FUTURE UPDATE AND USES OF THE MAF/TIGER SYSTEM

Presentation for the Census Scientific Advisory Committee

March 10, 2023

United States Census Bureau

U.S. Census Bureau GEOGRAPHY

ENHANCING THE MAF/TIGER SYSTEM

THIS DECADE'S MAF/TIGER SYSTEM IMPROVEMENTS WILL BE BUILT UPON THE SUCCESSES FROM THE 2020 CENSUS:

- USPS DELIVERY SEQUENCE FILE
- PARTNER FILES
- IN-OFFICE ADDRESS CANVASSING

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USPS DELIVERY SEQUENCE FILE

DELIVERED BIANNUALLY

9.3 million new DSF residential addresses added to the MAF between 2010 and 2020.

128.1 million DSF residential and deliverable addresses sent to the 2020 Census Enumeration Frame as housing units.

- **97.5 percent** of those addresses were enumerated.

The number of active DSF Rural Route addresses dropped from **1.85 million to 41,000** between 2007 and 2020.

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PARTNER FILES

TRIBAL, STATE, AND LOCAL GOVERNMENT FILE ACQUISITION 2013-2018

134.1 million addresses received from partners.

- 106.7 million addresses met minimum address criteria.

- ✔ 99.51 percent matched to the MAF.
- ✔ 521,000 new addresses added to the MAF.
- ✔ 75.2 million new MAF Structure Points.
- ✔ 1.4 million geocoding corrections.
- ✔ 1.2 million previously ungeocoded addresses geocoded.

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IN-OFFICE ADDRESS CANVASSING

IN-OFFICE ADDRESS CANVASSING SIGNIFICANTLY REDUCED 2020 CENSUS IN-FIELD ADDRESS CANVASSING

Clerical staff reviewed more than 11 million blocks to identify blocks that required follow-up during In-Field Address Canvassing.

2020 Census In-Office Address Canvassing validated 65% of the nation's addresses.

Implementing the 2020 In-Office Canvassing Methodology resulted in significant cost avoidance, an accurate frame, and a foundation for innovation.

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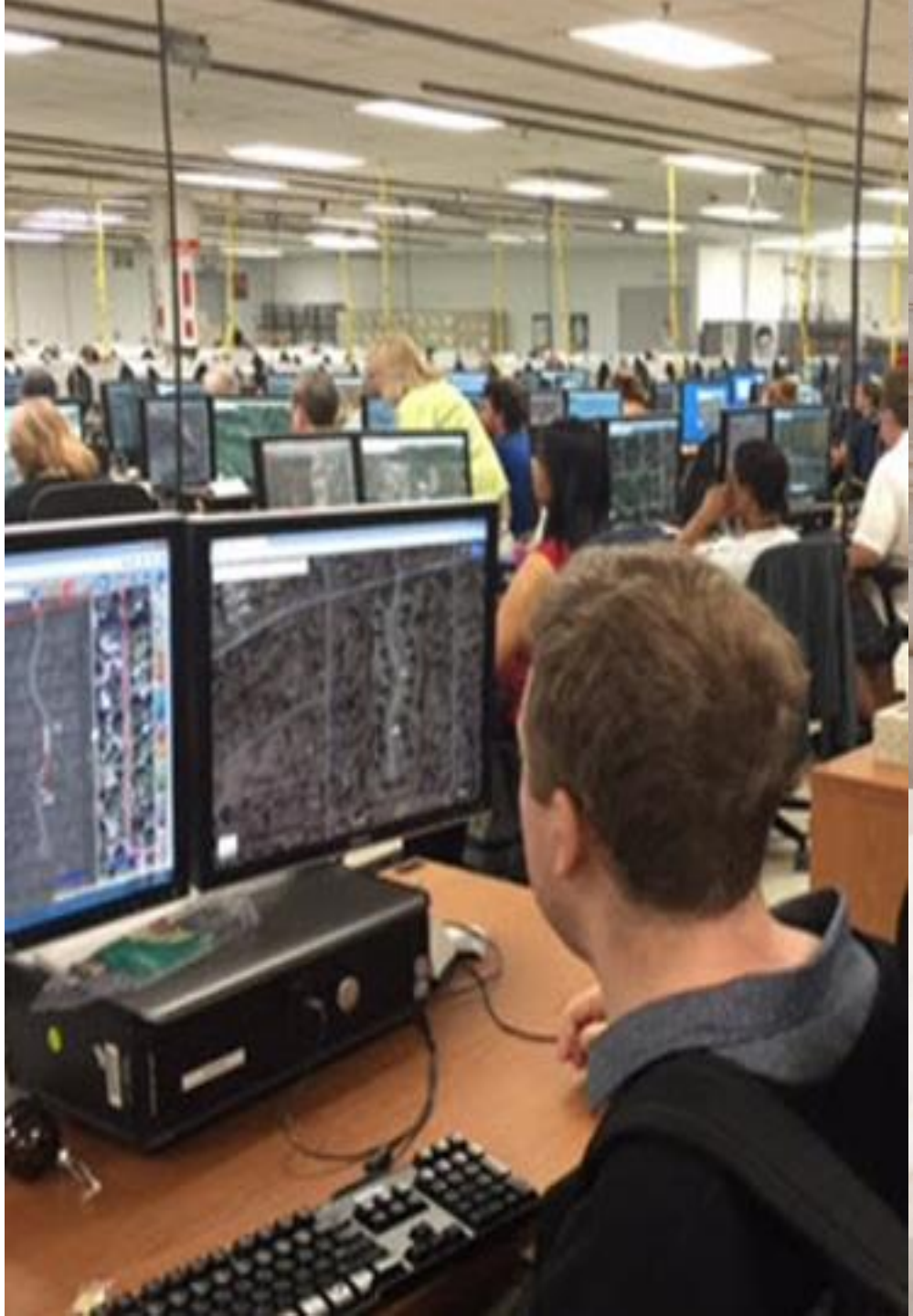

THE MAF/TIGER SYSTEM TODAY

Geospatial information in our MAF/TIGER System includes…

- Over 14 million unique geographic areas, including legal, administrative, and statistical areas (e.g., census tracts, block groups, blocks)
- Legal boundaries for approximately 40,000 units of government
- Approximately 7 million miles of roads
- More than 144. 5 million housing units
- Structure points for approximately 94% of those housing units

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POST ENUMERATION SURVEY RESULTS

NET COVERAGE ERROR RATES FOR HOUSING UNITS

1990	2000	2010	2020
0.96 percent (undercoverage)	0.61 percent (undercoverage)	0.60 percent (undercoverage)	0.04 percent (overcoverage)

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CAPTURING AND GEOCODING NEW GROWTH IN THE GEOGRAPHIC SUPPORT PROGRAM

