation. A portion of the vacated Minneapolis Fleet Service location at E. 44th St. and Snelling in southeast Minneapolis was selected as a suitable site for the project. Because the site was no longer actively used other than for winter storage, it provided adequate space inside and outside of the buildings for all sorting tables and supplies, empty cart storage, and temporary overnight storage of full waste and recycling containers as needed. The site's easy access off of Hiawatha Ave., its good lighting, and multiple overhead garage doors were also desirable features. The site had electricity, but no running water which necessitated rental of portable toilets, a water cooler for drinking purposes, and water jugs for hand-washing and general clean-up.

The waste and recycling collection and sorting portion of the field study was conducted during two 2-week periods, May 1-5 and May 8-12 and October 2-6 and 9-13, 2006. The education outreach portion was conducted during the intervening months and is discussed further in Appendix C.

B. Sample Selection

A total of 739 randomly selected addresses were chosen to participate in the study and each address was assigned a unique ID# for cart and data tracking purposes. The addresses were designated as either "control" or "treatment" through an equal split. The treatment[1] group received the education outreach later in the summer, prior to the October sort. The addresses were also evenly split across the normal Monday-Friday collection routes. This number of addresses provided an 80 percent probability of finding a statistically significant result at a 5 percent level of significance (one-tailed)

[1] The "treatment" involved trained staff visiting individual residents to conduct a brief survey of their recycling activities and offer information and resources to address their barriers in a manner that would motivate behavior change. Among the resources was a newly designed Minneapolis Curbside Recycling Guide. See Section V. for more discussion on the education outreach.

assuming that the treatment results in a 0.5 pound difference between the treatment group and the control group.

The project's estimated garbage and recycling sorting capacity during the May and October collection periods also constrained the experiment to these sample sizes. The beginning samples were 7 percent larger than necessary to allow for the need to remove addresses from the study should residents move or otherwise be excluded due to discovered vacant property. The cushion was based on 2005 U.S. Census mobility data for Minneapolis.

The 739 addresses included 870 dwelling units with the potential of 1,061 carts. According to City of Minneapolis records, 646 addresses or 87.4% were single-family dwellings, 73 were duplexes, 17 had three or four dwelling units, and only 3 had five or more dwelling units. Each address, regardless of the number of dwelling units, was treated as one data point for data tracking purposes due to the inability to distinguish the waste generated from individual units. The random sample included addresses from all 11 communities and 69 of the 81 neighborhoods in the City.

C. Personnel

Due to the large scope of the project, a substantial work crew was required to collect and deliver carts to the site, distribute carts throughout the site, conduct and supervise the sorting, and move carts and sorted materials to the scales and then out of the building for appropriate disposition. The project was managed by a Hennepin County staff person who also provided general site management. The primary labor force for sorting was provided by the Hennepin County Adult Corrections Facility (ACF), Community Work Program.[2] Each waste sorting table included one "table supervisor" who was County staff, the HDR staff person, or a volunteer city/county recycling coordinator.

Following is a summary of duties of the required project personnel:

Cart pick-up and delivery—City of Minneapolis crews
Cart Movers—3 (Includes 2 ACF crew leaders)
Waste Sorters for each of 4-5 tables—4 (includes 1 "table supervisor"), 16-20 total
Recycling Sorters—1 total (also helps with weighing and cart moving)
Weighing material and data entry—2 DES scale house staff, plus 2 ACF laborers for lifting material on and off the scale.
Supervision of sorters— 4-5 table supervisors
Oversight/Problem Solving/QC—County staff/ HDR Engineering
Roving supervisor—County staff/HDR Engineering
Waste & recycling dumping & removal from site—City of Minneapolis crews
Clean-up crew—All

D. Cart Pick-up and Delivery to Sorting Site

The City of Minneapolis developed pick-up routes based on the randomly selected addresses from each collection day. Approximately 150 addresses were scheduled to have their waste picked up each day, of which about half would also have their recycling collected.

During the first week of collection, waste carts were replaced with empty carts on a one-for-one basis and resident notification of the study was left with the cart at that time, as follows:

[2] This is a program designed to provide supervised work crews to complete local projects for organizations in the public and private sector. This crew also engages in community service ventures.

"The City of Minneapolis and Hennepin County are cooperating in a study of the Minneapolis Solid Waste Management Program. You are one of 750 homes that were randomly selected to participate in the study. The results of this study will be available after November 2006.

Please call 612-673-2433 if you wish a copy of this report.

Thank you for your cooperation."

The 94-gal. waste carts and recycling from the study addresses were picked up and delivered to the site by Minneapolis Problem Material flatbed trucks. At the time of pick-up, carts were immediately labeled with preprinted ID labels containing the address, day of the week, and the previously assigned unique ID# for cart and data tracking purposes. Cart identification did not differentiate between the control and treatment groups.

At the site, full carts were unloaded and queued up outside of the garage doors or in the adjacent building if it was raining or snowing. We attempted to keep multiple carts from the same address together, but this did not always happen and created confusion at the time of data entry when material from the same ID# appeared at the scale more than once. This problem was largely eliminated during the October sort.

All household recycling bins/containers were emptied and left behind at the time of pick-up. Bags and/or loose recycling, removed from an owner's bin or other container, were placed in 22-gal. carts for transport, maintaining material separation as much as possible. All recycling bags and/or carts were also labeled at time of pick-up, with the correct address and ID# for tracking purposes.

During the second week of collection, the original waste carts, now empty, were returned to the correct address and the full cart was collected, labeled, and then delivered to the sorting site.

E. Determination of Sorting Categories

The sorting categories were defined by the Minneapolis curbside solid waste and recycling program guidelines[3] and household hazardous waste (HHW) and problem materials' definitions. In addition, the project team agreed to add the category of organics as a measurable fraction of the waste stream to gain current data on that material. This is due to the County's increasing efforts to reduce the volume of MSW by diverting more organic material to composting. This category consists of all the non-recyclable paper in addition to food waste, and, in some cases, yard waste. Yard waste was included in this study as organics when it was found in the waste cart, even though it is technically banned from disposal in MSW. The organics was collected through a negative sort, i.e., after all recyclables including batteries and consumer electronics, the HHW, and the "real trash" items were removed, the remaining material on the sorting table was to be only the organics. Counting the "real trash", there

[3] The exceptions were that the programs' large item pick-up, which includes carpet rolls, mattresses and box springs, furniture, large metal items and major appliances, and the consumer electronics collection were not part of this study. All consumer electronics noted in the sorts were found in waste carts.

were 13 categories of material sorted from the waste and recycling. The following table details the sorting categories and instructions to the crews on how they were to be sorted.

Material Sorting Categories and Instructions to Sorters

Category	**What to include---------YES**	**What NOT to include----------NO**
Metal Cans	All food and beverage metal cans and aluminum foil, clean disposable aluminum pans	No aerosol cans or other types of cans that contained hazardous substances
Glass bottles and jars	All food and beverage glass containers	No broken glass, dishes, ceramics, mirrors, window glass
Plastic bottles	All plastic bottles with a neck	No bottles that contained hazardous substances, no motor oil bottles, no Styrofoam, no plastic jars or tubs or cups, no plastic film bags
Newspaper and supplements	Newsprint and inserts	No shredded or crumpled newspaper (see below), no plastic bags
Magazines and catalogs	Glossy paper, any thickness	No plastic wrappers
Dry food boxboard, office paper and mail	Boxes such as cookie, cereal, pasta, potato chips. All office paper, envelopes, file folders, notebook paper, Post-it Notes, all junk mail, shredded paper (normally, for recycling, this should be in a closed paper bag)	No plastic bag liners, no boxes from frozen or refrigerated food, no gift or toy boxes, no 12/24 pack beverage boxes (see below), no gift wrap, ribbons, or tissue paper (see below). No rubber bands
Phone books	Any kind of phone book	No plastic bags
Corrugated "cardboard" boxes	Most corrugated boxes	No pizza boxes or waxed containers (see organics below). No 12/24 pack beverage boxes (see below)
Household batteries	All small batteries, including buttons	No auto batteries here—see HHW
Consumer electronics	All electronic items or small appliances containing circuit boards.	No appliances that that do no contain electronics—place in garbage
Household hazardous waste (HHW) and other problem materials	Paints, pesticides, insecticides, weed killer, fluorescent bulbs, adhesives, motor oil, auto batteries, aerosols, mercury containing items, poisons, solvents, other chemicals, etc.	No empty aerosol cans--place in garbage.
Garbage (the only **"REAL TRASH")**	Everything that does not bio-degrade or decompose. All non-organic materials such as plastic packaging, bottle caps, Styrofoam, foil bags, wrappers, condiment packets, other misc. metal items, ceramic cups, misc. glass items, mirrors, rubber, bricks or stones, etc.	No organic materials listed in the next section—leave these items on the table until last.
Organics—this is all that should be left on the sorting table!!	All organic materials that are not typically recycled. **All NON-RECYCLABLE PAPER, FOOD WASTE, YARD WASTE.** Items such as pizza boxes, waxed boxes, frozen and refrigerated food boxes, gift or toy boxes, loose shredded or crumpled paper, 12/24 beverage boxes, gift wrap, paper ribbons, tissue paper, paper towels, facial tissue, paper cups and plates, paper napkins, Chinese and other paper food containers, paper milk and juice cartons, paper bags and waxed paper, paper fast food wrappers, coffee grounds, filters and tea bags, and ALL FOOD SCRAPS.	**No PLASTICS OF ANY KIND and NO METAL**, such as Styrofoam, plastic bottles, condiment packets, chip bags, candy wrappers, plastic food wrap, etc.

