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Recovery of Waste Newspaper from a Small Urban Community

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Report EPS 4-EC-79-6

Environmental Impact Control Directorate
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RECOVERY OF WASTE NEWSPAPER FROM A SMALL URBAN COMMUNITY

by

S.P.A.R. SYSTEMS
Ottawa

for the

WASTE MANAGEMENT BRANCH
ENVIRONMENTAL PROTECTION SERVICE
ENVIRONMENT CANADA

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ABSTRACT

This study was performed to evaluate procedures for the establishment of a waste newspaper recovery program in a small urban community of 8,053 people. It provides a step by step evaluation of all factors which affect the development of a successful recovery program including markets for waste newspaper, promotional materials, selection of collection equipment, collection schedules and recovery rates. The results of the study show the economics of different recovery systems. Recommendations are included for other communities to follow in the implementation of an efficient newspaper recovery program.

RÉSUMÉ

La présente étude a eu pour but d'évaluer les méthodes de mise sur pied d'un programme de récupération des vieux journaux dans une agglomération urbaine de 8053 personnes. Elle évalue, étape par étape, tous les facteurs influant sur la réussite d'un tel programme, notamment les débouchés pour les vieux journaux, les outils de promotion, le matériel de collecte, le calendrier des collectes et les taux de récupération. Les résultats portent sur les aspects économiques des différents systèmes de récupération et sont suivis par des recommandations à l'intention d'autres localités souhaitant mettre sur pied un programme efficace de récupération des vieux journaux.

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CONCLUSIONS

In 1970, the older section of Kanata implemented a newspaper recovery program with collection scheduled on a monthly basis. However, depressed waste newspaper market conditions in 1975 forced cancellation of the program. In 1977 the program was reorganized when a local cellulose firm offered to collect the waste newspaper from the community on a weekly basis, for a guaranteed period of one year.

A study was initiated on January 1, 1978, terminating on April 27, 1978, in the urban community of Kanata to establish procedures for the implementation of waste newspaper recovery programs in similar Canadian communities. The study proved the recovery programs in Kanata to be extremely successful. The following are the general conclusions based on that study.

1. A high percentage of residents participated in the program resulting in a recovery rate of 76 percent for the final month of the study period.
2. A total of 153,950 lbs of waste newspaper was collected from the community (2,400 household units, population 8,053) between January 1, 1978, and April 27, 1978.
3. The most efficient and practical type of collection vehicle was an enclosed five-ton van. By placing the materials directly into wooden bins located in the box of the truck, one week's collection of waste newspaper from the entire community could be sorted during collection and stored, which reduced the cost per ton to collect and process. While the packer truck was also an efficient vehicle for collection, the waste newspaper could not be sorted during the collection and it could only be off-loaded inside a building which is capable of accommodating this type of vehicle (large door and high ceiling). The small econoline van was also tried; it cost less to operate per hour, but it could not hold enough materials, resulting in many trips to the cellulose plant.
4. Low cost promotional methods used in Kanata, such as local paper advertising, fact sheets distributed to homeowners, and a cross-section

telephone survey, were effective as shown by the increase in the monthly recovery rate. The cost per household for this type of advertising was $0.17.

5. The arrangement with the waste newspaper contractor during the study was successful.
6. Part of the collection crew for waste newspaper contractor during the study was recruited from a local sheltered workshop which employs moderately handicapped people. This study demonstrated that certain handicapped people from the workshop were capable of handling the duties assigned to them. These duties included the loading of waste newspaper into the collections vehicle and the occasional sorting of paper at the time of collection. This arrangement could reduce some of the collection costs since the group receives minimum wages.
7. The only apartment building in Kanata did not participate in this study. Since the apartment building has its own refuse removal system and operates under a separate set of by-laws, it was difficult to apply the system that was developed for other housing units in Kanata. To start a recovery program in the apartment building, it was necessary to contact the owner of the building, the building manager and the refuse contractor. By the time the parties involved reached an agreement on this matter, the study had ended.
8. All housing units, excluding the apartment building, are under the municipality's jurisdiction for refuse removal. Waste newspaper collection was easy to negotiate with the municipality at the time of the study because the refuse contractor did not have any rights to the newspaper as part of his collection.
9. The understanding between the refuse contractor and the newspaper contractor was satisfactory. Each party agreed not to pick up the others material. Any newspaper not picked up on a collection day became the responsibility of the newspaper collection contractor. In few instances when newspaper was not picked up on a collection day, residents kept their paper until the following week's collection.
10. Weather conditions did affect the recovery rate of waste newspaper. In cases when the weather was so severe (i.e. freezing rain) that it hampered safe driving, newspaper collection had to be cancelled for

the week. On the other hand, when weather was bad, but not severe enough to warrant cancelling collection, the newspaper contractor asked residents to refrain from putting their newspaper out for collection; in such a case the contractor still collected from those homeowners who did not follow his instructions (see Tables 2, 3, 4 and 5).

11. No significant difference in recovery rate was registered when waste newspaper collection occurred the day after a holiday.

RECOMMENDATIONS

Based on the results of this study, certain recommendations can be made for the community of Kanata.

1. In Kanata, it is recommended that the waste newspaper collection take place once a week, on Tuesdays only (the normal refuse collection day for Area B residents). Area A residents must alter their schedule by placing waste newspaper out on a day other than the normal refuse collection (Area A refuse collection day being on Thursday). This procedure would support the continued success of the recovery program over the long term.
2. Promotional materials should continue to be used on a periodic basis to maintain the residents' interest in the recovery program.
3. The municipal drop-off shed should be better publicized both for rural residents as well as Kanata residents who may miss their specific waste newspaper collection day.

GLOSSARY OF TERMS

Refuse or Solid Waste: ashes, garbage, rubbish, discarded materials, clothing, waste paper, broken crockery and glassware, bottles, cans, and such other articles as would normally accumulate, but shall not include weighty or bulky articles such as stoves, furnaces, bed springs, mattresses, furniture, boxes, barrels, trees and water or fuel tanks.

Recovery Rate: tonnage of waste newspaper collected versus total tonnage available. Thus if 50 tons of newspaper enter the community monthly and 25 tons are recovered through collection, then the recovery rate is 50 percent.

Cellulose Insulation: type of home insulation made by shredding the waste newspaper and treating it with chemicals such as boraic acid to produce a finished fluffy fibre form.

Community Task Force: group of interested residents and/or municipal officials who assume the responsibility and leadership of organizing a public program.

Township Reeve: official elected head of the Township Council and chief executive officer of the corporation of the township, with the same duties and functions of a mayor.

Fact Sheet: a form of promotional literature which contains instructions as to the date, event, method and contract of a community program.

Drop-Off Shed: storage building where people outside of the collection route may drop-off their waste newspaper.

Drop-Off Bin: storage containers (wood or metal) provided for residents to drop-off their waste paper.

Single (housing unit): single, detached building containing one dwelling unit. Completely separated on all sides from any other dwelling or structure.

Semi-detached (housing unit): one of two dwellings located side by side in a building adjoining no other structure and separated by a common or party wall extending from ground to roof.

Rowhouse: a one family dwelling unit in a row of three or more attached dwellings separated by common or party walls extending from ground to roof.

Condominium Rowhouse: rowhouse held in condominium tenure, whereby the interior is privately owned, but the outside is commonly owned and shared.

Apartment Dwelling Units: all dwellings other than those described above including structures commonly known as triplexes, double duplexes and row duplexes.

Kanata, Ontario: small urban community with a population of 8,053 people. Community is divided into two sections by March Township:

a) Beaverbrook (older section of Kanata) for the purpose of this study is designated as 'Area A'.
b) Katimavik (newer section of Kanata) for the purpose of this study is designated as 'Area B'.

Street Mile: Kanata has a total of 25 miles of streets. This breaks down into an average of 96 household units per mile. This number varies depending upon type of housing unit (i.e. single - 100 ft. frontage, rowhouse - 30 ft. frontage).

1. INTRODUCTION

1.1 General

Kanata is located in the Township of March, 15 miles west of Ottawa, Ontario (see Figure 8, p. 39). The waste newspaper recovery program in Kanata was re-instituted when a local cellulose insulation firm signed an agreement with the Township of March for the waste newspaper collection. Because of the lack of detailed information on the collection systems, it was agreed that study be initiated according to the terms of reference found in Appendix V. It was further agreed that the same firm could continue as the principal collections contractor during the period of the study. Environment Canada was approached and became involved in the study because of the project's innovative nature and the possibility of making the practical information available to similar communities in Canada.

