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# Garbage In, Garbage Out. A Report On Per Capita Income And The Independent Effect On The Method Of New Jersey Municipal Trash Removal

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**Garbage In,**

**Garbage out**

**A Report on Per Capita Income and the Independent  
Effect on the Method of New Jersey Municipal  
Trash Removal**

Submitted to the  
Center for Public Service  
Master of Public Administration Program  
Seton Hall University

By

**Stephen E. Will**

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## I. Abstract

An analysis was done on data made from a 1991 report profiling of New Jersey municipal recycling and garbage practices, published by the New Jersey League of Municipalities Bureau of Municipal Information. In particular, focus was given to municipal solid waste removal type. My topic is the relationship between municipal per capita income and trash removal type. The point of the study is to see if there is a relationship between the variables.

## II. Introduction

As a future department head or administrator for a municipality, I feel this research is valuable in order to increase local government effectiveness and efficiency. Demographics play a large role in leading and managing local government. Having this information at our disposal will help municipal government officials make better decisions when dealing with residential trash removal.

The data I gathered was obtained from a 1991 New Jersey League of Municipality Report profiling recycling and garbage practices in New Jersey. My report will only deal with the trash removal type (municipal workers, municipal contract, private hauler) in participating municipalities found within the 1991 report. I then chose to use per capita income as the independent variable as it relates to the aforementioned.

I am going to examine the relationship between the type of trash hauling and median per capita income by municipality. The reason is that I'm hypothesizing that private haulers will be most expensive and only affordable to the more wealthy cities. This stems from my pre-

conceived notions that the wealthier the city, the more private hauling is used over municipal contract or municipal workers.

Municipal contracting will be the likely choice of least prosperous towns because municipal governments who use this choice award contracts based on the lowest bidding process, and effectively keeps prices down by the competition aspect. In turn, this saves lower per capita municipalities money.

Hauling by municipal employees will be the second choice regardless of per capita income because I feel these towns using their own workers feel a debt to society and the workers who live and work for these towns, will continue to do so.

### III. Literature/Background

Over the past twenty years, there have been numerous studies dealing with the privatization of local government services. In particular, solid waste refuse collection costs have been shown to be higher with local government workers doing the work as opposed to contracting out to private haulers (Savas, 1977, Siegel, 1999, Wessel, 1995). To give a point of reference, the term 'contracting out' is a form of privatization. Privatization can take many forms for various governmental agencies throughout the United States and the world (Faffel, 1999).

Advocates of privatization point to fiscal considerations (Clingermeier, 1997), higher efficiency (Boyne, 1998), greater expertise and more advanced equipment that a contractor specializing in a given field can offer (Ammons, 1995). Perhaps the biggest argument for contracting out of solid waste trash removal is that it is a means of maximizing economic

efficiency by reducing government costs while increasing the scope and quality of service delivery (Jensen, 1998).

More specifically, Chandler (1994) infers that the characteristics of solid waste refuse collection allows private firms to supply the little skill needed with abundant labor, at cheaper labor rates, and to perform the task for less than local governments can provide. Decreased costs are the main reason for local governments in adopting private sector delivery according to the latest International City/County Management Association (ICMA) survey results (Morley, 1999).

Which cities are more likely to contract out municipal trash services? Referring to Nelson (1997), small municipalities are more likely to contract out to take advantage of scale economies, longstanding property tax limits, high tax burdens coupled with small tax base(s).

Dilger (1997) argues that cities with relatively low per capita income may be more likely than cities with relatively high per capita income to privatize services. Wessel (1995) states that larger tax burdened populated cities (Newark, New Jersey for example) have a long history of contracting municipal waste. All of the above suggest that municipalities with lower per capita income are more likely to privatize. On the other hand, a study by Greene (1996) found that privatization levels were higher in wealthy, fiscally healthy, suburban cities. This echos Chandler (1997), who states that "per capita income" should be positively associated with sanitation privatization.

Thus, the scholars disagree.

#### IV. Methodology

Data collection for this study occurred in two stages. The data obtained from the New Jersey League of Municipalities (1991) profiled recycling and garbage practices in New Jersey. A mail survey of all five hundred and sixty seven (567) New Jersey municipalities produced four hundred (400) respondents, or seventy (70) percent. There were thirty two questions answered by recycling coordinators and municipal officials.

The area of focus for this research study from that 1991 report deals with collection type (municipal worker, municipal contract, private hauler, and other) of residential trash removal.

The second stage of data collection involved data obtained from the Municipal Year Book (1997). Per capita income for each responding municipality was tallied. The same information could have been obtained from the New Jersey Census Book (1990). I did check both sources and found the per capita income figures were identical. The next census will be taken again in the year 2000.