F. Sorting and Miscellaneous Equipment and Supplies

A variety of equipment and supplies were required to support the sorting project, as follows:

Equipment and Supplies

Item	Purpose	Qty. Ea. (sorting station or…)	Total Qty.	Responsi-bility
4'x8' plywood sheet (3/4" CDX)	5 waste & 1 recycling sorting table plus 1 extra for supplies	1	7	DES
94-gal. carts	Replacements upon pick-up of full carts	As needed	1,000 est.	Mpls.
22-gal. carts	To transport recycling to site For sorted SSO and "real trash" To support plywood tables	As needed 6 (3 sets of 2) 4	100 est. 30 + extras 28	Mpls. Mpls.
Empty recycling bins	For sorted materials (from both recycling and waste)	30 (3 sets of 10)	180 min.	Mpls.
5-gallon pails	For temporary storage of fluids	1	6	DES
Ice cream bucket (3 sets)	For batteries (for waste sorting only, recycling will be in plastic bag already)	3		DES
Cart ID# card	Color coded card to accompany waste and recycling carts/bins	4 for waste & 2 for recycling	4434 plus blanks	Mpls.
ID# card sleeve	To hold ID# card, capable of being attached to carts	1 for ea. waste, SSO and flat cart		Mpls.
Flat carts	Moving sorted material	NA	10-12	DES
Cultivators & hand rakes	To break open bags and move waste on table	3	12	DES
Scrapers (squeegees)	To clear debris off table	4	16	DES
Baggies/plastic bags	To hold misc. small items		As needed	DES
PPE	Safety glasses, latex and leather gloves for sorters		As needed	DES
2 Biffs	(no working facilities)		2	DES
Hot/cold water cooler & cups	(no water on site)		1 (hot/cold)	DES

Water jug	For hand-washing and general clean-up		1 five-gallon	ACF
Hand soap, towels, hand sanitizer	For hand-washing and drying		As needed	DES
Admin. tables and chairs	Data collection area and lunchroom		2-8 ft. (by scales) 2-8 ft. (lunch) 20 chairs	DES
Scales (that tare, with accuracy to 0.01)	To weigh all materials	2	2	DES
Lunch			For 8 days	DES
Steel Caps for Boots	Personal protective equipment		5 pairs	Mpls.
Clean City cart washing truck	For daily cleaning of carts and bins			Mpls.

G. Sorting Protocol and Methodology

4-5 sorting tables were in continual use for the waste sorting, and one table was used for the recycling sort/verification. Sorters were instructed that all waste carts and recycling bins from all dwellings at one address must be sorted into the same container, or multiple containers as needed for each material, resulting in one total weight for each sorted material from each address.

The procedure used during the project was as follows:

Waste carts—94-gal. carts

1. **Sorters** set up sorting tables with 10 empty recycling bins and (1) 22-gal. cart on each end.
2. **Sorters and/or cart movers** move waste carts into building and to sorting table, keeping all carts from one address/ID# together!
3. Only carts from one address/ID# to be moved to a sorting table at one time. Other carts must remain outside of building (or in building to the north, if raining or snowing).
4. **Sorters** pull proper ID# cards from administration table and hang on each 22-gal. cart and a flat cart.
5. **Sorters** remove bags from waste cart and place on table, break open. Place empty bags into the "real trash" 22-gal. cart.
6. **Sorters** dump any remaining waste in cart on table and spread out material with hand rake.
7. **Cart movers**, immediately move empty 94-gal. waste carts out of building, to temporary queuing area, keeping route ID# group together, then to cart queuing bunker for that day of week, still keeping route ID# group together.
8. **Sorters** pull off all recyclable materials and place in appropriate bin.
9. **Sorters** remove consumer electronics and HHW and other problem materials to appropriate bin.
10. **Sorters** remove the "real trash" items. Place these items in appropriate 22-gal. cart.
11. **Sorters** push remaining **SSO** material to end of table and into 22-gal. cart, clearing table of all material with scraper.
12. **Sorters** place all bins used for sorting from this address on a flat cart, keeping all together, and making sure that ID# card is attached to cart.
13. **Sorters** to move the flat cart full of bins of sorted material, plus the full garbage and SSO carts, from sorting table to the scale.
14. **Sorters** return to sorting table to set up empty bins and carts for next waste cart delivery.
15. **Scalehouse staff** to weigh material and hand record data on form, for each material sorted for each address.
16. **Cart movers** quickly move materials out of building after all weighing complete, and queue up or dump into appropriate vehicle for disposal or recycling.
17. **Cart movers** stack and return empty containers to inside the building.

Recycling—22-gal. carts

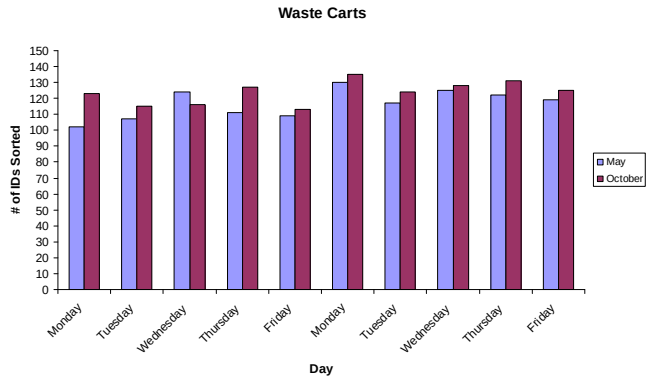
1. See #1 through #4 above
2. **Sorter** to remove bags or loose recycling from cart and sort into blue recycling bins
3. **Sorter** to remove contaminants and place in appropriate bin.
4. **Sorter to** place all bins used for sorting from this address on a flat cart (as needed), keeping all together, and making sure that ID# card is attached to cart.
5. **Sorter** to assure that material remains labeled (either on flat cart, or in blue bin)
6. **Sorter** moves material to scale station for weighing and data recording by Scalehouse staff.
7. **Sorter** returns to recycling sorting station for next recycling cart delivery.
8. **Cart movers** quickly move materials after weighing, and dump into appropriate area of recycling truck.
9. **Cart movers** move empty 22-gal. carts to specified cart queuing area for use the next day.

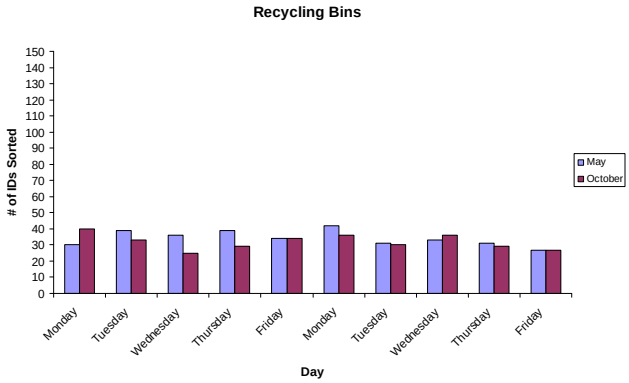


Following the sort, empty carts from each address were queued up in a bunkered shed adjacent to the building, using a different bunker for each day of the week to maintain address and route identification groupings. This facilitated return of original carts during the second week of the study.

H. Number of IDs Sorted

The sample size identified for collection each week was 739 addresses/ID#s for waste and 370 for recycling. This was approximately 148 IDs for waste and 74 IDs for recycling per day. The following charts indicate the number of IDs actually collected[4] and sorted on each day during the May and October sorts.





[4] During any given week, it is normal that a percentage of addresses will not "set out" waste and/or recycling. This is due to a variety of factors including insufficient waste and/or recycling, forgetting to set out, bad weather, illness, vacation, etc.

Detailed Sort Results

Following are the recycling recovery rate[5] calculations and the supporting summary weight data for both May and October. Also in this section is the analysis of the education outreach effect with comparisons for October vs. May and treatment vs. control. Lastly, material highlights regarding the organics, batteries, consumer electronics, and HHW are included because of their significance in the waste stream.

A. Recycling Recovery Rate Data

The summary weight data was separately totaled for May and October (see B. below), providing the following recycling recovery rates for each of the 10 recyclable materials. The recycling recovery rates for May and October were similar, although they tended to decline from May to October for the entire sample. While the total recycling recovery rates were reasonable (46% and 43%), our interest was in the individual material recovery rates. Newspaper was the most highly recovered material during both sorts, at nearly 70%. Two high volume, heavier materials, the mail boxboard mix—the lowest recovered material at only 18-19%—and cardboard (corrugated containers) which is also poorly recovered at 33% in May and only 24% in October, would be good targets for future education efforts intended to increase recycling recovery rates. Glass had a reasonably good recovery rate of over 50%, yet, because of its weight, could still make a significant contribution to increasing total weight recycled. Batteries and consumer electronics showed low overall volumes, however, consumer electronics set out for recycling were not part of this study.

