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**UNIT PRICING OF RESIDENTIAL SOLID WASTE:
A PRELIMINARY ANALYSIS OF 212 U. S. COMMUNITIES**

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A growing number of communities use unit-based fees for residential municipal waste as a market-based strategy to encourage waste diversion and waste reduction. Unit pricing has the potential to provide the appropriate signal to households regarding the true cost of waste generation. As a result, economic theory suggests that households may respond by decreasing the amount of waste generated and increasing the amount of waste diverted from landfills through recycling of consumer products, kitchen waste, and yard debris. While preliminary evidence from empirical research finds that implementation of unit pricing helps attain goals of waste diversion and landfill reductions, several important questions remain unanswered. Of particular interest are questions that examine the strengths and weaknesses of unit based pricing, including:

- (i) What information can and should be collected in order to track the performance of unit-based pricing programs?
- (ii) Can claims about the effectiveness of unit-based pricing be reconciled with the programs' actual performance?
- (iii) How do source reduction and materials diversion incentives interact?
- (iv) What types of communities are best suited for a unit-based pricing program?
- (v) How can communities minimize the adverse outcomes sometimes associated with unit-based pricing programs, especially illegal dumping and burning?
- (vi) What simple analysis can solid waste managers conduct to assess the suitability of unit-based pricing programs for their own communities?

Previous statistical analyses of the performance of unit pricing programs include household studies within a single community (Reschovsky and Stone, 1994; Fullerton and Kinnaman, 1996), across community comparisons with small sample sizes (Miranda, et al, 1994) or within a single region or state (Seguino et al, 1995), or case studies (Miranda, et al, 1996). While these have produced insights on household waste disposal and recycling behavior, and program design, some of the questions above may best be answered by comparing outcomes among different programs in communities with varying geographic and demographic characteristics. This paper summarizes a database of 212-unit pricing programs representing communities in thirty states. Included in the database is information on each community's unit-based pricing program, recycling program, yard waste collection program, solid waste educational efforts, illegal diversion, and waste disposal and recycling outcomes. The preliminary analysis presented here describes and compares the data which will be used in the future for model building and statistical regression analysis to assess the effectiveness of unit-based pricing and the interactions between source reduction and materials diversion.

Data Summary and Organization

Rather than using a survey for data collection, we compiled information on more than 1000

communities by requesting from each publicly and readily available materials on all aspects of their solid waste programs. Typically, we received brochures, newsletters, newspaper articles, other materials included in household mailings, and quarterly or annual reports. The information provided by communities was combined with state-level reports, the unit pricing literature, and information from the 1990 census. The resulting database includes information on 3468-unit pricing communities. Communities provided data of varying extent and quality and are grouped into categories based on usefulness for analysis and/or descriptive information.

Group 1:

The first group includes 212 communities with suitable data for statistical analyses. In particular, these communities provided the most extensive data on unit prices and waste generation. These communities represent thirty out of the 40 states that presently have unit pricing programs for residential solid waste collection and disposal. This database is geographically and demographically diverse, and will allow comparisons among communities with variable lengths of program history. They are a mix of rural and urban localities, ranging in size from just over 60 households to almost 800,000 households.

The Group 1 database is a Microsoft Excel (version 5.0) spreadsheet, which can be easily exported to SAS (version 6.11) for statistical analysis. Appendix 1 lists each variable name, value list, and code explanation. A subset of the data for each community was exported to a database management program (File Maker Pro version 2.0). The database management program is set up to create a one-page sheet summarizing features of each community's unit pricing, recycling, and yard waste programs (Appendix 2). It also allows easy sorting of the database by any variable, including variables for program features, location, or demographics. For instance, a sort can produce all communities with multi-tier programs, all the communities from a particular county or state, all communities within a population range, or all communities defined by a combination of variables.

Group 2:

The second group includes communities with mostly descriptive solid waste program information. Cities, towns, and villages with populations under 20,000 make up the majority of this group. Contacts from these communities provide the current year's rates for their unit-pricing programs and details about recycling, but track little information on waste generation outcomes. A very small percentage of this group consists of some larger urban communities that lacked much quantitative data. The project staff developed a separate data tracking sheet and data base to record information for this group. Variables recorded include: population; start date of unit pricing and recycling; unit pricing program type; information on other companion programs; and a qualitative assessment of the effect of unit-pricing on waste generation outcomes. Statistical analysis will not be feasible on the communities in this data base, but will provide an information resource on program design in small communities.

Data for Group 2 communities are also included in the database management program. As with the Group 1 communities, project staff can produce a one page program summary of Group 2 communities and sort by single variable or combination of variables. Combining the Group 1 and Group 2 communities, the database provides readily available information on

aspects of unit pricing, recycling, and yard waste programs in over 500 communities.

Group 3:

Information from all mail responses was combined with additional information from state-level contacts and the unit pricing literature to create a comprehensive tally of communities with unit based pricing for residential solid waste management. This tally identifies the names of unit pricing communities in 39 states, and includes data for most entries such as, start of unit pricing program and if it is a bag, tag, or can program. For a smaller percentage of the tally communities, additional data include: program type (fully variable, multi-tier, or additional base tax) and per unit fees. Communities that indicated they are considering unit pricing, or implementing a program within the next two calendar years, are also included. This tally accounts for unit pricing programs adopted through the first half of 1995 and totals 3468 communities (inclusive of groups 1,2, and 3). As shown in Appendix 3, this database lists each community by row along with the start date of the unit pricing program and the type of container used.

