Development of a Social Marketing Strategy for Waste Reduction in Sonoma County

Final Report

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Contents

An essential first step in the devel opment of effective programs is to un derstand the factors that lead individuals to engage in waste reduction activities.

EXECUTIVE SUMMARY

The Sonoma County Waste Management Agency (SCWMA) undertook a community-based social marketing pilot in the Town of Windsor. The purpose of this pilot was to increase diversion of paper fiber through the existing curbside collection programs. The first phase of this project consisted of four discrete tasks: a literature review; behavioral observations; focus groups; and a telephone survey. The second phase of this project entailed developing a community-based social marketing strategy, testing the strategy via focus groups and a pre-pilot and then implementing the pilot and evaluating its success. Highlights of this process are briefly described below and in detail in the main body of the report.

Literature Review

In order to effectively promote waste reduction in Sonoma County, an essential first step is to enhance understanding of the factors that lead individuals to engage in waste reduction activities. Environmental psychologists have demonstrated that the factors leading individuals to engage in one form of responsible environmental behavior, such as recycling, are in fact quite different from the factors that lead individuals to engage in other forms of responsible environmental behavior, such as reducing lawn watering. Further, this research demonstrates that even within a class of responsible environmental activities, such as waste reduction, very different sets of factors emerge as being important. That is, different factors motivate or impede an individual from curbside recycling compared to backyard composting. Since the factors that lead individuals to engage in waste reduction are activity specific, the first step of this project involved a review of the waste reduction literature. This review ensured that from the outset, the project had a firm foundation based upon the most current research in this area.

Several demographic factors have been explored as potential determinants of recycling. Age has been found to be related to recycling levels, with older participants generally recycling more (Vining & Ebreo, 1990; Lansana, 1992; Derksen & Gartrell, 1993). Further, higher levels of education and income have also been associated with greater participation (Jacobs, Bailey, and Crews, 1984).[1] In addition to demographic predictors, motivations for engaging in recycling have also been examined. Factors that have been explored include environmental concern, personal values of frugality, social influence, commitment to one's community, financial rewards, having friends and neighbors who recycle, peer pressure, and conservation of natural resources (Scott, 1999). Of these various factors, having friends and family who recycle often has been found to be a powerful determinant of recycling. For recyclers, concern for the environment and conservation of natural resources seem to be more important motivations than financial rewards or social pressure. However, social pressure can increase participation levels of non recyclers (De Young, 1990 and Gamba & Oskamp, 1994).

Elements of effective recycling programs have also been explored. The most important of these include enhancing knowledge of what can be recycled, making recycling convenient, providing incentives to recycle and gaining commitments to participate.

Behavioral Observations

Concurrent with the literature review, behavioral observations were conducted in the Town of Windsor. These observations, which were conducted with 1300 homes over a period of 5 weeks, provided a baseline against which the success of subsequent social marketing strategies could be assessed. This step involved:

- the preparation of a database containing a subset of Town of Windsor residential customers;
- development of a survey form to categorize and record various recycling behaviors;
- conducting a garbage and recycling analysis to objectively characterize current residential waste;
- measurement by weight of the amount of garbage and recyclables collected; and
- recording the above information into a database for analysis.

Focus Groups

The literature review assisted in identifying issues to be explored further with residents of Sonoma County through focus groups. These focus groups allowed residents of the Town of Windsor the opportunity to explain in their own words the factors that influence waste reduction in their day-to-day life. In all, four focus groups were conducted. Two of these focus groups were conducted with residents who were pre-identified as active in recycling and separating yard waste from their garbage, while two focus groups were conducted with residents who were not active in these areas. In addition, two of the focus groups were conducted exclusively with women and two with men. In these sessions, a researcher selected by the SCWMA lead the participants through a previously prepared set of questions that focused the discussions on issues that the literature review revealed as important. Providing this structure to the focus groups ensured that all significant topics were addressed in each session. During each of the sessions, the researcher recorded the participants' observations. These observations were tabulated and sent to McKenzie-Mohr Associates for further analysis. Of the various issues explored in the focus groups, the following emerged as central to the effort to increase the recycling of paper:

- Participants were limited in their knowledge of what paper products can be recycled; and
- When asked what would make it easier to know what types of paper can be recycled, participants replied that they would like a comprehensive listing that can be posted on or near the container, providing a convenient and ongoing reminder.

Telephone Survey

Focus groups are an essential first step in the development of a survey instrument that can be administered to a much larger and more representative sample of Town of Windsor residents. While limited in scope by the number of participants and the qualitative nature of the information obtained, the focus groups nonetheless provided valuable information about what issues residents viewed as important regarding paper recycling. As such, the focus groups helped to ensure that a more comprehensive telephone survey would be well constructed and that the questions contained in the survey would be readily understood by the respondents.

Potential phone survey participants were pre-selected based upon the frequency with which recyclables were placed at the curbside in the pilot area in the Town of Windsor. The telephone survey consisted almost exclusively of close-ended questions that could be quantitatively assessed. In April 2001 331 households were contacted and asked to participate in the survey. Of these, thirty-eight percent (127) agreed to participate. While the telephone survey addressed a number of issues, or primary importance are the factors that positively influence and constrain engaging in paper waste reduction.

Participants were asked to name as many paper items as possible that can go in the recycling containers. Recall of fiber paper products that can be recycled was, with the exception of newsprint, very poor. There were a total of thirteen possible paper fiber recyclables. One percent of the active recyclers (households who during baseline observations were found to have their recycling and yard waste containers out frequently) mentioned six or more of these recyclables, 3% mentioned five, 10% reported four, 23% reported two or three, 33% mentioned one of the paper recyclables, and 6% did not report any. For the inactive recyclers (households who had these containers out less than five times), 5% reported six of the thirteen recyclables, 4% reported five, 7% reported four, 16% reported three, 33% reported two, and 30% reported only one of the paper recyclables. Five percent of the inactive recyclers did not mention any of the thirteen paper and cardboard recyclables.

Early in 2001a 24-page recycling guide was mailed to all households in the Town of Windsor. On the cover was a note mentioning that the booklet should be kept for future reference and is good until 2002. Respondents were asked whether they remembered receiving the "Recycling Guide" earlier

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that year. If they did, they were asked if they still had it, and how often they referred to it when they had questions about what could be recycled.

Seventy-seven percent of the active recyclers remembered receiving the guide and 55% of those individuals still had it. Significantly more active recyclers remembered receiving the guide. However, significantly more inactive recyclers kept the guide. The participants who reported that they still had the "Recycling Guide" were asked how often they referred to it when they had questions about what can be recycled. Thirty-four percent of the active recyclers and 12% of the inactive recyclers reported that they referred to the guide all or nearly all of the time and 24% of the active recyclers and 38% of the inactive recyclers reported that they never or almost never referred to it.

Strategy Implementation

After collecting five weeks of baseline data, the pilot area of 1300 homes was divided into three roughly equivalent areas based upon Wednesday, Thursday and Friday garbage routes in the Town of Windsor.

Drop-Off Only: Residents in this group had left in front of their door an assembled box with a letter and decal inside. The letter explained the pupose of the pilot and asked that the decal be placed on their paper recycling containers. Further, it requested that the box be used in any room of their house to recycle paper.

Drop-Off & Commitment: The third group received the same materials as the "Drop-Off" only group. However, prior to receiving these materials residents in this group were called and asked to make a commitment to participate in the pilot.

Drop-Off & Commitment: The third group received the same materials via a door-hanger bag that the "Decals and Paper Recycling Box" group did. However, prior to receiving these materials residents in this group were called and asked to make a commitment to review the sticker and place it on their recycling container and use the cardboard box to divert as much recyclable paper as possible.

Results Summary & Commentary

These strategies affected frequency of participation, amount of waste diverted, and the composition of waste. Households who were in the Drop-Off Only condition set-out their recycling container more frequently than did participants in the Control condition (66% versus 54%, respectively). While initial analyses suggested that the Drop-Off and Commitment pilot households did not differ from the Control pilot households in frequency of participation, further analyses revealed that those households who made a commitment did participate more frequently than those households who were not reached or did not make a commitment (63% versus 50%, respectively).

Households in the Drop-Off condition also diverted more waste. By weight, these households diverted 27% more recyclables following the introduction of the pilot than they had beforehand (a 15% increase relative to the Control group). While overall the Drop-Off and Commitment group did not divert more recyclables, given the differences in frequency of participation noted above, it is possible that a sub-set of households in this group did alter their behavior, but that these changes were masked by the larger group. Differences in this group would also be less likely to be observed due to the lower weight of material set out for garbage, yard waste and recycling in this pilot area. The average household in this group produced 86 pounds of garbage, yard waste and recyclables a week compared to 112 pounds for the Drop-Off pilot area. These differences suggest that the pilot areas may have differed demographically, and in particular in terms of size of household and/or family income.

The community-based social marketing strategies also had a significant impact upon the composition of waste generated by the three pilot areas. The weight of recyclable paper found in the garbage decreased by 12.8% for the Drop-Off group while it decreased by 8% for the Drop-Off and Commitment group. The control group reduced their recyclable paper content by a much more modest 2.7%.

Future Directions

Commitment strategies have been used effectively to increase a wide range of sustainable activities (see McKenzie-Mohr & Smith, 1999). While these strategies have been used effectively in other projects, they were less effective in this project than simply providing stickers and a box to households (differences between and within the pilot areas make it difficult to know with precision how the two strategy applications compare). Nonetheless, this pilot provides some useful information regarding using commitments to increase waste diversion. First, gaining commitments to place a sticker on a recycling container was no more effective than simply mailing them to the resident along with a cover letter (23% versus 26% of households, respectively, were observed with stickers attached to their containers during the five weeks of follow-up observations).

A likely more effective strategy, that is being piloted in Waltham, Massachusetts, is to have the sticker applied when the containers are set out at the curbside on collection day. In Waltham, 65% of residents were found to have placed their recycling container out at the curbside over the period of two weeks. Hiring individuals to directly attach the sticker to the containers would result in a 40% increase in the number of households who have a permanent recycling reference affixed to their container. Given the small percentage of households who keep and refer to recycling booklets that are mailed to them, the attachment of stickers is likely to be far more effective.

The decision to use telephone commitment strategies in this project was based upon pre-pilot data in which 100% of the residents contacted agreed to review the sticker and place it on their container. Further, 100% of those called agreed to accept the cardboard box for recycling paper. In follow-up calls to these homes 100% had reviewed the sticker, 75% had placed it on their recycling container and 68% reported using the box. During the actual pilot a smaller percentage (75%) committed to review the sticker, suggesting that the callers for the pilot were less persuasive than for the pre-pilot. These observed differences in obtained commitments suggests the importance of careful screening and training of callers to ensure that a high percentage of households are likely to make a commitment.

This pilot also indicates that while the provision of a cardboard box was part of an effective strategy to divert paper recyclables, the ongoing use of these containers will likely be determined by how aesthetically pleasing the container is. In the follow-up telephone survey only 25% were found to still be using the container.

There is potential to use stickers to promote both recycling as well as the proper disposal of household hazardous waste(HHW). Few residents are aware of where to take HHW. By providing this information directly on the sticker it is likely that both recycling and HHW capture rates can be significantly increased.

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LITERATURE REVIEW

The average North American generates 3.2 pounds of solid waste per day (Nyamwange, 1996). Although most people agree that recycling is good for the environment, they do not generally engage in behavior that is consistent with these beliefs. In fact, the most active half of recycling households contribute 80% of the total materials recycled (Poole, 1992). Recycling, which can involve washing, separating, sorting and bundling items is more inconvenient than simply throwing an item away. This perceived inconvenience may lead to disappointing voluntary recycling rates. Indeed, even where recycling is mandated, people often do not recycle optimally (Werner & Makela, 1998).

Accordingly, it is important to understand the factors that are associated with effective recycling programs. Several demographic factors have been explored as potential determinants of recycling. Age has been found to be related to recycling levels, with older participants generally recycling more (Vining & Ebreo, 1990; Lansana, 1992; Derksen & Gartrell, 1993). Further, higher levels of education and income have also been associated with greater participation (Jacobs, Bailey, and Crews, 1984).[1] In addition to demographic predictors, motivations for engaging in recycling have also been examined. Factors that have been explored include environmental concern, personal values of frugality, social influence, commitment to one's community, financial rewards, having friends and neighbors who recycle, peer pressure, and conservation of natural resources (Scott, 1999). Of these various factors, having friends and family who recycle often has been found to be a powerful determinant of recycling. For recyclers, concern for the environment and conservation of natural resources seem to be more important motivations than financial rewards or social pressure. However, social pressure can increase participation levels of non recyclers (De Young, 1990 and Gamba & Oskamp, 1994).

Elements of effective recycling programs have also been explored. The most important of these are described below.

Information

The distribution of information through such avenues as flyers, booklets and the mass media is the most common intervention to increase recycling. These strategies are based upon the assumption that by making people more knowledgeable about what is recyclable and how they should prepare recyclables, they will be more likely to recycle (Schultz, 1998). Knowledge of recycling programs, including where and what type of materials can be recycled, has been found to be an important factor in determining participation (Scott, 1999). Further, approximately 20% of individuals do not participate simply because they do not understand the program (Martinez & Scicchitano, 1998). However, programs that have attempted to increase participation levels by providing information alone have produced mixed results and often show weak effects (Schultz, 1998). This is not to suggest that providing information is unimportant, only that information alone is often insufficient in fostering behavior change.

Incentives

Providing monetary incentives is based upon learning theory, which suggests that external rewards will cause a behavior to become more appealing (De Young, 1993). Accordingly, it is assumed that people will be more likely to recycle if there is financial benefit associated with their participation, such as reduced cost for garbage collection. In general, financial incentives have been shown to be very effective in increasing recycling capture rates, with rates often doubling (McKenzie-Mohr & Smith, 1999). Financial incentives, it appears, are most likely to be effective for individuals with less positive pro-environmental attitudes (Schultz & Oskamp, 1996).

