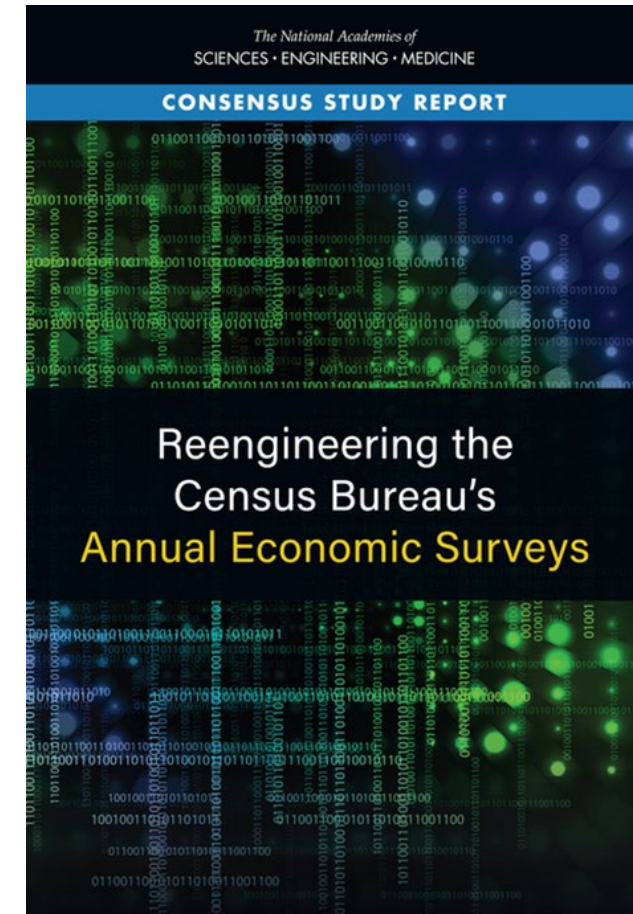


# Annual Integrated Economic Survey (AIES)

Federal Economic Statistics Advisory Committee (FESAC)  
December 2021

# Project Background

- The Census Bureau requested the Committee on National Statistics to review our portfolio of annual economic surveys.
- Economic Directorate leadership assessed the recommendations and determined the scope.
- The end result of this large-scale effort will be a new program called the **Annual Integrated Economic Survey (AIES)**.



# Drivers of this Effort



Meet data needs –  
timely, granular,  
standardized



Declining budgets



Improve efficiency – consistency  
across programs (content,  
processes, systems)



Declining response rates

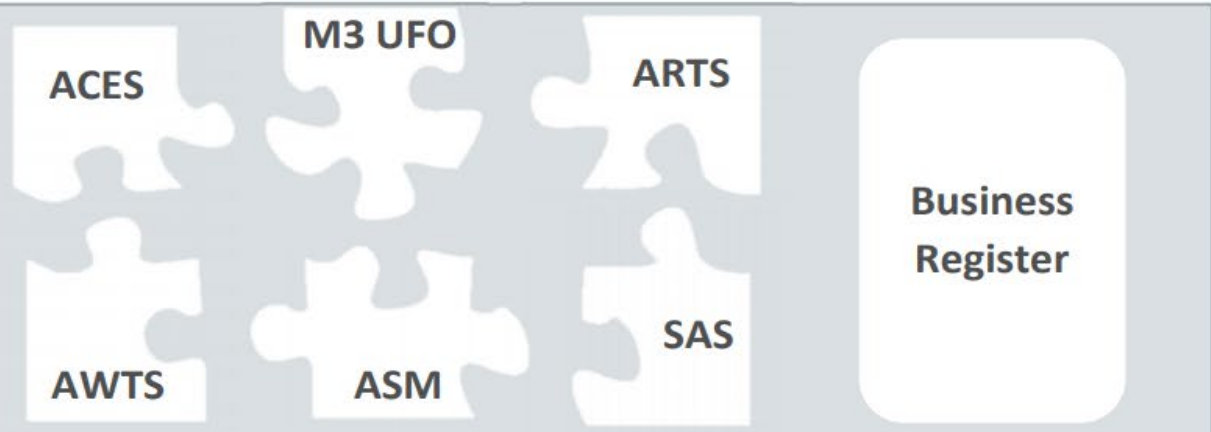


Stay relevant

# Annual Integrated Economic Survey (AIES)

Current State

- Industry focused
- Overlapping content
- National estimates
- Independent samples
- Different reporting units by program
- Inefficient processes and operations
- Varying classification systems



