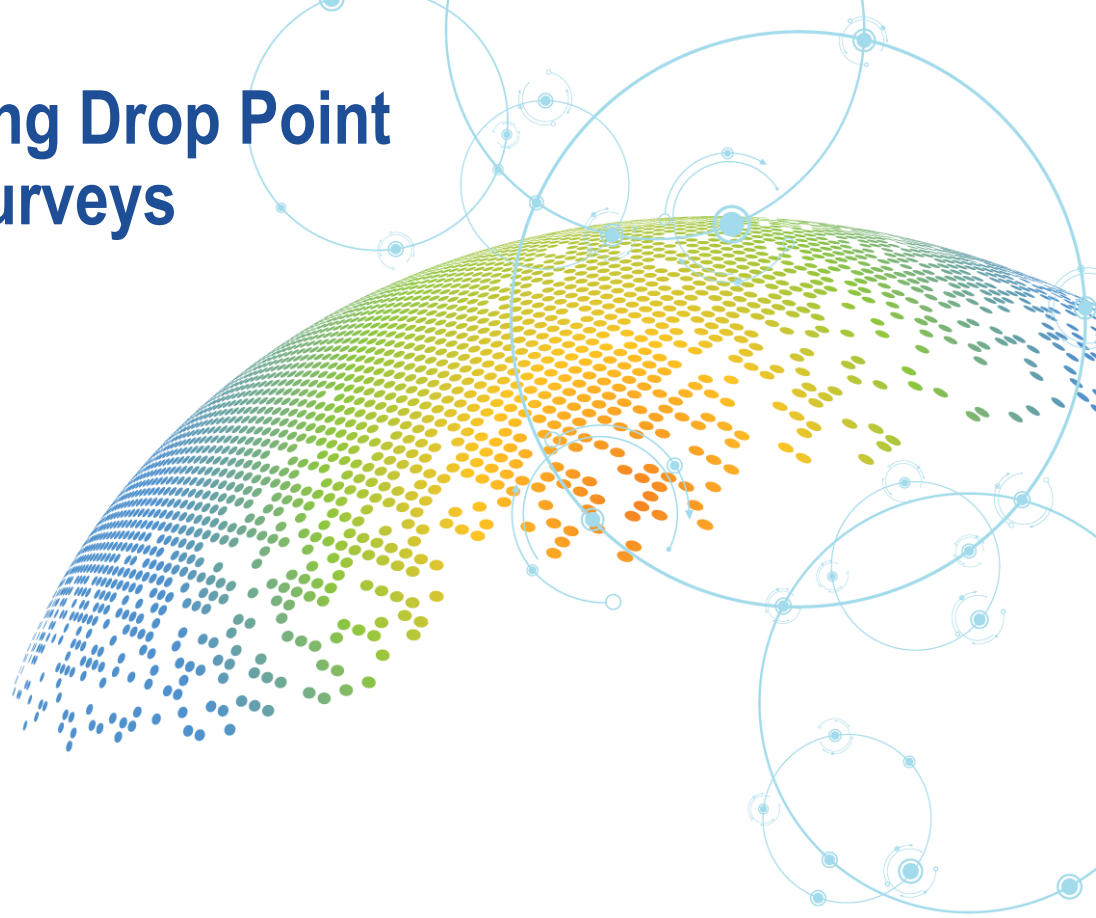


# New Approach for Handling Drop Point Addresses in Mail/Web Surveys

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# Address-Based Sampling (ABS)

- Residential Surveys with sampling frames of addresses derived from U.S. Postal Service Sources.
- USPS files were developed to aid in mail delivery.
- ABS frames have mail delivery features.
- Today's topic is **drop points**.



# Drop Points in ABS are *Not* These



Gum Drop



Eye Drop



Golf Ball Drop



Drop Point Knife

# Drop Points in ABS

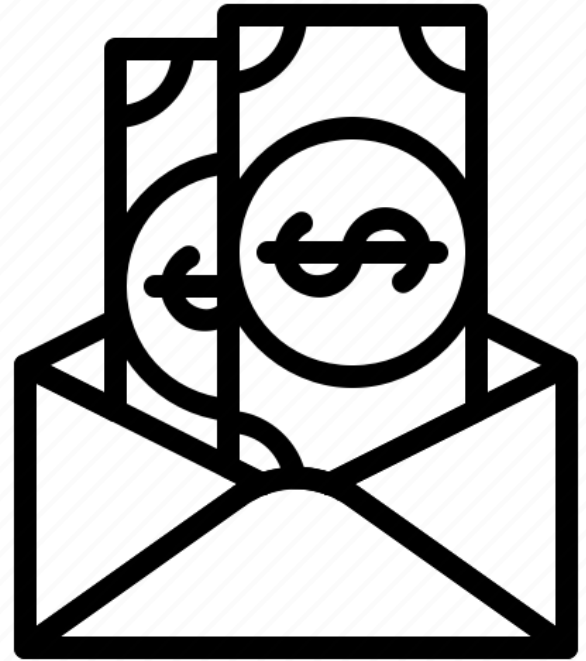
- A **drop point** is a mail receptacle that serves multiple housing units.
- The housing units served by the drop point are called **drop units**.