The statistical method that is generally employed to examine relationships between variables is called contingency table analysis or the analysis of cross-tabulations. I then move into chi-square testing for statistical significance.

The next statistics used are measures of association. These provide an indication of the extent and direction between two variables in a cross-tabulation. Measures of association are calculated on the basis of all the data in the contingency table. For this research, I used lambda, a nominal measure of association. Lambda is defined as the proportional reduction in error gained in predicting the category of the dependent variable when the value of the independent variable is taken into account, and evaluates how the prediction of the dependent variable is improved

when the value of the independent variable is known (Meier, 1997).

## V. Results

In the literature review I found that Greene (1996) and Chandler thought high per capita cities would be more likely to use private haulers for trash removal. On the other hand Boyne (1998), Wessel (1997), and Dilger (1997) thought that high per capita income cities would more likely to use municipal workers for trash removal. I agree with Greene and Chandler that high per capita income towns will use private haulers because wealthier towns have the money to pay private haulers and do not care if the costs are not included in their taxes. The monthly fee to them isn't a big deal. It all goes to the utility or value of money. The following demonstrates the results of my analysis.

Table 2 shows that higher income towns are more likely than lower income towns to use private haulers. Lower income towns are more likely than higher income towns to use municipal contract. Very little difference occurred using municipal workers. The chi-square shows statistical significance, while lambda shows a moderate relationship.



Table 1 Number of MunicipalitiesIn Each Category

Type of Trash Removal*	Per Capita Income		Total
	Less than \$18,750	More than \$18,750	
Municipal Workers	40**	45	85
Municipal Contract	76	52	128
Private Hauler	<u>75</u>	<u>101</u>	<u>176</u>
Total	191	198	389***

Note. \* Earlier reference in the text refers to "other" as another type of trash removal. From the 1991 League Survey, there were only six (6) municipalities using "other" with no explanation.

\*\* Indicates the number of municipalities

\*\*\* This number is short of the four hundred municipal survey respondents. Six responded with "other" and five (5) offered no response.

Table 2 Percentage Distribution for Data of Table 1

Type of Trash Removal	Per Capita Income	
	Less than \$18,750	More than \$18,750
Municipal Workers	21%*	23%
Municipal Contract	40%	26%
Private Hauler	<u>39%</u>	<u>51%</u>
Total	100%	100%
	(n = 191)	(n = 198)

Note. \* Percentages rounded off

**Table 3 Per Capita Income and Type of Trash Removal Type  
Calculations for Expected Frequency and Chi-Square**

<b>Observed Frequency</b>			
	<b>Per Capita Income</b>		
<b>Type of Trash Removal</b>	<b>Less than \$18,750</b>	<b>More than \$18,750</b>	<b>Total</b>
Municipal Workers	40	45	85
Municipal Contract	76	52	128
Private Hauler	<u>75</u>	<u>101</u>	<u>176</u>
<b>Total</b>	<b>191</b>	<b>198</b>	<b>389</b>

  

<b>Expected Frequency</b>			
	<b>Per Capita Income</b>		
<b>Type of Trash Removal</b>	<b>Less than \$18,750</b>	<b>More than \$18,750</b>	<b>Total</b>
Municipal Workers	42	43	85
Municipal Contract	63	65	128
Private Hauler	<u>86</u>	<u>90</u>	<u>176</u>
<b>Total</b>	<b>191</b>	<b>198</b>	<b>389</b>

p-value- 0.014

observed chi-square- 8.54, critical chi-square- 5.99

alpha- 0.05, probability of p associated with the specific chi-square- 0.014

**Table 4 Nominal Measurement of Association: Lambda Formula\***  
**Per Capita Income and Type of Trash Removal**

$$\text{Lambda} = \frac{\text{Number of errors in prediction Not knowing value of independent variable} - \text{Number of errors in Prediction knowing value of independent variable}}{\text{Number of errors in prediction Not knowing value of independent variable}}$$

For this study, Lambda shows:

$$\frac{.329 - .555}{.329}$$

.329

Equaling 0.68

**Note.\*** Lambda cannot be negative, but ranges from 0.0 to +1.0, with the higher number showing a greater predictive relationship between the variables. In this instance 0.68 is considered moderate in a predictive relationship between per capita income and trash removal type.

## VI. Conclusions/Recommendations/Implications

In summarizing the results from the study, the statistics used for this study show there is a relationship between per capita income (independent variable) and type of trash removal (dependent variable).

Looking back at my three hypothesis, we see that the preconceived notions that I had concerning hauling type were true. Private haulers were more often employed by wealthier cities was proven to be true.

Hypothesis number two stated that municipal contracting will be the likely choice of least prosperous towns. This proved to also be true.

Hypothesis number three holds that municipal employees will be used for trash removal regardless of income was proven to be true, with only two percentage points difference between the lower and higher income level municipalities.

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