



# What Happens to a Light Bulb After Being Distributed Through a Food Bank?

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# Con Edison's Food Bank LED Program

- In 2019, Con Edison began planning the second year of their LED light bulb distribution program through food banks in New York City and Westchester County
  - Program had been very successful in 2018 with 200,000 LED bulbs distributed
- Guidehouse was tasked with evaluating the in-service rate of the planned 250,000 distributed LED bulbs to complete the impact evaluation
  - Con Edison was also interested in demographic information about the low- and moderate-income segment that could be captured in parallel to support their efforts with these communities



<https://www.coned.com/en/about-us/media-center/news/20180618/con-edison-and-food-banks-teaming-provide-energy-efficient-lighting>





# Four Primary Research Constraints Identified

1

Contact information is not collected at the time of LED bulb distribution at the food pantries or included in program tracking data due to logistical difficulties

- Ruled out selection of a sample of participants to reach out to directly for a survey or on-site field visits to directly measure in service rate

2

English may not be the primary language spoken of all participants

- Need to consider offering an option for ESL participants for an equitable evaluation

3

Access to a smartphone or computer may be limited

- Need to consider offering multiple avenues to complete the survey such as phone and online

4

Participants may have limited time or interest in filling out a survey

- Need to provide an incentive for completing the survey that can be leveraged without access to a smartphone or computer

# Final Method Selected: Opt-In Survey with Incentive

Team decided on an opt-in survey that would be available to all participants that received LEDs via the food bank distribution

- **Every single box** of the 4-pack of LEDs included a small tab in both English and Spanish that included:
  - Information on the survey and the \$10 Amazon E-gift-card available to first 300 participants
    - Physical gift card could also be provided for physical Amazon stores in NYC
  - A link to the online survey
  - The phone number to take the phone option of the survey
  - Contact information



Photo of 4-pack of LED bulbs distributed through the food banks. *Source:* Con Edison 2019.



Tab promoting survey in English (front) and Spanish (back). *Source:* Con Edison 2019.

# Fielding the Opt-In Online Survey

The team limited the number of survey respondents to 300 since Con Edison planned to distribute **62,500 4-packs of LED bulbs. This may actually have reduced responses.**

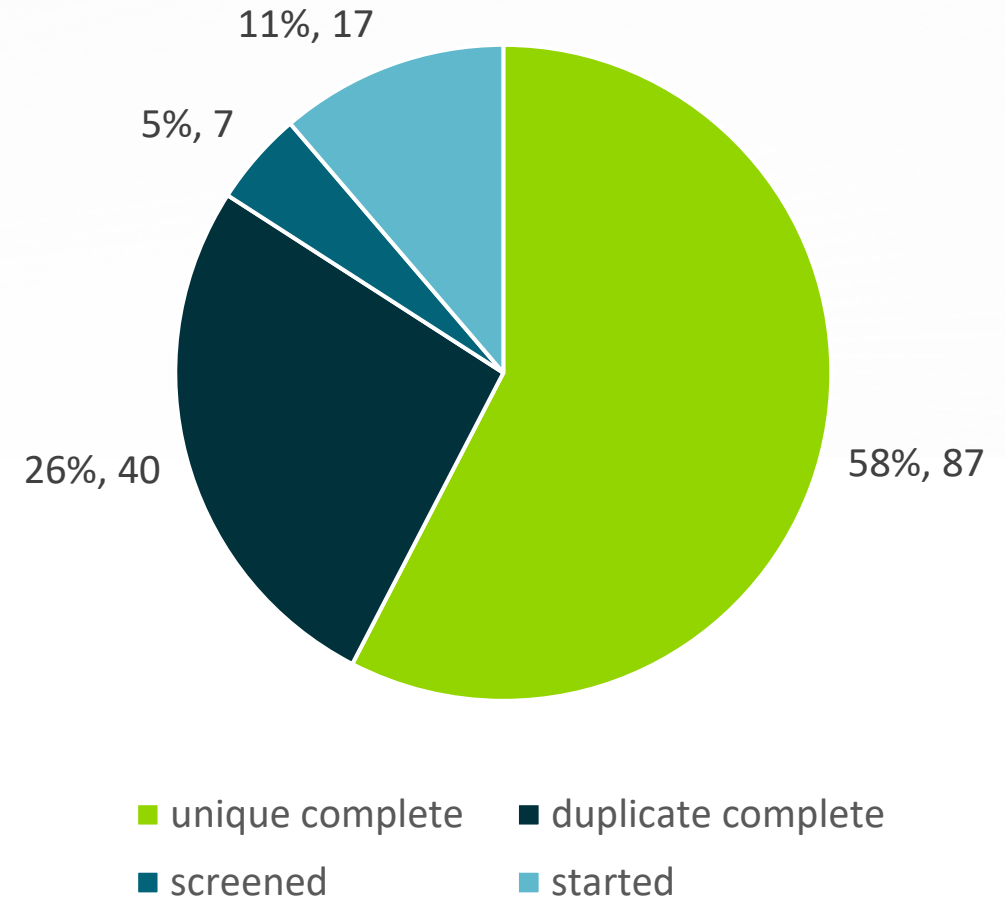
Survey was conducted from July through December 2019

