

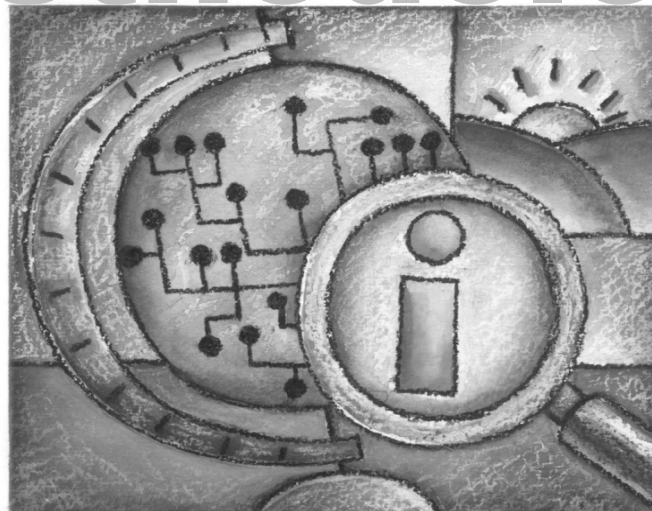
# **Mecklenburg County Residential Recycling Behavior 2009 Observation Study Summary Report**



# Background

- **Clark & Chase Research, Inc.** was contracted by the **Mecklenburg County Solid Waste Department** to measure recycling participation by County residents.
- **Two measures of recycling behavior were conducted:**
  - The first was a **telephone survey** of 2,000+ interviews conducted with randomly selected households in February-March 2009. This survey included a self-reported measure of participation in recycling.
  - The second measure was a **direct observation of curbside recycling behavior**, conducted in late 2009.

# Methodology



# Methodology

- **Observation Measure**

- Interviewers followed recycling trucks as they collected on selected routes, observing whether or not a recycling bin was left at the curb.
- As it was not feasible to randomly select households for observation, a random sample of routes, stratified by geography, was selected for measurement.
- Each route was observed twice in consecutive weeks to obtain both a participation rate and a set-out rate.

- **Observation Dates**

- For the City of Charlotte, observations began on Thursday, October 15, and concluded on Wednesday, October 28.
- For the six townships in Mecklenburg County (Cornelius, Davidson, Huntersville, Matthews, Mint Hill, and Pineville), observations began on Monday, November 2, and concluded on Friday, November 13.

# Methodology

## City of Charlotte Routes

- **Route Selection**

- 20 routes were randomly selected from among the 220 recycling routes that serve the City of Charlotte.
- Geographically, there are 4 recycling service zones (North, South, East, and West).
- For sampling purposes one route was selected to be observed on each collection day (Monday – Friday) for each of the four zones (totaling 20 routes observed).
- The following slide shows the total number of routes for each zone, and the number of routes selected for observation.

- **Service Providers**

- Recycling collection for the North, South, and East zones is provided by the City of Charlotte.
- Inland Service, a private contractor, provides recycling collection for the West zone.

# Methodology

## City of Charlotte Routes

### Charlotte Routes By Day Of Week

	<u>M</u>	<u>T</u>	<u>W</u>	<u>R</u>	<u>F</u>	<u>Total</u>
<b>North</b>						
<b>Total Routes:</b>	<b>15</b>	<b>13</b>	<b>13</b>	<b>14</b>	<b>13</b>	<b>68</b>
<b>Observed:</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>5</b>
<b>South</b>						
<b>Total Routes:</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>65</b>
<b>Observed:</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>5</b>
<b>East</b>						
<b>Total Routes:</b>	<b>11</b>	<b>11</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>52</b>
<b>Observed:</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>5</b>
<b>West</b>						
<b>Total Routes:</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>35</b>
<b>Observed:</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>5</b>

# Methodology

## City of Charlotte Routes

- **Household Selection**

- In the City of Charlotte, single and multi-family addresses are aligned by recycling route.
- The City provided maps of each of the selected routes and the residential addresses associated with each route.
- These addresses were downloaded to worksheets that were used by the interviewers during the observation process.

