

# The 2020 Census Address Canvassing: An Alternative Approach to a Full Address List Verification

Tim Trainor  
Geography Division  
US Census Bureau

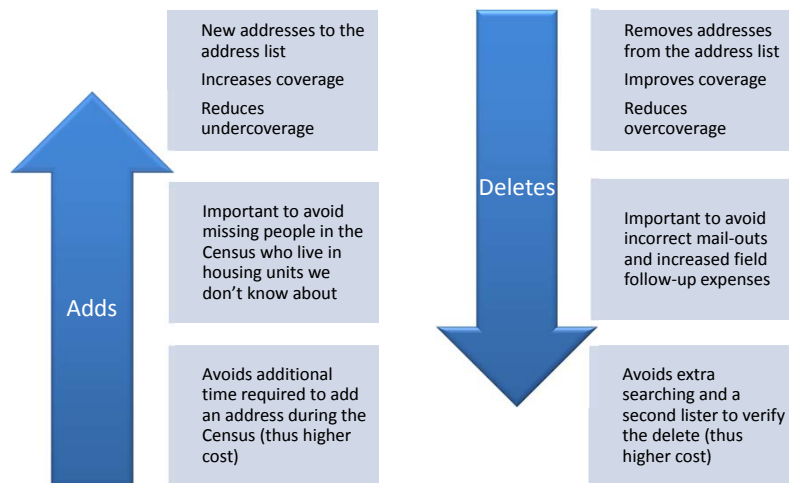
## What is Address Canvassing?

- Field operation whose primary purpose is to “update the address frame” prior to the Census
- Traditionally occurs one year prior to the decennial census
- Creates a critical baseline set of information
- Why? Because we have to count people once, only once, and in the right place

## 2010 Census Address Canvassing

- Covered the entire U.S. and Puerto Rico
  - except remote Alaska and northern Maine, where we had alternative operations
- In 2009, it involved 140,000 field staff who drove every road and verified or updated >155 million address records
  - verified and updated the address list (adds, deletes, moves, changes)
  - added new road features
  - collected GPS points for housing units
- One of the two most expensive decennial census field operations