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DATA SCIENCE AND TECHNOLOGY IN THE GEOGRAPHY DIVISION

IMAGERY

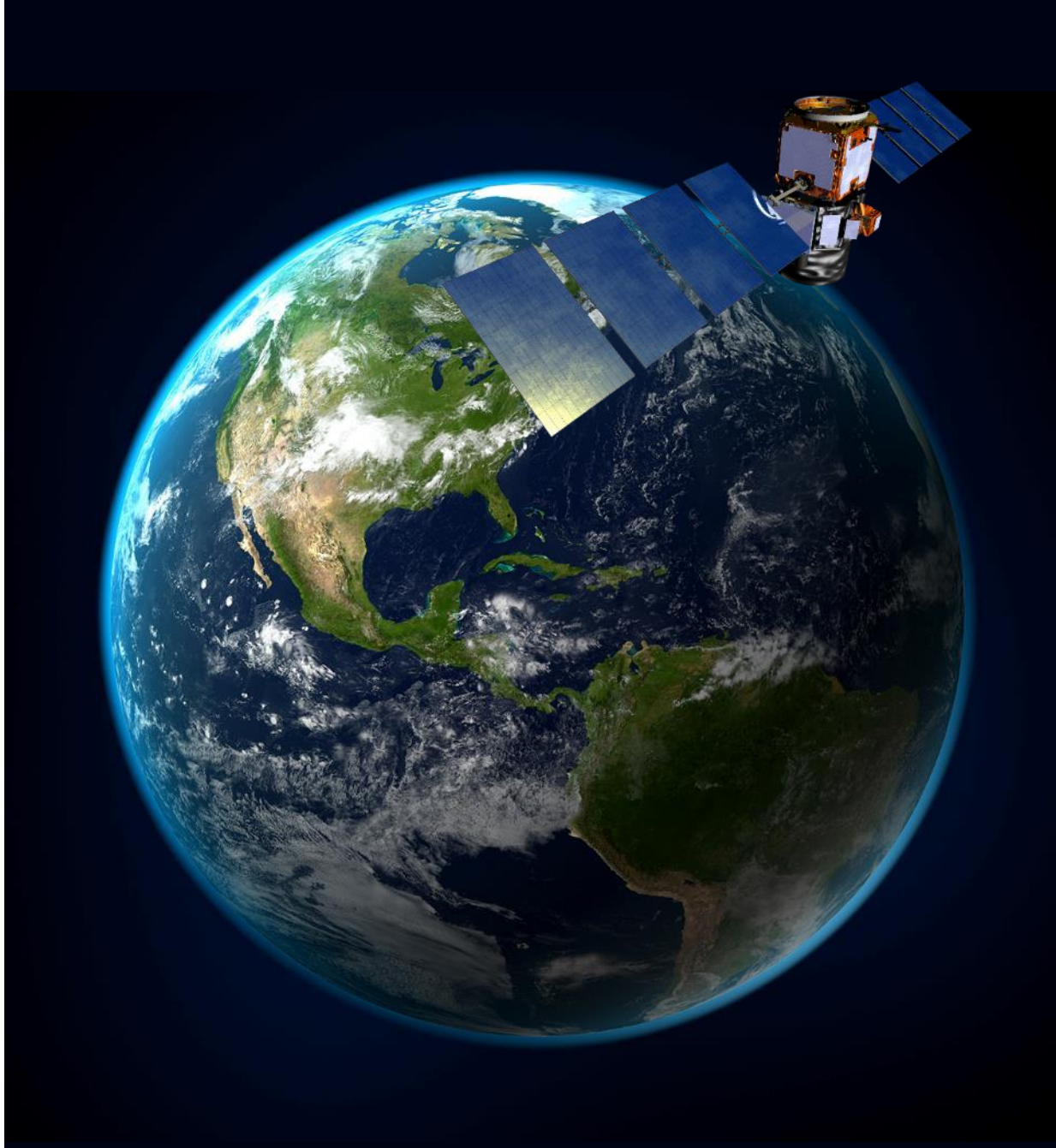
Satellite imagery for the entire nation is now freely available and updated frequently.

PARCELS

Improvements to national parcel datasets have opened access to a critical new address source.

MACHINE LEARNING

Applying Data Science methods such as machine learning to these datasets will allow the Geography Division to rely on automated solutions to improve and maintain the MAF/TIGER System.



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ANALYTICS AND CHANGE DETECTION

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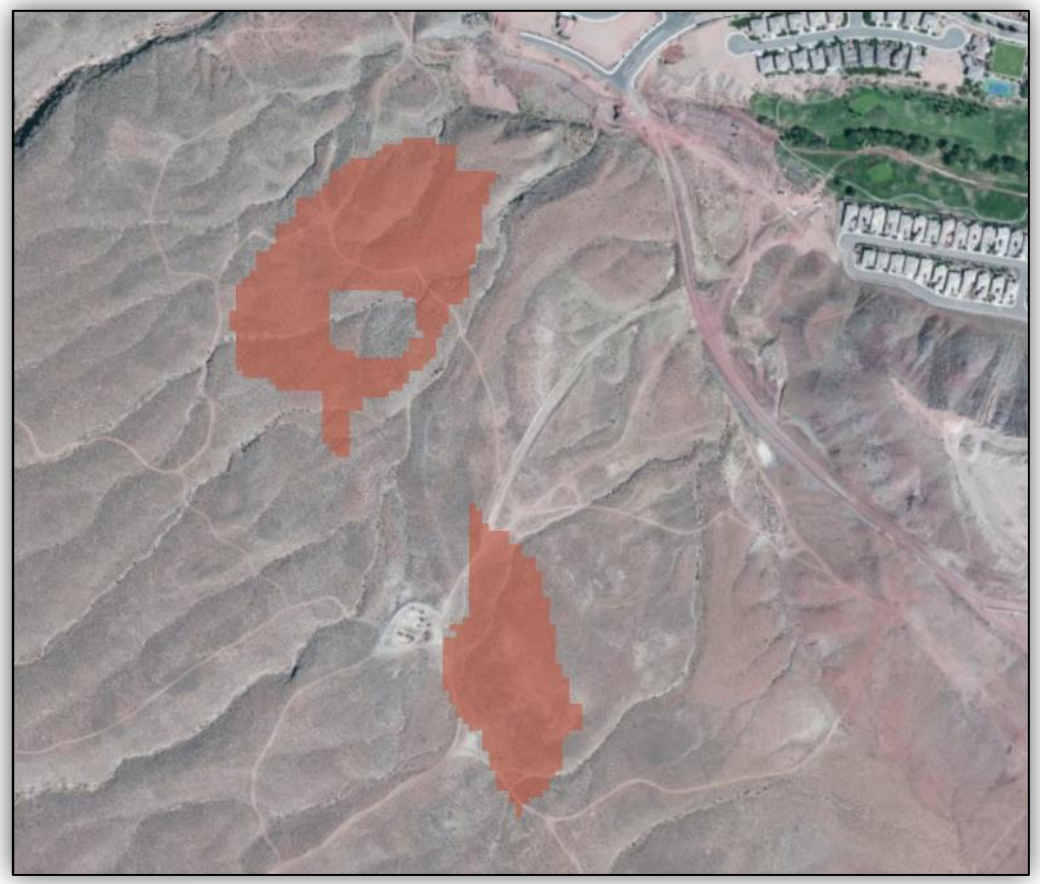
AUTOMATED CHANGE DETECTION



