

# Why Don't More People Recycle?

## The Abstract

The purpose of this experiment was to answer the question of why the majority of people in my community didn't recycle. To look at this I looked at recycling rates in the Palazzo Monte subdivision before and after a Republic Services recycling pilot project and looked at the effect that education( through signs, going door to door and surveying) had on the rate of recycling.

## **Problem Statement**

Nevada has numerous landfills that are filling with things that could be recycled because the majority of the community is not recycling. Pilot programs have increased the percentage of waste recycled from 6% to 30% but only a small number of neighborhoods are participating in the programs due to limited funding and the expense of converting the bins and trucks to the automated system.

## **The Question**

I noticed that many people in my neighborhood and school aren't recycling. Why not?

## **The Hypothesis**

If people in my neighborhood and school are educated about recycling and if the process is available and convenient then the recycling rates will significantly increase.

## **Materials**

1. Construction Paper
2. Computer paper
3. Cardboard box
4. Pencils/pens/colored pens/highlighters
5. Computer and printer with email

## Methods

### **1. Selecting the Sample:**

I decided to use my neighborhood, the Palazzo Monte subdivision in Henderson, as my test area. This consists of 117 homes in a gated community in Seven Hills. The people in these homes are of similar income and would be considered middle to upper middle class.

### **2. Finding a control and baseline:**

First of all, I went around my neighborhood and counted the number of homes that were currently recycling as a baseline. To find the recycling rate I counted the number of houses with recycling crates out in front on the designated recycling day on November 13, 2010. As another control, we had found the baseline recycling rate of a subdivision across the street called Villagio. Our neighborhood had recently had the roads resurfaced and a map of the area with all the house numbers had been given to my family. I used this “slurry map” to color in the recycling and non-recycling houses. I subtracted any homes that I knew were vacant due to foreclosures and adjusted my sample size. I also requested data from Republic Services that compared the weight of recycling weighed from the homes in the old manual program and the new pilot program.

### **3. Selecting a variable.**

I then found out through a mailer that my neighborhood had been selected for the new automated pilot recycling program that was to start on December 7<sup>th</sup>, 2010. The factor that would be affected is the recycling rate before and after the pilot program and before and after speaking with my neighbors and educating them about the program and recycling.

### **4. More Research:**

I attended the Henderson Recreation Center open-house on 11/17/10 to learn about the new pilot program. I spoke with Bob Coyle and Stephen Stefano

who were Republic Services executives who gave me a lot of information about recycling in our area and the pilot program.

### **5. Obtaining Data:**

I counted the houses again with the new bins and new program on 12/21/10 and 1/4/11 and mapped the data. I spoke with the mailman and he confirmed on my map which houses were vacant and not receiving mail. I wrote surveys for my neighbors asking about their characteristics, whether or not they recycle, and their opinion about why people don't recycle.

### **6. Changing the conditions:**

I then walked around my neighborhood and knocked on doors and gave out my surveys to every house. I spoke with people about my project, the pilot program, and shared what I knew about recycling in our area. I did a count the following Tuesday to see if surveying and talking changed the rate.

Then on 1/11/11, I set up my stand of information by the main gate (A tall box with pieces of paper with information on it) which thanked them for the surveys, and gave information on of what you can recycle and a reminder taped to it). Then I counted again around the neighborhood again on 1/18/11.

## The Results

In the cities of Las-Vegas and Henderson 83,000 tons of trash is generated per month of which 60% is recyclable. Currently only about 10% of that 60% (or 6% of the total waste) is actually recycled. This number seems pitiful to me and inspired me to look into this problem.