Framing

Another approach to encourage compliance and participation, and to educate individuals about recycling programs is to design effective public messages. A positively framed message emphasizes the benefits associated with compliance while a negatively framed message stresses the expenses associated with noncompliance (Scheer & Stern, 1992). A positively framed message has a better chance of changing beliefs than a negatively framed one because the latter is associated

with the negative consequences of failure to recycle which may provoke defensiveness and reactance in the individual (Lord, 1994). Overall, increased recycling participation may be most affected by a positively framed message in the mass media and a negatively framed personal appeal among acquaintances (Lord, 1994).

Prompts

Often signs and brochures are used in recycling programs to provide information and encourage recycling. Signs must be especially noticeable, clear, and memorable to be effective. They should be large, designed to attract attention and use a font easily read from a distance. The message should be short and easy to read with the main message in a larger font size and very specific (Werner et al., 1998). For recycling, using a picture or a sample of the actual object on the sign also helps to facilitate comprehension, particularly when language may be a barrier to participation. Signs should suggest behaviors that are easy and convenient, be very specific, say exactly what should/should not be done, and be near the requested behavior (Geller, 1989 and Stern & Oskamp, 1987 as cited in Werner, Rhodes & Partain, 1998).

Commitments

Using written commitments to encourage people to recycle is another method that has met with success. Research has shown that commitments produce high rates of immediate participation which are often maintained in long-term follow-ups (Werner et al., 1995). Commitments can be used alone or in combination with other interventions and can be individual or group, public or private, and written or verbal. Individual commitments have been shown to be more effective than group commitments, and public commitments are generally more effective than private ones (Wang & Katzev, 1990).

Convenience

Effective recycling programs are convenient. Substantial differences have been found between programs that require residents to take recyclables to a drop-off site and curbside collection. Further, sorting of recyclables appears to have an impact upon participation levels, with programs that require sorting having lower participation levels. In one study that investigated the impact of sorting upon participation, commingled participation rates were 50% higher (90% versus less than 40%).

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Participants were limited in their knowledge of what paper products can be recycled. It was suggested that the capture of ad ditional paper products could be achieved through improved awareness and education.

FOCUS GROUPS

On Tuesday, January 16th 2001, Wednesday, January 17th, Tuesday, January 22nd, and Wednesday, January 23rd four focus groups were conducted that explored recycling in the Town of Windsor, Sonoma County. The focus groups investigated personal motivations for recycling, knowledge of what can and cannot be recycled, barriers to recycling, perceptions of yard waste recycling, and recommendations regarding the current recycling program. Further, participants were asked what they believe would motivate people to recycle and what they believe would be the most effective method to communicate with the public concerning this issue. The protocol for the focus groups is available separately. Responses from each of the four focus groups are provided below.

MEN WHO RECYCLE

The participants in the first focus group included nine men who came from households that, based upon curbside inspections, recycled frequently. At the focus group, all of these individuals reported recycling "all" or "most of the time." A number of different motivations for recycling were mentioned. Among these, the most frequent was environmental concerns (9) and habit (2).

All participants reported that they recycle as often as they can. However, it was mentioned that some items, such as milk cartons, cannot be recycled and that there were not as many recyclable items as one participant was accustomed to on the East Coast. As well, some participants mentioned that reusing is an integral part of their waste reduction activities.

PAPER RECYCLING

Participants were asked what types of paper can and cannot be recycled in Windsor's curbside program. Four out of nine participants stated that they were knowledgeable regarding which types of paper can and cannot be recycled, while five out of nine did not feel knowledgeable. They responded that these items <u>can</u> be recycled:

- cardboard, newspaper, magazines, paperback books, white paper;
- grocery bags;
- envelopes; and
- thin cardboard containers.

They indicated that these items <u>cannot</u> be recycled:

- cellophane/plastic wrap;
- milk cartons;
- cardboard with plastic fibers;
- hardcover books;
- wax or chemically treated papers;
- any paper with food residue;
- any paper with metallic treatment;
- pizza boxes;
- medical containers;
- oil containers;
- aluminum foil; and
- plastic grocery bags.

Overall, these participants were limited in their knowledge of what paper products can be recycled and many were unsure of how to respond. It was suggested that the capture of additional paper products could be achieved through improved awareness and education.

When asked what would make it easier to know what types of paper can be recycled participants replied that they would like a comprehensive listing that can be posted on or near the container, providing a convenient and ongoing reminder. Additional responses included:

- notations on packaging;
- more specific directions from Sonoma County;
- code everything for whether or not it can be recycled; and
- be very specific on what can and cannot be recycled.

The next series of questions concerned convenience of recycling paper. Four out of nine participants claimed that it was convenient to determine whether paper can be recycled or not, whereas five said that it was inconvenient. As well, four participants said that it was convenient to separate newspaper from other paper for recycling, while five stated that it was inconvenient. Two respondents were frustrated over the handling of cardboard and one reported that he only puts newspaper in the bin. Another

respondent was unsure why other items cannot be recycled. Overall, their perception of convenience seemed directly related to their level of education and awareness and the consistency with which the hauler removed the recyclables.

For those that found it inconvenient to recycle paper they were asked what would make it more convenient. Their responses included:

- more cooperation from haulers;
- more space for a container near home office;
- consistent application of standards by haulers;
- wheels on containers (especially for older consumers); and
- improved handling technology to expand the types of paper that can be recycled.

Important issues appear to be frequent communication by the hauler to maintain awareness and consistency, as well as clarity in the explanation and application of pick-up rules.

Concerning the convenience of recycling corrugated cardboard, most described it as the most difficult item to recycle, as eight of nine found it inconvenient. Moreover, several respondents have injured themselves cutting and bundling cardboard.

To make it more convenient, participants suggested the following:

- more lenient compacting rules ("give us the benefit of the doubt");
- better tools for the hauler, such as a chipper, compactor, etc;
- allow recyclers to consolidate in a larger box (one stacked within the other);
- make it less work for the consumer;
- more co-operation from the hauler; and
- pass the compacting burden to the hauler.

In general, the group would like to see more consideration and co-operation from the hauler, particularly for those infrequent occasions where the consumer has to break down large boxes. The current perception is that there is a great deal of inconsistency, and in some cases unfair subjectivity, in what haulers will and will not pick up.

Five of the nine participants talked about having recent problems with the hauler that collects their recyclables. Problems reported include:

- the hauler did not know where they lived;
- problems with cardboard (telephoned several times);
- hauler drove by house, consumer had to call for pick-up;
- sloppy handling of materials, finding debris in the streets;
- delayed response on request for replacement containers;
- required to place recyclables across the street;
- problems with picking up Christmas trees;
- problems with driver courtesy and awareness of customers; and
- inconsistency in the types of items that are taken.

In general, respondents are less satisfied with the current hauler than they were with the previous company. It appears that most of the dissatisfaction centers on perceptions that the new hauler is less professional, less responsive, and less co-operative. Several respondents noted that the hauler has tried to be a good corporate citizen (e.g. free porta-potties at community events). A second, but closely related theme was the perception that consumers were not receiving the full financial benefits of their recycling efforts. There was a general feeling that recycling is a profit center for the hauler. In fact, one respondent said, "we are doing their [hauler's] work", but are not receiving the financial rewards. He mentioned that this will cloud any efforts to compel him to recycle in the future.

Yard Waste Recycling

Participants were asked what problems they have experienced with the container used for yard waste. There were no major problems reported, however, they reported minor problems with:

- leakage and water seepage;
- size of the container can be difficult to handle for older consumers; and

Most participants described card board recycling as inconvenient.

There was general confusion on when to put out yard waste. While some refer to the calendar, most guess or rely upon their neighbors.

- sometimes it is too small to handle all of the waste.

All but one participant reported that they were knowledgeable regarding what can be placed in the yard waste container. When asked which types of items can and cannot be recycled in the yard waste program participants responded that these items can:

- grass clippings;
- plant prunings;
- dead or cut vegetation;
- things that can be composted; and
- yard waste.

In addition, these items cannot:

- dirt;
- cement;
- lumber;
- coal;
- rocks;
- combustibles;
- branches larger than 1" in diameter; and
- poison oak.

The only suggestion for improvement was more information on the size of branches and trunks that can be recycled. Most respondents felt more confident when handling yard waste than other forms of recycling.

Six of the nine participants reported not knowing when to put the yard waste container at the curbside for recycling. They said that:

- they depend on their neighbors;
- they know that it is every other week, but lose track;
- unclear on holidays;
- "when in doubt, put it out!";
- the hauler occasionally skips regularly scheduled pick-ups; and
- there was general confusion on when to put out yard waste. While some refer to the calendar, most guess or rely upon their neighbors. In addition, a few had not received a calendar for 2001.

To conclude, participants were asked a few general questions regarding recycling. First, they asked what they believe is the most likely to motivate people in the Town of Windsor to recycle. They suggested:

- the use of small incentives and small gifts (e.g. clock radio);
- cash incentives and contests;
- positive education (stop talking about landfill crisis and focus on benefits);
- let people know where recycled materials go;
- disconnect between CRV taxes at retail but no cash rebate for recycling through hauler;
- tap into people's sense of duty;
- educate the public on the economic "bottom line" to the hauler (what are they making from recycling and what is passed on to the consumer in the form of reduced rates);
- make it more convenient; and
- there should be a clear relationship between recycling and economic benefit to the town of Windsor.

Note: Half of the participants report taking aluminum cans to the recycling center for a cash rebate.

Recommendations primarily centered upon several themes. Providing positive incentives, as opposed to penalties, public education on what happens to recyclables, recycling goals, progress toward those goals, the economic benefit of recycling for the hauler, the community, and the individual, and instilling a sense of civic pride and community involvement were common issues.

Participants were then asked whether their friends and family expect their household to recycle. Eight of the nine respondents agreed while only one did not. Next, they were asked what they feel is the most effective way for the Town of Windsor and the SCWMA to communicate with the public regarding recycling. Their recommendations included:

- more information on the economical impact on Windsor;
- a regular newsletter;
- more school education;
- regular updates on goal progress and

achievement (signs in high traffic areas);
- provide more tips;
- use inserts in bills, don't create more waste;
- posters in public places;
- stress economics and economic impact;
- use the Windsor Times;
- clever and witty ad campaign;
- help generate word of mouth;
- leadership from local politicians, set an example; and
- local radio.

Recommendations were related to more frequent and regular communications through a variety of both mass and direct media outlets, delivering the messages outlined above.

Lastly, additional comments and suggestions included:
- create a sense of purpose and civic duty;
- education, convenience, and positive economic incentives are key;
- local hauler needs to have a higher public awareness;
- more publicity for special hauling days (e.g. oil, paint, etc.);
- create a sense of community, friendly competition with other communities;
- help the children spread the word;
- keep the messages simple and straightforward;
- steady, on-going, public awareness;
- greater awareness about our consumption habits (recycling/reuse);
- individual savings incentives, discounts, and rebates; and
- tell the public about successes in other communities.

Overall, ongoing education and awareness efforts, improved convenience and cooperation from the hauler benefit both the community and the individual consumers.

MEN WHO DO NOT RECYCLE

Based upon curbside inspections, the seven participants in the second focus group were recycling very little or not at all. Interestingly, at the meeting, six of these individuals reported that they recycle most or all of the time. Their personal motivations included, to reduce trash, it's good for the environment, because of their grand-children, to save trees, because it makes "ecological common sense" and because it is a "good thing to do." The other individual who reported that he did not recycle cited his reasons as, too time consuming, a hassle to sort and prepare items for recycling, and because it is not a regular habit. Given the differences between these individuals self-reports and their actual behavior, the information obtained from these participants should be interpreted with caution.

Paper Recycling

Participants were asked what types of paper can and cannot be recycled in Windsor's curbside program. Six out of seven participants felt that they were not knowledgeable regarding which types of paper can and cannot be recycled (one out of seven did feel knowledgeable). Participants responded that these items can be recycled:
- newspaper;
- phone books;
- envelopes;
- paper bags;
- magazines;
- cartons; and
- pizza boxes.

They responded that these items cannot be recycled:
- laminated paper;
- coated paper;
- treated paper;
- glossy paper and staples;
- aluminum foil; and
- milk cartons.

Overall, most respondents were <u>not</u> sure of what can be recycled. Most acknowledged receiving a recycling guide, but failed to reference it.

When asked what would make it easier to know what types of paper can be recycled participants were evenly split between convenience and economics as primary motiva-

Based upon curb side inspections, the seven participants in the second focus group were recycling very little or not at all. Interestingly, at the meeting, six of these individuals reported that they recycle most or all of the time.

Most participants wanted cardboard boxes to be either picked up "as is" or to have containers located at conve nient central loca tions in the town.

tors. Additional responses included:

- clearly mark on the containers what can and cannot be recycled;
- more frequent reminders as inserts in the water bill;
- need bigger containers; and
- provide an economic incentive (e.g. reduce bills for greater recycling).

The next series of questions concerned convenience of recycling paper. All participants claimed that it was convenient to determine whether paper can be recycled or not. Newspaper was agreed to be the most convenient to recycle. The only suggestion was to provide information on how to reduce junk mail from being delivered to a home. When asked about the convenience of recycling corrugated cardboard, four stated that it was inconvenient whereas only two viewed it as convenient. The biggest complaint was having to break down boxes in 2 x 2 squares. Most participants wanted cardboard boxes to be either picked up "as is" or to have containers located at convenient central locations in the town.

Five participants discussed having recent problems with the hauler that collects their recyclables. Problems reported include:

- cans in the middle of the driveway;
- recycling bins are not neatly re-stacked; and
- bad experience with recycling cardboard – not picked up.

In general, respondents did not have any major complaints, however, there was an undercurrent of disappointment with the lack of customer service.

Yard Waste Recycling

Participants were asked what problems they have experienced with the container used for yard waste. Two respondents reported problems with:

- the container being difficult to empty when stuffed too full;
- a lack of adequate ventilation; and
- the container being too small for people with large yards.

