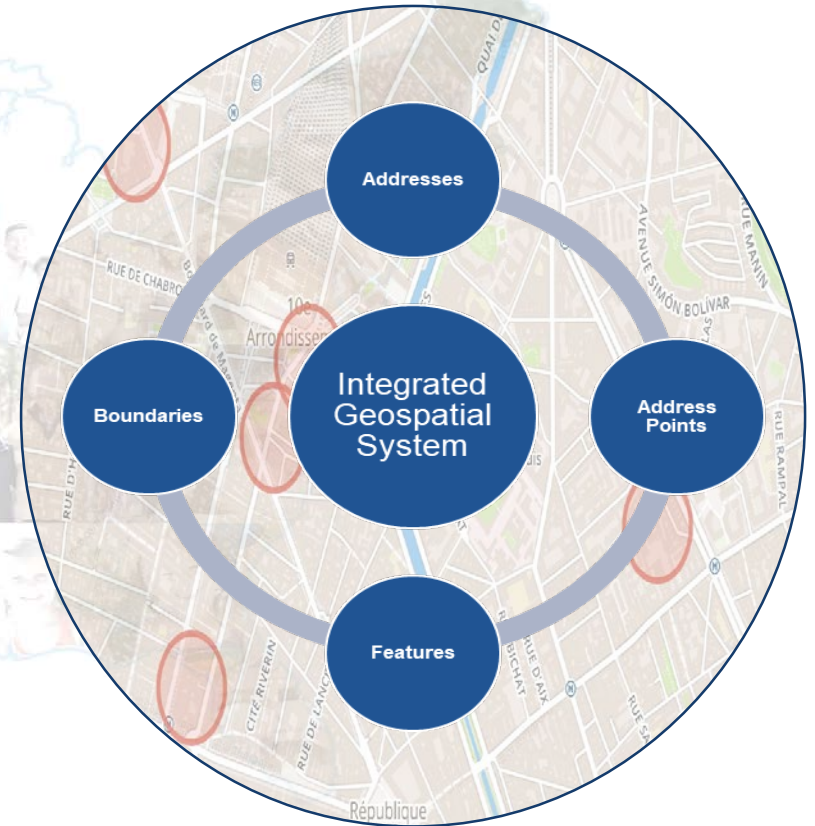# AutoCarto 2020

Geospatial Data Innovation at the
United States Census Bureau:
Where Next in Vision

November 17, 2020

Deirdre Dalpiaz Bishop
Chief, Geography Division

Addresses

Boundaries

Integrated Geospatial System

Address Points

Features

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Where Have We Been? Working on the 2020 Census!
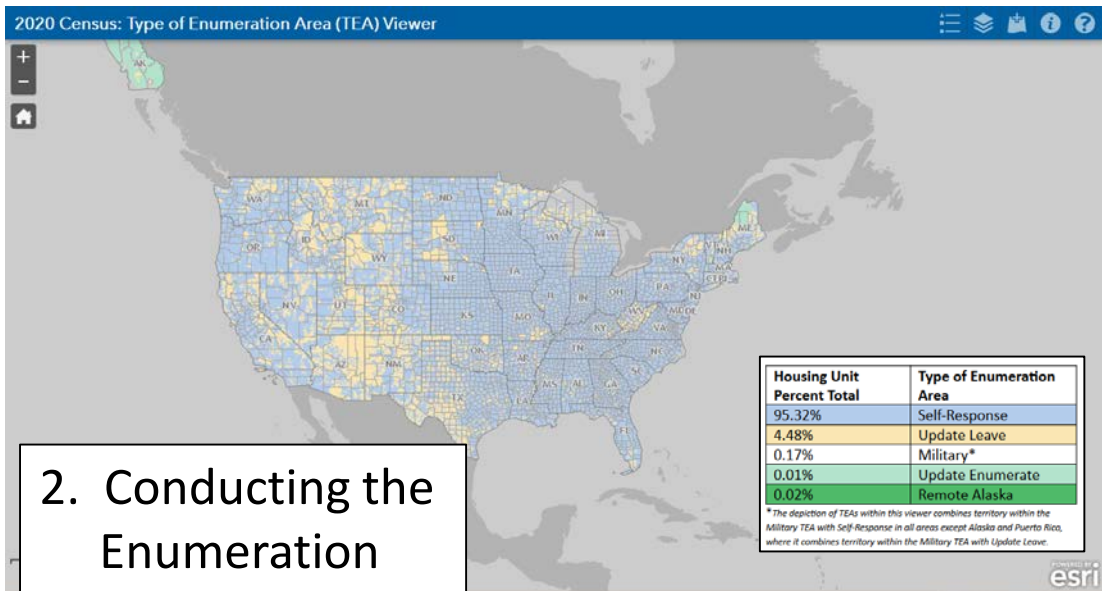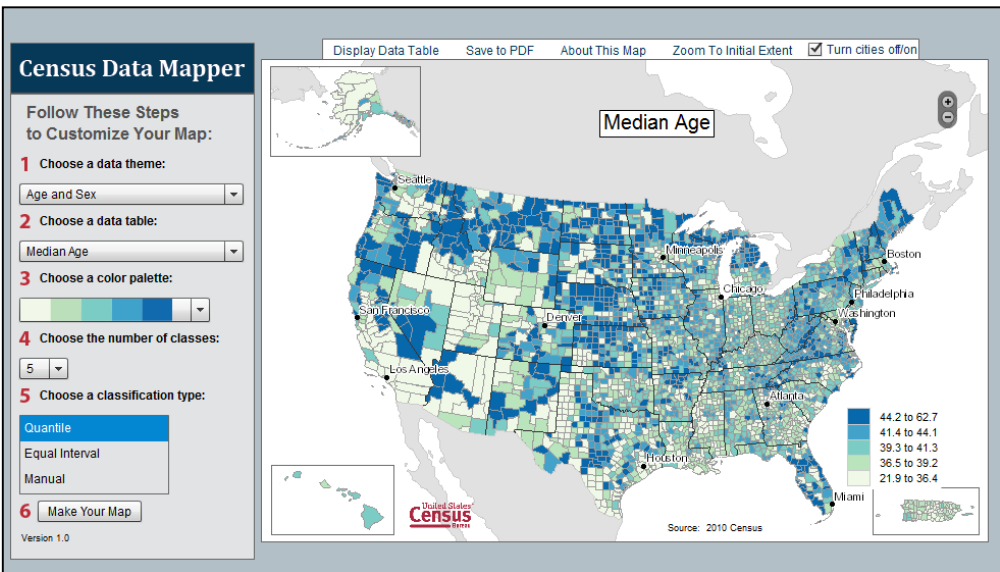
2020 Census