Future State

- Single source of truth for a company
- Continuous two way updates from surveys
- Alignment to enterprise programs
- Respondent centric
- Rotating content
- Coordinated collection and instruments
- Harmonized reporting units
- Targeted, coordinated sample
- National and state estimates
- Fully leverage alternative data
- Consistent classification systems
- Blended data products

Integrated Frame



2019



2020



2021



2022



2023



2024



Coordinate collection across SAS/ARTS/AWTS, conduct early sample research

Evaluate existing content and provide high level recommendations

Harmonize Content, Perform Cognitive Testing, Create Fame Prototype and HL Sample Design

Finalize Content & Modules, Conduct Field & Usability Testing

Develop Instrument, Finalize Frame, Draw Sample

Mail New Annual Integrated Economic Survey (AIES)



# Key AIES Improvements

- Holistic Approach
- Coordinated Sample
- One Data Collection and Instrument
- Modular Design
- Sub-national level data for Retail, Wholesale and Services
- Expanded product data (available for Retail, Wholesale, and Services)
- Common Systems and Tools
- Common Release Schedule

# Stakeholders

## Leadership Support

- Executive Sponsors  
Econ Associate Director  
Econ Assistant Director
- Senior Leadership Team  
Econ Associate Director  
Econ Assistant Director  
Econ Division Chiefs  
CES Division Chief
- Portfolio Management  
Governing Board (PMGB)

## Stakeholder Divisions

- Economic Applications Division (EAD)
- Economic Indicators Division (EID)
- Economic Management Division (EMD)
- Economic Statistical Methods Division (ESMD)
- Economy-Wide Statistics Division (EWD)

## AIES Internal Stakeholders

System Development and Implementation			
Survey Design and Integration			
Respondent Research			
Frame & Methods Component	Content Component	Operations Component	Alignment Component
Frame Improvements	2022 Econ Census Content Determination	Collection Strategy	Alternative Data Sources
Sampling	Annual Content Determination and Harmonization	Data Management	Full Service Account Manager Program
Frame & Sample Maintenance	Annual Data Products	Instrument Design	Analyst Toolkit
Estimation and Imputation	Data Review, Analysis and Correction	Data User Outreach	Indicator Alignment
Data Editing		Dissemination	
Disclosure Methodology			

### Budget Integration

- Economic Directorate Support Services (EDSS)
- CFO Budget Division (BUD)

### Enterprise Collaborators

Center for Enterprise Dissemination Services and Consumer Innovation (CEDSCI)	Data Architecture Standards	Data Ingest and Collection for the Enterprise (DICE) – Centurion 2.0	Data Ingest and Collection for the Enterprise (DICE) – QDM	Data Science Training Program
Disclosure Modernization	Enterprise Data Lake	Enterprise Frames Team	Improving Design of Web Surveys through Standardized Practices	

## Forums

- Federal Statistical Research Data Centers (FSRDC)
- Census Scientific Advisory Committee (CSAC)
- Federal Economic Statistics Advisory Committee (FESAC)
- National Association of Business, Economics and Technology (NABE)
- Federal Committee on Statistical Methodology (FCSM)
- State Data Centers (SDCs)

## AIES External Stakeholders

### Main Agency Collaborators

Federal Reserve Board (FRB)	Bureau of Labor Statistics (BLS)	Bureau Economic Analysis (BEA)	Centers for Medicare & Medicaid Services (CMS)
Industrial Production and Capacity Utilization, Index of Capital Production	Annual productivity series, producer price indexes, annual supply use tables	GDP, input/output accounts, capital stock estimates, GNP weight deflators	National Health Accounts, Health Care Providers Structure of Costs Analysis
National Institute of Standards and Technology (NIST)	Department of Commerce	Office of Management and Budget (OMB)	Congress
Manufacturing extension partnership	Data products use	Chief Statistician of the Federal statistical system	Appropriations and Budget