## Impact of Address Canvassing

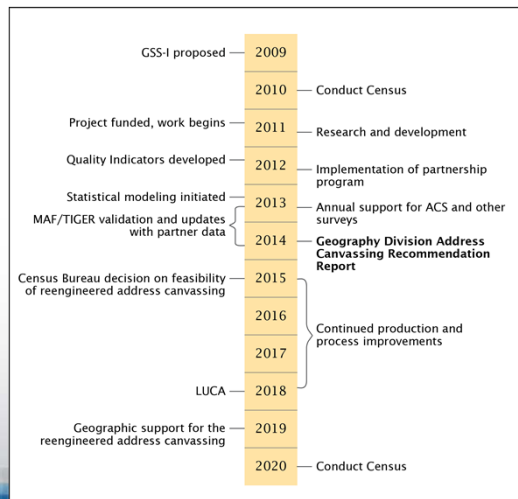


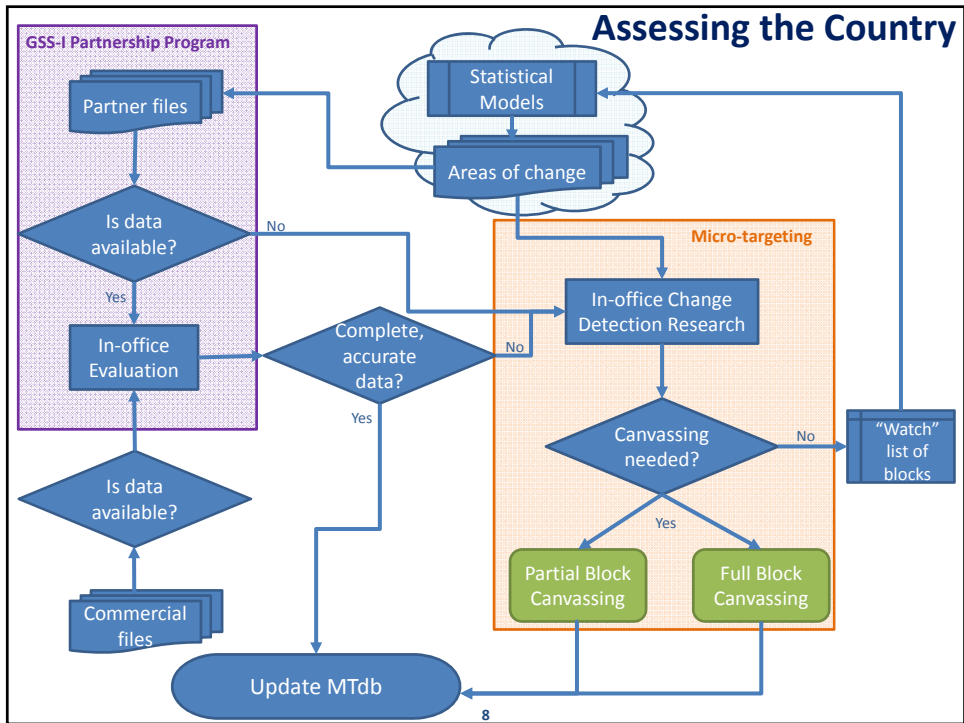
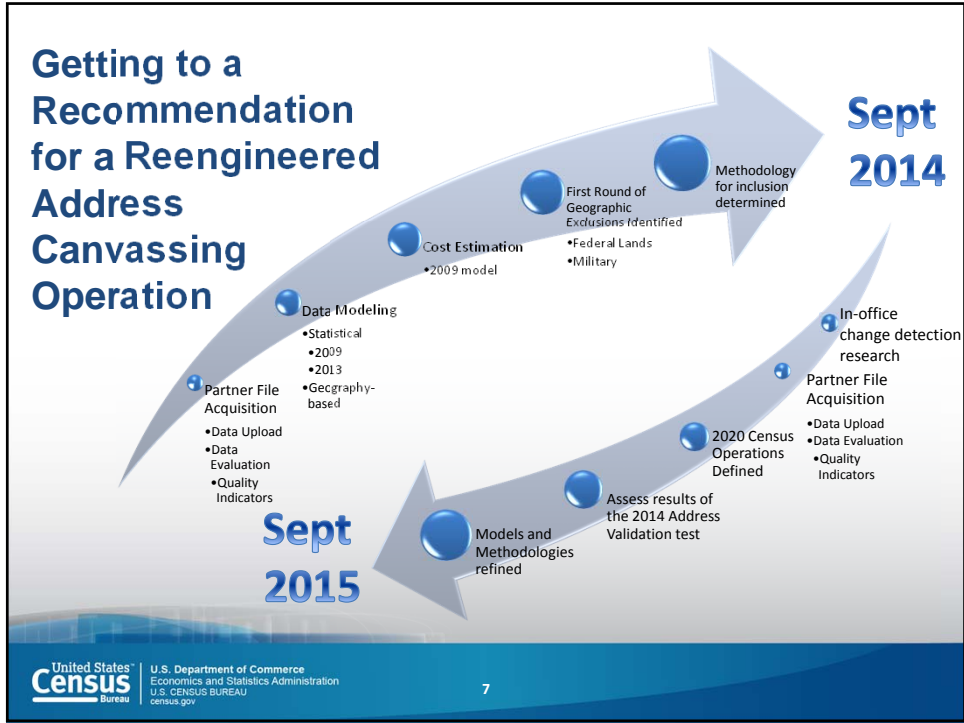
## 2020 Census: Address Canvassing Options

### General Questions:

- Is a traditional, on-the-ground canvassing operation necessary to ensure a complete and accurate address list for the decennial census?
- Are there areas of the country in which the address list and locational information can be kept current without canvassing?
- What characteristics identify an area that should be targeted for traditional canvassing?