Group 4:

Eighteen communities without unit-pricing programs sent responses providing information on their solid waste programs. Data on these flat fee communities will allow analyses comparing unit pricing communities to a control group (i.e. communities where residents pay a flat fee for collection of an unlimited quantity of trash). The Group 5 database is a Microsoft Excel (version 5.0) spreadsheet, which can be easily exported to SAS (version 6.11) for statistical analysis. Except for variables related to a unit fee pricing structure, the variables for this group are identical to Group 1.

Preliminary Analysis of 212 Unit Pricing Communities

Preliminary analyses were conducted on the 212 communities comprising Group 1 to examine the national representativeness of these communities, as well as the characteristics and design features of unit pricing, recycling, yard waste collection programs, and waste generation outcomes under various unit pricing program features.

Distribution

Table 1 shows the distribution by state for the 212-unit pricing communities in Group 1. The 212-unit pricing communities represent 30 states. Each community provided sufficient quantitative information on waste generation outcomes, unit fees, and numbers of participating households.

Table 1

Group 1 unit pricing communities by state					
State	#	State	#	State	#
AR	1	MD	1	NY	2

CA	18	ME	14	OH	5
CO	2	MI	7	OR	11
CT	3	MN	6	PA	10
FL	1	NC	1	RI	2
IA	17	ND	1	UT	1
ID	1	NE	1	VA	1
IL	20	NH	4	VT	3
IN	5	NJ	8	WA	28
MA	12	NM	1	WI	25

Demographics

Table 2 compares demographic data for the Group 1 unit pricing communities to national averages. The Group 1 communities tend to have higher median housing values and slightly higher per capita incomes, have a larger proportion of residents with high school degrees or higher, and have much smaller minority populations.

Table 2

Comparison of demographic variables for Group 1 unit pricing communities to national averages			
Variable	Unit pricing average	Unit pricing median	National averages
% urban	70	100	75
% white	92	97	80
% < 3 yrs	4	4	4
% < 18 yrs	25	25	26
% 18-24 yrs	11	9	8
% 25-64 yrs	50	51	51
% > 64 yrs	14	13	13
% households w/children	33	33	34
% non-family	31	30	29

households			
% completed high-school	81	81	75
% completed college	23	19	26
% completed grad school	8	6	7
% worked in 1989	83	84	79
median housing value	111,740	80,400	78,500
median hh income	33,190	29,565	33,056
per capita income	15,469	13,483	14,220

Table 3 provides a sense of the variability in population size of the Group 1 communities. This group's average is 41,202 persons. Most likely small communities that have adopted unit fees are underrepresented. Based on census data from approximately 3400-unit pricing communities, the average community size is just over 6,000 persons; as of yet very few large communities have adopted unit pricing. The fact that our data set is more representative of medium and larger size communities may result from the fact that these communities are more able and more likely to track data on program outcomes.

Table 3

Group 1 unit pricing communities' population statistics		
	Population	Households
Average	41,202	16,143
Median	10,042	3,994
Smallest Community: Gibson, IA	63	32
Largest Community: San Jose, CA	782,225	251,050

Waste Disposal and Diversion

Many Group 1 communities provided data on waste landfilled, recyclables and yard waste collected from the year prior to implementation of unit pricing and the first year after implementation. These data allow a simple statistical comparison to examine whether mean levels of annual per household waste disposal and diversion amounts significantly change after implementation of unit pricing. The results of a paired t-test are shown in Table 4. The p-value indicates whether or not the differences are statistically significant. In general, analysts conclude that if the p-value is less than 0.05, then the differences between before and after implementation data are significant. Thus, in the first year after implementation of unit pricing, the amount of per household waste landfilled was significantly less than and the amount of per household recyclables collected was significantly greater than the year prior to implementation. The waste landfilled analysis excluded communities where either recycling or yard waste programs were established in conjunction with the unit pricing programs or where recycling and yard waste programs were changed significantly. With this added condition, the number of usable observations with before and after data was reduced from 66 to 31. No significant change in outcomes was detected for the variables yard waste collected and total waste collected. In the case of yard waste, this is likely influenced by the very small number of observations. In the case of total waste collected, a p-value of 0.10 indicates that the before and after data differences are approaching statistical significance. The third row of Table 4 presents a range of values within which the change in average per household tonnage is expected to lie after implementation of unit pricing. The average Group 1 household decreased its waste landfilled by 0.14 to 0.27 tons annually. For recyclables, the average household increased the amount set out by 0.06 to 0.11 tons annually. Based on pre-unit pricing averages, annual per household waste landfilled decreased by 14 - 27% and recyclables collected increased by 32 - 59% in the first year after implementation of unit pricing.

Multivariate analysis will provide greater explanatory power to determine specific factors driving these changes. Subsequent analyses will include program characteristics, and demographic and economic variables detailed in other sections of this report.

Table 4: Results of a paired t-test of waste disposal and diversion data between the year prior to unit pricing and the first year after unit pricing implementation for Group 1 communities.