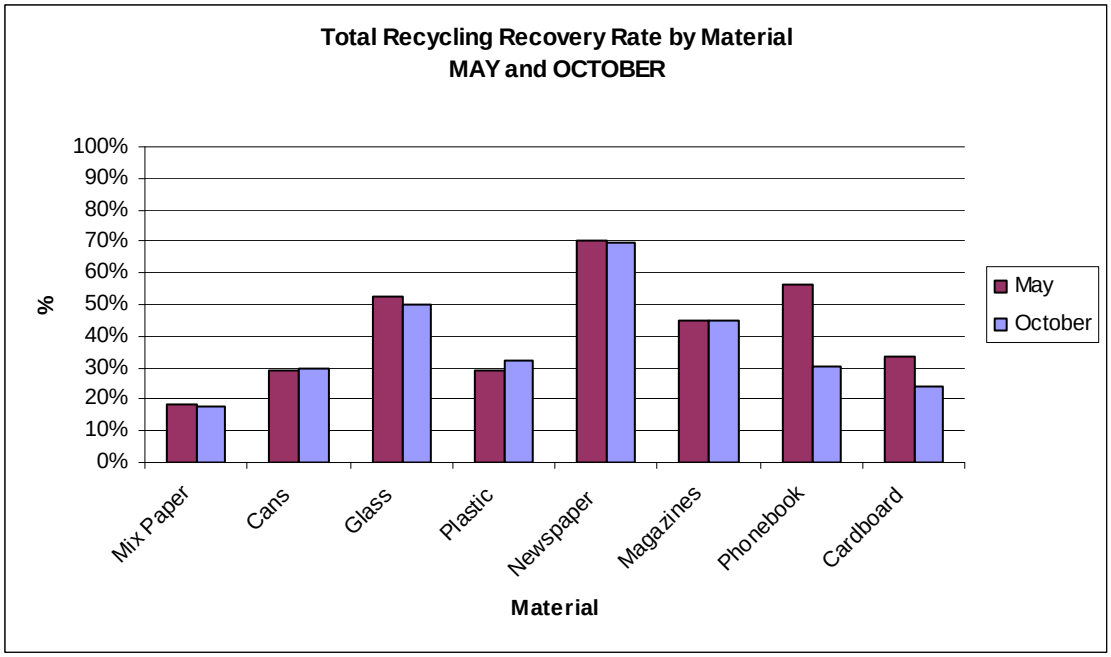
May Recycling Recovery Rate

	Recycling lbs. from Waste Cart	Recycling lbs. from Recycling Bin	Total Recyclable Material lbs.	Recycling Recovery Rate
Mail Boxboard Mix	2933.67	669.13	3602.8	18.57%
Metal Cans	701.46	285.45	986.91	28.92%
Glass	2171.10	2428.78	4599.879	52.80%
Plastic	1063.53	439.352	1502.878	29.23%
Newspaper	1779.03	4145.042	5924.072	69.97%
Magazines	916.07	745.38	1661.446	44.86%
Phone Books	306.49	397.78	704.27	56.48%
Cardboard	1265.54	632.56	1898.103	33.33%
Batteries	26.13	17.93	44.06	40.69%
Electronics	371.65	0.7	372.35	NA
Total	**11534.66**	**9762.10**	**21296.77**	**45.84%**

[5] The recycling recovery rate is the ratio of the amount of material actually recycled by the resident to the total recyclable material in both the waste cart and recycling bin.

October Recycling Recovery Rate

	Recycling lbs. from Waste Cart	Recycling lbs. from Recycling Bin	Total Recyclable Material lbs.	Recycling Recovery Rate
Mail Boxboard Mix	3171.08	694.7	3865.78	17.97%
Metal Cans	671.79	284.27	956.06	29.73%
Glass	2180.22	2182.6	4362.82	50.03%
Plastic	966.04	455.14	1421.18	32.03%
Newspaper	1895.67	4291.78	6187.45	69.36%
Magazines	1142.68	927.06	2069.742	44.79%
Phone Books	230.82	100.91	331.73	30.42%
Cardboard	1229.14	384.64	1613.78	23.83%
Batteries	59.55	4.88	64.43	7.57%
Electronics	758.41	1.19	759.60	NA
Total	**12305.40**	**9327.17**	**21632.57**	**43.12%**



B. Supporting Summary Weight Data

The supporting summary weight data is the basis for calculating the recycling recovery rates reported in A. above. Upon completion of the May and October sorts, total weights were calculated for both waste and recycling for each of the two weeks of sorting. The following summary tables reflect the 13 categories of sorted material, the number of ID's which had that material, those that did not have the material, the percentage of total IDs collected in which the material was found, the total pounds, and the percentage of the total weight represented by that material.

The "present" column plus the "not present" column equal the number of IDs from which waste was available for collection out of the total 739 IDs for each week, or from which recycling was collected out of approximately 370 each week.
In addition, this data provides information on the total pounds, and percentage of the total, of four categories of materials for the combined two-week periods in May and October. The 10 recyclable materials were added together in the small tables, and the large tables show the total pounds for each of the 13 sorted categories. Finally, the waste cart and recycling summary data were added together

for each month, reflecting the total waste generation and average pounds per set out address per week. This data yielded overall recycling rates of 15% for May and 14% for October.

The 10 recyclable materials are highlighted in green below.

May Week 1 WASTE CART Totals

Material	Present	Not Present	% Present	Pounds	% of Total
Garbage	551	1	99.82%	12,732.73	49.31%
SSO	529	23	95.83%	7,725.13	29.92%
Mail (Mix)	457	95	82.79%	1,343.98	5.20%
Cans	391	161	70.83%	353.11	1.37%
Glass	232	320	42.03%	1,026.23	3.97%
Plastic	366	186	66.30%	484.42	1.88%
Newspaper	409	143	74.09%	844.92	3.27%
Mags	148	404	26.81%	368.75	1.43%
PhoneBk	12	540	2.17%	120.72	0.47%
CardBrd	257	295	46.56%	534.13	2.07%
Batteries	61	491	11.05%	12.59	0.05%
Electronics	41	511	7.43%	213.85	0.83%
HHW	24	528	4.35%	61.35	0.24%
				25,821.90	Total Weight
				5,302.69	Total pounds of recyclables in waste
				20.54%	% of recyclables in waste

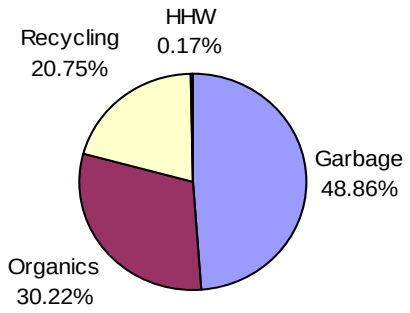
May Week 2 WASTE CART Totals

Material	Present	Not Present	% Present	Pounds	% of Total
Garbage	610	0	100.00%	14,419.27	48.47%
SSO	602	8	98.69%	9,066.85	30.48%
Mail (Mix)	527	83	86.39%	1,589.69	5.34%
Cans	400	210	65.57%	348.35	1.17%
Glass	268	342	43.93%	1,144.87	3.85%
Plastic	416	194	68.20%	579.11	1.95%
Newspaper	434	176	71.15%	934.11	3.14%
Mags	144	466	23.61%	547.32	1.84%
PhoneBk	19	591	3.11%	185.77	0.62%
CardBrd	314	296	51.48%	731.41	2.46%
Batteries	56	554	9.18%	13.54	0.05%
Electronics	36	574	5.90%	157.80	0.53%
HHW	12	598	1.97%	33.10	0.11%
				29,751.19	Total Weight
				6,231.97	Total pounds of recyclables in waste
				20.95%	% of recyclables in waste

May WASTE CART Totals

Material	Pounds	% of Total
Garbage	27,152	48.86%
Organics	16,792	30.22%
Recycling (10 materials)	11,535	20.75%
HHW	94	0.17%
Total Weight	55,573	100%

May Waste Cart Totals



May WASTE CART Total Pounds and Average Pounds per Set Out Address per Week

	Garbage	Organics	Mail Boxboard (Mix)	Metal Cans	Glass	Plastic	Newspaper
Total Pounds	27,152.00	16,791.98	2,933.67	701.46	2,171.10	1,063.53	1,779.03
Avg. pounds per set out per week	23.37	14.45	2.52	0.60	1.87	0.92	1.53

	Magazines	Phone Books	Cardboard	Batteries	Electronics	HHW	Total All Materials
Total Pounds	916.07	306.49	1,265.54	26.13	371.65	94.45	55,573.09
Avg. pounds per set out per week	0.79	0.26	1.09	0.02	0.32	0.08	

The 10 recyclable materials are highlighted in green.
Week 1 set out addresses total = 552; Week 2 set out addresses total = 610

May Week 1 RECYCLING BIN Totals

Material	Present	Not Present	% Present	Pounds	% of Total
Garbage	77	106	42.08%	52.09	1.09%
SSO	0	183	0.00%	0.00	0.00%
Mail (Mix)	61	122	33.33%	349.21	7.33%
Cans	113	70	61.75%	165.79	3.48%
Glass	104	79	56.83%	1,300.52	27.31%
Plastic	139	44	75.96%	223.95	4.70%
Newspaper	171	12	93.44%	2,074.53	43.56%
Mags	41	142	22.40%	282.65	5.93%
PhoneBk	8	175	4.37%	106.70	2.24%
CardBrd	39	144	21.31%	203.07	4.26%
Batteries	6	177	3.28%	3.48	0.07%
Electronics	1	182	0.55%	0.70	0.01%
HHW	0	183	0.00%	0.00	0.00%

4,762.69	Total Weight
4,710.60	Total pounds of recyclables
1.11%	% of waste in recycling

May Week 2 RECYCLING BIN Totals

Material	Present	Not Present	% Present	Pounds	% of Total
Garbage	75	88	46.01%	68.24	1.33%
SSO	0	163	0.00%	0.00	0.00%
Mail (Mix)	64	99	39.26%	319.92	6.25%
Cans	95	68	58.28%	119.66	2.34%
Glass	102	61	62.58%	1,128.26	22.04%
Plastic	127	36	77.91%	215.40	4.21%
Newspaper	143	20	87.73%	2,070.51	40.44%
Mags	35	128	21.47%	462.73	9.04%
PhoneBk	18	145	11.04%	291.08	5.69%
CardBrd	47	116	28.83%	429.49	8.39%
Batteries	5	158	3.07%	14.45	0.28%
Electronics	0	163	0.00%	0.00	0.00%
HHW	0	163	0.00%	0.00	0.00%
				5,119.75	Total Weight
				5,051.50	Total pounds of recyclables
				1.35%	% of waste in recycling

May RECYCLING BIN Totals

Material	**Pounds**	**% of Total**
Garbage	120	1.22%
Organics	0	0.00%
Recycling (10 materials)	9,762	98.79%
HHW	0	0.00%
Total Weight	9,882	100%

May RECYCLING BIN Total Pounds and Average Pounds per Set Out Address per Week

	Garbage	Organics	Mail Boxboard (Mix)	Metal Cans	Glass	Plastic	Newspaper
Total Pounds	120.33	0.00	669.13	285.45	2,428.78	439.35	4,145.04
Avg. pounds per set out per week	0.35	0.00	1.93	0.83	7.02	1.27	11.98

	Magazines	Phone Books	Cardboard	Batteries	Electronics	HHW	Total All Materials
Total Pounds	745.38	397.78	632.56	17.93	0.70	0.00	9,882.44
Avg. pounds per set out per week	2.15	1.15	1.83	0.05	0.00	0.00	