## Geographic Support System Initiative Timeline

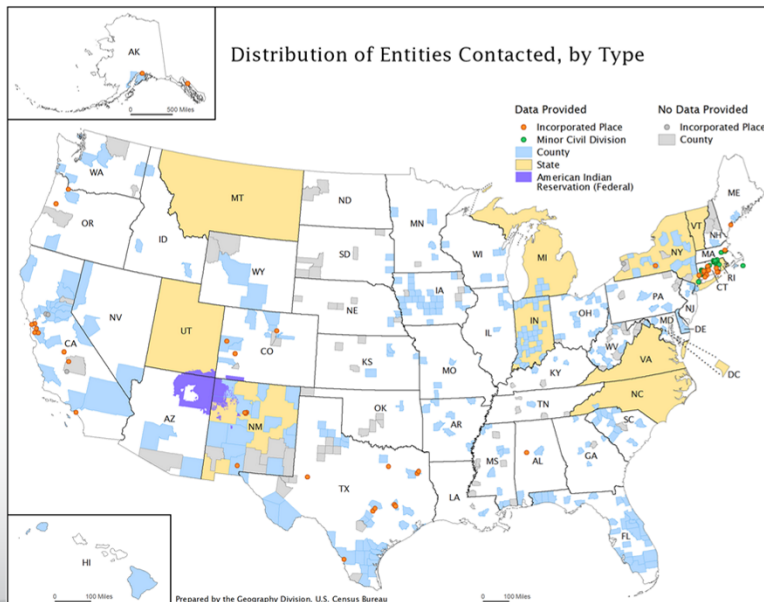




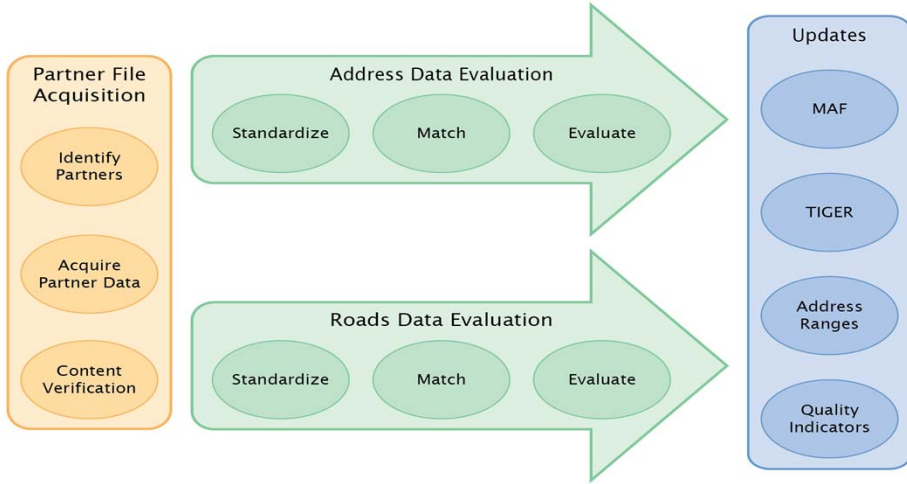
# GSS-I Partnership Coverage

Partnership Coverage (cumulative)	#
Number of partners contacted (so far...)	468
Number of partners that provided files	305
Number of partners that could not provide files because of use agreement or fee restriction	14
Governments represented	7,864
Census Tracts covered	28,500
Population covered*	117,228,778
Housing units covered*	49,028,579

\* Population and Housing calculated using 2010 Census Block Counts



# Partner File Processing Overview



# Address Updates Resulting from GSS-I Partner Files

National Total	Number of Addresses	%
Master Address File (MAF) addresses	195,546,962	
Un-geocoded addresses	5,195,353	2.7%
GSS-I Areas Evaluated to date	Number of Addresses	%
Partner addresses processed	30,547,359	
Partner addresses that matched to MAF addresses	23,410,653	76.6%
Geocode added to un-geocoded MAF addresses	306,835	1.3%
Addresses added to the MAF from partner files	64,183	0.2%

## Road Updates Resulting from GSS-I Partner Files

### GSS-I Updates from Partner Roads Data

National Total Miles of Roads	6,346,165	
<b>GSS-I Road Updates</b>		
Total Miles of Roads	2,592,571	
Total Miles of Roads Added	22,730	0.9%
Average Miles of Road Added	24.4	1.19%
Greatest Miles of Road Added	332.5	35.9%
Total Miles of Roads Modified	66,507	2.6%
Average Miles of Road Modified	73.5	3.36%
Greatest Miles of Road Modified	1,122.4	61.5%

## Micro-targeting Approach

- Use imagery to determine areas where change is occurring
- Identify blocks or parts of blocks where “boots on the ground” are necessary