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PARCEL MATCHING

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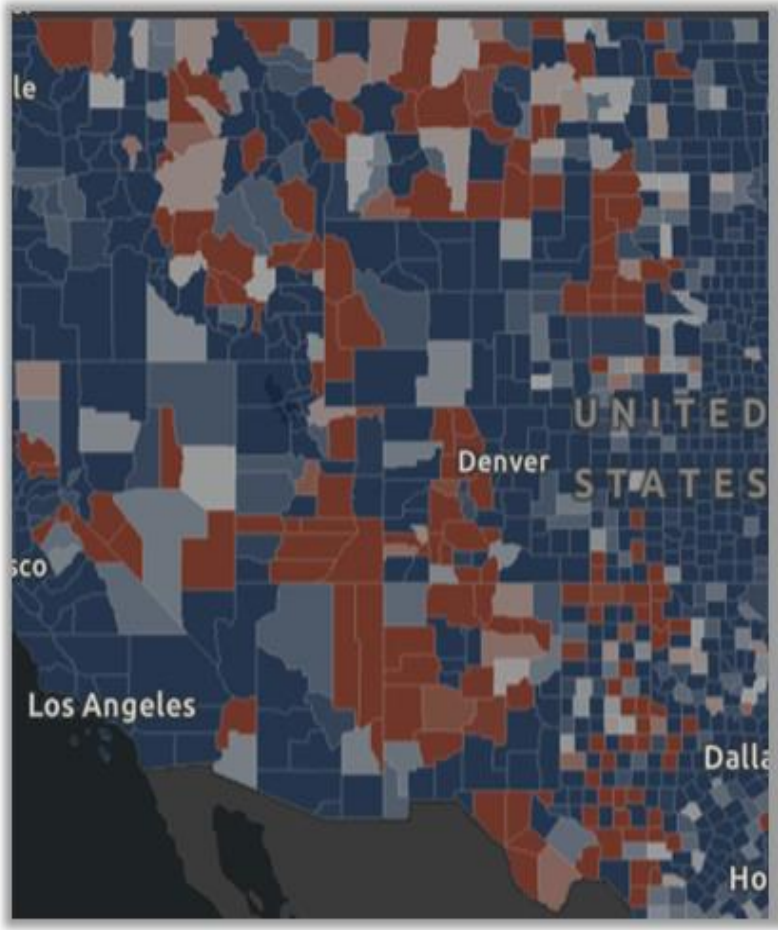
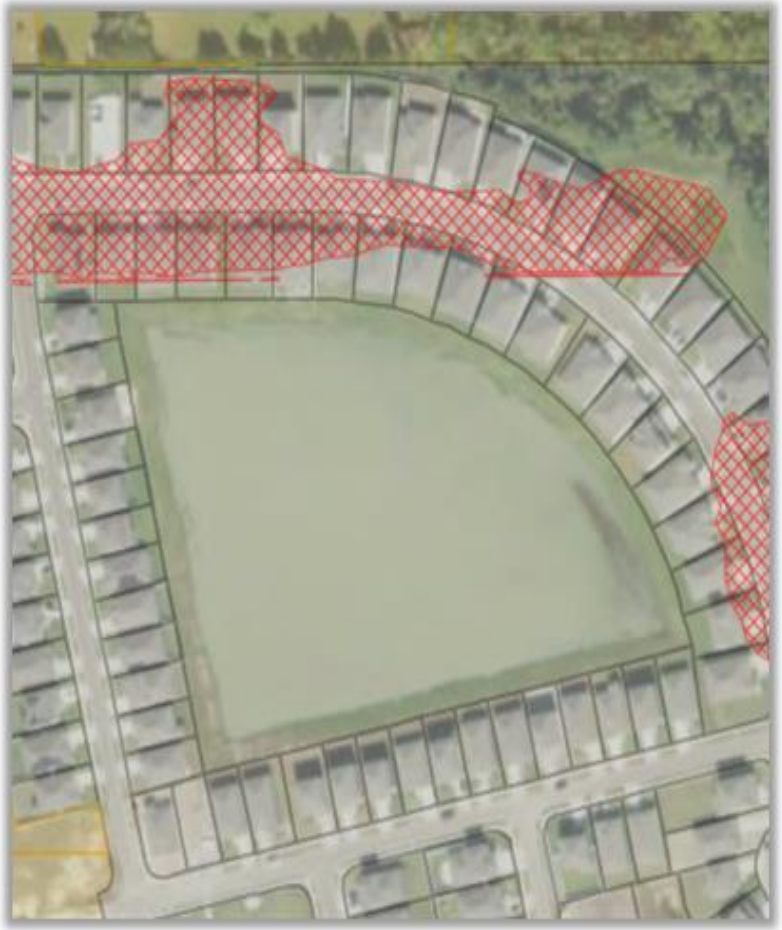
THE INTELLIGENCE DATABASE



GEOID2020	STATEFP	COUNTYFP	PAR_COUNT	PAR_AD_CC
010550102021028	01	055	19	
010550102021029	01	055	18	
010550102021030	01	055	23	
010550102021031	01	055	2	
010550102021032	01	055	4	
010550102021033	01	055	15	
010550102021034	01	055	4	
010550102021035	01	055	2	
010550102021036	01	055	17	
010550104011014	01	055	16	
010550104011015	01	055	9	
010550104011016	01	055	0	
010550104012000	01	055	99	
010550104012001	01	055	8	
010550106013026	01	055	42	
010550106013027	01	055	1	
010550106013028	01	055	83	
010550106013029	01	055	7	



