

MOORE

& Associates

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Final Report:

Pilot Multi-Tenant Office Paper Recycling Program Evaluation

Prepared for:

**Recycling at Work:
A Campaign of the National Office Paper Recycling Project
U.S. Conference of Mayors**

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Executive Summary

Implementing and maintaining a successful office paper recycling program is a continuing challenge for office building management and recycling service providers. In 1998, a report by Franklin Associates, sponsored by the Recycling At Work Campaign, identified the characteristics of a successful office paper recycling program and developed a strategy and action plan to bring office paper recovery to a new level of effectiveness.

Franklin Associates found that office paper recovery programs in multi-tenant buildings require significantly greater effort than those in single tenant buildings. In multi-tenant buildings, difficulties with coordination and communication among building managers, janitorial staff, tenants, and recycling service providers pose additional challenges for the success of a recycling program. To test the attributes that make recycling successful in multi-tenant buildings, Franklin Associates recommended additional research on the set-up and implementation of multi-tenant office paper recovery programs. The Recycling At Work campaign and the District of Columbia Solid Waste Management Administration responded in 1999 by launching a pilot study on office paper recycling in multi-tenant buildings, based in downtown Washington, DC.

This report by Moore & Associates presents the results of the study completed in 2001. The report's recommendations will provide a road map for Recycling At Work to focus our informational campaigns and programs on overcoming some of the current challenges faced by the recycling industry.

Pilot Program Design

Environmental Recycling, Inc. (ERI), a recycling service provider, was selected to partner with Recycling At Work and the District of Columbia Solid Waste Management Administration in the design and operation of the pilot program. ERI assisted Recycling at Work in selecting five buildings to participate in the program. The design of the office paper collection system reflected a combination of Franklin Associates study recommendations, ERI operational experience, and available markets for the recovered paper. The paper grade targeted for collection was Sorted Office Paper (includes all printing and writing papers, white bond, copy paper, colored paper, NCR forms, old newspapers, magazines, coated paper). Table E-1 provides details pertaining to implementing the pilot in each building.

Pilot office paper collections were initiated in Buildings 1, 2, and 4 in September 1999; Building 3 in November 1999; and Building 5 in February 2000. Building 3 ceased participating in the pilot after a few months of involvement. It is believed that the confidential nature of the wastepaper generated in this building, which houses medical tenants, affected program participation.

Implementation

Both ERI and Recycling At Work were involved in initial communications with the building managers, who were the primary contacts in each building. Building managers were supplied with desk-side containers and brochures for distribution to their tenants along with posters for tenants to display in their offices and janitorial memos in both English and Spanish. Instructional information was printed on the desk-side containers, thereby providing a more permanent reminder of what is recyclable to each of the program participants. Tenants were responsible for placement of the central containers in convenient, high-generation locations.

In each building, the custodial staff were responsible for emptying the central containers into 90-gallon rollout carts that were stored in a designated area near the loading dock. The carts were emptied, typically, on a once-a-week basis by ERI crews, who transported the recovered paper to ERI's processing facility. ERI provided the recycling service at no charge. Due to current market conditions, no revenues are returned to the participating buildings.

Table E-1. Multi-Tenant Office Paper Recycling Pilot Design Characteristics by Building

<i>Pilot Program Design Characteristics</i>	<i>BUILDING 1 1775 I St., NW</i>	<i>BUILDING 2 1920 L St., NW</i>	<i>BUILDING 3 1145 19th St, NW</i>	<i>BUILDING 4 700 13th St., NW</i>	<i>BUILDING 5 2600 Virginia Ave, NW</i>
<i>Pilot start date</i>	9/99	9/99	11/99	9/99	2/00
<i># of tenants in building</i>	9–15*	14–16*	65	15	50–60*
<i># of building occupants</i>	600	400	N/A	750	650
<i>Types of tenants</i>	Law firms, financial/ investment, consultants, government, airline mgt.	Political/ nonprofits, financial, architecture firms, duplication firm, consultants	Medical offices	Law firms	Law firms, Wash. Opera, embassies, consultants, credit union, medical/dental offices
<i>Restaurant/ cafeteria or retailers in bldg?</i>	none	none		2 restaurants, 3 retail	none
<i>Rentable office space (sq. ft.)</i>	189,922	100,651	128,000	239,702	190,000
<i>History of Program (new, former, existing)</i>	New	New	Former	Existing	Existing
<i>Promotion of recycled product purchasing?</i>	No	No	No	Yes	No
<i>Initial education</i>	Info. packet/ orientation	Info. packet	Info. packet	Info. packet/ orientation	Info. packet
<i>Follow up education</i>	none	none	none	12/06/99 lobby event, newsletter, 1 custodial orientation	2/22/00 lobby event, 2 custodial orientations

* Number of tenants increased over the pilot program period.

Results

Table E-2 summarizes grades and tonnage data for each building in the Recycling At Work pilot study. Table E-3 shows the monthly tonnage figures broken down to average pounds/square foot/month, and average pounds/building occupant/month.