All of the participants, except one, reported that they were knowledgeable regarding what can be placed in the yard waste container. When asked which types of items can and cannot be recycled in the yard waste program participants responded that these items can be placed in the yard waste container:

- grass;
- yard clippings;
- vegetation;
- anything organic; and
- tree trimmings less than 1".

In addition, these items were mentioned as items that cannotbe placed in the yard waste container:

- rocks;
- dirt;
- boards;
- food waste;
- rope;
- animal waste;
- paper;
- metal objects;
- poison oak; and
- fruit and vegetable waste.

Most of the participants seemed unsure of what could and could not be recycled. The only suggestion for improvement was more frequent information via flyers and inserts focussing on what can be recycled.

Three of the seven participants reported knowing when to put the yard waste container at the curbside for recycling, whereas four did not know. Two had kept the calendar given to them by the hauler, the rest relied upon their neighbours.

To conclude, participants were asked a few general questions regarding recycling. First, they asked what they believe is most likely to motivate people in the Town of Windsor to recycle. They suggested:

- financial incentives ("the more you recycle the less you pay on your bill");
- clarify the economic benefits to the Town of Windsor and individual homeowners;

- make the trash cans smaller and the recycle bins bigger;
- put wheels on the bins;
- corporate participation;
- progress report on goal achievement;
- "make it easy" - provide tips;
- promote recycling fund-raising drives through schools;
- more education about recycling plastic bags (should be taken by the hauler); and
- school environmental education

Most participants preferred individual incentives for recycling, but admitted that it would be difficult to implement. One participant noted that recycling decreases the size of the waste container used and is, therefore, cheaper. Recommendations primarily centered upon education and convenience. Convenience was a dominant concern and economics was seen as a way to partially overcome the inconvenience of recycling.

Participants were next asked whether their friends and family expect their household to recycle. Four of the seven respondents reported that friends and family did not expect them to recycle while three reported that there were these expectations. They suggested that children were a major influence, as was family and peer pressure. Next, they were asked what they feel is the most effective way for the Town of Windsor and the SCWMA to communicate with the public regarding recycling. Their recommendations included:

- an informal educational video on how to recycle, why it is important, and where it goes (concern about not knowing what happens to the materials and how much money the haulers make from their recycled materials);
- newsletter, flyers, radio, and TV spots;
- a consistent, concentrated PR campaign; and
- campaigns through the schools.

There was little or no interest in visiting a web site. Most felt that an ongoing public relations campaign through traditional media (with a print emphasis, but also radio and television) would be effective.

Lastly, closing comments and suggestions stated convenience as the most important issue concerning recycling. As well, the handling of cardboard was a significant concern. One participant commented that the term "waste management" puts a focus on waste rather than recycling.

WOMEN WHO RECYCLE

The third focus group consisted of six women who had indicated over the telephone that they currently recycle. At the meeting, all of these participants reported recycling "most" or "all of the time."

Regarding personal motivations to recycle, the participants responded:

- habit, recycling over 30 years, used to live on a farm;
- reduce impact on landfill;
- composting helps garden;
- redeem cans;
- able to use smaller trash cans;
- lived overseas, recycling more prevalent;
- clean environment for children;
- simple and easy way to reduce impact on the environment; and
- grew up learning to recycle and reuse as much as possible.

Overall, many indicated that their upbringing and a desire to reduce their impact on the environment generally, and the landfill specifically, had influenced their behavior.

The barriers to recycling mentioned included:

- tin cans are a hassle to wash;
- limits on what can and cannot be recycled; and
- remembering when to put things out (e.g. yard waste).

A lack of knowledge appeared to be the primary inhibitor, however, this group appeared to be highly motivated.

Paper Recycling

Participants were asked what types of paper can and cannot be recycled in Windsor's curbside program.

Overall, many indicated that their upbringing and a desire to reduce their impact on the environment generally, and the landfill specifically, had influenced their behavior.

In general, the group would like to see either cardboard boxes being taken as is or an alternative drop off and pick up solution developed.

Five out of six participants stated that they were not knowledgeable regarding which types of paper can and cannot be recycled (one did feel knowledgeable). They responded that these items can be recycled:

- newspaper;
- ads;
- brochures;
- cardboard;
- direct mail;
- periodicals;
- letter paper;
- paper grocery bags;
- wax paper;
- packaging; and
- egg cartons.

They responded that these items cannot be recycled:

- milk and juice cartons;
- photos and photo paper;
- waxed paper; and
- facial tissue (Kleenex).

When asked what would make it easier to know what types of paper can be recycled participants replied:

- a list of do's and don'ts, be specific and provide examples;
- spread the message through schools, increase frequency of mailings to consumers;
- web site as the list changes (only one said she would use it);
- print on grocery store bags;
- something you can post on or over the bins;
- newsletter; and
- on the back of the yard waste calendar.

Overall, most comments centered upon more frequent and specific communications as well as providing a means for posting the information next to the bins.

The next series of questions concerned convenience of recycling paper. All of the participants said that it was convenient to separate newspaper from other paper for recycling.

The only recommendation to make recycling paper more convenient was to place a divider in the paper bin, however, this did not seem to be a significant issue.

Concerning the convenience of recycling corrugated cardboard, three found it convenient while three found it inconvenient. To make it more convenient, participants suggested the following:

- have grocery stores take the cardboard, or have some other centralized drop off center for boxes;
- have a separate large container for cardboard;
- provide the names and phone numbers of organizations that need boxes and will pick them up; and
- it is hassle to cut up boxes into 2 x 2 squares, especially for older consumers and small, home-based business owners.

In general, the group would like to see either cardboard boxes being taken as is or an alternative drop off and pick up solution developed.

Half of the six participants talked about having recent problems with the hauler that collects their recyclables. Problems reported include:

- inconsistent pick up of recycling, especially cardboard and yard waste;
- inferior to the previous hauler;
- problems securing a can when they first moved in;
- unsure about Monday holiday pick-up;
- sometimes they leave a mess in haste; and
- inconsistency in the time of pick-up (especially 'green' waste).

Overall, inconsistency of service seemed to be the primary complaint.

Yard Waste Recycling

Participants were asked what problems they have experienced with the container used for yard waste. Only two participants reported problems. They centered upon difficulty in maneuvering the can, leaking containers, difficulty to tilt backwards when full (more ergonomic design including bigger wheels

and a more stable tilt and center of gravity). As well, the width of the container often does not fit through a door or gate.

Four of the participants reported that they were knowledgeable regarding what can be placed in the yard waste container, while two did not. When asked which types of items can and cannot be recycled in the yard waste program participants responded that these items can:

- leaves;
- rose and tree prunings;
- grass clippings, plant materials;
- fruits;
- coffee grinds;
- paper;
- gorilla hair bark; and
- uncooked vegetables.

In addition, these items cannot:

- animal wastes;
- food wastes;
- bacon grease;
- dirt;
- rocks;
- cement; and
- wood and construction materials.

Suggestions for improvement included printing the information directly on the can or use symbols and a flyer that you can post on or near the can.

None of the participants reported knowing when to put the yard waste container at the curbside for recycling. Most participants relied upon their neighbours, however one puts it out every week, just in case. It was suggested that a calendar could be printed in the water bills and in the Windsor Times. There was a preference for a weekly pick-up, especially during the spring and summer months.

To conclude, participants were asked a few general questions regarding recycling. First, they asked what they believe is the most likely to motivate people in the Town of Windsor to recycle. They suggested:

- greater incentives for using a smaller trash can (e.g. free service for using the smallest can);
- publicize community targets for recycling and progress toward the goal to create a sense of community;
- more education about how recycled materials can be used;
- more education through the schools (make it entertaining).

It was agreed that economic incentives would be the most effective combined with early education to change habits. They thought that there should be a link between education and progress towards goals with economic incentives or penalties.
Participants were next asked whether their friends and family expect their household to recycle. All of the respondents felt that they were expected to recycle. Next, they were asked what they feel is the most effective way for the Town of Windsor and the SCWMA to communicate with the public regarding recycling. Their recommendations included:

- community needs to know what the goals are and progress toward them;
- regular and frequent communications using several means of mass media, including television.
- more educational programs and community outreaches; and
- look at what "successful" recycling communities are doing.

There seemed to be two tracks of communication being recommended: a general campaign to raise overall awareness of why additional recycling is important and necessary in conjunction with a more targeted campaign focused on specific initiatives and training to help people get in the habit of recycling. Financial incentives should be tied to community as well as individual improvements in recycling. There should also be more information and education on conservation and reuse. Changes in collection policies and procedures should come with an explanations of why as well as how.

Lastly, additional comments and suggestions included:

- help consumers get their names off mail-

None of the participants reported knowing when to put the yard waste container at the curbside for recycling. Most participants relied upon their neighbors, however one puts it out every week, just in case.

As with the men who did not recycle, at the meeting seven of the women who do not recycle reported recycling most or all of the time.

ing lists to reduce the amount of direct mail they receive;

- help promote composting by expanding and boosting publicity about the community garden program;
- businesses can help change behavior by providing incentives for changing (e.g. credit for using canvas bags at grocery stores);
- can some of our waste be used to generate electricity?;
- reexamine laws that restrict the ability to recycle waste in schools and other public facilities.

Most of the comments focused on using many different means of regular and frequent communications on both the techniques and reasons for recycling. In addition, provide the "full picture" of where the waste goes and its impact on the environment. Sonoma County should also tap into broader national campaigns and initiatives.

WOMEN WHO DO NOT RECYCLE

The fourth focus group consisted of eight women who had indicated over the telephone that they did not recycle. As with the men who did not recycle, at the meeting seven of these participants reported recycling most or all of the time.

Regarding personal motivations to recycle, the participants responded:

- concern over impact on landfill;
- reduce impact on raw materials;
- financial incentives (redemption);
- having children has created a greater sensitivity toward the environment, as well as, a desire to be a role model;
- habit;
- reducing energy usage;
- encouraged by children; and
- reduce the amount of waste that is put in the trash can.

One respondent noted, "I'm too busy, it's not convenient for me. I have a large family and a trash compactor." Two respondents expressed "guilt" over not recycling at work because it is not as easy as recycling at home. The major reason for not recycling seems to be a lack of time and convenience. Several noted that the hauler and town have a very negative and antagonistic attitude. Their perception is that they feel threatened and bullied into following rules, which are often inconvenient. This has decreased their motivation to recycle and has lead to greater resistance to new initiatives. As well, many noted a disconnection between their ability to recycle at home and the lack of similar programs in their place of employment (both private and public sector).

PAPER RECYCLING

Participants were asked what types of paper can and cannot be recycled in Windsor's curbside program. Six of the eight participants stated that they were knowledgeable regarding which types of paper can and cannot be recycled (two did not feel knowledgeable). They responded that these items can be recycled:

- "anything paper";
- paper towels and paper plates;
- tissues;
- blueprint paper;
- computer paper;
- writing paper;
- catalogs;
- magazines; and
- paper bags;

They responded that these items cannot be recycled:

- wax paper;
- cereal boxes with a waxed or foil lining;
- tissues;
- magazines and catalogues;
- items with staples;
- printed wrapping paper;
- milk and butter cartons;
- paper that touches food (e.g. deli wrapper and food packaging);
- diapers;
- glossy paper;
- colored construction paper; and
- plastic coated paper.

Overall, there were varying levels of knowledge and certainty regarding what can and cannot be recycled.

When asked what would make it easier to know what types of paper can be recycled participants replied:

- a refrigerator magnet;
- distribute lists through schools;
- inserts that come with bills – "they need to be self-congratulatory";
- "the easiest thing is to just have them take it all" – the burden of sorting should go to the hauler;
- periodic (quarterly) postcard reminder that very clearly states what can and cannot be recycled;
- a financial benefit that is passed onto the consumer;
- better and more clear labeling on packaging; and
- put information and reminders right on the bill.

There was no consensus on the best method, but more frequent reminders are clearly needed.

The next series of questions concerned convenience of recycling paper. With the exception of cardboard, none of the participants currently separate newspaper from other forms of paper. Five of the eight participants reported that it was inconvenient to separate newspaper from other paper for recycling. The only recommendation to make recycling paper more convenient was to either have a separate container just for newspaper or place it all in one container. This question created confusion among the participants who were of the opinion that they currently do not have to separate papers. There was an antagonistic response to the suggestion that certain types of paper need to be sorted.

Concerning the convenience of recycling corrugated cardboard, six found it inconvenient while two found it convenient. To make it more convenient participants suggested the following:

- take boxes 'as is';
- take cardboard placed in the paper bin;
- more lenient size restriction – take bigger boxes; and
- hauler should be able to compact larger boxes without consumers breaking them down.

Most described cardboard as the most difficult paper product to recycle. They felt that it was a time consuming nuisance to break down boxes.

Three of the participants talked about having recent problems with the hauler that collects their recyclables. Problems reported included that if something falls out, the hauler does not pick it up (sloppy) and that sometimes they do not take cardboard and other items. About half of the participants commented that the hauler seems to place the highest premium on speed. One participant surmised that it may be because they underbid on their contract.

Yard Waste Recycling

Participants were asked what problems they have experienced with the container used for yard waste. Although there were no major problems reported, some thought that it should be larger and have better wheels, one respondent complained about the smell after a couple of weeks, several felt that it should have better aeration, and sometimes it is too heavy. They suggested that better and larger wheels would help with maneuvering problems.

All of the participants reported that they were knowledgeable regarding what can be placed in the yard waste container. When asked which types of items can and cannot be recycled in the yard waste program participants responded that these items can:

- grass;
- clippings; and
- prunings.

They responded that these items cannot:

- poison oak;
- animal waste;
- limbs greater than 4" in diameter;
- fruit (unsure);
- rocks and concrete;
- dirt;
- hot ashes;
- certain seeded fruits; and

Most described cardboard as the most difficult paper product to recycle. They felt that it was a time consuming nuisance to break down boxes.

Several respondents pointed out that their families had exposed them to recycling at an early age, creating a habit that still shapes their behavior.

- food waste (e.g. animal fat).