Variable	Waste Landfilled	Recyclables Collected	Yard Waste Collected	Total Collected
Number of observations	30	55	11	22
P-value	0.0001	0.0001	0.97	0.10
Tons/hh/year increase or decrease after unit pricing (95% confidence interval)	-0.28 to -0.15	0.06 to 0.11	-0.10 to 0.11	-0.22 to 0.02
% increase/decrease compared to year prior to unit pricing	15 - 28% reduction	32 - 59% increase	30% decrease to 31% increase	18% decrease to 2% increase

Program Age

Table 5 summarizes Group 1 unit pricing communities’ average program age. The average program began around 1990, while the oldest program, in Troutdale, Oregon, began around 1940. Although the greatest number of communities adopted unit fees in the last three years, some communities have used pricing structures roughly equivalent to a per unit fee for many years if not decades. For example, in many Washington and Oregon communities, residents have always paid for trash collection services based on fees that varied with the number of cans. However, frequently the fee structures originally established in these communities failed to provide a clear price incentive to reduce the number or size of trash cans. In response to growing use of unit fees in the late 80's and early 90's, many Washington and Oregon communities revised their rate structures by adding smaller can options and increasing the cost of additional cans.

Program age will be used as an explanatory variable in modeling per household changes in waste landfilled and recyclables collected. In particular, we are interested in the question of whether lag time exists before consumers adopt source reduction behaviors. We hypothesize that after implementation of unit fee programs, consumers initially focus on recycling and other diversion strategies. Under this hypothesis, attention to source reduction strategies comes after a longer period of education and information.

Table 5

Group 1 average unit pricing program age (as of 12/95)	
Average	6.2 years
Median	4 years
Oldest program	55 years Troutdale, OR
Youngest program	0.6 years Longmont, CO

Companion Program Implementation

Analyses of unit pricing’s effect on recycling and waste outcomes will take into account the sequence of implementation of unit pricing with companion recycling and yard waste programs. As Tables 6a and 6b show, just under half of the Group 1 unit-pricing communities had recycling programs in place prior to implementing unit fees. Of the remaining communities, 61 implemented their recycling programs with unit pricing and 21 implemented programs in years subsequent to the start of unit pricing. For yard waste, 66 programs were in operation prior to unit pricing and 42 were implemented in the same year as the unit fees. Forty-five communities have no curbside or drop off programs for yard waste.

Table 6a

Recycling program implementation with respect to unit pricing	
	Number of Group 1 communities
Implemented program before UBP	103
Implemented program with UBP	61
Implemented program after UBP	21

Table 6b

Yard waste program implementation with respect to unit pricing	
	Number of Group 1 communities
Implemented program before UBP	66
Implemented program with UBP	42
Implemented program after UBP	12
No program	45

The unit pricing literature almost uniformly finds that increased recycling rates follow unit pricing implementation (Miranda, et al, 1995). On average, this trend remained true for the Group 1 communities; the mean increase in annual per household recycling was 36% with a median increase of 13%. While unit pricing programs are usually implemented with an aggressive recycling program, it may be important to more carefully consider the interactions between source reduction and materials diversion programs. Recycling programs offer residents an easy and, often times, familiar option to exercise in response to unit fees. Though this strategy does not preclude source reduction activity, the more convenient the recycling program becomes, the less incentive residents may have to source reduce. Source reduction, though it is central to pollution prevention, requires more substantial changes in purchasing habits and lifestyle choices that residents may be unaware of, uninterested in pursuing, find difficult to adopt, or embrace only slowly over time. On the one hand, limiting recycling opportunities may better preserve the pollution prevention incentives created by implementation of unit pricing; on the other hand, using such a policy to drive a community's source reduction program might encourage resistance to unit pricing efforts. Of the 31 communities reported in Table 6a that did not start a recycling program with the unit pricing program, 80% implemented unit pricing in the 1980's before the great increases in the number of curbside recycling programs in the early 1990's. As recycling became a common component to solid waste management programs after 1990, municipal leaders interested in implementing unit pricing programs during the past six years may have faced community opposition if it was not accompanied by plans for recycling opportunities. Statistical analysis on the Group 1 data will study the interaction of unit pricing programs and municipal recycling programs to determine if greater recycling convenience discourages source reduction in favor of materials diversion activities, or if source reduction and materials diversion activities are in fact complementary.

Minimum Container Size

Previous case studies of nine-unit pricing communities revealed that employing relatively smaller minimum sized container reduced a community's landfilled waste more effectively (Miranda and Aldy, 1996). For each Group 1 community, we have data on the smallest size container option available to households. Initial scatter plots and computations of correlation coefficients of trash and recycling tonnages with minimum container size indicate a weak relationship. Figure 1 plots minimum container size versus yearly household trash tonnages. The correlation between these two variables is positive, but low -- 0.17. Figure 2 plots minimum container size versus yearly household recycling tonnages. The correlation in this case is -0.13. We will explore the relationship of this variable to waste outcomes further in multivariate regression analysis.