- Con Edison had two rounds of distribution events: first began in late July and second began in September.

Over this period, the online and phone survey was accessed 151 times.

**More than a quarter of survey entries were considered duplicates, leaving 87 unique entries. This represents a 0.13% survey response rate.**

Distribution of survey respondent types



Source: Guidehouse Analysis

# Survey Data Analysis for Duplicate Responses

The team did not limit the survey to a single response by IP address, even though that is an option, to be most inclusive of all participants that might use a shared device within the home or at a public location

1. First, the team reviewed IP addresses for duplicates.
2. If an IP address showed up more than once, the team next looked at gift card contact information.
  - In some cases, the respondent used the same contact information. In other cases, the respondent created new email addresses and names that generally had similar characteristics.
3. Next, the team reviewed the responses to look for trends.
  - Some of the responses from the same IP address were unique, indicating shared device usage, but in most cases they were not.
4. Finally, the team also looked across all email addresses and contact information since some duplicate respondents would use different devices to fill out the survey multiple times.
  - Most often, they took the survey multiple times in a short period. Other times, they reentered the survey many weeks later after having received their initial gift card.

**Any identified duplicate respondents did not receive gift cards and only their initial response was included.**  
**Overall, 87 (58%) of all responses were considered unique and complete.**



# Estimating First-Year ISR to Calculate First-Year Savings

ISR represents the % of program bulbs that have been installed in a given period of time. The first-year ISR is a measure of how many program bulbs were installed within the first year.

- Of the 87 unique participants, eight participants didn't know how many bulbs had been installed, leaving 79 responses.

Guidehouse calculated four first-year ISR values from the 79 responses leveraging the following calculations:

- **Received quantity:** The self-reported total quantity of bulbs received
- **Installed quantity:** The self-reported installed quantity of bulbs
- **Uninstalled quantity:** The self-reported quantity of bulbs that were installed and then subsequently removed
  - Reasons for removal included: 1) that they did not like the light quality, 2) that the bulb broke or burnt out, 3) that they did not dim, or 4) that they were just testing the bulb.
- **Quantity installed later:** the self-reported quantity of bulbs that the respondent intends to install within 6 months of receiving the bulb

ISR	Definition	First-Year Value
Current ISR	installed quantity / received quantity	0.47
Current ISR (accounting for uninstalls)	(installed quantity - uninstalled quantity) / received quantity	0.42
Delayed ISR	(installed quantity + quantity installed later) / received quantity	0.62
Delayed ISR (accounting for uninstalls)	(installed quantity + quantity installed later - uninstalled quantity) / received quantity	0.58

