JOINT FLORIDA
Model Task Force & Transportation
Data and Analytics Workshop

# 2020 Census

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# Census History

# Changes between 2010 and 2020 Census

- Aerial imagery to confirm address
  - 150,000 fieldworkers (2010) vs 50,000 fieldworkers (2020)
- $1.22/U.S. resident vs $1.43/U.S. resident (projected)
- Internet responses
- Fewer Census takers
  - 600,000 in 2010 vs 475,000 in 2020

**Projected congressional reapportionment after the 2020 Census**

Source: https://www.washingtonpost.com/graphics/2019/national/census-2020-technology/

# Census Timeline

| | |
|---|---|
| 5-year CTPP (2012-2016) | March 31 2019 |
| ACS 1-yr (2018 data) | September 26th 2019 |
| ACS 5-yr (2014-2018) | December 19 2019 |
| PUMS 1-yr (2018 data) | November 14th 2019 |
| PUMS 5-yr (2014-2018 data) | January 30th 2020 |
| Apportionment Counts State Pop Totals (2020) | By December 31, 2020 |
| 2020 Population Counts for all Census geography (PL 94-171) | By March 31, 2021 |
| 2020 Census Data to the Public | December 2021 |
| 2020 TIGER Files (new Block, BG and Tracts) | November 2020 - February 2021 |
| New Urban Area Geographies Released | Spring 2022 |

# Census Geography

- 2020 Census Participant Statistical Areas Program (PSAP) enables review of geography
  - The Census Bureau also will use the statistical areas defined for the 2020 Census to tabulate data for the annual American Community Survey (ACS) estimates and the Economic Census.
- CTPP no longer releasing TAZs and TAD
  - Future CTPP products will use only standard geography (https://www.fhwa.dot.gov/planning/census_issues/ctpp/status_report/sr0118/)

- **March - May 2018:** Census Bureau contacted 2010 Census PSAP participants to inquire about 2020 Census PSAP participation. ✓
- **July 2018:** Census Bureau distributed 2020 Census PSAP invitation materials to 2020 Census PSAP participants. ✓
- **January 2019:** 2020 Census PSAP delineation phase began. Participants had 120 calendar days to submit updates. ✓
- **January - February 2019:** Census Bureau conducted 2020 Census PSAP webinar trainings. ✓
- **July 2019:** Census Bureau conducted closeout of the 2020 Census PSAP delineation phase. ✓
- **January 2020:** 2020 Census PSAP verification phase begins. Participants have 90 calendar days upon receipt of the verification announcement to review the 2020 statistical areas and submit corrections. ✓
- **April 2020:** 2020 Census PSAP verification phase ends.
- **September 2020:** Census Bureau plans to conduct closeout of the 2020 Census PSAP verification phase.
- **November 2020 - February 2021:** 2020 statistical areas available for public use.

Source: https://www.census.gov/programs-surveys/decennial-census/about/psap.html

# Differential Privacy

- Why now? – Respondent privacy built in Census Bureau DNA

- Why now? – It's the law

*"To stimulate public cooperation necessary for an accurate census…Congress has provided assurances that information furnished by individuals is to be treated as confidential. Title 13 U.S.C. §§ 8(b) and 9(a) explicitly provide for nondisclosure of certain census data, and* ***no discretion is provided to the Census Bureau on whether or not to disclose such data…"*** (U.S. Supreme Court, Baldrige v. Shapiro, 1982)

- Why now? – More data and faster computers
  - Proliferation of databases
  - Complex, large-scale calculations with increasing ease

# Differential Privacy – Reconstruction and Re-identification

| Age | Sex | Race | Relationship |
|---|---|---|---|
| 66 | Female | Black | Married |
| 84 | Male | Black | Married |
| 30 | Male | White | Married |
| 36 | Female | Black | Married |
| 8 | Female | Black | Single |
| 18 | Male | White | Single |
| 24 | Female | White | Single |

| | Count | Median | Mean |
|---|---|---|---|
| Total | 7 | 30 | 38 |
| # Female | 4 | 30 | 33.5 |
| # male | 3 | 30 | 44 |
| # black | 4 | 51 | 48.5 |
| # white | 3 | 24 | 24 |
| Married | 4 | 51 | 54 |
| Black F | 3 | 36 | 36.7 |

**Reconstruction**

Dataset A

| Person 1 | Person 2 |
|---|---|
| A | X |
| B | Y |
| C | Z |

+

External Dataset B

| Joe Smith | Jane Doe |
|---|---|
| C | Z |

| Joe Smith | Jane Doe |
|---|---|
| A | X |
| B | Y |
| C | Z |

**Re-identification**

Source: https://www2.census.gov/about/policies/2019-11-paper-differential-privacy.pdf?#

# Differential Privacy – A Definition

-quantifies the precise amount of privacy risk…

-for all calculations/tables/data products produced…

-no matter what external data is available…

-now, or at any point in the future!

Source: https://www2.census.gov/about/policies/2019-11-paper-differential-privacy.pdf?#

# Differential Privacy – Epsilon

- The only way to absolutely eliminate all risk of re-identification would be to never release any usable data
- Differential privacy allows you to quantify a precise level of "acceptable risk"
- This measure is called the "Privacy Budget" or "Epsilon"
  - $\varepsilon=0$ (perfect privacy)
  - $\varepsilon=\infty$ (perfect accuracy)
- Each calculation, query, or tabulation of the data consumes a fraction of the privacy-loss budget
  - $(\varepsilon_1 + \varepsilon_2 + \varepsilon_3 + \varepsilon_4 \ldots + \varepsilon_n = \varepsilon_{Total})$
- Calculations/tables for which high accuracy is critical can receive a larger share of the overall privacy-loss budget

Source: https://www2.census.gov/about/policies/2019-11-paper-differential-privacy.pdf?#

# Differences – 2020 Census Vs Previous Census

**2000 and 2010 Census**

**2020 Census**

boyd, d. 2019. "Balancing Data Utility and Confidentiality in the 2020 US Census". https://datasociety.net/wp-content/uploads/2019/12/Differential_Privacy_12172019.pdf

# Transportation Implications

- Transportation communities relies upon small geography data
- Determine data products in advance – Because of the need for a global privacy loss budget and its allocation across all tables and features
- Invariants – Invariants at the state level
- Only positive whole numbers
- ACS implications going to be even more profound
  - Postponed till 2025

## Thank You

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