**Effectiveness Analysis of Pay-as-you-through Program in Massachusetts**

**Introduction**

Pay-as-you-throw (PAYT) program has become popular in Massachusetts in recent years. It is defined as a usage-pricing trash collection and recycling program for disposing of municipal solid waste. The effectiveness of a PAYT program is usually measured by its ability to increase recycling rate. The objective of the project is to understand what factors might influence the effectiveness of a PAYT program.

This project intends to answer two questions. The first is if a PAYT program is effective in increasing recycling rate on municipality level. The second question is based on the results of the first question. If PAYT programs do not do well in all municipalities, what factors might explain this kind of ineffectiveness in particular areas? Answering these questions will provide some insights on how to improve the effectiveness of PAYT programs in Massachusetts.

**Methods**

The main variable of interest of the project is PAYT program. To explore if implementing a PAYT program leads to an increase of recycling rate, both static and dynamic analyses are conducted. Two maps are created to depict the changes of recycling rate and PAYT program status within each municipality from year 2003 to 2008. A bar graph is used to compare the differences of recycling rates among municipalities with and without a PAYT program.

To answer the second question, a suitability model was constructed to identify municipalities where implementing a PAYT program will be effective in increasing recycling rate. The model assists in controlling for unobserved heterogeneity that might influence the effectiveness of PAYT programs: per capita income, population, town expenditures, education level and distance to recycling centers. Econometric analysis proves this kind of model is helpful for improving the effectiveness of PAYT programs.

**Findings**

From the dynamic analysis of the change in PAYT program status and recycling rate, we see that implementing a PAYT program does not necessarily lead to an increase in recycling rate for all municipalities. The reason is that the effectiveness of PAYT program is affected by demographic factors and distance to recycling centers. Econometric analysis proves this kind of model is helpful for improving the effectiveness of PAYT programs.

**Conclusions**

This project combines economic analysis with GIS technology and provides a detailed analysis of current PAYT program in Massachusetts. It provides valuable information for suggesting how to increase the effectiveness of municipal recycling program in the future. People need to be educated of the necessity of recycling and government should provide economic incentives to those poor areas which have a PAYT program. This can be done through advertising, and awareness raised as part of the curriculum in the schools located in poorer neighborhoods. Further research is needed before we reach a final conclusion on this issue.