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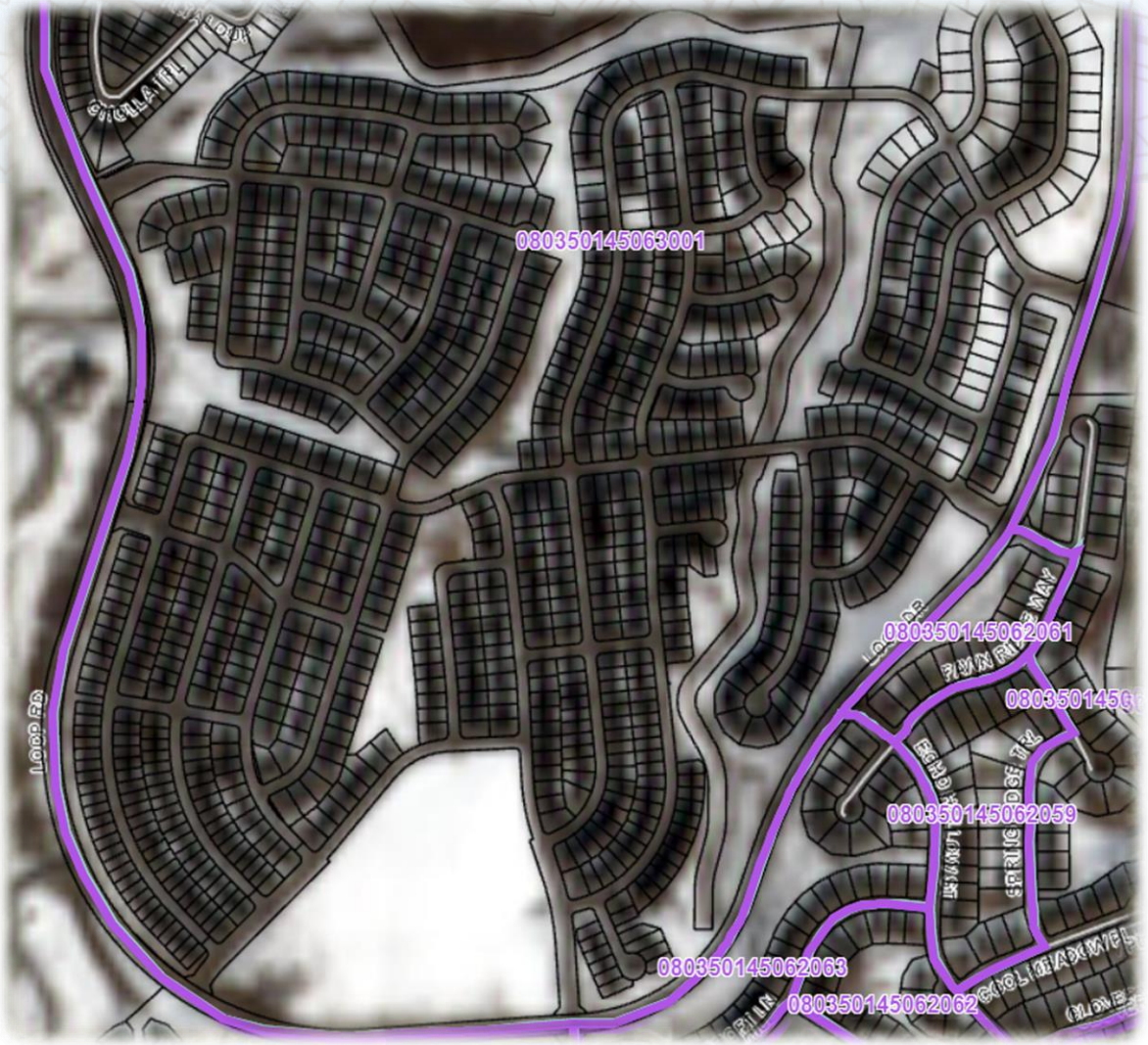
THE INTELLIGENCE DATABASE

ID Block Report: 080350145063001

- Automated Change Detection: Y
- Automated Change Detection Date: 12/30/2021
- Automated Change Detection Area: 113,179 sq/m
- MAF Unit Count: 161
- DSF Count: 161
- Parcels with addresses: 846
- Parcel-Match to MAF Ungeocoded: 685
- Last Operation: Non-Response Follow Up
- Last Operation Date: 12/22/2020

685 Ungeocoded MAF Units can receive a block assignment



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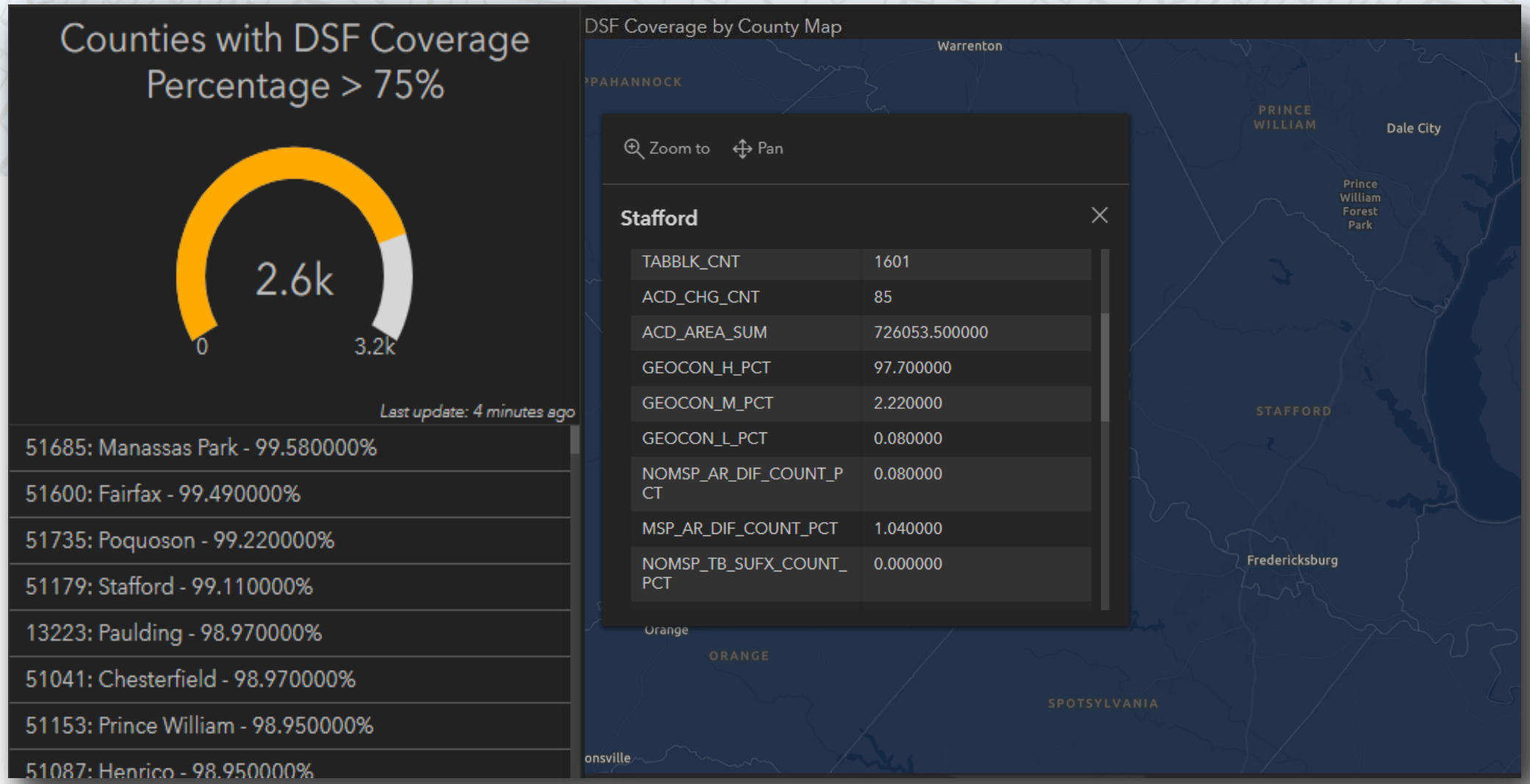