The 10 recyclable materials are highlighted in green.
Week 1 set out addresses total = 183; Week 2 set out addresses total = 163

May Combined WASTE CART and RECYCLING BIN Totals (Total Generation)

	Garbage	Organics	Mail Boxboard (Mix)	Metal Cans	Glass	Plastic	Newspaper
Total Pounds	27,272.33	16,791.98	3,602.80	986.91	4,599.88	1,502.88	5,924.07
Avg. pounds per set out per week	18.09	11.14	2.39	0.65	3.05	1.00	3.93

	Magazines	Phone Books	Cardboard	Batteries	Electronics	HHW	Total All Materials
Total Pounds	1,661.45	704.27	1,898.10	44.06	372.35	94.45	65,455.53
Avg. pounds per set out per week	1.10	0.47	1.26	0.03	0.25	0.06	

The 10 recyclable materials are highlighted in green.
Note: Average pounds per set out per week uses a weighted average of Weeks 1 and 2, waste and recycling set out addresses

October Week 1 WASTE CART Totals

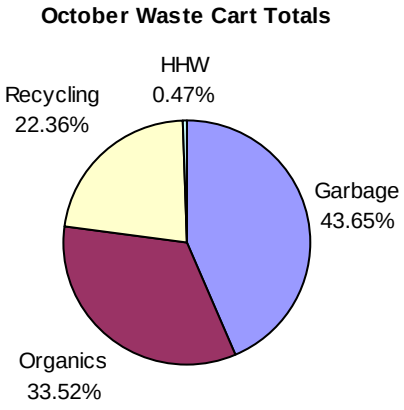
Material	Present	Not Present	% Present	Pounds	% of Total
Garbage	594	0	100.00%	11,746.44	43.83%
SSO	587	7	98.82%	9,032.82	33.70%
Mail (Mix)	538	56	90.57%	1,543.71	5.76%
Cans	400	194	67.34%	312.52	1.17%
Glass	235	359	39.56%	968.61	3.61%
Plastic	413	181	69.53%	451.22	1.68%
Newspaper	449	145	75.59%	956.74	3.57%
Mags	223	371	37.54%	499.86	1.87%
PhoneBk	10	584	1.68%	56.99	0.21%
CardBrd	292	302	49.16%	678.56	2.53%
Batteries	105	489	17.68%	20.89	0.08%
Electronics	32	562	5.39%	404.08	1.51%
HHW	45	549	7.58%	129.67	0.48%
				26,802.11	Total Weight
				5,893.18	Total pounds of recyclables in waste
				21.99%	% of recyclables in waste

October Week 2 WASTE CART Totals

Material	Present	Not Present	% Present	Pounds	% of Total
Garbage	633	4	99.37%	12,276.35	43.48%
SSO	622	15	97.65%	9,417.94	33.36%
Mail (Mix)	601	36	94.35%	1,627.37	5.76%
Cans	441	196	69.23%	359.27	1.27%
Glass	264	373	41.44%	1,211.61	4.29%
Plastic	471	166	73.94%	514.82	1.82%
Newspaper	487	150	76.45%	938.93	3.33%
Mags	270	367	42.39%	642.82	2.28%
PhoneBk	22	615	3.45%	173.83	0.62%
CardBrd	334	303	52.43%	550.58	1.95%
Batteries	139	498	21.82%	38.66	0.14%
Electronics	34	603	5.34%	354.33	1.25%
HHW	66	571	10.36%	127.78	0.45%
				28,234.29	Total Weight
				6,412.22	Total pounds of recyclables in waste
				22.71%	% of recyclables in waste

October WASTE CART Totals

Material	Pounds	% of Total
Garbage	24,023	43.65%
Organics	18,451	33.52%
Recycling (10 materials)	12,305	22.36%
HHW	257	0.47%
Total Weight	55,036	100%



October WASTE CART Total Pounds and Average Pounds per Set Out Address per Week

	Garbage	Organics	Mail Boxboard (Mix)	Metal Cans	Glass	Plastic	Newspaper
Total Pounds	24,022.79	18,450.76	3,171.08	671.79	2,180.22	966.04	1,895.67
Avg. pounds per set out per week	19.51	14.99	2.58	0.55	1.77	0.78	1.54

	Magazines	Phone Books	Cardboard	Batteries	Electronics	HHW	Total All Materials
Total Pounds	1,142.68	230.82	1,229.14	59.55	758.41	257.45	55,036.40
Avg. pounds per set out per week	0.93	0.19	1.00	0.05	0.62	0.21	

The 10 recyclable materials are highlighted in green.
Week 1 set out addresses total = 594; Week 2 set out addresses total = 637

October Week 1 RECYCLING BIN Totals

Material	Present	Not Present	% Present	Pounds	% of Total
Garbage	71	90	44.10%	63.64	1.44%
SSO	22	139	13.66%	19.17	0.43%
Mail (Mix)	74	87	45.96%	326.10	7.37%
Cans	105	56	65.22%	147.60	3.34%
Glass	96	65	59.63%	1,095.87	24.78%
Plastic	134	27	83.23%	249.47	5.64%
Newspaper	154	7	95.65%	1,944.64	43.97%
Mags	45	116	27.95%	366.65	8.29%
PhoneBk	3	158	1.86%	36.42	0.82%
CardBrd	42	119	26.09%	171.40	3.88%
Batteries	3	158	1.86%	1.06	0.02%
Electronics	1	160	0.62%	0.58	0.01%
HHW	0	161	0.00%	0.00	0.00%
				4,422.60	Total Weight
				4,339.79	Total pounds of recyclables
				1.91%	% of waste in recycling

October Week 2 RECYCLING BIN Totals

Material	Present	Not Present	% Present	Pounds	% of Total
Garbage	62	96	39.24%	74.53	1.46%
SSO	36	122	22.78%	51.79	1.01%
Mail (Mix)	78	80	49.37%	368.60	7.20%
Cans	101	57	63.92%	136.67	2.67%
Glass	98	60	62.03%	1,086.73	21.24%
Plastic	125	33	79.11%	205.67	4.02%
Newspaper	147	11	93.04%	2,347.14	45.88%
Mags	64	94	40.51%	560.41	10.95%
PhoneBk	8	150	5.06%	64.49	1.26%
CardBrd	51	107	32.28%	213.24	4.17%
Batteries	5	153	3.16%	3.82	0.07%
Electronics	1	157	0.63%	0.61	0.01%
HHW	3	155	1.90%	2.37	0.05%
				5,116.07	Total Weight
				4,987.38	Total pounds of recyclables
				2.53%	% of waste in recycling

October RECYCLING BIN Totals

Material	**Pounds**	**% of Total**
Garbage	138	1.45%
Organics	71	0.74%
Recycling (10 materials)	9,327	97.78%
HHW	2.37	0.03%
Total Weight	9,539	100%

October RECYCLING BIN Total Pounds, Average Pounds per Set Out Address per Week

	Garbage	Organics	Mail Boxboard (Mix)	Metal Cans	Glass	Plastic	Newspaper
Total Pounds	138.17	70.96	694.70	284.27	2,182.60	455.14	4,291.78
Avg. pounds per set out per week	0.43	0.22	2.18	0.89	6.84	1.43	13.45

	Magazines	Phone Books	Cardboard	Batteries	Electronics	HHW	Total All Materials
Total Pounds	927.06	100.91	384.64	4.88	1.19	2.37	9,538.67
Avg. pounds per set out per week	2.91	0.32	1.21	0.02	0.00	0.01	

The 10 recyclable materials are highlighted in green.
Week 1 set out addresses total = 161; Week 2 set out addresses total = 158

October Combined WASTE CART and RECYCLING BIN Totals (Total Generation)

	Garbage	Organics	Mail Boxboard (Mix)	Metal Cans	Glass	Plastic	Newspaper
Total Pounds	24,160.96	18,521.72	3,865.78	956.06	4,362.82	1,421.18	6,187.45
Avg. pounds per set out per week	15.59	11.95	2.49	0.62	2.81	0.92	3.99

	Magazines	Phone Books	Cardboard	Batteries	Electronics	HHW	Total All Materials
Total Pounds	2,069.74	331.73	1,613.78	64.43	759.60	259.82	64,575.07
Avg. pounds per set out per week	1.34	0.21	1.04	0.04	0.49	0.17	

The 10 recyclable materials are highlighted in green.
Note: Average pounds per set out per week uses a weighted average of Weeks 1 and 2, waste and recycling set out addresses

C. Analysis of Education Outreach Effect

The recycling recovery rates were analyzed to determine the effect of the education outreach, which occurred prior to the October sort. A difference in differences approach was used whereby each address' garbage and recycling measurements were taken during regular collections in the first two weeks of May 2006 and in the first two weeks of October 2006, approximately one month after the education effort.

The difference between the average differences in the treatment and control addresses' pre/post recycling recovery rates was subjected to a statistical test of significance. This approach controls for any differences between the two groups during the May collection that lasted through the October collection. The importance of controlling for this possible source of error was emphasized by a higher average recycling rate among treatment group addresses in May; a difference that can be attributed to chance in 12 percent of all possible samples.

In addition to comparing the treatment and control groups (received or did not receive educational information), differences in the recycling rate were analyzed for all addresses and materials and for particular sub-groups, e.g., renters or a particular recyclable material such as glass. No correction to the required level of statistical significance was made for multiple comparisons. A repeated measures general linear model was used to analyze the results and the below table summarizes the findings. A value of less than .05 in the last column signifies a difference that cannot be reasonably ascribed to chance. An observed difference in differences with a significance of more than .05 can be considered a result of chance.