Tables 7 and 8 show that greater differences in average minimum container size is evident comparing among program types (Table 7) rather than comparing among container types (Table 8). For instance, fully variable or additional base tax programs on average allow households to put out less than 30 gallons per week. In some communities, households have the option of monthly pick up of one 20 or 32-gallon container (which converts to 5 gallons/week for the former and 8 gallons/week for the latter). In contrast, multi-tier programs on average provide no incentive for households to put out less than 45 gallons per week. Looking at this data

in Table 8, we see minimal difference in the average minimum container size (approximately 5 gallons) among container types. The trends in these two tables suggest that program administrators should consider both container type and program type as important determinants of waste reduction incentives.

Figure 1: Household trash generation versus minimum container size.

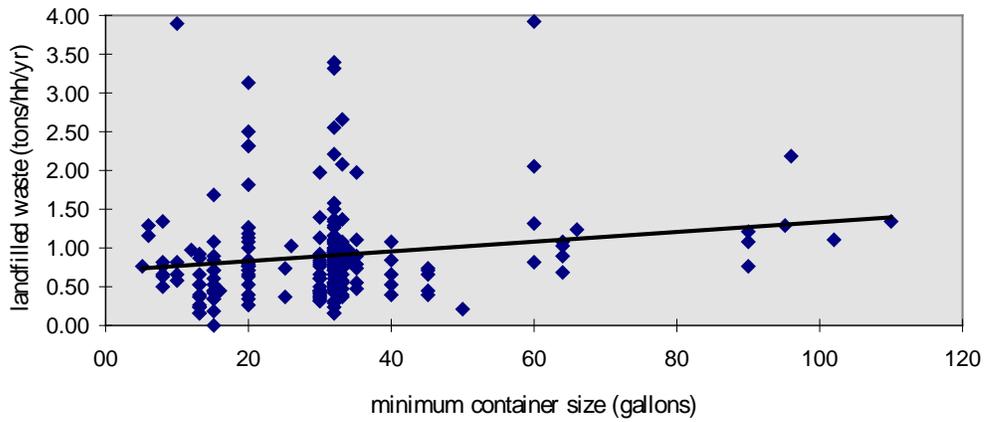


Figure 2: Recyclable tonnage generation versus minimum container size.

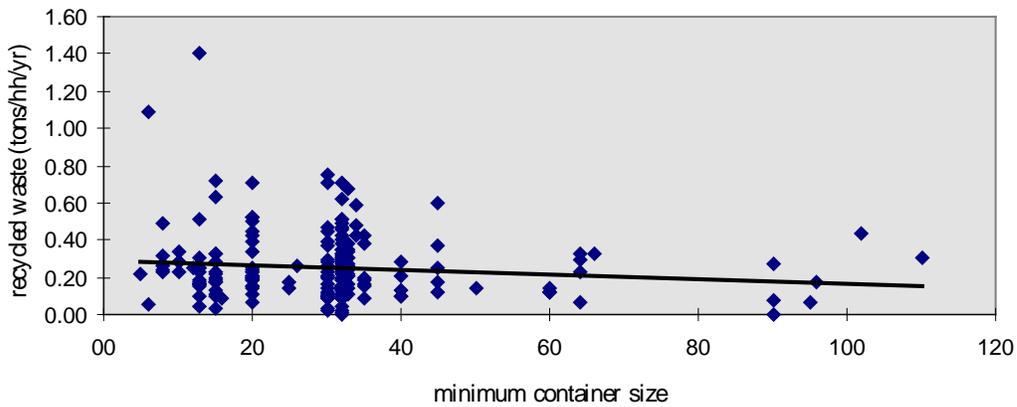


Table 7

Minimum container size (gallons/week) by program type for Group 1 communities			
	Multi tier^{1,2}	Fully Variable³	Additional Base Tax⁴
Average size	47	29	26
Median size	32	32	30
Smallest container	26	5 ⁵	8 ⁶
Largest container	96	110	102

¹ Minimum container size for multi-tier communities includes base service level. For all other program types, minimum container size equals the smallest container option of the variable fee.

² Multi-tier pricing has two fees. The first fee is flat and covers some minimum level of service. The second fee is unit-based and varies with any additional bags or cans collected above the base amount.

³ With fully variable pricing, households pay for each can/bag/tag set out. The unit fee is typically based on average costs.

⁴ Households pay a base amount, either through taxes or monthly bill, which does not cover any base level of service and additionally pay a unit fee for every can/bag/tag set out.

⁵ one 20 gallon can per month

⁶ one 32-gallon bag per month

Table 8

Minimum container size (in gallons/week) by container type for Group 1 communities				
	Bag	Tag	Can	Overall
Average minimum size	27	32	32	30
Median minimum size	30	32	32	32
Smallest container size	8 ¹	13	5 ²	--
Largest container size	96	102	110	--