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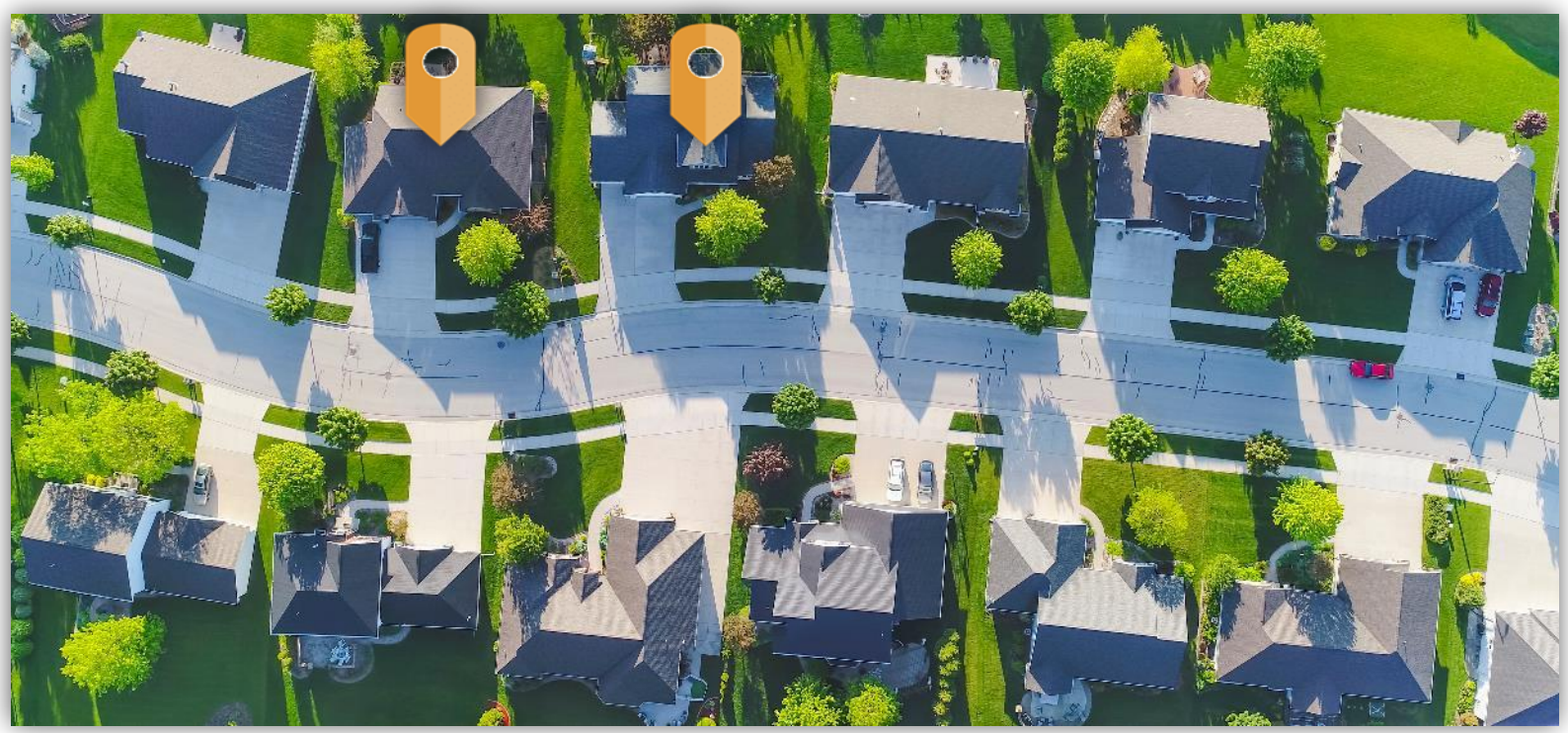
ONGOING IN-OFFICE GEOCODING OPERATIONS



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HOW WILL THIS IMPACT CENSUS AND SURVEY OPERATIONS?

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FRAMES PROGRAM

- THE FRAMES PROGRAM WILL EXPAND THE COVERAGE IN THE MAF TO INCLUDE BOTH RESIDENTIAL AND NON-RESIDENTIAL ADDRESSES.
- THE GEOSPATIAL FRAME WILL STORE A COMPREHENSIVE SET OF RESIDENTIAL, BUSINESS, AND MIXED-USE ADDRESSES TO MEET THE NEEDS OF DEMOGRAPHIC AND ECONOMIC PROGRAMS.
- ENHANCED MAF UPDATE WILL LEVERAGE APPROXIMATELY 56 MILLION TITLE 13 ADDRESSES FROM THE BUSINESS REGISTER AND JOB FRAME.
- THE GEOSPATIAL FRAME WILL BE LINKABLE TO THE OTHER ENTERPRISE FRAMES (DEMOGRAPHIC, BUSINESS, AND JOB).

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TEA EVOLUTION

Increases in the number of City-Style Addresses in the MAF resulted in increases to the Mailout/Mailback Universe.