Drop units corresponding to a drop point have identical street addresses (e.g., 123 MAIN ST for all units).

# The Problem with Drop Points (for mail contact)

- Cannot control which unit(s) receive
  - The survey invitation
  - Reminder mailings
  - Promised incentives



# Prior Solutions

- Select all units at a drop point and take what you get
- Select one and take what you get
- Remove drop points from the frame or sample

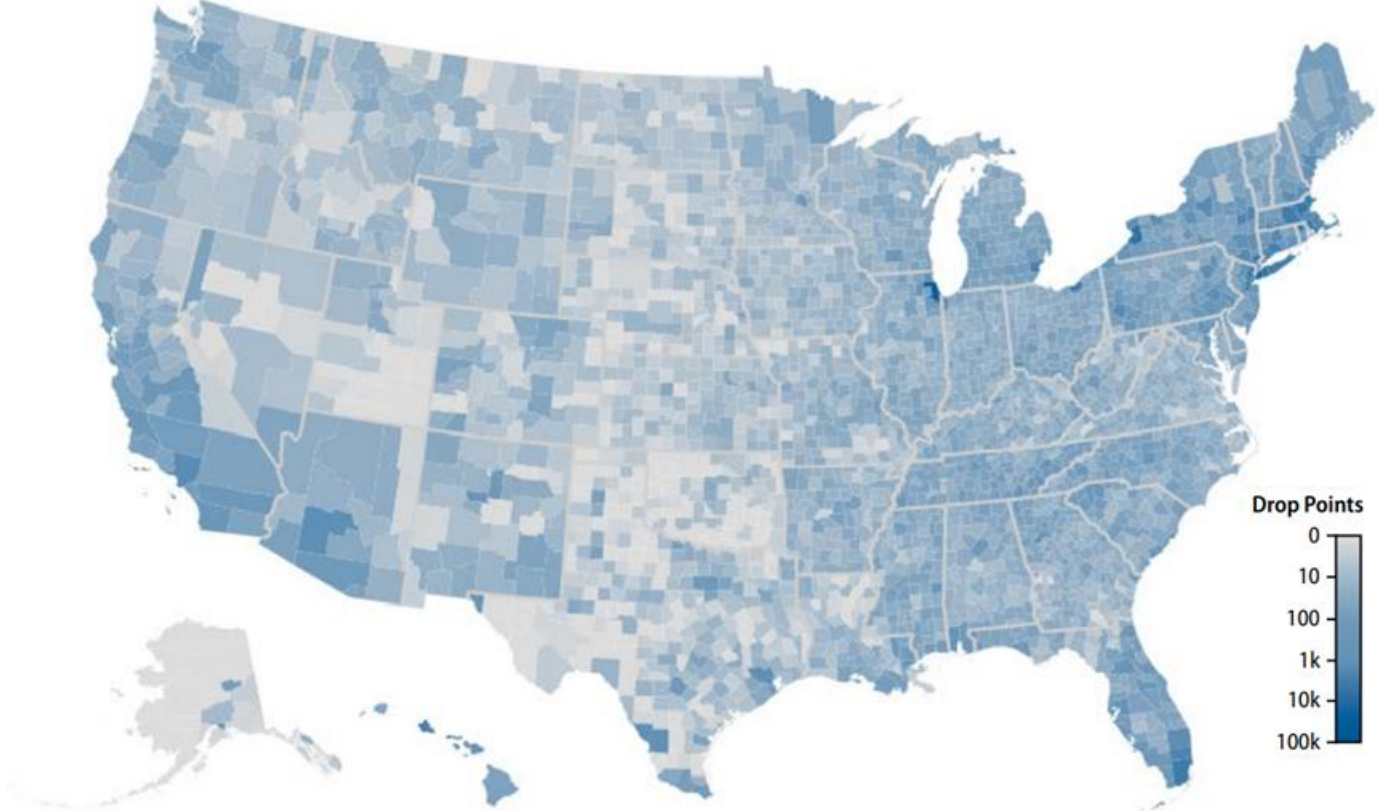
# Scope of the Issue

- Not a serious problem nationally.
  - 1.5% of U.S. housing units
  - 0.5% of unique residential mailing addresses
- However, drop points are concentrated in some local areas.
  - E.g., 27% of housing units in Queens, NY, are drop units
- Drop points and drop units can be a serious issue for subnational estimates.