Geography is the Cornerstone of the Decennial Census
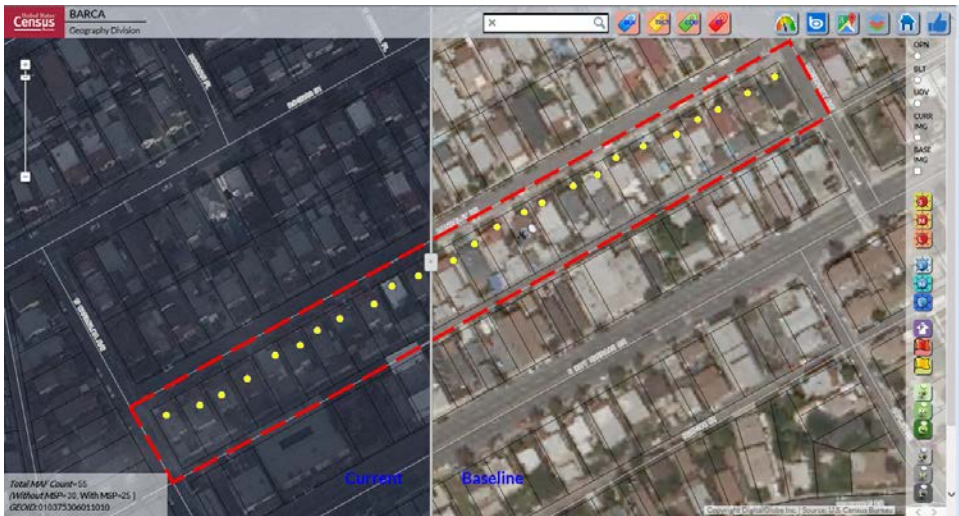
1. Establishing Where to Count

2. Conducting the Enumeration

3. Tabulating and Disseminating Results

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2020 Census
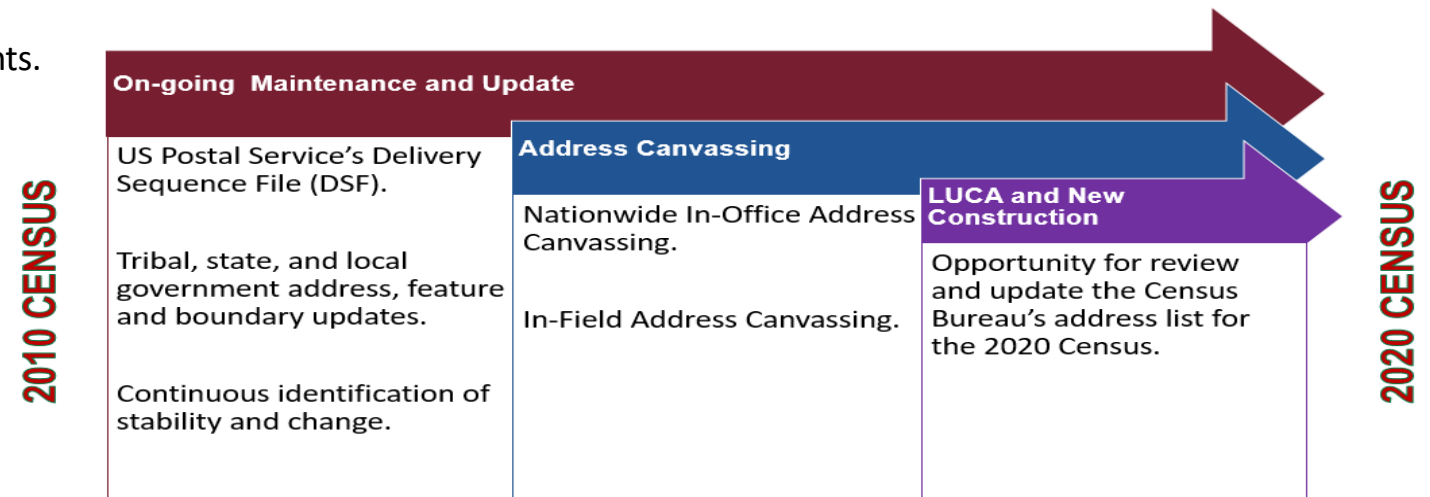## Establish Where to Count - Address List Development

Development of the 2020 Census Master Address File (MAF) started with the 2010 Census Base and utilized a variety of authoritative address datasets to implement a multi-layered update process.