Kanata is made up of the following cross-section of household units: singles, semi-detached, rowhouses, condominium rowhouses and apartment units. The socio-economic status of the community ranges from lower to upper class. Although a cross-section of every class type can be found in each housing unit, there is a particular concentration of the upper class in the single homes.

The recovery program in Kanata is unique in terms of its success to date. Various forms of newspaper collection have been attempted throughout the country and failed due to improper planning and follow-up, poor market conditions or lack of consistency on behalf of the contractor. These problems were not encountered in the Kanata study because of proper planning, co-operation from all parties involved, and a guaranteed market for the waste paper collected.

After reviewing the results of this study, it was possible for both parties to reach a long-term agreement for the collection of waste newspaper. For this reason the recovery program in Kanata should continue to succeed.

As time goes on, there will be an even greater demand for waste newspaper and the need for recovery programs to collect these materials will become a necessity. With the advent of new markets for waste newspaper (i.e. cellulose insulation), as well as studies now being carried out to

develop other uses for this material, the results of this study should prove beneficial in assisting other communities to develop similar programs.

1.2 Background Information

Following is a breakdown of household units by category and number:

Singles	1,117
Semi-detached	90
Rowhouses	806
Condominium Rowhouses	274
Apartment Units	122
Total units	2,409

There is an average of 96 household units per street mile. Once a week, there is curbside refuse collection, except in the summer months (July-August), when garbage is collected twice a week.

There are a potential 35 tons of waste newspaper available in Kanata, on a monthly basis. On the average this represents 29 lbs per household unit per month. This total is derived as follows:

Ottawa Citizen:	1,900 issues/day -	12,493 lbs/week
Ottawa Journal:	600 issues/day -	3,452 lbs/week
Ottawa Today:	105 issues/day -	158 lbs/week
Miscellaneous*:		400 lbs/week
		16,503 lbs/week

*(miscellaneous refers to other newspapers such as the Toronto Globe & Mail, Financial Post, Le Droit, etc.)

In the calculation of lbs per week being distributed into the community, a few basis concepts are applied:

i) it takes 73 pages of a regular size newspaper publication like the Ottawa Citizen to make up 1 lb

ii) it takes 106 pages of a tabloid size newspaper publication to make up 1 lb.

Because all parties agreed to have curbside collection on the regular refuse day pickup, which is on different days for Areas A and B, the waste newspaper had to be collected on two separate days:

i) AREA 'A' (older part of Kanata), 700 units, regular refuse day pickup on Thursday, available quantities of newspaper

per week: 4,684 lbs;

ii) AREA 'B' (newer part of Kanata), 1,700 units, on Tuesday, available quantities per week: 11,377 lbs.

1.2.1 Collection of Waste Newspaper. At the present time, there are no local by-laws which would affect the selective collection of refuse. The current refuse contractor does not have the right to the paper as part of the refuse. It clearly states in the agreement between the municipality and the refuse contractor that the contractor can only collect those materials placed out for refuse collection. He does not make the decision on what constitutes refuse. The refuse contractor was given an opportunity to collect the paper, but he turned it down. He co-operated with the present newspaper contractor by leaving the paper on refuse collection day, which is also the newspaper collection day.

The refuse contractor estimated that he would save money because he would collect the refuse faster and made fewer trips to the landfill per month. Since the refuse contractor was paid by household unit, he stood to benefit by not having to collect the waste newspaper. The Township, aware of this development, will make it a point of negotiation in the next refuse contract.

A waste newspaper depot (special drop-off shed) has been allowed by the Township. The main purpose of this depot is to allow rural residents, outside of the pickup area for waste newspaper in Kanata, to deposit their old newspapers in the drop-off sheds. Also, Kanata residents, who may have missed their scheduled pickup, can take their waste newspapers to the depot for recovery.

2. ORGANIZATION AND IMPLEMENTATION OF KANATA RECOVERY PROGRAM

2.1 Organization of Community Task Force

In order to encourage community involvement in the program, the Township Reeve sent invitations to 15 residents of Kanata inviting them to participate for several months in the general planning of the recovery program. Of those invited to attend, nine actually participated in regular monthly meetings.

2.2 Promotional Activity

After a survey of the promotional materials available, in proportion to the budget, the following methods were adopted:

i) information pamphlets were distributed by the local Township office and signed by the Reeve;

ii) half-page instructional ads were placed in the local newspaper, the Kanata Standard, published twice monthly and circulated free of charge to every householder;

iii) half-page follow-up ads were printed in the same local paper, outlining results of the previous month's collections;

iv) information pamphlets were mailed to each household in the event of a change in collection procedures; and

v) random telephone survey was conducted (list of telephone numbers acquired from the Township), asking people questions related to their recovery program (see Table 1).

With regard to the telephone survey, the majority of people contacted were more receptive to a weekly waste paper collection schedule as opposed to an 'every other week' collection pickup. Reaction to a monthly collection routine was almost all negative; the general attitude being that monthly pickup would result in too much confusion (i.e. forget collection date or accumulation of too much waste newspaper on monthly basis).

TABLE 1 - KANATA TELEPHONE SURVEY

# of household units available	2,400
# of household units contacted	240
% aware of collections program	95
% contacted who participate	84
% who participate - weekly - bimonthly - monthly % who do not participate	63 16 5 16
% who did not see advertising	3
% who would not participate on a monthly basis	58

2.3 Community With Respect to Local Markets

The nearest markets for waste newspaper in the Ottawa area are (see Figure 7):

i) Dealers: Florence Paper Co.

ii) Cellulose Insulation Firms: MonoTherm Insulation Mfg. Ltd. (12,000 tons/annum)
Thermo-Cell Insulation Ltd. (5,000 tons/annum)

iii) Paper Mills: E.B. Eddy Forest Products (5,200 tons/annum)
Canadian International Paper Co. - Gatineau (1,200 tons/annum)

All of these markets are within twenty miles of the community. The five markets have at this time a combined capacity of approximately 24,000 tons per annum of waste newspaper; this does not include the tonnage which is sold outside of Ottawa by the one existing dealer.

Other markets, within a 120 mile radius of Ottawa, include another five cellulose firms, as well as several paper mills of which

many are being partially supplied by the local dealer.

2.4 Selection and Preparation of Collection Equipment

There were three types of trucks used in the study:

i) a regular packer truck (Figure 1) with a holding capacity of six tons of newspaper per load and a rear loading compartment was provided by a local sanitation firm on a special collection basis for a period of one week, to demonstrate an alternative collection method.