Table E-2. Average Monthly Tonnage by Building (Year 2000)

Building Number and Location	Grades Recovered	Avg. Monthly Tonnage
Building 1 1775 I St., NW	WOL, SOP*	1.9
Building 2 1920 L St., NW	WOL, SOP	0.6
Building 3 1145 19 th St., NW	SOP	N/A
Building 4 700 13 th St., NW	SOP, WOL, MOP	2.4
Building 5 2600 Virginia Ave., NW	SOP	1.6

WOL = white office ledger; SOP = sorted office paper; MOP = mixed office paper

Table E-3. Average Monthly Tonnage in Pounds/Occupant and Pounds/Square Foot

Building Number and Location	Avg. pounds/ occupant/month	Avg. pounds/ Sq ft/month
Building 1 1775 I St., NW	6.21	0.020
Building 2 1920 L St., NW	3.17	0.013
Building 3 1145 19 th St., NW	N/A	N/A
Building 4 700 13 th St., NW	6.50	0.020
Building 5 2600 Virginia Ave., NW	4.82	0.016

In comparing the four active buildings, Building 4 recovered the highest total tonnage of paper as well as the greatest amount of paper per employee and per square foot. This was also the largest building participating, based on rentable square feet and number of building occupants. Building 1 was a close second, and was actually tied with Building 4 on a pounds-per-square-foot basis. Building 2 recovered the least paper, out of the four active buildings. Contaminants generally ranged from 5-10%. Building 5 (Watergate) generally had the most contaminants, due to the wide number and variety of tenants in this building.

Recycling At Work's pilot program was effective in identifying factors that contribute toward improving program performance and those that reduce program performance. These factors are listed below.

Factors Improving Program Performance:

- Tenant orientation sessions;
- Custodial orientation sessions;
- Use of attractive permanent recycling bins;
- Building manager commitment and ongoing follow-through in maintaining the program.

Factors Reducing Program Performance:

- Passive approach to program installation;
- Insufficient and/or poor signage and overall instruction;
- Insufficient training and follow-up communication with custodial staff;
- Inadequate storage room and poor access to storage containers;
- Inconsistent recycling service provision;
- Large number of tenants.

Recommendations

Based on what was learned through the pilot study and experience gleaned by Moore & Associates from programs elsewhere, Moore & Associates offers the following strategy recommendations.

Operational Strategies:

- Clearly define roles and responsibilities for building management, custodial staff, tenants and the recycling service provider pertaining to program installation as well as ongoing maintenance.
- Utilize a hands-on approach to install or enhance multi-tenant office paper recycling programs.
- Perform follow-up program maintenance on a regular basis.
- Provide adequate and accessible storage space for the collected paper.
- Consider providing permanent desk-side recycling bins to building occupants.
- Ensure that signage remains in place.
- Provide consistent service over time.

Promotion and Education Strategies:

- Provide clear and understandable guidance at the start of new office paper recycling programs geared to all players involved.
- Provide for periodic communication with tenants on an ongoing basis.
- Provide ongoing training and education of custodial staff.

Strategies for Consideration by Recycling at Work:

- Target future communications to building managers, while recognizing that others may be important in facilitating dissemination of this information
- Document the benefits to building management organizations resulting from instituting office paper recycling programs in their multi-tenant buildings for use in motivating building managers to establish and maintain such programs.
- Maintain flexibility with respect to program design recommendations.
- Develop a guide and associated planning tools for use by building managers.
- Conduct workshops for building managers in cooperation with other organizations.
- Create a technical assistance network through education and training of outside technical assistance service providers.

1.0 Background

In November 1998, a study entitled "A Strategy and Action Plan for Increasing Office Paper Recovery" was completed by Franklin Associates on behalf of the Principal Benefactors for Recycling at Work, a campaign of the U.S. Conference of Mayors. Sponsors of the project were Union Camp, Fort James, Xerox, the U.S. Postal Service, Lexmark and Waste Management.

The fiber recovery study addressed:

- The status of office paper recycling,
- Barriers to increased office paper recycling, and
- A strategy and action plan for use by Recycling at Work.

The study concluded that office paper recycling programs in multi-tenant buildings must be improved in order to increase office paper recycling rates nationwide. The report recommended that the Recycling at Work Campaign conduct a pilot program to determine strategies for effectively recovering high-grade paper from multi-tenant buildings and to identify challenges that should be addressed in multi-tenant office paper recycling program design and management. In June 1999, as recommended in the study, Recycling At Work initiated a pilot multi-tenant office paper recovery program. Office paper collections through this pilot began in September 1999. Recycling At Work monitored the pilot program results throughout the year 2000. Office paper collections initiated in the pilot are ongoing in four of the five participating buildings.

In 2001, Recycling at Work contracted with the paper consulting firm, Moore & Associates, to evaluate the results of the pilot project. Moore & Associates analyzed background information and records associated with the pilot; compiled recovered paper tonnage data; performed site visits in each participating building; interviewed the building managers, the recycling service provider, and selected tenants; and prepared this evaluation report.

Included in this report is a descriptive summary of the pilot program, an analysis of the results, and recommendations for use by Recycling at Work in promoting expansion of multi-tenant office paper recycling nationwide.

2.0 Pilot Program Design

Franklin Associates identified the following characteristics of successful office paper recycling programs:

- Commitment to the program by upper corporate management and the building manager;
- Effective linkage to a solid waste collector or paper stock dealer;
- Recovery of selected marketable grades of source-separated paper; and
- Identification of end users that fit with the recovery program design.

Recycling At Work designed the pilot multi-tenant office paper recycling program with these characteristics in mind.

Environmental Recycling, Inc. (ERI), a recycling service provider, was selected to partner with Recycling At Work in the design and operation of the pilot program. ERI assisted the Recycling at Work Campaign in selecting five buildings for inclusion in the program, based on the following criteria:

- Multi-tenant (at least 3 tenants or more);
- One new start up location;
- One existing program in need of revitalization;
- One building that will be encouraged to purchase recycled products, i.e. a “closed loop” approach to recycling;
- Cooperative and supportive building managers;
- Located in Washington, D.C. to facilitate monitoring and evaluation.

Table 2-1 lists the location, management company, and the selection criteria that apply to each of the participating buildings.