U.S. Postal Service (USPS) Delivery Sequence File (DSF)
- 5.9 million new addresses.
- 2.4 million residential addresses that were new to the DSF matched addresses already in the MAF.
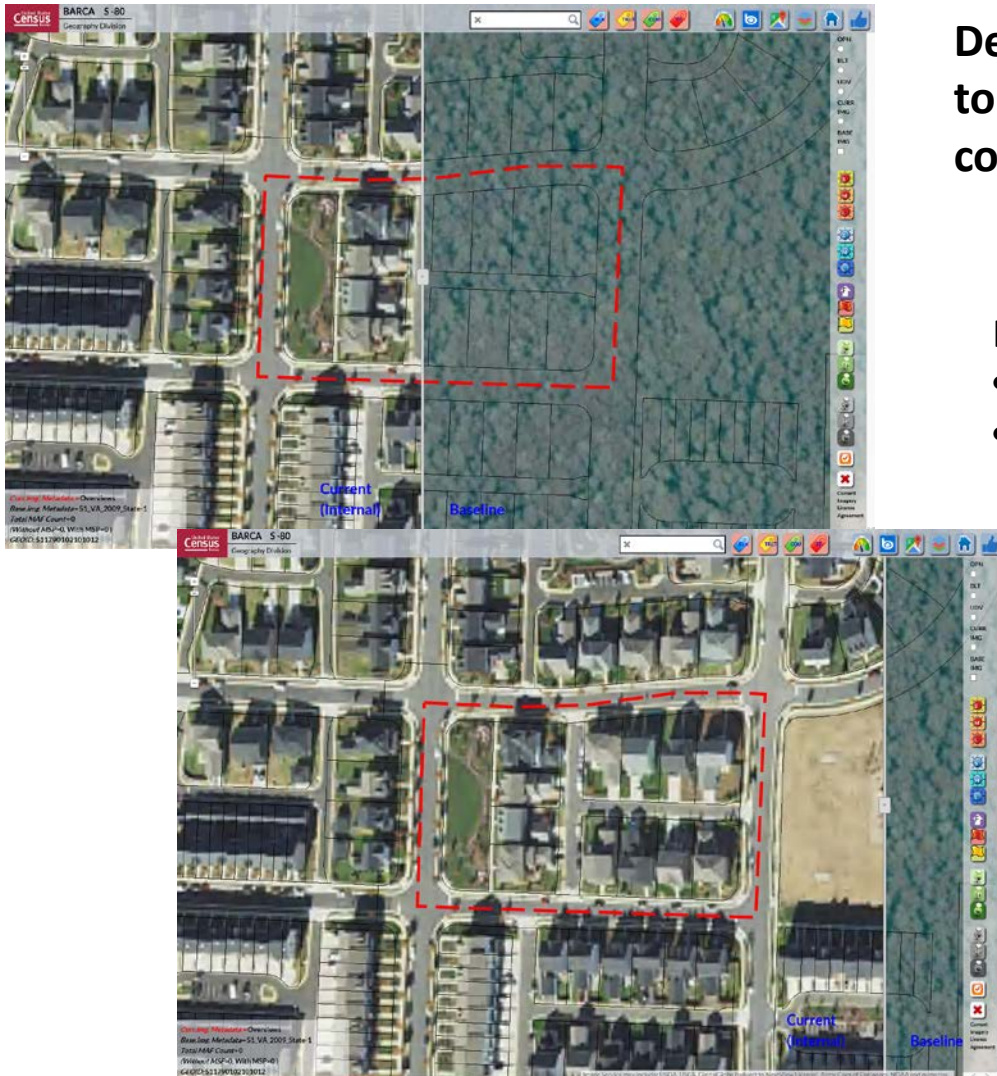
Geographic Partnership Programs
- Ongoing partnerships with tribal, state, and local governments.
  - 107 million addresses received.
    - 99.5 percent matched to the MAF.
    - Over 521,000 new addresses.
- Local Update of Census Addresses.
  - 22 million addresses received.
    - 81 percent matched to the MAF.
    - 3.4 million new addresses.
- New Construction.
  - 595,000 new addresses.

2010 CENSUS

On-going Maintenance and Update

US Postal Service's Delivery Sequence File (DSF).

Tribal, state, and local government address, feature and boundary updates.

Continuous identification of stability and change.

Address Canvassing

Nationwide In-Office Address Canvassing.

In-Field Address Canvassing.

LUCA and New Construction

Opportunity for review and update the Census Bureau's address list for the 2020 Census.

2020 CENSUS

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Establish Where to Count - Address Canvassing

Development for the 2020 Census MAF relied on imagery analysis to detect change and stability in the housing landscape, validate coverage, and identify where address updates were needed.
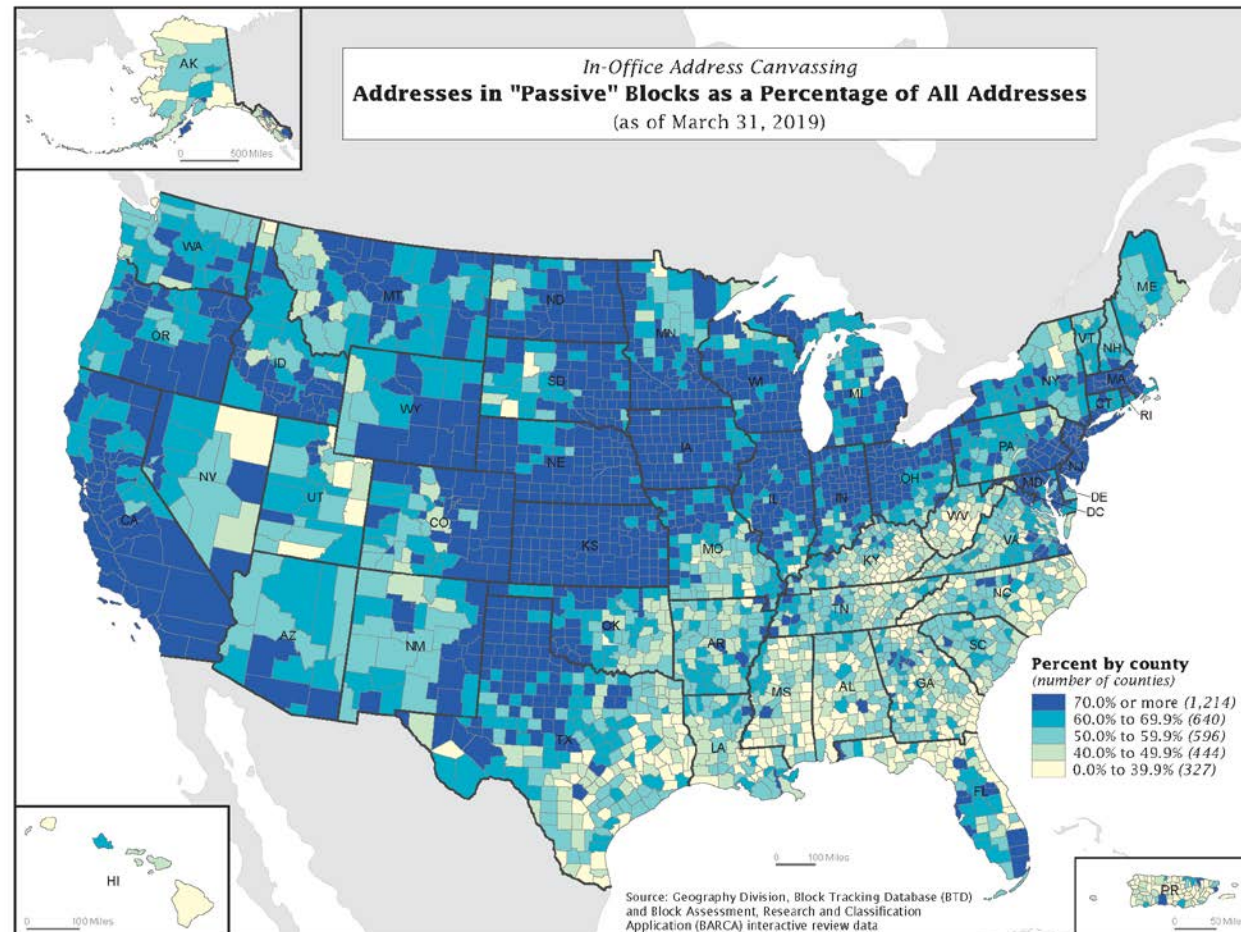
In-Office Address Canvassing
- Completed review of all 11,155,486 blocks in the U.S. in June 2017.
- Triggered blocks for re-review between June 2017 and March 2020 based on changes in partner-provided address datasets or in-office analysis of housing types and contexts.
  - Final Status (March 31, 2019):
    - Active: 1,093,488 blocks (9.8 percent).
    - Passive: 9,710,702 blocks (87.0 percent).
    - On Hold: 173,308 blocks (1.6 percent).
    - Triggered: 177,988 blocks (1.6 percent).