There was a relatively high level of awareness and confidence about what cannot be recycled, but some were surprised after looking at the official list. Two of the respondents compost. To make it easier to know what can be recycled participants suggested printing the list on the can, that a sticker be put on the can, and to providing the list in the phone book.

Seven of the participants reported knowing when to put the yard waste container at the curbside for recycling (one did not). Most participants relied upon their neighbours and others on the calendar provided by the hauler (about half have received the 2001 calendar).

To conclude, participants were asked a few general questions regarding recycling. First, they asked what they believe is the most likely to motivate people in the Town of Windsor to recycle. They suggested using incentives and rewards such as movie tickets, gift certificates, or coupons or a rebate. Another incentive would be to provide the smallest trash can for a nominal fee (with family size as a factor). Incentives, it was noted, should apply to larger employers and businesses as well as individuals. Community-wide financial incentives would be acceptable if they were applied to a specifically identified school or public safety programs. There was an interest in knowing the exact, local benefits of recycling, in terms of its impact on the landfills and the environment. They would also like to see a simplification of the system of bins and the consolidation of collection bins. Also, there could be recycling-based fund-raisers to benefit schools and non-profit community programs.

Participants were next asked whether their friends and family expect their household to recycle. Five of the respondents agreed. While friends and family do not heavily influence most respondents, they did acknowledge that peer pressure and guilt can have an impact. A few noted that they were chided for not recycling.

Next, they were asked what they feel is the most effective way for the Town of Windsor and the SCWMA to communicate with the public regarding recycling. Their recommendations included:

- frequent radio and television spots, make it a habit;
- billboards;
- school programs – make it part of the regular curriculum;
- Windsor schools should promote recycling within the school and set the example for students;
- staff a position to conduct outreach to schools and businesses;
- promote incentives;
- more public awareness about the landfill situation; and
- more public information about what happens to the materials they are recycled;
- banners in front of Exchange Bank (and other major town intersections); and
- more public awareness of recycling goals and our progress towards their achievement.

Most of the ideas centered around frequent communication that raised awareness on the reasons and benefits of recycling tied with focused outreach to local schools and businesses. While diverting waste from the landfill is the most compelling reason to recycle, most felt the overall campaign should be on other positive benefits of recycling.

Lastly, additional comments and suggestions included:

- provide more timely information on Christmas tree recycling (before and after Christmas);
- a hotline to answer questions (e.g. what to do with Styrofoam peanuts); and
- simplify the bin sorting and collection process.

Note: This was the most difficult group to recruit, but also had the highest representation of households with more than two occupants.

Summary

Almost all of the participants understood the connection between recycling and the desire to reduce the impact on our landfills, while some saw the broader environmental context of reducing our rate of harvesting and utilizing our remaining natural resources. Several respondents pointed out that their families had exposed them to recycling at an early age, creating a habit that still shapes their behavior. Another indication of the power of familial influence is that most respondents, even those who no longer have children in their household, identified education throughout local schools as very important in shaping the habits of the new generation of recyclers and influencing the behavior of parents and grandparents.

The two most common reasons for not recycling were a perceived lack of convenience and a lack of readily accessible knowledge on what can and cannot be recycled. The lack of convenience centered upon the complaints regarding sorting the items for recycling, maneuvering the bins and yard waste cans, and bundling cardboard, which was the largest complaint. To overcome the lack of knowledge regarding recyclables most participants favored a list that could be posted either directly on or near their recycling bins. Lack of knowledge seemed to center upon paper and plastic items in particular. A more subtle undercurrent was a feeling of disconnect between their individual recycling habits and the "big picture". On the whole, respondents wanted to know where their materials go, how they are recycled, what they are recycled into, and what the economic impacts and benefits to the hauler, the community, and individual ratepayers. A majority of participants believe that recycling is a profitable for the hauler, and they want a more detailed accounting of the economics of recycling.

The largest complaint was about the apparent inconsistency and perceived subjectivity with which cardboard is and is not picked up by the hauler. Another common complaint was that the hauler was sometimes sloppy and left debris when picking up recyclables. While most gave the hauler an overall passing grade, some mentioning community involvement, the types of complaints suggested a general perception that the hauler is much more focused on speed and efficiency than in providing responsive customer service. There was also a common perception that the current hauler had done an inadequate job of providing frequent and consistent public education and outreach. Most felt their profile and presence in the community is much lower than that of the previous hauler.

The most common ideas to increase participation centered upon several themes. The first was an outreach to local schools and businesses. It is perceived by a few participants that there is little to no effort made to recycle in Windsor schools and that recycling is not proactively promoted due to a lack of funds. It was suggested that SCWMA have representatives go to schools to provide brief elementary level classes on recycling, perhaps fashioned after the Sonoma County Water Agency school program on water conservation. Another idea was to raise awareness within the community. A highly visible and regular communication campaign discussing the role, impact and importance of recycling, where the recycled materials go, what they are converted into, and the economics would sufficiently increase awareness and consequently, participation. Closely tied to awareness is information and communication. Respondents would like to see more information on what can and cannot be recycled and receive regular updates on developments, including performance to date in reaching the 50% diversion target. Convenience was an important issue. To increase convenience it was suggested to have more lenient rules and methods for recycling cardboard, bins and containers with wheels, and weekly pick up of yard waste with an easier to maneuver container. As for economic incentives, most preferred individual incentives such as, reduced rates, rebates, or small prizes for achieving certain goals, while many would accept specific and well-documented economic benefits to the general community such as, school programs, new parks, and enhanced public safety programs. The last issue that respondents suggested surrounding increased participation was accountability. They desired specific and publicly communicated goals, performance measures, and rewards for achievement

The two most com mon reasons for not recycling were a per ceived lack of con venience and a lack of readily accessible knowledge on what can and cannot be recycled.

Respondents would like to see more in formation on what can and cannot be recycled and receive regular updates on developments, in cluding performance to date in reaching the 50% diversion target.

by the hauler, individuals, and the town of Windsor.

Lastly, there were several observed differences based on gender and levels of recycling. Household size seemed to be inversely related to the amount of recycling. In other words, respondents from larger households (four or more members) seemed to recycle less. Most participants, especially women, cited a lack of time and too many other priorities as barriers. Secondly, men seemed more interested in direct economic incentives where, by contrast, women would be satisfied with better accountability of the destination, utilization, and economics of recycled materials. Women with lower levels of recycling seem more aware and more forthcoming of their performance than men. In addition, men with lower levels of recycling seemed to be the largest proponents of a mass media based PR campaign, while the groups of higher-level recyclers preferred a combination of direct and focused outreach in addition to more general public relations. This may suggest that men who currently have little or no interest in recycling could be the most difficult and expensive group to reach.

TELEPHONE SURVEY

Residents of the Town of Windsor have been voluntarily participating in a curbside recycling and yard waste collection program for many years. In April 2001, a telephone survey was conducted with a random sample of Town of Windsor households to assess the perceived effectiveness of the programs, identify barriers to greater waste diversion, and receive feedback from the residents with respect to problems and concerns.

METHODOLOGY

Overall, 331 households were contacted and asked to participate in the survey. Of these, thirty-eight percent (127) agreed to participate. Of those individuals who wished not to participate, 34 completed a refusal survey (10%), and 170 did not participate at all.

The full survey included questions that explored the frequency and types of materials that residents recycled in their yard waste collection carts and recycling containers, as well as their overall satisfaction with the programs, the collection services, and the information materials.

Differences between the respondents who completed the full survey and those who completed the refusal survey were examined. These two groups of respondents did not differ regarding gender or education. However, those who completed the full survey were more likely to remember receiving the Recycling Guide and reported participating more frequently in the curbside recycling and yard waste collection programs. This suggests that those who participated in the full survey were more likely to participate in the waste diversion programs than those individuals who only completed the refusal survey or did not participate in the telephone survey at all. Of those who completed the full survey, 58% were female. Respondents reported on average being 31-40 years of age and having graduated college or technical school. The vast majority of residents lived in single-detached houses (98%) that they owned (91%). The majority of households were occupied by either two residents (35%) or four residents (28%).

To identify barriers to behavior change it is useful to investigate the differences between those who are engaged in the desired behavior and those who are not. Thus, respondents were identified as active and inactive recyclers so that comparisons could be made between these two groups. Over a five-week period, the frequency of yard waste collection and recycling collection was recorded for each home in the pilot area. During this period, the recycling containers could be put out each week for a maximum of five collections. In contrast, the yard waste container could be put out every second week, for a maximum of three collections. Thus, if a home placed their recycling containers out for collection for all five collections and their yard waste container out for all three collections, they were given a score of five for recycling and a score of three for yard waste collection. Because the yard waste and recycling scores were highly correlated they were combined. A median split was then used to divide active recyclers from inactive recyclers (the median is the point in a distribution in which 50% of all cases fall above and below it). The median for the combined scores was five. Consequently, households with scores of five or greater were defined as "active recyclers," while households with scores of less than five were defined as "inactive recyclers." This project is unique in that it combines actual direct observations of recycling behavior with householder's self-reports of their level of recycling. As indicated in the focus groups and shown later, direct observations were unrelated to inactive recycler's self-reports. Inactive recyclers consistently reported recycling far more than they actually did. This finding indicates that caution should be used whenever self-reports of environmental behavior are obtained.

Of the 127 residents participating in the telephone survey, there were 70 active recyclers (55%) and 57 (45%) inactive recyclers. There were 46 (36%) active females, 28 (22%) inactive females, 24 (19%) active males, and 29 (23%) inactive males. On average, both active and inactive recyclers were between the ages of 31 and 40 (31% and 39%, respectively) and 41-50 (30% and 35%, respectively). They lived in single-detached houses (99% active and 97% inactive), and owned their own homes

Those who participated in the full survey were more likely to participate in the waste diversion programs than those individuals who only completed the refusal survey or did not participate in the telephone survey at all.

Overall, 85% of the respondents either moderately or strongly agreed that the yard waste collection cart was convenient to use.

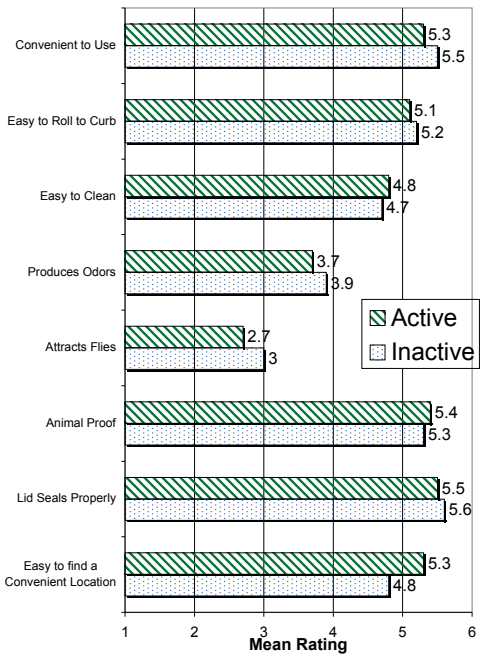
(99% active and 83% inactive). Active and inactive recyclers were most likely to have either two (36% and 33%, respectively) or four (28% and 32%, respectively) members living in their households. Many active recyclers had graduated college or technical school (39%) and inactive recyclers had either had some college or technical training (32%) or had graduated (32%).

SURVEY RESULTS

YARD WASTE

Respondents were first asked if they were currently using their yard waste collection cart. All of the active recyclers reported using their cart compared to 95% for the inactive recyclers. Actual observations revealed that during the five-week observation period, 6% of the active recyclers placed their yard waste collection cart out four times (pickup was only available three times during the five weeks) , 64% three times, 24% two times, and 6% placed it out for only one of the five weeks. For the inactive recyclers, 54% did not place the cart out at all, 26% put it out once, 18% twice, and 2% recycled yard waste three of the five weeks. Therefore, significant differences exist between these two groups regarding participation in yard waste collection.

CHART: PERCEPTIONS OF CURBSIDE YARD WASTE COLLECTION



Respondents were asked to rate a variety of statements on a scale from one to six for which one is "strongly disagree" and six is "strongly agree". First, they were asked to rate a series of statements concerning the yard waste collection cart and it's perceived convenience. This included whether it was easy to roll to the curb and clean; if it produced odors; attracted flies; was animal proof; whether the lid sealed properly; and if it was easy to find a convenient location to store the cart. The statements that the participant responded to are provided in bold, followed by the results for each item.

THE CART IS CONVENIENT TO USE

Overall, 85% of the respondents either moderately or strongly agreed that the yard waste collection cart was convenient to use. For the active recyclers 69% strongly agreed and for the inactive recyclers 54% strongly agreed.

THE CART IS EASY TO ROLL TO THE CURB

Seventy-six percent of the active recyclers and 77% of the inactive recyclers either moderately or strongly agreed that the yard waste carts were easy to roll to the curb. Only 16% of the active recyclers and 14% of the inactive recyclers gave the statement a score of three or below.

THE CART IS EASY TO CLEAN

There were a high percentage of "don't know" and "not applicable" responses for this statement (17% for active recyclers and 21% for inactive recyclers). The surveyors reported that some participants indicated that they had never tried to clean their yard waste container. Of those who did rate the statement, 46% of the active recyclers and 32% of the inactive recyclers either moderately or strongly agreed that the cart was easy to clean.

THE CART PRODUCES ODORS

There was great variability in response to this statement. As shown by the chart, the mean response was 3.7 for active recyclers and 3.9 for inactive recyclers. Forty-six percent of

the active recyclers and 49% of the inactive recyclers disagreed with this statement and thought the cart was relatively odorless. However, 36% of the active recyclers and 33% of the inactive recyclers moderately or strongly agreed with this statement.

THE CART ATTRACTS FLIES

As with the last item, there was considerable variability in the responses to this statement. Seventy percent of the active recyclers and 67% of the inactive recyclers did not believe that the cart attracted flies. However, 19% of the active recyclers and 10% of the inactive recyclers strongly agreed with this statement.

THE CART IS ANIMAL PROOF

Seventy-seven percent of the active recyclers and 81% of the inactive recyclers either moderately or strongly agreed that the cart is animal proof. Only 7% strongly or moderately disagreed with this statement.