The design of the office paper collection system reflected a combination of Franklin Associates study recommendations, ERI operational experience, and available markets for the recovered paper. Based on market conditions, the paper grade targeted for collection was Sorted Office Paper (all printing and writing papers, white bond, copy paper, colored paper, NCR forms, old newspapers, magazines, coated paper). A decision was made to supply recycling program participants with desk-side recycling containers that they were responsible for emptying into central collection bins. This collection method was regarded by ERI as a better means of minimizing contaminants than use of a "dual waste basket" system in which housekeeping staff empty recycling bins located in individual offices.

Table 2-1. Buildings Participating in the Pilot Office Paper Recycling Project

Building No.	Building Address	Management Company	Selection Criteria
1	1775 I St, NW	Institutional Property Managers, Inc.	New program. Tenants and management expressed great interest.
2	1920 L St, NW	Lincoln Properties (formerly Legatt McCall)	New program.
3	1145 19 th St, NW	REIT Management and Research, Inc.	Former program begun in 1995, to be restarted and enhanced.
4	700 13 th St, NW	CarrAmerica	Existing program, to be enhanced.
5	2600 Virginia Ave (The Watergate)	TrizecHahn	Existing program begun in 1998, to be enhanced.

Given the multi-tenant nature of the buildings, heavy emphasis was placed on initial program promotion and education. The communication strategies were varied to some extent, due to building-specific differences and interest in testing different strategies as part of the pilot program. One strategy that was tested in two buildings (Buildings 4 and 5) was holding a promotional lobby event. Another strategy, tested in Building 4, was promotion of the purchase of office supplies made from recycled paper, to inform building occupants about the value of recycling as a means of supplying raw materials for use in making new products. A third strategy, tested in Buildings 1 and 4, was conduction of building manager and tenant orientation sessions.

A description of the general approach to promotion and education utilized in all buildings is provided in the next section. More information on building-specific promotion and education strategies are described in the Summary of Results.

3.0 Pilot Initiation and Operation

Table 3-1 provides details pertaining to implementing the pilot in each building. Pilot office paper collections were initiated in Buildings 1, 2, and 4 in September 1999; Building 3 in November 1999; and Building 5 in February 2000. Building 3 ceased participating in the pilot after a few months of involvement. The original building manager could not be reached to provide an explanation. It is believed that the confidential nature of the wastepaper generated in this building, which houses medical tenants, affected program participation.

The basic approach to installing the office paper collection system in each of the buildings was as follows. Both ERI and Recycling At Work were involved in initial communications with the building managers, who were the primary contacts in each building. Building managers were supplied with desk-side containers and brochures for distribution to their tenants along with posters for tenants to display in their offices and janitorial memos in both English and Spanish. Instructional information was printed on the desk-side containers, thereby providing a more permanent reminder of what is recyclable to each of the program participants. Tenants were responsible for placement of the central containers in convenient, high-generation locations such as near printers and duplicating machines.

In each building, the custodial staff were responsible for emptying the central containers into 90-gallon rollout carts that were stored in a designated area near the loading dock. Custodial staff were given the option of lining the central containers with plastic bags and hauling the bagged paper to the storage area for deposit into the roll-out carts (bags included), or else rolling a cart through each of the tenant offices and collecting non-bagged paper from the central containers en route. The carts were emptied, typically, on a once-a-week basis by ERI crews, who transported the recovered paper to ERI's processing facility. ERI provided the recycling service at no charge. Due to market conditions, no revenues were returned to the participating buildings.

4.0 Summary of Results

Data on the tonnage and general quality (grade specification met) of the paper recovered from each building were recorded by ERI on a monthly basis. ERI estimated the tonnage by counting the number of full and partially full roll-out carts collected from each building by a specific truck on a given collection day, weighing the full truckload, determining an average weight per cart, then allocating the tonnage to each building in accordance with the number of carts generated. ERI determined paper quality by visual examination of each cart's contents and assigning a paper grade to each cart. Data on the percentage of contaminants in the paper were not collected; however, ERI provided a rough estimate of contaminants: ranging from 5 to 10%.

Table 3-1. Multi-Tenant Office Paper Recycling Pilot Design Characteristics by Building

<i>Pilot Program Design Characteristics</i>	<i>BUILDING 1 1775 I St., NW</i>	<i>BUILDING 2 1920 L St., NW</i>	<i>BUILDING 3 1145 19th St, NW</i>	<i>BUILDING 4 700 13th St., NW</i>	<i>BUILDING 5 2600 Virginia Ave, NW</i>
<i>Pilot start date</i>	9/99	9/99	11/99	9/99	2/00
<i># of tenants in building</i>	9–15*	14–16*	65	15	50–60*
<i># of building occupants</i>	600	400	N/A	750	650
<i>Types of tenants</i>	Law firms, financial/ investment, consultants, government, airline mgt.	Political/ nonprofits, financial, architecture firms, duplication firm, consultants	Medical offices	Law firms	Law firms, Wash. Opera, embassies, consultants, credit union, medical/dental offices
<i>Restaurant/ cafeteria or retailers in bldg?</i>	none	none		2 restaurants, 3 retail	none
<i>Rentable office space (sq. ft.)</i>	189,922	100,651	128,000	239,702	190,000
<i>History of Program (new, former, existing)</i>	New	New	Former	Existing	Existing
<i>Promotion of recycled product purchasing?</i>	No	No	No	Yes	No
<i>Initial education</i>	Info. packet/ orientation	Info. packet	Info. packet	Info. packet/ orientation	Info. packet
<i>Follow up education</i>	none	none	none	12/06/99 lobby event, newsletter, 1 custodial orientation	2/22/00 lobby event, 2 custodial orientations

* Number of tenants increased over the pilot program period.

The tonnage and grade information was provided to the Recycling at Work project coordinator and the building managers on a periodic basis. Moore & Associates compiled and analyzed this information in completing this pilot project evaluation. Building-specific results are briefly discussed below, followed by a comparative assessment of program performance in all of the buildings.