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2020 Census
In-Office and In-Field Address Canvassing - Analysis of Results

In-Office Address Canvassing validated 65 percent of the nation's addresses.

In-Office Address Canvassing
Addresses in "Passive" Blocks as a Percentage of All Addresses
(as of March 31, 2019)

Percent by county
(number of counties)

- 70.0% or more *(1,214)*
- 60.0% to 69.9% *(640)*
- 50.0% to 59.9% *(596)*
- 40.0% to 49.9% *(444)*
- 0.0% to 39.9% *(327)*

Source: Geography Division, Block Tracking Database (BTD) and Block Assessment, Research and Classification Application (BARCA) interactive review data

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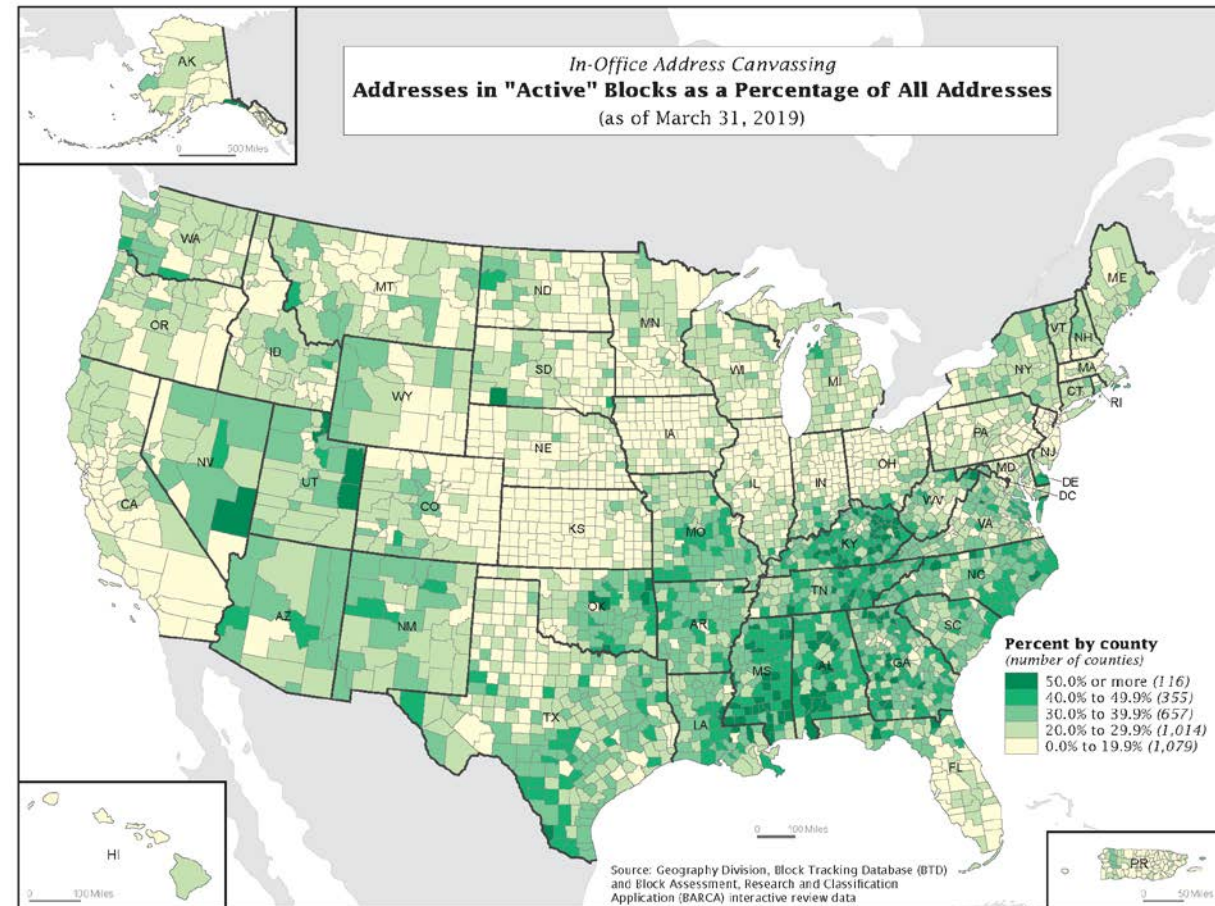START HERE >

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2020 Census
In-Office and In-Field Address Canvassing - Analysis of Results

In-Field Address Canvassing occurred from August to October 2019:

- 35 percent of the nation's addresses sent to the field for review, verification, or update.