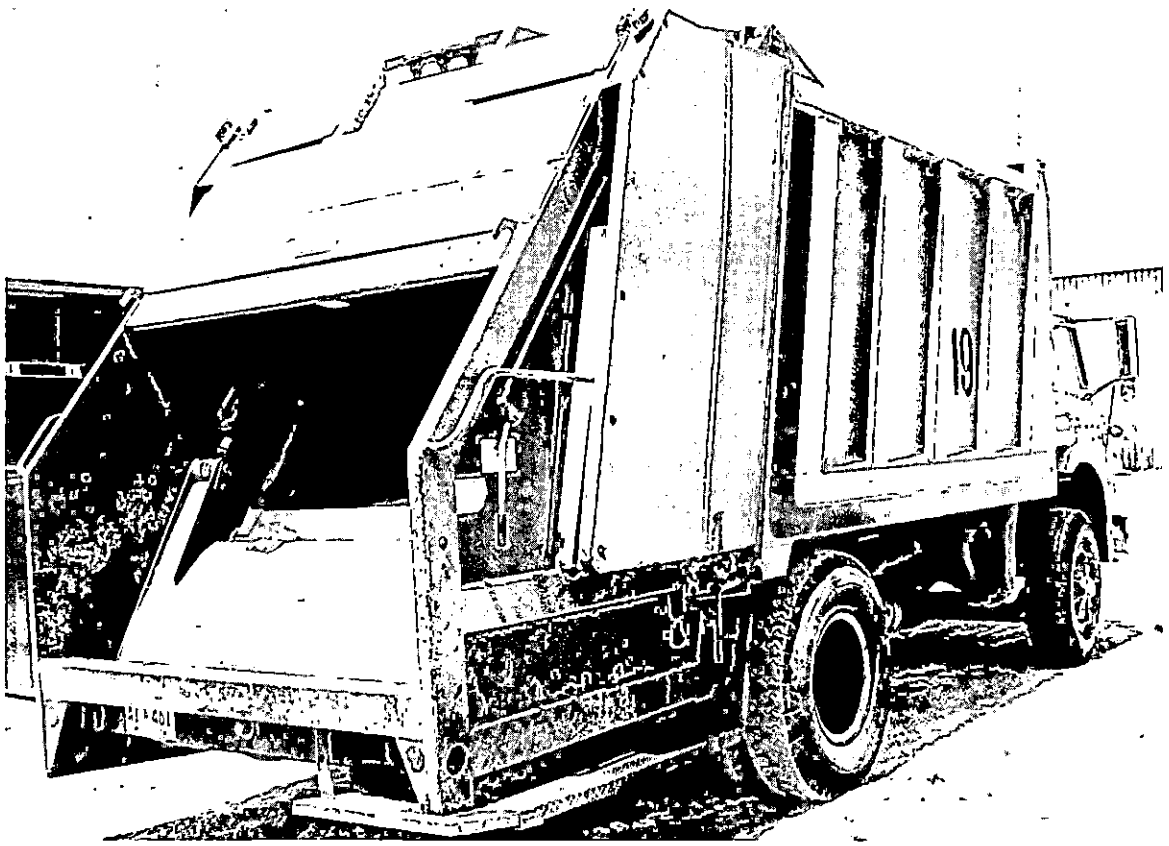


FIGURE 1 - PACKER TRUCK USED FOR WASTEPAPER COLLECTION

ii) Five-ton enclosed van (20 ft. box), coupled with 4' x 4' x $2\frac{1}{2}$' wooden bins on castors and a hydraulic tail-gate assembly (Figure 2). The number of bins used for each pickup varied according to the projected quantities of paper to be collected.

iii) Econoline (1 ton) van, whereby the paper was stacked manually inside, was provided by the sheltered workshop for a special collection period of one week (Figure 3).

FIGURE 2 - FIVE TON ENCLOSED VAN WITH HYDRAULIC TAIL-GATE LIFT USED FOR WASTE NEWSPAPER COLLECTION IN KANATA, ONTARIO

FIGURE 3 - ECONOLINE VAN OFTEN USED IN THE COLLECTION OF SOURCE-SEPARATED NEWSPAPER IN SMALL COMMUNITIES

2.5 Monitoring Program

Forms for the recording of all information, (i.e. dates, times, manpower, type of vehicle & equipment used, cost tonnages available, tonnages collected, participation levels, recovery rate, revenues), were prepared for this study.

The program was monitored on a weekly basis to ensure that all data were gathered, and recorded at all times (Appendix II).

In Tables 2, 3, 4 & 5, the following data were recorded for the months of January, February, March and April 1978: collection dates, weather conditions, quantities available, quantities collected, collection times, crew size (D-driver, H-helper), type of vehicle, cost to operate per hour, total cost to collect, collection cost per ton and the average recovery rate for each area per month.

TABLE 2 - COLLECTIONS DATA - JANUARY 1978

AREA 'A'

Date	Weather Conditions	Quantity Collected	Collection Time	Crew	Vehicle	Cost/hr*	Total Cost	Collection Cost/Ton	Recovery Rate
Jan. 5	Normal*	2,800 lbs	3 hrs	D-H	5-Ton	$20.75	$62.25	$44.46	-
Jan. 12	Normal*	2,900 lbs	3 hrs	D-H	5-Ton	$20.75	$62.25	$42.93	-
Jan. 19	Snow	2,100 lbs	3.5 hrs	D-H	5-Ton	$20.75	$72.62	$69.16	-
Jan. 26	Freezing Rain	No Coll.	-	-		-	-	-	-
Totals-A		7,800 lbs	9.5 hrs				$197.12	$50.54	42%

* - Truck & driver @ $17.00/hr. - commercial rate; helper @ $3.75/hr., including benefits
- Any additional new members @ the rate of $3.75/hr.

AREA 'B'

Date	Weather Conditions	Quantity Collected	Collection Time	Crew	Vehicle	Cost/hr	Total Cost	Collection Cost/Ton	Recovery Rate
Jan. 3	Normal*	5,700 lbs	6 hrs	D-H-H	5-Ton	$24.50	$147.00	$51.58	-
Jan. 10	Snow	3,500 lbs	6.5 hrs	D-H-H	5-Ton	$24.50	$159.25	$91.00	-
Jan. 17	Snow	3,500 lbs	6.5 hrs	D-H-H	5-Ton	$24.50	$159.25	$91.00	-
Jan. 24	Excellent	6,100 lbs	6 hrs	D-H-H	5-Ton	$24.50	$159.25	$48.20	-
Totals-B		18,800 lbs	25 hrs				$624.75	$65.16	41%

Combined Summary for January of Data for Areas A & B:

Quantity Available	:	64,244 lbs
Quantity Collected	:	26,600 lbs
Total Cost to Collect:		$ 821.87
Cost/Ton to Collect	:	$ 61.79
Recovery Rate	:	41%

*No snow or freezing rain

TABLE 3 - COLLECTIONS DATA - FEBRUARY 1978

AREA 'A'

Date	Weather Conditions	Quantity Collected	Collection Time	Crew	Vehicle	Cost/hr	Total Cost	Collection Cost/Ton	Recovery Rate
Feb. 5	Normal*	4,900 lbs	3.5 hrs	D-H	5-Ton	$20.75	$72.62	$29.64	-
Feb. 9	Normal*	3,500 lbs	3 hrs	D-H	5-Ton	$20.75	$62.25	$35.57	-
Feb. 16	Normal*	3,500 lbs	3 hrs	D-H	5-Ton	$20.75	$62.25	$35.57	-
Feb. 23	Normal*	2,950 lbs	1.8 hrs	D-H	Packer	$27.50	$49.50	$33.45	-
Totals-A		14,850 lbs	11.3 hrs				$246.62	$33.19	79%

AREA 'B'

Date	Weather Conditions	Quantity Collected	Collection Time	Crew	Vehicle	Cost/hr	Total Cost	Collection Cost/Ton	Recovery Rate
Feb. 7	Snow	3,500 lbs	5 hrs	D-H-H	5-Ton	$24.50	$122.50	$70.00	-
Feb. 14	Normal*	7,700 lbs	6.5 hrs	D-H-H	5-Ton	$24.50	$159.25	$41.36	-
Feb. 21	Normal*	5,000 lbs	3.3 hrs	D-H-H	Packer	$31.00	$102.30	$40.92	-
Feb. 28	Normal*	4,700 lbs	4 hrs	D-H-H	5-Ton	$24.50	$122.50	$52.13	-
Totals-B		20,900 lbs	19.8 hrs				$506.55	$48.47	46%

Combined Summary for February of Data for Areas A & B:

Quantity Available	:	64,244 lbs
Quantity Collected	:	35,750 lbs
Total Cost to Collect:		$ 753.17
Cost/Ton to Collect	:	$ 42.12
Recovery Rate	:	56%

*No snow or freezing rain

TABLE 4 - COLLECTIONS DATA - MARCH 1978

AREA 'A'

Date	Weather Conditions	Quantity Collected	Collection Time	Crew	Vehicle	Cost/hr	Total Cost	Collection Cost/Ton	Recovery Rate
March 2	Normal***	3,600 lbs	2.5 hrs	D-H	5-Ton	$20.75	$51.88	$28.82	-
March 16	Excellent	A 5,000 lbs	4.5 hrs	D-H-H	1-Ton	$17.00*	$76.50	$30.60	-
		B 3,800 lbs	2 hrs	D-H-H	5-Ton	$22.50**	$45.00	$23.68	-
March 30	Normal***	6,400 lbs	2.5 hrs	D-H-H	5-Ton	$22.50**	$56.25	$17.58	-
Totals-A		18,800 lbs	11 hrs				$229.63	$24.43	89%

AREA 'B'