### Strategies

Federal Register Notices	Consultation with Key Federal Data Users	Account Managers Program	Customer Interaction Platform (eCorrespondence)
Selected Business Associations	Accounting Experts	Consultation, Cognitive	Consultation with Trade Associations
		Promotion and Outreach	



U.S. Department of Commerce  
Economics and Statistics Administration  
U.S. CENSUS BUREAU  
[census.gov](https://www.census.gov)

# Annual Program Requirements

- **Helped to shape the new integrated annual survey**
- **Evaluated existing requirements for the individual in-scope surveys**
  - Decided which requirements to keep
  - Standardized requirements across trades, where possible
  - Determined necessary modifications
- **Developed new, overarching requirements, as needed**
- **Updated as Sampling Team develops comprehensive sample design**

# Annual Program Requirements include:

- **General requirements and working assumptions**
  - Overview of the survey
    - Frequency of collection
    - Coordinated sample
    - In-scope trades/data items/NAICS levels
    - Classification systems
- **Guidelines**
  - Administrative data
  - Government-operated establishments
  - Nonemployer coverage



# Annual Program Requirements include (cont):

## Industry coverage

- Align across the annual programs
  - Different NAICS levels for national and subnational estimates
- **Geography**
  - National
  - Divisional/Regional
  - State
- **Sampling requirements/reliability constraints (CV)**
  - Core Business Statistics
  - Products (secondary)

# Product Release

For AIES we plan to release:

- **Core Business Statistics**, which will include data for common program items at detailed NAICS levels
- **Geographic Area Statistics**, which will include:
  - For Retail, Wholesale and Services, estimates for revenue, payroll and employment for selected states and balance of region at a consistent NAICS level
- **Product Statistics**, which will include:
  - NAPCS broad lines for select trades/industries
- **Miscellaneous Subjects**
  - Industry specific items at the national level at detailed NAICS levels

# Current Work

- Continue to negotiate and work through program requirement obstacles
- Identify data items needed for bridge or reconciliation purposes
- Standardize variable names and align with the economic census where possible
- Continue to work with internal and external stakeholders

# Future Goals & Milestones

- Determine AIES sample size
  - Balance accuracy and availability of subnational estimates with workload constraints
- Determine feasibility of producing nonemployer estimates for manufacturing and wholesale
- Eliminate the use of non-standard NAICS across all trades and data items
- Identify NAICS publication levels for “select” 5- and 6-digits
- Develop economy-wide data products planned for publication

# Content Harmonization

- **Purpose of the content team:** Review existing survey content for the in-scope surveys and harmonize for collection in the integrated annual survey. In order to do this, started by:
  - **Making high-level recommendations on content**
    - Built content repository
    - Assigned topics and sub-topics to all existing content
    - Identified and documented stakeholder needs and uses of annual data
  - **Identifying content for each of the topic-based modules**
    - Standardized and harmonized content
    - Collaborated with framework team
    - Starting point for development and testing



# Draft Modules and Topics

- **Module 1**

- Business Classification
- Business Characteristics
  - Operational Status
  - Organizational Change
- High-level Company Totals
- Collection Process

- **Module 2**

- Detailed Revenues
- Products
- Detailed Expenses

- **Module 3**

- Assets
- Liabilities
- Inventories
- Capital Expenditures

- **Module 4**

- All other topics not previously covered

# Research To Date

- Conducted a record-keeping study to see how businesses maintain their books and get a better idea of data accessibility
- Carried out a coordinated collection pilot, consolidating contacts and communication within companies in multiple in-scope surveys

# Next Steps for Content

- **Test our content**
  - Conduct cognitive testing and a Pilot Survey in 2022
- **Prepare to process the data**
  - Determine program requirements and systematic solutions, leveraging latest technology
- **Align content with other programs**
  - Use sound data management principles to standardize variable names to align across programs, including the Economic Census

# Next Steps for Content Time Series Evaluation

We are evaluating on an item-by-item basis any changes to content between AIES and the current programs.