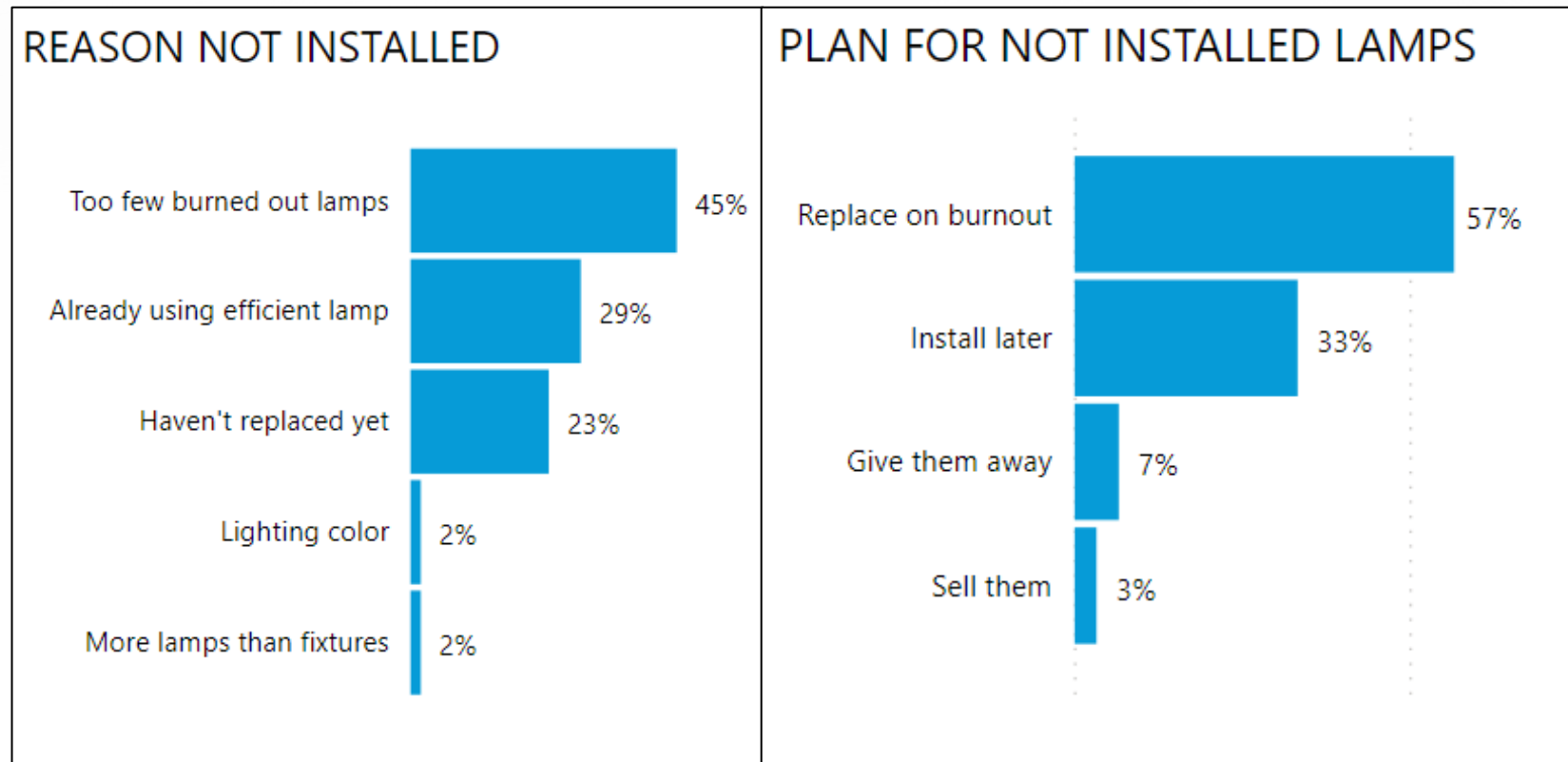
Source: Guidehouse Analysis

# Method for Treating Lamps in Not Installed

## Guidehouse reviewed the reasons for not installing lamps and the respondents plans for those lamps

Many of the respondents provided reasons for not installing lamps and plans related to these lamps that indicated **later installation** was highly likely.

Guidehouse recommended Con Edison calculate lifetime savings using a three-year ISR.



Source: Guidehouse Analysis



# Estimating Three-Year ISR to Calculate Lifetime Savings

Guidehouse used the Residential Lighting Evaluation Protocol of the Uniform Method Protocol to calculate a three-year ISR.

- Evaluators can assume that 24% of stored bulbs will be installed in the second year and an additional 24% in the third year.

Team made two key assumptions:

1. Assumed that bulbs that were uninstalled would not be re-installed later and were excluded from the assumed amount in storage.
2. The 10% of respondents that indicated planning to give away/sell the bulbs were not excluded because 1) finding was unverified and 2) bulbs that are given away/sold to Con Edison customers could still generate program savings.