- **Observations of Recycling Behavior**

- The recycling behavior for a total of 17,876 addresses was observed twice over a two-week period.
- The distribution of observations by zone was:
  - North – 27%
  - South – 20%
  - East – 24%
  - West – 29%

# Methodology

## Township Routes

- **Route Selection**

- Based on the sampling methodology and town collection schedules, 19 routes were randomly selected from the 50 routes that service the six towns: Cornelius (3), Davidson (2), Huntersville (5), Matthews (4), Mint Hill (4), and Pineville (1).
- The following slide shows the total number of routes for each town, and the number of routes selected for observation.

- **Service Providers**

- Recycling collection for each of the townships is provided by private contractor:
  - **Waste Management:** Cornelius and Huntersville
  - **Republic:** Davidson, Matthews and Pineville
  - **RCS:** Mint Hill



# Methodology

## Township Routes

### Township Routes By Day Of Week

	<u>M</u>	<u>T</u>	<u>W</u>	<u>R</u>	<u>F</u>	<u>Total</u>
<b>Cornelius</b>						
<b>Total Routes:</b>	<b>1.5</b>	<b>1.5</b>	<b>1.5</b>	<b>1.5</b>	<b>1.5</b>	<b>7.5</b>
<b>Observed:</b>	<b>1</b>		<b>1</b>		<b>1</b>	<b>3</b>
<b>Davidson</b>						
<b>Total Routes:</b>			<b>4</b>			<b>4</b>
<b>Observed:</b>			<b>2</b>			<b>2</b>
<b>Huntersville</b>						
<b>Total Routes:</b>	<b>3.5</b>	<b>3.5</b>	<b>3.5</b>	<b>3.5</b>	<b>3.5</b>	<b>17.5</b>
<b>Observed:</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>5</b>
<b>Matthews</b>						
<b>Total Routes:</b>	<b>4</b>	<b>3</b>		<b>3</b>	<b>2</b>	<b>12</b>
<b>Observed:</b>	<b>1</b>	<b>1</b>		<b>1</b>	<b>1</b>	<b>4</b>
<b>Mint Hill</b>						
<b>Total Routes:</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>		<b>8</b>
<b>Observed:</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>		<b>4</b>
<b>Pineville</b>						
<b>Total Routes:</b>	<b>1</b>					<b>1</b>
<b>Observed:</b>	<b>1</b>					<b>1</b>

## Methodology

## Township Routes

- **Household Selection**

- In the six towns, single and multi-family addresses were not aligned by recycling route.
- Each of the three service contractors provided Clark & Chase Research, Inc. with a series of maps that corresponded at a street level with the recycling routes they serve.
- These maps were studied and an effort was made to identify specific addresses that comprised each of the routes based on the streets listed.
- These addresses were downloaded from the Mecklenburg County Master Address Table (provided October 27, 2009) to worksheets that were used during the observation process.

## Methodology

## Township Routes

- **Observations of Recycling Behavior**

- The recycling behavior for a total of 18,269 addresses was observed twice over a two-week period.
- The distribution of observations by town was:
  - Cornelius – 20%
  - Davidson – 7%
  - Huntersville – 27%
  - Matthews – 17%
  - Mint Hill – 21%
  - Pineville – 7%

## Methodology

## Observation Process

- **Logistics**

- **During each observation day, the interviewers met at a designated location (Ott Street for three of the City zones or at locations specified by the private contractors for the other routes) to begin their assignment.**
- **For each route, the interviewer was provided driver contact information, maps, and a worksheet with pre-listed addresses.**
- **Interviewer breaks coincided with driver break periods or when the driver needed to empty a full truck.**

# Methodology

## Observation Process

- **Procedures**

- Each interviewer was assigned one truck to follow per day, and stayed with the truck throughout the entire collection day.
- Interviewers followed the truck instead of going out ahead of it on the route in order to:
  - **Capture addresses where recycling was put out “just in time” as the recycling truck approached,**
  - **And maintain route integrity as trucks did not always follow routes in a consistent fashion.**
- The interviewer followed behind the truck, recording information regarding each house on the route.
- Any unusual circumstances or weather conditions were listed in the comments section on the worksheet.
- Completed observation forms were edited each day.
- All data entry was 100% verified.