## Change Detection

- Comparing multiple vintages of imagery with our address list, by census block
  - Housing change vs. no change visible in imagery
  - Housing change tracked in our address list?
  - Block built out, or otherwise unlikely to develop?
- As a proof of concept, we are doing this interactively
- Investigating incorporating automated change detection techniques

## MAF-to-Imagery Comparison

Three stages to the process:

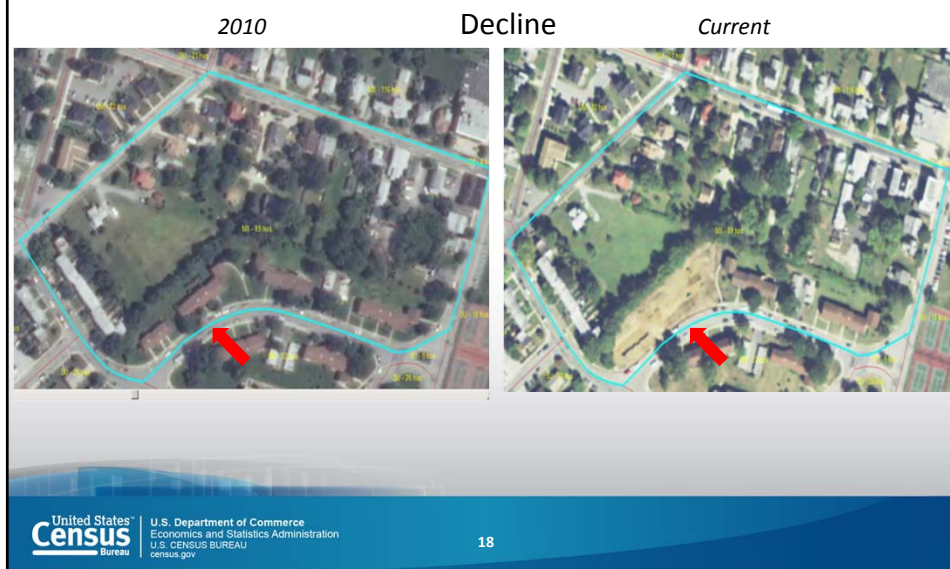
- Automated block classification based on housing unit type and whether the number of housing units remained stable on the address list, increased, or decreased between 2010 and 2013.
- Review of imagery to identify stability or change, as well as whether block appears to be built-out or evidence of future growth.
- Comparison of block classification and number of housing units with units visible in imagery to affirm consistency between the MAF and imagery or to identify discrepancies.