**Guidehouse recommended accounting for uninstalls and applying a three-year ISR of 0.74.**

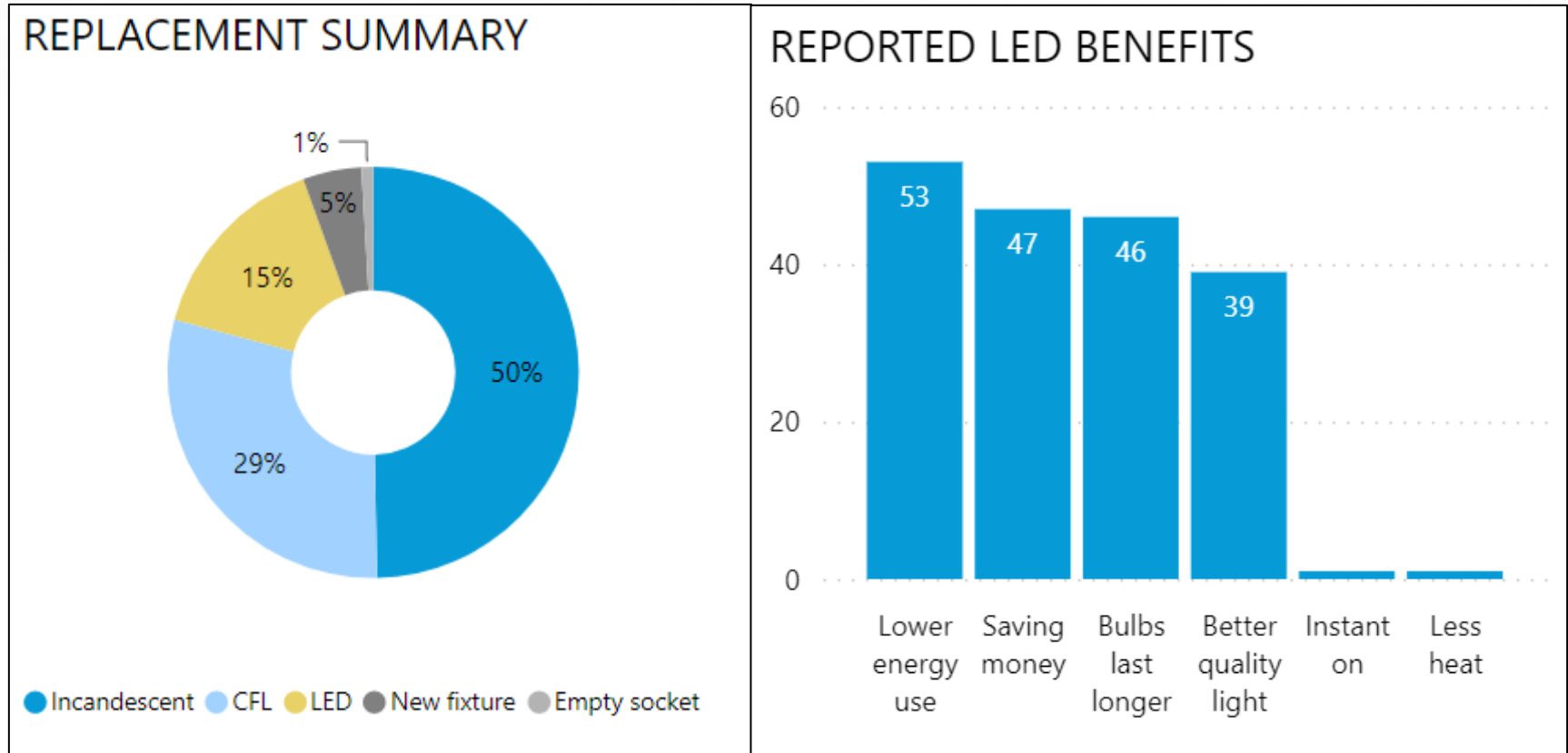
ISR	First-Year Value	Percentage Assumed in Storage	Three-Year Value
Current ISR	0.47	0.53	0.69
Current ISR (accounting for uninstalls)	0.42	0.53	0.64
Delayed ISR	0.62	0.38	0.78
Delayed ISR (accounting for uninstalls)	0.58	0.38	0.74

Source: Guidehouse Analysis

# Additional Survey Results

The survey included additional questions to gather information to inform future program efforts:

- Detailed questions on installation
- Satisfaction
- Purchasing habits
- Basic demographics