Date	Weather Conditions	Quantity Collected	Collection Time	Crew	Vehicle	Cost/hr	Total Cost	Collection Cost/Ton	Recovery Rate
March 7	Normal***	6,400 lbs	5 hrs	D-H-H	5-Ton	$24.50	$122.50	$38.28	-
March 14	Normal***	5,800 lbs	5 hrs	D-H-H	5-Ton	$24.50	$122.50	$42.24	-
March 21	Normal***	6,200 lbs	5.5 hrs	D-H-H	5-Ton	$22.50**	$123.75	$39.92	-
March 28	Normal***	5,500 lbs	5 hrs	D-H-H	5-Ton	$22.50**	$112.50	$40.90	-
Totals-B		23,900 lbs	20.5 hrs				$481.25	$40.27	49%

Combined Summary for March of Data for Areas A & B:

Quantity Available	: 69,430 lbs
Quantity Collected	: 42,700 lbs
Total Cost to Collect:	$ 710.88
Cost/Ton to Collect	: $ 33.30
Recovery Rate	: 61%

*Using sheltered workshop One-Ton Van, Supervisor/Driver, & two handicapped persons
**Using contractor's Five-Ton Van & driver, with the workshop's two helpers @ $2.75/hr
***No snow or freezing rain

TABLE 5 - COLLECTIONS DATA - APRIL 1978

AREA 'A'

Date	Weather Conditions	Quantity Collected	Collection Time	Crew	Vehicle	Cost/hr	Total Cost	Collection Cost/Ton	Recovery Rate
April 6	No Collec.	-	-	-	-	-	-	-	-
April 13	Normal*	6,500 lbs	3 hrs	D-H	5-Ton	$20.75	$62.25	$19.15	-
April 20	Normal*	4,400 lbs	2.5 hrs	D-H	5-Ton	$20.75	$51.88	$23.58	-
April 27	Normal*	4,200 lbs	2.5 hrs	D-H	5-Ton	$20.75	$51.88	$24.70	-
Totals-A		15,100 lbs	8 hrs				$166.01	$21.99	81%

AREA 'B'

Date	Weather Conditions	Quantity Collected	Collection Time	Crew	Vehicle	Cost/hr	Total Cost	Collection Cost/Ton	Recovery Rate
April 4	Normal*	6,000 lbs	5 hrs	D-H-H	5-Ton	$24.50	$122.50	$40.83	-
April 11	Normal*	8,800 lbs	5.5 hrs	D-H-H	5-Ton	$24.50	$134.75	$30.63	-
April 18	Normal*	12,000 lbs	6 hrs	D-H-H	5-Ton	$24.50	$147.00	$24.50	-
April 25	Normal*	7,000 lbs	5.5 hrs	D-H-H	5-Ton	$24.50	$134.75	$38.50	-
Totals-B		33,800 lbs	22 hrs				$539.00	$31.89	74%

Combined Summary for April of Data for Areas A & B:

Quantity Available	:	64,244 lbs
Quantity Collected	:	48,900 lbs
Total Cost to Collect:		$ 705.01
Cost/Ton to Collect	:	$ 28.83
Recovery Rate	:	76%

*No snow or freezing rain

2.6 Implementation Stage - Summary

Area A generated 4,684 lbs per week, whereas Area B generated 11,377 lbs per week. During the month of March, there was a greater quantity available because of the increase in production days.

The average cost per ton to collect in April was $28.83, based on a split collection: Area A on Tuesday, Area B on Thursday. The collection cost should drop to about $26.00 per ton with the implementation of the new procedure to collect from the entire community (June 1978).

A summary of all data collection for each month is provided in Table 6:

TABLE 6 - SUMMARY OF MONTHLY COLLECTION COSTS, QUANTITIES AND RECOVERY RATES

Month	Quantity Entering Community*	Quantity Collected	Recovery Rate	Collection Costs	Cost/ton To Collect
Jan.	64,244	26,600	41%	$821.87	$61.79
Feb.	64,244	35,750	56%	$753.17	$42.12
March	69,430	42,700	61%	$710.88	$33.30
April	64,244	48,900	76%	$705.01	$28.83

* Of this quantity not all is potentially recoverable (i.e. household use)

2.7 Implementation Stage - Comments

On collection days when there was heavy rain or snowfall, residents were requested to not put their paper out for pickup. On this point co-operation was good since days when weather was bad, quantities collected dropped significantly.

Residents co-operated in preparing the materials for recycling by placing the newspaper, in most cases, on one side of the driveway, opposite from the garbage. When Provincial Sanitation Service (PSS) collected during the one week, the firm said the program was well organized in comparison to another Township where this contractor was collecting and the instructions (flyers, ads in the local paper) had not

been made clear to the residents.

Area A residents participated extremely well on the every other week collection trial during March. The recovery rate even increased indicating that residents did respond to the flyer and to an ad in the local paper. Also weather conditions, for the most part, were ideal for the paper collection.

The sanitation firm (PSS) that performed the one week trial collection with a packer truck was able to pickup from the community in considerably less time than required by the regular collections contractor. This time differential was pointed out to the contractor, who thereafter improved his collection system.

Since the collections contractor was also the end user in this study, the materials went directly to his plant, where they were recycled into cellulose insulation. This step eliminated the need to bale the materials, which would probably have to occur in other communities where no local market is available, and where the materials must be packaged and stored before shipping them to the market.

It was intended that the one existing apartment building join in the project, but a variety of different problems prevented this. The main obstacles were that the building is privately owned, has its own refuse removal and operates under a different set of by-laws. This was not an issue with other types of housing units as their refuse removal is under the municipality's jurisdiction.

At the study's end, the apartment building was becoming involved in the paper collection. The contractor was constructing special bins (see Figure 4) to fit the apartment service entrance, where the paper would be picked up. The building manager was to act as a co-ordinator for the paper collection and would notify the contractor when a pickup was necessary. This procedure with the same collections contractor has already proven successful in several apartment buildings throughout Ottawa.

FIGURE 4 - WOODEN BIN USED TO STORE RECOVERED NEWSPAPER IN TRUCK OR APARTMENTS

3 KANATA MARKETABILITY & PROFITABILITY ANALYSIS

In Table 7 the breakeven point occurs between the recovery rates of 56 and 61 percent, based on collection costs in the community of Kanata. These results are also dependent on the assumption that production costs (baling, warehousing, including overhead) for waste newspaper are performed at an average cost of $15.00 per ton. (In some instances, where dealers operate large plants with high speed baling equipment, the total production cost can be as low as $8.00 per ton, excluding profit).

TABLE 7 - PROFITABILITY ANALYSIS

Month	Cost/Ton to collect (from Table 6)	Recovery Rate	Normal Prod. Costs*	Total Cost	Average Market Price (Mill) fob deal.	Profit/(Loss) per ton
Jan.	$61.79	41%	$15.00	$75.87	$50.00	($26.79)
Feb.	$42.12	56%	$15.00	$57.12	$50.00	($ 7.12)
March	$33.30	61%	$15.00	$48.30	$50.00	$ 1.70
April	$28.83	76%	$15.00	$43.83	$50.00	$ 6.17

*(Average dealer cost per ton for baling, warehousing and overhead, excluding collection costs)

These profitability figures are also based on an average mill market price, f.o.b. the dealer plant, of $50.00 per ton, which was the case during this study. Mill market prices, in this case a local mill, were used as a guideline in order to arrive at a profit or loss situation for each month, because of the longer history behind the mill's buying of waste newspaper. Their price tends to be a more stable one and is more reliable in making a proper assessment.

In this project, there was an exception to the rule in that the collections contractor was also the end user, thereby eliminating the normal processing steps (baling & warehousing). This is why the figure of $15.00 per ton was added to the cost per ton to collect (Table 7),

so that normal costs could be outlined for the entire recovery process.