Building 1: 1775 I St., NW

Fifteen tenants and approximately 600 employees work in this building. A majority of tenants are law firms, with others including investment and consulting firms, government offices, and an airline management office. The building did not have an office paper recycling program before this pilot project started. The program installed during this pilot project is still in operation.

The tenants in the building had been requesting recycling services for some time, and were very eager to have the opportunity to begin office paper recycling. Reports from the service provider and building engineer indicate that the program has worked well from the beginning. Custodial staff have been trained on proper collection procedures. Tenants and employees received desk-side bins during initial installation and orientation. No other educational or promotional activities have taken place.

Custodial staff collect office paper from central containers once a week. Tenants call building management if they need more frequent service or additional desk-side recycling boxes. The day porter or building engineer services the additional recyclables and delivers requested desk-side bins to their offices.

During the year 2000, an average of 1.9 tons of office paper were recovered per month, or a total of approximately 22.4 tons per year.

Building 2: 1920 L St., NW

Building 2 was the poorest performer of all the active pilot project buildings. Sixteen tenants and approximately 400 employees work in this building. Tenants include associations and nonprofits, financial institutions, architecture firms, consultants, and a copy shop. As with Building 1, Building 2 did not have a paper recycling program before this pilot project started. The program installed during this pilot is still in operation.

A tour of two tenant spaces revealed a wide discrepancy in program setup. One tenant had purchased its own plastic Rubbermaid desk-side recycling bins. These were placed by each desk and used along with the central bins in copy and break rooms provided by ERI. The other tenant had central bins set up in the copy room, but there were no desk-side bins to be found.

This inconsistent setup in tenant spaces is usually a direct result of minimal building management involvement. ERI generally assisted with the installation of central containers in copy rooms, but left the delivery of desk-side bins and the distribution of educational materials to the building management.

During the year 2000, an average of 0.63 tons of office paper was recovered per month from Building 2, or a total of approximately 7.5 tons per year.

Building 3: 1145 19th St., NW

Building 3 is a medical building with 65 tenants comprised entirely of doctors' offices. A successful recycling pilot project could not be established at this site. There were only a couple of months with measurable recyclable paper collection. Recycling services were stopped at this building for lack of participation. It is believed that the confidential nature of the paper involved affected program participation.

Building 4: 700 13th St., NW

Fifteen tenants and approximately 750 employees work in this building. A majority of tenants are law firms. The building had an existing paper recycling program before the pilot project was started. The pilot helped to reinvigorate the program and get more tenants involved.

Building management took an active role in running the office paper recycling program at this site. A few months after orientation materials and recycling containers had been installed, a promotional lobby event was held to raise awareness throughout the building. This event was held midday to catch tenants coming and going for their lunch break. An educational display about recycling and recycled-content products was set up, refreshments were provided, and Recycling at Work personnel were on site to answer questions about the recycling program. Additional communications include office paper recycling updates and reminders as part of a building management newsletter regularly sent to each tenant. One custodial orientation was also held to educate the custodial crew on why recycling is important and how to service the recycling containers.

During their tour of the building in June 2001, Moore & Associates discovered that some of the tenants were unaware of the availability of desk-side containers for use in recycling. Building 4 took an active role in implementing its office paper recycling program. However some tenants may not have been properly set up with desk-side bins initially, or else follow-up educational efforts were needed to ensure that tenants remained aware of the means to participate in recycling.

Building 4 was also an active participant in a recycled products purchasing program. A catalog of products made from recycled materials was faxed to the purchasing agent for the building. Tenants in the building were asked to make a conscious effort to purchase paper products (paper towels/toilet paper) that were produced using a high percentage of post-consumer recycled content. No data on the amount of recovered paper products purchased were collected for analysis in this study; but it is known that building management continues to utilize some recycled content paper products.

During the year 2000, an average of 2.4 tons of office paper was recovered per month, or a total of approximately 28.8 tons per year.

Building 5: 2600 Virginia Ave., NW

Sixty tenants and approximately 650 employees work in this building – part of the Watergate complex. A majority of tenants are law firms, embassies, consultants, medical/dental offices, a credit union, and offices for the Washington Opera. This building has a large number of relatively small tenants. The other buildings participating in the pilot project, by comparison, have the opposite structure. This different structure makes the office paper recycling somewhat more difficult to run in this building because of the increased communication that is required.

Building 5 had an existing office paper recycling program in place. The pilot study provided an opportunity to reinvigorate this program. Building management believed that they had the necessary supplies and educational materials in place and good communication with tenants to help them recycle well. Tenants were supplied with information packets and educational material, and desk-side containers were distributed. A promotional lobby event was held to raise awareness about the recycling program. The lobby event was similar to the one held in Building 4 but also included a basket-shooting contest in which participants received a U.S. Conference of Mayors T-shirt if they were successful in making 2 out of 3 baskets. The "balls" used in this game were balls of crumpled recyclable office paper.

One particular complaint from building management was a problem with custodial staff throwing some of the cardboard desk-side recycling bins away when they cleaned office space in the evening. Building management was getting a lot of calls from tenants asking for replacement bins. This led to a second custodial orientation in this building.

During the year 2000, an average of 1.6 tons of office paper was recovered per month, or a total of approximately 19.2 tons per year.

5.0 Assessment Findings**Paper Recovery Effectiveness**

Office paper recycling program performance is typically measured by the average monthly tonnage and quality of the office paper collected. Table 5-1 summarizes grades and tonnage data for each building in the Recycling At Work pilot study. Table 5-2 shows the monthly tonnage figures broken down to average pounds/square foot/month, and average pounds/building occupant/month. This breakdown facilitates comparison of recycling program performance in each building, and what factors improved or reduced program performance.