  - 88.2 percent were validated by field work.

  - 2,688,190 new addresses identified (i.e., not on the original address list sent to the field).

   - 1,553,275 (57.8 percent) matched to addresses added to the MAF through concurrent in-office processes.

In-Office Address Canvassing
Addresses in "Active" Blocks as a Percentage of All Addresses
(as of March 31, 2019)

Percent by county
(number of counties)
- 50.0% or more *(116)*
- 40.0% to 49.9% *(355)*
- 30.0% to 39.9% *(657)*
- 20.0% to 29.9% *(1,014)*
- 0.0% to 19.9% *(1,079)*

Source: Geography Division, Block Tracking Database (BTD) and Block Assessment, Research and Classification Application (BARCA) interactive review data

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2020 Census
Where to Count Established

Address list development resulted in the 2020 Census enumeration universe.

- Approximately 152 million addresses.

- 95 percent received an invitation in the mail.

- 5 percent were hand delivered an invitation and/or the interview was completed at the door.
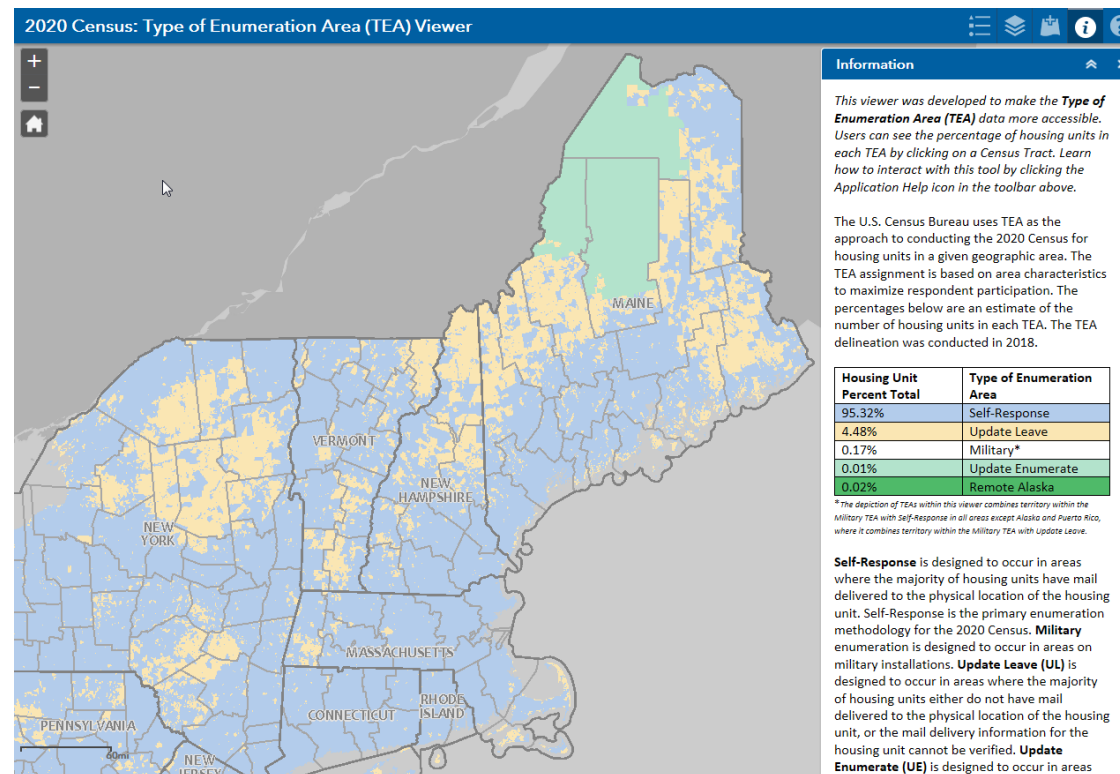
2020 Census