- Plan is to evaluate each item separately to determine impact
- AIES Product Team will compare proposed publication series to historical ones and determine any necessary mitigation strategies
- Once we have a full list of series changes and proposed mitigation strategies together, will begin discussion with internal and external stakeholders

# Frame Background

- Build a list of employer business units from the Business Register (BR) for use for AIES sampling research that meet program requirements
- Include content from the BR and the Economic Census needed for the AIES sample and subsequent processing activities
- Review existing methods used to create inputs to the sampling frame:
  - Align where possible to common methodology
  - Understand and document unique constraints
  - Develop list for future research/action
- Establish a production process



# Frame Accomplishments & Current Work

- **Completed:**
  - Developed Frame prototype using latest BR data
    - Currently being used for the sampling team for research
- **In Progress**
  - Refinement of frame based on input from sampling team
  - Delivery of updated production frame targeted for November 2022

# Sampling Design Requirements (Totals)

## National

- Revenue/receipts, Annual Payroll, Inventories, Capital Expenditures...
- Disaggregated industry (NAICS) levels
  - Differs by sector
  - 4-digit NAICS, 5-digit NAICS, 6-digit NAICS

## Subnational (Geographic)

- Revenue/receipts, Annual Payroll, 1<sup>st</sup> Quarter Employment
- Aggregated NAICS levels (3-digit, 4-digit)
  - “Direct use” states (meet target reliability for Annual Payroll)
    - 26 states
    - Allocated within region
  - “Balance” of region category for non-direct use states

# Sampling Unit = Company

## ***Option 1: Sample multi-industry company in one industry***

- Collect roster data
  - Company lists all industries
  - Company reports for all industries
- Sampling issues:
  - Bias in industry-sampling stratum (overrepresentation)
  - Bias in other industries (underrepresentation)

## ***Option 2: Create more than one artificial sampling unit for each company, with each sampling unit representing expected proportion of activity in industry***

- Collect industry-specific data
- Sampling issue:
  - Spurious allocation leads to bias!

# Current Decision: Sidestep Both Options

- “Complexity” determines initial certainty status

	Number of Sectors	Number of Industries*	Number of States	Status	Sampling Weight
Company operates in	2 or more	2 or more	(Not considered)	Certainty	1
	1	3 or more	(Not considered)	Certainty	1
	1	2	2+	Certainty	1
	1	2	1	Noncertainty**	> 1
	1	1	2+	Noncertainty	> 1