# Methodology

## Data Processing

- **Data Cleaning**

- **The pre-listed addresses did not always align with the observed routes.**
  - **Some addresses on the route maps (including businesses and vacant lots) were not serviced by the recycling trucks. Interviewers identified these addresses for elimination where possible.**
    - **The final database of observations was also cross-checked against the Mecklenburg County Tax Parcel database and the updated Master Address Table (both provided January 8, 2010). Addresses without a serviceable residence were removed.**
  - **Other addresses not pre-listed on the worksheets were serviced by the recycling trucks. Interviewers added these addresses to the worksheets.**
  - **Routes did not always cover the same streets on both observations. Households must have been observed twice to be included in the final data.**

## Methodology

## Data Weighting/Projection

- The data is **weighted** to ensure no **geographic area** is over-or-under-represented in the results. Households were grouped by route into ten geographies:
  - Each of the six towns (**Cornelius, Davidson, Huntersville, Matthews, Mint Hill, and Pineville**),
  - And each of the four Charlotte zones (**North, South, East, and West**).
- The data is then **projected** to the number of Mecklenburg County households participating in curbside recycling, as estimated by the Mecklenburg County Master Address Table (provided January 8, 2010).
  - According to the City of Charlotte routes (which provided the best available data), **10.6%** of Charlotte addresses that receive recycling service are categorized as **“multi-family” or “unknown type.”**
  - Therefore, for projection purposes, it is assumed that **10.6%** of each town route would consist of addresses that are multi-family/unknown.
  - The following slide shows the number of observed addresses by jurisdiction, and the households they are estimated to represent.

## Methodology

## Data Weighting/Projection

	<b>Observed</b>	<b>Projected</b>
<b><u>Total HHs</u></b>	<b><u>36,145</u></b>	<b><u>267,200</u></b>
<b>Charlotte</b>	<b>17,876</b>	<b>214,400</b>
<b>North</b>	<b>4,899</b>	<b>73,800</b>
<b>South</b>	<b>3,490</b>	<b>48,500</b>
<b>East</b>	<b>4,245</b>	<b>46,100</b>
<b>West</b>	<b>5,242</b>	<b>46,000</b>
<b>Cornelius</b>	<b>3,714</b>	<b>9,200</b>
<b>Davidson</b>	<b>1,306</b>	<b>3,500</b>
<b>Huntersville</b>	<b>5,009</b>	<b>18,000</b>
<b>Matthews</b>	<b>3,180</b>	<b>9,500</b>
<b>Mint Hill</b>	<b>3,868</b>	<b>10,700</b>
<b>Pineville</b>	<b>1,192</b>	<b>1,800</b>





# **Summary**

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# **Conclusions**

## Summary & Conclusions

- **The purpose of this study is to measure participation in recycling among households with curbside service, through direct observation. Specifically, there is interest in two measures:**
  - **Participation Rate:** The percent of households that participate one or more times in a two-week period.
  - **Set-out Rate:** The percent of households that set out recyclables on an average collection day.
- **Furthermore, there is an interest in seeing how well this observed data coincides with self-reported measures of the same behavior.**
- **Results are based on observing the recycling participation of 36,000+ households from 39 randomly selected routes in Mecklenburg County.**

## Summary & Conclusions

**Based on this observation research, we draw the following conclusions . . . .**

- **The participation rate of Mecklenburg households in curbside recycling is 56%.**
  - Among townships, those in Davidson participate the most (84%) and those in Mint Hill and Pineville participate the least (57%).
  - In Charlotte, South Charlotte participates the most (64%) and North Charlotte participates the least (48%).
- **The average set-out rate of Mecklenburg households in curbside recycling is 43%.**
  - Among townships, those in Davidson participate the most (69%) and those in Pineville participate the least (42%).
  - In Charlotte, South Charlotte participates the most (51%) and North Charlotte participates the least (37%).