Conducting the Enumeration - Identifying Low-Response Neighborhoods and Encouraging Participation
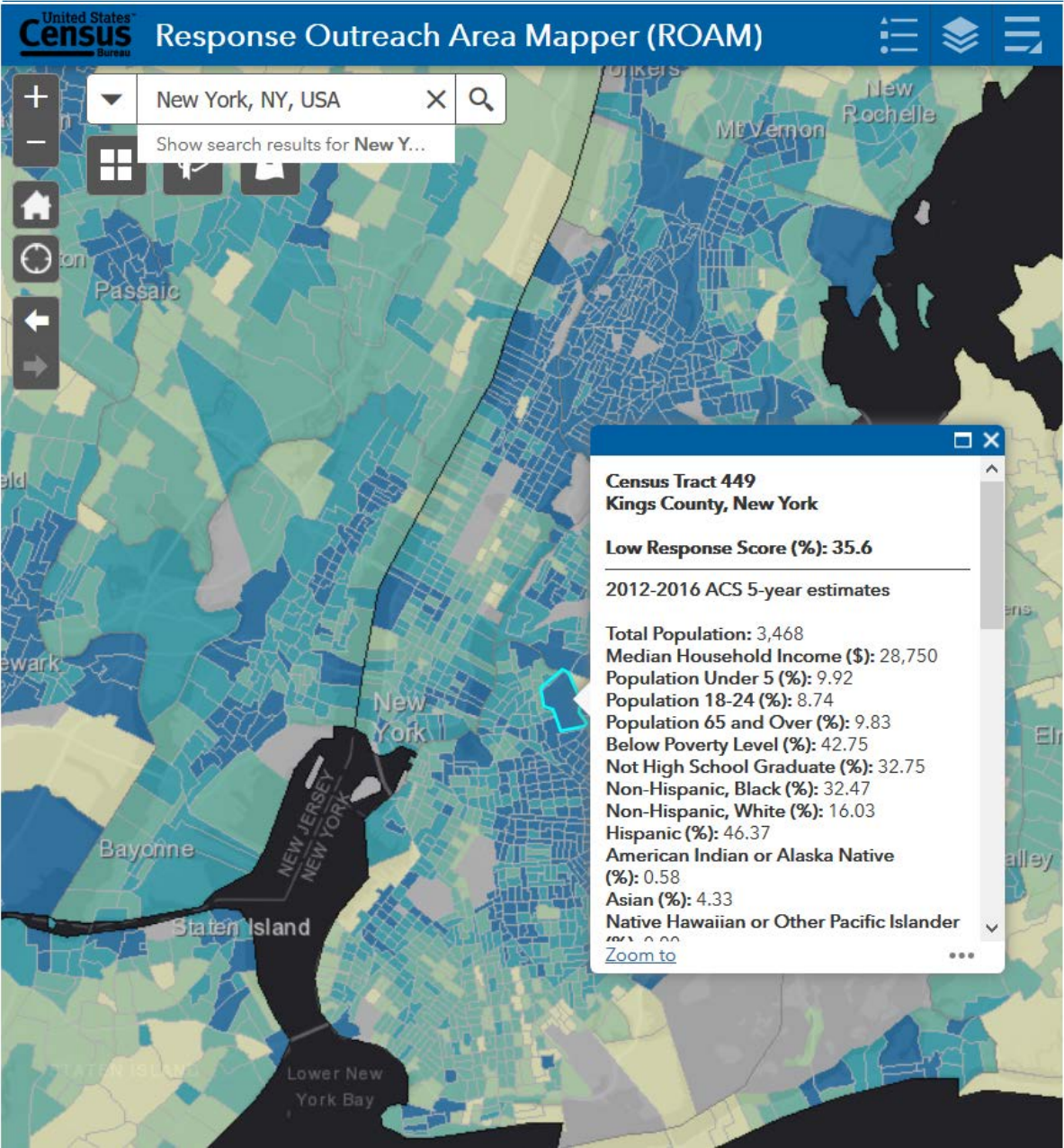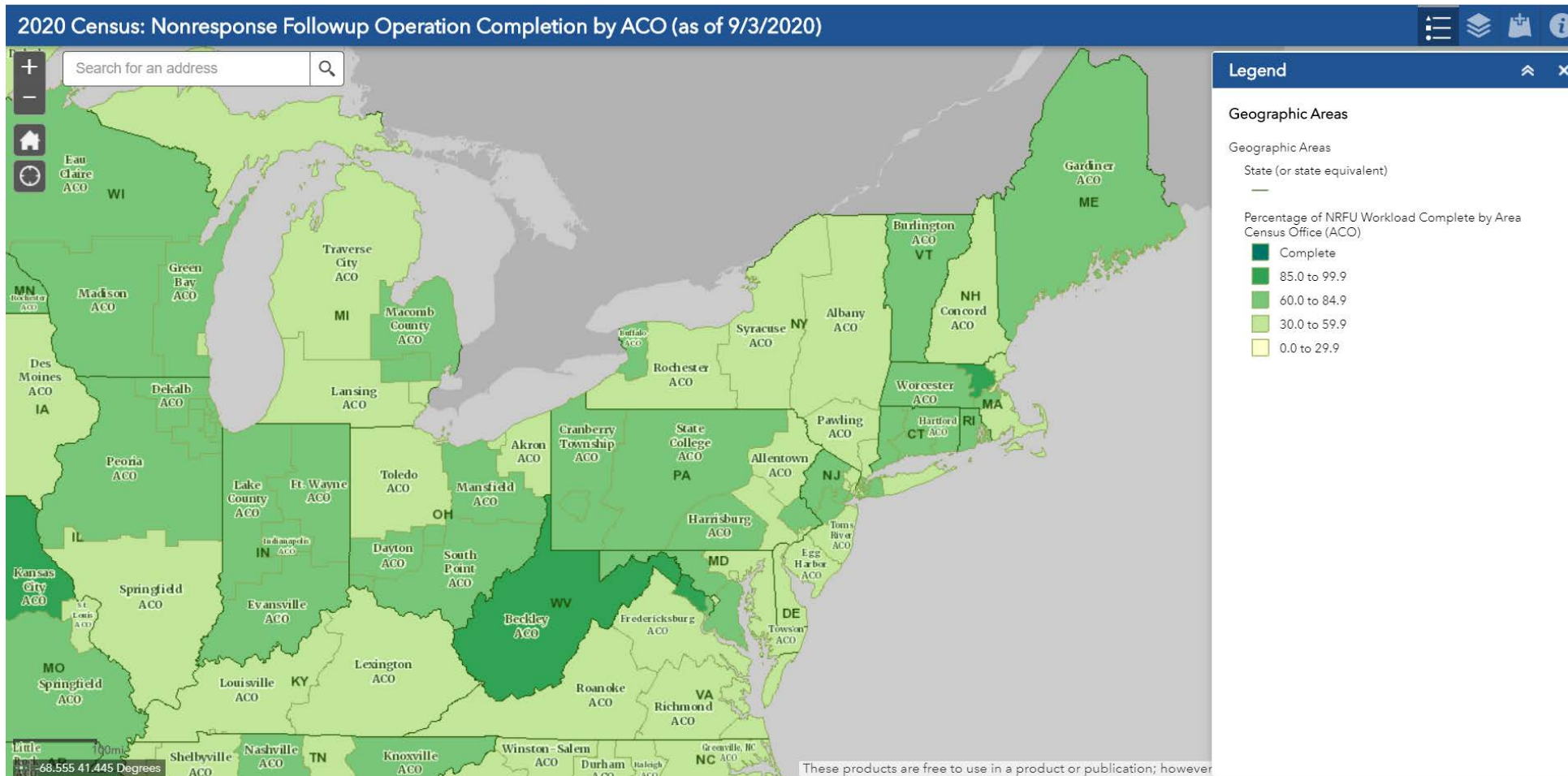
2020 Census
Conducting Nonresponse Followup

https://gis-portal.data.census.gov/arcgis/apps/webappviewer/index.html?id=771cf5999c6a4611acb397a3a342e0b0