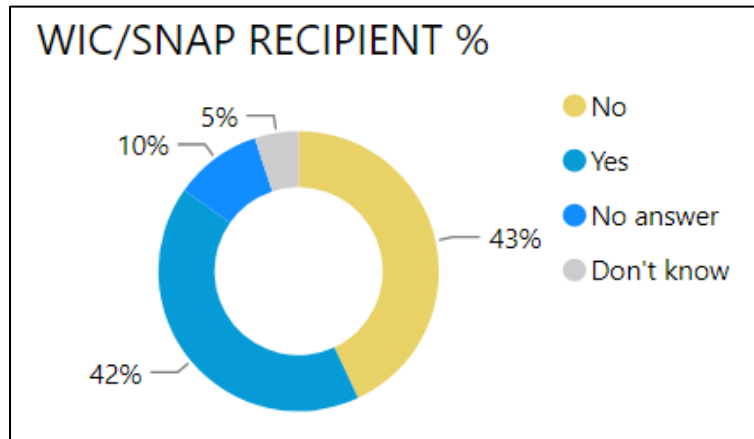


Source: Guidehouse Analysis

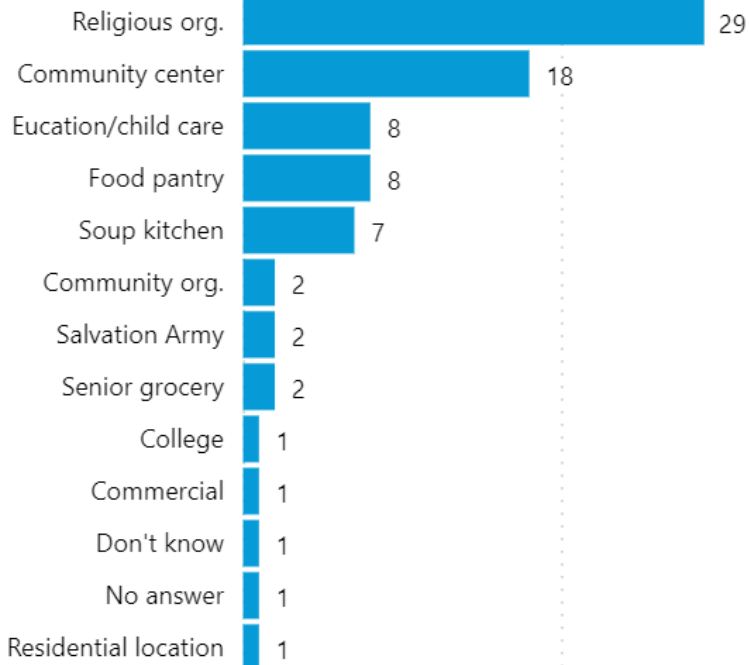
# Demographics of Food Pantry Patrons

In New York state, the 2019 Climate Leadership and Community Protection Act requires that 20% of funds spent on energy efficiency needs to be spent on disadvantaged communities. Con Edison was interested in gathering information on disadvantaged communities.

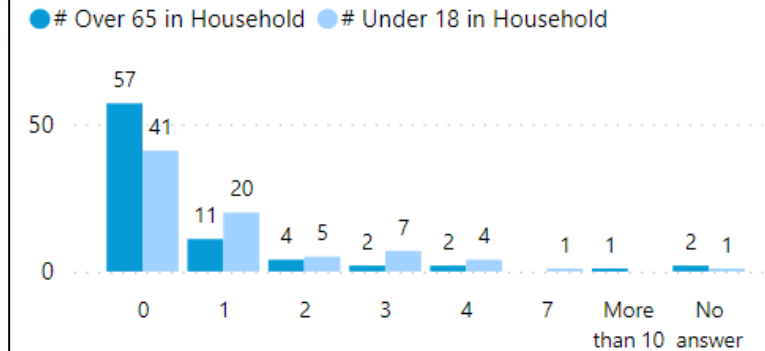
The survey asked about participation in the Supplemental Nutrition Assistance Program (SNAP) or the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) to identify “low-income” respondents.