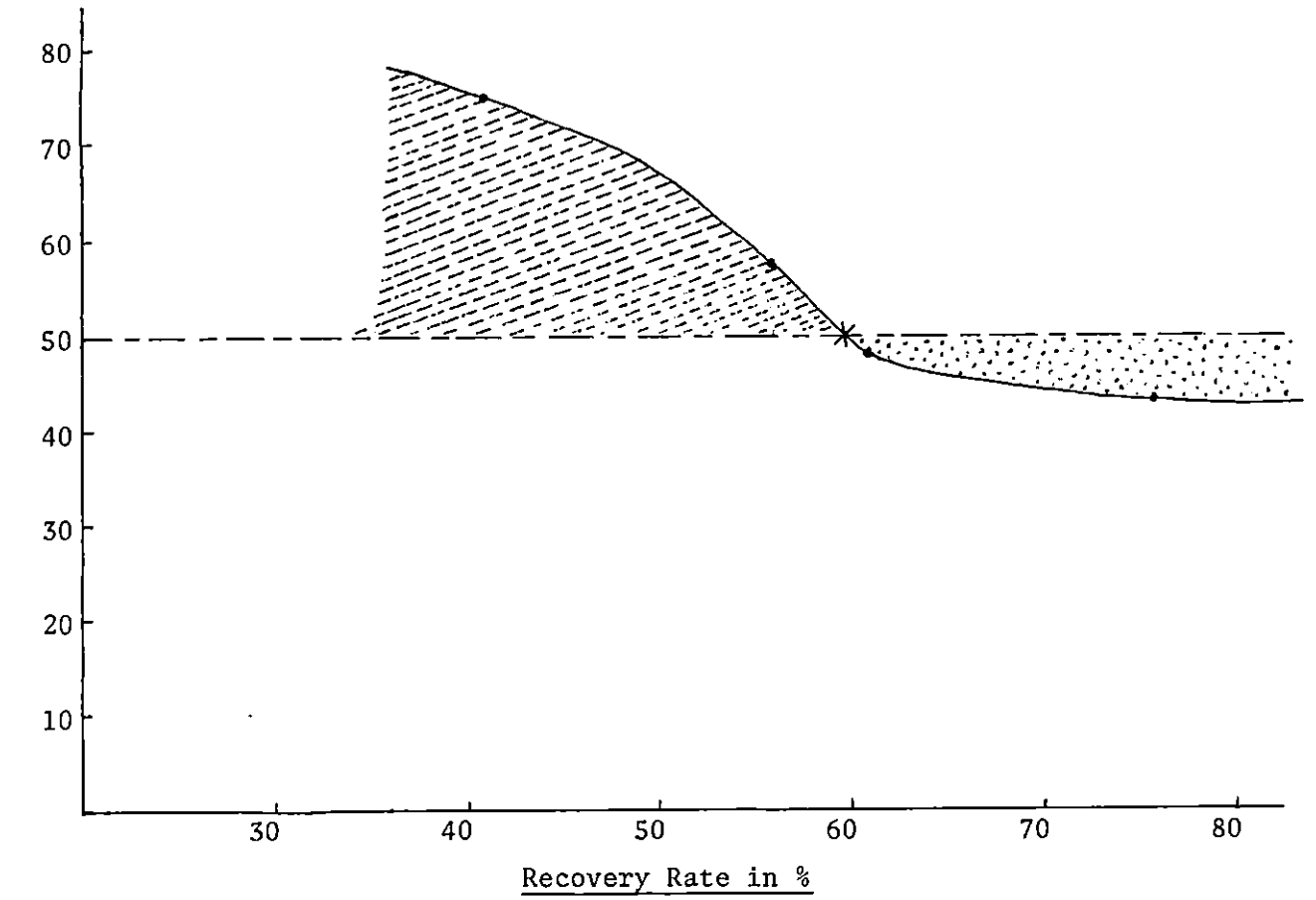
The month of April illustrates costs for collection and processing ($28.83 & $15.00) respectively, totalling $43.83, which reflects costs associated with an almost ideal recovery rate (over 70%). These costs are definitely compatible with normal market conditions (i.e. paper mills); any higher prices that cellulose firms or paper mills may pay would represent a sizable profit margin if the collections contractor was not paying for the waste paper. After a recovery program has been operating for a certain length of time, it may be possible to have the collections contractors pay for the waste paper collected, if substantial profit margins permit.

Municipalities should be aware of false market conditions that may suddenly arise, such as waste newspaper prices @ $110 per ton in the fall of 1977. This was only a temporary high in the market caused by a sudden influx of cellulose firms scrambling for waste paper, causing a temporary shortage in materials.

The normal market range for this grade is usually between $45 - $60 per ton, f.o.b. the waste paper dealer's plant, in mill-size bales (1,000 lbs).

Figure 5 points out that the breakeven point (the percentage recovery rate needed to cover all recovery & collection costs at a market price f.o.b. the dealer of $50 per ton) occurs at approximately a 58% recovery rate level, based on the collection conditions in Kanata. This rate may vary in other communities, depending upon certain factors such as mileage, labour rates and the type of vehicle used in collection.

FIGURE 5 - PROFITABILITY CHART FOR THE KANATA NEWSPAPER RECOVERY PROGRAM



*Cost/Ton: (includes costs for collection, baling, warehousing and overhead)

— — — — — — Average Mill Price/Ton (January - April, 1978)

——————— Cost per Ton to Recover and Process

Loss Position

Profitable Position

In the above chart (Figure 5) the breakeven point for the Kanata Newspaper Recovery Program occurred between February and March when the recovery rate reached 58 percent. Until that time, the program was in a loss position.

In March and April the entire recovery process continued to operate at a profitable level, with the waste newspaper recovery rate above 60 percent and the average mill price at $50.00 per ton.

4 OVERVIEW

4.1 Resident Participation

The participation levels were difficult to interpret at the very outset because many residents were not placing their newspaper out for collection every week. For example, a particular street may have a 60 percent overall recovery rate, but the participation level may vary each week. That is why in Tables 2 - 5 the recovery rates are only shown as an average for the month. During the same two week period in one of the areas of the community, the recovery rate would have exceeded 100%, based on the amount of paper recovered in comparison to what is available. This was because many people saved their paper for more than one week at a time due to bad weather conditions on several occasions.

The degree of particiption was monitored very closely through a 'checking off method' (see Appendix II, Sample H and Appendix V), performed by driving ahead of the contractor's truck on various occasions, usually in a consecutive four-week pattern. The frequency and manner in which paper was placed out for collection was also monitored, by street and area (once/week, once/month, opposite sides of the laneway for refuse and paper, paper mixed with the refuse). When the announcement was made for the change in frequency of collection in Area 'A', from once every week collection to 'every other week' (March 2, 16, 30), residents' response was excellent. Out of 700 household units only nine had placed their paper out on the wrong day (March 9), indicating that the instructions were of definite value.

One of the findings of the telephone survey was that, in most instances, people living in single family units were more prepared to store their waste paper if bad weather conditions forced a cancellation of newspaper collection. Residents living in other types of housing units did not think that they had the capacity to store waste paper for an extended period of time.

Another finding was that many of those not participating did so because they did not believe in the program itself.

4.2 General Problems

In the month of January one collection had to be cancelled due

to a severe freezing rain storm, making it impossible to travel on the roads. On several other occasions there were heavy snow storms; however, the contractor still performed the collections as scheduled.

Throughout the period of this study, Area 'A' was collected on Thursdays and Area 'B' on Tuesdays. This coincided with the present refuse removal schedule. By having to travel out to the community (one hour return) from the contractor's plant twice a week, instead of once, the total cost to collect increased by approximately $2.00 to $4.00 per ton. This extra hour could have been spent collecting paper. Because it is feasible to collect from the entire community (2,400 units) in one day, it has been recommended that the Thursday collection be changed to Tuesday to coincide with Area 'B's collection.

This change will not only reduce the cost to collect, but will also make advertising much easier by having one consistent collection day for waste newspaper throughout the year. This recommendation was presented to the municipal officials and accepted. The change to take place as of June 1, 1978. This allows one month for proper advertising in order to prepare Area 'A' residents for the change in schedule.

4.3 General Benefits

This program has potential for engaging certain handicapped individuals in a new type of employment. They would be able to work as crew members in collecting the paper and loading it onto the truck. It would be a co-operative effort with the workshop supplying the labour and the contractor providing the vehicle, bins and driver. This opens up new avenues for sheltered workshops elsewhere in Canada that may be interested in projects of this nature or want to expand on their present facility. Even if the sheltered workshop people were not acting as crew members, this type of recovery program does create some type of new employment, as it takes two to three people per truck to handle the collection duties properly.