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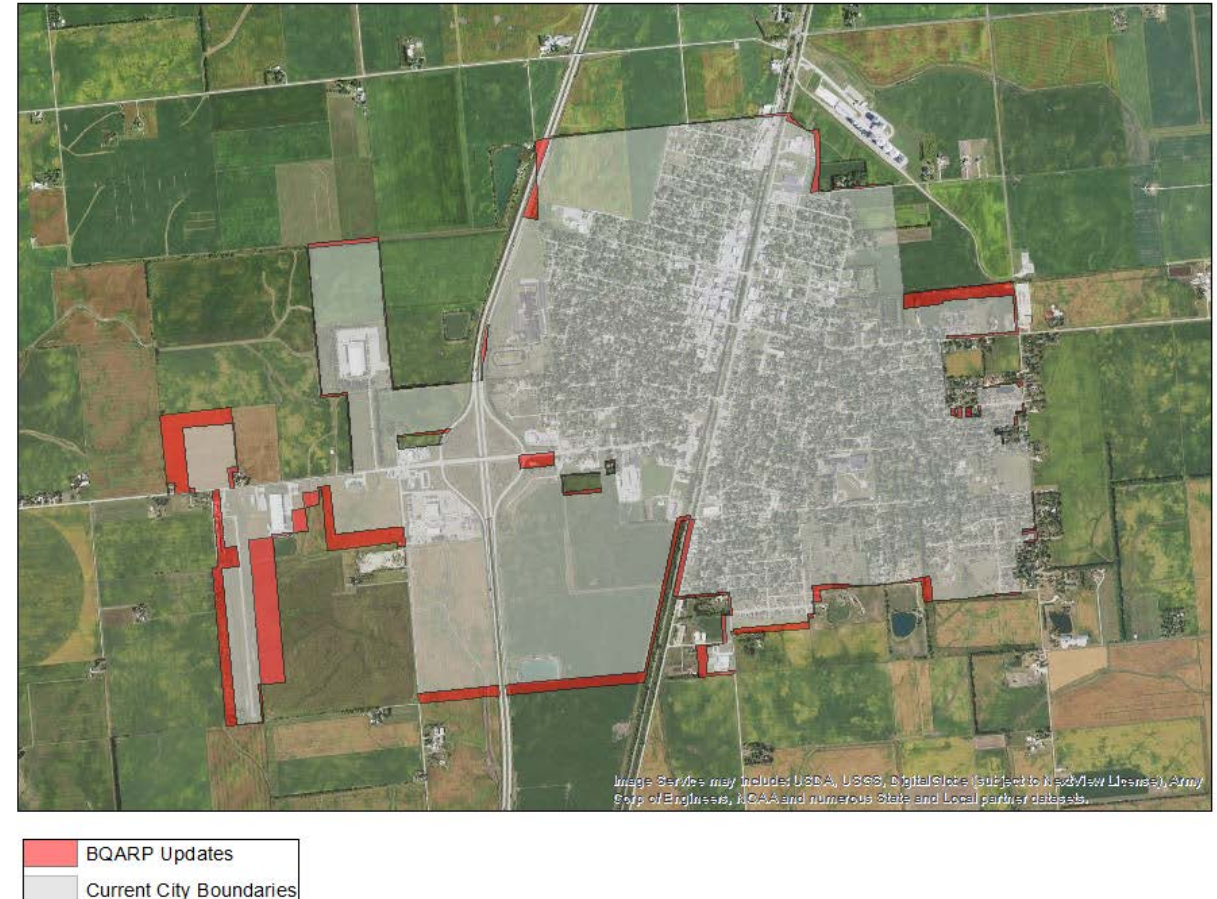START HERE >

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2020 Census
Tabulation and Dissemination

Accurate data require accurate boundaries for geographic areas.

Through the Boundary Quality Assurance and Reconciliation Project (BQARP), we corrected misalignment of boundaries for cities, towns, and other governmental entities in the TIGER data base using parcel data and other geospatial data sources.

Over 260,000 realignments have been made since the program began in 2015.

BQARP Updates in Ford County, Colorado

Image Service may include USDA, USGS, DigitalGlobe (subject to NextView License), Army Corp of Engineers, NOAA and numerous State and Local partner datasets.

BQARP Updates
Current City Boundaries

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Where Do We Go Next? Vision for the Future!

Vision for the Future
Enables Continuous Updates

	People	Process	Technology

People **Process** **Technology**

2010

Largest workforce in history leveraged to canvas the U.S. and Puerto Rico

In-person verification and update of 156 million records; Collected GPS points *in person;* processed **address data** from USPS and realigned all roads

*Field Data Collection Automation (FDCA) limits functionality to **addresses and features** for canvassing*