Recycling Recovery Rate	Sample sizes Treatment vs.Control	Average post-pre difference Treatment Group	Average post-pre difference Control group	Difference in differences Treatment vs. Control	Significance of difference in differences
All recyclables	308/319	-2.21 %	-2.19%	-.02 %	.498
Renters	**57/69**	**-0.52%**	**-8.54%**	**8.02%**	**.120**
Owners	251/250	-2.60%	-0.44%	-2.16%	.301
Pledged vs. control group	123/319	-3.26%	-2.19%	-1.07%	.397
Interviewed vs. control group	231/319	-2.67%	-1.93%	-0.74%	.418
Mail/boxboard	293/289	-0.32%	-1.56%	1.24%	.324
Metal cans	228/242	0.41%	-3.23%	3.74%	.184
Glass	152/179	-2.09%	-4.93%	2.84%	.293
Plastic	251/256	1.13%	-2.75%	3.88%	.149
Newspapers	266/279	-1.27%	-1.39%	0.12%	.489
Magazines	**105/102**	**0.87%**	**-6.91%**	**7.78%**	**.077**
Phone books	2/5	43.67%	-40.00%	83.67%	.130
Cardboard	153/179	-1.16%	1.01%	-2.17%	.307
Batteries	21/31	0.00%	-3.23%	3.23%	.338
Electronics	6/10	-13.11%	0.00%	-13.11%	.182

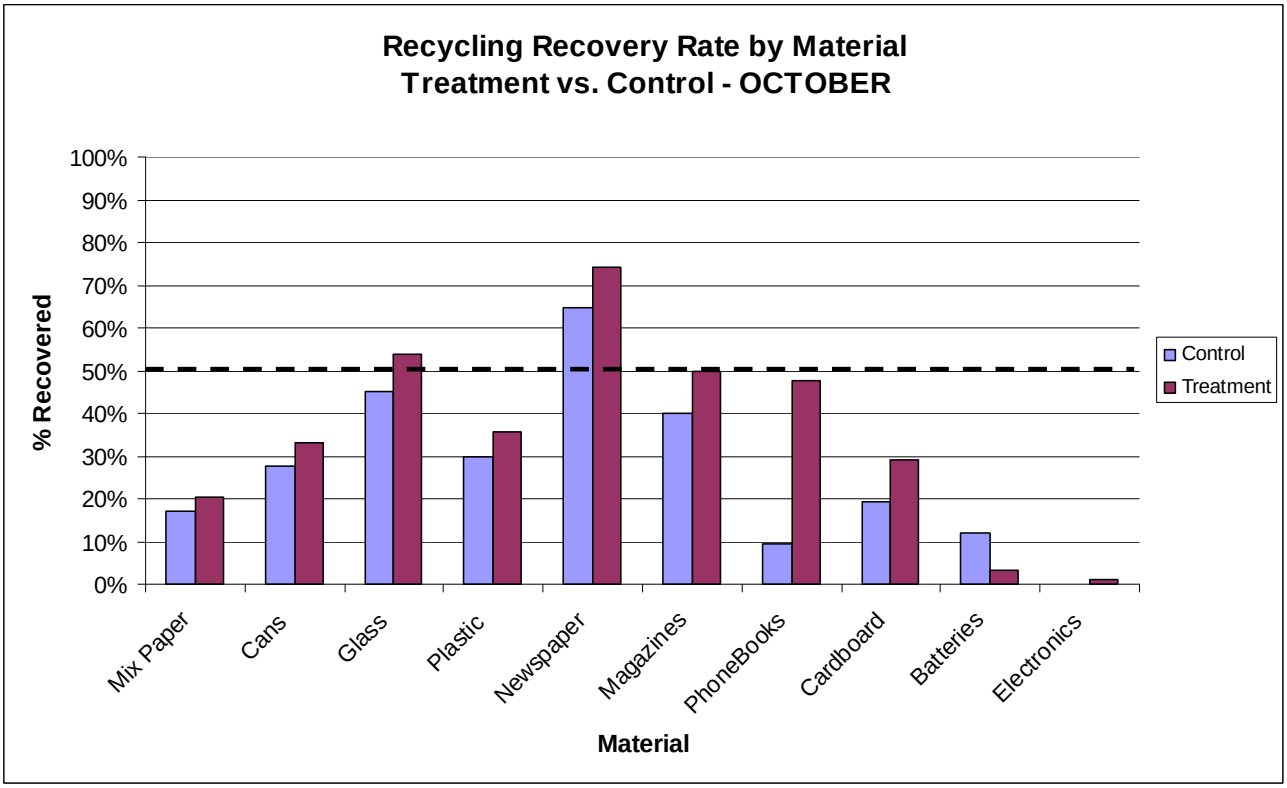
Note: The total sample for analysis was eventually reduced from 739 to 627 (308 in the treatment group and 319 in the control group). Addresses were excluded from the study because there was no recycling in the recycling or garbage containers at these addresses in either May or October or because a majority of the residents at an address moved after the May collection but before the October collection.

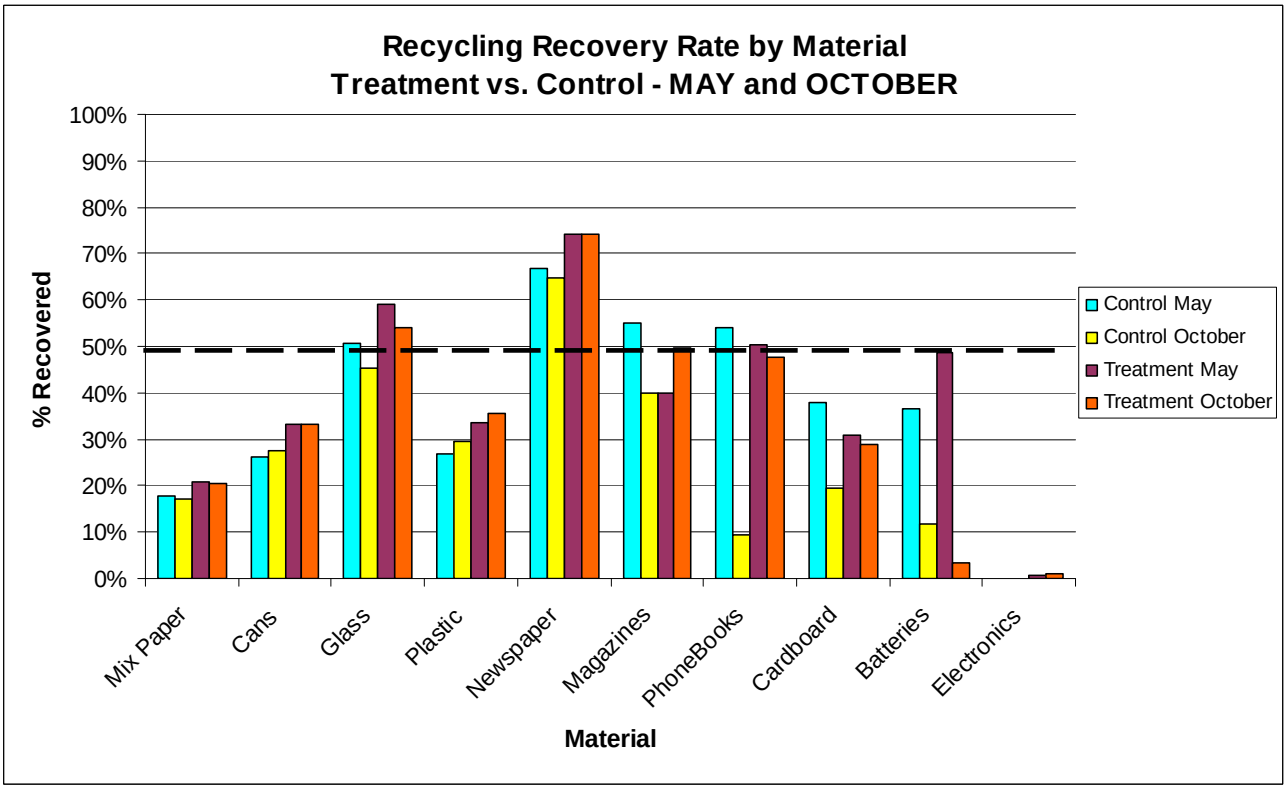
The education effort was expected to be more effective for those who were interviewed personally and especially effective for those who pledged to improve their recycling, however, there is resident self-selection in both groups. Consequently, for these sub-groups, the observed difference in differences represents a mixture of this selection process and the treatment effect.

Recycling recovery rates tended to decline from May to October for both treatment and control groups. None of the tests showed that the education had a statistically significant positive effect on recycling behavior, although results for **renters** and **magazines** are suggestive of an improvement. Small sample sizes made it unlikely that the tests of significance would identify improvements.

The following charts show the recovery rates for the treatment and control groups both before (May) and after (October) the education. While the charts indicate higher recovery rates for the treatment than for the control group for several materials in October, the differences were not large enough to be statistically significant.[6] For a more detailed discussion of the education outreach, see Appendix D.

[6] 5 percent significance


Recycling Recovery Rate by Material
Treatment vs. Control - OCTOBER
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Recovered
Mix Paper
Cans
Glass
Plastic
Newspaper
Magazines
PhoneBooks
Cardboard
Batteries
Electronics
Material
Control
Treatment


Recycling Recovery Rate by Material
Treatment vs. Control - MAY and OCTOBER
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Recovered
Mix Paper
Cans
Glass
Plastic
Newspaper
Magazines
PhoneBooks
Cardboard
Batteries
Electronics
Material
Control May
Control October
Treatment May
Treatment October

D. Material Highlights – Organics, Batteries, Consumer Electronics, and HHW

Along with one of the primary objectives of determining current recycling recovery rates, we were very interested in assessing the amount of organic material in the waste stream. This fraction of the waste stream had not been measured for its potential recovery rate since the last state MSW composition study in late1999. The interest in this material is increasing due to the County's expanded efforts to reduce the volume of MSW by diverting more organic material to composting. In this study, organics consisted of all the non-recyclable paper in addition to food waste, and, in some cases, yard waste.[7] Yard waste was included in this study as organics when it was found in the waste cart, even though it is technically banned from disposal in MSW. From anecdotal observations, yard waste was a very insignificant amount.