## Summary & Conclusions

- **Three in ten Mecklenburg households (31%) recycle every collection day. One in four (24%) recycle less often.**
  - Among townships, over half of those in Davidson (55%) participate every collection day while only one in four Pineville households (27%) participate that often.
  - In Charlotte, nearly four of ten South Charlotte households (38%) participate every collection day while only one in four households in North and West Charlotte (26%) participate that often.
- **Self-reported recycling behavior is clearly overstated when compared to the actual behavior. The data suggests . . .**
  - For every ten households that say they participate in recycling, about seven actually do.
  - For every ten households that say they set-out recyclables on a given collection day, only six of ten actually do.
  - Recycling is a socially desirable behavior, and self-reported measures of participation are less reliable than direct observation as an estimate of actual behavior.

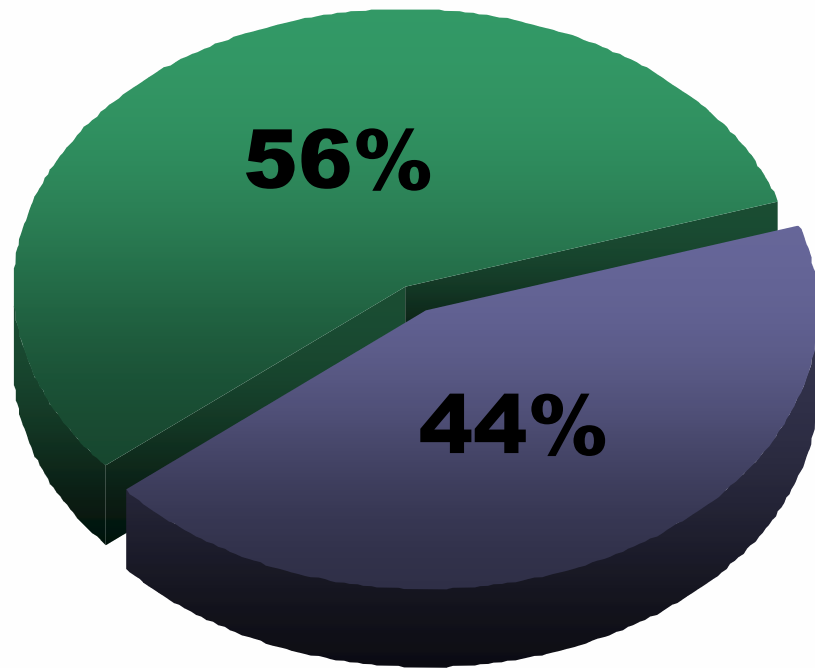
# Detailed Findings



## Mecklenburg County

## Participation Rate

**How Many Recycle at Least Once Over Two Recycling Days**



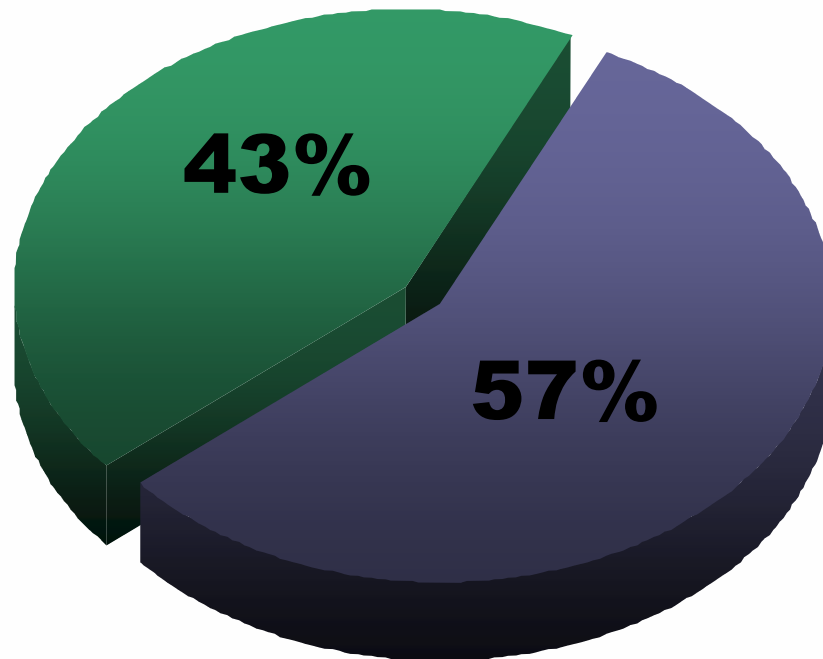
■ Recycled 1+ Days ■ Did Not

**In Mecklenburg County (the City of Charlotte and the six townships), five of nine households (56%) recycled at least once during the two observations conducted over consecutive weeks.**