## Imagery Analysis: Identify Change



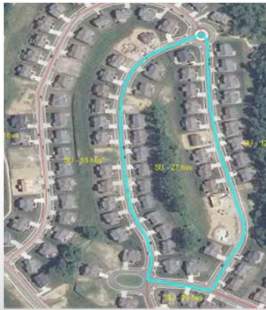
## Imagery Analysis: Identify Change



# Imagery Analysis: Compare to Address List

## Tracked growth

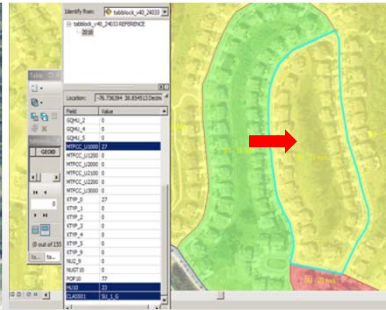
2010 vintage



Current vintage



Up to date address list



# Imagery Analysis: Compare to Address List

## Untracked growth

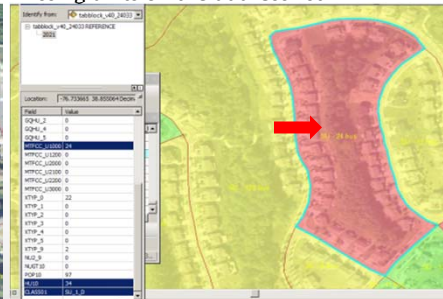
2010 vintage



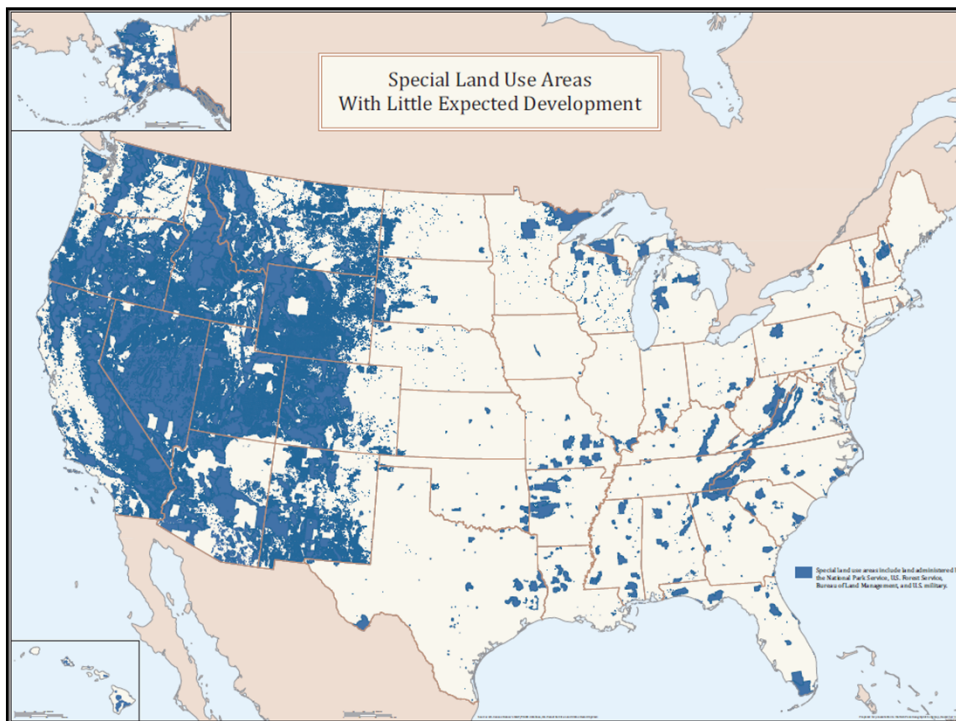
Current vintage



Missing units on the address list



## Imagery Analysis: Built out



## Test Activities

- Prove in the major design decisions for the 2020 Census
- Authenticate new methodologies, ensure that the quality of data is maintained, and to quantify cost savings
- Utilize the advantages of planned automation and available real-time data to transform the efficiency and effectiveness of data collection operations

## Address Validation Test Objectives

- Conduct a national-level model evaluation test
- Enable us to develop and test the use of statistical modeling to:
  - Measure error in the MAF during the decade
  - Identify areas for the 2020 address canvassing operation
- Begin to assess geographic approaches for these activities

## Address Validation Test Analysis

- Compare outcomes in field with predictions based on the statistical models
- Examine results in blocks with no addresses
- Investigate data from aerial imagery and other geographic sources
  - To select blocks for targeting
  - For some blocks, to identify portion(s) to be targeted

## Partial Block Canvassing Test Objectives

- Component of the Address Validation Test
- Test ability to navigate to targeted area/coordinate using locational information produced by in-office review.
- Compare information collected in blocks with partial canvassing to information in blocks with full canvassing
- Collect metrics to measure efficiency and cost.
- Are there issues that affect fieldwork or collecting accurate information:
  - Is imagery required? What other tools/data are needed?
  - Should updates other than those specified be collected?
  - How do we limit the scope of work once in the field?

## Partial Block Canvassing Test Analysis

- Analyze results from fieldwork in comparison to expectations based on in-office review.
  - Did we collect the information we expected?
  - Did we find additional updates in the field?
- Compare results against GSS-I partner-provided address updates (adds, changes, etc.) to confirm validity.
- For blocks in both the partial block and full block canvassing, compare results and assess reasons for differences, if any.
  - Did full block canvassers find additional updates, especially any that might not be detectable through in-office review? E.g., hidden units and E911 conversion changes.
- Prepare report, including recommendations relating to potential implementation.

## Next Steps

- Decision on a reengineered 2020 address canvassing
- Apply statistical models using 2013-vintage data for predicting into the future
- Determine how to extend the process to the entire nation, including automated change detection techniques
- Identify areas where existing address sources (USPS, local files) are sufficient for keeping the address list current and complete
- Research methods to identify “built out” areas to monitor and remove from Address Canvassing universe

# Questions?