2000 CENSUS	2010 CENSUS	2020 CENSUS
80 PERCENT	91 PERCENT	96 PERCENT

FUTURE
>96 PERCENT

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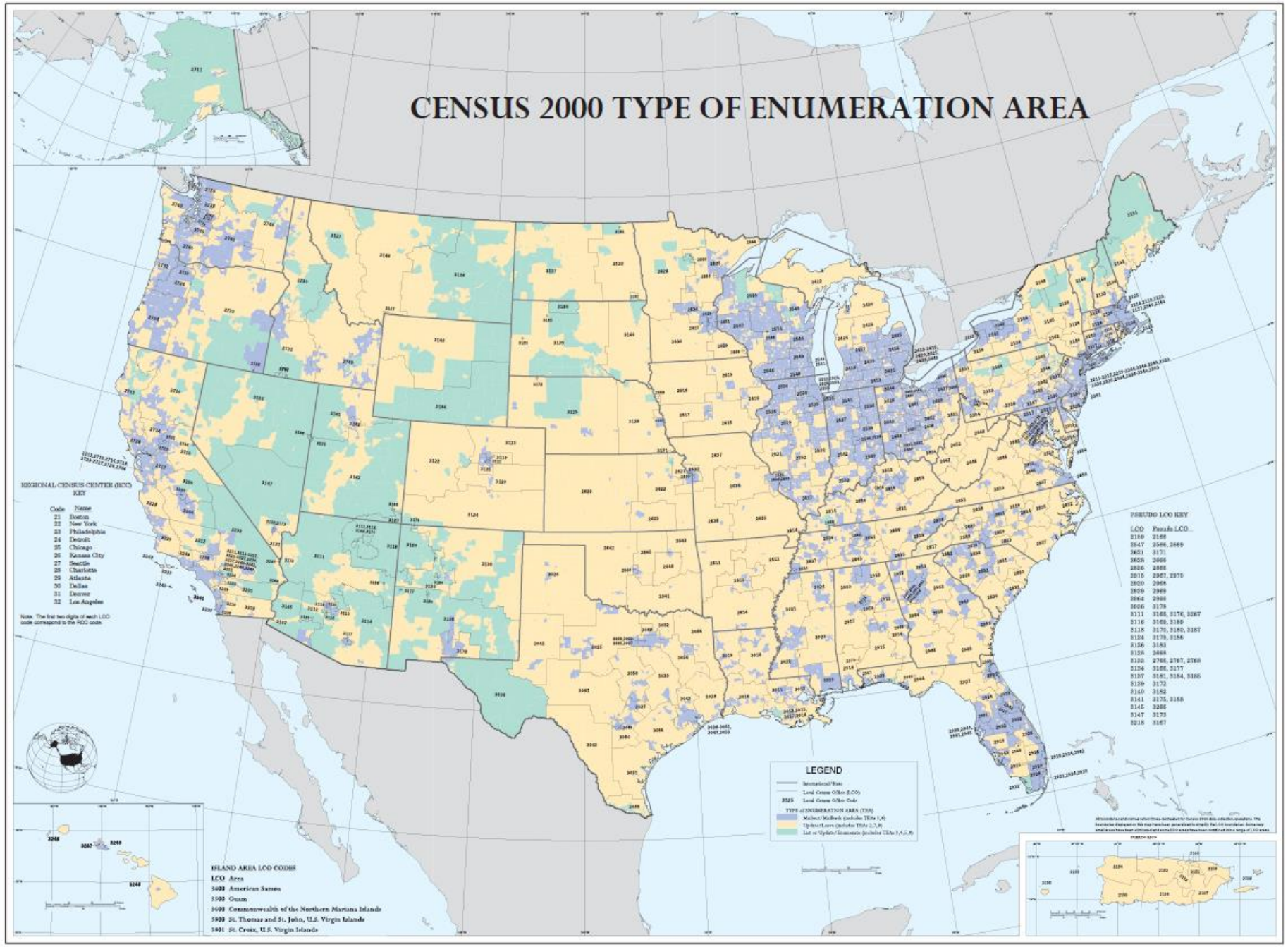
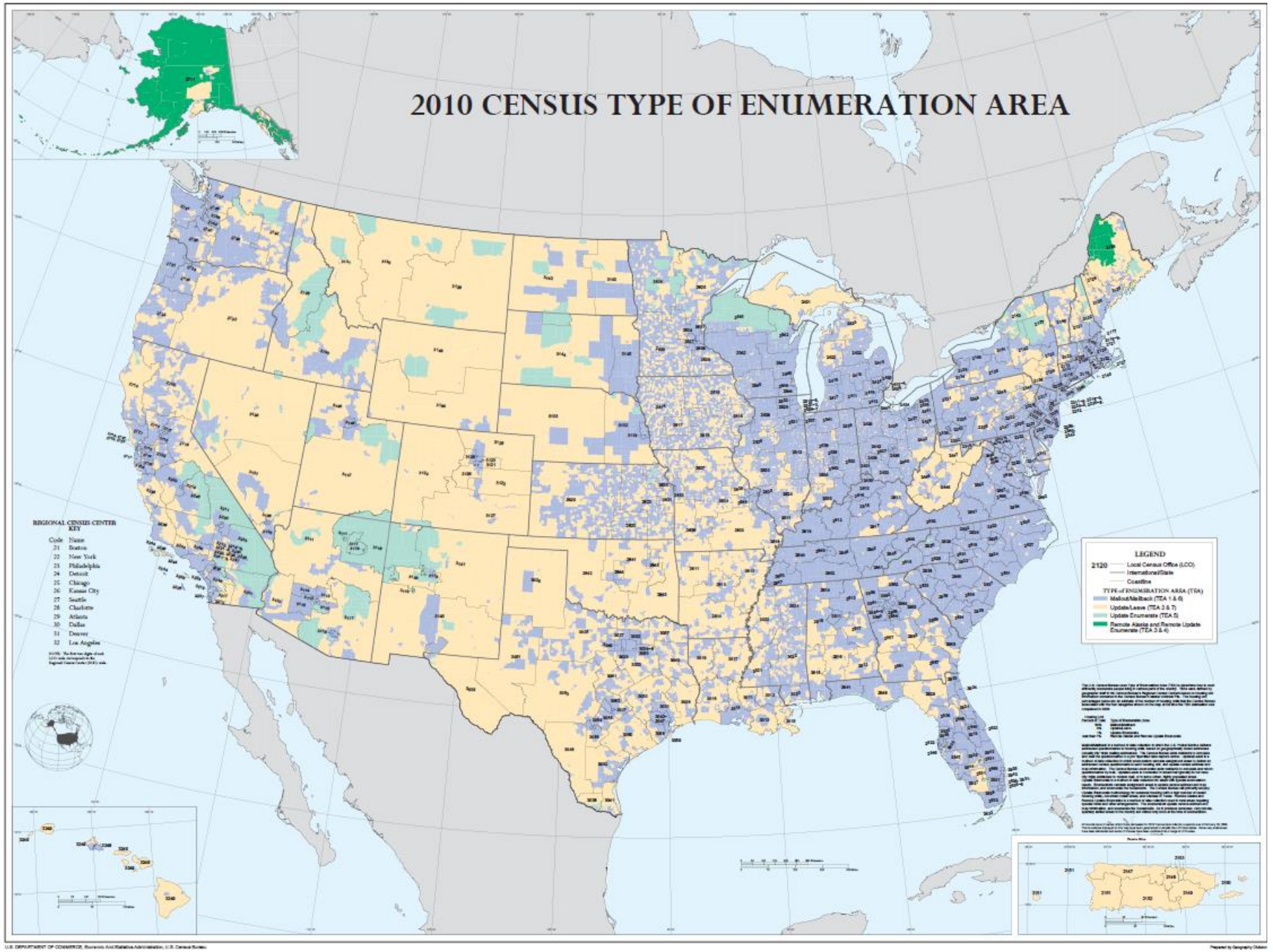


U.S. DEPARTMENT OF COMMERCE, Economics and Statistics Administration, U.S. Census Bureau

2000 CENSUS

TYPE OF ENUMERATION AREA (TEA)