There were no organics found in recycling bins in May, and only 71 pounds were found in October. The percentages of organics found in weekly waste carts were fairly consistent as shown below:

May and October Organics

Time Period	Total Weight of Waste Carts	Weight of Organics	% Organics of Total Weight
May Week 1	25,822	7,725	29.92%
May Week 2	29,751	9,067	30.48%
October Week 1	26,802	9,033	33.70%
October Week 2	28,234	9,418	33.36%

The following tables highlight the weights for batteries, consumer electronics, and HHW along with their respective percentages of total weights in garbage and recycling. Although relatively small amounts of these items were found in waste carts, these are the items that pose a greater risk to human health and the environment. Both the City of Minneapolis and Hennepin County strive to educate residents about properly disposing of these potentially hazardous items.

Sorted Batteries, Consumer Electronics, and HHW

May 2006							
(Note: all weights are in pounds)	**Total weight all materials**	**Batteries weight**	**Batteries % of total weight**	**Consumer Electronics weight**	**Consumer Electronics % of total wt**	**HHW weight**	**HHW % of total weight**
Garbage Wk 1	25,821.90	12.59	0.05%	213.85	0.83%	61.35	0.24%
Recycling Wk 1	4,762.69	3.48	0.07%	0.70	0.01%	0.00	0.00%
Total Week 1	**30,584.59**	**16.07**	**.05%**	**214.55**	**.70%**	**61.35**	**.20%**
Garbage Wk 2	29,751.19	13.54	0.05%	157.80	0.53%	33.10	0.11%
Recycling Wk 2	5,119.75	14.45	0.28%	0.00	0.00%	0.00	0.00%
Total Week 2	**34,870.94**	**27.99**	**.29%**	**157.80**	**.53%**	**33.10**	**.11%**
Grand Total	**65,455.53**	**44.06**	**.41%**	**372.35**	**1.37%**	**94.16**	**.14%**

[7] Disposable diapers and large pieces of wood were not included in the organics category, as was the case in the state study. See Appendix A for a more complete description of organics.

October 2006							
(Note: all weights are in pounds)	**Total weight all materials**	**Batteries weight**	**Batteries % of total weight**	**Consumer Electronics weight**	**Consumer Electronics % of total wt**	**HHW weight**	**HHW % of total weight**
Garbage Wk 1	26,802.11	20.89	.08%	404.08	1.51%	129.67	.48%
Recycling Wk 1	4,422.60	1.06	.02%	.58	.01%	.00	.00%
Total Week 1	**31,224.71**	**21.95**	**.07%**	**404.66**	**1.3%**	**129.67**	**.42%**
Garbage Wk 2	28.234.29	38.66	.14%	354.33	1.25%	127.78	.45%
Recycling Wk 2	5,116.07	3.82	.07%	.61	.01%	2.37	.05%
Total Week 2	**33,350.36**	**42.28**	**.13%**	**354.94**	**1.06%**	**130.15**	**.39%**
Grand Total	**64,575.07**	**64.23**	**.10%**	**759.60**	**1.18%**	**259.82**	**.40%**

After the batteries, consumer electronics, and HHW had been weighed for this study, they were set aside for further characterization by County staff and local staff from the Rechargeable Battery Recycling Corporation (RBRC). RBRC was interested in determining the number and type of rechargeable batteries found in waste carts since they administer a national rechargeable battery recycling program. The results from this study will help them assess their public education efforts regarding the program in our region and help the County and City focus education efforts on the specific items found during the sort.

Winona County

From: Anne Morse [AMorse@Co.Winona.MN.US]
Sent: Wednesday, March 04, 2009 3:56 PM
To: Sandhei, Peder
Subject: Comments on container recovery from a rural Minnesota county

Peder,

Thanks for the opportunity to provide written comments on what more counties can bring to the table to improve beverage container recovery.

With budget deficits of historic proportions confronting state and local governments, there is literally no way that we are able to invest additional dollars in recycling services. Instead, we consider ourselves lucky to be able to hold the line on current operations. At this point in time, we are focused on attempting to wring every possible increased efficiency out of our current system.

We are also challenged to maintain current operations with fewer staff members, as a delay of new hires has been implemented in our county, and a hiring freeze is being discussed.

With these enormous constraints on our ability to grow our recycling programs, we must look to new and innovative ways of capturing our materials that don't rely on increased investment from local governments.

Sincerely,

Anne Morse
Winona County
507.457.6468

Minnesota Beverage Association

Background: After 4 meetings and 4 conference calls on how to increase the recycling rate of beverage containers, the MPCA is requesting the Minnesota Beverage Association and other groups to write a paragraph indicating which activities from the spreadsheet MBA would play a role in and which activities we would support but maybe don't have a direct role. Therefore, I have listed below by sector those items we would play a role in and those we would actively support.

An important point to restate that has been discussed at all the meetings is the difficulty with the data and the recycling rates. It was accepted by the group that we would not be able to prove attainment of 80% recycling rate for beverage containers without massive expenditure on data collection and that it would be far better to spend the money on programs. MBA did commit and did finish a study to determine number of containers available for recycling. That information will be shared in aggregate form with the MPCA shortly. The consensus of the group was to measure what we are and will be doing to improve rates- If we can count up the impact of new programs, we can at least measure that and show progress. With the extremely reduced resources of the State and others involved in this project, it is more effective to spend those resources on programs than on data collection.

Curbside

MBA will play a role in:

1. Education (Point of Sale/Point of Disposal)
a. MBA members will continue to have recycling messages on containers,
b. As a part of a comprehensive campaign will provide point of sale messaging such cooler door stickers, messages in our ads,
c. Others should be part of that campaign to be effective- haulers messages to customers, labels on bins, messages from city and counties- press efforts by MPCA. MBA can use its member's marketing expertise to assist.
d. The costs of such a program can be extensive- MBA's financial contribution here would have to be leveraged with the efforts of others.
2. Financial Incentives – Recyclebank-
a. MBA will continue to encourage members to be sponsors of Recyclebank,
b. MBA will target areas for ongoing "Get Caught" program, promotions at drop off centers
3. Organics Collection to Improve Sorting- MBA could piggy back in those areas where there is an organized campaign for composting- that would be a good time to increase our education efforts.
4. Track progress of programs and pilots, measure results of new initiatives
a. MBA members will be asked to report to Association their programs and efforts and then MBA could send the information to MPCA-
b. Focus group and market research- ABA executive summaries or other data could be forwarded to MPCA- ways to change behavior!
5. Help create peer pressure
a. this could be done through the education campaign, get caught, face book,

MBA would actively support:

6. Changes in Opportunity to Recycle legislation to set minimum standards for curbside programs to include economic incentives, parallel service, mandatory recycling, same day pickup, larger container sizes, and sustained education and outreach. MBA would not support disposal bans without these program enhancements to provide improved recycling access.

Multi Family

MBA will play a role in:

1. Dedicated container collection- Message in the Bottle

a. continue to support this program using money, bins, advertising through the MBA and through individual member involvement.

2. Education (Point of Sale/Point of Disposal)

a. MBA members will continue to have recycling messages on containers,

b. As a part of a comprehensive campaign will provide point of sale messaging such cooler door stickers, messages in our ads,

c. Others should be part of that campaign to be effective- haulers messages to customers, labels on bins, messages from city and counties- press efforts by MPCA

3. Financial Incentives- recyclebank
    a. MBA will continue to encourage members to be sponsors of Recyclebank,
    b. MBA will target areas for ongoing "Get Caught" program, promotions at drop off centers

4. if you sell beverage containers, you must provide a recycling containers,

a. we already work with our customers to provide recycling bins- how would this be mandated and enforced? Owner of property should get bins from recycler/waste hauler.

b. For multi-family does this mean if we have vending machines we should be providing recycling bins? It would be more effective to be a comprehensive recycling program for several materials coordinated with the recycler/waste hauler.

5. resource mgmt contracts- not sure what this means but similar to #8- recycling should be as commonplace waste contracts- a comprehensive approach to energy usage, all recycling, and waste reduction. We could play a small role? Education?
   WasteWise could provide this service under contract?

MBA will actively support:

6. Legislation to change Building Codes to Require recycling space and plans-
7. Legislation to extend Opportunity to recycle to multi-family and non-residential
8. Mandatory recycling and disposal bans only if accompanied by legislation to enhance recycling service and access.

Uncertain:

9. Apply Eureka Study Lessons- not familiar with these lessons.
10. reverse vending- there is not a good model for this that is cost effective.
11. truth in pricing/clear pricing systems- not sure what this would be.

Special Events/Public

Schools:

MBA will play a role in:

1. Enforce Public Entity Law

a. support that MPCA sends out a reminder letter to public entities of their expectation to recycle;

b. MBA will continue to encourage members through contracts with schools to provide for recycling assistance- this takes many forms based on the needs of the schools and the ability of the schools to sustain a program.

MBA will actively support:

2. Incorporate 3r's into curriculum, especially math and science

3. School District Solid Waste Plan for Recycling and composting

a. MBA could assist with MPCA and others meeting with MN School Board Assn. to educate public responsibility and best practices- Bob Meeks, bmeeks@mnmsba.org, 507-934-2450.

b. be part of their annual meeting and regional meetings

4. School success report cards- positive press

a. focus should be on average programs that can be duplicated with little effort and resources- more benefit than highlight top more expensive more extensive programs- or use average programs to send message that almost everyone is doing it- you should too.

5. others as they relate to commercial/retail

Events:

MBA plays a role in:

1. Dedicated container collection- Message in a Bottle

a. MBA will continue to partner when possible with this program through the Association and its individual members.

2. Enlist Volunteers to help at recycling stations
3. require recycling plans in event planning- event coordinator show proof of recycling efforts and contract with recycler/waste hauler. Bins and materials should be provided by the recycler/waste hauler. MBA will also continue to assist with bins. MBA would like to work with the city/county so that the bins can be stored and reused by the city/county for other events.
4. fundraising – cans for kids-

a. MBA will continue to partner with this program and similar such programs.

Parks and Recreation

MBA plays a role in:

1. Adopt a park

a. Individual members of MBA will continue to support these programs

2. provide infrastructure- make bins available

a. While the recyclers/waste haulers should play the primary role in providing the necessary and appropriate bins and the city/counties should provide the maintenance of the program, MBA will continue to partner on these programs.