Table 5-1. Average Monthly Tonnage by Building (Year 2000)

Building Number and Location	Grades Recovered	Avg. Monthly Tonnage
Building 1 1775 I St., NW	WOL, SOP*	1.9
Building 2 1920 L St., NW	WOL, SOP	0.6
Building 3 1145 19 th St., NW	SOP	N/A
Building 4 700 13 th St., NW	SOP, WOL, MOP	2.4
Building 5 2600 Virginia Ave., NW	SOP	1.6

WOL = white office ledger; SOP = sorted office paper; MOP = mixed office paper

Table 5-2. Average Monthly Tonnage in Pounds/Occupant and Pounds/Square Foot

Building Number and Location	Avg. pounds/occupant/month	Avg. pounds/Sq ft/month
Building 1 1775 I St., NW	6.21	0.020
Building 2 1920 L St., NW	3.17	0.013
Building 3 1145 19 th St., NW	N/A	N/A
Building 4 700 13 th St., NW	6.50	0.020
Building 5 2600 Virginia Ave., NW	4.82	0.016

Figure 5-1 shows monthly tonnages over time for each of the four buildings actively participating in the pilot.

In comparing the four active buildings, Building 4 recovered the highest total tonnage of paper as well as the greatest amount of paper per employee and per square foot. This was also the largest building participating, based on rentable square feet and number of building occupants. Building 1 was a close second, and was actually tied with Building 4 on a pounds-per-square-foot basis. Building 2 recovered the least paper, out of the four active buildings.

Many different factors affect the amount and quality of material collected in office paper recycling programs. Some of these include:

- The type and number of tenants in the building;
- Whether there was an existing recycling program in place prior to installation of the program in question;
- The attitude of tenants – do they feel the program is filling a need?
- Whether building management was enthusiastic about installing a recycling program;

- The kind of training and support the custodial staff receive;
- Who was in charge of program installation; and
- The methods used for ongoing program maintenance.

The way such factors are addressed helps determine how effectively office paper will be recovered. Many of the factors listed above should be addressed differently when installing a multi- versus a single-tenant building. The most apparent difference is the need to rely more heavily on the active involvement and assistance of building management, as it is the building managers who are in direct communication with each tenant on a regular basis. In addition, each tenant in a multi-tenant building may have different needs and preferences that should be understood and taken into consideration.

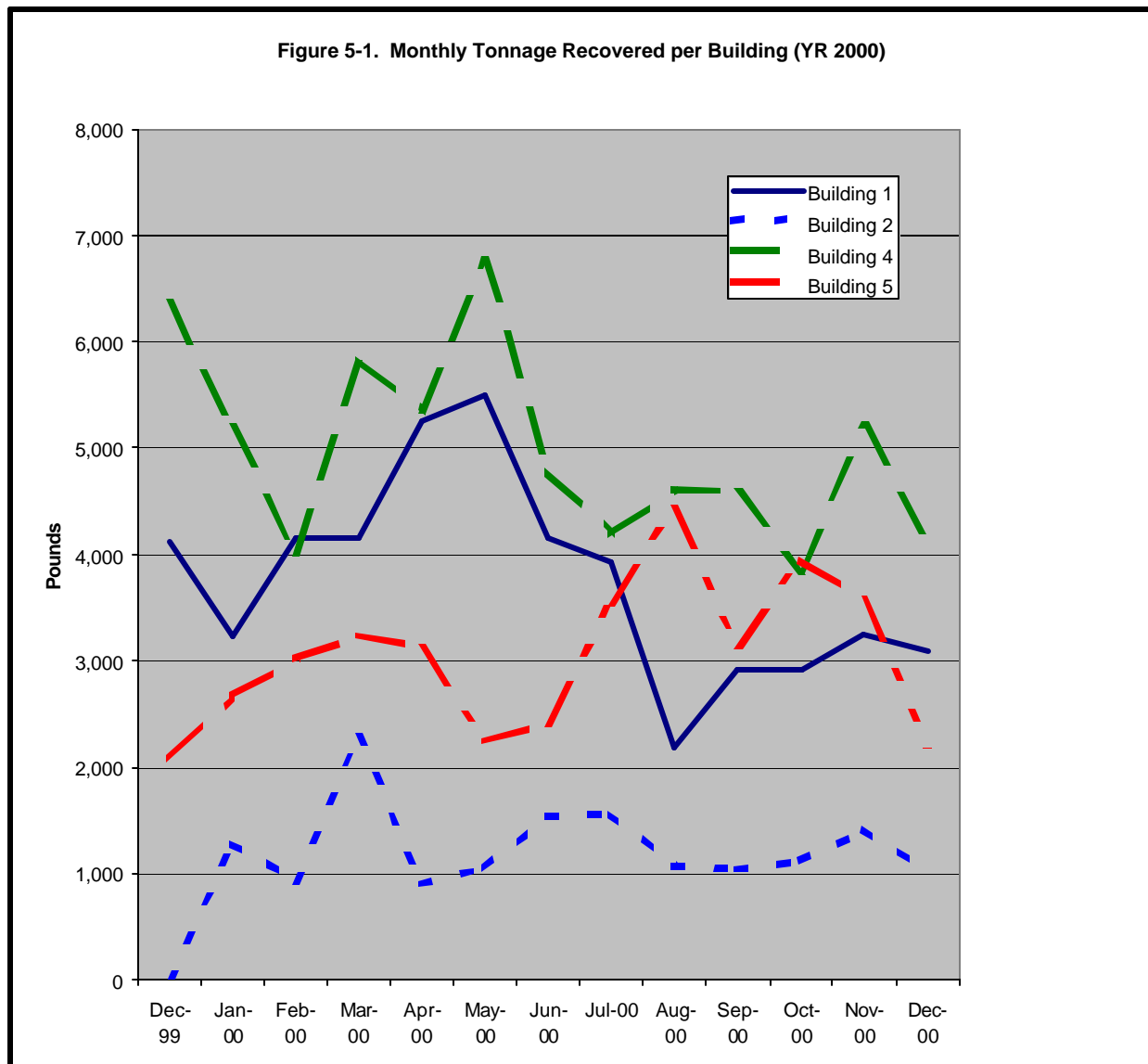
Another very important, but less apparent difference is tenant motivation for recycling. In a single tenant building there may be a stronger material resource and cost savings strategy behind the program: lower building operating costs may be a direct benefit to a single tenant. For this reason, it is more likely that “higher-ups” in the tenant’s organization will be actively involved in the decision to participate in recycling. Such senior management support generally results in higher tenant participation. In multi-tenant buildings, the motivation for recycling would follow a more “environmentally friendly” track – mostly because any economic benefit from recycling would be felt by building management and not individual tenants. For this reason, tenant interest and support may vary in a multi-tenant building, and a more hands-on approach to promoting the benefits of recycling will be required on the part of the program operator.