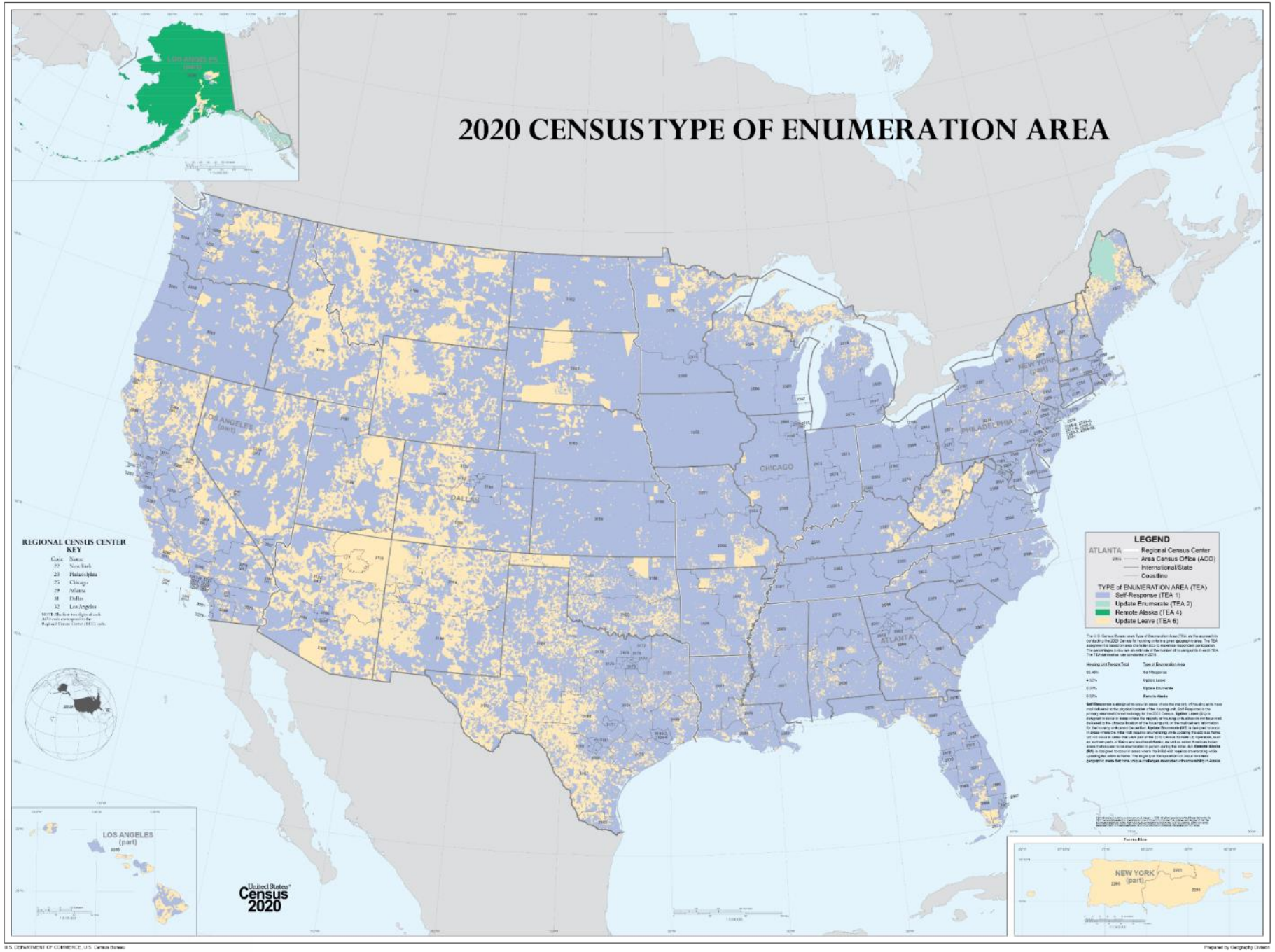
- Mailout/Mailback and Self-Response
- Update Leave
- Update Enumerate



2010 CENSUS

TYPE OF ENUMERATION AREA (TEA)

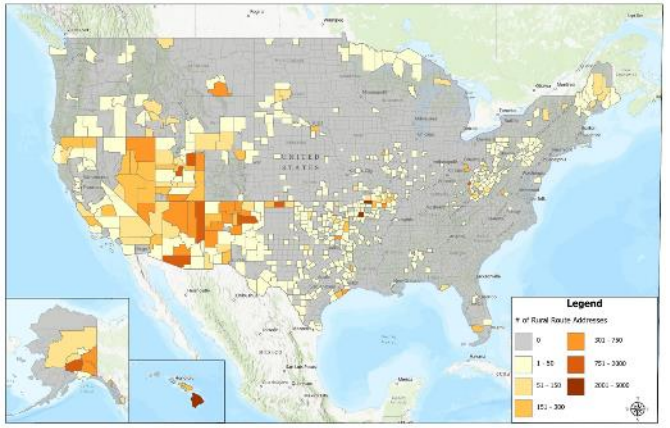
- Mailout/Mailback and Self-Response
- Update Leave
- Update Enumerate
- Remote Alaska and Remote Update Enumerate