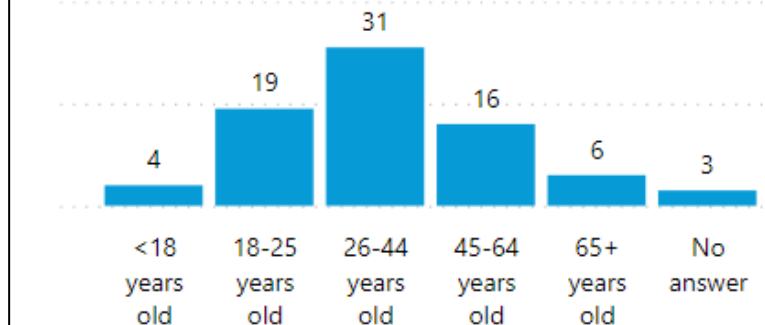
## DISTRIBUTING ORGANIZATION TYPE



## HOUSEHOLD DEMOGRAPHICS



## CUSTOMER AGE RANGE



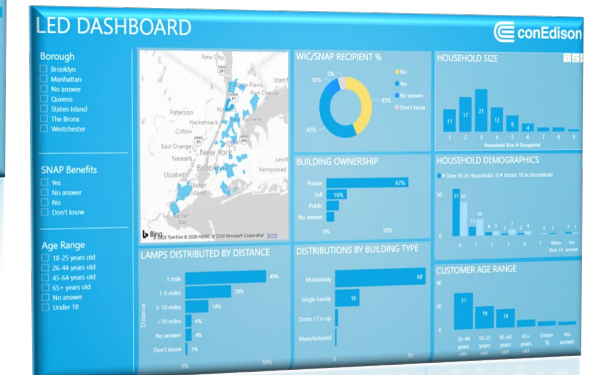
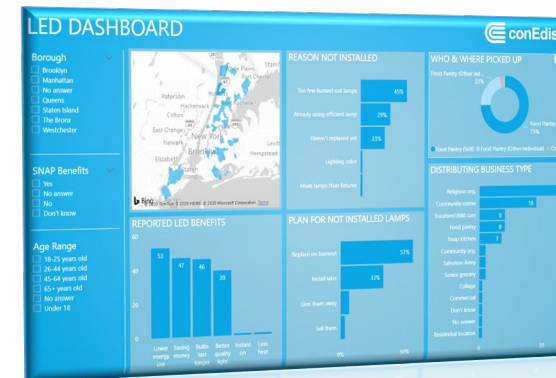
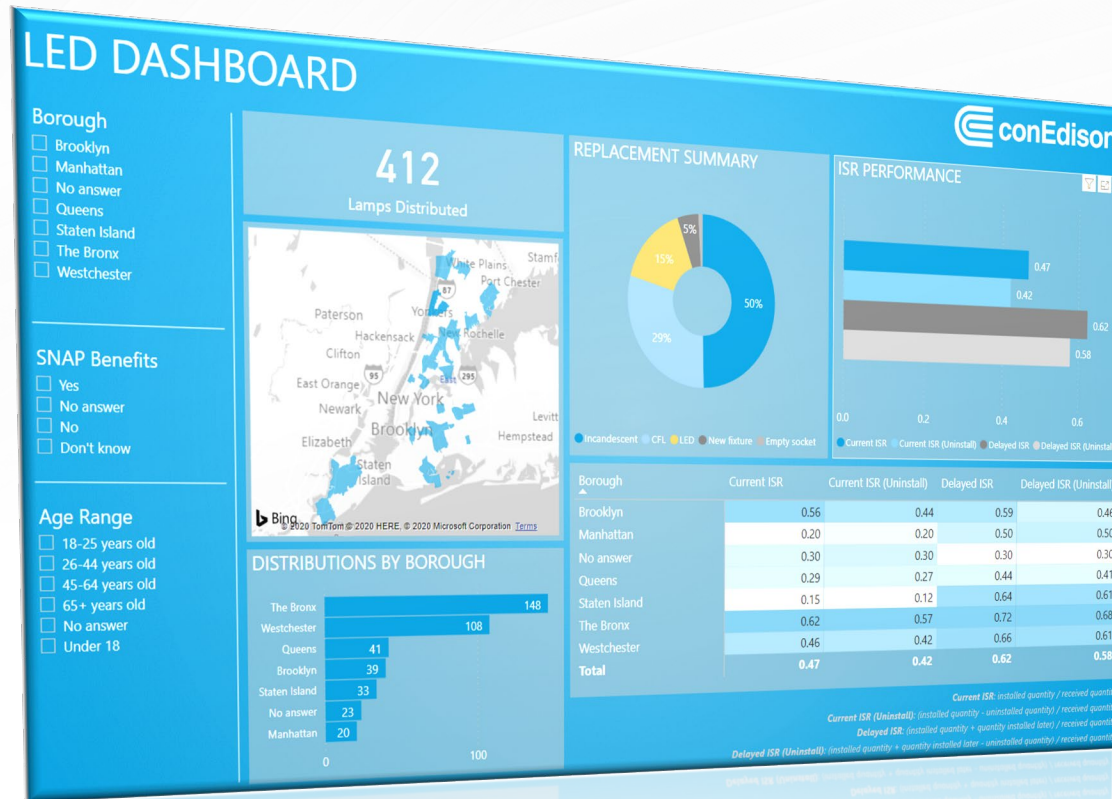
Source: Guidehouse Analysis