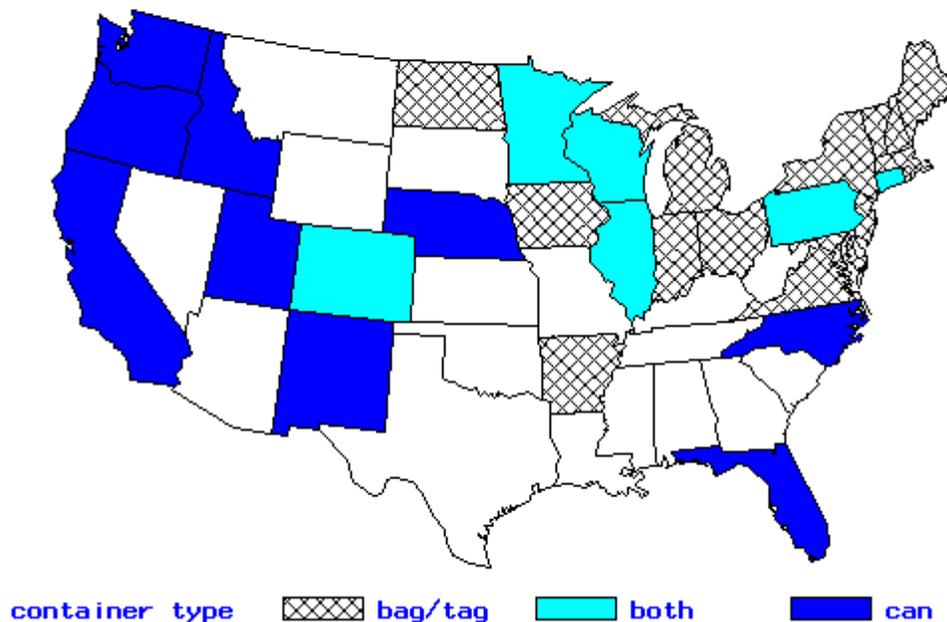
¹ one 32-gallon bag per month

² one 20 gallon can per month

Geographic Trends

In previous case studies by Miranda and Aldy (1996), the distribution of can and bag or tag programs followed a distinctive geographic pattern. West coast communities exclusively employed can-based systems, while Midwest and Eastern communities preferred bag or tag programs. The same strong pattern is seen in these 212 communities. Map 1 shows each state represented in the study and types of containers utilized by the Group 1 unit pricing communities. All unit pricing communities in Washington, Oregon, California, Colorado, and Idaho are can programs. The states of Utah, New Mexico, Nebraska, North Carolina, and Florida have only one community each, all of which use can based systems. Most Northeastern states and several Great Lake states rely on bag or tags exclusively.

Map 1: State Summary of container types used by Group 1 communities



Household Choice

Twenty-Seven Group 1 communities retain a flat fee option for residents (Table 9). In some cases, haulers continue to offer a flat fee option along with a variable fee. In some communities where both public and private haulers operate, the municipality has adopted unit fees without requiring haulers to do the same. The percentage of households in either group opting for a flat fee for their trash collection is high (approximately 50%) and may represent a considerable barrier to achieving waste diversion and reduction goals. In one Northeastern community, residents can avoid paying any fees curbside by self-hauling their waste to a drop off site. In communities where over half the households choose to pay for solid waste services through the traditional flat fee, we would expect to see greater per household tonnages for waste landfilled and lower per household tonnages of recyclables collected. To account for this possibility in statistical analysis, we will control for the proportion of households who choose the

flat fee option.

Table 9

Number of Group 1 communities that offer an alternative to unit based pricing		
UBP Alternative	# of Communities	Average % of households choosing flat fee
Flat fee is among options offered by hauler	13	52%
Residents can opt out of municipal unit based program and contract with a private hauler who charges a flat rate	13	46%
Residents self hauls waste and pays no charge	1	no information available

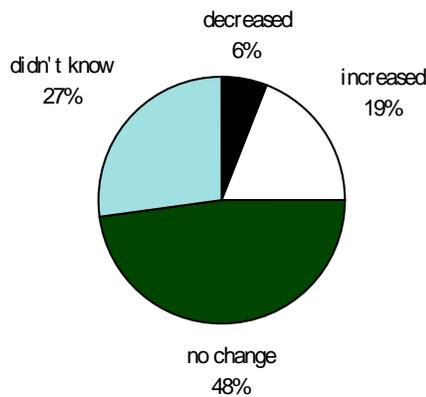
Mandatory Recycling

Figure 3 compares trash and recycling outcomes in Group 1 communities with and without mandatory recycling ordinances. One hundred thirteen communities mandated recycling, while in 99 communities recycling is voluntary. On average, in communities with voluntary recycling, trash disposal is greater and recycling is less by 0.24 and 0.05 tons/year/household, respectively. The interpretation of these results, however, is not straightforward. These numbers do not imply causation, i.e. that mandatory recycling increases diversion rates. An alternative explanation is that lower trash disposal and greater recycling may be more a reflection of underlying values in the community, values incorporated into law by mandatory recycling legislation. In our statistical analysis, we will continue to test the relationship between mandatory recycling and waste outcomes keeping in mind that without considering levels of trash disposal and recycling before mandatory source separation, interpretation is difficult.