## Mecklenburg County

## Set-out Rate

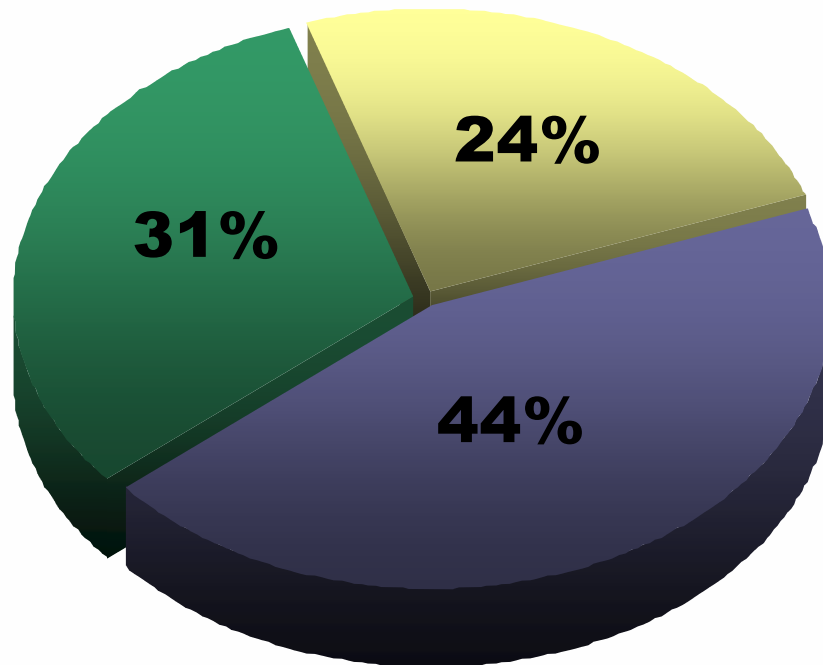
**How Many Recycle on an Average Recycling Day**



■ **Recycled**    ■ **Did Not**

**In Mecklenburg County, over four of ten households (43%) will set-out recyclables on an average recycling day.**

**Recycling Frequency**



**In Mecklenburg County, three of ten (31%) households participate frequently. One in four (24%) participate occasionally.**

**Note:**

Due to rounding, percentages may not total 100%

■ **Recycled Twice (Frequent)** ■ **Recycled Once (Occasional)** ■ **Not Recycled**