MBA will actively support:

3. enforce public entity law
4. push buy recycled/recyclable

a. beverage containers are recyclable. If this means cups- that is different issue.

Commercial/Retail

MBA will play a role in:

1.Company Sustainability Plans- beverage industry does this already- MN Chamber and WasteWise should strongly promote this to its members.

2. Dedicated Container Collection- MBA will be working with RAM to try to find a way to take Message in a Bottle to 10 more cities in the state in 2009.

3. Education (point of sale, point of disposal)

a. MBA members will continue to have recycling messages on containers,

b. As a part of a comprehensive campaign will provide point of sale messaging such cooler door stickers, messages in our ads,
c. Others should be part of that campaign to be effective- haulers messages to customers, labels on bins, messages from city and counties- press efforts by MPCA.
4. Financial incentives- support expanding Recyclebank or similar programs to commercial, should expand single stream recycling to commercial- not sure how MBA could help besides continuing to sponsor Recyclebank.
5. If you sell beverage containers you must provide recycling container. This is not logical for retail- it should be if there is consumption at the retail site, recycling should be provided. Just because they sell beverages doesn't mean there is a need for recycling on site. Containers should be provided by the recycler/waste hauler as a part of that contract. This does not have to mean that the beverage supplier provides the bins.
6. Organics collection to improve sorting- if there is a concerted effort – then maybe MBA and recyclers/waste haulers could piggy back with an education campaign for overall recycling.

MBA will actively support:
7. Disposal Ban- this would be very effective in the commercial retail area but there are issues with enforcement. NC liquor/bars model might be a good one to start with?
8. Extend Opportunity to Recycle to non-residential- this would be very effective- requires more comprehensive recycling not just beverage containers.
9. Mandatory recycling. Similar to item above- MBA supports this especially if it is comprehensive including up to three products, not just beverage containers.
9. Property tax credit for business recycling- tax credits should relate to solid waste tax- maybe reduce the commercial rate from 17 to 16% based on the amount of recycling?
10. SCORE money to support business recycling- since the majority of solid waste taxes is paid by commercial entities – counties and cities should be encouraged to spend at least 20% of their SCORE funds assisting commercial recycling- MPCA should track the city and county efforts undertaken right now- maybe could compile a best practices.
11.Truth in Pricing.

St. Croix County

Jennifer Havens, St Croix County (Wisconsin)

Specialty:

Schools:
St Croix County (SCC) provided a link to our school guide for others to use. It is not a perfect guide but something to bring to the table. It is helpful in working with the schools to also bring their haulers into the discussion.

Events & Parks/Rec
In 2009, St Croix County has identified Special events as a priority focus for the recycling program. The plan is to purchase up to 100 temporary recycling containers and a trailer to transport them and make them available for use at events. SCC is partnering with Dunn County in order to cost share the cost of the bins and staff for the program. The counties are also working with the municipalities that oversee the parks to include recycling guidelines for events and contract language for organizations that use the parks. Information/education/best practices materials will also be developed to assist event organizers with volunteers, placement of containers and signage.

Note: SCC may be adjusting its event recycling plans and scaling back a bit with recent budget reductions that have come from the state.

Commercial/Retail:

In WI, our state law bans anyone from disposing of recyclables in a landfill, including businesses, so if a business is found with recyclables in their trash they can be cited by the state and in many cases, where local ordinances exist, by a local responsible unit. The state language is below. The term 'person' means any individual, corporation, limited liability company, partnership, association, local governmental unit, as defined in s. 66.0131 (1) (a), state agency or authority or federal agency.

287.07(3)
(3) General disposal restrictions. Beginning on January 1, 1995, no person may dispose of in a solid waste disposal facility or burn without energy recovery in a solid waste treatment facility in this state any of the following:
(a) An aluminum container.
(b) Corrugated paper or other container board.
(c) Foam polystyrene packaging. – I think this was repealed
(d) A glass container.
(e) A magazine or other material printed on similar paper.
(f) A newspaper or other material printed on newsprint.
(g) Office paper.
(h) A plastic container.
(i) A steel container.
(j) A waste tire, as defined in s. 289.55 (1) (c).
(k) A container for carbonated or malt beverages that is primarily made of a combination of steel and aluminum.

Convenience Stores: In 2008, SCC and 5 other counties in Western WI worked on c-store recycling as a priority project. We share a recycling assistant who inventoried the stores in all 6 counties, developed marketing materials for the program, provided stores with assistance in establishing a program and providing referrals to county recycling coordinators for stores that were not able to achieve compliance. The counties were able to due this through the Recycling Efficiency Incentive grant from the state of WI. The challenges of this program were that most stores just wanted to know what the bottom line was for compliance and weren't very interested in the other program components (posters, education, etc). In some cases enforcement was the only way.

Truth in pricing: SCC is proposing the following language in the new draft ord:

Rates and Services

Haulers shall include in the base rate for trash collection the collection cost for recyclable materials. Haulers shall not deduct any amount from a customer's rate if the recycling services are not used. Haulers shall include in all customer invoices a cost breakdown for trash and recycling collection services.

Haulers can seek an exemption from a. above for any person or persons within a service area if reasonable access to a drop-off facility or alternate collection system for the collection of recyclable materials is available at least two days each month for a minimum of five hours each day. Haulers shall apply to the Planning and Zoning Department for an exemption on forms provided by the Department. A waste audit shall be conducted in conjunction with review and approval.

Haulers shall charge all residential customers on the basis of volume of trash collected, which shall be measured by the volume capacity of the container used by the customer.

All residential charges shall be based upon a volume-based rate system. The minimum level of service shall be 45 gallons or less per week with additional volumes offered at the hauler's discretion.

In offering or arranging for services, a hauler shall provide reasonable notice of the full range of container sizes or levels of services offered by the hauler, and shall provide to each customer that customer's requested container size or level of service.

Nothing in this section shall be construed as prohibiting any hauler from providing separate pricing for special collection of bulky items, yard waste, contaminated recyclables, unscheduled pick up of trash, or trash volume that exceeds container sizes or levels of service, such as bags, boxes, or bundles.

Note: I am attaching the link to our draft recycling ordinance. This language has not been approved, but it is the direction we are heading. The draft is not for public consumption, but there is some value in what we have so far. Take it for what it is worth. You can review the draft amendments at: http://www.co.saint-croix.wi.us/Departments/Recycling/events.htm

Association of Recycling Managers

Disposal Ban. Help with education through newsletters, websites and other means, limited ability to enforce

Education (Point of Sale/Point of Disposal). Willing to promote at municipal facilities that sell beverages and at disposal points in municipal facilities. Willing to promote to businesses, but have limited resources to do so.

Financial Incentives (Recyclebank, TOMRA, Rebates, Carbon Trading).
Limited ability to facilitate programs - not much money. However, when possible willing to strike public/private partnerships

Mandatory Recycling. Help implement, but lack staff to fully enforce

Organics Collection to Improve Sorting. Help implement on a city by city basis - meaning if a city is interested

Promote Social Ethics. Help implement. Have partnered with Rethink Recycling and Recycle More. Willing to continue with these . and new partnerships

Pay as you throw. Help implement on a city by city basis - meaning if a city is interested

Communication between Government and Haulers. Help implement. Willing to attend workshops and forums and sit on stakeholder panels, etc.

Feedback Coops. Not sure what this is.

Track progress of programs and pilots, measure results of new initiatives. Help implement on a city by city basis - meaning if a city is interested

Help Create Peer Pressure. Help implement. Willing to implement programs developed through partnerships such as Rethink Recycling and Recycle More

Increase Container Size. Help implement on a city by city basis - meaning if a city is interested

Parallel Access for Trash and Recycling. Can implement code requirements

Same Day Collection. Can zone city to do so in cities with the political will

Conscientious in one area begets it in others (New/Fresh helps strategies, programs and messages). Always willing to talk trash… and recycling.

Dakota County

In follow up to our meeting last Friday, below please find Dakota Counties perspective as it relates to the four curbside program goals:

Organics Collection to improve recycling - Many folks would like the opportunity to compost there food waste in concert with their current recycling efforts or to build on their recycling efforts by composting. There are however, impediments to this program such as plastic bag contamination at the composting facilities and availability of geographically accessible composting sites. By offering up more opportunity for composting, this would allow more opportunity for recycling for folks that want to do more for the environment.

Same Day Collection – Promotes increased participation. Residences prefer to only have to set their garbage and recycling out one time and not have to set out on different days. Separate day collection can be very confusing to folks such as the elderly and can cause hardship to those that may have some ailment or medical condition.

Increase Container Size – We offer up tote size recycling containers to all residences in Dakota County. Many haulers however offer up larger size containers such as 64 and 90 gallon. By allowing customers options without penalty, to have a larger container, would allow for more curbside recycling. The larger the recycling container provided to the resident, the greater the volume of recyclables placed in the container by the resident.

Farmington Study - Dakota County and Farmington are conducting a study to measure the difference in participation and the volume per household of collected recyclables that has occurred with the introduction of single stream recycling pickup system. In December 2008 a consultant, with County staff help, directly observed resident participation and obtained sample weight measurements from Farmington households under the city's previous weekly, multi-sort recycling program using an 18 gallon curbside bin. In February 2009, staff observed participation and obtained sample weights after Farmington households switched to the new single stream program using a 64 gallon recycling cart. Data analysis is underway and results are expected to be available by the end of March 2009.

Some additional comments from Dakota County on the Curbside Program:

- **Increased and innovative publicity** - it seems there is a need for more public awareness on the importance recycling beverage containers – especially cans. How about some creative, dramatic publicity campaign that gets attention to the subject

- **Studies** – What the heck is going on out there – there is a lack of information and another study along the lines of the 2006 Minneapolis/Hennepin County is required. We suspect as much as 50% of discarded aluminum cans and a higher % of plastic beverage containers are going straight into the trash – yet we cannot document this very well. Additional studies must be done to establish baselines to determine if increased publicity has the desired effect.