Illegal Diversion

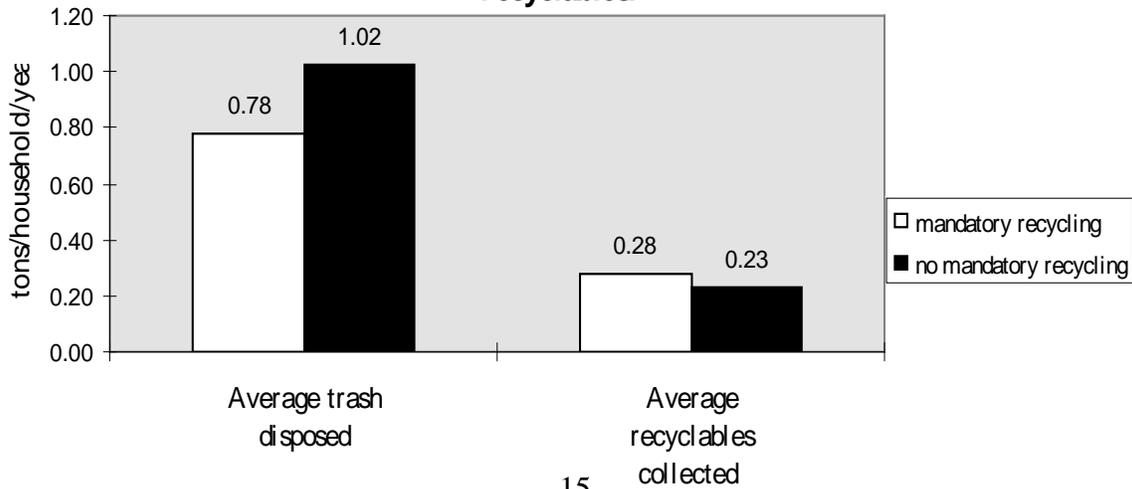
Most commonly, Group 1 communities indicated no change in illegal dumping activity with implementation of unit pricing programs (Figure 4). Over one quarter of the communities did not track illegal dumping or did not have any readily available information.

Figure 4: Percentage of communities indicating an increase, decrease, or no change in the level of illegal diversion with implementation of a unit pricing program.



Though we were unable to obtain data such as, number of citations or fines issued, or annual tonnages of illegally disposed of material, statistical analysis may still be possible. Using

Figure 3: Average yearly household trash and recycling tonnages for communities with and without mandatory source separation of recyclables.



logistic regression analysis, we can investigate the contribution of various explanatory variables towards the likelihood of an illegal dumping problem. Variables of interest include, enforcement of illegal dumping ordinances, level of unit fee, and demographic variables.

Conclusion

With data on well over 200 variables and with such a broad distribution of geographic localities, program types and program histories, the communities database has rich potential for statistical analysis. This preliminary examination provides a snapshot of trends and the variability in many central features of unit based pricing programs. The results will be used in subsequent steps of data study and model building for regression analysis.

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APPENDIX 1: Variable and code explanation for data on Group 1 communities.

Variable name	Values	Explanation
Unit based pricing		
PLACE		name of community
COUNTY		county, if known
STATE		state
REQUEST	Y or N	contact person requests a copy of results
CURRPOP	numeric	current, total population, if given
TOTALHH	numeric	total residential households, if given
UBPYEAR1	month-year	month and year unit pricing began
UBPTOTYR	numeric	# of years unit pricing used through 1995
UBPALT	1 or 0	1=residents have option other than unit fee; 0=unit fee is residents only option
ALTSFHH	%	percent of hh choosing alternative fee to unit pricing
DISPALT	U, C, or S	U=resident chooses flat rate for unlimited collection offered by hauler; C=resident contract with private hauler who doesn't offer unit fees; S=resident self-hauls waste and pays no charge.
FEEBASIS	W or V	W=weight; V=volume
UBPCONT1, UBPCONT2	B, C, T, N	B=bags; C=cans; T=tags; N=not applicable; or specified other
UFEETYPE	V, M, T	V=fully variable; M=multi-tier; T=additional base tax
BASEFEE	\$/month	fixed monthly fee resident pays for a base level of service per collection period
BASESRVC	# of gallons	# of gallons covered by the base fee
ADDAMT	\$/month	tax amount on a monthly basis resident pays which covers some of the fixed costs of disposal and collection -- no base service
FEEWGHT	\$/lb	fee per unit weight, if applicable
LIMIT/32G	# lbs	weight limit per bag or can

EXCESS	1, 2, or 3	1=trash not collected; 2=trash collected, notice left; 3=trash collected, resident charged extra fee
MINSIZE	#	minimum container size
95UFEEGL ... 89UFEEGL	\$/gallon	dollar per gallon fee for bag, tag , or sticker programs by year
95UMIVOL ... 89UMIVOL	# gallons	smallest can volume in a subscription can program by year
95UMIFEE ... 89UMIFEE	\$/can	monthly fee per container volume for subscription can program by year
95FGLMIN ... 89FGLMIN	\$/gallon	dollar per gallon fee for the smallest container in a subscription can program by year
95UMAVOL ...89UMAVOL	# gallons	largest can volume in a subscription can program by year
95UMAFEE ... 89UMAFEE	\$/can	monthly fee per container volume for a subscription can program by year
95FGLMAX ... 89FGLMAX	\$/gallon	dollar per gallon fee for the largest container in a subscription can program by year
95XTRA ... 89XTRA	\$/month	monthly fee for an occasional extra 32 gallon can in a subscription can program
UBPBILL	N, W, M, Q, Y, D	billing frequency N=not applicable (bag, tag, or sticker); W=weekly; M=monthly; Q=quarterly; Y=yearly; D=pay at drop off site
UBPFREQ	8, 4, 2, 1, 0	8=2/week; 4=weekly; 2=biweekly; 1=monthly; 0=drop-off
95USFHH ... 90USFHH	#	number of single family households receiving trash collection services (unless otherwise noted, can include non-unit pricing hh when that is an option)
95UMFHH ... 90UMFHH	#	number of multi-family households receiving residential trash collection and paying residential fees (vs. commercial)
UBPHAUL	C, P, F, or D	type of garbage hauler C=city; P=private contract; F=franchise; D=drop off only
DISPOSE	L, I, or B	where waste is disposed L=landfill; I=Incinerator; or B=both