At the present waste newspaper recovery rate, about 288 tons of waste newspaper per annum will be removed from the solid waste stream in the community of Kanata. This not only is a direct saving of $720.00 per annum on land-fill entrance fees ($2.50 per ton), but could also result

in a potential saving on refuse collection costs of between $15.00 to $20.00 per ton to the municipality, depending on what arrangement they come to in their next refuse contract. This figure is arrived at as follows:

288 tons (50 loads of refuse) x 3 hrs/load x $35/hr.

This totals $5,250.00 or approximately $18/ton.

During the next few years, the municipality will have its waste newspaper collected and recycled into cellulose insulation, which will be used to insulate homes. The energy savings resulting from this process are substantial. It has been further proven that there is a definite saving in energy when waste paper is utilized in paper production, as is the case in communities where the waste newspaper collected is sold to paper mills.

Diverting a potential 288 tons of recyclable materials from the landfill site has definite positive savings, both from an environmental standpoint as well as an economical one. The accumulated benefits derived by expanding similar recovery programs across Canada would be quite relevant.

5 RECOMMENDATIONS FOR THE ESTABLISHMENT OF A RECOVERY PROGRAM IN SIMILAR COMMUNITIES

Based on the results of this study, certain recommendations can be made for other urban communities interested in setting up a newspaper recovery program.

1. The curbside collection of waste newspaper should be done on a weekly basis as opposed to an 'every other week' pickup. Every other week may mean less collection costs, but usually more money has to be invested in advertising. Residents often forget which week is for waste newspaper collection and need to be reminded more through use of flyers and other promotional materials. However, with collection of waste newspaper done on a weekly basis, a better service is supplied to the residents. Also, the less complex a recovery program is, the easier it will be to win residents' support. While transportation costs for the collection vehicle and the amount of newspaper collected in one week may not justify a weekly pickup system, wherever possible it should be the preferred method.

2. Every recovery program requires some promotional materials. Positive results can be achieved by promoting through low-cost flyers mailed to each resident, as well as prominent ads purchased in the local newspaper (see Appendix II, Samples E,F,G). This type of promotion must be sustained on a monthly basis, more often in the initial stages. It must be well defined yet simple. Residents must be informed of the results, especially when definite progress is achieved (see Appendix II, Sample E). Other, more expensive kinds of promotional materials, such as television and radio, are not necessary. The amount of publicity generated for the recovery program would not justify the cost. To advertise the recovery program, bumper stickers and decals could be manufactured.

3. A community task force should be established with members drawn from both residents and municipal officials. It is

the group's job to oversee all aspects of the recovery program. Some of the responsibilities could be:

i) to investigate the possibility of setting up a recovery program before a formal proposal is presented to the town or city council. It should include an analysis of the local markets for waste newspaper, the availability of collection contractors, local by-laws affecting the program, tonnages available of waste newspaper and the type and frequency of collections;

ii) to organize all promotional activity by assessing which materials are the most economical and efficient for the specific recovery program, and

iii) to monitor the program closely.

4. Sufficient time must be allocated (6 - 12 months) for the proper development of the program. A certain element of risk enters any recovery program and it is necessary to allow for unknown variables, such as poor weather conditions and holidays that could disrupt the newspaper collection.

5. As it takes several months for a program to reach a recovery level that is economically successful, municipal officials should select a contractor who is prepared to co-operate on a long-term basis. The contract should be effective for at least one year and include a re-negotiation clause to protect both parties against certain uncontrollable circumstances (i.e. poor weather conditions, strikes by mills, cellulose firms, etc.).

6. After a recovery program is operating successfully, municipal officials should assess the reduction of solid waste collected by the refuse contractor. If a large amount of newspaper is generated by the community, the cost for refuse collection could be greatly reduced. This point should be considered in future refuse contract negotations.

7. Different collection methods should be adopted if the recovery program is to be successful. In most cases curbside collection - the removal of solid waste from the homeowner's curbside - will be the main type of collection method used. However, for

obvious reasons curbside collection is not applicable to apartment dwellers. An agreement should be reached with the waste newspaper contractor to put special drop-off bins in each apartment building. It is important that these bins be easily accessible to residents living in the building. On the curbside collection day, the apartment bins can be emptied at the same time, in order that the newspaper contractor avoids paying excess transportation costs.

8. In a recovery program that has a separate newspaper collection, a definite arrangement should exist between the refuse and waste paper contractors. This is to ensure that both parties understand who has the final responsibility regarding collection of waste newspaper and guarantees that the waste paper is collected even if certain households do not have their paper collected for one week.

APPENDIX I

CURBSIDE COLLECTION
THE FIVE STEP PROGRAM

CURBSIDE COLLECTION
THE FIVE STEP PROGRAM

Curbside collection, the method of recovery used in Kanata, Ontario, is a simple five step program.

1. Save newspapers only.
2. Place newspapers in either heavy brown paper grocery bags or cardboard boxes (Figure 2, p. 7).
3. Do not use string or other contaminants to bundle.
4. Place newspapers at the curb by eight A.M. on a regular refuse day*
5. Use opposite sides of driveway for papers and refuse to enable collection crews to tell the difference (Figure 3, p. 8).

* based on one refuse collection per week; in the event of two refuse collection days per week, one of these should be designated as the paper collection day

APPENDIX II

PROMOTIONAL MATERIALS AND MONITORING

SAMPLE A - Collections Data Sheet

SAMPLE B - Kanata Telephone Survey Sheet

SAMPLE C - Invitational Letter from Reeve to Members of Task Force

SAMPLE D - Letter from Reeve to Community Residents

SAMPLE E - Newspaper Ad Publicizing Recovery Program

SAMPLE F - Flyer Announcing Collection Date Changes

SAMPLE G - Newspaper Ad Publicizing Special Collections

SAMPLE H - Participation Level Sheet - Kanata

SAMPLE A - COLLECTIONS DATA SHEET

AREA 'A'

Date	Weather Conditions	Quantity Collected	Collection Time	Crew	Vehicle	Cost/hr	Total Cost	Collection Cost/Ton	Recovery Rate
Totals-A									

AREA 'B'

Date	Weather Conditions	Quantity Collected	Collection Time	Crew	Vehicle	Cost/hr	Total Cost	Collection Cost/Ton	Recovery Rate
Totals-B									

Combined Summary ( ) of
Data for Areas A & B:

Quantity Available :
Quantity Collected :
Total Cost to Collect:
Cost/Ton to Collect :
Recovery Rate :

SAMPLE B- KANATA TELEPHONE SURVEY

Date: _____

ADDRESS	AWARE		GLASS	TIN	PAPER	PARTICIPATES			SEEN ADV.		W.T.P.Mo.		COMMENTS
	Yes	No				Weekly	BiMon.	Monthly	Yes	No	Yes	No	

January 3, 1978

As you are aware, Kanata has re-instituted the curbside collection of waste newsprint during the past few months.

As part of a submission made on behalf of a local consulting firm, S.P.A.R. Systems, a study has been approved by the Federal Department of Environment, to assist in the monitoring of the collection, over a period of several months. Hopefully, the results will assist the Township in making the collection programme as successful as possible.

This study has received the approval of the Township, and at this stage, we would like to form an advisory committee, to assist the Township in ensuring that the programme is successful.

Your name has been mentioned as a possible member of this task force. During the term of the study, there would be three or four meetings, at which we would expect you, as a member of the Community, to attend, and offer advice concerning the collection programme. Attendance at these several meetings, which would be held in the evening, the first to be on Wednesday, January 11th, 1978, at 8:00 p.m., would represent the extent of involvement on your behalf.

If you are interested in participating, please confirm so immediately, by calling Diana Pilsworth at 592-2735. Diana will be acting as the Community Group Coordinator during the term of the project, which will run from January until April, 1978.

Meetings will be held on Wednesday evenings, the first to be at Diana Pilsworth's residence, at 32 Kingsford Crescent.

Thank you for your cooperation.

Yours truly,

Marianne Wilkinson
Reeve,
Township of March

SAMPLE C - INVITATIONAL LETTER FROM REEVE TO MEMBERS OF TASK FORCE

TOWNSHIP OF MARCH R.R. #1 KANATA, ONT. K2K 1X7 592-4281

Dear President of Kanata/March:

This letter, comes to you from the Reeve and Council of March Township, requesting your participation in, and committment to the Township paper recycling programme.

Those of you who are newer residents of this community may not know that your Municipality was the first in the Province of Ontario to initiate and provide curbside pick-up of paper and glass for recycling.