THE CART'S LID SEALS PROPERLY

There was very strong support for this statement with, overall, 65% strongly agreeing with it. Further, 87% of active recyclers and 89% of inactive recyclers moderately or strongly agreed.

IT WAS EASY TO FIND A CONVENIENT LOCATION TO STORE THE CART

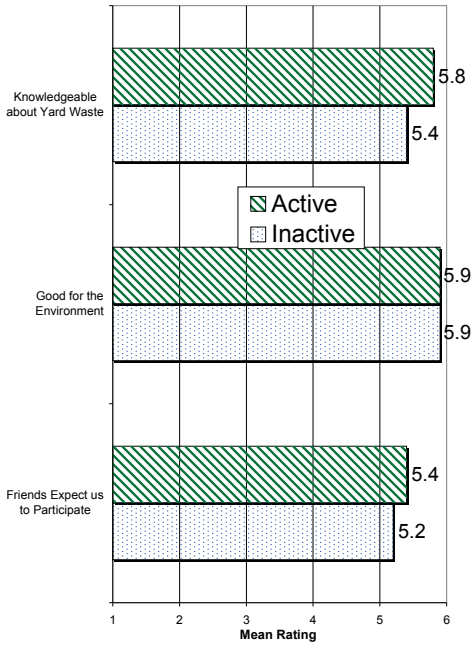
Eighty-one percent of the active recyclers and 61% of the inactive recyclers moderately or strongly agreed with this statement. Although the mean ratings between the two groups were relatively close (active recyclers = 5.3, inactive recyclers = 4.8) this statement proved to be an important statement for distinguishing between the two groups of recyclers. Significantly more active recyclers reported that it was easier to find a convenient location to store the cart than did the inactive recyclers. This may suggest that one of the barriers that is preventing the inactive recyclers from collecting yard waste is that they do not feel that it is easy to find a convenient location to keep their cart and are thus less likely to collect and recycle their yard waste. Only 10% of the active recyclers reported disagreeing with this statement (indicating that it was not easy to find a convenient location). Nearly twice as many (19%) of the inactive recyclers disagreed with the same statement

Next, respondents were asked to rate several statements on the same six-point scale concerning their knowledge of what yard waste can be placed in the cart, if they thought that the yard waste collection program was good for the environment, and whether they thought that their friends expected them to participate.

I FEEL THAT I AM KNOWLEDGEABLE REGARDING WHAT YARD WASTE CAN BE PLACED IN THE CART

Perceived knowledge is often an important variable when comparing people who recycle with people who do not. There was a significant difference in the perceived level of knowledge of the active and inactive recyclers. Although the mean ratings appear to be similar, as seen in the chart, active recyclers are significantly more likely to feel that they are more knowledgeable with regards to what can be placed in the yard waste collection cart than inactive recyclers. All of the active recyclers reported that they moderately (17%) or strongly (83%) agreed with this statement. In contrast, only 58% of the inactive recyclers strongly agreed with this statement. It appears that perceived knowledge of what is recyclable is connected with

CHART: KNOWLEDGE, ENVIRONMENTAL PERCEPTIONS AND NORMS



It appears that perceived knowledge of what is recyclable is connected with actual recycling behaviors.

Inactive recyclers reported composting significantly less fre quently than active recyclers.

actual recycling behaviors.

PARTICIPATING IN THE CURBSIDE YARD WASTE COLLECTION PROGRAM IS GOOD FOR THE ENVIRONMENT

As expected, there was strong agreement with this statement. Ninety-nine percent of the active recyclers and 95% of the inactive recyclers moderately or strongly agreed with it.

FRIENDS EXPECT OUR HOUSEHOLD TO PARTICIPATE IN THE YARD WASTE COLLECTION PROGRAM

While 70% of the active recyclers and 61% of the inactive recyclers moderately or strongly agreed with this statement, nearly twice as many inactive recyclers (19%) disagreed with this statement compared to active recyclers (10%). Overall, 11% of the respondents reported either "don't know" or "not applicable". Next, participants were asked to name all of the items that they were aware of that could go into the yard waste collection cart. The percentage of respondents who mentioned each item is presented below. For example, 96% of the active recyclers and 95% of the inactive recyclers mentioned grass clippings.

As can be seen, most participants mentioned that grass can be placed in the yard waste collection cart (though no one specifically mentioned Bermuda grass). Surprisingly, inactive recyclers were more likely to mention leaves, weeds, brush and branches than were active recyclers. This data, however, does not necessarily mean that inactive recyclers are more aware of the various items that can be placed in the yard waste collection cart. They may have been more motivated to mention more items, perhaps to counteract guilt over their lack of participation.

Other items that were mentioned by participants, but are not included in the above categories included, flowers (8%), tree and plant trimmings (7%), fruits and vegetables (5%), dirt (3%), bark and wood (2%).

COMPOSTING

Because yard waste recycling and backyard composting directly impact each other, respondents were asked whether their household owned a backyard composter. Overall, 11% of the respondents owned a backyard composter. Eleven percent of the active recyclers and 10.5% of the inactive recyclers owned a backyard composter. Those participants who reported that they owned a composter were asked how frequently they

CHART: KNOWLEDGE OF YARD WASTE ITEMS

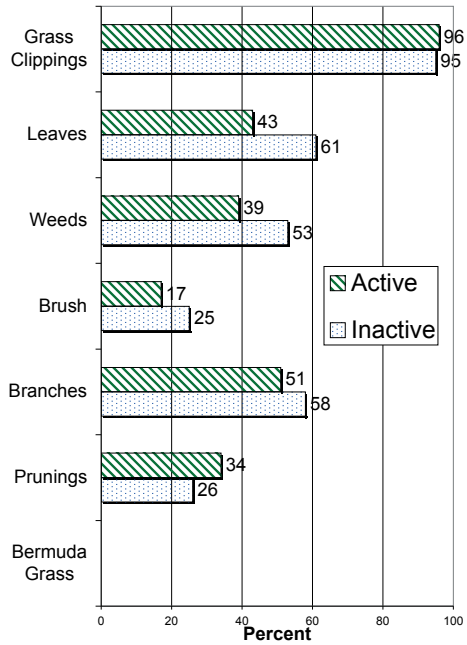
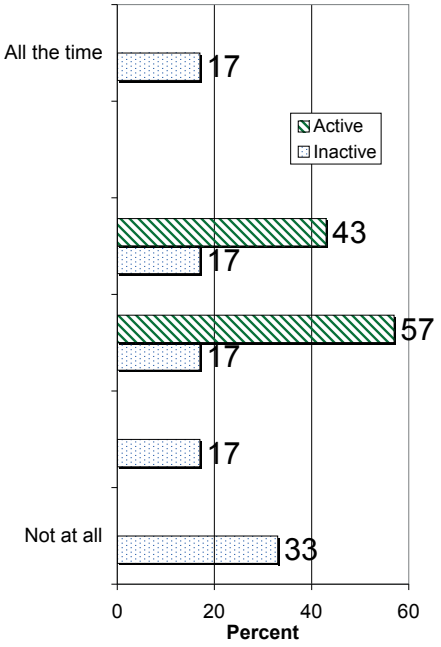


CHART: FREQUENCY OF COMPOSTING



used it on a scale from "1 - not at all" to "6 - all the time". Inactive recyclers reported composting significantly less frequently than active recyclers.

Participants were asked whether they had any further feedback regarding the collection of yard waste. Although many participants did not have anything to add, the main complaints were that the materials should be collected every week, the containers were too heavy and awkward, the collectors were rude and more items should be accepted. The primary complaint was that collection was too infrequent. Twelve participants mentioned that they would like to see their yard waste collected every week and eleven more suggested increased frequency in the fall and spring to accommodate the increase in yard waste production during these seasons. Two individuals complained of odors and another two wanted Christmas trees to be collected as well. In addition, several complained that the collectors are rude and that they do not clean the cart when they pick up yard waste.

RECYCLING BEHAVIORS

As can be seen in the following chart, 84% of active recyclers and 42% of inactive recyclers reported recycling "all the time." When combined with the respondents who reported recycling just less than "all the time," fully 86% of the active participants and 65% of the inactive participants report recycling frequently.

Although 84% of active recyclers reported recycling all of the time, only 73% actually did so during the observation period. Further, while 11% of active participants reported recycling just under "all the time," 24% were observed to have recycled four of the five weeks and 3% for three of the five weeks. For the inactive recyclers, 49% did not recycle at all during the observation period, 28% recycled for one of the five weeks, 19% recycled two of the weeks, and 4% recycled four of the five weeks.

KNOWLEDGE OF RECYCLABLES, INFORMATION, SCHEDULE

Respondents were asked the extent to which they agreed with the statement: "I feel that I am knowledgeable regarding what can be recycled." As shown below, 80% of the active participants and 43% of the inactive participants reported moderate or strong agreement with this statement.

Respondents were also asked to rate their

84% of active recyclers and 42% of inactive recyclers reported recycling "all the time."

CHART: FREQUENCY OF RECYCLING

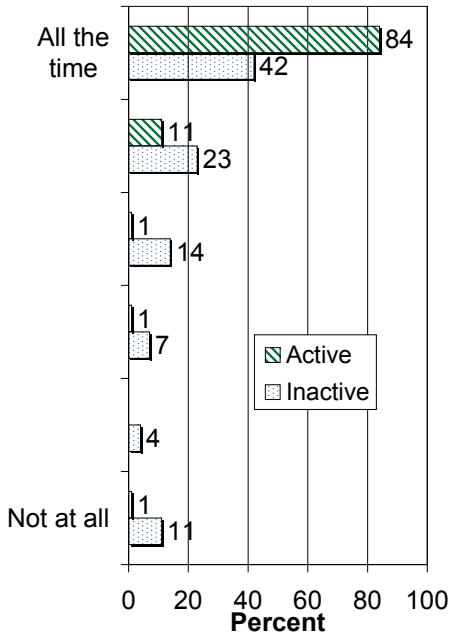
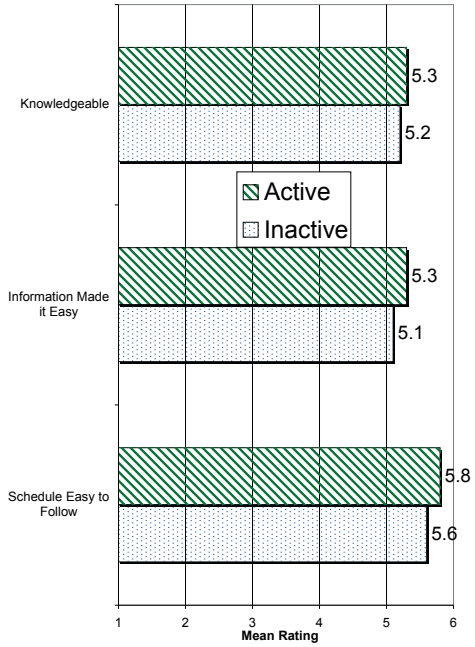


CHART: KNOWLEDGE, INFORMATION AND SCHEDULE



Sixty percent of the active recyclers and 53% of the inactive recyclers reported that they moder ately or strongly agreed that there is enough room in the recycling containers to hold all of their recyclables.

Active recyclers were far more likely to find the activity in general to be con venient than were inactive recyclers. Seventy-five percent of active recyclers strongly agreed that recycling was con venient, while only 43% of inactive recy clers did.

agreement with the statement, "The information that was provided made it easy to know what could be recycled," and "The recycling collection schedule is easy to follow." For the first statement, while the means were similar, closer scrutiny revealed that 76% of the active recyclers moderately or strongly agreed with the statement while 67% of inactive recyclers did.

Both inactive and active recyclers reported that they found the schedule easy to follow.

CONVENIENCE

Participants were also asked if there was enough room in the recycling containers to hold all of their recyclables, if they found it easy to find a convenient location to store the containers, and if they found it easy to get the recycling containers to the curb. Sixty percent of the active recyclers and 53% of the inactive recyclers reported that they moderately or strongly agreed that there is enough room in the recycling containers to hold all of their recyclables. Only 14% of each group reported moderate or strong disagreement with the statement. Concerning the ease of finding a convenient location to store the recycling containers, like the yard waste container, there was a significant difference between active and inactive recyclers. Overall, active recyclers were more likely to agree with this statement than inactive recyclers, which may indicate that it is an important consideration when designing an effective recycling program. Ninety-one percent of active recyclers reported strong or moderate agreement with this statement, compared to 65% of inactive recyclers.

Although the means between the two groups appear to be similar, there was also a significant difference between active and inactive recyclers concerning the ease of getting the containers to the curb. Seventy-three percent of active recyclers and only 58% of inactive recyclers reported moderate or strong agreement with this statement. These numbers suggest that active recyclers are finding it much easier to get the recycling containers to the curb than are inactive recyclers. This may be an important barrier to recycling for the inactive recyclers.