FILLAGE	#	year in which landfill was constructed
FILLYEARS	#	number of years of remaining landfill capacity
EXPAND	1 or 0	possibility to expand the capacity of the landfill 1=yes; 0=no
TIPUNIT	T or Y	per unit basis of tipping fee T=tons; Y=cubic yards
95LFTIP ... 90LFTIP	\$	yearly per unit landfill tipping fee
95INCTIP ... 90INCTIP	\$	yearly per unit incinerator tipping fee
FREEMSW	1 or 0	residents can periodically dispose of trash or bulky goods without paying unit fees (i.e. Spring clean ups)
FREEYR	year	year free program began
FREETIME	#	number of weeks program occurs per year
RECYCLING		
RECYLAW	year	year of mandatory recycling law
RECYCLING	C, D, or B	recycling program options C=curbside; D=drop off; B=both
RECYCURB	S or M	extent of curbside recycling program S=single family residents only; M=single family and (some or all) multi family residents
RECYFREQ	#	number of recycling collections per month
RECYCOLL	A, B, C, or D	hauler method of collection A=same day & truck; B=same day diff. truck; C=different day; D=drop off only
RECYBIN	1 or 0	residents receive a free recycling bin 1=yes; 0=no
95RSFHH ... 90RSFHH	#	yearly number of single family households who can potentially participate in recycling
95RMFHH ... 95RMFHH	#	yearly number of multi family households who can potentially participate in recycling
SFRRATE	%	latest years recycling participation rate for single family households; 99 for don't know
MFRATE	%	latest years recycling participation rate for multi family households; 99 for don't know; 00 for not

		applicable
NPRECYR ... CBRECYR	year	year curbside collection began for each recyclable material
NPRECSET ... CBRECSET	S, C, M, or D	method of recyclable material preparation S=separated; C=commingled with some other materials; M=commingled with all other materials; D=drop off only
NPDROPYR ...CBDROPYR	year	year drop off collection began for each recyclable material
OTHRREC1 ... OTHREC6	name	additional recyclable materials
OTRECYR1 ... OTRECYR6	year	see above
ORECSET1 ... ORECSET6	S, C, M, or D	see above
RECYHAUL	P, R, F, or D	who does collection of recyclables P=public/municipal workers; R=private hauler; F=franchised hauler; D=drop off only
95RECFEE ... 90RECFEE	\$/month	each year's monthly recycling fee paid by residents; separate from unit fee for trash
YARD WASTE		
YWASTLAW	year	year of law mandating separation of yw from landfillable trash
YARDWAST	C, D, or B	refer to RECYCLING
YARDCURB	S or M	extent of curbside yard waste collection S=single family residents only; M=single family and (some or all) multi-family residents
YARDCOLL	A, B, C, or D	refer to RECYCOLL
95YSFHH ... 90YSFHH	#	yearly number of single family households who can potentially participate in yard waste program
95YMFHH ... 90YMFHH	#	yearly number of multi family households who can potentially participate in yard waste program
YTYPEFEE	N, V, M, T, or F	fee associated with yard waste collection N=no separate fee; V=fully variable; M=multi-tier; T=additional base tax; F=flat fee
YARDBILL	N, W, M, Q	refer to UBPBILL

YARDHAUL	C, P, F, or D	type of hauler for yw collection C=city; P=private; F=franchise; D=drop off only
WASTEYR	year	year curbside collection of yw began
WASTMNTH	#	number of months/year yw collected
WASTFREQ	#	number of collections/month of yard waste
WADROPYR	year	year drop off site for yw began
YWCNT1	B, C, T, O, or N	type of container for yw collection B=bags; C=cans; T=tags; O=open/street side; N=not applicable
YWCNT2	see above	see above
YWLIMIT	lbs.	weight limit per yw container
YWEXCESS	1, 2, or 3	refer to EXCESS
95YFEEGL .. 90YFEEGL	\$/month	dollar per gallon yard waste fee for bag, tag , or sticker programs by year
95YMIVOL ... 90YMIVOL	# gallons	smallest can volume in a yard waste subscription can program by year
95YMIFEE ... 90YMIFEE	\$/can	monthly fee per smallest container volume for yard waste subscription can program by year
95YMAVOL ... 90YMAVOL	# gallons	largest can volume in a subscription can program by year
95YMAFEE ... 90YMAFEE	\$/can	monthly fee per largest container volume for yard waste subscription can program by year
LEAFCURB	year	year curbside collection of leaves began
LEAFWEEK	#	number of weeks/year of leaf collection
LEAFDROP	year	year drop off collection began of leaves
LEAFFEE	1 or 0	fees associated with curbside or drop off collection of leaves; 1=yes; 0=no
HDAYCURB	year	year curbside collection of Christmas trees began
HDAYWEEK	#	number of weeks/year of Christmas tree collection
HDAYROP	year	year drop off collection of Christmas trees began
HDAYFEE	1 or 0	fees associated with curbside or drop off collection of Christmas trees; 1=yes; 0=no