- **Financial incentives** – the MBA might consider providing a bonus amount for a school or church fund raising event. The target would be to recycle all types of beverage containers and it could be structured similarly to old time paper drives.

- **Enhance Hauler Licensing Requirements - Label Recycling Carts with What Can be Recycled – (Curbside and Commercial) –** Metro counties and cities license haulers and have different requirements, but model language for consistent labeling on recycling carts of what can be recycled would be beneficial and likely incorporated. Most city/Dakota County licensing requirements require only haulers to include hauler contact information, leaving the customer confused on which container is for trash and which is for paper vs. container recycling.
- **Focus Resource Management Contracts on Larger Schools/Colleges, Medical Industry and other Large Commercial Sectors.** Resource Management contracts appear to be most successful in larger organizations, where more waste is generated, and there are larger opportunities for waste reduction, reuse, recycling and economies of scale for other "value-added" services. Larger organizations also tend to have internal "environmental coordinators" that work on environmental regulatory and abatement issues, and having internal commitment increases the likelihood that a Resource Management program will be successful.
- **Enforce Public Entities Law** – Education should be targeted first for there is still great need to know what to recycle (education campaign is needed) along with a program to expand on the current recycling infrastructure (more recycling containers).

Rebecca A. Kulas
Environmental Management Specialist
Dakota County Environmental Management Department
14955 Galaxie Avenue
Apple Valley, MN 55124
952.891.7043

www.co.dakota.mn.us/environmentroads

Remember to visit the Recycling Zone!

Hilltopper Refuse and Recycling Service Inc.

Dedicated Container Collection (Message in a Bottle. For Residential recycling, we have dedicated curbside recycling bins that residents must use.

Disposal Ban. Wisconsin has a landfill ban on recyclable materials (NR 544)

Education (Point of Sale, Point of Disposal). Most municipalities we serve educate their residents on the recycling program. We offer support services if more information or if additional information is needed. We have developed many recycling info guides that are used by the municipalities.

Extend Opportunity to Recycle to Non-Residential. As recycling haulers, we offer recycling opportunities to **ALL** who want to reduce/reuse and recycle.

Financial Incentives (Recyclebank, TOMRA, Rebates). Financial incentives fall into avoided disposal costs and cheaper container costs for recycling containers vs. refuse containers.

Mandatory Recycling. Most municipalities have mandatory recycling ordinances on the books.

Organics Collection to Improve Sorting. Only few curbside yard waste collection systems in place. No Source Separated Organics yet in place.

Northbridge Comments

One important outcome of this process should be to advance ideas about possible legislation to support the goals and objectives of increasing recycling. In the areas of curbside and multi-family at least there appear to be several opportunities for amending existing legislation to promote best practices and modernize the original opportunity to recycle legislation that put recycling infrastructure into place in Minnesota in the first place.

Curbside

Nearly all of the items in the curbside matrix are multi-material focused, rather than solely focused on beverage container material. That is not surprising given what other initiatives in the past have found – that focusing on a particular waste stream segment ultimately benefits all materials. The Curbside Value Partnership, for example, was initially conceived to target aluminum cans, but evolved into a broader project targeted at all curbside material.

Consolidating several of these multi-material initiatives, the matrix identifies a series of best practices for curbside that should, at the very least, be a recommendation of this group and may provide the basis for legislation. For example, the definition of an acceptable curbside program could be expanded to include a minimum number of these practices. Items 1 and 2 should perhaps be required of all programs. Alternatively, adopting these practices might qualify communities to receive additional funding or a higher tier of funding from existing sources.

The best practices identified are:

1. Economic incentives – households must have an economic incentive to reduce disposal of household trash and/or encourage waste reduction and recycling of all material types. This could be provided through adoption of variable rate programs for trash ("pay as you throw" or EPA's "SMART" initiative) as through implementation of some type of sustainable recycling rewards program (e.g., RecycleBank or Get Caught Recycling).

2. Parallel service – households with trash collection service must receive recycling collection at no additional cost (*i.e.*, embedded in trash rates)

3. Mandatory recycling

4. Same day pickup – trash and recycling

5. Increased container size – minimum size criteria for recycling containers

6. Education and outreach – demonstrate sustainable outreach and education programs

The state would track compliance with these through existing reporting and would track changes in overall tonnage recycled each year associated with changes in program design. This would institutionalize the measurement of changes resulting from the new standards.

Multi Family

There appear to be two possible legislative initiatives that could support the multi-family area:

- Change building codes to require recycling space and plans. State codes could require new construction and substantial renovations to include provisions for collecting recyclables in parallel with trash. If internal infrastructure is installed (e.g., chutes), recyclables should have their own chute. If carts or similar collection containers are placed on floors or in parking areas, recycling should be available in the same location, with appropriate signage and instruction.

- Extend Opportunity to Recycle to multi-family and non-residential dwellings. Pairing up with changes to the building code, building owners and property managers should be required to comply with a tailored version of the opportunity to recycle law. This should ensure:

    - Parallel access – opportunity to recycle at the same location and at the same time that trash is disposed at no additional cost (i.e., embedded in overall waste management rates)
    - Education and outreach – sustainable education programs for tenants and residents
    - Adequately sized containers – recycling receptacles/dumpsters sized to accommodate materials
    - Minimum material – require collection of cans, plastic bottles, newspaper, cardboard, mixed paper, (glass? other?)

Commercial/Retail

Extending the Opportunity to Recycle to non-residential locations following a similar plan to the multi-family proposal. Building owners and property managers should be required to comply with a tailored version of the opportunity to recycle law. This should ensure:

- Parallel access – opportunity to recycle at the same location and at the same time that trash is disposed at no additional cost (i.e., embedded in overall waste management rates)
- Education and outreach – sustainable education programs for tenants
- Adequately sized containers – recycling receptacles/dumpsters sized to accommodate materials
- Minimum material – needs to be tailored to business types
    - Licensed beverage sellers (bars, restaurants serving alcohol) required to collect beverage containers, cardboard
    - Offices (minimum size requirement) required to collect office and mixed paper
    - Etc.

Wisconsin Department of Natural Resources

ALL SPECIALTY SECTOR VENUES:

Enforce Public Entity Law/Mandatory Recycling: Wisconsin regulations include a provision similar in effect to Minnesota's Public Entity Law. All owners of non-residential properties and facilities are required by local ordinance in Wisconsin to provide for the recycling at those facilities of the paper and container materials subject to Wisconsin's landfill bans. "Non-residential facilities and properties" is defined broadly to mean all commercial, retail, industrial, institutional and governmental facilities and properties, including those under construction, and special events of all types (s. NR 544.03(21).

Because Wisconsin's recycling regulations are generally administered through local ordinances, the enforcement of the non-residential recycling requirements is a local government responsibility. Local units are required to maintain compliance assurance plans describing their enforcement procedures. In addition, the Wisconsin DNR conducts annual program reviews of a subset of local government units to ensure (among other things) that local recycling ordinances are being adequately enforced.

Education (Point of Sale, Point of Disposal): Point-of-sale education relies on cooperation and resources (e.g., materials, shelf space) from the retailer and the distributor providing the product to the retailer. We are not aware of any broadscale point-of-sale recycling education or advertising campaigns in Wisconsin for beverages within the specialty sector, although this approach has likely been tried at individual venues. This appears to be an opportunity for increased communication in support of recycling.

Likewise, point-of-disposal education (innovative or intensive signage) is an area that could be improved. Current signage is generally improvised by the venue or event host.

Financial Incentives: It might be possible to set up a deposit system at an individual event or venue, similar to airport luggage carts. We are not aware that this concept has been tried in Wisconsin for beverage containers.

If You Sell Beverages You Must Provide A Recycling Container: This requirement is effectively in place in Wisconsin.

SCHOOLS:

Incorporate 3R's into curriculum, especially math and science: Wisconsin DNR has a number of programs that help reinforce recycling in school curricula. The programs are voluntary but are relatively popular, and include "Wee Recyclers" arts and crafts for preschools, a variety of recycling activity guides for grade schools through high schools, and "Keep It In The Loop" activity and learning programs for grades K-3 and

4-8. Wisconsin does not have a statewide curriculum requirement for environmental education.

School District Solid Waste Plan for Recycling and Composting: Wisconsin does not have a program to require or review solid waste plans for school districts, and we are not aware of any local government requirements along these lines. All schools in Wisconsin are required to offer recycling under local ordinance as one of the required components of an effective recycling program.

School Success Report Cards: Wisconsin DNR, in collaboration with the state Department of Public Instruction, administers a voluntary learning and achievement program called "Green & Healthy Schools" which includes recycling among several other measures of environmental health and sustainability in elementary, middle and high schools. There are currently 19 certified Green & Healthy Schools, and a number in the process of obtaining certification (a three-year process).

EVENTS:

Dedicated Recycling Container (e.g., Message in a Bottle): Numerous events have adopted distinctive containers for recycling, including the Wisconsin State Fair. In addition, several counties have purchased recycling bins which they make available to event sponsors at no charge.

Enlist Volunteers to help at Recycling Stations: This strategy has been tried at certain events in Wisconsin. In 2008, UW-Madison student volunteers were enlisted to man recycling stations at Camp Randall Stadium in Madison during NCAA football games. This approach is obviously very labor-intensive and difficult to sustain.

Require Recycling Plans in Event Permits: We are not aware of any Wisconsin municipalities that have adopted this approach.

Fundraising (Cans for Kids): This may be happening in Wisconsin, but we are not aware of any specific examples.

PARKS AND RECREATION:

Adopt a Park: Many Wisconsin municipalities and state parks operate Adopt-A-Park programs or other "Friends"-type programs, which typically include litter pickup.

Provide Infrastructure (Make Bins Available): The availability of recycling bins in municipal parks and recreation areas (e.g., golf courses, softball diamonds, soccer complexes) in Wisconsin is spotty at best. This represents an opportunity to reinforce recycling behaviors away from home. There may be some sponsorship opportunities in this area.

Enforce Public Entity Law: [see above]

Push Buy Recycled/Recyclable: [?]