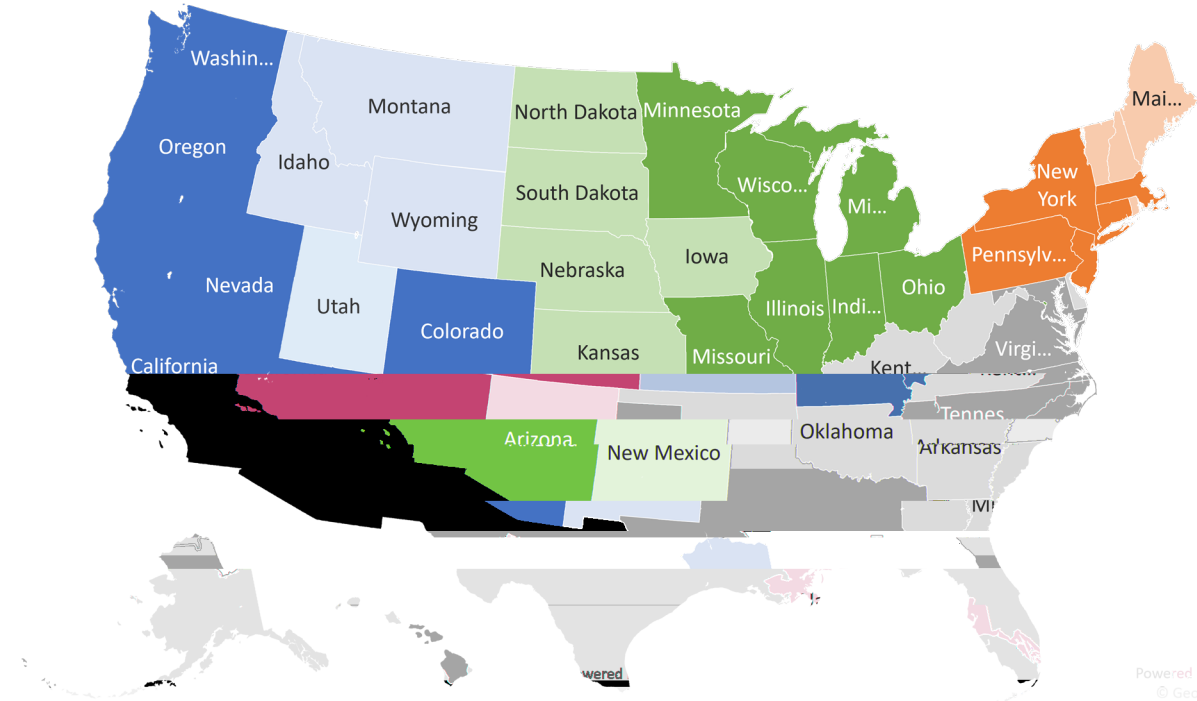
\* 4-digit NAICS industry

\*\*Sectors 44, 45, 62

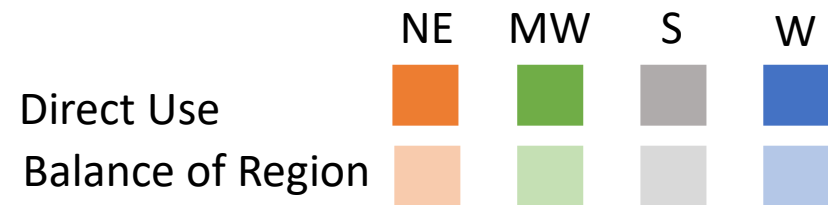
- The designated certainty units are excluded from sampling

# Targeted Direct Use States

	Region			
	Northeast	Midwest	South	West
State	Connecticut	Illinois	Florida	Arizona
	Massachusetts	Indiana	Georgia	California
	New York	Michigan	Maryland	Colorado
	New Jersey	Minnesota	North Carolina	Nevada
	Pennsylvania	Missouri	South Carolina	Oregon
		Ohio	Tennessee	Washington
		Wisconsin	Texas	
			Virginia	
Allocated	5	7	8	6
Total	9	12	16	13



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# Sampling Team Accomplishments

- Developed end-to-end high level skeleton survey design using drafted Annual Program requirements provided
  - Sampling unit is the company
  - Annual Payroll is the measure of size variable
  - Initial stratification criteria
    - Assessed establishment counts by NAICS and state to determine feasibility of producing *publishable* state-level estimates
    - Refinements may be needed depending on strata counts and strata allocations
  - Power allocations
  - Probability proportional to size (PPS) sampling
    - Inclusion probabilities designed for multi-purpose design
- Determined sample selection procedure
  - Stratified sequential sampling (Chromy method)

# Sampling Team Current Work

- Winsorization procedure (under development)
  - Prevent overly-large weights
  - Designed to minimize sampling variance
- Develop end-to-end sampling code for research (under development)
  - Propose alternative AIES sample sizes
- Incorporate indicator sampling design
- Determine frequency of sample
- Assess response burden
  - May consider rotation options/time-in-sample constraints

# Still to determine...

- Collection Instrument Requirements
- Data Processing and Analysis System/Tools
  - New edits required
  - Imputation methodology to be developed
  - Estimation/weighting (national and subnational estimates)
  - Variance estimation
- Data Disclosure Avoidance
- Detailed Dissemination Plan

# Challenges

- Establishing the appropriate collection unit
- Determining which processing system to use since current in-scope surveys process data in different systems
- Conducting the pilot
- Availability of enterprise solutions
- Adequate resources and competing priorities
- Inability to recycle current methodology

# Key Tasks/Deliverables

Key Task/Deliverable	Planned Timeframe
Conduct cognitive testing	Oct. 2021 – Mar. 2022
Complete the pilot survey	Jan. – Dec. 2022
Deliver production frame methodology and programs	Sept. 2022
Finalize instrument requirements	Oct. 2022
Obtain the sample	Jul. - Aug. 2023
Perform usability testing	Jul. - Aug. 2023
Receive production-ready instrument	Dec. 2023
Mail the Annual Integrated Economic Survey	Jan.-Mar. 2024
Release new products	2025





# THANK YOU

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