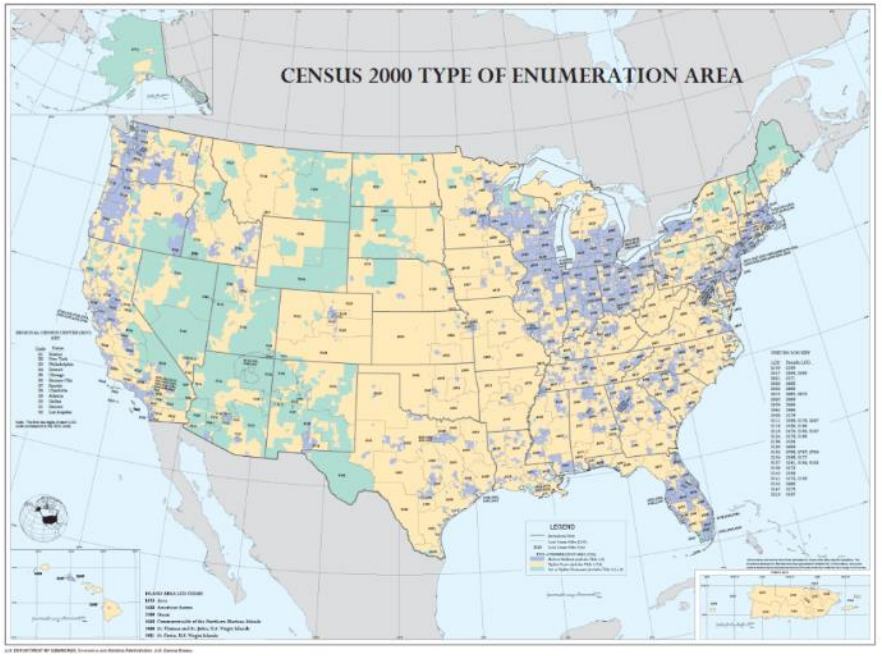


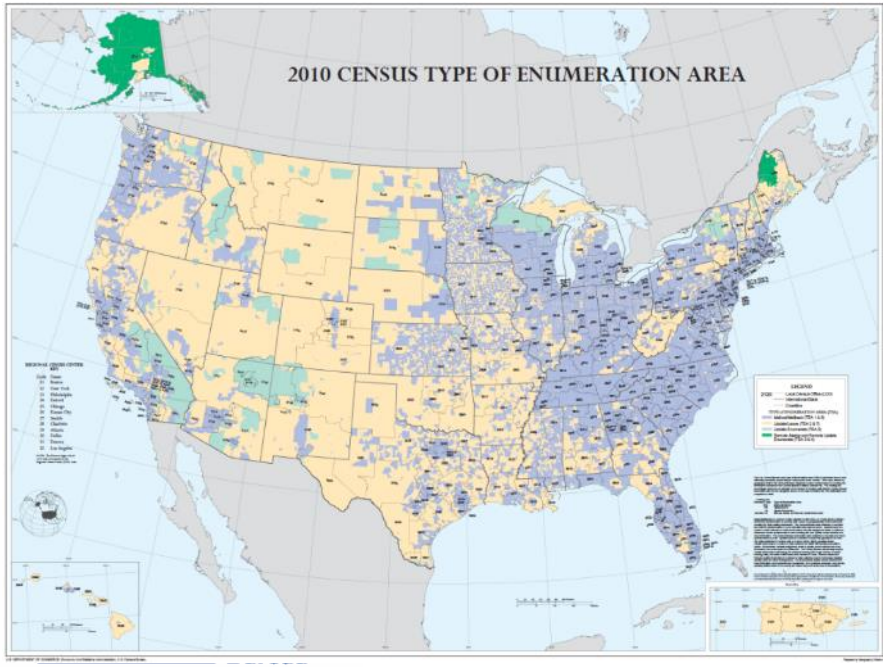
2020 CENSUS

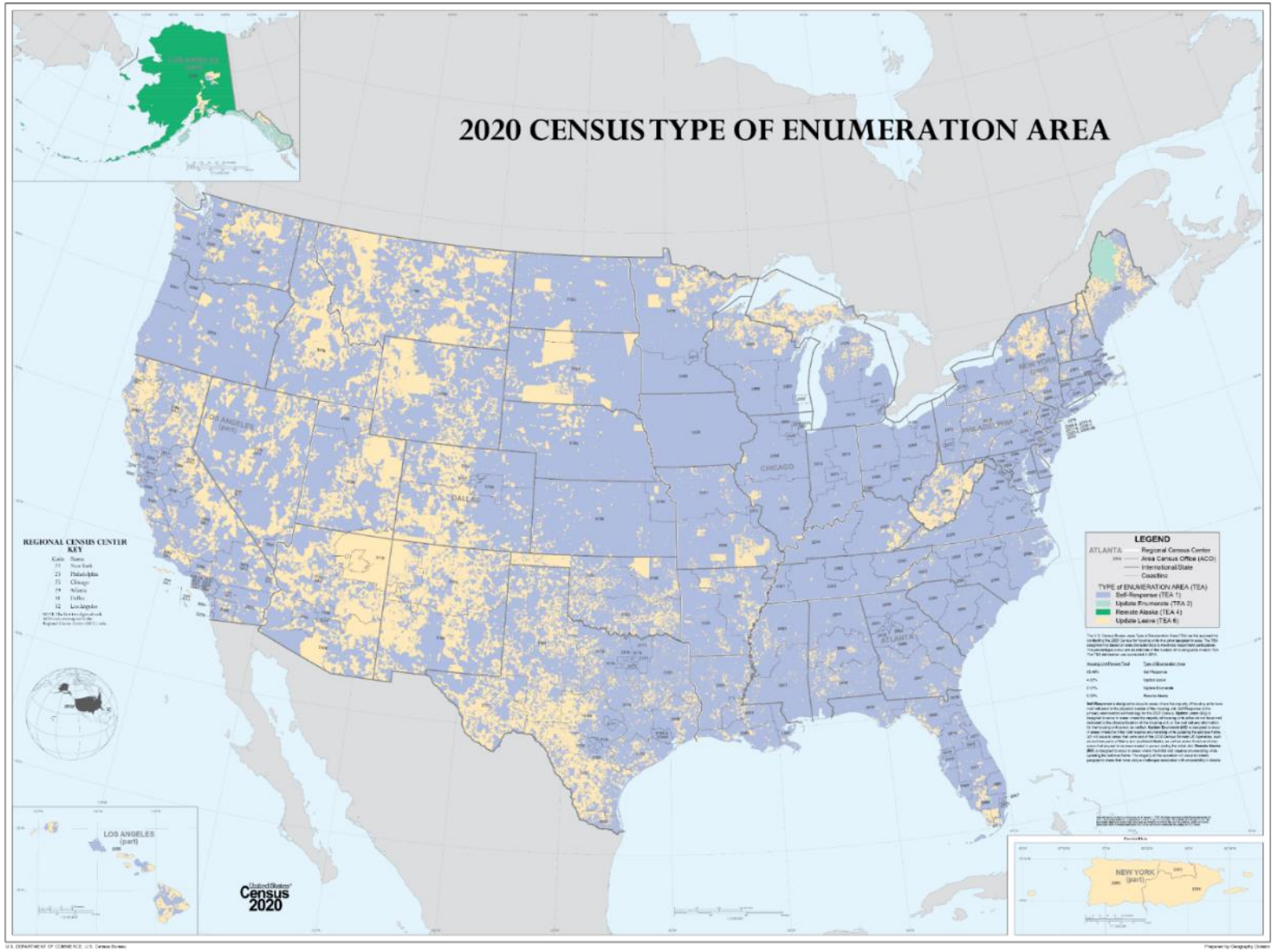
TYPE OF ENUMERATION AREA (TEA)

- Mailout/Mailback (Self-Response)
- Update Leave
- Update Enumerate
- Remote Alaska and Remote Update Enumerate









Mailout/Mailback (Self-Response)

Update Leave

Update Enumerate

Remote Alaska or Remote Update Enumerate

EVOLUTION OF IN-FIELD CANVASSING

2000

100 PERCENT In-Field Address Canvassing through Address Listing and Block Canvassing operations.

Paper based operation.

2010

100 PERCENT In-Field Address Canvassing.

Digital data collection including GPS.

2020

35 PERCENT In-Field Address Canvassing.

100 PERCENT In-Office Address Canvassing.

Digital data collection including GPS.

FUTURE

100 PERCENT In-Office Address Canvassing.

Limited In-Field Address Canvassing as necessary.

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NEXT STEPS

CONTINUE MODERNIZING THROUGH THE USE OF TECHNOLOGY, BUILDING UPON SUCCESSES OF THE PAST

ISSUE FORMAL ADDRESS CANVASSING RECOMMENDATION IN 2024

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MODERNIZATION

The Geographic Support Program is capitalizing on advances in technology, methodology, and geospatial data to ensure the MAF/TIGER System will remain accurate throughout the decade.

ACCURACY

The MAF/TIGER System is more accurate than ever.

QUALITY

The MAF/TIGER System includes more City-Style addresses than ever.

EFFICIENCY

Current methods for automated change detection and MAF/TIGER updates are efficient and cost effective.

QUESTIONS FOR THE COMMITTEE

- WHAT IS THE COMMITTEE'S FEEDBACK ON THE PLAN FOR CONTINUED MODERNIZATION WITHIN THE GEOGRAPHIC SUPPORT PROGRAM?
- WHAT ARE YOUR RECOMMENDATIONS FOR STRENGTHENING THESE METHODS MOVING FORWARD?

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THANK YOU!

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