The paper programme, which began in November 1970 operated with an 80% participation rate for five successful years. Unhappily, however, in 1975 the waste paper market collapsed, and the programme was suspended. A recent, and we hope, sustained resurgence in the market place, has permitted a resumption of the paper pick-up in Kanata. Collection times are listed on the reverse of this letter.

The benefits of high resident participation in such a programme are as follows:

Benefit #1: Collection costs for regular garbage should not escalate as rapidly. (Regular collection costs will be encouraged to remain stable, if large quantities of recyclable and/or reusable material are removed from the waste stream).

Benefit #2: The lifetime of the landfill site we are using will be extended. (This is important since suitable locations for landfill sites are becoming scarce and expensive).

Benefit #3: The waste newspapers will be converted into insulation, a product which will help to save energy by reducing the consumption of oil or gas used for home heating.

We look forward to your continued support of our garbage reduction and recycling programmes. They depend for their success on YOU!

M. Wilkinson
Reeve
TOWNSHIP OF MARCH

SAMPLE D - LETTER FROM REEVE TO COMMUNITY RESIDENTS

PLEASE RETAIN

RECYCLING INFORMATION

AREA	PAPER Call 592-2735 for information	GLASS Call 592-1174 for information	TIN CANS EGG CARTONS
"A"	Every Thursday Curbside	1st Wed. every month Curbside	DROP-OFF every 3 months Call 592-4489 for information
"B"	Every Tuesday Curbside	3rd Wed. every month Curbside	COMPOST may be done in your own backyard Call 592-2735 for information
Katimavik	Every Tuesday Curbside	3rd Wed. every month Curbside	

NOTE: A depot for the use of rural residents is being considered.

REMEMBER! Paper Day is Garbage Day for all areas except those marked with an asterisk

AREA "A"	AREA "B"
Lismer Carmichael Carr Borduas Pellan Riopelle Milne Beaverbrook Garden Homes* Jackson Court Bethune Garden Homes Varley Drive Varley Garden Homes*	Pentland Tiffany Reaney Square Sandwell Kingsford Leacock Drive Leacock Garden Homes* Rutherford Selwyn Banting Salter Square Katimavik

NOTE: If the weather is bad (rain, snow, or sleet) please hold your paper until the next collection.

(LETTER FROM REEVE - CONT.)

SAMPLE E - NEWSPAPER AD PUBLICIZING RECOVERY PROGRAM

KEEP UP THE GOOD WORK!

The residents of Kanata placed over 17 tons of newsprint by the curb in January, 1978, for recycling purposes.

You Can't Beat Us, So Why Not Join Us

17 tons represents just over 50 per cent of all newsprint entering Kanata monthly. If you haven't participated in the program to date, all you have to do is:

- ***Pile all newsprint until garbage day.***
- ***Place in a brown bag or cardboard box.***
- ***Leave by the curb.***

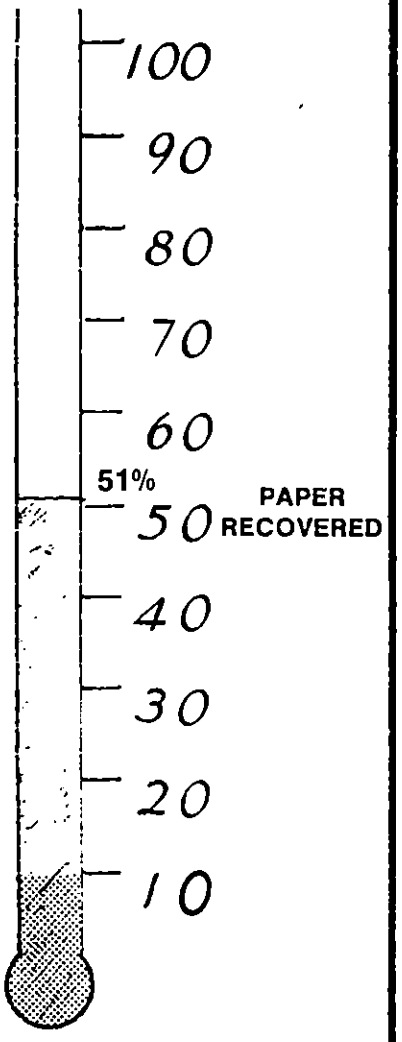
Look At It This Way

Trees don't grow overnight, but recycled paper does! One ton of reprocessed old newspaper saves 17 trees. That's a saving of 289 trees in Kanta just for January's collection.

Remember:

Paper is one of Canada's valuable natural resources. Let's keep it that way.

Watch for further information concerning the collection in your particular area.



WASTE NEWSPRINT COLLECTION

Area 'A' Residents

Lismer, Carr, Pellan, Milne, Jackson Court,
Carmichael, Borduas, Riopelle, Varley Drive,
Garden Homes: Beaverbrook, Bethune, Varley

- We thank those who have cooperated to date on the weekly collection of waste newsprint.
- For the past three months, Kanata has been the subject of a pilot study funded by Environment Canada, to evaluate different recovery procedures for waste newsprint.
- As part of this study, your area has been selected to participate in placing your newsprint at the curb on an **"EVERY OTHER WEEK"** basis, during the month of March.
- Your paper collection days will be as follows: **MARCH 2, MARCH 16 and MARCH 30.**
- **DO NOT** place your paper out on March 9 and March 23.
- The purpose of this pilot change in frequency of collection is to evaluate the difference in collection costs, as well as rate of participation.
- If you have any comments or suggestions, please write them on the back of this notice, and mail them to:

S.P.A.R. Systems*

1673 Carling Avenue
Suite 103 A
OTTAWA, ONTARIO, K2A 1C4
(*Secondary Materials Consultants)

SAMPLE F - FLYER ANNOUNCING COLLECTION DATE CHANGES

SAMPLE G - NEWSPAPER AD PUBLICIZING SPECIAL COLLECTIONS

AREA "A" RESIDENTS ONLY

Paper Collection Programme

Lismer
Carr
Pellan
Milne
Varley Dr.
Varley Garden Homes
Beaverbrook Garden Homes
Carmichael Court
Borduas
Riopelle Court
Jackson Crt.
Bethune Garden Homes

will undergo a

SPECIAL PAPER COLLECTION PROGRAMME

during the month of March

Your Collection Dates will be as follows:

THURSDAY, MARCH 2nd
THURSDAY, MARCH 16th
THURSDAY, MARCH 30th

Please DO NOT put your papers out on MARCH 9 and MARCH 23

A Separate Flyer will be mailed to you explaining this in greater detail.

Thank You for Your Co-operation

KANATA COMMUNITY TASK FORCE — RECYCLING PROGRAMME

Participation Level Sheet - KANATA

Area: _____ Date: _____

Street	No. Units	Units Participating	No Response	Comments

APPENDIX III

ILLUSTRATIONS OF CURBSIDE COLLECTION

FIGURE 6 - HOUSEHOLD REFUSE SEPARATE FROM PACKAGED NEWSPAPER IS EASILY IDENTIFIABLE BY COLLECTIONS CONTRACTOR

FIGURE 7 - WASTE NEWSPAPER PLACED IN KRAFT BAGS FACILITATES HANDLING

APPENDIX IV

KANATA (GEOGRAPHICAL LOCATION)