# Guidehouse Developed A PowerBI Dashboard to Facilitate Further Review of Survey Results

The dashboard included three tabs: 1) ISR Calculations, 2) ISR Drivers, and 3) Respondent Demographics

Each tab has three primary “slicers” on the left-hand side which can be used to modify the visualizations included on each tab: 1) Borough, 2) SNAP Benefits, and 3) Age Range.



# Lessons Learned from Conducting an Equitable Evaluation

## A \$10 Incentive is Sufficient for Generating Duplicate Responses

Allowing the same IP address to be used to respond to the survey multiple times led to a significant number of duplicate responses.

As general best practice to avoid duplicate responses, **Guidehouse recommends including a code with the material promoting the survey that is unique for each item distributed.** The survey tool would then only allow one response per unique code.

- Including a unique code may not always be an option for evaluation due to logistical challenges, as was the case at the time with the LED food bank evaluation effort.

## Including a Spanish Option Doubled Spanish-Speaking Respondents

Guidehouse concluded that having both an English and Spanish version likely doubled the number of Spanish-speaking respondents from seven to fourteen

Half of the survey participants that indicated that their primary language was Spanish responded to the English version

- This indicates that not all Spanish speakers are excluded when only one language option is available
- Since consultation with a native speaker was necessary for an appropriate translation, **the benefits of including multiple language versions need to be considered against the additional logistics**

# How to Use These Findings to Improve Programs Targeted at Low-Income Customers

## Not All “Low-Income” Receive SNAP/WIC

Only ~ 50% of the respondents indicated receiving or being eligible for SNAP or WIC benefits.

- Indicates either that not all patrons of food pantries are “low-income” or that other criteria need to be used to define a “low-income” customer.
- To identify how to better target programs to low-income customers, utilities need to determine criteria to define these customers that can be easily collected as part of evaluation efforts.

## Not All Free Bulbs Get Installed in Three Years

The first-year and three-year ISR were found to be much lower than previously assumed

- Respondents indicated a hesitancy of replacing inefficient working light bulbs with LED bulbs even if the information provided indicated it would immediately provide them with a cost savings.
- A free EE product distribution program could be implemented in parallel with a program to recycle and collect inefficient products.
- Program material could further encourage customers to replace inefficient products immediately to achieve the greatest savings.



# How These Findings Can Inform Future Evaluation Efforts

## Increase Survey Response Rate

- Of the 62,500 packages of LED bulbs distributed, only 87 unique respondents completed the survey over a 6-month period. This represents a 0.13% survey response rate. Additional actions could be taken:
  - Conducting in-person outreach at the food pantries to point out the survey and the incentive
  - Include reminders or flyers about the surveys even after the distribution event
  - Emphasize how the survey helps the utility provide better programs

## Develop State-Wide Results

- Findings could be leveraged along with research in other jurisdictions with different demographics to explicitly include an ISR in the deemed savings algorithm in state-wide TRMs
  - Updates to state-wide TRMs would need to consider that Con Edison's program is implemented primarily in a highly urban setting. However, the final ISR results did not vary significantly by county.

## Research Methods to Improve Communication of Benefits

- Future efforts could focus on the most effective methods to communicate that replacing inefficient light bulbs immediately with efficient LEDs will lead to immediate energy and cost savings.
  - While this information was included, it may not have been conveyed in the most effective method to lead to a high initial installation of the LED bulbs.

# Your Guides

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