(Amaya, 2017, and <http://abs.rti.org/>)



# Drop Points by County



Source: <http://abs.rti.org/atlas/drops/viz>



# 2020 Residential Energy Consumption Survey (RECS)

- National survey of primary **housing units** to collect information about their energy consumption
- Sponsored by the Energy Information Administration (eia.gov)
- [www.eia.gov/consumption/residential/](http://www.eia.gov/consumption/residential/)
- ABS survey with web and mail responses
- Largest in program history, with an expected total sample of about 18,000 completed interviews
- First time targeting consumption estimates at state level for all 50 states and DC

# Treatment of Drop Points in RECS

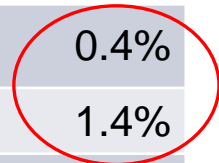
- 2015 RECS
  - Drop units were included in the sample for face-to-face interviews.
  - Drop units were not pursued (treated as nonrespondents) when RECS converted to web/mail.
- 2020 RECS
  - Entirely web/mail
  - 50-state design, plus DC
  - Drop points and drop units critical for some state estimates

# Decision 1: Exclude drop points with 5+ units

- 80% of drop points have 2 units. 97.7% have 2-4 units.
- Very little loss in coverage from excluding large drop points.

**Table 1. States with Highest Percentages of Drop Units in RECSs Frame**

	Residential Units on ABS Frame	# Units in Drop Points w/ 2-4 Units	Percentage of Total Units	# Units in Drop Points W/ 5+ units	Percentage of Total Units
<b>Total US</b>	133,279,048	1,527,150	1.1%	504,302	0.4%
<b>NY</b>	8,003,095	669,947	8.4%	113,392	1.4%
<b>NJ</b>	3,602,007	158,321	4.4%	5,837	0.2%
<b>IL</b>	5,271,264	180,539	3.4%	28,913	0.5%
<b>MA</b>	2,863,888	91,343	3.2%	8,099	0.3%



## Decision 2: Substitute for Selected Drop Units

For each selected drop unit:

1. Identify other non-drop point buildings with the same number of units.
2. Select the nearest candidate building.
3. Randomly select a unit within the selected substitute building.

(The trick is identifying the units that constitute a building.)

# Sample Substitution in the Literature

- Substitution is not uncommon for nonrespondents, especially for nonresponding PSUs (schools, agencies, etc.)
- Substitution is a form of imputation.
- Substitutes can be selected randomly, purposively, or with respect to an auxiliary variable.
- Concern whether substitutes adequately remove nonresponse bias.

(Nishimura 2015; Chapman 1982)

# Next Steps - Validation

**Table 2. Distribution of Substitution Distances (miles)  
by Building Size for Drop Units in Five Simulated RECS Samples**

Statistic	Overall	Building Size (# Units)		
		2	3	4
Avg n	631	460	132	39
%n	100.0%	72.9%	21.0%	6.1%
MEAN	0.400	0.415	0.337	0.437
MIN	0.000	0.000	0.001	0.002
P1	0.003	0.002	0.003	0.003
P5	0.005	0.005	0.005	0.004
P10	0.008	0.008	0.007	0.005
P25	0.017	0.017	0.018	0.016
P50	0.035	0.036	0.033	0.044
P75	0.091	0.098	0.066	0.145
P90	0.836	0.991	0.363	0.633
P95	2.300	2.493	1.174	2.549
P99	6.251	6.274	5.545	11.628
MAX	48.944	20.672	48.944	16.224

# Pairwise Validation

- How similar are the characteristics of the selected drop units and their substitute units?
- Using sources such as Zillow, Redfin, online images, we compared
  - Structure type
  - Structure features
  - Neighborhood characteristics
  - Heating fuel
  - A/C
- Labor Intensive!



# Example of Similar Drop Unit/Substitute Pair



# Example of Less Similar Drop Unit/Substitute Pair



# Validation in Aggregate

- RTI plans a survey of selected drop units as a companion to the substitute units in a community survey.
- How well do the response rates of drop units match the response rates of the substitute units?
- How well do the responses of the drop units as a group match the responses of the substitute units?

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# Thank you

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