Concerning convenience, respondents were asked to rate their agreement with two statements: "It is convenient for our household to recycle", and "It is convenient for our house-

CHART: ROOM, CONVENIENCE AND EASE TO CURB

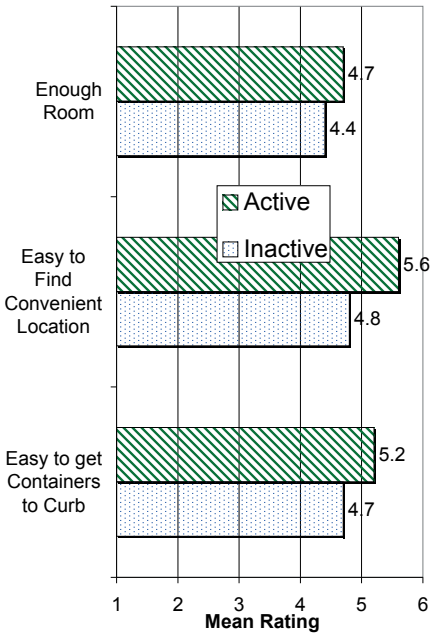
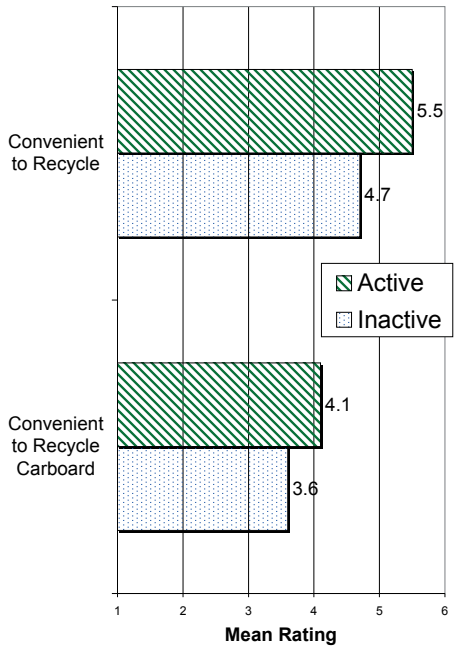


CHART: CONVENIENCE RECYCLING, CARDBOARD



hold to recycle cardboard."

Both of these statements resulted in significant differences between active and inactive recyclers. Regarding recycling convenience, active recyclers were far more likely to find the activity in general to be convenient than were inactive recyclers. Seventy-five percent of active recyclers strongly agreed that recycling was convenient, while only 43% of inactive recyclers did.

Concerning the convenience of recycling cardboard, active recyclers were significantly more likely to report that it was convenient than were inactive recyclers. Forty percent of active recyclers reported strong agreement with the statement, "It is convenient for our household to recycle cardboard" while only 20% of the inactive recyclers did so. However, the inconvenience of recycling cardboard was an important issue for some respondents. Fully 26% of active recyclers and 32% of inactive recyclers moderately or strongly disagreed with this statement.

SATISFACTION WITH RANGE

A majority of participants (71%) indicated that they were moderately or strongly satisfied with the current range of materials that could be recycled. Seventy-three percent of active recyclers reported moderate or strong agreement with the statement, "I am satisfied with the range of materials that can be recycled" compared to 69% for inactive recyclers. None of the participants reported that they strongly disagreed and only 13% rated the statement with a score of two or three (14% of the active recyclers and 11% of the inactive recyclers). The mean rating was 5.0 for active recyclers and 5.1 for inactive recyclers.

GOOD FOR THE ENVIRONMENT

As expected, the mean ratings for the statement, "Participating in the curbside recycling program is good for the environment" were very high. For both active and inactive recyclers, the mean was 5.9.

FRIENDS EXPECT US TO PARTICIPATE

The mean ratings for the statement, "Friends expect our household to participate in the curbside recycling program," were 5.5 for active recyclers and 4.9 for inactive recyclers. Approximately 53% of the active recyclers and 38% of the inactive recyclers reported strong agreement with this statement.

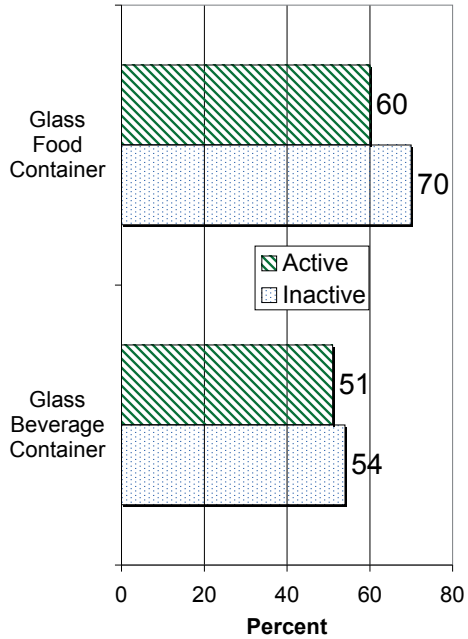
TYPES OF RECYCLABLES

Participants were asked to name as many items as possible that can go in the recycling containers. Items were divided into five categories: glass recyclables; metal cans and foil; paper and cardboard; plastic recyclables; and milk/soy and juice cartons. The percentage of participants, divided by active and inactive recyclers, who mentioned each of the recyclable items within each category, are displayed in the charts that follow.

GLASS RECYCLABLES

Sixty percent of the active recyclers and 70% of the inactive recyclers mentioned glass food containers. Glass beverage containers were mentioned by 51% of active recyclers and by 54% of inactive recyclers.

CHART: GLASS RECYCLABLES MENTIONED



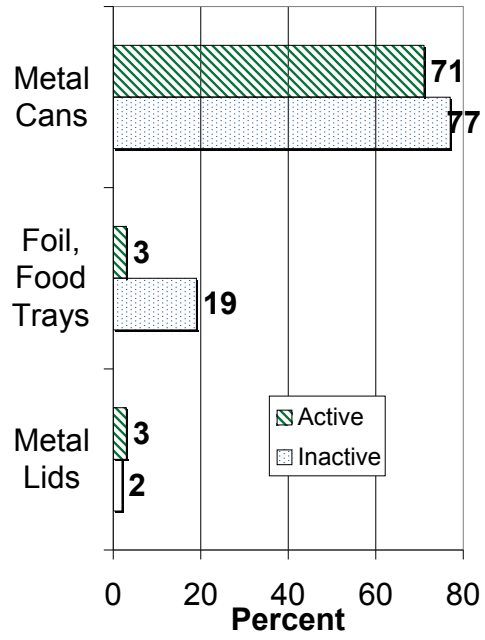
METAL CANS AND FOIL

A majority of participants (71%) indicated that they were moderately or strongly satisfied with the current range of materials that could be recycled.

Recall of paper fiber products that can be recycled is, with the exception of news print, very poor. There were a total of thirteen possible fi ber recyclables. Only one percent of active recyclers mentioned six or more of these recyclables.

As can be seen in the following chart, metal cans were mentioned by a significant majority of active and inactive recyclers. However, foil and food trays and metal lids were much less frequently mentioned.

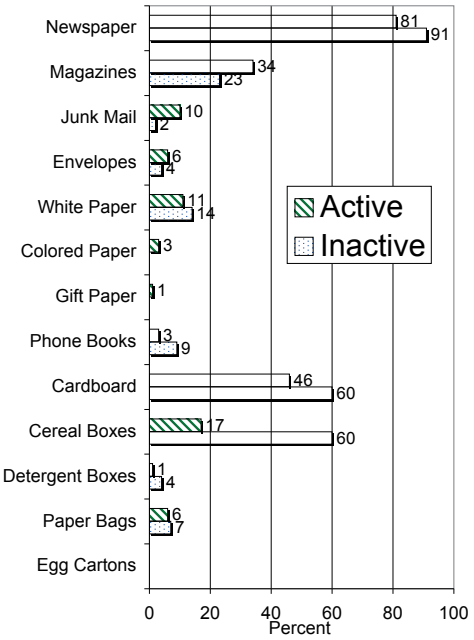
CHART: METAL RECYCLABLES MENTIONED



PAPER AND CARDBOARD

As is clearly demonstrated in the chart, recall of fiber paper products that can be recycled is, with the exception of newsprint, very poor. There were a total of thirteen possible paper fiber recyclables. One percent of the active recyclers mentioned six or more of these recyclables, 3% mentioned five, 10% reported four, 23% reported two or three, 33% mentioned one of the paper recyclables, and 6% did not report any. For the inactive recyclers, 5% reported six of the thirteen recyclables, 4% reported five, 7% reported four, 16% reported three, 33% reported two, and 30% reported only one of the paper recyclables. Five percent of the inactive recyclers did not mention any of the thirteen paper and cardboard recyclables.

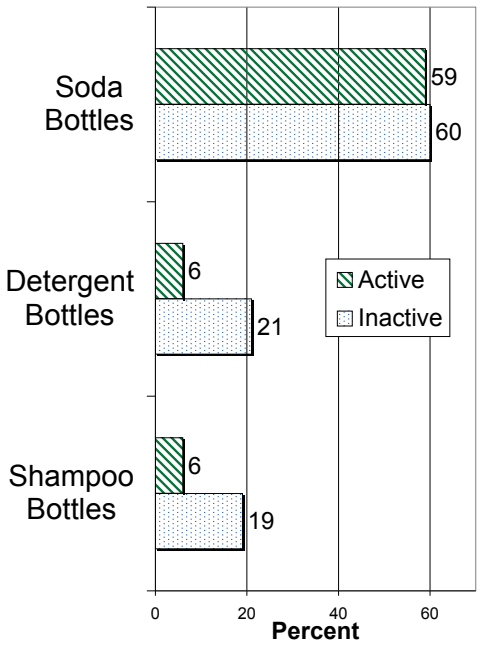
CHART: PAPER FIBER RECYCLABLES MENTIONED



PLASTIC RECYCLABLES

As with paper fiber recyclables, recall for plastic recyclables was only significant for soda bottles. For the other two items, fewer than a quarter of participants mentioned each.

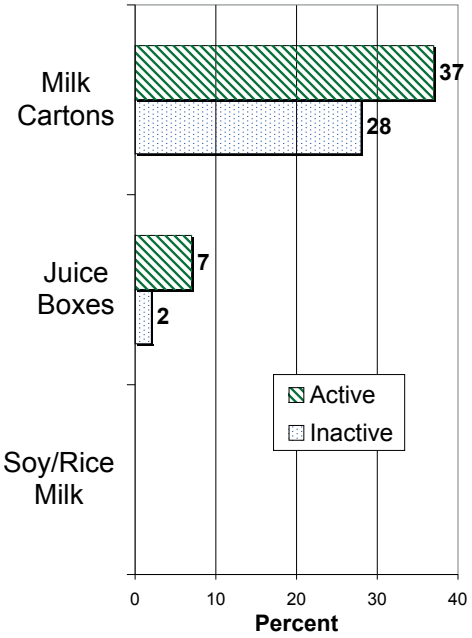
CHART: PLASTIC RECYCLABLES MENTIONED



MILK/SOY AND JUICE CARTONS

As shown below, only a minority of participants mentioned milk cartons. Hardly any of the respondents recalled juice boxes and no one mentioned soy or rice milk cartons.

CHART: CARTON RECYCLABLES MENTIONED



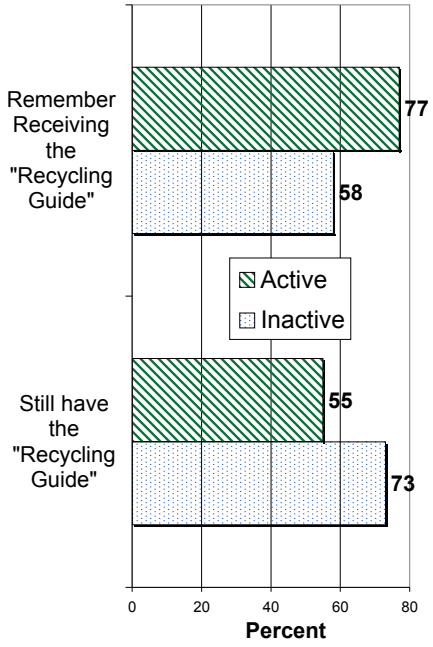
Other items that respondents mentioned but that were not included in the above categories included; Styrofoam containers, plastic food containers, distilled water bottles, aerosol and paint cans, books, shredded paper, pizza boxes, plastic wrappings, baby wipe containers, and paper towel tubes.

RECYCLING GUIDE

Earlier this year recycling guides were mailed to all households in the Town of Windsor. On the cover is a note mentioning that the booklet should be kept for future reference and is good until 2002. Respondents were asked whether they remembered receiving the "Recycling Guide" earlier that year. If they did, they were asked if they still had it, how often they referred to it when they had questions about what could be recycled, and where they kept it. The following chart represents their responses.

The first question represents the percentage of individuals, divided into groups of active and inactive recyclers, who reported that they remembered receiving the "Recycling Guide". The second question represents only those individuals who said; "yes" to the first question and who still had the "Recycling Guide". For example, 77% of the active recyclers remembered receiving the guide earlier this year and 55% of those individuals still had it. Significantly more active recyclers remembered receiving the guide. However, significantly more inactive recyclers kept the guide.

CHART: RECYCLING GUIDE



The participants who reported that they still had the "Recycling Guide" were asked how often they referred to it when they had questions about what can be recycled. Thirty-four percent of the active recyclers and 12% of the inactive recyclers reported that they referred to the guide all or nearly all of the time and 24% of the active recyclers and 38% of the inactive recyclers reported that they never or almost never referred to it. Therefore, active recyclers who still have the recycling guide refer to it far more often than inactive recyclers.

Finally, those participants who still had the "Recycling Guide" were asked where they kept it. The most popular choice was in the kitchen or on the refrigerator (12). Six participants kept it in a filing cabinet, five

Thirty-four percent of the active recyclers and 12% of the inactive recyclers reported that they referred to the guide all or nearly all of the time and 24% of the active recyclers and 38% of the inactive recyclers reported that they never or almost never referred to it.

The kitchen is a primary source for many recyclables and it is therefore not surprising that many of the items that showed higher levels of recall were items that are "kitchen related".

in a drawer, and five in the garage. Others mentioned that they taped it to the wall over their bins, on a table, in the living room, in a desk, and in the laundry room.

Lastly, participants were asked whether they had any problems or concerns with the present recycling collection services or the information materials that were provided. Overwhelmingly the largest complaint regarded recycling cardboard, which was mentioned by 23 respondents. Participants found it difficult to bundle, time consuming, hard to fit in the bin, and inconvenient. Several participants mentioned that the cardboard was often too big and if they placed too much in the bin the collectors would remove the excess and leave it behind. The second most common concern regarded the range of recyclables collected. Several respondents noted that they would like to see the range of recyclables increased, specifically more types of plastic (5) and plastic bags (2). Six participants also suggested that adding wheels would allow the containers to be more easily rolled to the curb, as they can be heavy and cumbersome. Five respondents found the collectors rude and messy and three reported that their bins were too small to hold all of their recyclables. In contrast, four people said that they would like four bins (i.e. separate bins for plastic and glass) while four said they would rather have one large bin and not have to separate their recyclables at all. Lastly, participants would like to see a clearer holiday schedule (2), more flyers (2), a magnet for their refrigerator (1), and a lid to stop the newspapers from blowing away (1).