In addition to recovered paper market conditions, the types of tenants will largely determine what materials are most available and should be targeted for recovery. If there are a large number of doctors’ offices, mixed office paper (MOP) may be the paper grade that is the best target. If law firms predominate, white office ledger (WOL) may be suitable as a target grade.

The extent to which confidentiality is a concern to tenants also affects the type and availability of paper for recycling. Telephone interviews with some of the tenants in the pilot buildings indicated that some tenants believed they were ineligible to participate in recycling due to the need to use the services of an outside confidential paper destruction company. However, other pilot program tenants with confidentiality needs shredded their paper in-house, then placed the shredded paper in the recycling bins.

In all pilot project buildings Sorted Office Paper (SOP) was the grade targeted for recovery. This grade includes all printing and writing papers (white bond and colored), envelopes (except brown envelopes), NCR forms, newspaper, magazines, and other glossy paper. The grades actually set out for collection included SOP and white office ledger (WOL), with mixed office paper (MOP) collected in small amounts at one location.

Buildings typically collected between two and six 90-gallon carts of office paper per week. Material that was downgraded from WOL to SOP usually included newspapers and magazines mixed with office paper. Newspapers and magazines would usually account for less than 10% of



the total volume of material collected. Paper cartloads that included file folders, or Kraft fiber material was downgraded to MOP.

Contaminants generally ranged from 5-10%. Building 5 (Watergate) generally had the most contaminants, due to the wide number and variety of tenants in this building. Primary problem contaminants were unbleached Kraft paper bags and envelopes, and the wrappers for copier paper reams, which contain a hidden layer of protective plastic film.

Recycling At Work's pilot program was effective in identifying factors that contribute toward improving program performance and those that reduce program performance. These factors are discussed in the following section.

6.0 Conclusions

After reviewing the paper recovery data and information obtained through site visits and interviews, Moore & Associates has developed the following conclusions regarding factors that improve office paper program performance and those that appear to have led to reduced program performance.

Factors Improving Program Performance

Tenant orientation sessions. All buildings were supplied with information packets for distribution to tenants. The buildings that additionally provided a structured orientation and desk-side container distribution showed notably better overall performance. Orientation programs were usually done with the building manager and one representative from each tenant (usually the office manager) present. The office manager would be briefed on the program by the building manager or service provider, and return to his/her office with desk-side bins and “how-to” information for their office staff. This sort of additional work invested on the front end of an office-paper recycling program will usually provide for increased performance over the long-term. Follow-up lobby events also contributed to boosting paper recovery, although recovery levels appeared to drop off again somewhat as time went by.

Custodial orientation sessions. Key to successful office paper collection is the custodial staff who perform this work. In Washington DC, custodial staff typically include a large number of Spanish speaking employees. Spanish language procedure sheets were distributed as part of the information packet distributed in each building. The buildings that held custodial orientations, and reviewed the recycling procedures with the custodial staff in detail performed more consistently. After this initial orientation, the custodial supervisor was usually the person in charge of ongoing training for his/her staff.

Use of attractive permanent recycling bins. By far the highest recycling participation observed by Moore & Associates during the site visits was in the offices of a tenant that had purchased their own recycling bins. Provision of these bins to each employee showed management commitment to recycling and an expectation that all employees are to recycle. Furthermore, the user friendly and highly visible nature of the containers appeared to help maintain awareness and support for the program.

Building manager commitment and ongoing follow through in maintaining the program. As indicated by the tonnage data, this factor appears to be most critical in overall program performance. In the buildings with the most active building managers, recovered paper tonnage was the highest. In Building 2, where building managers changed during the pilot, overall tonnage was the worst of the four buildings actively participating in the pilot. Lack of building manager commitment was clearly a contributing factor in the termination of the pilot in Building 3. Of particular importance is building manager follow-through in keeping their tenants (both existing and new) informed about the recycling program. Building managers should also regularly keep tenants equipped with desk-side and central containers and educational literature.

They should ensure that custodial contractors are committed to informing and training their employees on how to service the recycling containers.

Factors Reducing Program Performance

Passive approach to program installation. In most instances in the pilot study, tenants were left to themselves to acquire and set up their desk-side containers in order to participate. They were simply given notice that a recycling program had been started and given a location where they may pick-up their desk-side bin. This passive approach, with less involvement by building management, will lead to a lower participation rate and poor program performance.