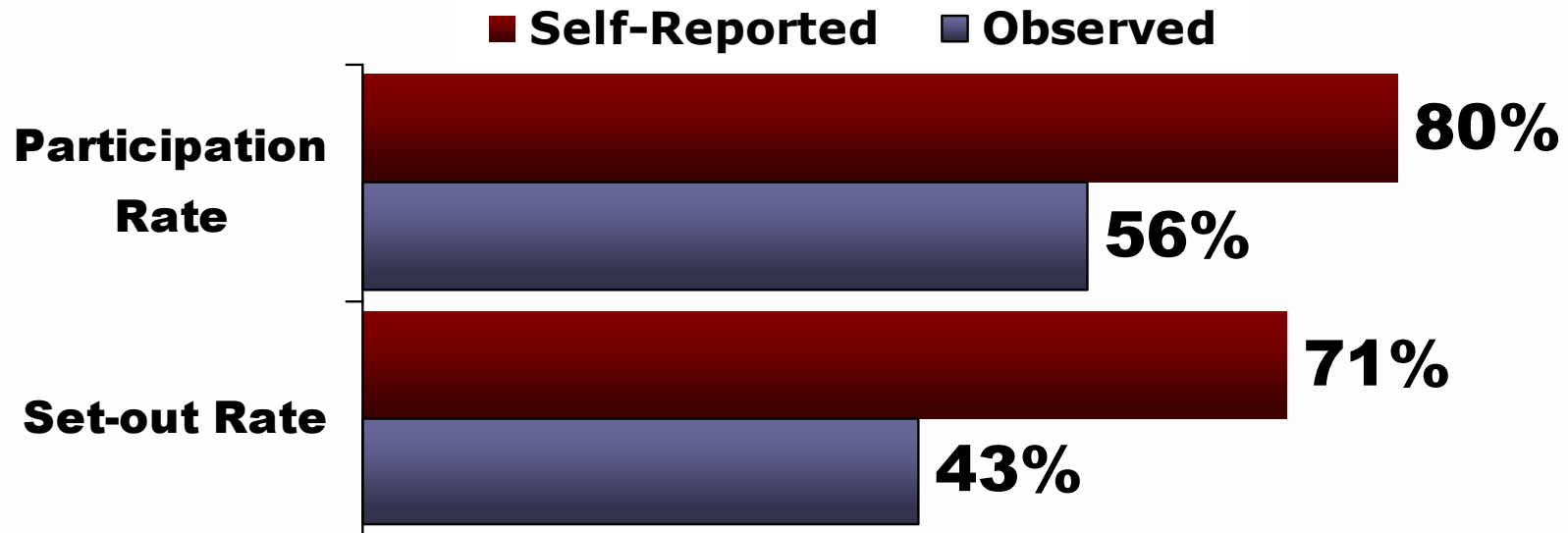
## Mecklenburg County

## Self-Reported vs. Observed

**Self-reported: Mecklenburg Recycling Survey** (February 19 – March 18, 2009)

**Participation** - “Over the two most recent collection days, did your household set out recyclables at the curbside at least one of those days?”

**Set-out** - “On the most recent collection day, did your household set any recyclables at the curbside?”



Recycling is such a socially desirable behavior that self-reports on recycling are overstated by a substantial margin. Overall, of households in Mecklenburg County that say they recycle, seven of ten actually do. Of those that say they set out recycling on a given collection day, about six of ten actually do.

## By Jurisdiction

## Participation & Set-out Rates

	<u>Participation</u>	<u>Set-out</u>	<u>Not Recycle</u>
<b>Total</b>	<b>56%</b>	<b>43%</b>	<b>44%</b>
<b>Davidson</b>	<b>84%</b>	<b>69%</b>	<b>16%</b>
<b>Matthews</b>	<b>68%</b>	<b>54%</b>	<b>32%</b>
<b>Huntersville</b>	<b>64%</b>	<b>50%</b>	<b>36%</b>
<b>Cornelius</b>	<b>63%</b>	<b>49%</b>	<b>37%</b>
<b>Mint Hill</b>	<b>57%</b>	<b>46%</b>	<b>43%</b>
<b>Pineville</b>	<b>57%</b>	<b>42%</b>	<b>43%</b>
<b>Charlotte</b>	<b>53%</b>	<b>42%</b>	<b>47%</b>
<b>South</b>	<b>64%</b>	<b>51%</b>	<b>36%</b>
<b>West</b>	<b>53%</b>	<b>39%</b>	<b>47%</b>
<b>East</b>	<b>51%</b>	<b>41%</b>	<b>49%</b>
<b>North</b>	<b>48%</b>	<b>37%</b>	<b>52%</b>

## By Jurisdiction

## Recycling Frequency

Days Recycled:	<u>Frequent: Both Days</u>	<u>Occasional: One Day</u>	<u>Not Recycle</u>
<b>Total</b>	<b>31%</b>	<b>24%</b>	<b>44%</b>
<b>Davidson</b>	<b>55%</b>	<b>29%</b>	<b>16%</b>
<b>Matthews</b>	<b>40%</b>	<b>27%</b>	<b>32%</b>
<b>Huntersville</b>	<b>35%</b>	<b>29%</b>	<b>36%</b>
<b>Cornelius</b>	<b>35%</b>	<b>28%</b>	<b>37%</b>
<b>Mint Hill</b>	<b>35%</b>	<b>22%</b>	<b>43%</b>
<b>Pineville</b>	<b>27%</b>	<b>30%</b>	<b>43%</b>
<b>Charlotte</b>	<b>30%</b>	<b>24%</b>	<b>47%</b>
<b>South</b>	<b>38%</b>	<b>26%</b>	<b>36%</b>
<b>West</b>	<b>26%</b>	<b>26%</b>	<b>47%</b>
<b>East</b>	<b>30%</b>	<b>21%</b>	<b>49%</b>
<b>North</b>	<b>26%</b>	<b>22%</b>	<b>52%</b>