### The Weight Data

Table 1 is a list of weights that was obtained by Republic Services by weighing all the trucks that collect regular trash and trucks with materials to be recycled in the month of November and December 2010 in Las Vegas and Henderson. They measured homes in the manual recycling program areas (with the separate crates that are sorted) and measured the pilot-program areas (with automated trucks and no sorting required.) Last November only 6.83% of the total waste was actually recycled from areas that are in the manual recycling program. A similar number of 6.64 % was obtained for December. In Table 2 which measured the pilot program areas over the same time period, 30.2% of the total waste stream is being recycled. The average recycled in the same area before the new program was 1.6 pounds per week per home, and after the program the average was 13 pounds per week per home

Republic Services processes 5,000 tons of recycling per month. Unfortunately the pilot-program is only in 2.8 % of homes in Clark County. This is due to cost of the new bins and new automated trucks. Workers at Republic Services sort some of the recyclables out manually but most of the materials are sorted through new machines that can now handle a higher load of recyclables.

### The Participation Study

Table 3 shows my personal counts of homes in my subdivision of Palazzo Monte in Seven Hills that are participating in recycling. Maps 1 and 5 are two representative days that are the first and last counts of the experiment. Maps 2,3,4 can be found in my notebook.

I walked around my subdivision on 5 separate recycle days during my experiment and I counted every house that had recycle bins out front and houses that didn't. The first column on Table 3 is abbreviations of the five streets in the subdivision. The houses that had bins out appear on the table in the **YES** column. Houses without bins are in the **NO** column. The third column represents foreclosures and the fourth column is homes where the people were known to be on vacation. The fifth column represents the total number of houses in the subdivision which is 117. When I calculated the percentage if **YES** and **NO** I subtracted the foreclosures from the total houses and used the total in column 7.

With the data from 11/13/10, my calculations showed 30.7 percent of my neighborhood recycled and 69.3% didn't; also 2.6 percent were foreclosures. During this time, our subdivision was part of the manual recycling program. I was told by our recycle pick-up driver on that day that our area was definitely one of the heaviest recycling routes in Clark County. Sadly, I could guess that the recycle rate for the rest of the city was much lower than 30%. On December 7<sup>th</sup>, our subdivision started the pilot automated program.

I counted again on 12/21/10 and found that 57.9% of my neighborhood recycled and 42.1% didn't; also 2.6% were foreclosures.

I counted again on 1/4/11 and obtained similar results of 62.4% recycled and 34.2% didn't.

On 1/8/11 I gave out surveys to everyone in my neighborhood by typing out 117 copies of my survey and going door to door asking everyone to fill it out. The surveys had questions like age, ethnicity, political party, whether they had pets or put up holiday lights. The purpose of this was to see if I could find a pattern and predict who will recycle. Out of the 117 surveys I got 62 back. The results are shown in table and significant differences were highlighted. See Analysis section for more on this.

On 1/11/11 (after the surveys) I counted for a third time and 41% of my neighborhood recycled and 56.4% didn't; also 2.6% were foreclosures. I ran into a problem with the counts on this day. Typically the recycling is picked up in the evening. However, on this day, the recycling was picked up around noon and I didn't get home from school until 3:30. When I counted I noticed that many of the neighbors had already put their bins away and therefore the number of no's was artificially high and therefore this day should not be considered accurate.

On 1/16/11 I put out a reminder sign with information about what could be recycled.

On 1/18/11 (after the informational stand) I counted for a fourth time and 74.7% recycled and 25.2% didn't; also. I spoke with the mailman and he told me exactly which houses were not currently receiving mail and therefore was vacant and I adjusted my numbers. The new percentages showed 92% recycled and 8 % didn't

I went back and attempted to adjust the percentages based on the new foreclosure data and that is what appears in columns 8-11 of the table. The numbers were not affected much. The final day however, I made a new adjustment based on not only the new foreclosure data but also corrected the numbers based on whether they had trash only out or none at all.

## Analysis

Looking at Republic Services weight data, it is clear that there is a significant difference in the amount by weight of recycling between the manual recycling program that 97% of the community does and the new pilot program that 3% are doing. The difference is an average of 1.6 pounds per house per week versus 13 pounds per house per week with the new pilot program. This shows an increase of 8 times the amount when looking at the weight.