2020

*Reengineered field operations include **more automation and remote activities**, which reduced the number of field workers*
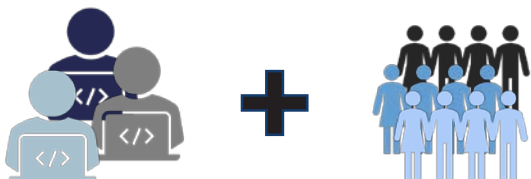
In-Office Address Canvassing *improves efficiency; deeper utilization of partner-provided address and spatial data to make MAF/TIGER updates more accurate and frequent*
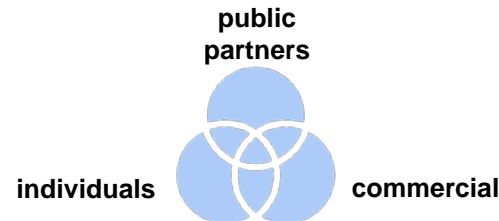
Listing and Mapping Application (LiMA) increases functionality to enable enumerators to capture data on tablets, on-the-spot

2030

Optimization of workforce allows GEO to focus on strategic innovation initiatives with increased enterprise-level impacts

public partners

individuals   **commercial**

Less restrictive validation with higher accuracy through individuals and public partnerships; commercial sources may fill gaps in federal, tribal, state and local sources

Enlist broader support to reduce cost of custom engineering and elevate functionality that also meets GEO standards

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Vision for the Future
Enables Continuous Updates

CORNERSTONES

Boundaries

Governmental unit boundaries for the nation, statistical areas

Addresses

Addresses for the nation, geocoding services

Features

Roads for the nation, product integration

Imagery

Sourced from federal, tribal, state, and local providers

Partnerships

Outreach and collaboration, data sharing

Expertise/Leadership

Expertise shared across international and domestic domains

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Vision for the Future
Six Cornerstones

> ### Looking Ahead

Addresses

- ❖ Continue Delivery Sequence File (DSF) Refresh
- ❖ Start continual In-Office Address Canvassing
- ❖ Conduct on-going updates for:
  - ➢ Non-residential addresses
  - ➢ Group quarters
  - ➢ Military housing
  - ➢ Transient locations
  - ➢ Island Areas
- ❖ Continue leadership on the Puerto Rico Address Data Working Group to improve address and geolocation data for Puerto Rico
- ❖ Explore greater contributions to the National Address Database

Features

- ❖ Identify where feature changes are occurring on the landscape and acquire appropriate source material to enable these updates within our system, products, and services
- ❖ Continue on-going road feature update within our system, products, and services
- ❖ Improve representation and spatial quality of non-road features (hydrographic, rail, etc.) within our system, products, and services

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Census 2020

Vision for the Future
Six Cornerstones

Looking Ahead

Boundaries

- ❖ Continue national Boundary and Annexation Survey (BAS), with annual nonresponse follow up
- ❖ Ongoing update of School District boundaries
- ❖ Continue leadership of the National Boundary Group
- ❖ Continued coordination of agencies to integrate national and international boundaries
- ❖ Consider the possibility of intercensal update of statistical geographic areas
- ❖ Assess need for new types of geographic areas for data tabulation (e.g., gridded data) as well as changes to concepts to keep pace with needs of analysts and policy makers (e.g., settlement classifications such as urban, suburban, rural, exurban)

Imagery

- ❖ Continue use of satellite and aerial imagery for change detection and system update
- ❖ Expand imagery expertise within the Census Bureau and integration of imagery with existing products and services
- ❖ Explore integration of other remote sensing sources, such as LiDAR, into change detection and system update
- ❖ Continue to advocate for open access to national satellite and aerial imagery sources within the federal community

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Vision for the Future
Six Cornerstones

Looking Ahead

Leadership

- ❖ Provide geospatial subject matter and policy leadership in engagements with partners, and national and international organizations
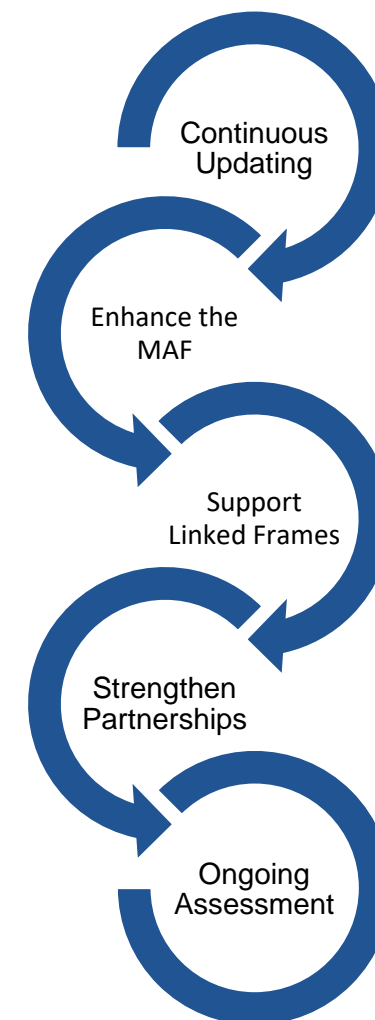- ❖ Expand staffing structure necessary to support these leadership positions and responsibilities

Partnership

- ❖ Maintain relationships with tribal, federal, state, and local governments
- ❖ Explore mechanisms for more efficiently sharing data amongst these organizations

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Vision for the Future
Geographic Support Program of the Future

- Continuous updating of addresses, features, and boundaries through the decade.
  - ❖ Identify and utilize the best data sources and methods based on need and context.

- Enhance the MAF to be a compendium of all addresses – residential, non-residential, and mixed use—needed to support all areas of the Census Bureau.

- Support the vision for efficient linking of the Census Bureau's foundational datasets to maximize integration and enterprise-wide use of our rich array of data assets:
  - ❖ Geospatial Frame
  - ❖ Business Frame
  - ❖ Job Frame
  - ❖ Demographic Frame

- Strengthen partnerships at all levels of government as well as with other sectors and organizations.

- Ongoing assessment of utility and relevance of data objects, attributes, and concepts.
  - Utilize data science methods to measure quality and coverage, plan and coordinate update processes, and evaluate our effectiveness.

Continuous Updating

Enhance the MAF

Support Linked Frames

Strengthen Partnerships

Ongoing Assessment

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Vision for the Future
Creating an Integrated and linked Infrastructure to Modernize the Census Bureau's Statistical Foundation

Thank You

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