Insufficient and/or poor signage and overall instruction. Many of the tenant spaces were properly outfitted with central collection bins. However, Moore & Associates' on-site inspections determined that signage was lacking for many of these central containers. Poor labeling of containers can lead to increased contamination and confusion over what is recyclable. Such confusion often results in poor recycling program performance. Related to this is insufficient ongoing instruction on what and how to recycle. In on-site and telephone interviews with individual building occupants, it became evident that there was confusion about what and how to recycle in several of the pilot program buildings. Some building occupants were not aware of some of the items that are accepted for recycling; others were unaware that desk-side containers were available for their use on a request basis; and some occupants thought that custodial staff were supposed to empty their desk-side containers. This confusion is most likely a result of insufficient ongoing communication between the building managers and tenants, and tenant representatives and their employees regarding the recycling program.

Insufficient training and follow-up communication with custodial staff. Communication difficulties between building management and custodial staff can lead to performance problems. Building managers agreed that keeping custodial staff informed and motivated to properly service the recycling containers was an ongoing challenge yet was critical to the success of their office paper recycling programs. As discussed above, custodial staff were given procedure sheets and posters printed in English and Spanish. This was beneficial; however it is doubtful that all custodial employees are literate and that all speak English or Spanish. In some buildings the distribution of this printed material was the only means used to educate and train the custodial staff.

In addition to the communication challenges involved in initial training of custodial staff, there is often high custodial employee turnover. One building manager stated that their custodial staff turned over completely approximately every two weeks. Furthermore, as was the case in at least one of the buildings, building managers frequently change their custodial service providers. This can contribute to the breakdown in understanding proper recycling procedures by the custodial staff, and reduced program performance can result.

Inadequate storage room and poor access to storage containers. The amount and location of storage space for the 96-gallon carts used for containing paper collected by the custodial staff may affect the amount of paper recovered. In one building (Building 5), storage space appeared

to be inadequate. This was the same building which reported a problem with custodial staff discarding desk-side containers as well as recyclable paper. When the storage carts are overflowing, custodial staff may be inclined to discard recyclables rather than struggle with finding other means of storing the paper.

In two cases where carts were easily accessible in a loading dock area, the tonnage collected was relatively high. In two cases where carts were stored in a cage or closet, the tonnage collected was lower. Carts stored out in the open may assist in reminding cleaning staff to place recyclable office paper in the correct place versus putting it in the trash dumpster. This may be especially true when a new employee is the person handling the trash and recycling; they may not know separate containers are available for the office paper if they are not visible.

Inconsistent recycling service provision. There was one report of a several-week-period where there was a shortage of desk-side containers. When desk-side containers were not available, it is possible that some building occupants who had expressed interest in recycling became discouraged and lost interest in participating. There were also several reports that there were times when collections by ERI were skipped. In some cases, recycling collections were skipped due to difficulty accessing the building loading dock. Skipped pick-ups often lead to an overflow of recyclables. As stated above, when storage containers become full, custodial staff tend to throw overflow paper in the trash.

Large number of tenants. The number of tenants in a building appeared to affect program performance as well. Building 5 (60 tenants) seemed to put a relatively equal level of effort into maintaining its recycling program, in comparison to Buildings 1 and 4 (15 tenants each). Yet overall, Building 5 recovered significantly less tonnage per building occupant than did Buildings 1 and 4. The more tenants there are in a building, the more difficult it is to maintain awareness and understanding about the recycling program among all tenants and their employees. This challenge is even greater when there is substantial tenant turnover, which is something that is also more prevalent in buildings with large numbers of tenants.

7.0 Recommendations

Based on what was learned through the pilot and the experience of Moore & Associates in establishing and operating office paper recycling programs elsewhere, Moore & Associates offers the following strategy recommendations. These recommendations may be beneficial in developing guidance materials for use by others in establishing and operating multi-tenant office paper recycling programs and for guiding the future activities of the Recycling at Work Campaign.

Operational Strategies

Clearly define roles and responsibilities for building management, custodial staff, tenants and the recycling service provider pertaining to program installation as well as ongoing

maintenance. Ideally, roles and responsibilities should be outlined in writing and agreed upon. Where appropriate, operational expectations should be incorporated into service agreements. This may be especially helpful in ensuring that training of new employees is provided by custodial supervisors.

Utilize a hands-on approach to install or enhance multi-tenant office paper recycling programs. As mentioned earlier, tenants in multi-tenant buildings will not have the same motivation for recycling as those in single-tenant buildings. Without a direct benefit to the tenant, relying on them to properly install their office paper recycling program is not the most effective course of action. Steps should be taken to ensure each tenant space has been properly set up. This requires an office walkthrough by building management or the custodial contractor. Often it is easier if building management provides the service of installing the recycling program for each tenant. As tenant space is being installed, office staff should be given recycling procedure sheets as they receive their desk-side bin. Office managers should be the main point of contact for each tenant, and have program information available to give new employees.

Perform follow-up program maintenance on a regular basis. This is generally the role of building management, although some service providers may also perform periodic maintenance functions. Building managers can include in their contractual expectations of custodial staff that they monitor signage and the condition of recycling containers in tenant spaces. Building management personnel can check the setup during visits with tenants and inquire, as part of regular correspondence, if there are any operational issues with respect to the recycling program that need attention.

Provide adequate and accessible storage space for the collected paper. An important part of any recycling program is storing the material and having the service provider collect the full carts in a timely fashion. Some effort should be taken when looking for a place to store collection carts. There should be sufficient room for enough containers to store a week's worth of collected paper. Additionally, the storage space should be easily accessible by the custodial staff and the service provider on collection days. Visible carts will serve as both an easy storage location and as a reminder to service the central containers in tenant spaces. Carts stored in cramped closets or locked cages are often not as effective. They do not allow for easy access, take more time to service, and can be forgotten or viewed as "in storage" by uninformed building staff.