When looking at the participation data I collected, it showed a different increase.

Before the pilot program the average recycling rate was 30.7% in my neighborhood. After the pilot program (which makes recycling more convenient) the average recycling rate was 63.2% in my neighborhood. After my surveys and information stand (which informs people about recycling) the rate of recycling went up to about 91.9%.

This information tells me the pilot program (with a convenient system that includes a bin that doesn't require sorting and weekly pick up) doubles the rate from 30.7% participation to 63.2%. The issue of inconvenience is also supported by my surveys on which people listed inconvenience as the number one reason people don't recycle. The two Republic Services executives that I spoke with also list this reason as the main factor.

Going door to door, and speaking with my neighbors, and putting up signs, also increased the rate another 28.7%. It is unclear whether this is due to the education or to the fact that neighbors are nice and want to help me or were embarrassed that the fact that they weren't recycling was being brought to people's attention. Nevertheless, the combination of survey, education, and signs results in a 28.7% increase.

The survey did give some information that could be useful to predict recycling. (see Table 4) There is a correlation between the before and after recyclers (people that participated in both programs) and voting patterns. Before and after recyclers are more likely to vote in local elections and put up holiday lights. I also found that the majority of people in my neighborhood are middle aged, highly educated white people from the west coast that have pets but it didn't show a difference between recycling behaviors.

Back to the quantitative data, the two different sources of data show us that with the pilot program the participation doubles, but the amount per house

quadruples. It would be interesting to see how the weight per house changes further after education but I don't have any weight data after January 1.

This shows that pilot programs work and allow half of the recyclable materials to be recycled and personal effort can increase this amount even further toward the goal of 60% which would be all of the recyclable materials in the waste stream.

My results have inspired me to attempt to convince the mayors and city council to extend the pilot programs to be city wide and to help inspire kids to talk with the neighbors to increase recycling even further.

I plan to relay my findings to the executives at Republic services and write letters to the mayors of Henderson and Las Vegas, and the Henderson city council members.

### **Regarding recycling at my school:**

I also had wanted to include my school in my recycling project. I noticed when I tried to throw away my powerade bottle at lunch that there are no recycle bins in the cafeteria. Many plastic bottles and cans are needlessly thrown away each day. My mom called the district and spoke with Katie Duffy at CCSD operations who informed us that there is a recycling incentive program which Hyde Park doesn't currently participate in. All schools are eligible and if the school recycles, thousands of dollars per year are returned to the school. A teacher or parent recycling representative is needed and the principal just has to call Mike McGraff at the district and sign the contract. The conditions of the contract are simple. It is my hope that I can get a teacher and the principal to agree to sign it so Hyde Park can be a role model for recycling and get money for the school too.



## Conclusion

In this experiment, I was trying to answer the question, **Why don't the majority of people in my community recycle?** For my hypothesis, I thought that **if people in my neighborhood and school are educated about recycling and if the process is available and convenient then the recycling rates will significantly increase.** Based on the data that was collected during the experiment, in particular the fact that the recycling rate went from 30 to 60 to 92% **my hypothesis was supported.**

During this experiment, several possible sources of experimental error occurred:

1. **Inaccurate counting.** This could be due to time of data collection (they may have put bin away before the count), unknown vacations or foreclosures, people waiting to put the recycle bin out until it is full and thereby skipping a week. I found out late in the experiment that I had been under-reporting the foreclosures.
2. **Inaccuracy of survey reporting.** People may have been embarrassed about not recycling and perhaps did not tell the truth. People reported on the survey that they recycled despite not having their bins out on any of the count days. We only received one survey from people that reported no recycling at all. Also, the box went missing the last day of survey return and I am not sure if the box had any surveys in it.
3. **People may not have seen the education stand** as it was only up for a limited time due to Home Owners Association rules.

By avoiding or fixing the experimental errors, the results would be more reliable.