Note: Due to rounding, percentages may not add to 100%

## By Jurisdiction

## Self-Reported vs. Observed

	<u>Participation</u>		<u>Set-out</u>	
	<u>Self-report</u>	<u>Observed</u>	<u>Self-report</u>	<u>Observed</u>
<b>Total</b>	<b>80%</b>	<b>56%</b>	<b>71%</b>	<b>43%</b>
<b>Davidson</b>	<b>89%</b>	<b>84%</b>	<b>84%</b>	<b>69%</b>
<b>Matthews</b>	<b>90%</b>	<b>68%</b>	<b>86%</b>	<b>54%</b>
<b>Huntersville</b>	<b>84%</b>	<b>64%</b>	<b>77%</b>	<b>50%</b>
<b>Cornelius</b>	<b>88%</b>	<b>63%</b>	<b>83%</b>	<b>49%</b>
<b>Mint Hill</b>	<b>92%</b>	<b>57%</b>	<b>85%</b>	<b>46%</b>
<b>Pineville</b>	<b>70%</b>	<b>57%</b>	<b>60%</b>	<b>42%</b>
<b>Charlotte</b>	<b>81%</b>	<b>53%</b>	<b>73%</b>	<b>42%</b>

Again, recycling is such a socially desirable behavior that self-reports on recycling are overstated by a substantial margin. The exception is Davidson – Of those who say they recycle, 94% actually have.

## By Home Value

## Participation & Set-out Rates

<b><u>Property Tax Value</u></b>	<b><u>Participation Rate</u></b>	<b><u>Set-out Rate</u></b>
<b>Less than \$110,000</b>	<b>40%</b>	<b>29%</b>
<b>\$110,000 to &lt;\$150,000</b>	<b>59%</b>	<b>45%</b>
<b>\$150,000 to &lt;\$200,000</b>	<b>69%</b>	<b>55%</b>
<b>\$200,000 or more</b>	<b>78%</b>	<b>66%</b>

Participation in curbside recycling tends to increase as the value of the home increases.

# Recommendations



## Recommendations

- The fact these studies show a large **social desirability bias** in self-reported recycling behavior does have some implications for how Mecklenburg County approaches their **advertising and promotional messaging** for recycling.
  - Householders' willingness to so overstate their actual behavior indicates they recognize recycling is the “right thing to do” and this rightness does not seem to be debatable. We'd suggest other reasons for not recycling - practical matters and what's required of the participants - are more likely to be barriers.
    - In the telephone survey, respondents primarily cited practical reasons for not recycling.
  - We'd suggest marketing messages will be better if they place less emphasis on the environmental aspects of recycling (the “**why**”) and more emphasis on the practical issues (the “**how**”) - that recycling is easier (e.g. single-stream, new rollout cans, etc.) and now requires little effort to participate.

## Recommendations

- The **relationship between home value and actual recycling activity** (e.g. the greater the tax value of the home, the greater the likelihood that household will recycle) is a socio-economic issue. Recycling also varies by town and regions of Charlotte.
  - This suggests that promotional and education messaging target lower-income neighborhoods and households first.
- The **social desirability** of recycling needs to be accounted for. While attitudes toward recycling and new ideas can be informative, it appears **observation** is a more dependable measure of **recycling participation**. It will help future measures if Mecklenburg County . . .
  - Has more precise route information by specific geographical areas,
  - The specific households served by specific routes, and
  - Routes that are consistently followed on each collection day.



# Thank You

**We appreciate working with you. For questions:**

**Jack E. Clark, PhD**

**704.998.9661**

**[jclark@clarkandchase.com](mailto:jclark@clarkandchase.com)**

**Greg W. Chase, MBA**

**704.998.9664**

**[gchase@clarkandchase.com](mailto:gchase@clarkandchase.com)**

**Clark & Chase Research, Inc.**

**4600 Lebanon Road – Suite A**

**Charlotte, NC 28227**