Consider providing permanent desk-side recycling bins to building occupants. An additional way for building management to promote and show support for the office paper recycling program is to purchase and supply brightly-colored, plastic recycling bins to their tenants, like the blue Rubbermaid containers purchased by one of the pilot building tenants. Desk-side as well as taller "Slim Jim" containers can replace the cardboard bins used in the pilot project. This purchase will show an investment in the program on the part of the property management and may assist in increased participation and recovery rates. Despite the container's higher initial cost, they are far more durable and likely to be discarded by custodial staff.

Ensure that signage remains in place. Clear and attractive signage for central containers will help promote the office paper recycling program, bring attention to the central locations where office staff can empty their desk-side containers, and help to ensure that the correct materials are placed in the containers for recycling.

Provide consistent service over time. Changes in the frequency of container servicing, changes in the list of materials acceptable for recycling and on-again-off-again service can reduce recycling program performance. Recyclers want their service provided in a predictable and consistent fashion.

Promotion and Education Strategies

Provide clear and understandable guidance at the start of new office paper recycling programs geared to all players involved. Successful multi-tenant recycling programs generally have good ongoing communication between the recycling service provider, tenants, building engineer, and custodial staff. The thread that ties all of them together is building management. Consequently, education must begin with building managers. When the building management is aware of what is required to make a recycling program successful and understands how this benefits them, then their involvement in informing and educating the remaining participants in the recycling system increases.

Provide for periodic communication with tenants on an ongoing basis. An effective method used in one of the pilot project buildings is incorporating office paper recycling information in the building management newsletter that is sent to each tenant on a regular basis. E-mail is another excellent tool to reach tenants in order to maintain the office paper recycling program. E-mail messages can quickly and easily be forwarded by office managers and distributed to staff. This sort of follow-up as little as four times a year would be effective in keeping a recycling program in good working order. Also, maintaining clear and attractive signage for central containers will help promote the office paper recycling program and bring attention to the central locations where office personnel recycle.

Provide ongoing training and education of custodial staff. Before as well as periodically after office paper recycling has been installed in a building, the custodial staff needs to have hands on training. The initial training ideally would be bilingual, and provided by someone other than the custodial supervisor. After reviewing procedures, the entire custodial staff should be shown the basic setup in one of the tenant spaces, and also the location in the service area where the collection carts will be stored. This arrangement will give all employees the chance to hear and see how the program will work. The two pilot study buildings that had special custodial orientations both performed relatively well. Follow-up trainings should be on a schedule similar to program maintenance and performed once per quarter, with spot training provided to new employees.

Another effective communication tool is use of a pictorial procedure sheet. A step-by-step “how-to” sheet with pictures and minimal text will help address communication barriers resulting from native language differences as well as illiteracy. This information can be posted on the

back of custodial closet doors where it can be easily reviewed by custodial supervisors when new employees are hired.

Strategies for Consideration by Recycling at Work

Provided below are strategy recommendations for consideration by Recycling at Work in promoting the expansion of office paper recycling in multi-tenant buildings nationwide.

Target future communications to building managers, while recognizing that others may be important in facilitating dissemination of this information. It is clear that building managers are the central players in the establishment and maintenance of multi-tenant office paper recycling programs. It is the building management that chooses the recycling service provider, determines what is expected of custodial staff, and has ongoing communication with every tenant in the building.

Document the benefits to building management organizations resulting from instituting office paper recycling programs in their multi-tenant buildings for use in motivating building managers to establish and maintain such programs. This information, paired with the pilot project evaluation results, will serve as a solid foundation for developing future educational and instructional materials. A focus on documenting potential waste hauling and disposal cost savings would be particularly beneficial, since waste management costs comprise a substantial portion of the budget in building management operations.

Maintain flexibility with respect to program design recommendations. Each building in the pilot study had different factors to consider when installing and running their office paper recycling program. This is a clear sign that there has to be multiple methods to getting a program installed and running well. In working with just five buildings, various circumstances were present that created obstacles for program installation and operation. A factor that may not be a problem for one building could be for another. There are basic operational and educational methods that can be instituted, but there also needs to be flexibility based on circumstances that may be unique to each building.

Develop a guide and associated planning tools for use by building managers. Some pilot buildings performed better than others, and one didn't get off the ground at all. In the buildings that should have performed better, there may have been special circumstances that were not addressed in the beginning for lack of resources, knowledge or manpower on the part of building management. A multi-tenant office paper recycling planning guide could be a valuable resource for use by building managers in creating their own customized approach to installing a recycling program and trouble-shooting operational difficulties that arise. In addition, recycling service providers could use the guide to determine what should be communicated to their building manager customers when installing new multi-tenant office paper recycling programs. The guide (perhaps in downloadable or CD-based format) could be structured to lead the user through the decision-making process and could contain decision matrices, flow charts, sample communication materials, sample contract language for incorporation into recycling and custodial service agreements, and a series of planning worksheets.

Conduct workshops for building managers in cooperation with other organizations. Moore & Associates supports the idea of providing training for building managers in cooperation with such organizations as the Building Owners and Managers Association. The guide and planning tools recommended above could be developed for use as workshop instructional materials. Other organizations that may be interested in cosponsoring such training include the American Forest and Paper Association, the Paper Stock Industries Chapter of the Institute for Scrap Recycling Industries, Inc., and the National Recycling Coalition.

Create a technical assistance network through education and training of outside technical assistance service providers. Recycling at Work can leverage the use of its technical assistance resources by educating and training other individuals and organizations on how to promote effective multi-tenant recycling programs. One means of doing this would be to develop a workshop for state and local recycling program personnel that could be held in conjunction with various state recycling conferences and the National Recycling Congress. A tool kit could be developed and distributed to workshop participants that contains much of the same materials described above plus information for use in promoting office paper recycling at the state and local level.