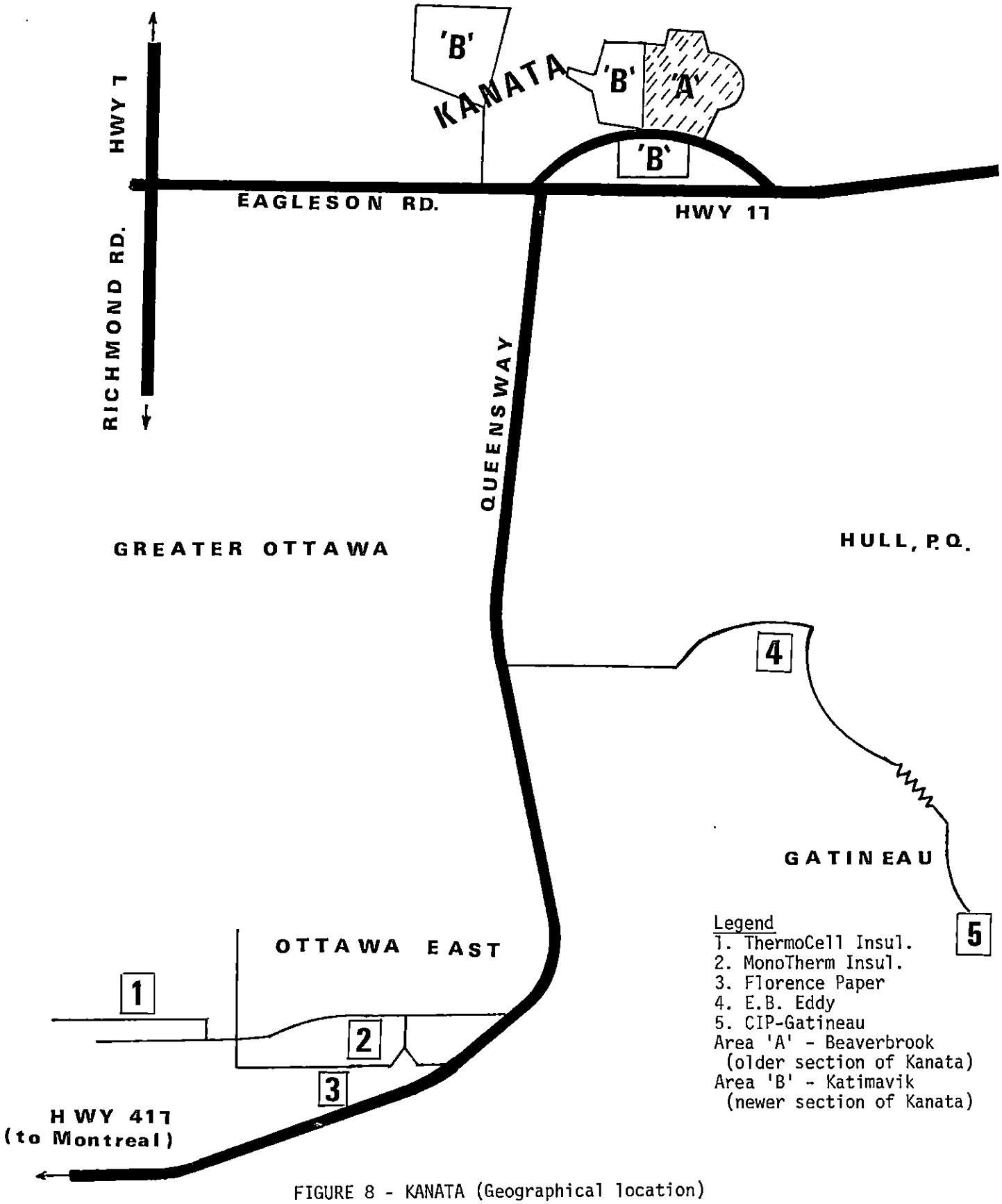


FIGURE 8 - KANATA (Geographical location)

APPENDIX V

RESULTS OF 'CHECKING OFF METHOD'

RESULTS OF 'CHECKING OFF' METHOD

AREA 'A'

Number of household units checked: 176

Date	# Participated	% Part. Level	COMMENTS
January 12	80	45	Normal conditions
February 5	120	68	Normal conditions
March 2	110	63	No collection previous week
March 16	130	74	Special advertising
March 30	125	71	Excellent conditions

AREA 'B'

Number of household units checked: 522

Date	# Participated	% Part. Level	COMMENTS
January 3	179	34	Normal conditions
January 10	80	15	Heavy snowfall
January 17	100	19	Heavy snowfall
January 24	360	69	Excellent weather conditions

Notes:

In both areas 'A' and 'B', only certain streets were checked off on a continuous basis; these were selected at random and were representative of the community.

APPENDIX VI

TERMS OF REFERENCE

TERMS OF REFERENCE FOR THE STUDY ON RECOVERY OF WASTE NEWSPRINT FROM A SMALL URBAN COMMUNITY - KANATA

This study would be carried out in Kanata, a community located in the Township of March, approximately 2,000 households in this community, made up of single unit dwellings, townhouses, condominiums and apartments.

OBJECTIVES

The principal objectives of this contract will be:

(a) to demonstrate procedures for the establishment of a waste newsprint recovery system from a small urban community.

(b) to prepare a step by step evaluation of all the factors affecting the development of a successful recovery program.

(c) to determine the true economics of the system(s) and to prepare economic equation(s) which will allow an assessment to be made of system(s) at other locations and/or under different circumstances.

(d) to determine applicability of the system(s) to other communities.

(e) to prepare a report that will include procedures for establishing a newsprint recovery system(s) in similar communities.

STATEMENT OF WORK

1. Field Work

1.1 The consultant shall provide a detailed description of the type of community to include:

(1) breakdown of the number of household units by area into categories such as: single unit dwellings, townhouses, condominiums and apartments;

(2) the geographical location of the community with respect to the various markets;

(3) any local by-laws which would have a major impact on the

selection of collection system (i.e., no depots allowed, no curbside collection permitted, whether or not the current garbage contractor has preferred rights to the paper as part of his garbage contract, etc.);

(4) the socio-economic status of the community as a whole and by category as identified in item #1.1 (1);

(5) various factors such as: number of household units per square mile, potential recovery weights per unit, collection system(s) and storage facilities available within the community itself, and types of community associations available for assistance during the implementation stages.

1.2 The consultant shall, in consultation with the Environment Canada, the municipal authorities, and the local community and environmental groups, set-up the waste newsprint recovery system which will include:

(1) promotional activity such as: information pamphlets, radio, television, newspaper ads, open-line talk shows and newspaper articles;

(2) various collection means such as: containers in the apartment, drop-off depots in a selected area and curbside collection in other selected areas;

(3) selection and preparation of equipment such as: trucks, containers and depots, relative merits of purchasing or leasing shall be evaluated;

(4) preparation of proper forms for recording of all data during the implementation stage;

(5) preparation of collection schedules for waste newsprint from containers in the apartment, drop-off depots, and curbside stations;

(6) proper educational program on how to prepare the materials at-source;

(7) design of a monitoring program in order that all pertinent data is gathered.

1.3 The consultant shall implement the system and during the course of the study he will record:

(1) weekly quantities from different types of dwellings and by method of collection (container, depot and curbside);

(2) type of vehicle used for collection and crew size;

(3) man-hours and vehicle costs;

(4) processing required, if any, prior to delivery of waste newsprint to the market;

(5) problems associated with the particular type of collection method and changes to be incorporated for the next week's collections.

1.4 The consultant shall survey the potential local markets on a regular basis (weekly) to establish a profit or loss recovery position.

1.5 The consultant shall submit progress reports during the course of the study.

2. Cost/Benefit Analysis

2.1 The consultant shall identify all costs associated with implementing a waste newsprint recovery system in a small urban community. It is to include costs for: PR program, collection, equipment and monitoring program.

2.2 Also evaluating the total system, the analysis should highlight benefits such as: creation of employment, economic, environmental and energy and resource conservation.

3. Report

3.1 The consultant will compile all data report upon his investigations providing the information on items # 1 & 2.

3.2 In addition, the consultant shall record the following:

(1) the most effective method of educating householders to achieve high particpation levels;

(2) total quantities collected during the study period;

(3) quantities per each type of dwelling;

(4) weekly participation rate (% of the total/area);

(5) recovery rates: lbs per household on the overall, and lbs per household of those participating. In addition recovery rates for different type of dwellings shall be identified;

(6) cost to recover one ton of waste newsprint, price to be expected and profit or loss recovery position;

(7) socio-economic impact on different participation levels;

(8) degree of participation.

3.3 The consultant shall prepare conclusions and recommendations. He shall comment on feasibility of introducing this type of system at other communities.

3.4 The consultant shall recommend, with respect to policies and procedures, changes in order that the system can be implemented at other communities.

3.5 First draft of the final report shall be prepared by January 2, 1978, or by an earlier date as required by the scientific authority (5 copies).

3.6 Final report shall be presented by February 17, 1978 (10 copies). Also, the original copy shall be submitted in the form that is compatible with government printing capabilities.

4. Work Schedule

The study to begin on October 1, 1977 and to terminate on January 6, 1978.

The work schedule would be as follows:

Weeks 1 & 2

--meetings and preparation of the system

Weeks 2 - 14

--actual system implementation