PHASE TWO

In Phase Two of this project, specific strategies were focus group tested, refined and then piloted. After describing potential aspects of the social marketing strategy, each of these steps is detailed.

SOCIAL MARKETING STRATEGIES

The literature review, focus groups and telephone survey provided a strong foundation for identifying the important elements of the community-based social marketing strategy. Based upon this research, the following emerged as potential aspects of an effective strategy to divert more paper and yard waste.

Enhance Understanding

Knowledge, even among active recyclers, of what items are recyclable is poor. The recycling guide, while providing detailed information, has not to date been an effective tool for enhancing knowledge. Few respondents have kept the guide and an even smaller number refer to it frequently.

To enhance knowledge of the items that can be recycled, decals should be placed on the recycling and yard waste containers. By affixing easy to understand decals to the sides of these receptacles, residents will be provided with ongoing timely information on what is recyclable.

The telephone survey gauged support for affixing decals to the sides of the recycling containers. Overall, 78% of respondents moderately or strongly agreed that having stickers on the sides of the recycling containers would make it easier to know what is recyclable. Given the poor levels of recall indicated earlier for recyclable materials, and the perception on the part of inactive recyclers that they are not knowledgeable, it is encouraging that so many respondents supported the provision of stickers.

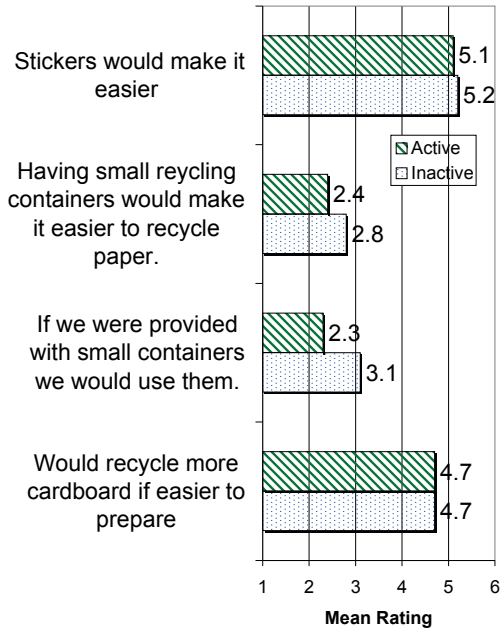
Commitment

Affixing decals to the sides of recycling receptacles increases the likelihood that residents will become more aware of what items are recyclable. However, it doesn't ensure enhanced awareness, as there is no guarantee that residents will refer to the decals. To further increase the likelihood that residents will refer to the stickers, public commitments can be sought. For example, residents can be asked to make a pledge to initially familiarize themselves with the items that are recyclable by reviewing the decal. Further, they can be asked to pledge to refer to the stickers whenever they are unsure if an item is recyclable. To enhance the likelihood that residents will follow through with the pledges, they can be made public by publishing their names in the local newspaper.

Diverting Paper

The kitchen is a primary source for many recyclables and it is therefore not surprising that many of the items that showed higher levels of recall were items that are "kitchen related." Unfortunately, paper is used throughout the house and for convenience reasons and/or lack of knowledge is not likely to be carried to the location where the recycling containers are kept. A solution to this problem is to provide householders with "mini-recycling" containers that can be placed in those rooms where a lot of paper waste is generated (e.g., home offices). The telephone survey tested support for providing these mini-recycling containers. Participants were asked to rate the following two statements: " Having small recycling

Chart: Support for Strategies



One of the most significant challenges in delivering an effective recycling program is that not only does behavior need to be changed, but also these changes need to be sustained over time.

Affixing decals to the sides of recycling receptacles increases the likelihood that residents will be come more aware of what items are recy clable.

containers that could be placed in different rooms in our home would make it easier to recycle paper, " and "If we were provided with small recycling containers to place in different rooms in our home to collect paper we would use them." Support was generally low for this social marketing strategy with 79% of the active recyclers and 70% of the inactive recyclers mildly to strongly disagreeing with this statement on a six-point scale. For the second statement, whether they would use them if they were provided, support was marginally stronger with 14% of the active recyclers and 21% of the inactive recyclers reporting strong agreement. However, 59% and 30%, respectively, reported strong disagreement with using these containers. While support for these containers was low, it was important to test this idea further given its potential to divert paper. Many respondents might have felt that they were being asked to place these containers throughout their home. Consequently, participants in the strategy focus groups were shown different paper recycling containers and support for using them was explored.

Cardboard

Recycling cardboard is often a confusing and frustrating task for many individuals as it must be flattened and cut or folded into small pieces. Survey participants were asked if it was convenient for their household to recycle cardboard. Although 40% of the active recyclers and 20% of the inactive recyclers strongly agreed, there were many respondents who disagreed. Forty percent of the active recyclers and 55% of the inactive recyclers reported mild to strong disagreement. To further explore this issue, respondents were asked to rate the statement, "I would recycle more cardboard if it was easier to prepare for recycling." Results indicate that respondents would recycle more cardboard if it was easier to prepare. Fifty-seven percent of the active recyclers and 66% of the inactive recyclers either moderately or strongly agreed and only 11% and 9%, respectively, strongly disagreed. While it is beyond the scope of the present project to address these concerns, easing the preparation of cardboard for recycling should be explored with the hauler as inconvenience is a significant barrier to diverting more cardboard.

STRATEGY FOCUS GROUPS

On July 9th and 10th of 2001 two focus groups were conducted to obtain feedback on the proposed elements of the community-based social marketing strategy. The first focus group was composed of 10 women, the second, of 8 men.

Labelling Containers

Participants were asked for their reactions to attaching decals to the recycling and yard waste containers. While the women were more strongly in favor of adding the labels than where the men, almost all participants thought it would be helpful. The two most common reasons for supporting the use of decals included:

- Convenience -- no need to refer to a booklet to ascertain what is recyclable; and
- Cost effective way for residents to become more knowledgeable regarding what can be recycled.

Participants were also shown several prototype labels. Respondents were divided over the inclusion of photographs as well as information on both what could and could not be recycled. During subsequent conversations, however, consensus emerged that including both what could and could not be included would be useful.

Additional suggestions regarding the labels included:

- The need for the decals to be durable and waterproof (e.g., heavily laminated);
- Decals should be worded for children and teens;
- Text should be both in English and Spanish; and
- Information on how to prepare cardboard for recycling should be provided.

Based on the feedback received, the decal shown on this page was developed for the pilot.

Gaining Commitments

After receiving feedback from respondents about the decals, they were next asked about obtaining commitments. They were first asked what they thought of the idea of residents receiving a phone call from the Town of Windsor regarding recycling. They learned that as part of this call residents would be asked to make a pledge to refer to the decal. Half of the women and all but one of the men were opposed to the idea. Respondents referred to the idea as "childish," "insulting," and a "gimmick." Needless to say, they were even less impressed with the prospect of having their names published in the newspaper. Indeed, all but one male and one female respondent were opposed to the idea.

Participants were also asked whether they would consider placing a static-cling sticker in their front window saying that they support recycling. While this option did not garner the negative response that the previous two items did, it was not warmly received. Respondents were reluctant to post a sticker in their window and felt that it would not motivate others to recycle. Several respondents noted that they are clearly able to

Half of the women and all but one of the men were op posed to the use of commitments. Re spondents referred to the idea as "child ish," "insulting," and a "gimmick."

Of the 33 who re ported receiving the materials, 100% had reviewed the sticker and 75% reported placing the stickers on the bins.

see who recycles by the mere presence of recycling containers at the curbside.

Overall, respondents did not see a strong need for providing containers that they could use for recycling paper. Despite the fact that diversion for paper items is low, most reported that they already had a container that they used for this purpose. Of the containers that were shown to the respondents, the most popular choice was a paper bag (particularly among the women). Several of the men suggested that residents be provided with a choice that suited their needs.

PRE-PILOT STRATEGY TEST

Given the negative response to the use of commitment and the provision of a recycling container for paper, the overall strategy was piloted on a small scale prior to being implemented across the pilot area. In total, 46 residents of the Town of Windsor were contacted and asked if they would be willing to make a pledge to review a sticker that would subsequently be left in a preassembled box at the their front door. Fully 100% of the residents agreed to review the sticker. Further, 100% of those called agreed to accept a cardboard container that they could use for recycling paper (these containers were selected due to their lower relative cost, durability compared to a paper bag, and the ability to print the recycling information directly on the box). Finally, in stark contrast to the results obtained in the focus groups, 85% of those called agreed to have their names published in the newspaper.

At a later time these households were surveyed by telephone to gauge their participation in the pre-pilot. Of the original 46 homes, 40 were reached by the surveyor. Of these 40, 33 reported receiving the materials. Of the 33 who reported receiving the materials, 100% had reviewed the sticker and 75% reported placing the stickers on the bins. Fully 92% felt the decals were informative and 68% reported using the box.

CONTEXT

The social marketing strategy project for Sonoma County was developed with the knowledge that a single-stream recycling program was going to be implemented County-wide shortly after completion of the pilot project. Single-stream recycling is the commingling of all recyclables (containers and paper fiber) from residents in a single container that would be placed at the curb and emptied using automated collection equipment. The staff of the SCWMA were aware that this would address some of the barriers to recycling, especially convenience of cardboard recycling. The social marketing research was intended to support this new recyclables collection system by identifying other barriers and motivations and developing a strategy that would maximize the diversion of paper fiber, a major recyclable component in the waste stream. Preliminary results of the pilot project were used to develop labels that were attached to the single stream recycling containers identifying the acceptable materials using English and Spanish text and pictures.

STRATEGY IMPLEMENTATION

Based on the results of the strategy focus groups and the pre-pilot telephone calls, the following community-based social marketing strategy was devised. After collecting five weeks of baseline data, the pilot area of 1500 homes was divided into three roughly equivalent areas based upon Wednesday, Thursday and Friday garbage routes in the Town of Windsor.

Control: Baseline and follow-up data were obtained, but residents in this area received no strategies to increase their level of paper recycling. This group served as a comparison for the other two groups.

Drop-Off Only: Residents in this group had left in front of their door an assembled box with a letter and decal inside. The letter explained the pupose of the pilot and asked that the decal be placed on their paper recycling containers. Further, it requested that the box be used in any room of their house to recycle paper.

Drop-Off & Commitment: The third group received the same materials as the "Drop-Off" only group. However, prior to receiving these materials residents in this group were called and asked to make a commitment to participate in the pilot. The following script was used for these calls:

> Hello, my name is _____ and I am calling about recycling in the Town of Windsor. Could I please speak to the person in your home who is primarily responsible for recycling?
>
> Repeat introduction if another person comes to the phone.
>
> As you may know, the State of California has mandated that all communities must recycle 50% of their waste by 2003 or face stiff fines. In order to meet this 50% goal, we are asking residents of the Town of Windsor to assist us. In the next few days a sticker will be delivered that describes all the types of paper that can be recycled. We are calling to ask if you will read the sticker to learn all of the items that are recyclable and attach it to your paper recycling bin. Would you be willing to read the sticker and apply it to your container?
>
> If no: Thank the resident for his/her time.
>
> If yes: That's great. Thank you for agreeing to assist us. At the same time that we distribute the stickers, we can also deliver a small cardboard container that can be used to collect paper for recycling. We are hoping that residents will place this small box in a location in their home where a lot of paper waste is generated. This container will also provide information on the different types of paper that are recyclable. Would you be willing to use this container to collect paper for recycling?
>
> If no: Thank the resident for his/her time.
>
> If yes: Thank you for agreeing to use the box. We are also asking residents if they would be willing to help us with an advertisement that we plan to take out in the Windsor Times. This ad would list the residents who have pledged to divert as much waste as possible through recycling. We are hoping that having hundreds of names appear in the ad will encourage many more people to recycle. Are you willing to pledge to recycle more and have your name appear in the ad?
>
> If no: Thank the resident for his/her time.
>
> If yes: Thank you for your willingness to have your name appear in the ad. How would you like your name listed and can I please get the correct spelling?
>
> Thank the resident for his/her time.

Extensive data was recorded regarding these calls to allow the utility of this strategy to be ascertained. Of the 396 telephone numbers that were available for this pilot area, 319 or 81% had working telephone numbers. Of these households, fully 88% were reached over the course of three waves of calling (61% first wave, 19% second wave, 8% third wave). On average the callers were able

The third group received the same materials via a door-hanger bag that the "Decals and Paper Recy cling Box" group did. However, prior to receiving these materials residents in this group were called and asked to make a commitment to participate in the pilot.

For all three pilot areas set-out rates for the baseline and follow-up were nearly identical for recycling, yard waste and garbage.

to reach 8 callers per hour. Of the 281 households reached, fully 72% committed to review and attach the stickers and 53% (148) agreed to have their names published in the newspaper (their names were published in the February 20-26, 2002 issue of *The Windsor Times*).

The two pilot areas that received materials consisted of 886 homes in total. The cost to produce and deliver recycling boxes to these homes was $3116 or $3.51 per home. The three color stickers for the paper recycling containers cost $291 to print or an additional 33 cents per home. Finally, the telephone calls to the Drop-off and Commitment households cost $3074 or $6. 43 per home. In total, delivery of the Drop-Off Only strategy cost $3.88 per home, while the Drop-Off and Commitment strategy cost $10.31 per household, or 266% more.

RESULTS

The effectiveness of the pilot was assessed through three measures: drive-by observations of participation in recycling and yard-waste collection; weight of recyclables, yard-waste and garbage; and a waste sort.

Drive-by Observations

Drive-by observations were made prior to and following the introduction of the strategies. During the baseline, these observations included recording for five weeks whether recycling and garbage containers had been placed at the curb and for three weeks whether yard waste containers were set out for all households in the three pilot areas.