COMPKITC	1 or 0	city sells composting kits
COMPKITH	1 or 0	hauler sells composting kits
COMPINFO	1 or 0	composting information available
95PRKIT ... 93PRKIT	\$	cost to resident for composting kit
95COMP HH .. 93COMP HH	#	number of composting kits sold
LARGITEM	C, D, or B	see RECYCLING
95LRGMAX ... 93LRGMAX	\$/item	maximum fee for the collection of large item
95LRGMIN ... 93LRGMIN	\$/item	minimum fee for the collection of a large item
LARGFREQ	#	see RECYFREQ
HHWEEK	#	number of weeks/year collection of HHW available
HHWFEE	1 or 0	fee associated with collection of HHW
OTHRHHW	1 or 0	HHW collected by entity other than the municipality
EDUCATION		
REDUCED	1 or 0	source reduction information available to residents
INITIAL	1 or 0	education program accompanied start of the ubp program
JUNKMAIL	1 or 0	information given on how to avoid junk mail
SMARTSHP	1 or 0	info given on waste reducing shopping behavior and emphasis on buying recyclable goods
HHITEMS	1 or 0	encourages the repair, reuse, or donation of unneeded household items
HAZALT	1 or 0	gives alternatives to using household hazardous wastes
LIMITS	1 or 0	suggests limits to purchasing such as making gifts,
COOPRENT	1 or 0	ideas of cooperation among several households (sharing tools) or renting items that are used infrequently
OTHER	1 or 0	
REDXINFO	1, 2, 3, or 4	presentation of source reduction information

		1=brochures; 2=newspaper; 3=demo or class; 4=other
MAILING	1, 2, 3, or 0	frequency in education program 1=more than once per year; 2=once per year; 3=upon demand; 0=none
BROCHURE	1, 2, 3, or 0	frequency in education program 1=more than once per year; 2=once per year; 3=upon demand; 0=none
RADIO/TV	1, 2, 3, or 0	frequency in education program 1=more than once per year; 2=once per year; 3=upon demand; 0=none
PRINT	1, 2, 3, or 0	frequency in education program 1=more than once per year; 2=once per year; 3=upon demand; 0=none
SCHOOL	1, 2, 3, or 0	frequency in education program 1=more than once per year; 2=once per year; 3=upon demand; 0=none
BILLBRDS	1, 2, 3, or 0	frequency in education program 1=more than once per year; 2=once per year; 3=upon demand; 0=none
MEETING	1, 2, 3, or 0	frequency in education program 1=more than once per year; 2=once per year; 3=upon demand; 0=none
OTHERED	1, 2, 3, or 0	frequency in education program 1=more than once per year; 2=once per year; 3=upon demand; 0=none
EDPROG	name	name of other education program
BURNING	1 or 0	community has ordinance restricting the burning of trash
LITTER	1 or 0	community has ordinance punishing littering
DUMPSTER	1 or 0	community has ordinance against illegal use of commercial dumpsters
ILLEGAL	1, 2, or 3	change in illegal dumping since start of ubp program 1=decreased; 2=no change; 3=increased
ENFORCE	1 or 0	steps taken to increase enforcement or advertisement of ordinances

STEPS	C, F, or N	steps taken in case of illegal dumping C= id attempted, person contacted but not fined; F= id attempted, person fined; N= no id attempted
OUTCOMES		
95WASTE	tons	actual residential trash tonnage for 1995
SWMONTHS	#	number of months represented by above number
95LNDFIL	tons	estimated full year trash tonnage for 1995 if actual number was less than a full year
94LNDFIL ... 85LNDFIL	tons	yearly residential trash tonnage
95RECYL	tons	actual residential recyclable tonnage for 1995
RMONTHS	#	number of months represented in above number
95RECYL2	tons	estimated residential recyclable tonnage for 1995 if actual number was less than a full year
94RECYL ... 90RECYL	tons	yearly residential recyclable tonnages
95YARD ... 90YARD	tons	yearly residential yard waste tonnages
95OTHER ... 90OTHER	tons	yearly tonnages of other curbside or drop off collections
COSTS & REVENUES		
95TCOST ... 90TCOST	\$	annual total costs for all solid waste programs
95SWCOST ... 90SWCOST	\$	annual costs for trash collection and disposal
95RECOSt ... 90RECOSt	\$	annual costs for recycling collection
95YWCOST ... 90YWCOST	\$	annual costs for yard waste collection
95EDCOST ... 90EDCOST	\$	annual costs for education program costs
95TOTREV ... 90TOTREV	\$	annual total revenues for all solid waste programs
95SUBPREV ... 92SUBPREV	\$	annual revenues from unit pricing program
95RECREV ... 92RECREV	\$	annual revenues from recycling program
95SALREV ...	\$	annual revenues from the sale of recyclable

92SALREV		materials
95YWREV ... 93YWREV	\$	annual revenues from yard waste collection
95SPLREV ... 93SPLREV	\$	annual revenues special collection programs