For the follow-up, five weeks of observations for recycling and three weeks of observations for yard waste were made (with the exception of the "Drop-Off Only" group for which observations were made for four weeks for recycling and three weeks for yard waste). Once again, these measures involved recording whether a garbage, yard waste and recycling container were set out each week. In addition, during the follow-up the presence of a decal on the recycling container was also recorded.

As shown in the table, during the baseline and follow-up identical participation rates were observed for the control group for recycling, yard waste and garbage (54%, 51% and 83%, respectively). A similar pattern was found for the other two groups. For the group that had the materials dropped off, but were not asked to make a commitment, 66% set out their recycling container during the baseline and the follow-up. In addition, 50% set out their yard waste container during the baseline, while 52% did during the follow-up. Eighty-eight percent set out their garbage during both the baseline and follow-up. For the group of households that received both the phone calls and had the materials dropped-off, equivalent set-out rates were observed for recycling (54%), while 27% of households set out their yard waste during the baseline and 28% did so

Table: Drive-By Observations

Baseline	Recycling	Yard waste	Gar bage
Control (554 homes)	54%	51%	83%
Drop-off Only (408 homes)	66%	50%	88%
Drop-off & Commitment (478 homes)	54%	27%	81%
Follow-up	**Recycling/ (Stickers)**	**Yard waste**	**Gar bage**
Control (554 homes)	54%	51%	83%
Drop-off Only (408 homes)	66% (26%)	52%	88%
Drop-off & Commitment (478 homes)	54% (23%)	28%	82%

during the follow-up. Finally, nearly equivalent numbers of residents set out their garbage during the baseline and follow-up (81% and 82%, respectively).

Since not all homes in the "Drop-Off Commitment" group were able to be contacted, additional analyses compared those households who had been contacted with those who were not. These analyses revealed that significant differences existed within this group. Those households who pledged to have their names in the newspaper set out their recycling container 3.0 times on average over the five weeks compared to 3.1 times for the households who pledged to review the sticker and accept a box, but were not willing to have their names in the newspaper. In contrast, those households who were not reached by telephone, or who did not make a commitment, set out their container on average 2.5 times. In other words, the commitments obtained in this project resulted in recycling containers being set out 10% more frequently. Presuming that frequency of set-out is associated with higher levels of diversion, this higher set-out rate should result in significantly higher diversion across a community.

Finally, the percentage of households that attached stickers was also observed. As shown in the table, 26% of the "Drop-Off Only" households had attached the sticker compared to 23% of the "Drop-Off, Commitment" group.

Table: Recycling, Yard Waste and Garbage Weights per Week per Household

Baseline	Recycling	Yard waste	Garbage
Control (549 homes)	13.6 lbs	26.6 lbs	49.5 lbs.
Drop-off Only (404 homes)	21.0 lbs	26.6 lbs	64.3 lbs.
Drop-off & Commitment (474 homes)	17.6 lbs.	20.4 lbs.	47.5 lbs.
Follow-up	**Recycling**	**Yard waste**	**Garbage**
Control (549 homes)	15.2 lbs. (+12%)	31.2 lbs. (+17%)	46.0 lbs. (-7%)
Drop-off Only (404 homes)	26.7 lbs. (+27%)	26.8 lbs. (+.6%)	54.2 lbs. (-16%)
Drop-off & Commitment (474 homes)	17.4 lbs. (-1%)	15.9 lbs. (-22%)	52.7 lbs. (+10%)

Recycling, Yard Waste and Garbage Weights

The second set of measurements involved recording the weight of recyclables, yard waste and garbage collected for the three pilot areas prior to and following the implementation of the community-based social marketing strategies. These measurements occurred in the late fall of 2000 and then again at the same time in 2001.

As shown in the table, the amount of recyclables and yard waste collected from the control group increased from the baseline to the follow-up, while the amount of garbage collected decreased. Recyclables collected rose from 13.6 pounds to 15.2 (a 12% increase). Yard waste captured increased from 26.6 pounds to 31.2 pounds (a 17% increase) while the amount of garbage decreased over the same period by 7%. Those households who received the drop-off only also significantly reduced the amount of garbage produced and the recyclables/yard waste diverted. Recyclables captured rose fully 27% from 21 pounds per household per week to 26.7 pounds (a 15% increase over and above the control group's increase). Unlike the control group, the amount of yard waste collected rose by only .6%. However, the amount of garbage collected decreased from 64.3 pounds per week to 54.2 pounds (a 16% decrease over baseline and a 9% decrease relative to the control group).

For the "Drop-off & Commitment" group the weight measures were consistent with

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Given the consis tently positive im pact that personal contact and public commitments have had in other projects their lack of impact in this project is puzzling.

the drive-by observations. In contrast to what was expected, this group's diversion of recyclables remained essentially unchanged, while the amount of yard waste diverted decreased from 20.4 pounds to 15.9 pounds per week per household (a 22% decrease) and the amount of garbage collected increased by 10% from 47.5 pounds per week to 52.7 pounds. Given the consistently positive impact that personal contact and public commitments have had in altering behaviors in other projects, these results are puzzling.

WASTE SORTS

The final of the three measures involved collecting five weeks of garbage from the three pilot areas and conducting a waste sort of the gathered materials. These waste sorts were collected before and after the introduction of the community-based social marketing strategies. The following table provides the results from the follow-up waste sort. Each number indicates the percentage of the total, by weight, represented by a particular item. For example, 2.3% of the collected garbage for the control group consisted of recyclable aluminum and metal cans (top left corner). The numbers in parentheses indicate whether the percentage increased or decreased from the baseline waste sort (the percentage of aluminum and metal cans for the control group, by weight, increased from .9% to 2.3% of the total, an increase of 1.4%). Since the goal is to decrease the amount of recyclables found in the garbage stream, positive results are represented by a decrease in the amount of recyclables found in the waste sort. As is clearly shown in the table, the pilot significantly affected the amount of paper recycled. While the amount of recyclable paper decreased marginally for the control group (-2.7%), the decrease was significantly larger for the Drop-Off (-12.8%) and Drop-Off and Commitment groups (-8%). With the exception of "miscellaneous other," most other items either did not change from baseline to follow-up or their representation in the waste stream increased. The waste sorts also clearly identify that organics comprise a significant percentage of the waste stream and therefore provide an opportunity for further diversion through curbside organic collection.

TABLE: 2001 WASTE SORTS FOR CONTROL, DROP-ONLY, AND DROP + COMMITMENT GROUPS (BASELINE CHANGE)

	Control	Drop	Commit	Average
Aluminum Metal	2.3%(1.4)	2.2%(1.5)	2.6%(1.9)	2.4%(1.6)
Ferrous Metal	1.5%(-.8)	2.9%(.3)	2.5%(.3)	2.3%(-.1)
Food Waste	23.5%(3.4)	26.2%(5.8)	24.3%(3.9)	24.7%(4.3)
Hazardous Waste	0.3%(0)	0.3%(0)	0.4%(.1)	0.3%(0)
Miscellaneous Other	16.3%(-6.9)	17.2%(-2.1)	12.8%(-4.3)	15.4%(-4.4)
Non-Recyclable Paper	8.1%(2.3)	7.8%(2.6)	7.7%(1.1)	7.9%(2.0)
Plastics #1 & #2	1.7%(.1)	1.5%(-.3)	2.2%(.5)	1.8%(.1)
Plastics #3 - #6	1.7%(.1)	0.8%(-.6)	1.1%(-.1)	1.2%(-.2)
Plastics Other	10.0%(2.9)	10.0%((2.9)	9.4%(3.8)	9.8%(3.2)
Recyclable Glass	4.4%(.4)	2.7%(-.4)	4.0%(-.2)	3.7%(-.1)
Recyclable Paper	20.2%(-2.7)	17.1%(-12.8)	21.7%(-8)	19.7%(-7.8)
Textiles	3.0%(.5)	3.8%(1.1)	2.5%(.4)	3.1%(.7)
Wood	1.8%(.6)	2.3%(1.8)	0.9%(.6)	1.7%(1)

FOLLOW-UP SURVEY

To further explore the impact that the social marketing strategies had upon residents in the "Drop-Off Only" and "Drop-Off and Commitment" groups, a telephone survey was conducted with 117 residents. The survey began by asking if the resident remembered receiving the materials. Thirty-two percent of the residents who did not receive a telephone call preceding the drop-off of the materials did not recall receiving the materials compared to 22% of those who had received the call. Roughly equal numbers of residents in each group reported reading the sticker (58% for the "Drop-Off Only" and 62% for the "Drop-Off and Commitment"). However, these groups differed dramatically in their self reports of placing the sticker on the bin. Only 22% of those who did not receive a call reported putting the sticker on the bin compared to 56% of those who had

received a call and had agreed to have their names published in the newspaper. Too few surveys were completed with residents who received a call, but did not agree to have their names in the newspaper, to allow any meaningful analysis of this group.

Roughly equivalent numbers of respondents in each group found the sticker informative (44% and 42%) and reported that they had increased their recycling rates (38% and 42%). While initially a larger percentage of those residents who had agreed to have their names published in the newspaper reported using the box to recycle paper (54% versus 32%), both groups were functionally equivalent regarding longer-term use (26% and 22%).

SUMMARY & CONCLUSION

This pilot project specifically targeted the recycling of paper. To enhance paper recycling, three strategies were utilized. Barrier research had revealed that most residents were unaware of the diverse array of paper items that are recyclable. As a consequence, stickers were provided that could be applied to the side of the paper recycling container that provided this information. To make paper recycling more convenient, residents were also provided with a small assembled cardboard box that could be placed in a room in which paper waste was generated. Finally, to enhance the likelihood that the sticker would be referred to and the box utilized, telephone commitments were sought.

Results Summary & Commentary

These strategies affected frequency of participation, amount of waste diverted, and the composition of waste. Households who were in the Drop-Off condition set-out their recycling container more frequently than did participants in the Control condition (66% versus 54%, respectively). While initial analyses suggested that the Drop-Off and Commitment pilot households did not differ from the Control pilot households in frequency of participation, further analyses revealed that those households who made a commitment did participate more frequently than those households who were not reached or did not make a commitment (63% versus 50%, respectively).

Households in the Drop-Off condition also diverted more waste. By weight, these households diverted 27% more recyclables following the introduction of the pilot than they had beforehand (a 15% increase relative to the Control group). While overall the Drop-Off and Commitment group did not divert more recyclables, given the differences in frequency of participation noted above, it is possible that a sub-set of households in this group did alter their behavior, but that these changes were masked by the larger group. Differences in this group would also be less likely to be observed due to the lower weight of material set out for garbage, yard waste and recycling in this pilot area. The average household in this group produced 86 pounds of garbage, yard waste and recyclables a week compared to 112 pounds for the Drop-Off pilot area. These differences suggest that the pilot areas may have differed demographically, and in particular in terms of size of household and/or family income.

The community-based social marketing strategies also had a significant impact upon the composition of waste generated by the three pilot areas. The weight of recyclable paper found in the garbage decreased by 12.8% for the Drop-Off group while it decreased by 8% for the Drop-Off and Commitment group. The control group reduced their recyclable paper content by a much more modest 2.7%.

Future Directions

Commitment strategies have been used effectively to increase participation in a wide range of sustainable activities such as recycling (see McKenzie-Mohr & Smith, 1999). For example, commitment techniques have reduced energy and water use, boosted recycling rates and altered transporation choices. While these strategies have been used effectively in other projects, they were less effective in this project than simply providing stickers and a box to households (differences between and within the pilot areas make it difficult to know with precision how the two strategy applications compare). Nonetheless, this pilot provides some useful information regarding using commitments to increase waste diversion. First, gaining com-

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mitments to place a sticker on a recycling container was no more effective than simply dropping them off along with a cover letter (23% versus 26% of households, respectively, were observed with stickers attached to their containers during the five weeks of follow-up observations).

A likely more effective strategy, that is being piloted in Waltham, Massachusetts, is to have the sticker applied when the containers are set out at the curbside on collection day. In Waltham 65% of residents were found to have placed their recycling container out at the curbside over the period of two weeks. Hiring individuals to directly attach the sticker to the containers would result in a 40% increase in the number of households who have a permanent recycling reference affixed to their container. Given the small percentage of households who keep and refer to recycling booklets that are mailed to them, the attachment of stickers is likely to be far more effective. Further, this strategy is likely to be particularly attractive when volunteers can be used to attach the stickers.

The decision to use telephone commitment strategies in this project was based upon pre-pilot data in which 100% of the residents contacted agreed to review the sticker and place it on their container. Further, 100% of those called agreed to accept the cardboard box for recycling paper. In follow-up calls to these homes 100% had reviewed the sticker, 75% had placed it on their recycling container and 68% reported using the box. During the actual pilot a smaller percentage (75%) committed to review the sticker, suggesting that the callers for the pilot were less persuasive than for the pre-pilot. These observed differences in obtained commitments suggests the importance of careful screening and training of callers to ensure that a high percentage of households are likely to make a commitment.

This pilot also indicates that while the provision of a cardboard box was part of an effective strategy to divert paper recyclables, the ongoing use of these containers will likely be determined by how aesthetically pleasing the container is and how motivated residents are to reduce waste. In the follow-up telephone survey only 25% were found to still be using the container. This number may well have been greater if the fees paid for garbage collection were higher in the Town of Windsor.

There is potential to use stickers to promote both recycling as well as the proper disposal of household hazardous waste(HHW). Few residents are aware of where to take HHW. By providing this information directly on the sticker it is likely that both recycling and HHW capture rates can be significantly increased.

Finally, one of the most significant challenges in delivering an effective recycling program is that not only does behavior need to be changed, but also these changes need to be sustained over time. Providing residents with feedback on the collective impact that their changed behavior is having can be a powerful vehicle for maintaining behavior change. Accordingly, it is suggested that the SCWMA provide ongoing feedback to residents regarding the amount of waste diverted through recycling and the types of products that are created from recyclables.